Cessna
A Textron Company

Service Manual

1977 Thru 1986

MODEL 182 & T182 SERIES

Member of GAMA

FAA APPROVAL HAS BEEN OBTAINED ON TECHNICAL DATA IN THIS PUBLICATION THAT AFFECTS AIRPLANE TYPE DESIGN.

REVISION 3 TO THE BASIC MANUAL INCORPORATES TEMPORARY REVISION I, DATED 3 OCTOBER, 1994.

D2068-3-13
(RGI-100-5/01)

1 MAY 1985

REVISION 3 2 JANUARY 1996

Cessna
A Textron Company

TEMPORARY REVISION NUMBER 3

DATE 7 October 2002

MANUAL TITLE	1977 Thru 1986 Model 182 & T182 Series Service Manual
MANUAL NUMBER - PAPER COPY	D2068-3-13
MANUAL NUMBER - AEROFICHE	D2068-3-13AF
TEMPORARY REVISION NUMBER	D2068-3TR3

MANUAL DATE 1 May 1985 **REVISION NUMBER** 3 **DATE** 2 January 1996

This Temporary Revision consists of the following pages, which affect and replace existing pages in the paper copy manual and supersede aerofiche information.

SECTION	PAGE	AEROFICHE FICHE/FRAME	SECTION	PAGE	AEROFICHE FICHE/FRAME
2	34	1/C20			
2	34A/Deleted	NA			
2	38	1/C24			
2	39	1/D01			
2	40	1/D02			
2	40A	Added			
2	40B	Added			
15	24C	Added			
15	24D	Added			

REASON FOR TEMPORARY REVISION

1. To add a Component Time Limits section and a fuel quantity indicating system operational test.

FILING INSTRUCTIONS FOR THIS TEMPORARY REVISION

1. For Paper Publications, file this cover sheet behind the publication's title page to identify the inclusion of the Temporary Revision into the manual. Insert the new pages into the publication at the appropriate locations and remove and discard the superseded pages.

2. For Aerofiche Publications, draw a line with permanent red ink marker, through any aerofiche frame (page) affected by the Temporary Revision. This will be a visual identifier that the information on the frame (page) is no longer valid and the Temporary Revision should be referenced. For "added" pages in a Temporary Revision, draw a vertical line between the applicable frames. Line should be wide enough to show on the edges of the pages. Temporary Revisions should be collected and maintained in a notebook or binder near the aerofiche library for quick reference.

TEMPORARY REVISION NUMBER 2

DATED 7 January 2000

MANUAL TITLE 1977 THRU 1986 MODEL 182 & T182 SERIES SERVICE MANUAL

MANUAL NUMBER - PAPER COPY D2068-3-13 **AEROFICHE** D2068-3-13AF

TEMPORARY REVISION NUMBER PAPER COPY D2068-3TR2 **AEROFICHE** N/A

MANUAL DATE 1 MAY 1985 **REVISION NUMBER** 3 **DATE** 2 JANUARY 1996

This Temporary Revision consists of the following pages, which affect existing pages in the paper copy manual and supersede aerofiche information.

SECTION	PAGE	AEROFICHE FICHE/FRAME	SECTION	PAGE	AEROFICHE FICHE/FRAME
2	34A	Added			
18	4A	Added			
18	4B	Added			

REASON FOR TEMPORARY REVISION

To include the inspection requirements of Cessna Service Bulletin SEB99-18.

To provide additional information for the stop drilling of cracks that originate at the trailing edge of control surfaces with corrugated skins.

FILING INSTRUCTIONS FOR THIS TEMPORARY REVISION

For Paper Publications:

File this cover sheet behind the publication's title page to identify the inclusion of the Temporary Revision into the manual. Insert the new pages into the publication at the appropriate locations. Draw a line, with a permanent red ink marker, through any superceded information.

For Aerofiche Publications:

Draw a line through any aerofiche frame (page) affected by the Temporary Revision with a permanent red ink marker. This will be a visual identifier that the information on the frame (page) is no longer valid and the Temporary Revision should be referenced. For "added" pages in a Temporary Revision, draw a vertical line between the applicable frames which is wide enough to show on the edges of the pages. Temporary Revisions should be collected and maintained in a notebook or binder near the aerofiche library for quick reference.

LIST OF EFFECTIVE PAGES

INSERT LATEST REVISED PAGES. DESTROY SUPERSEDED PAGES.

NOTE

The portion of the text affected by the revision is indicated by a vertical line in the outer margins of the page. Changes to illustrations are indicated by miniature pointing hands.

Original	0	1 May 1985
Revision	1	1 October 1985
Revision	2	1 June1992
Revision	3	2 January 1996

TOTAL NUMBER OF PAGES IN THIS PUBLICATION IS 696.

* The asterisk indicates pages changed, added, or deleted by the current change.

Page No.	Revision No.
*Title	3
*A thru C	3
i	2
*ii thru iv	3
*1-1	3
1-2 thru 1-3	0
1-4 thru 1-14	1
1-15	2
*1-16	3
1-17 thru 1-21	2
1-22 Blank	2
*2-1	3
2-2 thru 2-3	0
2-4 thru 2-7	1
*2-8	3
2-9 thru 2-14	1
2-15 thru 2-18	0
2-19 thru 2-20	1
2-21 thru 2-23	0
2-24 thru2-27	2
*2-28	3
2-29 thru 2-31	2
*2-32	3
2-33 thru 2-36	2
*2-37 thru 2-39	3
2-40 thru 2-43	2
*2-44 thru 2-71	3
*2-72 Blank	3
3-1 thru 3-2	1
3-3	0
3-4 thru 3-6	1
3-7 thru 3-15	0
3-16	2
3-17	0
3-18	1
3-19 thru 3-20	0
3-20A	0
3-20B Blank	0
3-21 thru 3-23	0
3-24 thru 3-25	1
3-26 thru 3-28	0
4-1	1
4-2 thru 4-3	0
4-4 thru 4-8	1
5-1 thru 5-2	1
5-3	0
5-4 thru 5-5	1
5-6	0
5-7 thru 5-9	1
5-10 thru 5-12	0
5-12A	1
5-12B Blank	1
5-13 thru 5-16	0
5-17	1
5-18 thru 5-25	0
5-26	1
5-27 thru 5-33	0
5-34	1
*5-35	3
5-36	1
*5-37	3
*5-38 Blank	3
6-1	1
6-2 thru 6-6	0
6-7	1
6-8	0
7-1	1
7-2 thru 7-6	0
*7-7	3
7-8 thru 7-10	0
8-1	1
8-2 thru 8-6	0
9-1	1
9-2 thru 9-5	0

LIST OF EFFECTIVE PAGES

Upon receipt of a revision to this book, personnel responsible for maintaining this publication in current status should ascertain that all previous revisions have been received and incorporated.

TABLE OF CONTENTS

WARNING

When performing any inspection or maintenance that requires turning on the master switch, installing a battery, or pulling the propeller through by hand, treat the propeller as if the ignition switch were ON. Do not stand, nor allow anyone else to stand, within the arc of the propeller, since a loose or broken wire, or a component malfunction, could cause the propeller to rotate.

CROSS REFERENCE LISTING OF POPULAR NAME VS. MODEL NUMBERS AND SERIALS

All aircraft, regardless of manufacturer, are certified under model number designations. However, popular names are often used for marketing purposes. To provide a consistent method of referring to these aircraft, the model number will be used in this publication unless the popular name is necessary to differentiate between versions of the same basic model. The following table provides a listing of popular name, model number and serial number.

POPULAR NAME	MODEL YEAR	MODEL	SERIAL BEGINNING	SERIAL ENDING
SKYLANE	1977	182Q	18265176	18265965
SKYLANE II	1978	182Q	18263479, 18265966	18266590
	1979	182Q	18266591	18267300
	1980	182Q	18267301	18267715
REIMS/CESSNA SKYLANE	1977	F182P	F18200026	F18200064
REIMS/CESSNA SKYLANE II				
F SKYLANE	1978	F182Q	F18200065	F18200094
F SKYLANE II	1979	F182Q	F18200095	F18200129
	1980	F182Q	F18200130	F18200169
SKYLANE	1981	182R	18267302, 18267716	18268055
TURBO SKYLANE	1982	182R	18268056	18268293
SKYLANE II	1983	182R	18268294	18268368
TURBO SKYLANE II	1984	182R	18268369	18268434
SKYLANE	1985	182R	18268435	18268541
TURBO SKYLANE	1986	182R	18268542	18268586
SKYLANE-WITH VALUE GROUP A				
TURBO SKYLANE-WITH VALUE GROUP A				

INTRODUCTION

This manual contains factory-recommended procedures and instructions for ground handling, servicing, and maintaining Cessna 182 Series Models. The 182 and T182 Series Models covered in this manual are identical, except the Model T182 is turbocharged. Besides serving as a reference for the experienced mechanic, this manual also covers step-by-step procedures for the less experienced. If properly used, it will better enable the mechanic to maintain Cessna 182 Series airplanes and thereby establish a reputation for reliable service.

This service manual is designed for aerofiche presentation. To facilitate the use of the aerofiche, refer to the aerofiche header for basic information.

KEEPING CESSNA PUBLICATIONS CURRENT

The information in this publication is based on data available at the time of publication and is updated, supplemented, and automatically amended by all information issued in Service News Letters, Service Bulletins, Supplier Service Notices, Publication Changes, Revisions, Reissues and Temporary Revisions. All such amendments become part of and are specifically incorporated within this publication. Users are urged to keep abreast of the latest amendments to this publication through information available at Cessna Authorized Service Stations or through the Cessna Product Support subscription services. Cessna Service Stations have also been supplied with a group of supplier publications which provide disassembly, overhaul, and parts breakdowns for some of the various supplier equipment items. Suppliers publications are updated, supplemented, and specifically amended by supplier issued revisions and service information which may be reissued by Cessna; thereby automatically amending this publication and is communicated to the field through Cessna's Authorized Service Stations and/or through Cessna's subscription services.

WARNING: ALL INSPECTION INTERVALS, REPLACEMENT TIME LIMITS, OVERHAUL TIME LIMITS, THE METHOD OF INSPECTION, LIFE LIMITS, CYCLE LIMITS, ETC., RECOMMENDED BY CESSNA ARE SOLELY BASED ON THE USE OF NEW, REMANUFACTURED, OR OVERHAULED CESSNA APPROVED PARTS. IF PARTS ARE DESIGNED, MANUFACTURED, REMANUFACTURED, OVERHAULED, PURCHASED, AND/OR APPROVED BY ENTITIES OTHER THAN CESSNA, THEN THE DATA IN CESSNA'S MAINTENANCE/SERVICE MANUALS AND PARTS CATALOGS ARE NO LONGER APPLICABLE AND THE PURCHASER IS WARNED NOT TO RELY ON SUCH DATA FOR NON-CESSNA PARTS. ALL INSPECTION INTERVALS, REPLACEMENT TIME LIMITS, OVERHAUL TIME LIMITS, THE METHOD OF INSPECTION, LIFE LIMITS, CYCLE LIMITS, ETC., FOR SUCH NON-CESSNA PARTS MUST BE OBTAINED FROM THE MANUFACTURER AND/OR SELLER OF SUCH NON-CESSNA PARTS.

1. REVISIONS/CHANGES. These are issued to the Service Stations by Cessna Aircraft Company for this publication as required, and include only pages that require updating.

2. REISSUE. Manual is reissued to Service Stations as required, and is a complete manual incorporating all the latest information and outstanding revisions/changes. It supersedes and replaces previous issue(s).

REVISIONS/CHANGES and REISSUES can be purchased from your Cessna Service Station or directly from the Cessna Parts Distribution, (CPD 2) Dept. 701, Cessna Aircraft Company, 5800 East Pawnee, Wichita, Kansas 67201.

All supplemental service information concerning this manual is supplied to all appropriate Cessna Service Stations so that they have the latest authoritative recommendations for servicing these Cessna aircraft. Therefore, it is recommended that Cessna owners utilize the knowledge and experience of the Cessna Service Station Organization.

CUSTOMER CARE SUPPLIES AND PUBLICATIONS CATALOG

A Customer Care Supplies and Publications Catalog is available from your Cessna Service Station or directly from the Cessna Parts Distribution, (CPD 2) Dept. 701, Cessna Aircraft Company, 5800 East Pawnee, Wichita, Kansas 67201. The Supplies and Publications catalog lists all publications and Customer Care Supplies available from Cessna for prior year models as well as new products.

SUPPLEMENTAL TYPE CERTIFICATE INSTALLATIONS

Inspection, maintenance and parts requirements for supplemental type certificate (STC) installations are not included in this manual. When an STC installation is incorporated on the airplane, those portions of the airplane affected by the installation must be inspected in accordance with the inspection program published by the owner of the STC. Since STC installations may change systems interface, operating characteristics and component loads or stresses on adjacent structures, Cessna provided inspection criteria may not be valid for airplanes with STC installations.

CUSTOMER COMMENTS ON MANUAL

Cessna Aircraft Company has endeavored to furnish you with an accurate, useful, up-to-date manual. This manual can be improved with your help. Please use the return card, provided with your manual, to report any errors, discrepancies, and omissions in this manual as well as any comments you wish to make.

SECTION 1

GENERAL DESCRIPTION

1-1. GENERAL DESCRIPTION.

1-2. MODEL 182, F182, and T182 SERIES.

1-3. DESCRIPTION. The Cessna Model 182, F182 and T182 series aircraft, described in this manual, are high wing, strut-braced monoplanes of all-metal, semimonocoque construction. The aircraft are of conventional design consisting of five basic units, i.e. fuselage, wing, stabilizers, flight control surfaces and landing gear. The landing gear is of contemporary fixed tricycle layout for increased ground stability and is equipped with steerable nose gear, tubular spring-steel main gear struts and ABS speed fairings for all wheels. In addition, the nose gear utilizes an air/hydraulic fluid type shock strut. Standard cabin seating is four place with an optional child's seat installation available. A carpeted baggage compartment area is provided aft of the passenger seats. The power plant for the 182 and F182 series aircraft consists of a single air-cooled, six cylinder horizontally-opposed O-470 Series Continental engine. The power plant for the T182 series aircraft is a turbocharged, air-cooled, horizontally-opposed, six-cylinder, O-540 Lycoming engine. Both engines are coupled directly to a two-bladed all-metal, constant speed McCauley propeller.

1-4. AIRCRAFT SPECIFICATIONS. Leading particulars of these aircraft, with dimensions based on gross weight, are given in figure 1-1. If these dimensions are used for constructing a hangar or computing clearances, remember that such factors as nose gear strut inflation, tire pressures, tire sizes and load distribution may result in some dimensions that are considerably different from those listed.

1-5. STATIONS. A station diagram is shown in figure 1-2 to assist in locating equipment where a written description is inadequate or impractical.

MODELS 182, F182 AND T182

GROSS WEIGHT (Takeoff and Landing)	
(182 & F182 thru 1980)	2950 lb.
(T182 & 182 1981 & ON)	3100 lb.
FUEL CAPACITY	
Standard Wing (Total)	61 gal. THRU 1978
Standard Wing (Usable)	56 gal. THRU 1978
Long-Range (Total)	80 gal. THRU 1978
Long-Range (Usable)	75 gal. THRU 1978
Wet Wing (Total)	92 gal. 1979 & ON
Wet Wing (Usable)	88 gal. 1979 & ON
OIL CAPACITY	
Without External Oil Filter (182 & F182)	12 qts.
With External Oil Filter (182 & F182)	13 qts.
Without External Oil Filter (T182)	8 qts.
With External Oil Filter (T182)	9 qts.
ENGINE MODEL (182 & F182)	CONTINENTAL O-470 Series
ENGINE MODEL (T182)	LYCOMING O-540 Series
PROPELLER (Constant Speed)	82" McCAULEY
MAIN WHEEL TIRES	6.00 x 6, 6-Ply rating
Pressure	42 psi
NOSE WHEEL TIRE	5.00 x 5, 6-Ply rating
Pressure	49 psi
NOSE GEAR STRUT PRESSURE (Strut Extended)	55 psi to 60 psi
✪ WHEEL ALIGNMENT	
Camber	5° to 7°
Toe-In	0" to .06"
AILERON TRAVEL	
Up	20° ± 2°
Down	15° ± 2°
WING FLAP TRAVEL	0° ± 0° to 40° +1° -2° THRU 1981 0° ± 0° to 38° +0° -1° 1982 & ON
RUDDER TRAVEL (Measured Parallel to Water Line)	
Right	24° +0 -1
Left	24° +0 -1
RUDDER TRAVEL (Measured Perpendicular to Hinge Line)	
Right	27° 13' +0 -1
Left	27° 13' +0 -1
ELEVATOR TRAVEL (Relative to Stabilizer)	
Up (182 & F182)	26° ± 1° THRU 1980
Up (182 & T182)	28° ± 1° 1981 & ON
Down (182 & F182)	17° ± 1° THRU 1980
Down (182& T182)	21° ± 1° 1981 & ON
ELEVATOR TRIM TAB TRAVEL	
Up (182 & F182)	25° ± 2° THRU 1980
Up (182& T182)	24° ± 2° 1981 & ON
Down (182, F182 & T182)	15° ± 1°
PRINCIPAL DIMINSIONS	
☆ Wing Span	432.00"
Tail Span	140.00"
Lenght (182 & F182)	337.47"
Length (T182)	338.97"
★ Fin Height	109.68"
Track Width	109.25"
BATTERY LOCATION	Aft of Baggage Compartment

☆ Measured with strobe lights installed.

✪ Measured with aircraft empty.

★ (Maximum with nose gear depressed and flashing beacon installed on fin.)

Figure 1-1. Aircraft Specifications

MODEL 182, F182, and T182 SERIES

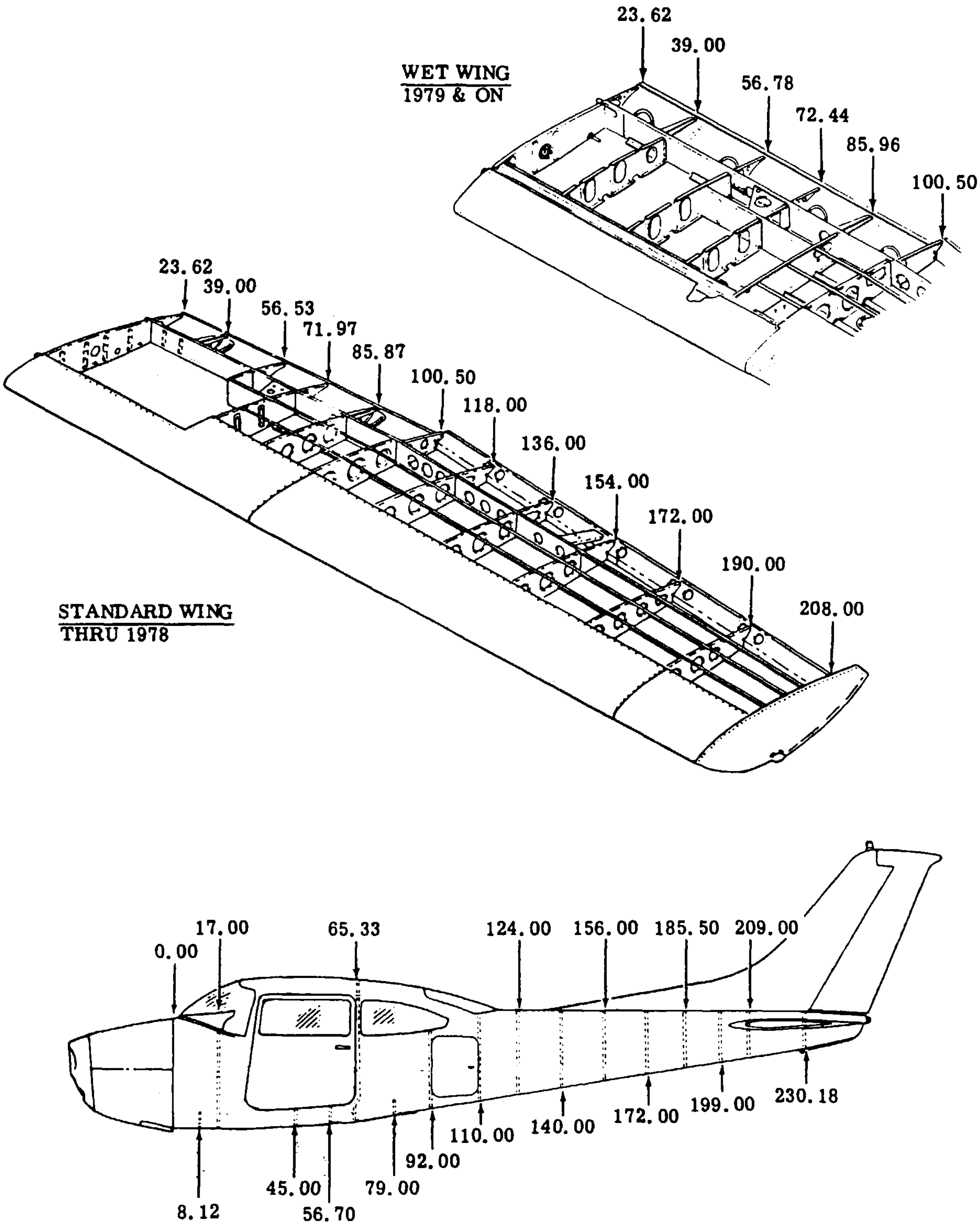


Figure 1-2. Reference Stations

1-6. GENERAL. This chapter deals with general torque and safetying practices used to ensure security of installation and prevent overstressing of components. Special torque values, when required, are specified with the specific component maintenance and installation instructions.

1-7. TORQUEING PROCEDURES. The importance of correct application cannot be overemphasized. Undertorque can result in unnecessary wear of nuts and bolts as well as parts they are holding together. When insufficient pressures are applied, uneven loads will be transmitted throughout assembly, which may result in excessive wear or premature failure due to fatigue. Overtorque can be equally damaging because of failure of a bolt or nut from overstressing threaded areas.

a. Calculating Torque. There are a few simple, but very important, procedures that should be followed to assure that correct torque is applied:

1. Calibrate torque wrench periodically to assure accuracy; and recheck frequently.

2. When using a torque wrench adapter which changes distance from torque wrench drive to adapter drive, the indicated reading must be adjusted for desired torque reading. (See Figure 1-2.)

3. Be sure that bolt and nut threads are clean and dry unless otherwise specified.

4. Determine friction drag torque and add to specified dry torque value to ensure proper bolt utilization.

(a) Hand-turn nut onto bolt until it stops.

(b) Using a torque wrench, measure running torque (torque required to turn nut on bolt).

(c) This running torque must be added to specified dry torque value to ensure proper bolt utilization.

EXAMPLE

Average running torque for a nut	= 15 in.-lbs.
Dry torque required	= 125 ±5 in.-lbs.
Final torque wrench reading	= 140 ±5 in.-lbs.

(d) Since running torque will become less due to nut/bolt re-use (in accepted applications), this procedure must be repeated each time.

(e) When necessary to tighten from bolt head, increase torque value by an amount equal to shank torque (torque required to turn bolt when installed). Measure with a torque wrench.

EXAMPLE

Average running torque for a nut	= 15 in.-lbs.
Average running shank torque for installed bolt	= 10 in.-lbs.
Dry torque required	= 125 ±5 in.-lbs.
Final torque wrench reading	= 150 ±5 in.-lbs.

b. Torque Values - Bolts and Nuts. (See Table 1-1.)

1. Tables included in this section do not apply to the following exceptions:

(a) Sheet metal screws should be tightened firmly, but with no specific torque value.

(b) Screws attached to nutplates should be tightened firmly, but with no specific torque value.

(c) Bolts, nuts, and screws used in control systems and installations where required torque would cause binding or interfere with proper operation of parts.

(d) Screws used with dimpled washers should not be drawn tight enough to eliminate washer crown.

(e) Fasteners that have a specified torque in a specific installation.

2. The values shown in Table 1-1 are based on parts being clean and dry with no lubricants added.

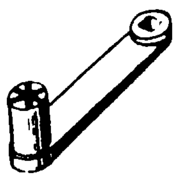
3. Castellated nuts requiring cotter pins should be tightened to low torque value. Torque can be increased to install cotter pin, but should never exceed maximum torque value.

NOTE

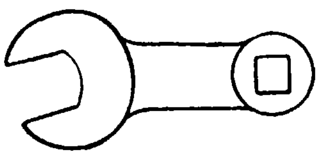
Self-locking castellated nuts, MS17825 and MS17826, require a separate torque range. These values are shown separately in torque value tables.

SHORT OPEN END ADAPTER

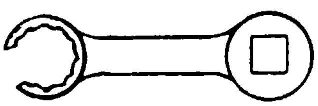
SETSCREW ADAPTER



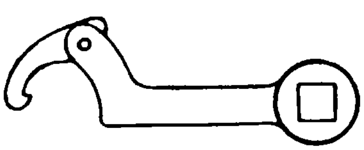
HOSE CLAMP ADAPTER



OPEN-END WRENCH ADAPTER



FLARE NUT WRENCH ADAPTER



SPANNER WRENCH ADAPTER

NOTE

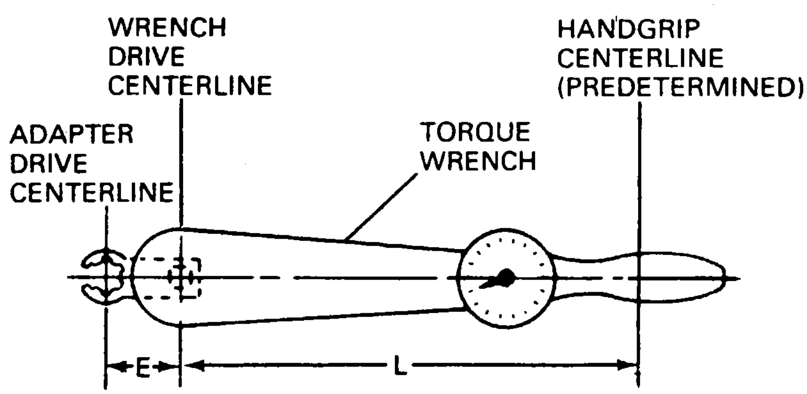
When using a torque wrench adapter which changes the distance from torque wrench drive to adapter drive, apply following formula to obtain corrected torque reading.

FORMULA

$$\frac{T \times L}{L + E} = Y$$

LEGEND

T = Desired Torque
Y = Indicated Torque
L = Effective Length Lever
E = Effective Length of Extension

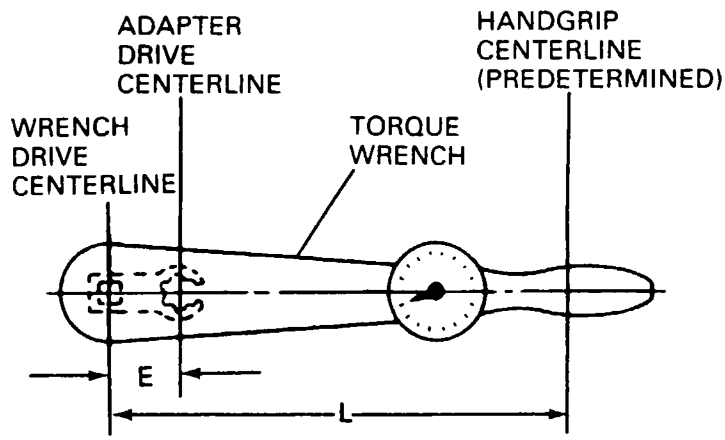


EXAMPLE

T = 135 In.-Lbs
Y = Unknown
L = 10.0 In.-Lbs
E = 1.5 In.

$$Y = \frac{135 \times 10}{10 + 1.5} = \frac{1350}{11.5} = 117.39$$

Y = 117 In.-Lbs



EXAMPLE

T = 135 In.-Lbs
Y = Unknown
L = 10.0 In.-Lbs
E = −1.5 In.

$$Y = \frac{135 \times 10}{10 - 1.5} = \frac{1350}{8.5} = 158.82$$

Y = 159 In.-Lbs

Figure 1-3. Torque Wrench Adapter Adjustment

BOLT TORQUE VALUES

	Tension	Shear
BOLTS	AN3 thru AN20 AN42 thru AN49 AN73 thru AN81 AN173 thru AN186 AN509NK9 AN525NK525 MS20033 thru MS20046 MS20073 MS20074 MS24694 MS27039	NOTE: Bolts in tension column may be used with shear nuts. Bolts in shear column should not be used unless a minimum of two threads extend beyond nut after installation.
NUTS	AN310 AN315 AN363 AN365 MS20365 MS20500 MS21045 NAS679 NAS1021	AN320 AN364 MS20364 NAS1022

	Tension	Shear
BOLTS	MS20004 thru MS20024 NAS144 thru NAS148 NAS172 NAS174 NAS333 thru NAS340 NAS585 thru NAS590 NAS624 thru NAS644 NAS1303 thru NAS1320 NAS517	NAS464
NUTS	AN310 AN315 NA363 AN365 MS20365 MS21045 NAS679 NAS1021 NAS1291	AN320 AN364 NAS1022 MS20364

Nut-bolt size	FINE THREAD SERIES Torque Limits in.-lbs. MIN.	MAX.	Torque Limits in.-lbs. MIN.	MAX.
8-36	12	15	7	9
10-32	20	25	12	15
1/4-28	50	70	30	40
5/16-24	100	140	60	85
3/8-24	160	190	95	110
7/16-20	450	500	270	300
1/2-20	480	690	290	410
9/16-18	800	1000	480	600
5/8-18	1100	1300	660	780
3/4-16	2300	2500	1300	1500
7/8-14	2500	3000	1500	1800
1-14	3700	4500	2200	3300
1-1/8-12	5000	7000	3000	4200
1-1/4-12	9000	11000	5400	6600

Nut-bolt size	COURSE THREAD SERIES Torque Limits in.-lbs. MIN.	MAX.	Torque Limits in.-lbs. MIN.	MAX.
8-32	12	15	7	9
10-24	20	25	12	15
1/4-20	40	50	25	30
5/16-18	80	90	48	55
3/8-16	160	185	95	110
7/16-14	235	255	140	155
1/2-13	400	480	240	290
9/16-12	500	700	300	420
5/8-11	700	900	420	540
3/4-10	1150	1600	700	950
7/8-9	2200	3000	1300	1800
1-8	3700	5000	2200	3000
1-1/8-8	5500	6500	3300	4000
1-1/4-8	6500	8000	4000	5000

Nut-bolt size	FINE THREAD SERIES Torque Limits in.-lbs. MIN.	MAX.	Torque Limits in.-lbs. MIN.	MAX.
10-32	25	30	15	20
1/4-28	80	100	50	60
5/16-24	120	145	70	90
3/8-24	200	250	120	150
7/16-20	520	630	300	400
1/2-20	770	950	450	550
9/16-18	1100	1300	650	800
5/8-18	1250	1550	750	950
3/4-16	2650	3200	1600	1900
7/8-14	3550	4350	2100	2600
1-14	4500	5500	2700	3300
1-1/8-12	6000	7300	3600	4400
1-1/4-12	11000	13400	6600	8000

Nut-bolt size	MS17825 Torque Limits in.-lbs. MIN.	MAX.	MS17826 Torque Limits in.-lbs. MIN.	MAX.
10-32	28	35	16	20
1/4-28	65	80	35	45
5/16-24	180	225	70	90
3/8-24	260	325	100	125
7/16-20	460	575	180	225
1/2-20	720	900	240	300
9/16-18	880	1100	320	400
5/8-18	1300	1600	480	600
3/4-16	2200	2800	880	1100
7/8-14	3700	4600	1500	1900
1-14	5400	6800	2400	3000
1-1/8-12	8000	10000	4000	5000
1-1/4-12	11000	14000	5600	7000

Table 1-1. Torque Values - Bolts and Nuts

c. Torque Value - Threaded Straight Fittings.

NOTE

Tables in this section are for general applications. Refer to specific installations for special torque values and procedures.

1. Connectors installed in bosses with no required orientation should be installed using torque values given in Table 1-2.

THREADED CONNECTOR					
TUBE OUTSIDE DIAMETER (Inches)	THREAD	JAM-NUT Torque-Limits (in.-lbs.)		CONNECTOR w/ PACKING w/o JAM-NUT Torque-Limits (in.-lbs.)	
		MIN.	MAX.	MIN.	MAX.
1/8	5/16-24	35	50	50	55
3/16	3/8-24	65	80	65	75
1/4	7/16-20	85	105	95	105
5/16	1/2-20	105	125	125	135
3/8	9/16-18	120	150	155	165
1/2	3/4-16	240	280	280	305
5/8	7/7-14	320	380	380	405
3/4	1/16-12	500	600	550	600
1	1-5/16-12	720	880	800	900
1-1/4	1-5/8-12	960	1200	900	1000
1-1/2	1-7/8-12	1200	1440	900	1000
2	2-1/2-12	1400	1500	900	1000

Table 1-2. Torque Values
Jam-Nuts and Threaded Connector

2. Connectors installed in bosses requiring a specific orientation do not use a torque value, but use the following steps:

(a) Place jam-nut on fitting along with retainer and packing.

(b) Turn nut down until packing is firmly against lower threaded section of fitting.

(c) Install fitting into boss and tighten until there is a sudden increase in torque.

(d) Tighten fitting 1-1/2 turns.

(e) Orientation is accomplished by tightening fitting, but not exceeding one turn.

(f) Tighten jam-nut to torque values in Table 1-2.

3. Bulkhead fittings are installed with jam-nuts and should be torqued to values in Table 1-2.

4. Torque values for hose end fittings (nipple or nut) are given in Table 1-3.

TORQUE VALUE - HOSE ASSEMBLIES				
HOSE INSIDE DIAMETER	Nipple or Nut			
	ALUMINUM Torque-Limits in.-lbs.		STEEL Torque-Limits in.-lbs	
	MIN.	MAX.	MIN.	MAX.
1/8	20	30	75	85
3/16	25	35	95	105
1/4	50	65	135	150
5/16	70	90	170	200
3/8	110	130	270	300
1/2	230	260	450	500
5/8	330	360	650	700
3/4	460	500	900	1000
1	500	700	1200	1400
1-1/4	800	900	1520	1680
1-1/2	800	900	1900	2100
1-3/4	—	—	—	—
2	1800	2000	2660	2940

Table 1-3. Torque Values
Hose Assemblies

5. Torque values for straight threaded fittings used with rigid lines are given in Table 1-4.

THREADED STRAIGHT FITTING TORQUE VALUE (RIGID TUBE)													
	FLARED END						STRAIGHT END						
TUBE OUTSIDE DIAMETER	ALUMINUM Torque-Limits in-lbs.		ALUMINUM On Oxygen Lines Torque-Limits in-lbs.		STEEL Torque-Limits in-lbs.		6061-0 ALUMINUM 5052-0 ALUMINUM Torque-Limits in-lbs.		STEEL Torque-Limits in-lbs.		6061-T(X) ALUMINUM w/ steel sleeve Torque-Limits in-lbs.		
	MIN.	MAX.	MIN.	MAX.	MIN.	MAX.	MIN.	MAX.	MIN.	MAX.	TUBE WALL	MIN.	MAX.
1 8							20	30	45	55			
3 16					90	100	30	40	90	100	0.028	45	55
1 4	40	65			135	150	40	65	135	150	0.022	80	105
											0.028	80	105
											0.035	80	105
											0.049	90	115
5 16	60	80	100	125	180	200	60	80	180	200	0.028	80	105
											0.035	80	105
											0.042	125	175
3 8	75	125			270	300	75	125	270	300	0.028	125	175
											0.035	125	175
											0.049	125	175
1 2	150	250			450	500	150	250	450	500	0.028	135	180
											0.035	200	300
											0.049	400	500
											0.058	400	500
											0.065	400	500
5 8	200	350			700	800	200	350	700	800	All	500	600
3 4	300	500			1100	1150	300	500	1100	1150	All	600	700
1	500	700			1200	1400	500	700	1200	1400	All	1000	1300
1-1 4	600	900			1300	1450	600	900	1300	1450	All	1300	1500
1-1 2	600	900			1350	1500	600	900	1350	1500	All	1400	1700
2							600	900	1500	1700			

Table 1-4. Torque Values - Straight Threaded Fittings (Line)

1-8. SAFETYING PROCEDURES. The use of safety wire, cotter pins, lockwashers, and self-locking nuts is to prevent relative movement of critical components subject to vibration, torque, tension, etc., which could cause attaching parts to be broken, loosened, and/or detached.

1-9. SAFETY WIRE PROCEDURES.

a. Identification. Lockwire comes in three types which are identified by size and color. The three types are classified by use.

1. Inconel and Monel wire is used for general lockwiring and is identified by a natural wire color.

(a) Inconel can withstand temperatures up to 1500°F.

(b) Monel can withstand temperatures up to 800°F.

2. Copper that is cadium-plated and dyed yellow is used for shear and seal wiring applications.

(a) Shear applications are those where it is necessary to break or shear wire to permit operation or actuation of emergency devices.

(b) Seal applications are where wire is used with a lead seal to prevent tampering or use of a device without indication.

3. Aluminum Alloy (Alclad 5056) is dyed blue and is used exclusively for safety-wiring magnesium parts.

4. Size of wire is dependent on material and purpose of installation.

(a) 0.020-inch diameter copper wire should be used for shear and seal application.

(b) 0.020-inch diameter wire may be used to lockwire parts with tie holes smaller than 0.045 inches; or, on parts with tie hole diameters between 0.045 and 0.062 when spacing between ports is less than two inches; or, when bolts and screws of 0.25-inch diameter or less are closely spaced.

(c) 0.032-inch minimum diameter wire is used for general purpose lockwiring.

NOTE

When using single-wire method of locking, the largest wire that will fit tie holes should be used.

b. Lockwire Installation. There are two basic forms of lockwiring. The single-wire method has limited application; the double-twist method is the common method of lockwiring.

1. Use new wire for each application; do not try to re-use old wire.

2. Single-wire method is accomplished by passing a single wire through tie holes and back with ends then twisted together. (See Figure 1-4.)

(a) Single-wire method is used for shear and seal wiring applications.

(b) Single-wire method can be used in closely spaced, closed geometric patterns. Closely spaced is defined as spacing two inches or less between centers of parts.

CAUTION

Screws in closely spaced geometric patterns which secure hydraulic or air seals, hold hydraulic pressure, or are used in critical areas should use double-twist method of lockwiring.

3. Lockwiring by the double-twist method is really one wire twisted on itself several times and is accomplished by the following steps (see Figure 1-4).

(a) Insert one end of wire through tie holes of bolt head and firmly loop around bolt head.

NOTE

This does not necessarily apply to castellated nuts when slot is close to top of nut. The wire will be more secure if it is made to pass along side of stud.

(b) While taut, twist strands to within 1/8 inch of next part. The twisting keeps wire taut without overstressing and prevents wire from becoming nicked, kinked, or mutilated.

(c) Lockwiring multiple groups by double-twist method is accomplished in a similar manner except twists between parts are alternated between clockwise and counterclockwise.

(d) After last tie hole, wire is twisted three to five times to form a pigtail.

(e) Cut off any excess wire and bend pigtail towards part.

4. When lockwiring widely spaced multiple groups by double-twist method, three units shall be the maximum number in a series.

NOTE

Widely spaced multiple groups shall mean those in which fasteners are from four to six inches apart. Lockwiring shall not be used to secure fasteners or fittings which are spaced more than six inches apart, unless tie points are provided on adjacent parts to shorten span of lockwire to less than six inches.

5. When lockwiring closely spaced multiple groups, the number of units that can be lockwired by a 24-inch length of wire shall be the maximum number in a series.

6. Parts should be lockwired so that wire is placed in tension (pulled on) if a part attempts to loosen.

c. Required Lockwire Installation Applications.

1. Bolts and other fasteners securing critical parts that affect airplane safety and operation.

(a) In blind-tapped hole applications or bolts or castellated nuts on studs, lockwiring is installed in same manner as described for bolt heads.

(b) Hollow head bolts are safetied in manner prescribed for regular bolts.

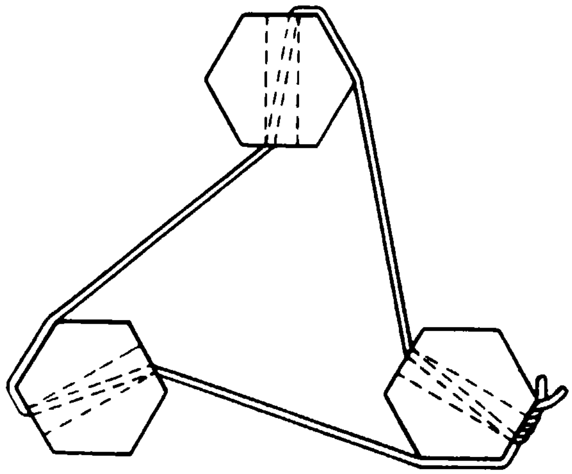
(c) Drain plugs and cocks may be safetied to a bolt, nut, or other part having a free tie hole in accordance with instructions described.

(d) External snap rings may be locked if necessary using general locking principles as described and illustrated. Internal snap rings should not be lockwired.

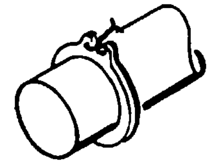
(e) When locking is required on electrical connectors which use threaded coupling rings, or on plugs which employ screws or rings to fasten individual parts of plug together, they shall be lockwired with 0.020-inch diameter wire in accordance with locking principles as described and illustrated. It is preferable to lockwire all electrical connectors individually. Do not lockwire one connector to another unless it is necessary to do so.

(f) Drilled head bolts and screws need not be lockwired if installed into self-locking nuts or installed with lockwashers. Castellated nuts with cotter pins or lockwire are preferred on bolts or studs with drilled shanks, but self-locking nuts are permissible within limitations described in Paragraph 1-13.

2. For new design, lockwire shall not be used to secure nor shall lockwire be dependent upon fracture as basis for operation of emergency devices such as handles, switches, and guard-covering handles that operate emergency mechanisms such as emergency exits, fire extingushers, emergency cabin pressure release, emergency landing gear release, and the like. However, where existing structural equipment or safety of flight emergency devices requires shear wire to secure equipment while not in use, but which are dependent upon shearing or breaking of lockwire for successful emergency operation of equipment, particular care exercised to assure that wiring under these circumstances shall not prevent emergency operations of these devices.



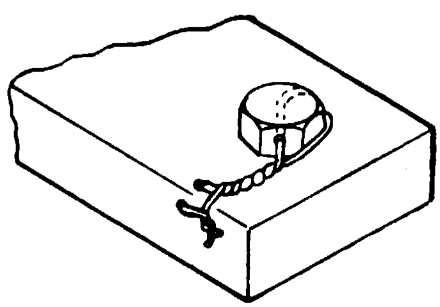
BOLTS IN CLOSELY SPACED, CLOSED
GEOMETRICAL PATTERN. SINGLE- WIRE METHOD.



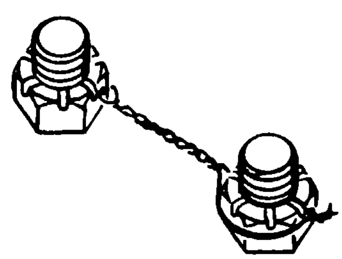
EXTERNAL SNAP RING
SINGLE-WIRE METHOD

NOTE

RIGHT-HAND THREADED PARTS SHOWN. REVERSE DIRECTION FOR LEFT-HAND THREADS.



SINGLE FASTENER APPLICATION
DOUBLE-TWIST METHOD



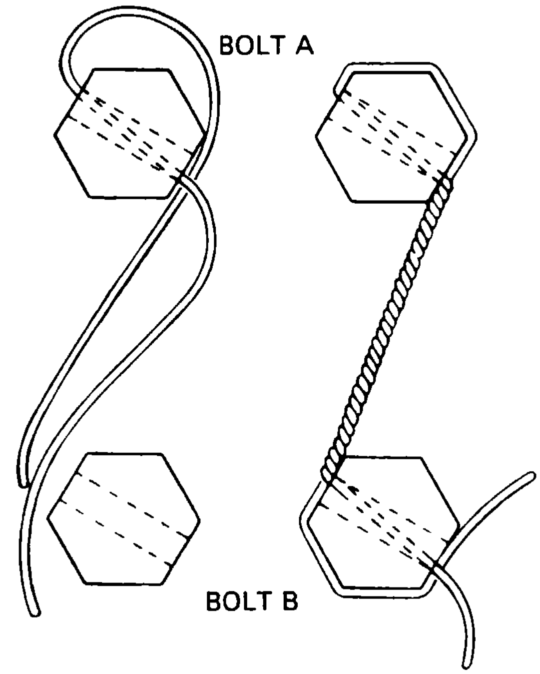
CASTELLATED NUTS ON DRILLED STUDS
DOUBLE-TWIST METHOD

Figure 1-4. Lockwire Safetying (Sheet 1 of 2)

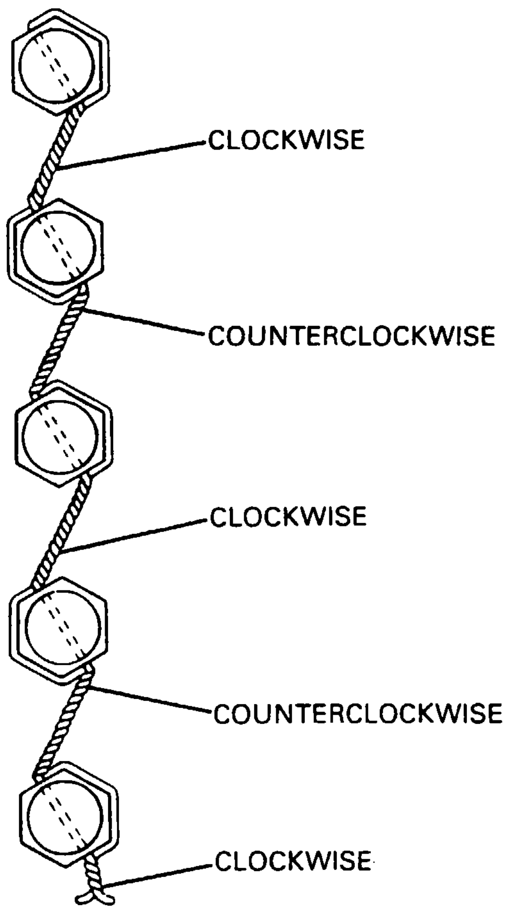
DOUBLE-TWIST METHOD

STEP 1. Insert wire through bolt A and bend around bolt (if necessary, bend wire across bolt head). Twist wires clockwise until they reach bolt B.

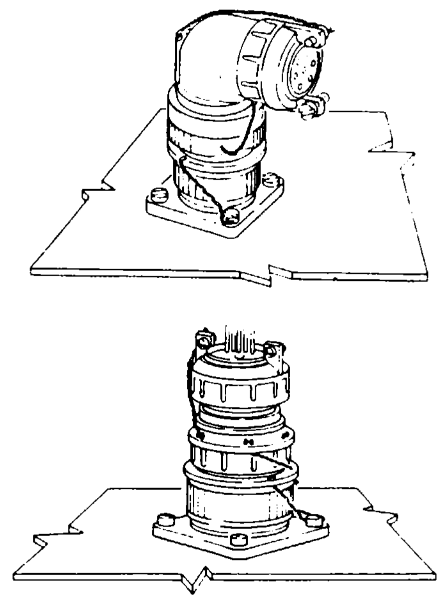
STEP 2. Insert one end of wire through bolt B. Bend other end around bolt (if necessary, bend wire across head of bolt). Twist wires counterclockwise 1/2 inch or six twists. Clip ends. Bend pigtail back againt part.



DOUBLE-TWIST METHOD



MULTIPLE FASTENER APPLICATION
DOUBLE-TWIST METHOD



ELECTRICAL CONNECTION

Figure 1-4. Lockwire Safetying (Sheet 2 of 2)

1-10. USE OF COTTER PINS.

a. Cotter Pin Installation. Castellated nuts and pins may be safetied with cotter pins or lockwire. The preferred method is to use cotter pins.

1. Select cotter pin material in accordance with temperature, atmosphere, and service limitations (see Table 1-5).

COTTER PINS (MS24665)		
MATERIAL	TEMP	USE
Carbon Steel	Up to 450°F	Pins that contact cadmium-plated surfaces. General Applications Normal Atmospheres
Corrosion-Resistant	Up to 800°F	Pins that contact corrosion-resistant steel. Corrosive atmospheres

Table 1-5. Cotter Pin Temperature and Use

2. Cotter pins shall be new upon each application.

3. When nuts are to be secured to fastener with cotter pins, tighten nut to low side (minimum) of applicable specified or selected torque range, unless otherwise specified, and if necessary, continue tightening until slot aligns with hole. In no case shall you exceed high side (maximum) torque range.

4. If more than 50 percent of cotter pin diameter is above nut castellation, a washer should be used under nut or a shorter fastener should be used. A maximum of two washers may be permitted under a nut.

5. The largest diameter cotter pin which hole and slots will accommodate should be used, but in no application to a nut, bolt, or screw shall pin size be less than sizes described in Table 1-6.

(6) Install cotter pin with head firmly in slot of nut with axis of eye at right angles to bolt shank. Bend prongs so that head and upper prong are firmly seated against bolt (see figure 1-5).

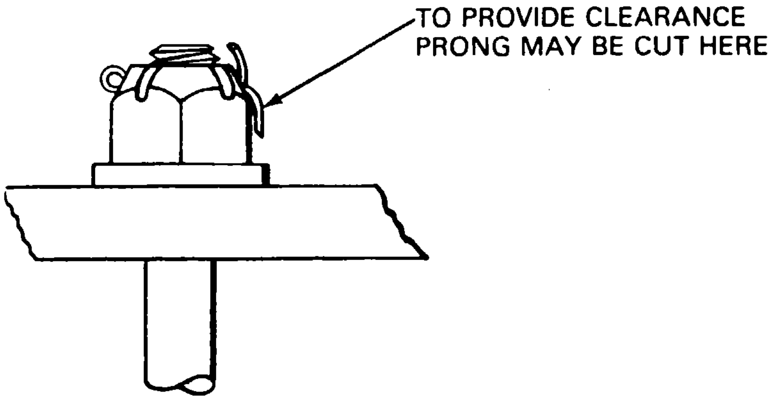
COTTER PIN - MINIMUM SIZE	
THREAD SIZE	MINIMUM PIN SIZE
6	0.028
8	0.044
10	0.044
1/4	0.044
5/16	0.044
3/8	0.072
7/16	0.072
1/2	0.072
9/16	0.086
5/8	0.086
3/4	0.086
7/8	0.086
1	0.086
1-1/8	0.116
1-1/4	0.116
1-3/8	0.116
1-1/2	0.116

Table 1-6. Cotter Pin Minimum Size

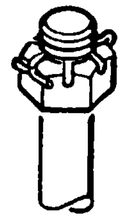
(7) In pin applications, install cotter pin with axis of eye parallel to shank of clevis pin or rod end. Bend prongs around shank of pin or rod end (see Figure 1-5).

CAUTION

Cadium-plated cotter pins should not be used in applications bringing them in contact with fuel, hydraulic fluid, or synthetic lubricants.

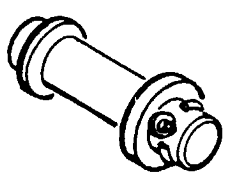


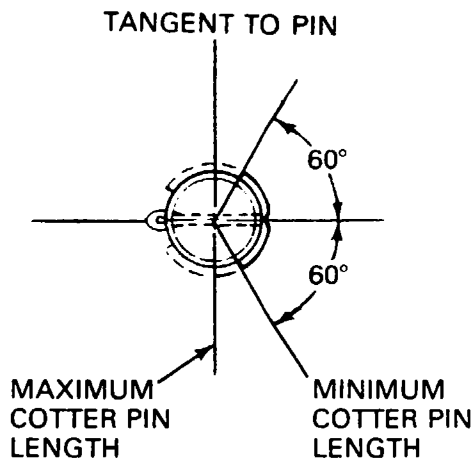
PREFERRED METHOD



ALTERNATE METHOD

CASTELLATED NUT ON BOLT





PIN APPLICATION

Figure 1-5. Installation of Cotter Pins

1-11. USE OF LOCKING CLIPS.

a. Safetying Turnbuckles. (See Figure 1-6.)

1. Prior to safetying, both threaded terminals shall be screwed an equal distance into turnbuckle body and shall be screwed in at least so far that not more than three threads of any terminal are exposed outside body.

2. After turnbuckle has been adjusted to its locking position, with slot indicator groove on terminals and slot indicator notch on body aligned, insert end of locking clip into terminal and body (refer to Figure 1-6) until U-curved end of locking clip is over hole in center of body.

(a) Press locking clip into hold to its full extent.

(b) Curved end of locking clip will expand and latch in body slot.

(c) To check proper seating of locking clip, attempt to remove pressed "U" end from body hole with fingers only.

NOTE

Do not use tool as locking clip could be distorted.

3. Locking clips are for one time use only and shall not be re-used.

4. Both locking clips may be inserted in same hole of turnbuckle body or in opposite holes of turnbuckle body.

1-12. USE OF LOCKWASHERS.

a. Lockwashers can be used only under the following conditions.

1. When self-locking feature cannot be provided in externally or internally threaded part.

2. When a cotter pin cannot be used to prevent rotation of internal threads with respect to external threads.

3. When lockwire cannot be used to prevent loosening of threaded parts.

4. When fastening is not used for fabrication of primary structure.

5. When loosening of threaded parts would not endanger safety of airplane or people.

6. When corrosion encouraged by gouging aluminum or magnesium alloys by edges of teeth on tooth-locked washers would not cause malfunctioning of parts being fastened together.

1-13. USE OF SELF-LOCKING NUTS.

a. Restrictions.

1. Self-locking nuts cannot be used under certain conditions.

(a) Used, reworked, or reprocessed nuts should not be installed for any application.

(b) Do not use if at joints in control systems for singular attach points.

(c) Do not use on externally threaded parts that serve as an axle of rotation for another part where tensional (torque) loads can cause nut to loosen and/or become separated. Examples are pulleys, levers, linkages, and cam followers.

NOTE

Self-locking nuts can be used when threaded parts are held by a positive locking device that requires shearing or rupture before torsional loads can act on threaded parts.

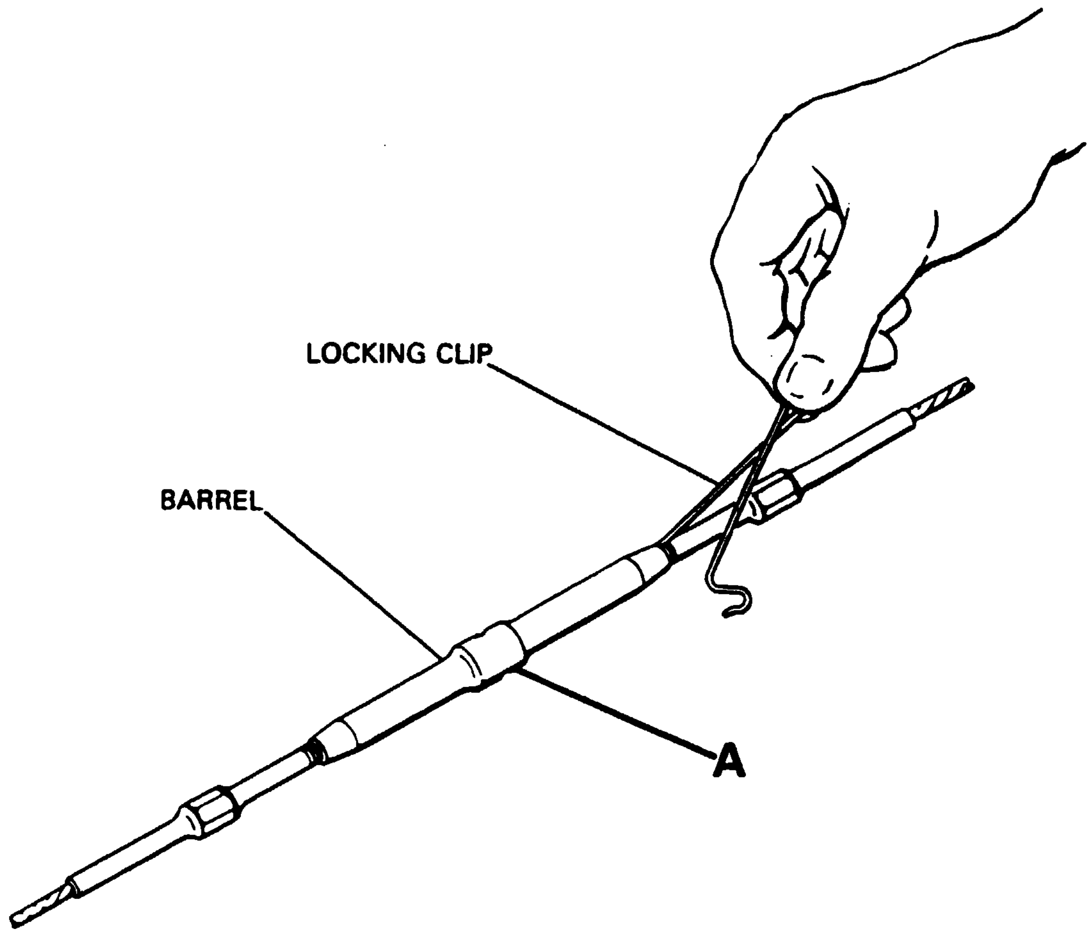
(d) Do not use where a loose nut, bolt, or screw could fall or be drawn into an area that would impede or damage or otherwise distort operation.

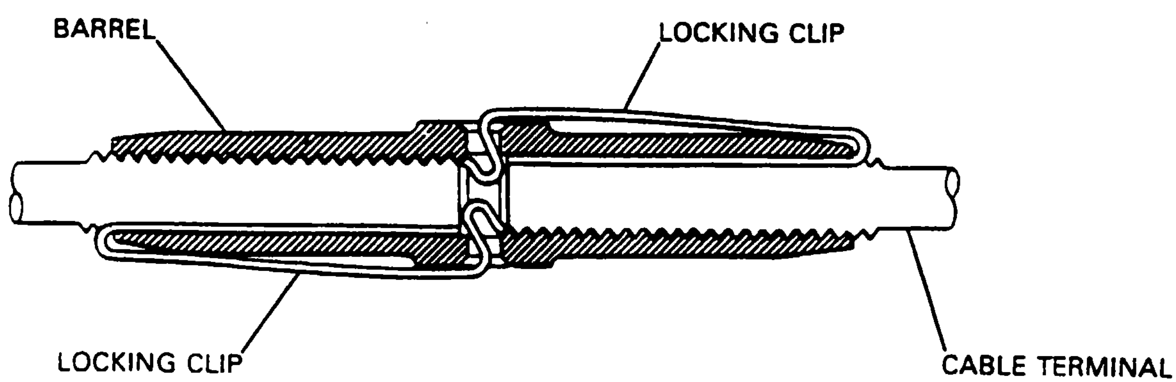
(e) Do not use to attach access panels and doors or to assemble components that are routinely disassembled or removed for access and servicing.

(f) In general, do not use self-locking nuts where loss of bolt affects safety of flight.

2. Bolts, studs, or screws, excluding Hi-Locks, must extend through self-locking nut for a length equivalent of two threaded pitches. This length includes chamfer.

3. Self-locking nuts which are attached to structure shall be attached in a positive manner to eliminate possibility of their rotation or misalignment when tightening is to be accomplished by rotating bolts to structure, and permit replacement of nuts.





Detail A

Figure 1-6. Safetying Turnbuckle Assemblies

1-14. CONTROL CABLE WIRE BREAKAGE AND CORROSION LIMITATIONS.

a. Inspection of Control Cables.

1. Control cable assemblies are subject to a variety of environmental conditions and forms of deterioration that ultimately may be easy to recognize such as wire/strand breakage, or the not so readily visible types of deterioration including corrosion and/or distortion. The following information will aid in detecting these cable conditions.

2. Broken Wire.

(a) Examine cables for broken wires by passing a cloth along length of cable. This will detect broken wires, if cloth snags on cable. Critical areas for wire breakage are those sections of cable which pass through fairleads, across rub blocks, and around pulleys. If no snags are found, then no further inspection is required. If snags are found or broken wires are suspected, then a more detailed inspection is necessary which requires that the cables be bent in a loop to confirm broken wires (refer to figure 1-7). Loosen or remove cable to allow it to be bent in a loop as shown. While rotating cable, inspect bent area for broken wires.

(b) Wire breakage criteria for cables in flap, aileron, rudder, and elevator systems are as follows:

(1) Individual broken wires are acceptable in primary and secondary control cables at random locations when there are no more than six broken wires in any given ten-inch cable length.

3. Corrosion.

(a) Carefully examine any cable for corrosion that has a broken wire in a section not in contact with wear-producing airframe components such as pulleys, fairleads, rub blocks, etc. It may be necessary to remove and bend cable to properly inspect it for internal strand corrosion as this condition is usually not evident on outer surface of cable. Replace cable if internal corrosion is found. If a cable has been wiped clean of its corrosion-preventive lubricant and metal-brightened, the cable shall be examined closely for corrosion.

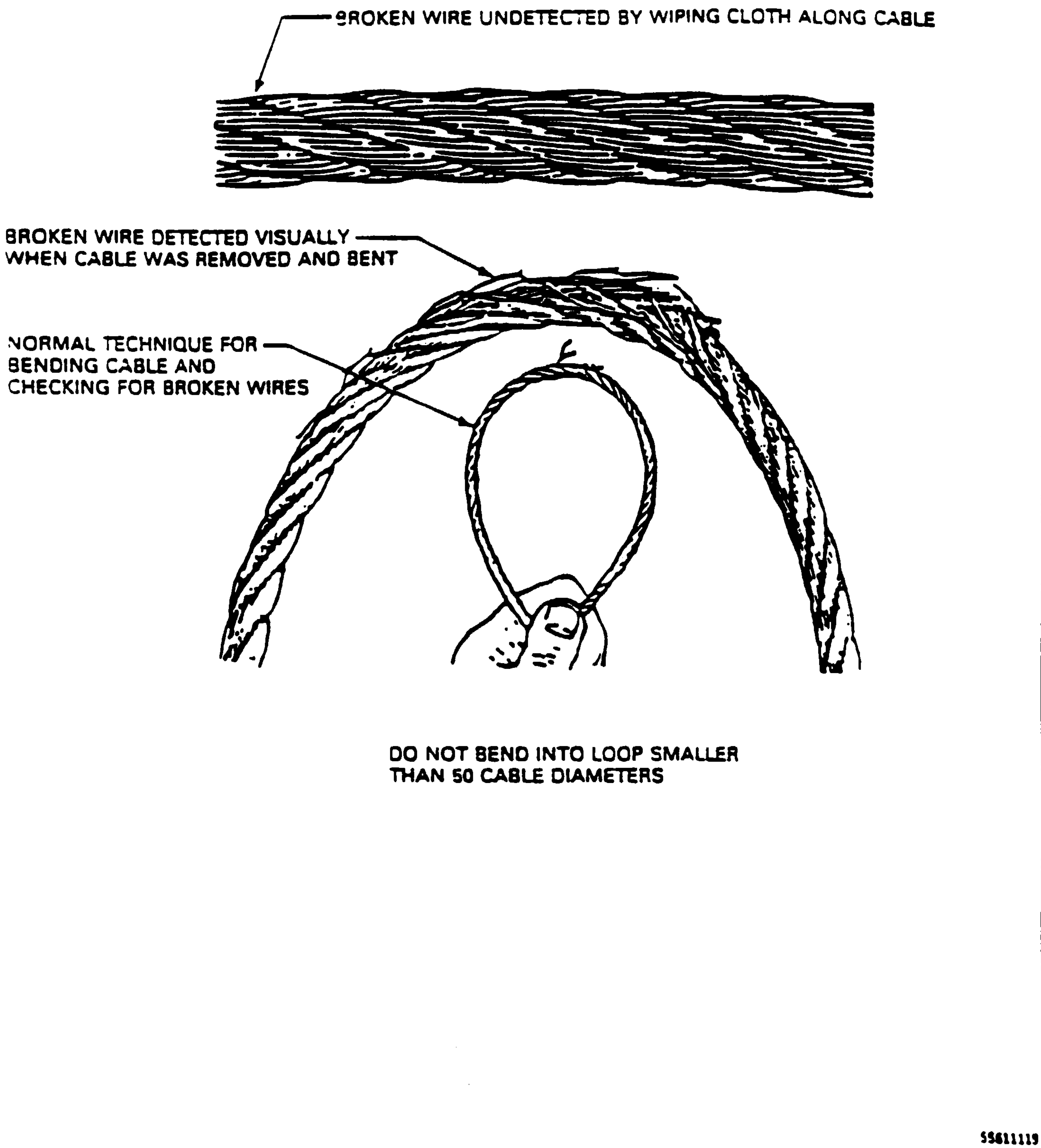


Figure 1-7 Cable Broken Wire Inspection

1-15. ADHESIVES, CEMENTS AND SEALANTS - SHELF LIFE AND STORAGE.

a. General.

1. This section provides information which defines the proper storage and usable life (shelf life) of adhesives, cements and sealents which are used for maintenance and/or repair of the airplane. Also, included in this section is the criteria used for testing these materials after the normal shelf life has expired, to determine if an extension to the shelf life is possible.

2. Shelf life refers to a specified period of time usually from the date of manufacture (normally stamped or printed on the product container) to the expiration date (which should be determined using limits specified in Table 1-7 or if applicable, the manufacturer's expiration date printed or stamped on the product container). The specified shelf life is dependent on proper storage in accordance with the limits specified in this section and/or the manufacturer's instructions.

b. Storage Criteria.

1. Storage of Adhesives and Cements. All adhesives and cements shall be stored under controlled temperature conditions. If open shop storage becomes necessary, these products shall in no case be stored in an area which will subject them to temperatures in excess of 95°F. Containers shall be tightly closed prior to being placing them into the proper storage environment. For proper storage environment, refer to Table 1-7 and the following paragraphs.

(a) Class I - These adhesives are epoxy base materials and have one year storage at room temperature. 0°F storage will extend the storage life. Refer to the product container instructions for storage temperature and life.

(b) Class II, III and IV - These adhesives are rubber and resin base and are good for six months at room temperature storage. 40°F storage will extend the storage life. Refer to the product container instructions for limits of each adhesive.

(c) Class V - These are silicone rubber adhesives. If stored in their original containers at a temperature below 80°F, have a shelf life of one year or as indicated on the storage container

(d) Class VI - These are solvent bonding solvents They should be stored in their original containers and tightly closed, and stored at 40°F temperature

(e) ClassVII - Cyanoacrylate base materials must be stored in the original containers at 40°F or as specified on the container instructions

(f) Class VIII - These are pressure sensitive materials The shelf life is two years when stored at 75°F and 50 percent relative humidity

(g) Class IX - These are polyurethane products. Store in original container, between 70°F and 100°F. Urethanes are moisture sensitive and precautions should be taken to ensure complete protection from moisture contamination. Container must be tightly closed at all times.

(h) Class X - These are acrylic base materials. They require storage at 40°F or per instructions on product container.

c. Storage of Sealants.

1. All sealants shall be stored under controlled temperature conditions. If open shop storage becomes necessary, these products shall in no case be stored in an area which will subject them to temperatures in excess of 95°F or below 40°F. Containers shall be tightly closed prior to placing them in the proper storage environment. For proper storage environment, refer to Table 1-7 and the following paragraphs.

(a) Premixed and frozen sealants shall be stored at -40°F or colder and shall not be used more than six weeks after the date of mixing even if all storage is at -40°F or colder. If storage temperatures rise above -40°F, but not warmer than -30°F, the material may be stored for a maximum of two weeks warmer than -40°F plus time at -40°F or colder for a combined total not to exceed five weeks beyond the date of mixing. If storage temperatures rise above -40°F but are not warmer than -20°F, the materials may be stored for a maximum of one week above -30°F plus time at -40°F or colder for a combined total not to exceed four weeks beyond the date of mixing.

(b) Unmixed sealants shall be stored at a controlled temperature of between 40°F and 80°F and have a shelf life of approximately six months when stored within this temperature range. Unmixed sealants stored at temperatures exceeding 80°F shall be used within five weeks.

2. All materials should be used on a "first in-first out" basis. The adhesives, cements and sealants should be rotated so this requirement can be accomplished. All material containers should be clearly marked with a "use by" date, consisting of the year and month. All materials not used by this date must be tested prior to use. Refer to Testing criteria and Table 1-7.

d. Testing Criteria.

1. Any material (adhesive, cement or sealant) not used within its shelf life will be tested and the results reviewed to determine if the material is usable. If there is doubt about the material being usable, it must be properly disposed of. Material that has exceeded its original shelf life may be retested to determine if the material meets its requirements. Materials meeting their requirements will have their shelf life extended as specified in Table 1-7. Materials with shelf life extensions must be retested after a specified period of time Refer to Table 1-7

2. Testing of Overaged Adhesives and Cements.

NOTE

Overaged adhesives and cements are those that have exceeded their original shelf life and must be tested prior to use and/or given extended shelf life.

(a) Class I Epoxy Adhesive - Examine both components to ensure that they are still workable. Check for gelling and/or contamination Stir components and mix a small amount of adhesive. Verify that adhesive sets up and hardens.

(b) Class II, III and IV Rubber and Resin Base Adhesives - Open containers and check for gelling and/or contamination. Check for spreading and drying.

(c) Class V Silicone Rubber Adhesives - Examine adhesive for hardness. If adhesive is still soft and can be spread, it is acceptable. Verify that adhesive will harden.

(d) Class VI Solvent Bonding Solvents - Check for signs of apparent contamination. Solvents should be clean and clear with no signs of cloudiness.

(e) Class VII Cyanoacrylic Base Adhesives - Verify that product is still liquid with no visible signs of contamination.

(f) Class VIII Pressure Sensitive Materials - Open containers and inspect for hardening, gelling and contamination. Stir components and mix a small amount of adhesive. Verify that adhesive sets up properly.

(g) Class X Acrylic Adhesives - Inspect base material to ensure that it is still liquid. Mix a small amount of the components and verify that it sets up properly.

3. In general, if these materials exhibit normal physical properties, with no signs of hardening, gelling or contamination and set up and/or harden properly as applicable, the shelf life may be extended as specified in Table 1-7.

e. Testing of Overaged Sealants

NOTE

Overaged sealants are those that have exceeded their original shelf life and must be tested prior to use and/or given extended shelf life.

1. For identification of sealants Classification, refer to Fuel, Weather, Pressure and High-Temperature Sealing - Maintenance Practices.

2. Overaged sealants to be tested for possible shelf life extension shall be properly mixed using the correct materials, procedures and equipment.

3. Overaged premixed frozen sealants, along with unmixed sealants should be visually inspected. Sealants which show conclusive evidence of separation, discoloration and/or gelling prior to the addition of a thinner or curing agent shall be discarded. When in doubt of the sealant quality, the overaged sealant should be compared with the same type of sealant, under six months old, which is known to be satisfactory.

4. The mixed sealants may be tested by placing a small amount of sealant (smaple buttons) on a sheet of paper. After the sample buttons have cured, they should be cut in half and examined. The sealant should show no signs of spots or streaks of unmixed base compound or curing agent. However, sample buttons containing spots, streaks, discoloration and/or variations in uniformity of color are acceptable if these spots, streaks, etc., are tack free upon inspection. All mixed sealant should be as void free as possible.

5. Contaminated sealant, premixed sealant that have been thawed and refrozen shall be discarded.

6. Type I, Class A sealants should be checked for appearance, application time, tack-free time, cure time, and adhesion.

7. Type I, Class B sealants should be checked for appearance, applicatiion time, cure time, tack-free time, and adhesion. In addition, Class B-2 and B-4 sealants should be checked for initial flow.

8. Type I, Class C sealants should be checked for appearance, application time, cure time and adhesion. In addition, Class C sealants should be tested to determine that they ARE NOT at a tackfree condition at the end of their rated work life (squeeze out life).

9. Type II sealants should be checked for appearance, application time, tack-free time and cure time.

10. Type III sealants should be easily thinned with MEK, when difficulty is encountered in thinning the sealant, it should be discarded.

11. Type IV sealants should be checked for appearance, application time, tack-free time and cure time.

12. Type V and VI sealants should be checked for appearance, tack-free time and cure time.

13. Type VII sealants should be checked for appearance, application time, tack-free time and cure time.

14. Type VIII sealants should be checked for appearance, application time, tack-free time, cure time and adhesion. Adhesion to aluminum should be (peel) less than two-pounds per inch of width.

PRODUCT	STORAGE CONDITION (TEMPERATURE IN DEGREES FAHENHEIT)	SHELF LIFE IN MONTHS	EXTEND SHELF LIFE IN MONTHS	RETEST IN MONTHS
ADHESIVES AND CEMENTS				
EA9309.3NA	40 TO 80°F	12 Months	6 Months	6 Months
EA9339	40 TO 80°F	12 Months	6 Months	6 Months
EA9314	40 TO 80°F	12 Months	6 Months	6 Months
EA9330	40 TO 80°F	12 Months	6 Months	6 Months
EA907	40 TO 80°F	12 Months	6 Months	6 Months
Devcon F	40 TO 80°F	12 Months	6 Months	6 Months
EA934NA	40 TO 80°F	12 Months	6 Months	6 Months
380/6	40 TO 80°F	12 Months	6 Months	6 Months
A1186B	40 TO 80°F	12 Months	6 Months	6 Months
EC2216	40 TO 80°F	12 Months	6 Months	6 Months
#10 Fastset	40 TO 80°F	12 Months	6 Months	6 Months
608 Quickset	40 TO 80°F	12 Months	6 Months	6 Months
EC880	40 TO 80°F	8 Months	3 Months	3 Months
EC847	40 TO 80°F	8 Months	3 Months	3 Months
EC1300L	40 TO 80°F	•6 Months	•3 Months	•3 Months
5452	40 TO 80°F	12 Months	6 Months	6 Months
56431	40 TO 80°F	12 Months	6 Months	6 Months
1636	40 TO 80°F	12 Months	6 Months	6 Months
RTV - 157	40 TO 80°F	12 Months	6 Months	6 Months
RTV - 158	40 TO 80°F	12 Months	6 Months	6 Months
RTV - 159	40 TO 80°F	12 Months	6 Months	6 Months
RTV732	40 TO 80°F	12 Months	6 Months	6 Months
RTV102	40 TO 80°F	12 Months	6 Months	6 Months
RTV103	40 TO 80°F	12 Months	6 Months	6 Months
RTV106	40 TO 80°F	12 Months	6 Months	6 Months
RTV108	40 TO 80°F	12 Months	6 Months	6 Months
RTV109	40 TO 80°F	12 Months	6 Months	6 Months
RTV94034	40 TO 80°F	12 Months	6 Months	6 Months
Loctite 222	40 TO 80°F	12 Months	6 Months	6 Months
Loctite 242	40 TO 80°F	12 Months	6 Months	6 Months
Loctite 271	40 TO 80°F	12 Months	6 Months	6 Months
Loctite 277	40 TO 80°F	12 Months	6 Months	6 Months
Loctite 290	40 TO 80°F	12 Months	6 Months	6 Months
Loctite 416	40 TO 80°F	12 Months	6 Months	6 Months
Loctite 495	40 TO 80°F	12 Months	6 Months	6 Months
Loctite 515	40 TO 80°F	12 Months	6 Months	6 Months
Loctite 569	40 TO 80°F	12 Months	6 Months	6 Months
Loctite 592	40 TO 80°F	12 Months	6 Months	6 Months
Loctite 595	40 TO 80°F	12 Months	6 Months	6 Months

• Do not use after three months of storage in the 81°F to 90°F range
Do not use after five days of storage above 90°F

Table 1-7 (Sheet 1 of 2)

PRODUCT	STORAGE CONDITION (TEMPERATURE IN DEGREES FAHENHEIT)	SHELF LIFE IN MONTHS	EXTEND SHELF LIFE IN MONTHS	RETEST IN MONTHS
ADHESIVES AND CEMENTS (CONTINUED)				
Loctite 601	40 TO 80°F	12 Months	6 Months	6 Months
Loctite 620	40 TO 80°F	12 Months	6 Months	6 Months
Loctite 680	40 TO 80°F	12 Months	6 Months	6 Months
Loctite 1282	40 TO 80°F	12 Months	6 Months	6 Months
Loctite 1283	40 TO 80°F	12 Months	6 Months	6 Months
DA-5521	40 TO 80°F	12 Months	6 Months	6 Months
PS-18	40 TO 80°F	12 Months	6 Months	6 Months
PS-30	40 TO 80°F	12 Months	6 Months	6 Months
XA-3678	40 TO 80°F	12 Months	6 Months	6 Months
XF-3585	40 TO 80°F	12 Months	6 Months	6 Months
LR-100-226	40 TO 80°F	12 Months	6 Months	6 Months
EC776	40 TO 80°F	* 8 Months	* 3 Months	*3 Months
SB and P2	40 TO 80°F	12 Months	6 Months	6 Months
SEALANTS				
Pro-Seal 890	40 TO 80°F	6 Months	2 Months	2 Months
GC-408	40 TO 80°F	6 Months	2 Months	2 Months
PR1422	40 TO 80°F	6 Months	2 Months	2 Months
PR1440	40 TO 80°F	6 Months	2 Months	2 Months
GC435	40 TO 80°F	6 Months	2 Months	2 Months
Pro-Seal 567	40 TO 80°F	6 Months	2 Months	2 Months
PR810	40 TO 80°F	6 Months	2 Months	2 Months
Pro-Seal 700	40 TO 80°F	6 Months	2 Months	2 Months
GC1900	40 TO 80°F	6 Months	2 Months	2 Months
PR366	40 TO 80°F	6 Months	2 Months	2 Months
Pro-Seal 735	40 TO 80°F	6 Months	2 Months	2 Months
Pro-Seal 895	40 TO 80°F	6 Months	2 Months	2 Months
Pro-Seal 706B	40 TO 80°F	6 Months	2 Months	2 Months
PR1321	40 TO 80°F	6 Months	2 Months	2 Months
GC200	40 TO 80°F	6 Months	2 Months	2 Months
RTV-730	40 TO 80°F	6 Months	2 Months	2 Months
Pro-Seal 815	40 TO 80°F	6 Months	2 Months	2 Months
GC402	40 TO 80°F	6 Months	2 Months	2 Months
PR-1005L	40 TO 80°F	*8 Months	*3 Months	*3 Months
GC-3001	40 TO 80°F	*8 Months	*3 Months	*3 Months
444R	40 TO 80°F	*8 Months	*3Months	*3 Months

* Do not use after three months of storage in the 81°F to 90°F range
Do not use after five days of storage above 90°F.

Table 1-7 (Sheet 2 of 2)

SECTION 2

GROUND HANDLING, SERVICING, CLEANING, LUBRICATION AND INSPECTION

WARNING

When performing any inspection or maintenance that requires turning on the master switch, installing a battery, or pulling the propeller through by hand, treat the propeller as if the ignition switch were ON. Do not stand, nor allow anyone else to stand within the arc of the propeller, since a loose or broken wire, or a component malfunction could cause the propeller to rotate.

TABLE OF CONTENTS — Page No. Aerofiche/Manual

2-1. GROUND HANDLING.

2-2. TOWING. Moving the aircraft by hand is accomplished by using the wing struts and landing gear struts as push points. A tow bar attached to the nose gear should be used for steering and maneuvering the aircraft on the ground. Beginning with 1982 the tow bar is stowed under the rear seat using two clips, one attached to the center leg of the seat and one secured to the floorboard under the left side of the seat. When no tow bar is available, press down at the horizontal stabilizer front spar adjacent to the fuselage to raise the nose wheel off the ground. With the nose wheel clear of the ground, the aircraft can be turned by pivoting it about the main wheels.

CAUTION

When towing the aircraft, never turn the nose wheel more than 29° (degrees) either side of center or the nose gear will be damaged. Do not push on control surfaces or outboard empennage surfaces. When pushing on the tailcone, always apply pressure at a bulkhead to avoid buckling the skin.

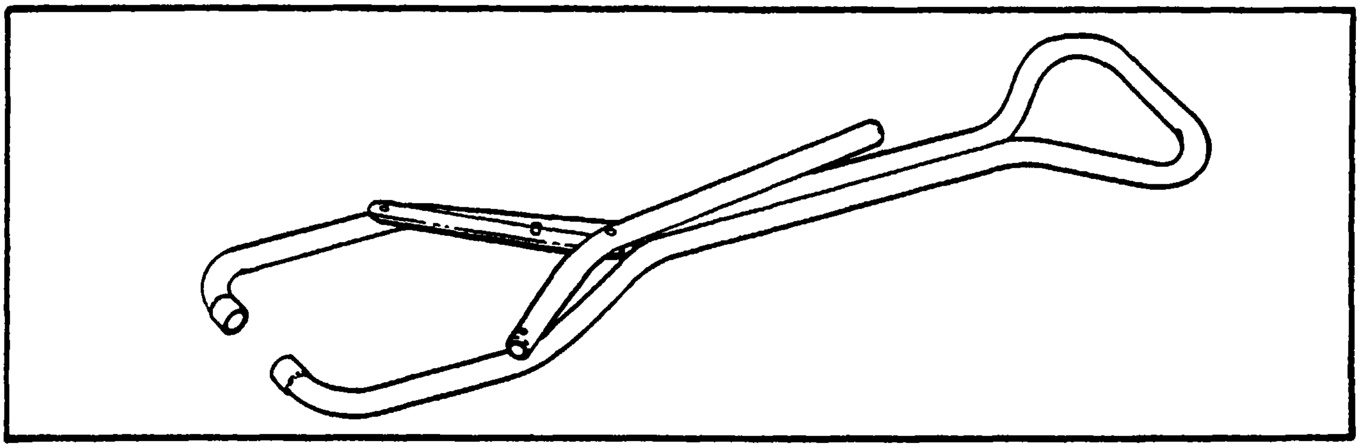
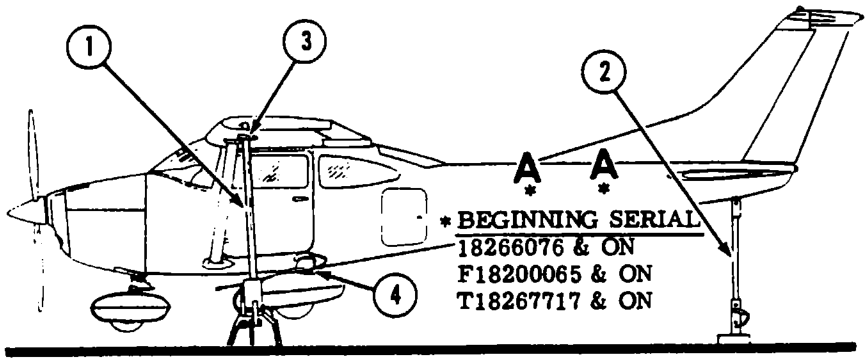


Figure 2-1. Typical Tow Bar

SHOP NOTES:



ITEM NUMBER	TYPE AND PART NUMBER	REMARKS
1	#2-170 Basic jack #2-109 Leg Extension #2-70 Slide tube extension	Closed height: 69-1/2 inches; extended height: 92 inches (Insert slide tube extension into basic jack).
2	Cessna #2-168	Universal tail stand (See Note 1)
3	Built-in jack pad	Part of step bracket (See Caution)
4	Block	1x4x4 padded with 1/4" rubber

1. Weighted adjustable stand attaches to tie-down ring.
2. Items (1) and (2) are available from the Cessna Supply Division.

JACKING PROCEDURE

a. Lower aircraft tail so that wing jack can be placed under front spar just outboard of wing strut.
b. Raise aircraft tail and attach tail stand to tie-down ring. BE SURE that tail stand weighs enough to keep tail down under all conditions and is strong enough to support aircraft weight.
c. Raise jacks evenly until desired height is reached.

CAUTION

When using the universal jack point, flexibility of the gear strut will cause the main wheel to slide inboard as the wheel is raised, tilting the jack. The jack must be lowered for a second operation. Jacking both main wheels simultaneously with universal jack points is not recommended.

NOTE

Corresponding points on both upper door sills may be used to level the aircraft laterally. Reference points for longitudinal leveling of the aircraft are two screws on the left side of the tailcone. These are indicated in the above illustration by **A**.

(Also refer to paragraph 2-5)

Figure 2-2. Jacking Details

2-3. HOISTING. The aircraft may be lifted with a hoist of two-ton capacity by using hoisting rings, which are optional equipment, or by means of suitable slings. The front sling should be hooked to each upper engine mount at the firewall, and the aft sling should be positioned around the fuselage at the first bulkhead forward of the leading edge of the stabilizer. If the optional hoisting rings are used, a minimum cable length of 60 inches for each cable is required to prevent bending of the eyebolt-type hoisting rings. If desired, a spreader jig may be fabricated to apply vertical force to the eyebolts.

2-4. JACKING. See figure 2-2 for jacking procedures.

2-5. LEVELING. Corresponding points on both upper door sills may be used to level the aircraft laterally. Reference point for leveling the aircraft longitudinally is the top of the tailcone between the rear window and the vertical fin. Beginning with Serials 18266076 & ON, F18200065 & ON, and T182-67717 & ON, leveling points have been added to the left side of tailcone at Sta. 139.65 and 171.65. Remove NAS221-7 screws and install suitable studs to support a level.

2-6. WEIGHING AIRCRAFT. Refer to Pilot's Operating Handbook.

2-7. PARKING. Parking precautions depend principally on local conditions. As a general precaution, set parking brake or chock the wheels and install the controls lock. In sever weather conditions and high wind, tie down the aircraft as outlined in paragraph 2-8 if a hangar is not available.

2-8. TIE-DOWN. When mooring the aircraft in the open, head into the wind if possible. Secure control surfaces with the internal control lock and set brakes.

CAUTION

Do not set parking brakes when they are overheated or during cold weather when accumulated moisture may freeze them.

a. Tie ropes, cables, or chains to the wing tie-down fittings located at the upper end of each wing strut. Secure the opposite ends of ropes, cables, or chains to ground anchors.

b. Secure a tie-down rope (no chains or cables) to upper strut of the nose gear, and secure opposite end of rope to a ground anchor.

c. Secure the middle of a rope to the tail tie-down ring. Pull each end of rope away at a 45 degree angle and secure to ground anchors at each side of tail.

d. Secure control lock on pilot control column. If control lock is not available, tie pilot control wheel back with front seat belt.

e. These aircraft are equipped with a spring-loaded steering bungee which affords protection against normal wind gusts. However, if extremely high wind gusts are anticipated, additional external locks may be installed.

2-9. FLYABLE STORAGE. (Airplanes with a Lycoming engine). Flyable storage is defined as a maximum of 30 days non-operational storage and/or the first 25 hours of intermittent engine operation.

NOTE

Lycoming O-540 Series aircraft engines used in the T182 series aircraft are delivered from Cessna with MIL-L-6082 Aviation Grade Mineral Oil. This engine oil should be used to replenish the oil supply during the first 25 hours of engine operation at the first 25 hour oil change and until a total of 50 hours have accumulated or oil consumption has stabilized. Then use Ashless Dispersant Oil conforming to MIL-L-22851 in accordance with the oil chart in figure 2-4.

During the 30 day non-operational storage or the first 25 hours of intermittent engine operation, every seventh day the propeller shall be rotated by hand without running the engine. After rotating the engine five revolutions, stop the propeller 45° to 90° from the position it was in. If the aircraft is stored outside, tie-down in accordance with paragraph 2-8. In addition, the pitot tube, static air vents, air vents, openings in the engine cowling, and other similar openings shall have protective covers installed to prevent entry of foreign material. If at the end of thirty (30) days aircraft will not be removed from storage, the engine shall be started and run. The preferred method would be to fly the aircraft for thirty (30) minutes, and up to but not exceeding normal oil and cylinder temperatures.

CAUTION

Excessive ground operation shall be avoided.

2-9A. FLYABLE STORAGE. (Airplanes with a Continental engine.)

NOTES

Preservation date should be written on propeller tag.

Maintain complete and accurate engine preservation records to ensure proper preservation of the engine cylinders can be documented and confirmed at a later date if necessary.

The airplane is delivered from Cessna with a Corrosion Preventive Aircraft Engine Oil mixture. This engine oil is a blend of aviation grade straight mineral oil and corrosion preventive compound. This oil should be used for the first 25 hours of engine operation. In the event it is necessary to add oil during the first 25 hours of operation, use MIL-L-6082 aviation grade straight mineral oil of the correct viscosity.

Flyable storage is defined as a maximum of 30 days non-operational storage and can be broken down into the following two programs.

a. Program 1 - engines or cylinders with less than 50 operating hours.

1. Propeller pull-thru every five days. (See step c.)

2. Fly airplane every 30 days. (See step d.)

b. Program 2 - engines or cylinders with more than 50 operating hours to TBO if not flown weekly.

1. Propeller pull-thru every seven days. (See step c.)

2. Fly airplane every 30 days. (See step d.)

c. The propeller should be rotated by hand without running the engine. For four and six cylinder straight drive engines, rotate engine six revolutions, stop propeller 45°to 90° from original position. For six cylinder geared engines, rotate propeller four revolutions and stop propeller 30° to 60° from original position.

CAUTION

For maximum safety, accomplish engine rotation as follows:

1. Verify magneto switches are OFF.
2. Place throttle in CLOSED position.
3. Place mixture control in IDLE CUT-OFF position.
4. Set brakes and block airplane wheels.
5. Leave airplane tie-downs installed and verify that cabin door latch is open.
6. DO NOT stand within arc of propeller blades while turning propeller.

d. The airplane should be flown for thirty (30) minutes, reaching, but not exceeding, normal oil and cylinder temperatures. If the aircraft cannot be flown it should be represerved in accordance with paragraph 2-11. (Temporary Storage) or paragraph 2-14. (Idefinite Storage). Ground running is not an acceptable substitute for flying.

NOTE

If step 2 in each program cannot be accomplished on schedule due to weather, maintenance, etc., pull the propeller through daily and accomplish as soon as possible.

e. If airplane is stored outside, tie it down in accordance with paragraph 2-8. In addition, the pitot tube, static air vents, air vents, openings in the engine cowling, and other similar openings shall have protective covers installed to prevent entry of foreign material.

2-10. RETURNING AIRCRAFT TO SERVICE. After flyable storage, returning the aircraft to service is accomplished by performing a thorough pre-flight inspection. At the end of the first 25 hours of engine operation, drain engine oil, clean oil pressure screen (or change external oil filter) and service engine with correct grade and quantity of engine oil. See figure 2-4 and paragraph 2-23 for correct grade of engine oil.

2-11. TEMPORARY STORAGE. Temporary storage is defined as aircraft in a non-operational status for a maximum of 90 days. The aircraft is constructed of corrosion resistant alclad aluminum, which will last indefinitely under normal conditions if kept clean, however, these alloys are subject to oxidation. The first indication of corrosion on unpainted surfaces is in the form of white deposits or spots. On painted surfaces, the paint is discolored or blistered. Storage in a dry hangar is essential to good preservation and should be procured, if possible. Varying conditions will alter the measures of preservation, but under normal conditions in a dry hangar, and for storage periods not to exceed 90 days, the following methods of treatment are suggested.

a. Fill fuel tanks or bays with correct grade of gasoline.

b. Clean and wax aircraft throughly.

c. Clean any oil or grease from tires and coat tires with a tire preservative. Cover tires to protect against grease and oil.

d. Either block up fuselage to relieve pressure on tires or rotate wheels every 30 days to prevent flat spotting the tires.

e. Lubricate all airframe items and seal or cover all openings which could allow moisture and/or dust to enter.

NOTE

The aircraft battery serial number is recorded in the aircraft equipment list. To assure accurate warranty records, the battery should be reinstalled in the same aircraft from which it was removed. If the battery is returned to service in a different aircraft, appropriate record changes must be made and notification sent to the Cessna Claims Department.

f. Remove battery and store in a cool, dry place; service battery periodically and charge as required.

NOTE

An engine treated in accordance with the following may be considered being protected against normal atmospheric corrosion for a period not to exceed 90 days.

g. Disconnect spark plug leads and remove upper and lower spark plugs from each cylinder.

NOTES

On 182 and F182 Series aircraft equipped with Continental O-470 Series aircraft engine the preservative oil must be Lubricating Oil - Contact and Volatile, Corrosion Inhibited, MIL-L-46002, Grade 1, or equivalent.

On T182 Series aircraft equipped with Lycoming O-540 Series aircraft engine. MIL-C-6529, Type I, preservative oil must be used.

For airplanes with a Continental engine, the preservative oil must be MIL-L-46002, grade 1, at room temperature. Two preservative oils recommended for use in Teledyne Continental engines for temporary and indefinite storage are NOX RUST VCI-105 (Danbert Chemical Co., 4700 S. Central Avenue, Chicago, IL.) and PETROTECT VA (Pennsylvania Refining Company, Butler, PA).

h. Using a portable pressure sprayer, spray preservative oil through the upper spark plug hole of each cylinder with the piston in a down position. Rotate crankshaft as each pair of cylinders is sprayed.

i. After completing step "h," rotate crankshaft so that no piston is at a top position. If the aircraft is to be stored outside, stop two-bladed propeller so that blades are as near horizontal as possible to provide maximum clearance with passing aircraft.

j. Again, spray each cylinder without moving the crankshaft, to thoroughly cover all interior surfaces of the cylinder above the piston.

k. Install spark plugs and connect spark plug leads.

l. Apply preservative oil to the engine interior by spraying approximately two ounces of the preservative oil through the oil filler tube.

m. Seal all engine openings exposed to the atmosphere, using suitable plugs or non-hygroscopic tape. Attach a red streamer at each point that a plug or tape is installed.

n. If the aircraft is to be stored outside, perform the procedures outlined in paragraph 2-8. In addition, the pitot tube, static source vents, air vents, openings in the engine cowling, and other similar openings should have protective covers installed to prevent entry of foreign material.

o. Attach a warning placard to the propeller to the effect that the propeller shall not be moved while the engine is in storage.

2-12. INSPECTION DURING STORAGE.

a. Inspect airframe for corrosion at least once a month. Remove dust collections as frequently as possible. Clean and wax aircraft as required.

b. Inspect the interior of at least one cylinder through the spark plug hole for corrosion at least once each month.

NOTE

Do not move crankshaft when inspecting interior of cylinder for corrosion.

c. If at the end of the 90 day period, the aircraft is to be continued in non-operational storage, repeat the procedural steps "g" thru "o" of paragraph 2-11.

2-13. RETURNING AIRCRAFT TO SERVICE. After temporary storage, use the following procedures to return the aircraft to service.

a. Remove aircraft from blocks. Check tires for proper inflation.

b. Check and install battery.

c. Check that oil sump has proper grade and quantity of engine oil.

d. Service induction air filter and remove warning placard from propeller.

e. Remove materials used to cover openings.

f. Remove, clean and gap spark plugs.

g. While spark plugs are removed, rotate propeller several revolutions to clear excess rust preventive oil from cylinders.

h. Install spark plugs and torque to values specified in Section 11 & 11A. Connect spark plug leads.

i. Check fuel strainer. Remove and clean filter screen if necessary. Check fuel tanks or bays and fuel lines for moisture and sediment. Drain enough fuel to eliminate moisture and sediment.

j. Perform a thorough pre-flight inspection, then start and warm-up engine.

2-14. INDEFINITE STORAGE. (Airplanes with a Lycoming engine.) Indefinite storage is defined as aircraft in a non-operational status for an indefinite period of time. Engines treated in accordance with the following may be considered protected against normal atmosphere corrosion, provided procedures outlined in paragraph 2-15 are performed at intervals specified.

a. Operate engine until oil temperature reaches normal operating range. Drain engine oil sump in accordance with procedures outlined in paragraph 2-23. Close drain valve or install drain plug.

b. Fill oil sump to normal operating capacity with corrosion preventative mixture which has been thoroughly mixed.

NOTE

Corrosion preventative mixture consists of one part compound MIL-C-6529C, Type I, mixed with three parts new lubricating oil of the grade recommended for service.

c. Immediately after filling the oil sump with a corrosion preventative mixture, fly the aircraft for a period of time not to exceed a maximum of 30 minutes.

d. After flight, with engine operating at 1200 to 1500 RPM, and induction air filter removed, spray corrosion preventative mixture into induction airbox, at the rate of one-half gallon per minute. Spray until heavy black smoke comes from exhaust stack. Then increase the spray until engine is stopped.

CAUTION

Spraying the mixture too fast can cause a hydrostatic lock.

e. Do not rotate propeller after completing step "d."

f. Remove all spark plugs and spray corrosion preventative mixture, which has been preheated (221° to 250°F,) into all spark plug holes to thoroughly cover interior surfaces of cylinders.

NOTE

To thoroughly cover all surfaces of the cylinder interior, move the nozzle of the spray gun from the top to the bottom of the cylinder. If by accident the propeller is rotated following this spraying, re-spray the cylinders to insure an unbroken coverage on all surfaces.

g. Install spark plugs or solid plugs into the lower spark plug holes and install dehydrator plugs in the upper spark plug holes. Be sure that dehydrator plugs are blue in color when installed.
h. Cover spark plug lead terminals with shipping plugs (AN4060-1), or other suitable covers.
i. With throttle in full open position, place a bag of desiccant in the induction air intake and seal opening with moisture resistant paper and tape.
j. Place a bag of desiccant in the exhaust tailpipe and seal openings with moisture resistant tape.
k. Seal cold air inlet to the heater muff with moisture resistant tape.
l. Seal engine breather tube by inserting a protex plug in the breather hose and clamping in place.
m. Seal all other engine openings exposed to atmosphere, using suitable plugs or non-hygroscopic tape.

NOTE

Attach a red streamer to each location where plugs or tapes are installed. Either attach red streamers outside th sealed area with tape or to the inside of the sealed area with safety wire to prevent wicking of moisture into the sealed area.

n. Drain corrosion-preventive mixture from engine sump and reinstall drain plug or close drain valve.

NOTE

The corrosion-preventive mixture is harmful to paint and should be wiped from painted surfaces immediately.

o. Attach a warning placard on the throttle control knob to the effect that the engine contains no lubricating oil. Placard the propeller to the effect that it should not be moved while the engine is in storage.
p. Prepare airframe for storage as outlined in paragraph 2-11 thru step "f".

NOTE

As an alternate method of indefinite storage, the aircraft may be serviced in accordance with paragraph 2-11, providing the aircraft is run up at maximum intervals of 90 days and then reserviced per paragraph 2-11.

2-14A. INDEFINITE STORAGE. (Airplanes with a Continental engine.) Indefinite storage is defined as aircraft in a non-operational status for an indefinite period of time. Engines treated in accordance with the following may be considered protected against normal atmosphere corrosion, provided procedures outlined in paragraph 2-15 are performed at intervals specified.

a. Drain engine oil and refill with MIL-C-6529 Type II. The aircraft should be flown for thirty (30) minutes, reaching, but not exceeding normal oil and cylinder temperatures. Allow engine to cool to ambient temperature.
b. Remove top spark plug and spray preservative oil (Lubrication Oil - Contact and Volatile Corrosion - Inhibited, MIL-L-46002, Grade 1) at room temperature, through upper spark plug hole of each cylinder with piston in approximately bottom dead center position. Rotate crankshaft as each pair of opposite cylinders is sprayed. Stop crankshaft with no piston at top dead center. A pressure pot or pump-up type garden pressure sprayer may be used. The spray head should have ports around circumference to allow complete coverage of cylinder walls.

NOTE

The preservative oil must be MIL-L-46002, grade 1, at room temperature. Two preservative oils recommended for use in Teledyne Continental engines for temporary and indefinite storage are NOX RUST VCI-105 (Daubert Chemical Co., 4700 S. Central Avenue Chicago, IL.) and PETROTECT, VA (Pennsylvania Refining Company, Butler, PA).

c. Respray each cylinder without rotating crank. To thoroughly cover all surfaces of cylinder interior, move nozzle or spray gun from top to bottom of cylinder.

NOTE

MIL-C-6529 Type II may be formulated by thoroughly mixing one part compound MIL-C-6529 Type I (Esso Rust-Ban 628, Cosmoline No. 1223 or equivalent) with three parts new lubricating oil of the grade recommended for service (all at room temperature). Single grade oil is recommended.

d. Apply preservative to engine interior by spraying MIL-L-46002, Grade 1 oil (approximately two ounces) through oil filler tube.
e. Install dehydrator plugs MS27215-1 or-2, in each of the top spark plug holes, making sure that each plug is blue in color when installed. Protect and support spark plug leads with AN-4060 protectors.
f. DO NOT rotate propeller after completing step "e".
g. If engine is equipped with a pressure type carburetor, preserve this component by the following method. Drain carburetor by removing the drain and vapor vent plugs from regulator and fuel control unit. With mixture control in "Rich" position, inject lubricating oil, grade 1010, into fuel inlet at a pressure not to exceed 10 psi until oil flows from vapor vent opening. Allow excess oil to drain, plug inlet and tighten and safety the drain and vapor vent plugs. Wire throttle in open position, place bags of desiccant in the intake and seal opening with moisture resistant paper and tape or a cover plate.

h. If carburetor is removed from engine, place a bag of desiccant in throat of carburetor air adapter. Seal adapter with moisture resistant paper and tape or a cover plate.
i. Place a bag of desiccant in the exhaust pipes and seal the openings with moisture resistant tape.
j. Seal cold air inlet to heater muff with moisture resistant tape to exclude moisture and foreign objects.
k. Seal engine breather by inserting a dehydrator MS27215-2 plug in breather hose and clamping in place.
l. Seal all other engine openings exposed to atmosphere, using suitable plugs or non-hygroscopic tape.
m. Attach a red streamer to each place on the engine where bags of desiccant are placed. Either attach red streamers outside of sealed area with tape or to inside of sealed area with safety wire to prevent wicking of moisture into sealed area.
n. Drain corrosion-preventive mixture from engine sump and reinstall drain plug or close drain valve.

NOTE

The corrosion-preventive mixture is harmful to paint and should be wiped from painted surfaces immediately.

o. Attach a warning placard on the throttle control knob to the effect that the engine contains no lubricating oil. Placard the propeller to the effect that it should not be moved while the engine is in storage.
p. Prepare airframe for storage as outlined in paragraph 2-11., steps "a." through "f.".

2-15. INSPECTION DURING STORAGE. (Airplanes with a Lycoming engine.) Aircraft in indefinite storage shall be inspected as follows:
a. Inspect cylinder protex plugs each seven days.
b. Change protex plugs if their color indicates an unsafe condition.
c. If the protex plugs have changed color in one half of the cylinders, all desiccant material in the engine should be replaced with new material.
d. Respray the cylinder interiors with corrosion preventive mixture every six months and replace desiccant and protex plugs.

NOTE

Before spraying, inspect the interior of one cylinder for corrosion through the spark plug hole and remove at least one rocker box cover and inspect the valve mechanism.

215A. INSPECTION DURING STORAGE. (Airplanes with a Continental engine.) Aircraft in indefinite storage shall be inspected as follows:
a. Aircraft prepared for indefinite storage should have cylinder dehydrator plugs visually inspected every 15 days. The plugs should be changed as soon as their color indicates unsafe conditions of storage. If the dehydrator plugs have changed color in one-half or more of the cylinders, all desiccant material on the engine should be replaced.
b. The cylinder bores of all engines prepared for indefinite storage should be resprayed with corrosion-preventive mixture every six months, or more frequently if bore inspection indicates corrosion has started earlier than six months. Replace all desiccant and dehydrator plugs. Before spraying, engine should be inspected for corrosion as follows: Inspect interior of at least one cylinder on engine through the spark plug hole. If cylinder shows start of rust, spray cylinder corrosion-preventive oil and turn prop over six times, then respray all cylinders. Remove at least one rocker box cover from engine and inspect valve mechanism.

2-16. RETURNING AIRCRAFT TO SERVICE. After indefinite storage, use the following procedure to return the aircraft to service.
a. Remove aircraft from blocks. Check tires for correct inflation.
b. Check and install battery.
c. Remove all materials used to seal and cover openings.
d. Remove warning placards posted at throttle and propeller.
e. Remove and clean engine oil screen, then reinstall and safety. On aircraft equipped with an external oil filter, install new filter.
f. Remove oil sump drain plug or open drain valve and drain sump. Install or close drain valve and safety. Service engine with oil per figure 2-4.
g. Service and install the induction air filter.

NOTE

The corrosion-preventive mixture will mix with the engine lubricating oil, so flushing the oil system is not necessary. Draining the oil sump will remove enough of the corrosion-preventive mixture.

WARNING

On aircraft with a Continental engine, upon returning the aircraft to service do not use the corrosion-preventive oil referenced in paragraph 2-14.

h. Remove dehydrator plugs and spark plugs or plugs installed in spark plug holes. Rotate propeller several revolutions by hand to clear corrosion-preventive mixture from cylinders.
i. Clean, gap and install spark plugs and rotate propeller by hand though the compression strokes of all the cylinders to check for possible liquid lock. Torque plugs the value specified in Section 11 or 11A.
j. Check fuel strainer. Remove and clean filter screen. Check fuel cells and fuel lines for moisture and sediment. Drain enough fuel to eliminate moisture and sediment.
k. If the carburetor has been preserved with oil, drain it by removing the drain and vapor vent plugs from the regulator and fuel control unit. With mixture control in "Rich" position, inject service type

gasoline into fuel inlet at a pressure not to exceed 10 psi until all of the oil is flushed from the carburetor. Reinstall carburetor plugs and attach fuel line.

l. Perform a thorough preflight inspection, then start and warm up engine.

m. Thoroughly clean and test fly aircraft.

2-17. SERVICING.

2-18. GENERAL DESCRIPTION. Servicing requirements are shown in figure 2-4. The following paragraphs supplement this figure by adding details not included in the figure.

2-19. FUEL. Fuel tanks should be filled immediately after flight to lessen condensation in the tanks and lines. Tank capacities are listed in figure 1-1. The recommended fuel grade to be used is given in figure 2-4.

WARNING

DURING ALL FUELING PROCEDURES, FIRE FIGHTING EQUIPMENT MUST BE AVAILABLE. TWO GROUND WIRES FROM DIFFERENT POINTS ON THE AIRPLANE TO SEPARATE APPROVED GROUND STAKES SHALL BE USED TO PREVENT ACCIDENTAL DISCONNECTION OF ONE GROUND WIRE. ENSURE THAT FUELING NOZZLE IS GROUNDED TO THE AIRPLANE.

NOTE

Tie-down rings should be used as grounding points for all grounding wires during refueling procedures.

2-20. USE OF FUEL ADDITIVES FOR COLD WEATHER OPERATION. Strict adherence to recommended preflight draining instructions will eliminate any free water accumulations from the tank sumps. While small amounts of water may still remain in solution in the gasoline, it will normally be consumed and go unnoticed in the operation of the engine.

One exception to this can be encountered when operating under the combined effect of: 1) use of certain fuels, with 2) high humidity conditions on the ground 3) followed by flight at high altitude and low temperature. Under these unusual conditions small amounts of water in solution can precipitate from the fuel stream and freeze in sufficient quantities to induce partial icing of the engine fuel system.

While these conditions are quite rare and will not normally pose a problem to owners and operators, they do exist in certain areas of the world and consequently must be dealt with, when encountered.

Therefore, to alleviate the possibility of fuel icing occurring under these unusual conditions it is permissible to add isopropyl alcohol or ethylene glycol monomethyl ether (EGME) compound to the fuel supply. See Figure 2-3 for Fuel Additive Mixing Ratio.

The introduction of alcohol or EGME compound into the fuel provides two distinct effects: 1) it absorbs the dissolved water from the gasoline and 2) alcohol has a freezing temperature depressant effect.

Alcohol, if used, is to be blended with the fuel in a concentration of 1% by volume. Concentrations greater than 1% are not recommended since they can be detrimental to fuel tank materials.

The manner in which the alcohol is added to the fuel is significant because alcohol is most effective when it is completely dossolved in the fuel. To insure proper mixing the following is recommended:

1. For best results the alcohol should be added during the fueling operation by pouring the alcohol directly on the fuel stream issuing from the fueling nozzle.
2. An alternate method that may be used is to premix the complete alcohol dosage with some fuel in a separate clean container (approximately 2-3 gallon capacity) and then transfer this mixture to the tank prior to the fuel operation.

Any high quality isopropyl alcohol may be used, such as:

Anti-icing fluid (MIL-F-5566) or

Isopropyl alcohol (Federal Spec. TT-I-735a).

Ethylene glycol monomethyl ether (EGME) compound in compliance with MIL-I-27686 or Phillips PFA-55MB, if used, must be carefully mixed with fuel in concentrations not to exceed 0.15% by volume.

CAUTION

Mixing of the EGME compound with the fuel is extremely important because concentration in excess of that recommended (0.15 percent by volume maximum) will result in detrimental affects to the fuel tanks, such as deterioration of protective primer and sealants and damage to O-rings and seals in the fuel system and engine components. Use only blending equipment that is recommended by the manufacturer to obtain proper proportioning.

CAUTION

Do not allow the concentrated EGME compound to come in contact with the airplane finish or fuel cell as damage can refult.

Prolonged storage of the airplane will result in a water buildup in the fuel which "leeches out" the additive. An indication of this is when an excessive amount of water accumulates in the fuel tank sumps. The concentration can be checked using a differential refractometer. It is imperative that the technical manual for the differential refractometer be followed explicitly when checking the additive concentration.

2-21. FUEL DRAINS. Fuel drains are located at various places throughout the fuel system. Refer to Section 12 for location of the various drains in the system. The strainer drain valve is an integral part of

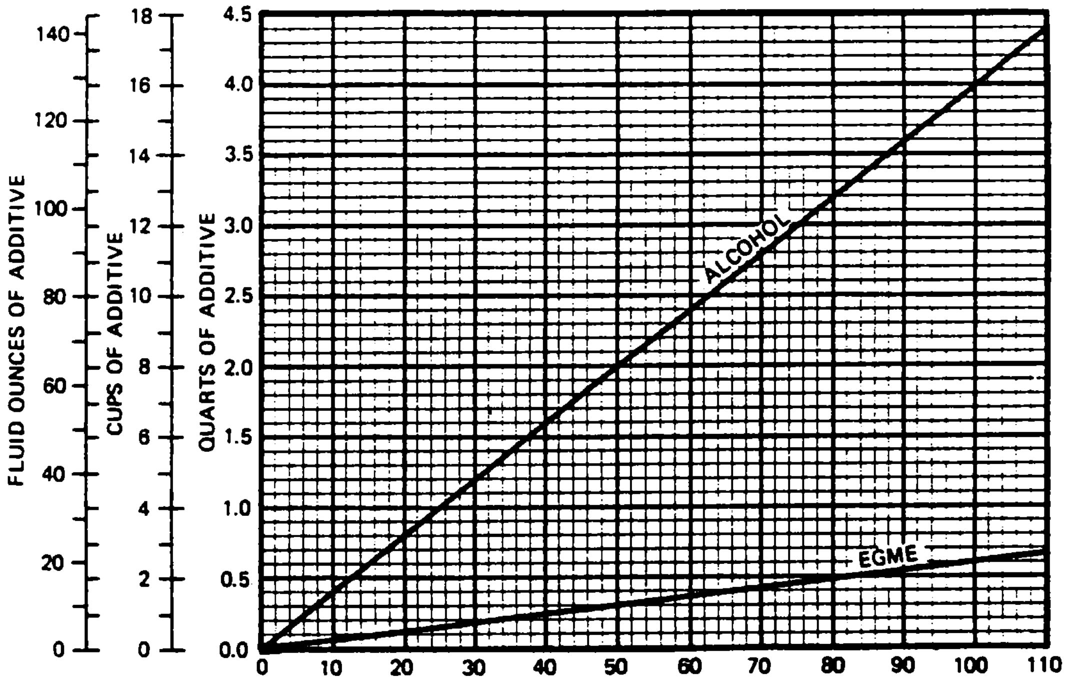


Figure 2-3. Fuel Additive Mixing Ratio Chart

the fuel strainer assembly. The strainer drain is equipped with a control which is located adjacent to the oil dipstick. Access to the control is through the oil dipstick access door. Remove drain plugs and open drain valves at the intervals specified in the inspection charts in this Section. Also, during daily inspection of the fuel strainer, if water is found in the strainer, there is a possibility that the wing tank sumps or fuel lines contain water. Therefore, all drain plugs/valves should be removed and all water drained from the system. To activate drain valve for fuel sampling, place cup up to valve and depress valve with rod protruding from cup. (Refer to Section 12.)

2-22. CARBURETOR DRAIN PLUG INSPECTION. In order to prevent the possibility of thread sealant contamination in the carburetor float chamber, cleaning and inspection of the carburetor should be accomplished at each 100-hour inspection and anytime water in the fuel is suspected.

a. With the fuel valve OFF, remove carburetor drain plug and clean off any sealant present on the end of the plug or in the threads on the plug.

b. Inspect drain plug hole in the carburetor and remove any sealant remaining in the hole.

c. Install drain plug as follows:

1. Install drain plug in carburetor 1-1/2 to 2 turns.

2. Apply sealant to drain plug threads. Use NS-40 (RAS-4) or equivalent.

3. Tighten and safety drain plug.

f. Turn fuel valve ON and inspect for evidence of fuel leakage.

2-23. ENGINE OIL. Check engine lubricating oil with the dipstick five to ten minutes after the engine has been stopped. The aircraft should be in as near a level position as possible when checking the engine oil, so that a true reading is obtained. Engine oil should be drained while the engine is still hot, and the nose of the aircraft should be raised slightly for more positive draining of any sludge which may have collected in the engine oil sump. Engine oil should be changed every six months, even though less than the specified hours have accumulated. Reduce these intervals for prolonged operations in dusty areas, in cold climates where sludging conditions exist, or where short flights and long idle periods are encountered, which cause sludging conditions. Always change oil and clean oil pressure screen (or change external filter) whenever oil on the dipstick appears dirty.

WARNING

The U.S. Environmental Protection Agency advises that mechanics and other workers who handle engine oil are advised to minimize skin contact with used oil and promptly remove used oil from the skin. In a laboratory study, mice developed skin cancer after skin was exposed to used engine oil twice a week without being washed off, for most of their life span. Substances found to cause cancer in laboratory animals may also cause cancer in humans.

Continental O-470 Series aircraft engines used in 182 and F182 airplanes are delivered from Cessna with a corrosion preventive aircraft engine oil conforming to MIL-C-6529. Use this oil for the first 25 hours of engine operation. If it becomes necessary to add oil during this period, use aviation grade straight mineral oil of the recommended viscosity conforming to MIL-L-6082. After the first 25 hours of engine operation, drain the engine oil sump and clean the oil pressure screen. If an oil filter is installed, change filter. Refill oil sump with recommended quantity and grade of ashless dispersant oil. Newly overhauled engines should also be operated on aviation grade straight mineral oil conforming to MIL-L-6082 for the first 25 hours.

Lycoming O-540 Series aircraft engines used in T182 airplanes are delivered from Cessna with aviation grade straight mineral oil conforming to MIL-L-6082. If it becomes necessary to add oil during the first 25 hours of engine operation use aviation grade straight mineral oil of the recommended viscosity conforming to MIL-L-6082. After the first 25 hours drain the engine oil and clean the oil pressure screen. If an oil filter is installed, change filter. Refill oil sump with aviation grade straight mineral oil of the recommended viscosity, conforming to MIL-L-6082, and continue to use until a total of 50 hours of engine operation have accumulated or oil consumption has stabilized. Drain the engine oil and refill sump with recommended quantity and grade of ashless dispersant oil. Ashless dispersant oil MUST BE USED after first 50 engine hours, or consumption has stabilized. The same procedure applies to newly overhauled engines.

An oil quick-drain valve may be installed in the oil drain port of the oil sump. This valve provides a quick and cleaner method of draining the engine oil. To drain the oil, proceed as follows:

a. Operate engine until oil temperature is at a normal operating temperature.
b. (With Quick-Drain Valve) Attach a hose to the quick-drain valve in oil sump. Push up on quick-drain valve until it locks open, and allow oil to drain through hose into container.
c. (Without Quick-Drain Valve) Remove oil drain plug from engine sump and allow oil to drain into a container.
d. After engine oil has drained, close quick-drain valve or install and safety drain plug.
e. Remove and clean oil pressure screen or change external oil filter.
f. Service engine with correct quantity and viscosity of aviation grade engine oil.

NOTE

Refer to inspection charts for intervals for changing oil and filter. See figure 2-4 for correct viscosities and quantities of aviation grade oil.

2-24. ENGINE INDUCTION AIR FILTER. The induction air filter keeps dust and dirt from entering the induction system. The value of maintaining the air filter in a good clean condition can never be overstressed. More engine wear is caused through the use of a dirty or damaged air filter than is generally believed. The frequency with which the filter should be removed, inspected, and cleaned will be determined primarily by aircraft operating conditions. A good general rule however, is to remove, inspect, and clean the filter at least every 100 hours of engine operating time and more frequently if warranted by operating condition. Under extremely dusty conditions, daily servicing of the filter is recommended. To service the induction air filter, proceed as follows:

a. Remove filter from aircraft.

NOTE

Use care to prevent damage to filter element when cleaning filter with compressed air.

b. Clean filter by blowing with compressed air (not over 100 psi) from direction opposite of normal air flow. Arrows on filter case indicate direction of normal air flow.

CAUTION

Do not use solvent or cleaning fluids to wash filter. Use only a water and household detergent solution when washing the filter.

c. After cleaning as outlined in step "b", the filter may be washed, if necessary, in a solution of warm water and a mild household detergent. A cold water solution may be used.

NOTE

The filter assembly may be cleaned with compressed air a maximum of 30 times or it may be washed a maximum of 20 times. A new filter should be installed after using 500 hours of engine operating time or one year, whichever should occur first. However, a new filter should be installed at anytime the existing filter is damaged. A damaged filter may have sharp or broken edges in the filtering panels which would allow unfiltered air to enter the induction system. Any filter that appears doubtful, shall have a new filter installed in its place.

d. After washing, rinse filter with clear water until rinse water draining from filter is clear. Allow water to drain from filter and dry with compressed air (not over 100 psi).

NOTE

The filtering panels of the filter may become distorted when wet, but they will return to their original shape when dry.

e. Be sure air box is clean, inspect filter. If filter is damaged, install a new filter.
f. Install filter at entrance to air box with gasket on aft face of filter frame and with air flow arrows on filter frame pointed in the correct direction.

2-25. VACUUM SYSTEM FILTER. The vacuum system central air filter keeps dust and dirt from entering the vacuum-operated instruments. Inspect filter every 100 hours for damage. Replace filter every 500 hours of operation or whenever it becomes sufficiently clogged to cause suction gage readings to drop below 4.6 in. Hg. Do not operate the vacuum system with the filter removed, or a vacuum line disconnected as particles of dust or other foreign matter may enter the system and damage the vacuum-operated instruments.

CAUTION

Excessive smoking in the cabin will cause premature filter clogging.

2-26. BATTERY. Battery servicing involves adding distilled water to maintain the electrolyte even with the horizontal baffle plate at the bottom of the filler holes, checking the battery cable connections, and neutralizing and cleaning off any spilled electrolyte or corrosion. Use bicarbonate of soda (baking soda) and water to neutralize electrolyte or corrosion. Follow with a thorough flushing with a wire brush, then coat with petroleum jelly before connecting. The battery box also should be checked and cleaned if any corrosion is noted. Distilled water, not acid or "rejuvenators," should be used to maintain electrolyte level. Check the battery every 100 hours (or at least every 90 days) and oftener in hot weather. See Section 16 for detailed battery removal, installation, and testing.

2-27. TIRES. Maintain tire pressure at the pressure specified in figure 1-1. When checking tire pressure, examine tires for wear, cuts, bruises, and slippage. Remove oil, grease, and mud from tires with soap and water.

NOTE

Recommended tire pressures should be maintained. Especially in cold weather, remember that any drop in temperature of the air inside a tire causes a corresponding drop in air pressure.

2-28. NOSE GEAR SHOCK STRUT. The nose gear shock strut requires periodic checking to ensure that the strut is filled with hydraulic fluid and is inflated to the correct air pressure. To service the nose gear shock strut, proceed as follows:

a. Remove valve cap and release all air.
b. Remove valve housing assembly.
c. Compress strut completely (stops in contact with outer barrel hub).
d. Oil level.
   1. Fluid used should comply with specification MIL-H-5606.
   2. Fill strut to bottom of valve installation hole.
   3. Maintain oil level at bottom of valve installation hole.
e. Fully extend strut.
f. Replace valve housing assembly.
g. With strut fully extended and nose wheel clear of ground, inflate strut to 55-60 psi.

NOTE

The nose landing gear shock strut will normally require only a minimum amount of service. Maintain the strut extension pressure as shown in Section 1. Lubricate landing gear as shown in figure 2-5. Check the landing gear daily for general cleanliness, security of mounting, and for hydraulic fluid leakage. Keep machined surfaces wiped free of dirt and dust, using a clean lint-free cloth saturated with hydraulic fluid (MIL-H-5606) or kerosene. All surfaces should be wiped free of excessive hydraulic fluid.

2-29. NOSE GEAR SHIMMY DAMPER. The nose gear shimmy damper contains a compensating mechanism within the hollow piston rod. This is for thermal expansion and contraction of the hydraulic fluid in the damper. The shimmy damper must be filled completely with hydraulic fluid, free of entrapped air with the compensating piston bottomed in the piston rod. Before servicing the shimmy damper, ascertain that the compensating piston is bottomed in the piston rod. Service the shimmy damper at least every 50 hours as follows:

a. Remove shimmy damper from the aircraft.
b. While holding the shimmy damper in a vertical position with the filler plug pointed upward, loosen filler plug to allow excess fluid to escape.
c. Allow the spring to bottom out the floating piston inside the shimmy damper rod.
d. When the fluid stops flowing, insert a length of stiff wire through the air bleed hole in the setscrew at the end of the piston rod until it touches the floating piston. The depth of insertion should be 3-13/16 inches.

NOTE

If the wire insertion is less than 3-13/16 inches, the floating piston is lodged in the shaft. If the wire cannot be used to free the piston, the rod assembly and piston should be replaced.

e. After determining that floating piston is bottomed, move dampener rod to place piston to the end of the barrel opposite the filler plug.
f. Remove filler plug and fill shimmy dampener with hydraulic fluid.

NOTE

Be sure that the shimmy dampener and hydraulic fluid are at 70° to 80°F while filling the shimmy dampener.

g. Install filler plug, and wash dampener in cleaning solvent and wipe dry with a clean cloth.
h. Install dampener on aircraft.

NOTE

Keep shimmy dampener, especially the exposed portions of the dampener piston shaft, clean to prevent collection of dust and grit which could cut the seals in the dampener barrel. Keep machined surfaces wiped free of dirt and dust, using a clean lint-free cloth saturated with hydraulic fluid (MIL-H-5606) or kerosene. All surfaces should be wiped free of excessive hydraulic fluid.

2-30. HYDRAULIC BRAKE SYSTEMS. Check brake master cylinders and refill with hydraulic fluid as specified in the inspection charts. Bleed the brake system of entrapped air whenever there is a spongy response to the brake pedals. Refer to Section 5 for filling and bleeding of the brake systems.

2-31. CLEANING.

2-32. GENERAL DESCRIPTION. Keeping the aircraft clean is important. Besides maintaining the trim appearance of the aircraft, cleaning lessens the possibility of corrosion and makes inspection and maintenance easier.

2-33. CLEANING WINDSHIELD AND WINDOWS.

2-33A. MATERIALS REQUIRED.

NAME	MANUFACTURER	USE
Mild soap or detergent (hand dishwashing type without abrasives).	Commercially available.	Cleaning windshields and windows.
Aliphatic naphtha Type II conforming to Federal Specification TT-N-95.	Commercially available.	Removing deposits which cannot be removed with mild soap solution on acrylic windshields and windows.
*Polishing wax.		Waxing acrylic windshields and windows
Turtle Wax (paste).	Turtle Wax, Inc. Chicago, IL. 60638	
Great Reflections Paste Wax	E.I. duPont de Nemours and Co. (Inc.) Wilmington, DE 19898	
Slip-Stream Wax (paste)	Classic Chemical Grand Prairie, TX 75050	
Acrylic polish conforming to Federal Specification P-P-560 such as:		Cleaning and polishing acrylic windshields and windows.
Permatex plastic cleaner No. 403D	Permatex Company, Inc. Kansas City, KS 66115	
Cotton flannel or cotton terry cloth material.	Commercially available.	

* These are the only polishing waxes tested and approved for use by Cessna Aircraft Company.

CAUTION

Windshields and windows are easily damaged by improper handling and cleaning techniques.

a. Place airplane inside hangar or in shaded area and allow to cool from heat of sun's direct rays.
b. Using clean (preferably running) water, flood surface. Use bare hands with no jewelry to feel and dislodge any dirt or abrasive materials.
c. Using a mild soap or detergent (such as dishwashing liquid) in water, wash surface. Again use only bare hands to provide rubbing force. (A clean cloth may be used to transfer soap solution to surface, but extreme care must be exercised to prevent scratching surface.)
d. On acrylic windshields and windows only, if soils which cannot be removed by a mild detergent remain, Type II aliphatic naphtha applied with a soft clean cloth may be used as a cleaning solvent. Be sure to frequently refold cloth to avoid redepositing soil and/or scratching windshield with any abrasive particles.
e. Rinse surface thoroughly with clean fresh water and dry with a clean cloth.

CAUTION

DO NOT use any of the following on or for cleaning windshields and windows: methanol, denatured alcohol, gasoline, benzene, xylene, MEK, acetone, carbon tetrachloride, lacquer thinners, commercial or household window cleaning sprays.

2-33B. WAXING.

a. Hand polishing wax should be applied to acrylic surfaces. (The wax has an index of refraction nearly the same as transparent acrylic and tend to mask any shallow scratches on windshield surface).
b. Acrylic surfaces may be polished using a polish meeting Federal Specification P-P-560 applied per manufacturer's instructions.

CAUTION

DO NOT use rain repellent on acrylic surfaces.

NOTE

When applying and removing wax and polish, use a clean soft cloth.

2-33C. PREVENTIVE MAINTENANCE.

NOTE

Utilization of the following techniques will help minimize windshield and window crazing.

a. Keep all surfaces of windshields and windows clean.
b. If desired, wax acrylic surfaces.
c. DO NOT park or store airplane where it might be subjected to direct contact with or vapors from: methanol, denatured alcohol, gasoline, benzene, xylene, MEK, acetone, carbon tetrachloride, lacquer thinners, commercial or household window cleaning sprays, paint strippers, or other types of solvents.
d. DO NOT use solar screens or shields installed on inside of airplane or leave sun visors up against windshield. The reflected heat from these items causes elevated temperatures which accelerate crazing and may cause formation of bubbles in inner ply of multiple ply windshields.

2-34. INTERIOR TRIM. The instrument panel, interior plastic trim, and control knobs need only be wiped with a damp cloth. Oil and grease on the control wheels and control knobs can be removed with a cloth moistened with Stoddard solvent. Volatile solvents, mentioned in the caution note of paragraph 2-33, must never be used since they soften and craze the plastic trim.

2-35. PAINTED SURFACES. The painted exterior surfaces of your new Cessna have a durable, long lasting finish. Approximately 10 days are required for the paint to cure completely; in most cases, the curing period will have been completed prior to delivery of the airplane. In the event that polishing or buffing is required within the curing period, it is recommended that the work be done by someone experienced in handling uncured paint. Any Cessna Dealer can accomplish this work.

Generally, the painted surfaces can be kept bright by washing with water and mild soap, followed by a rinse with water and drying with cloths or a chamois. Harsh or abrasive soaps or detergents which cause corrosion or scratches should never be used. Remove stubborn oil and grease with a cloth moistened with Stoddard solvent.

To seal any minor surface chips or scratches and protect against corrosion, the airplane should be waxed regularly with a good automotive wax applied in accordance with the manufacturer's instructions. If the airplane is operated in a seacoast or other salt water environment, it must be washed and waxed more frequently to assure adequate protection. Special care should be taken to seal around rivet heads and skin laps, which are the areas most susceptible to corrosion. A heavier coating of wax on the leading edges of the wings, and tail and on the cowl nose cap and propeller spinner will help reduce the abrasion encountered in these areas. Reapplication of wax will generally be necessary after cleaning with soap solutions or after chemical de-icing operations.

2-36. ALUMINUM SURFACES. The aluminum surfaces require a minimum of care, but should never be neglected. The aircraft may be washed with clean water to remove dirt and may be washed with non-alkaline grease solvents to remove oil and/or grease. Household type detergent soap powders are effective cleaners, but should be used cautiously since some of them are strongly alkaline. Many good aluminum cleaners, polishes and waxes are available from commercial suppliers of aircraft products.

2-37. ENGINE AND ENGINE COMPARTMENT. An engine and accessories wash down should be accomplished during each 100-hour inspection to remove oil, grease, salt corrosion or other residue that might conceal component defects during inspection. Also, periodic cleaning can be very effective in preventive maintenance.

Precautions should be taken when working with cleaning agents such as wearing of rubber gloves, an apron or coveralls and a face shield or goggles. Use the least toxic of available cleaning agents that will satisfactorily accomplish the work. These cleaning agents include: (1) Stoddard Solvent (Specification P-D-680 type II), (2) A water alkaline detergent cleaner (MIL-C-25769J) mixed, 1 part cleaner, 2 to 3 parts water and 8 to 12 parts Stoddard solvent or (3) A solvent base emulsion cleaner (MIL-C-4361B) mixed 1 part cleaner and 3 parts Stoddard solvent.

CAUTION

Do not use gasoline or other highly flammable substances for wash down.

Perform all cleaning operations in well ventilated work areas and ensure that adequate firefighting and safety equipment is available. Do not smoke or expose a flame, within 100 feet of the cleaning area. Compressed air, used for cleaning agent, application or drying, should be regulated to the lowest practical pressure. Use of a stiff bristle brush rather than a steel brush is recommended if cleaning agents do not remove excess grease and grime during spraying.

A recommended procedure for cleaning an engine and accessories is as follows:

CAUTION

Do not attempt to wash an engine which is still hot or running. Allow the engine to cool before cleaning.

a. Remove engine cowling in accordance with paragraph 11-3.
b. Carefully cover the coupling area between the vacuum pump and the engine drive shaft so that no cleaning solvent can reach the coupling or seal.
c. Cover the open end of the vacuum discharge tube.
d. Cover the vacuum relief valve filter, if installed in the engine compartment.
e. Use fresh water for wash down when the engine is contaminated with salt or corrosive chemicals. A cleaning agent such as described previously may then be used to remove oil and grime.

CAUTION

Care should be exercised to not direct cleaning agents or water streams at openings on the starter, magnetos, alternator or vacuum pump or turbocharger relief valve.

f. Thoroughly rinse with clean warm water to remove all traces of cleaning agents.

Cleaning agents should never be left on engine components for an extended period of time. Failure to remove them may cause damage to components such as neoprene seals and silicone fire sleeves, and could cause additional corrosion.

g. Completely dry engine and accessories using clean, dry compressed air.
h. Remove the cover over the coupling area.
i. Remove the cover from the vacuum discharge tube.
j. Remove the cover from the vacuum relief valve filter, if installed.
k. If desired, engine cowling may be washed with the same cleaning agents, then rinsed thoroughly and wiped dry. After cleaning engine, relubricate all control arms and moving parts as required.
l. Reinstall engine cowling.

WARNING

For maximum safety, check that the magneto switches are OFF, the throttle is closed, the mixture control is in the idle cut-off position, and the airplane is secured before rotating the propeller by hand. Do not stand within the arc of the propeller blades while turning the propeller.

m. Before starting engine, rotate the propeller by hand no less than four complete revolutions.

2-38. UPHOLSTERY AND INTERIOR cleaning prolongs upholstery fabrics and interior trim. To clean the interior, proceed as follows:
a. Empty all ash trays and refuse containers.
b. Brush or vacuum clean the upholstery and carpet to remove dust and dirt.
c. Wipe leather and plastic trim with a damp cloth.
d. Soiled upholstery fabrics and carpet may be cleaned with a foam-type detergent used according to the manufacturer's instructions.
e. Oil spots and stains may be cleaned with household spot removers, used sparingly. Before using any solvent, read the instructions on the container and test it on an obscure place in the fabric to be cleaned. Never saturate the fabric with volatile solvent; it may damage the padding and backing material.
f. Scrape sticky material from fabric with a dull knife, then spot clean the area.

2-39. PROPELLER. The propeller should be wiped occasionally with an oily cloth to remove grass and bug stains. In salt water areas this will assist in corrosion proofing the propeller.

2-40. WHEELS. The wheels should be washed periodically and examined for corrosion, chipped paint, and cracks or dents in the wheel halves or in the flanges or hubs. If defects are found remove and repair in accordance with Section 5. Discard cracked wheel halves, flanges or hubs and install new parts.

2-41. LUBRICATION.

WARNING

The U.S. Environmental Protection Agency advises that mechanics and other workers who handle engine oil are advised to minimize skin contact with used oil and promptly remove used oil from the skin. In a laboratory study, mice developed skin cancer after skin was exposed to used engine oil twice a week without being washed off, for most of their life span. Substances found to cause cancer in laboratory animals may also cause cancer in humans.

2-42. GENERAL DESCRIPTION. Lubrication requirements are shown in figure 2-5. Before adding lubricant to a fitting, wipe fitting free of dirt. Lubricate until grease appears around part being lubricated, and wipe excess grease from parts. The following paragraphs supplement figure 2-5 by adding details not shown in the figure.

2-43. TACHOMETER DRIVE SHAFT. Refer to Sections 11 and 15.

2-44. WHEEL BEARINGS. Clean and repack the wheel bearings at the first 100-hour inspection and at each 500-hour inspection thereafter. If more than the usual number of take-offs and landings are made, extensive taxiing is required, or the aircraft is operated in dusty areas or under seacoast conditions, cleaning and lubrication of the wheel bearings shall be accomplished at each 100-hour inspection.

2-45. NOSE GEAR TORQUE LINKS. Lubricate nose gear torque links every 50 hours. When operating from a dirt strip or in extremely dusty areas, more frequent lubrication of the torque links is required.

2-46. WING FLAP ACTUATOR. Clean and lubricate wing flap actuator jack screw each 100 hours as follows:
a. Expose jack screw by operating flaps to full-down position.
b. Clean jack screw threads with solvent rag and dry with compressed air.

NOTE

It is not necessary to remove actuator from aircraft to clean or lubricate threads.

c. With oil can, apply light coat of No. 10 weight non-detergent oil to threads of jack screw.

2-47. ROD END BEARINGS. Periodic inspection and lubrication is required to prevent corrosion of the bearing in the rod end. At each 100-hour inspection, disconnect the control rods at the aileron and nose gear steering bungee, and inspect each rod end for corrosion. If no corrosion is found, wipe the surface of the rod end balls with general purpose oil and rotate ball freely to distribute the oil over its entire surface and connect the control rods to their respective units. If corrosion is detected during the inspection, install new rod ends.

SPECIFIED AVIATION GRADE FUELS:

WARNING

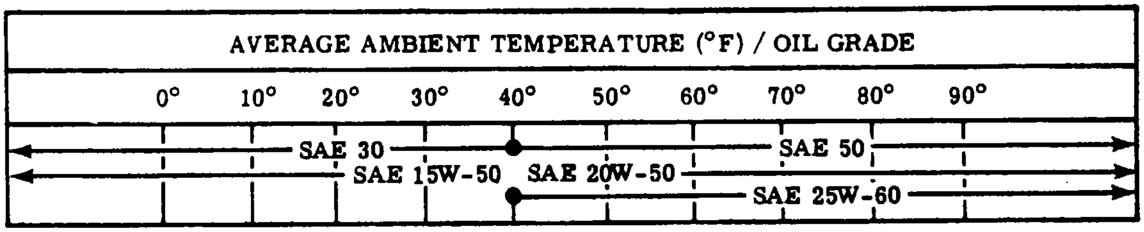
ONLY AVIATION GRADE FUELS ARE APPROVED FOR USE.

ENGINE MODEL	APPROVED FUEL GRADES	NOTE
CONTINENTAL 0-470-U	100LL (blue)	1
	100 (green) (formerly 100/130)	1

NOTE

1. Compliance with Continental Aircraft Engine Service Bulletin M82-8 and all supplements or revisions thereto, must be accomplished.

SPECIFIED AVIATION GRADE OIL:



Aviation grade ashless dispersant oil, conforming to Continental Motors Specification MHS-24, and all revisions or supplements thereto, must be used except as noted in paragraph 2-23, herein. Refer to Continental Aircraft Engine Service Bulletin M82-8 and any superseding bulletins, revisions or supplements thereto, for further recommendations.

Oil capacities for the aircraft are given in the following chart. To minimize loss of oil through the breather, fill to specified oil level on dipstick for normal operation (flight of less than three hours duration). For extended flight, fill to FULL mark on dipstick. Do not operate with less than MINIMUM FOR FLIGHT quantities listed. If an external oil filter is installed, one additional quart of oil is required when filter is changed.

CAPACITY (TOTAL)	CAPACITY (TOTAL WITH FILTER)	NORMAL OPERATION	MINIMUM FOR FLIGHT
12	13	10	9

Figure 2-4. Servicing (Sheet 1 of 5)

SPECIFIED AVIATION GRADE FUELS:

WARNING

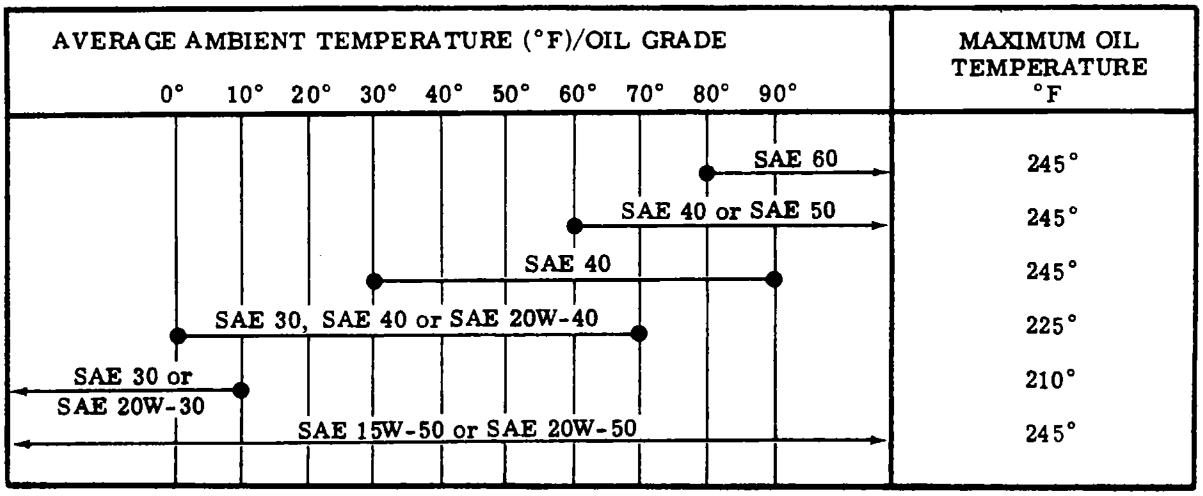
ONLY AVIATION GRADE FUELS ARE APPROVED FOR USE.

ENGINE MODEL	APPROVED FUEL GRADES	NOTE
LYCOMING 0-540-L	100LL (blue)	1
	100 (green) (formerly 100/130)	1

NOTE

1. Compliance with Avco Lycoming Service Instruction No. 1070, and all revisions thereto, must be accomplished.

SPECIFIED AVIATION GRADE OIL:

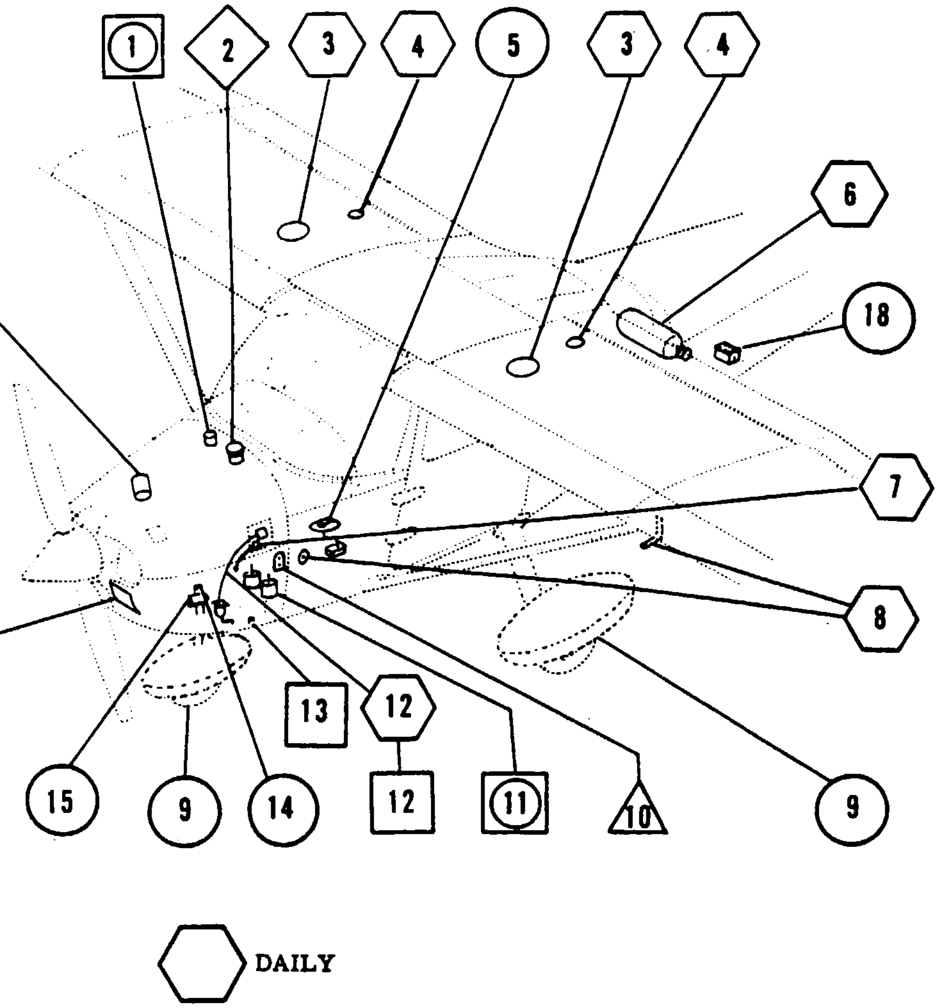


The overlap of oil grades is based on a mid-range of ambient ground temperature vs maximum oil inlet temperature. Aviation grade ashless dispersant oil conforming to Avco Lycoming Service Instruction No. 1014 , and all revisions and supplements thereto MUST BE USED.

Oil capacities for the aircraft are given in the following chart. For extended flight, fill to FULL mark on dipstick. Do not operate with less than MINIMUM FOR FLIGHT quantities listed. If an external oil filter is installed, one additional quart of oil is required when filter is changed.

CAPACITY (TOTAL)	CAPACITY (TOTAL WITH FILTER)	NORMAL OPERATION	MINIMUM FOR FLIGHT
8	9	6	5

Figure 2-4. Servicing (Sheet 2 of 5)



HYDRAULIC FLUID:
SPEC. NO. MIL-H-5606

OXYGEN:
SPEC. NO. MIL-O-27210

3 FUEL CELLS:
Service after each flight. Keep full to retard condensation. Refer to paragraph 2-21.

4 FUEL CELL DRAINS:
Drain off any water and sediment before first flight of the day.

12 FUEL STRAINER:
Drain off any water and sediment before first flight of the day.

7 OIL DIPSTICK:
Check on preflight. Add oil as necessary. Refer to paragraph 2-23 for details. Check that filler cap is tight and oil filler is secure.

8 PITOT AND STATIC PORTS:
Check for obstructions before first flight of the day.

6 OXYGEN CYLINDER:
Check for anticipated requirements before each flight. Refer to Section 14.

Figure 2-4. Servicing (Sheet 3 of 5)

FIRST 25 HOURS

17 ENGINE OIL SYSTEM:
Refill with ashless dispersant oil. Refer to paragraph 2-23.

50 HOURS

17 ENGINE OIL SYSTEM:
Change oil each 50 hours if engine is NOT equipped with external oil filter; if equipped with SHORT external filter; change filter each 50 hours, and oil at least each 100 hours, or every 6 months.

9 TIRES:
Maintain correct tire inflation as listed in figure 1-1. Refer to paragraph 2-27.

14 NOSE GEAR SHOCK STRUT:
Keep strut filled and inflated to the correct pressure. Refer to paragraph 2-28.

100 HOURS

13 CARBURETOR DRAIN PLUG:
Check for thread sealant residue in float chamber. Refer to paragraph 2-22.

12 FUEL STRAINER:
Disassemble and clean strainer bowl and screen.

16 INDUCTION AIR FILTER:
Clean filter per paragraph 2-24. Replace if damaged.

17 ENGINE OIL SYSTEM:
If engine is equipped with LONG external oil filter, change oil and filter each 100 hours, or every 6 months.

1 VACUUM RELIEF VALVE FILTER:
Replace each 100 hours.

18 BATTERY:
Check electrolyte level and clean battery box each 100 hours or 90 days.

15 SHIMMY DAMPER:
Check fluid level and refill as required in accordance with paragraph 2-29.

2 VACUUM SYSTEM CENTRAL AIR FILTER:
Inspect for damage each 100 hours. Refer to paragraph 2-25.

Figure 2-4. Servicing (Sheet 4 of 5)

200 HOURS

5 SELECTOR VALVE DRAIN:
Remove plug and drain off any water or sediment. Refer to paragraph 2-21.

11 BRAKE MASTER CYLINDERS:
Check fluid level and fill as required with hydraulic fluid.

500 HOURS

16 INDUCTION AIR FILTER:
Replace each 500 hours or annually. Refer to paragraph 2-24.

2 VACUUM SYSTEM CENTRAL AIR FILTER:
Replace each 500 hours. Refer to paragraph 2-25.

AS REQUIRED

10 GROUND SERVICE RECEPTACLE:
Connect to 24-volt DC, negative-ground power unit. Refer to Section 16.

Figure 2-4. Servicing (Sheet 5 of 5)

FREQUENCY (HOURS)

50 100 500 1000

METHOD OF APPLICATION

HAND | GREASE GUN | OIL CAN | SYRINGE (FOR POWDERED GRAPHITE)

WHERE NO INTERVAL IS SPECIFIED, LUBRICATE AS REQUIRED AND WHEN ASSEMBLED OR INSTALLED.

NOTE

The military specifications listed are not mandatory, but are intended as guides in choosing satisfactory materials. Products of most reputable manufacturers meet or exceed these specifications.

LUBRICANTS

PG	SS-G-659	POWDERED GRAPHITE
GR	MIL-G-81322A	GENERAL PURPOSE GREASE
GH	MIL-G-23827A	AIRCRAFT AND INSTRUMENT GREASE
GL	MIL-G-21164C	HIGH AND LOW TEMPERATURE GREASE
OG	MIL-L-7870A	GENERAL PURPOSE OIL
PL	VV-P-236	PETROLATUM
GP		NO. 10-WEIGHT, NON-DETERGENT OIL
OL	VV-L-800A	LIGHT OIL

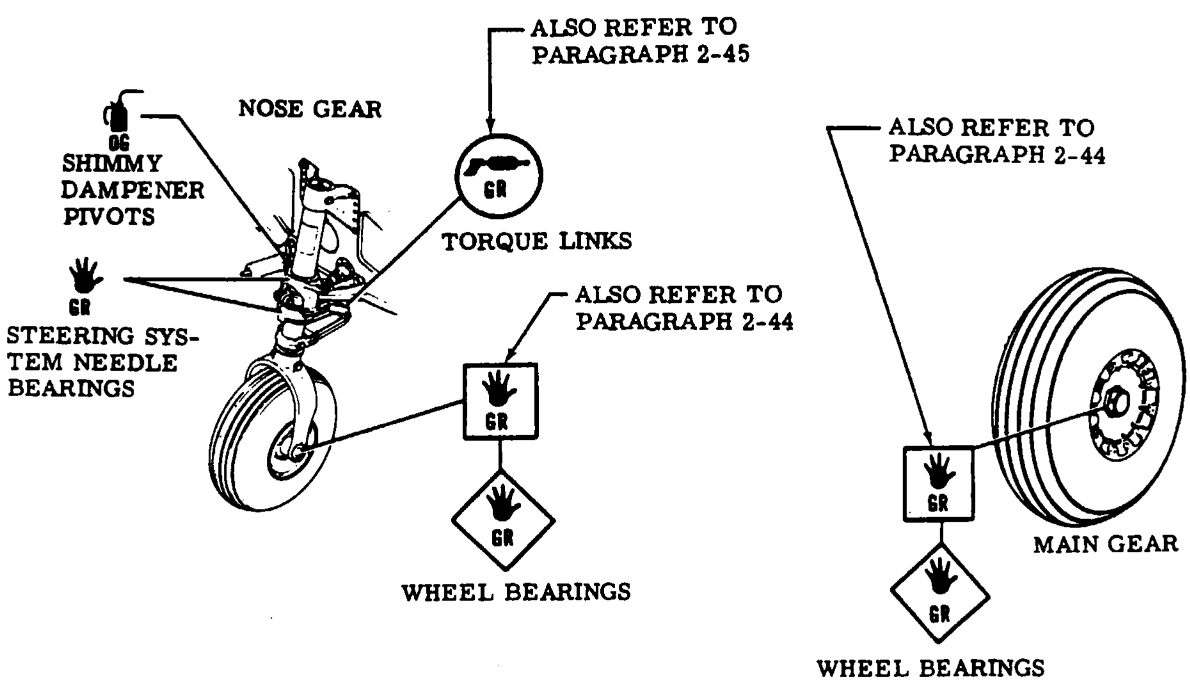


Figure 2-5. Lubrication (Sheet 1 of 3)

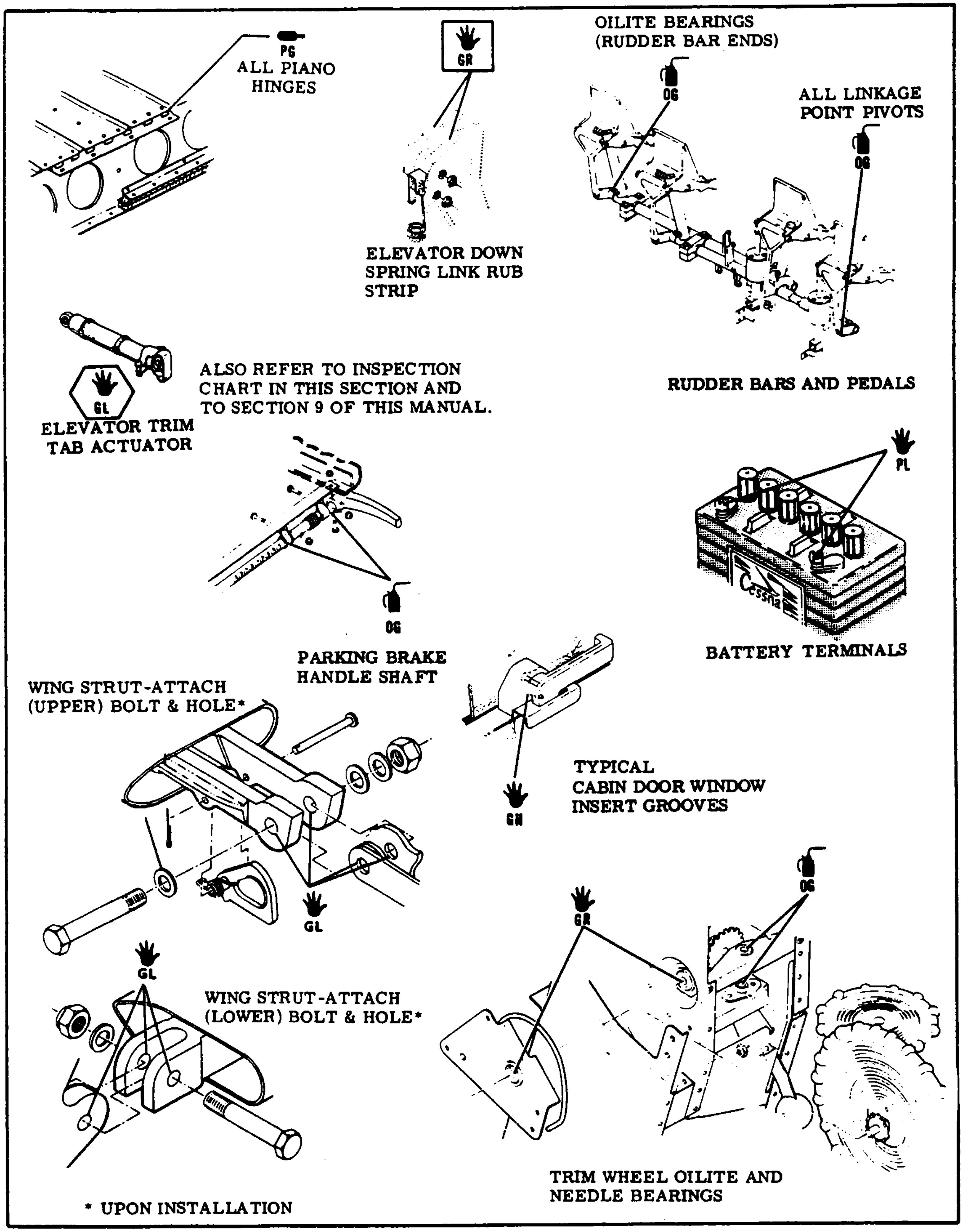
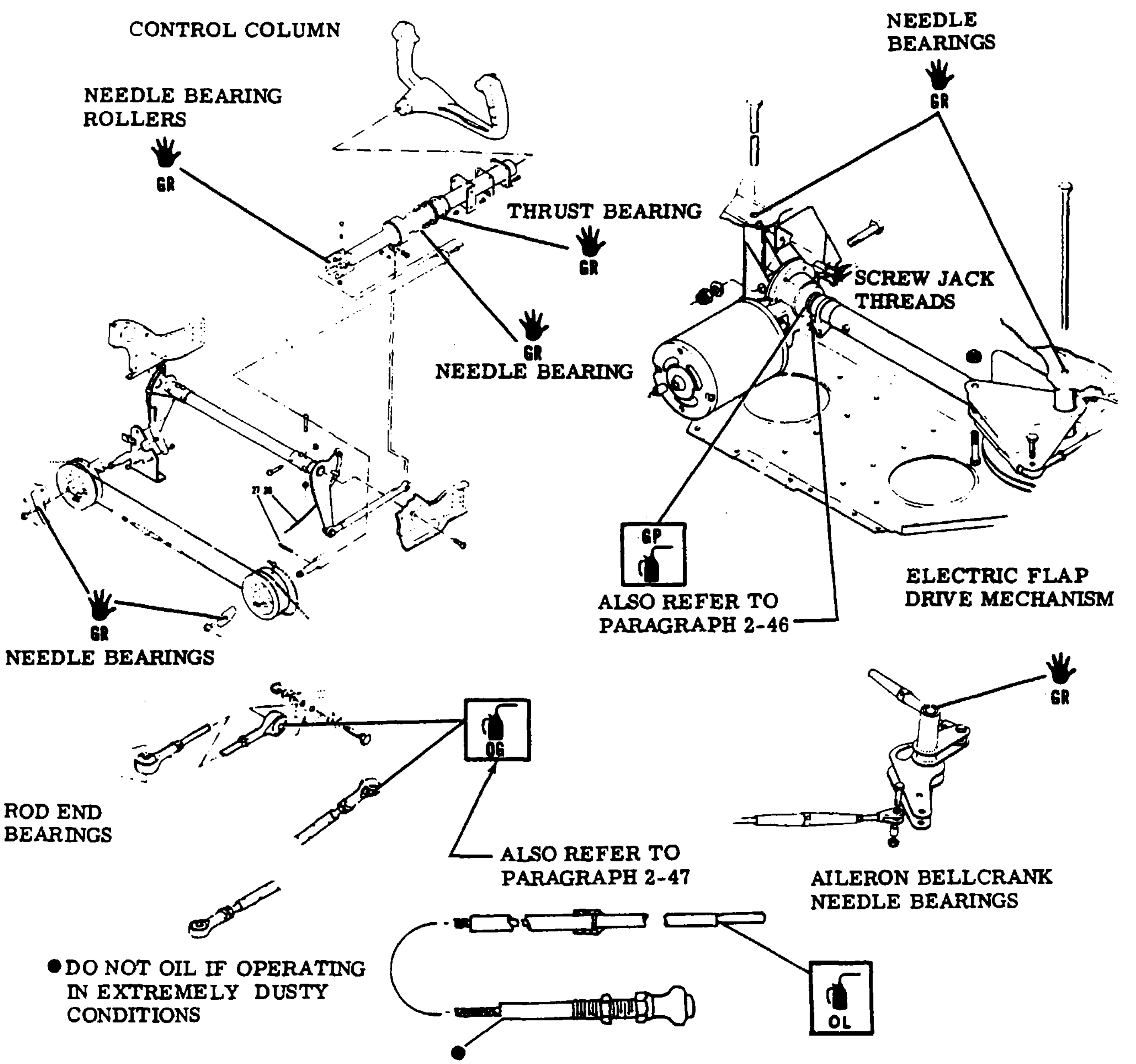


Figure 2-5. Lubrication (Sheet 2 of 3)



NOTES

Sealed bearings require no lubrication.

Do not lubricate roller chains or cables except under seacoast conditions. Wipe with a clean, dry cloth.

Lubricate unsealed pulley bearings, rod ends, Oilite bearings, pivot and hinge points, and any other friction point obviously needing lubrication, with general purpose oil every 1000 hours or oftener if required.

Paraffin wax rubbed on seat rails will ease sliding the seats fore and aft.

Lubricate door latching mechanism with MIL-G-81322A general purpose grease, applied sparingly to friction points, every 1000 hours or oftener, if binding occurs. No lubrication is recommended on the rotary clutch.

Figure 2-5. Lubrication (Sheet 3 of 3)

2-48. GENERAL INSPECTION (MODEL 182 & T182 AIRPLANES).

NOTE

Cessna Aircraft Company recommends PROGRESSIVE CARE for airplanes flown 200 hours or more per year, and 100-HOUR INSPECTION for airplanes flown less than 200 hours per year.

A. Inspection Requirements.

(1) Two basic types of inspections are available as defined below:

(a) As required by Federal Aviation Regulation Part 91.409 (a), all civil airplanes of U.S. registry must undergo an annual inspection each 12 calendar months. In addition airplanes operated commercially (for hire) must also have an annual 100 hour inspection each 100 hours of operation as required by Federal Aviation Regulation Part 91.409(b).

(b) In lieu of the above requirements, an airplane may be inspected in accordance with a progressive inspection program in accordance with Federal Aviation Regulation Part 91.409 (d), which allows the work load to be divided into smaller operations that can be accomplished in a shorter time period. The CESSNA PROGRESSIVE CARE PROGRAM has been developed to satisfy the requirements of Part 91. 409 (d).

B. Inspection Program Selection.

(1) As a guide for selecting the inspection program that best suits the operation of the airplane, the following is provided:

(a) If the airplane is flown less than 200 hours annually, the following conditions apply:

1. If flown for hire.

a. An airplane operating in this category must be inspected each 100 hours of operation (100-HOUR) and each 12 calendar months of operation (ANNUAL).

2. If not flown for hire.

a. An airplane operating in this category must be inspected each 12 calendar months of operation (ANNUAL). It is recommended that between annual inspections, all items be inspected at the intervals specified in the Inspection Time Limits Charts and Component Time Limits Charts.

(b) If the airplane is flown more than 200 hours annually, the following condition applies:

1. Whether flown for hire or not, it is recommended that airplanes operating in this category be placed on the CESSNA PROGRESSIVE CARE PROGRAM. However, if not placed on the CESSNA PROGRESSIVE CARE PROGRAM, the inspection requirements for airplanes in this category are the same as those defined under Paragraph B. (1) (a) 1.a. or 2.a. CESSNA PROGRESSIVE CARE PROGRAM may be utilized as a total concept program which ensures that the inspection intervals in the inspection charts are not exceeded. Manuals and forms which are required for conducting the CESSNA PROGRESSIVE CARE PROGRAM inspections are available from the Cessna Supply Division.

C. Inspection Charts.

NOTE

Cessna has prepared these Inspection Charts to assist the owner or operator in meeting the foregoing responsibilities and to meet the intent of Federal Aviation Regulation Part 91.409 (d). The Inspection Charts are not intended to be all-inclusive, for no such charts can replace the good judgment of a certified airframe and powerplant mechanic in performance of his duties. As the one primarily responsible for this airworthiness of the airplane, the owner or operator should select only qualified personnel to maintain the airplane.

(1) The following Inspection Charts (Inspection Time Limits, Component Time Limits, Progressive Care Inspection, and Expanded Inspection) show the recommended intervals at which items are to be inspected based on normal usage under average environmental conditions. Airplanes operated in extremely humid tropics, or in exceptionally cold, damp climates, etc., may need more frequent inspections for wear, corrosion, and lubrication. Under these adverse conditions, perform periodic inspections in compliance with this chart at more frequent intervals until the operator can set his own inspection periods based on field experience. The operator's inspection intervals shall not deviate from the inspection time limits shown in this manual except as provided below:

(a) Each inspection interval can be exceeded by 10 hours or can be performed early at any time prior to the regular interval as provided below:

1. In the event of late compliance of any operation scheduled, the next operation in sequence retains a due point from the time the late operation was originally scheduled.
2. In the event of early compliance of any operation scheduled, that occurs 10 hours or less ahead of schedule, the next phase due point may remain where originally set.
3. In the event of early compliance of any operation scheduled, that occurs more than 10 hours ahead of schedule, the next phase due point must be rescheduled to establish a new due point from the time of early accomplishment.

(2) As shown in the charts, there are items to be checked at 50 hours, 100 hours, 200 hours, or at Special of Yearly inspection. Special or Yearly inspection items require servicing or inspection at intervals other than 50, 100, or 200 hours. If two inspection time requirements are listed for one inspection item, one hourly and the yearly, both apply and whichever requirement occurs first determines the time limit.

(a) When conducting a 50-hour inspection, check all items listed under EACH 50 HOURS. A 100-hour inspection includes all items listed under EACH 50 HOURS and EACH 100 HOURS. The 200-hour inspection includes all items listed under EACH 50 HOURS, EACH 100 HOURS, and EACH 200 HOURS. All of the items listed would be inspected, serviced, or otherwise performed as necessary to ensure compliance with the inspection requirements.

(b) A COMPLETE AIRPLANE INSPECTION includes all 50-, 100-, and 200-hour items plus those Special and Yearly Inspection Items which are due at the specified time.

(c) Component Time Limits Charts should be checked at each inspection interval to ensure proper overhaul and replacement requirements are accomplished at the specified times.

D. Inspection Guidelines.

(1) The Inspection Charts are to be used as a recommended inspection outline. Detailed information of systems and components in the airplane will be found in various chapters of this Maintenance Manual and the pertinent vendor publications. It is recommended that reference be made to the applicable portion of this manual for service instructions, installation instructions, and to the vendor's data or publications specifications for torque values, clearances, settings, tolerances, and other requirements.

(2) For the purpose of this inspection, the term on condition is defined as follows: The necessary inspections and/or checks to determine that a malfunction or failure will not occur prior to the next scheduled inspection.

(3) MOVABLE PARTS: Inspect for lubrication, servicing, security of attachment, binding, excessive wear, safetying, proper operation, proper adjustment, correct travel, cracked fittings, security of hinges, defective bearings, cleanliness, corrosion, deformation, sealing, and tension.

(4) FLUID LINES AND HOSES: Inspect for leaks, cracks, bulging, collapsed, twisted, dents, kinks, chafing, proper radius, security, discoloration, bleaching, deterioration, and proper routing; rubber hoses for stiffness and metal lines for corrosion.

(5) METAL PARTS: Inspect for security of attachment, cracks, metal distortion, broken spotwelds, condition of paint (especially chips at seams and around fasteners for onset of corrosion) and any other apparent damage.

(6) WIRING: Inspect for security, chafing, burning, arcing, defective insulation, loose or broken terminals, heat deterioration, and corroded terminals.

(7) STRUCTURAL FASTENERS: Inspect for correct torque in accordance with applicable torque values. Refer to Bolt Torque Data during installation or when visual inspection indicates the need for a torque check.

NOTE

Torque values listed are not to be used for checking tightness of installed parts during service.

(8) FILTERS, SCREENS, AND FLUIDS: Inspect for cleanliness and the need for replacement at specified intervals.

(9) System check (operation or function) requiring electrical power must be performed using 28.5 ±0.25 volts bus voltage. This will ensure all components are operating at their designed requirements.

(a) Airplane file.

1. Miscellaneous data, information, and licenses are a part of the airplane file. Check that the following documents are up-to-date and in accordance with current Federal Aviation Regulations. Most of the items listed are required by the Federal Aviation Regulations. Since the regulations of other nations may require other documents and data, owners of exported airplanes should check with their own aviation officials to determine their individual requirements.

a. To be displayed in the airplane at all times:

1) Standard Airworthiness Certificate (FAA Form 8100-2).
2) Aircraft Registration Certificate (FAA Form 8050-3).
3) Aircraft Radio Station License (Federal Communication Commission Form 556 if transmitter is installed).
4) Radio Telephone Station License (Federal Communication Commission Form 409 if Flitefone Radio Telephone is installed).

b. To be carried in the airplane at all times:

1) Weight and Balance Data Sheets and associated papers (all copies of the Repair and Alteration Form, FAA Form 337, are applicable).
2) Equipment List
3) Pilot's Operating Handbook and FAA-Approved Airplane Flight Manual.

c To be made available upon request:

1) Airframe, Engine, Propeller, and Avionics Maintenance Records.

2-49. PRE-INSPECTION CHECKS. (MODEL 182 & T182 AIRPLANES.)

A. Pre-inspection Operational Checks.

(1) Before beginning the step-by-step inspection, start and run up the engine and upon completion, shut down the engine in accordance with instructions in the Pilot's Operating Handbook and FAA-Approved Airplane Flight Manual. During the run-up, observe the following, making note of any discrepancies or abnormalities:

(a) Engine temperatures and pressures.
(b) Static RPM. (Also refer to Section 11 and 11A of this manual.)
(c) Magneto drop. (Also refer to Section 11 and 11A of this manual.)
(d) Engine response to changes in power.
(e) Any unusual engine noises.
(f) Fuel selector and/or shutoff valve; operate engine on each tank (or cell) position and OFF position long enough to ensure shutoff and/or selector valve functions properly.
(g) Idling speed and mixture; proper idle cut-off.
(h) Alternator and ammeter.
(i) Suction gage.
(j) Fuel flow indicator.

(2) After the inspection has been completed, an engine run-up should again be performed to determine that any discrepancies or abnormalities have been corrected.

(3) Some of the items in the Inspection Time Limits paragraph are optional, therefore not applicable to all airplanes.

Mechanic's Pre-inspection Discrepancies or Abnormalities to be Checked:

Mechanic's Post-inspection Corrective Action Taken:

2-50. INSPECTION TIME LIMITS. (MODEL 182 & T182 AIRPLANES.)

			EACH 50 HOURS	EACH 100 HOURS	EACH 200 HOURS	SPECIAL INSPECTIONS HOURS	SPECIAL INSPECTIONS YEARS
A		**Placards (Refer to Pilot's Operating Handbook).**					
A	1	Placards and Decals - Inspect presence, legibility, and security. Consult Pilot's Operating Handbook and FAA-Approved Airplane Flight Manual for required placards.			●		
B		**Fuselage (Section 3).**					
B	1	Fuselage Surface - Inspect for skin damage, loose rivets, condition of paint, and check pitot-static ports and drain holes for obstruction. Inspect covers and fairings for security.		●			
B	2	Internal Fuselage Structure - Inspect bulkheads, doorposts, stringers, doublers, and skins for corrosion, cracks, buckles, and loose rivets, bolts and nuts.			●		
B	3	Control Wheel Lock - Check general condition and operation.			●		
B	4	Fuselage Mounted Equipment - Check for general condition and security of attachment.			●		
B	5	Antennas and Cables - Inspect for security of attachment, connection, and condition.			●		
B	6	Emergency Locator Transmitter - Inspect for security of attachment and check operation by verifying transmitter output. Check cumulative time and useful life of batteries in accordance with FAR Part 91.207. Refer to Section 16 - Emergency Locator Transmitter - Checkout Interval.		●			
B	7	Instrument Panel Shock Mounts, Ground Straps, and Covers - Inspect for deterioration, cracks, and security of attachment.			●		
B	8	Pilot's and Copilot's Inertia Reels - Inspect for security of installation, proper operation, and evidence of damage.		●			
B	9	Seats, Seat Belts, and Shoulder Harnesses - Check general condition and security. Check operation of seat stops and adjustment mechanism. Inspect belts for condition and security of fasteners.		●			
B	10	Windows, Windshield, Doors, and Seals - Inspect general condition. Check latches, hinges, and seals for condition, operation, and security of attachment.		●			
B	11	Upholstery, Headliner, Trim, and Carpeting - Check condition and clean as required.				EACH 400	EACH 1
B	12	Flight Controls - Check freedom of movement and proper operation through full travel with and without flaps extended. Check electric trim controls for operation (as applicable.)		●			
B	13	Aileron, Elevator, and Rudder Stops - Check for damage and security. Compliance with Cessna Service Letter SE80-65 is required.		●			
B	14	Portable Hand Fire Extinguisher - Inspect for proper operating pressure, condition, security of installation, and servicing date.		●			

	2-50 INSPECTION TIME LIMITS. (MODEL 182 & T182 AIRPLANES.)	EACH 50 HOURS	EACH 100 HOURS	EACH 200 HOURS	SPECIAL INSPECTIONS HOURS	SPECIAL INSPECTIONS YEARS
B	15 Seat Tracks and Stops - Inspect seat tracks for condition and security of installation. Check seat track stops for damage and correct location. Ensure inspection of seat rails for cracks EACH 50 HOURS. Refer to Section 3.	●				
B	16 Control Column - Inspect pulleys, cables, sprockets, bearings, chains, bungees, and turnbuckles for condition and security.			●		
B	17 Fuel Line and Selector Valve Drain(s) - Remove plug and drain.		●			
C	**Wings and Empennage (Section 4)**					
C	1 Wing Surfaces and Tips - Inspect for skin damage, loose rivets, and condition of paint.		●			
C	2 Wing Struts and Strut Fairings - Check for dents, cracks, loose screws and rivets, and condition of paint.		●			
C	3 Wing Spar and Wing Strut Fittings - Check for evidence of wear. Check attach bolts for indications of looseness and retorque as required.			●		
C	4 Wing Structure - Inspect spars, ribs, skins, and stringers for cracks, wrinkles, loose rivets, corrosion, or other damage.			●		
C	5 Metal Lines, Hoses, Clamps, and Fittings - Check for leaks, condition, and security. Check for proper routing and support.			●		
C	6 Wing Access Plates - Check for damage and security of installation.			●		
C	7 Vertical and Horizontal Stabilizers, Tips and Tailcone - Inspect externally for skin damage and condition of paint.		●			
C	8 Vertical and Horizontal Stabilizers and Tailcone Structure - Inspect bulkheads, spars, ribs, and skins for cracks, wrinkles, loose rivets, corrosion, or other damage. Inspect vertical and horizontal stabilizer attach bolts for looseness. Retorque as necessary. Check security of inspection covers, fairings, and tips.		●			
C	9 Elevator/Rudder Downspring - Check structure, bolts, linkage, bellcrank, and push-pull tube for condition, operation, and security. Check cables for tension, routing, fraying, corrosion, and turnbuckle safety. Check travels if cables require tension adjustment or if stops are damaged.		●			
D	**Landing Gear and Brakes (Section 5)**					
D	1 Brakes, Master Cylinders, and Parking Brake - Check master cylinders and parking brake mechanism for condition and security. Check fluid level and test operation of toe and parking brake.		●			
D	2 Main Gear Tubular Struts - Inspect for cracks, dents, corrosion, condition of paint or other damage. Check axles for condition and security.		●			
D	3 Brake Lines, Wheel Cylinders, Hoses, Clamps, and Fittings - Check for leaks, condition, and security and hoses for bulges and deterioration. Check brake lines and hoses for proper routing and support.				EACH 400	EACH 1

2-50 INSPECTION TIME LIMITS. (MODEL 182 & T182 AIRPLANES.)	EACH 50 HOURS	EACH 100 HOURS	EACH 200 HOURS	SPECIAL INSPECTIONS HOURS	SPECIAL INSPECTIONS YEARS
D 4 Wheels, Brake Discs, and Linings - Inspect for wear, cracks, warps, dents, or other damage. Check wheel through-bolts and nuts for looseness.		●			
D 5 Tires - Check tread wear and general condition. Check for proper inflation.		●			
D 6 Wheel Fairings, Strut Fairings, and Cuffs - Check for cracks, dents, and condition of paint.		●		A	
D 7 Main Landing Gear Attachment Structure - Check for damage, cracks, loose rivets, bolts and nuts and security of attachment.		●			
D 8 Nose Gear Steering Mechanism - Check for wear, security, and proper rigging.			●		
D 9 Nose Gear - Inspect torque links, steering rods, and boots for condition and security of attachment. Check strut for evidence of leakage and proper extension. Check strut barrel for corrosion, pitting, and cleanliness. Check shimmy damper and/or bungees for operation, leakage, and attach points for wear and security.		●			
D 10 Nose Gear Fork - Inspect for cracks, general condition, and security of attachment.			●		
D 11 Wheel Bearings - Clean, inspect and lube.				B	
D 12 Nose Gear Attachment Structure - Inspect for cracks, corrosion, or other damage and security of attachment.		●			
E **Aileron Control System (Section 6)**					
E 1 Ailerons and Hinges - Check condition, security and operation.		●			
E 2 Aileron Structure, Control Rods, Hinges, Balance Weights, Bellcranks, Linkage, Bolts, Pulleys, and Pulley Brackets - Check condition, operation, and security of attachment.		●			
E 3 Ailerons and Cables - Check operation and security of stops. Check cables for tension, routing, fraying, corrosion, and turnbuckle safety. Check travel if cable tension requires adjustment or if stops are damaged. Check fairleads and rub strips for condition.			●		
E 4 Autopilot Rigging - Check per Avionics Installation Manual.				C	
E 5 Aileron Controls - Check freedom of movement and proper operation through full travel with and without flaps extended		●			
F **Wing Flap Control System (Section 7)**					
F 1 Flaps - Check tracks, rollers, and control rods for security of attachment. Check operation.		●			
F 2 Flap Actuator Threads - Clean and lubricate. Refer to paragraph 2-46 for detailed instructions.		●			
F 3 Flap Structure, Linkage, Bellcranks, Pulleys, and Pulley Brackets - Check for condition, operation and security.			●		
F 4 Wing Flap Control - Check operation through full travel and observe Flap Position indicator for proper indication.			●		
F 5 Flaps and Cables - Check cables for proper tension, routing, fraying, corrosion, and turnbuckle safety. Check travel if cable tension requires adjustment.			●		

2-50	INSPECTION TIME LIMITS. (MODEL 182 & T182 AIRPLANES.)	EACH 50 HOURS	EACH 100 HOURS	EACH 200 HOURS	SPECIAL INSPECTIONS HOURS	SPECIAL INSPECTIONS YEARS
F	6 Flap Motor, Actuator, and Limit Switches (electric flaps) - Check wiring and terminals for condition and security. Check actuator for condition and security.			●		
G	**Elevator Control System (Section 8)**					
G	1 Elevator Control - Check freedom of movement and proper operation through full travel with and without flaps extended.		●			
G	2 Elevator, Hinges, and Cable Attachment - Check condition, security, and operation.		●			
G	3 Elevator Control System - Inspect pulleys, cables, sprockets, bearings, chains, and turnbuckles for condition, security, and operation.			●		
H	**Elevator Trim Tab Control System (Section 9)**					
H	1 Elevator Trim Tab and Hinges - Check condition, security, and operation.		●			
H	2 Elevator Trim System - Check cables, push-pull rods, bellcranks, pulleys, turnbuckles, fairleads, rub strips, etc. for proper routing, condition, and security.		●			
H	3 Trim Controls and Indicators - Check freedom of movement and proper operation through full travel. Check pulleys, cables, sprockets, bearings, chains, bungees, and turnbuckles for condition and security. Check electric trim controls for operation as applicable.			●		
H	4 Elevator Trim Tab Stop Blocks - Inspect for damage and security.			●		
H	5 Elevator Trim Tab Actuator - Clean, lubricate.				D	
H	6 Elevator Trim Tab Actuator - Free-Play limits inspection. Refer to Section 9-9 for cleaning, inspection, and repair procedures.			●		
I	**Rudder Control System. (Section 10)**					
I	1 Rudder - Inspect the rudder skins for cracks and loose rivets, rudder hinges for condition, cracks and security; hinge bolts, hinge bearings, hinge attach fittings, and bonding jumper for evidence of damage and wear, failed fasteners, and security. Inspect the rudder hinge bolts for proper safetying of nuts with cotter pins. Inspect balance weight for looseness and the supporting structure for damage.		●			
I	2 Rudder Pedals and Linkage - Check for general condition, proper rigging, and operation. Check for security of attachment.			●		
I	3 Rudder, Tips, Hinges, and Cable Attachment - Check condition, security, and operation.		●			
I	4 Rudder - Check internal surfaces for corrosion, condition of fasteners, and balance weight attachment.			●		
J	**Engines (Sections 11 and 11A)**					

2-50. INSPECTION TIME LIMITS. (MODEL 182 & T182 AIRPLANES.)

			EACH 50 HOURS	EACH 100 HOURS	EACH 200 HOURS	SPECIAL INSPECTIONS HOURS	SPECIAL INSPECTIONS YEARS
J	1	Cowling and Cowl Flaps - Inspect for cracks, dents, and other damage, security of cowl fasteners, and cowl mounted landing lights for attachment. Check cowl flaps for condition, security, and operation.	•				
J	2	Engine - Inspect for evidence of oil and fuel leaks. Wash engine and check for security of accessories.	•				
J	3	Engine Controls and Linkage - Check general condition, freedom of movement through full range. Check for proper travel, security of attachment, and for evidence of wear. Check friction locks for proper operation.	•				E
J	4	Cowl Flap Controls - Check freedom of movement through full travel.	•				
J	5	Ignition Switch and Electrical Harness - Inspect for damage, condition, and security.		•			
J	6	Firewall Structure - Inspect for wrinkles, damage, cracks, sheared rivets, etc. Check cowl shock mounts for condition and security.			•		
J	7	Engine Shock Mounts, Engine Mount Structure, and Ground Straps - Check condition, security, and alignment.			•		
J	8	Induction System - Check security of clamps, tubes, and ducting. Inspect for evidence of leakage.	•				
J	9	Induction Air Filter - Remove and clean. Inspect for damage, and service per paragraph 2-24.		•		F	
J	10	Induction Airbox, Valves, Doors, and Controls - Remove air filter and inspect hinges, doors, seals, and attaching parts for wear and security. Check operation. Clean and inspect air filter and re-oil if flock-coated.		•			
J	11	Alternate Induction Air System - Check for obstructions, operation, and security.	•				
J	12	Alternator - Check brushes, leads, commutator or slip ring for wear.					G
J	13	Alternator, Mounting Bracket, and Electrical Connections - Check condition and security. Check alternator belts for condition and proper adjustment. Refer to Paragraph 16-42 for belt tension.	•				
J	14	Starter, Starter Solenoid, and Electrical Connections - Check for condition of starter brushes, brush leads, and commutator.		•			H
J	15	Oil Cooler - Check for obstructions, leaks, and security of attachment.	•				
J	16	Exhaust System - Inspect for cracks and security. Air leak check exhaust system. Refer to Section 11 and 11A, Paragraphs 11-98 and 11-75A, for inspection procedures.	•				
J	17	Exhaust System (turbocharged engine) - Inspect couplings, seals, clamps, and expansion joints for cracks. Air leak check exhaust system.	•				
J	18	Auxiliary (Electric) Fuel Pump (T182) - Check pump and fittings for condition, operation, security. Remove and clean filter (as applicable).		•			
J	19	Engine-Driven Fuel Pump - Check for evidence of leakage, security of attachment, and general condition.		•			
J	20	Magnetos - Inspection, lubrication, and overhaul procedures.				I	

2-50 INSPECTION TIME LIMITS. (MODEL 182 & T182 AIRPLANES.)

		EACH 50 HOURS	EACH 100 HOURS	EACH 200 HOURS	SPECIAL INSPECTIONS HOURS	SPECIAL INSPECTIONS YEARS
J	21 Magnetos - Check external condition, security, and electrical leads for condition. Check timing to engine and internal timing if engine timing requires adjustment.		•		J	
J	22 Magnetos - Timing procedures and intervals.				K	
J	23 Ignition Harness and Insulators - Check for proper routing, deterioration, and condition of terminals.		•			
J	24 Spark Plugs - Remove, clean analyze, test, gap, and rotate top plugs-to-bottom and bottom plugs-to-top.		•			
J	25 Cylinder Compression - Perform differential compression test.			•		
J	26 Carburetor - Drain and flush carburetor bowl, clean inlet strainer, and drain plug. Check general condition and security.		•			
J	27 Engine Primer - Check for leakage, operation, and security.		•			
J	28 Hoses, Metal Lines, and Fittings - Inspect for signs of oil and fuel leaks. Check for abrasions, chafing, security, proper routing and support and for evidence of deterioration.	•				L
J	29 Cold and Hot Air Hoses - Check condition, routing, and security.		•			
J	30 Engine Cylinders, Rocker Box Covers, and Pushrod Housings - Check for fin damage, cracks, oil leakage, security of attachment, and general condition.		•			
J	31 Turbocharger (if applicable) a. Inspect turbocharger mounting bracket, ducting, linkage, and attaching parts for general condition, linkage or damage, and security of attachment. b. Check waste gate, actuator, controller, oil and vent lines, overboost relief valve, and compressorhousing for leakage, apparent damage, security of attachment,and evidence of wear. Check waste gate return spring for condition and security.		• • •		M	
J	32 Turbocharger (if applicable) a. Remove heat shields and inspect for burned areas, bulges or cracks. Remove tailpipe and ducting - inspect turbine for coking, carbonization, oil deposits, and turbine impellers for damage.			•		
J	33 Engine Baffles and Seals - Check condition and security of attachment.	•				
J	34 Engine Oil Change Short Oil Filter (approximately 4.8 inches) a. Replace Filter. b. Add recommended grade aviation oil to replace oil lost in existing filter Without Oil Filter - Drain oil sump and oil cooler, inspect and clean screens, and refill with recommended grade aviation oil.	•			N	
J	35 Long Oil Filter (approximately 5.8 inches) - Drain oil sump and oil cooler, replace filter element, refill with recommended grade aviation oil.		•		N	

2-50. INSPECTION TIME LIMITS (Model 182 & T182 Airplanes)			EACH 50 HOURS.	EACH 100 HOURS	EACH 200 HOURS	SPECIAL INSPECTIONS HOURS	SPECIAL INSPECTIONS YEARS
J	36	Crankcase, Oil Sump, and Accessory Section – Inspect for cracks and evidence of oil leakage. Check bolts and nuts for looseness and retorque as necessary. Check crankcase breather lines for obstructions, security and general condition.		•			
K		**Fuel System (Section 12)**					
K	1	Integral Fuel Tanks – Check for evidence of leakage and condition of fuel caps, adapters, and placards.		•		O	
K	2	Fuel Bladders – Check for leaks and security, condition of fuel caps, adapters and placards.		•		O	
K	3	Fuel System – Inspect plumbing and components for mounting and security.		•			
K	4	Fuel Tank or Bladder Drains – Drain water and sediment.	•				
K	5	Fuel Tank Vent Lines and Vent Valves – Check vents for obstruction and proper positioning.		•			
K	6	Fuel Selector Valve – Check controls for detent in each position, security of attachment, and for proper placarding.		•			
K	7	Fuel Strainer, Drain Valve, and Controls – Check freedom of movement, security, and proper operation. Disassemble, flush and clean screen and bowel.		•			
K	8	Fuel Quantity Indicators – Check for damage and security of installation.					Each 1
K	9	Fuel quantity indicating system operational test is required every 12 months. Refer to Section 15 for detailed accomplishment instructions.					Each 1
L		**Propeller and Propeller Governor (Section 13)**					
L	1	Proper Mounting – Check for security of installation.	•				
L	2	Propeller Blades – Inspect for cracks, dents, nicks, scratches, erosion, corrosion, or other damage.	•				
L	3	Spinner – Check general condition and attachment.	•				
L	4	Spinner and Spinner Bulkhead – Remove spinner, wash, and inspect for cracks and fractures.		•			
L	5	Propeller Mounting Bolts – Inspect mounting bolts and safety-wire for signs of looseness. Retorque mounting bolts as required.			•		
L	6	Propeller Hub – Check general condition.			•		
L	7	Propeller Governor and Control – Inspect for oil and grease leaks.	•			P	
L	8	Propeller Anti-ice Slip Rings, Brushes and Boots – Inspect for condition, and security. Perform operational check.	•				
M		**Utility Systems (Section 14)**					
M	1	Ventilation System – Inspect clamps, hoses, and valves for condition and security.				400	Each 1
M	2	Heater Components, Inlets, and Outlets – Inspect all lines, connections, ducts, clamps, seals and gaskets for condition, restriction, and security.		•			
M	3	Cabin Heat and Ventilation Controls – Check freedom of movement through full travel. Check friction locks for proper operation.			•		
M	4	Pitot Tube and Stall Warning Vane – Check for condition and obstructions.	•				

	2-50 INSPECTION TIME LIMITS. (MODEL 182 & T182 AIRPLANES.)	EACH 50 HOURS	EACH 100 HOURS	EACH 200 HOURS	SPECIAL INSPECTIONS HOURS	SPECIAL INSPECTIONS YEARS
M	5 Pitot Tube Heater Element - Perform operational check.	●				
M	6 Heated Windshield Panel - Check operation, security of installation, electrical wiring, and condition of storage bag.			●		
M	7 Oxygen System - Inspect masks, hoses, lines, and fittings for condition, routing, and support. Test operation and check for leaks.			●		
M	8 Oxygen Cylinder - Inspect for condition, check hydrostatic test date and perform hydrostatic test, if required.					EACH 5
N	**Instruments and Instrument Systems (Section 15)**					
N	1 Vacuum System - Inspect for condition and security.		●			
N	2 Vacuum System Hoses - Inspect for hardness, deterioration, looseness, or collapsed hoses.		●			
N	3 Vacuum Pump - Check for condition and security. Check vacuum system breather line for obstructions, condition, and security.		●			
N	4 Vacuum System Air Filter - Inspect for damage, deterioration and contamination. Clean or replace, if required. NOTE: Smoking will cause premature filter clogging.		●		Q	
N	5 Vacuum System Relief Valve - Inspect for condition and security.		●		R	
N	6 Instruments - Check general condition and markings for legibility.		●			
N	7 Instrument Lines, Fittings, Ducting, and Instrument Panel Wiring - Check for proper routing, support, and security of attachment..			●		
N	8 Static System - Inspect for security of installation, cleanliness, and evidence of damage.			●		
N	9 Navigation Indicators, Controls, and Components - Inspect for condition and security.			●		
N	10 Airspeed Indicator, Vertical Speed Indicator, and Magnetic Compass - Calibrate.					EACH 2
N	11 Altimeter and Static System - Inspect in accordance with FAR Part 91.411.					EACH 2
N	12 Instrument Panel Mounted Avionics Units (Including Audio Panel, VHF Nav/Com(s), ADF, Transponder, DME, and Compass System) - Inspect for deterioration, cracks, and security of instrument panel mounts. Inspect for security of electrical connections, condition, and security of wire routing.			●		
N	13 Avionics Operating Controls - Inspect for security and proper operation of controls and switches and ensure that all digital segments will illuminate properly.			●		
N	14 Remote Mounted Avionics - Inspect for security of units and electrical connectors, condition and security of wire routing. Also check for evidence of damage and cleanliness.			●		
N	15 Microphones, Headsets, and Jacks - Inspect for cleanliness, security, and evidence of damage.			●		
N	16 Magnetic Compass - Inspect for security of installation, cleanliness, and evidence of damage.			●		

	2-50 INSPECTION TIME LIMITS. (MODEL 182 & T182 AIRPLANES.)	EACH 50 HOURS	EACH 100 HOURS	EACH 200 HOURS	SPECIAL INSPECTIONS HOURS	SPECIAL INSPECTIONS YEARS
O	**Electrical Systems (Section 16)**					
O	1 General Airplane and System Wiring - Inspect for proper routing, chafing, broken or loose terminals, general condition, broken or inadequate clamps, and sharp bends in wiring.			●		
O	2 Instrument, Cabin, Navigation, Beacon, Strobe, and Landing Lights - Check operation, condition of lens, and security of attachment.		●			
O	3 Circuit Breakers and Fuses - Check operation and condition. Check for required number of spare fuses.		●			
O	4 Battery - Check general condition and security. Check level of electrolyte.		●		S	
O	5 Battery Box and Cables - Clean and remove any corrosion. Check cables for routing, support, and security of connections.		●			
O	6 Switch and Circuit Breaker Panel, Terminal Blocks, and Junction Boxes - Inspect wiring and terminals for condition and security.			●		
O	7 Alternator Control Unit - Inspect wiring, mounting, condition, and wire routing.			●		
O	8 Switches - Check operation, terminals, wiring, and mounting for conditions, security, and interference.			●		
O	9 Instrument Panel and Control Pedestal - Inspect wiring, mounting, and terminals for condition and security. Check resistance between stationary panel and instrument panel for proper ground.			●		
O	10 External Power Receptacle and Power Cables - Inspect for condition and security.			●		
P	**Post Inspection**					
P	1 Replace all fairings, doors, and access hole covers. Ground check engine, alternator charging rate, oil pressure, tachometer, oil temperature and pressure gages, and general operation of components.					
Q	**Perform the Following Operational Checks:**					
Q	1 Brakes - Test toe brakes and parking brake for proper operation		●			
R	**Service Bulletins/Airworthiness Directives**					
R	1 Check that all applicable Cessna Service Bulletins and Supplier Service Bulletins are complied with					
R	2 Check that all applicable Airworthiness Directives and Federal Aviation Regulations are complied with.					
R	3 Ensure all Maintenance Record Entries required by Federal Aviation Regulations are completed before returning the airplane to service					

Special Inspections Legends:

A. If the airplane is flown from surfaces with mud, snow, or ice, the main gear speed fairings should be checked that there is no accumulation which could prevent normal wheel rotation.
B. First 100 hours and each 500 hours thereafter. More often if operated under prevailing wet or dusty conditions.
C. Each 600 hours or 1 year, whichever comes first.
D. Lubrication of the actuator is required each 1000 hours or 3 years, whichever comes first. See figure 2-5 for grease specification.
E. Lubricate each 100 hours (except in extreme dusty conditions). These controls are not repairable and should be replaced every 1500 hours or whenever maximum linear movement exceeds 0.050 inch.
F. Clean filter per Paragraph 2-24. Replace paper filter at least each 500 hours.
G. Inspect each 500 hours.
H. For Prestolite starter only, inspect the commutator and brushes each 1500 hours.
I. After 500 hours of operation, perform the following checks:
   1. Inspect contact points for condition and adjust or replace as required.
   2. Inspect carbon brush, high-tension lead, and distributor block for condition and clean or replace as required.
   3. Inspect impulse coupling and pawls for condition and replace as required. Use light pressure only, do not force pin (or drill bit) when checking pawls.
   4. Inspect bearings and lubricate, replace bearings, if required.
   5. Lubricate contact point cam.
   6. Completely overhaul, or replace existing magneto with a new or rebuilt exchange magneto, at every engine overhaul.
   7. Overhaul and Maintenance Manual, Publication No. 1037C1-13, covering Model 4200/6200 series magnetos, is available from Cessna Supply Division.
J. Compliance with Bendix Service Bulletin 599D or latest revision is required.
K. AT the first 25 hours, first 50 hours, first 100 hours, and thereafter at each 100 hours, the contact breaker point compartment and magneto-to-engine timing should be inspected and checked. If magneto-to-engine timing is correct within plus zero degrees to minus two degrees, internal timing need not be checked. If timing is out of tolerance, remove magneto and set internal timing, then install and time to the engine. Refer to Section 11 or 11A and the magneto manufacturers service instructions for magneto timing procedures.
L. Replace engine compartment rubber hoses (Cessna installed only) every five years or at engine overhaul, whichever occurs first. This does not include drain hoses. Hoses which are beyond these limits and are in a serviceable condition, must be placed on order immediately and then be replaced within 120 days after receiving the new hose(s) from Cessna. Replace drain hoses on condition. Engine flexible hoses (Continental or Lycoming installed) (Refer to Continental or Lycoming Maintenance Manual and Continental or Lycoming Engine Service Bulletins).
M. Replace turbocharger oil line check valves every 1000 hours. (Refer to Cessna Single Engine Service Bulletin SEB92-7.)
N. Continental engine (182): Add straight grade mineral oil if required. After 25 hours, drain and refill with ashless dispersant oil. Lycoming engine (T182): Add straight grade mineral oil if required. After 25 hours, drain and refill with straight grade mineral oil until a total of 50 hours have accumulated or oil consumption stabilizes, then change to ashless dispersant oil. Continental and Lycoming engines: After initial break-in (25 or 50 hours). If NOT equipped with an external filter, change oil and clean screens each 50 hours. If equipped with SMALL external filter, change filter each 50 hours and oil each 100 hours. If equipped with LARGE external filter, change oil and filter each 100 hours. In all cases, change oil at least each 6 months regardless of accumulated hours.
O. Each 1000 hours.
P. If leakage is evident, refer to McCauley Service Manual.
Q. Replace every 500 hours.
R. Replace filter each 100 hours.
S. Check electrolyte level and clean battery box each 100 hours or 90 days.

2-51. COMPONENT TIME LIMITS

1. General

A. Most components listed throughout Section 2 should be inspected as detailed elsewhere in this section and repaired, overhauled or replaced as required. Some components, however, have a time or life limit, and must be overhauled or replaced on or before the specified time limit.

NOTE: The terms overhaul and replacement as used within this section are defined as follows:

Overhaul - Item may be overhauled as defined in FAR 43.2 or it can be replaced.

Replacement - Item must be replaced with a new item or a serviceable item that is within its service life and time limits or has been rebuilt as defined in FAR 43.2.

B. This section provides a list of items which must be overhauled or replaced at specific time limits. Table 1 lists those items which Cessna has mandated must be overhauled or replaced at specific time limits. Table 2 lists component time limits which have been established by a supplier to Cessna for the supplier's product.

C. In addition to these time limits, the components listed herein are also inspected at regular time intervals set forth in the Inspection Charts, and may require overhaul/replacement before the time limit is reached based on service usage and inspection results.

2. Cessna-Established Replacement Time Limits

A. The following component time limits have been established by Cessna Aircraft Company.

Table 1: Cessna-Established Replacement Time Limits

COMPONENT	REPLACEMENT TIME	OVERHAUL
Restraint Assembly Pilot, Copilot, and Passenger Seats	10 years	NO
Trim Tab Actuator	1,000 hours or 3 years, whichever occurs first	YES
Vacuum System Filter	500 hours	NO
Vacuum System Hoses	10 years	NO
Pitot and Static System Hoses	10 years	NO
Vacuum Relief/Regulator Valve Filter (If Installed)	500 hours	NO
Engine Compartment Flexible Fluid Carrying Teflon Hoses (Cessna-Installed) Except Drain Hoses (Drain hoses are replaced on condition)	10 years or engine overhaul, whichever occurs first (Note 1)	NO
Engine Air Filter	500 hours or 36 months, whichever occurs first (Note 9)	NO

COMPONENT	REPLACEMENT TIME	OVERHAUL
Engine Mixture, Throttle, and Propeller Controls	At engine TBO	NO
Check Valve (Turbocharger Oil Line Check Valve)	Every 1,000 hours of operation (Note 10)	NO
Oxygen Bottle - Lightweight Steel (ICC-3HT, DOT-3HT)	Every 24 years or 4380 cycles, whichever occurs first	NO
Oxygen Bottle -Composite (DOT-E8162)	Every 15 years	NO
Engine Driven Dry Vacuum Pump Drive Coupling (Not lubricated with engine oil)	6 Years or at vacuum pump replacement, whichever occurs first	NO
Engine Driven Dry Vacuum Pump (Not lubricated with engine oil)	500 hours (Note 10)	NO
Standby Dry Vacuum Pump	500 hours or 10 years, whichever occurs first (Note 10)	NO

3. Supplier-Established Replacement Time Limits

A. The following component time limits have been established by specific suppliers and are reproduced as follows:

Table 2: Supplier-Established Replacement Time Limits

COMPONENT	REPLACEMENT TIME	OVERHAUL
ELT Battery	Note 3	NO
Vacuum Manifold	Note 4	NO
Magnetos	Note 5	YES
Engine	Note 6	YES
Engine Flexible Hoses (Lycoming and TCM Installed)	Note 2	NO
Auxiliary Electric Fuel Pump	Note 7	YES
Propeller	Note 8	YES

NOTES:

Note 1: This life limit is not intended to allow flexible fluid-carrying Teflon or rubber hoses in a deteriorated or damaged condition to remain in service. Replace engine compartment flexible Teflon (AE3663819BXXXX series hose) fluid carrying hoses (Cessna installed only) every ten years or at engine overhaul, whichever occurs first. Replace engine compartment flexible rubber fluid carrying hoses (Cessna installed only) every five years or at engine overhaul, whichever occurs first (this does not include drain hoses). Hoses which are beyond these limits and are in a serviceable condition, must be placed on order immediately and then be replaced within 120 days after receiving the new hose from Cessna.

Note 2: For Textron Lycoming engines, refer to latest Textron Lycoming Engine Service Bulletins. For TCM engines, refer to Teledyne Continental Service Bulletin SB97-6, or latest revision.

Note 3: Refer to FAR 91.207 for battery replacement time limits.

Note 4: Refer to Airborne Air & Fuel Product Reference Memo No. 39, or latest revision, for replacement time limits.

Note 5: For airplanes equipped with Slick magnetos, refer to Slick Service Bulletin SB2-80C, or latest revision, for time limits.

For airplanes equipped with TCM/Bendix magnetos, refer to Teledyne Continental Motors Service Bulletin No. 643, or latest revision, for time limits.

Note 6: For engines, Refer to Teledyne Continental Service Information Letter SIL98-9, or latest revision, for time limits. For Textron Lycoming engines, Refer to Textron/Lycoming Service Instruction S.I. 1009AJ, or latest revision, for time limits.

Note 7: Refer to Cessna Service Bulletin SEB94-7 Revision 1/Dukes Inc. Service Bulletin NO. 0003, or latest revision.

Note 8: Refer to the applicable McCauley or Hartzell Service Bulletins and Overhaul Manual for replacement and overhaul information.

Note 9: The air filter may be cleaned, refer to Section 2 of this service manual for servicing instructions. For airplanes equipped with an air filter manufactured by Donaldson, refer to Donaldson Aircraft Filters Service Instructions P46-9075 for detailed servicing instructions.
The address for Donaldson Aircraft Filters is:
Customer Service
115 E. Steels Corners RD
Stow OH. 44224

Do not overservice the air filter, overservicing increases the risk of damage to the air filter from excessive handling. A damaged/worn air filter may expose the engine to unfiltered air and result in damage/excessive wear to the engine.

Note 10: Replace the turbocharger oil line check valve every 1,000 hours of operation (Refer to Cessna Service Bulletin SEB91-7 Revision 1, or latest revision).

Note 11: Replace engine driven dry vacuum pump not equipped with a wear indicator every 500 hours of operation, or replace according to the vacuum pump manufacturer's recommended inspection and replacement interval, whichever occurs first.

Replace stand-by vacuum pump not equipped with a wear indicator every 500 hours of operation or 10 years, whichever occurs first, or replace according to the vacuum pump manufacturer's recommended inspection and replacement interval, whichever occurs first.

For a vacuum pump equipped with a wear indicator, replace pump according to the vacuum pump manufacturer's recommended inspection and replacement intervals.

2-53. PROGRESSIVE CARE PROGRAM. (MODEL 182 & T182 AIRPLANES)

A. Progressive inspection Program.

(1) Purpose and Use.

(a) As detailed in Federal Aviation Regulation Part 91.409. paragraph (d), airplane operators that desire to use a Progressive Inspection Program must be inspected in an accordance with an authorized progressive inspection program. This chapter presents the current progressive inspection program for the Cessna Model 182 & T182, recommended by the Cessna Aircraft Company.

B. Introduction.

(1) Following is the recommended Progressive Care Program for Model 182 & T182 airplanes.

(2) This program is divided into four separate operations which are to be accomplished initially after 50 hours of operation and each 50 hours of operation thereafter. Additional special requirements indicated as Special Inspection, which are required at other intervals are specified separately.

(3) Recommended progressive care inspection may be accomplished by one of the following.

NOTE

Some 100 HOUR items are covered in Operations 1 and 3, also some 200 HOUR items are covered in Operations 1, 2, 3, and 4. These items are placed here for convenience and expediency of the total inspection. After the first completion of all four Operations, these items will be at the proper intervals.

(a) NEW DELIVERED AIRCRAFT - A new delivered aircraft must have less than 50 hours total time in service and enough calendar time remaining since the issuance date of the original Airworthiness Certificate to allow the owner/operator to complete a cycle of all four Operations before the first annual inspection becomes due. Operation 1 will be due at 50 hours time in service. Operation 2 will be due at 100 hours. Operation 3 will be due at 150 hours and Operation 4 will be due at 200 hours. There are additional inspection requirements for new aircraft at the FIRST 50 HOUR inspection point. In addition to performing Operation I, the FIRST 50 HOUR ITEMS listed in the inspection Time Limits Charts in 2-59 must also be performed. After these FIRST 50 HOUR items have been accomplished, they have permanent inspection time limits which are covered in the Operations Schedules.

(b) ALL OTHER AIRCRAFT - To quality other aircraft which have more than 50 hours time in service for the Progressive Inspection Program, conduct a COMPLETE AIRPLANE INSPECTION. Operation 1 will become due 50 hours from the time the COMPLETE AIRPLANE INSPECTION was accomplished.

(4) Performance of the inspections as listed herein at the specified points will assure compliance with the Inspection Time Limits detailed in 2-59. Special inspections shall be complied with at prescribed intervals and/or intervals coinciding with operations 1 through 4 as outlined in 2-52.

(5) An operator may elect to perform the recommended inspections on a schedule other than that specified. Any inspection schedule requiring the various inspection items detailed in this chapter be performed at a frequency equal to that specified herein or more frequently is acceptable. Any inspection item performed at a time period in excess of that specified herein must be approved by the appropriate regulating agency.

(6) As defined in Federal Aviation Regulations Part 91.409 (d), the frequency and detail of the Progressive Inspection Program shall provide for the complete inspection of the airplane within each 12-calendar months. If the airplane is approaching the end of a 12-calendar month period, but the complete cycle of 4 operations has not been accomplished, it will be necessary to complete the remaining operations, regardless of airplane hours before the end of the 12-calendar month period. If the Progressive inspection Program is to be discontinued, an annual inspection becomes due at the time when any item reaches a maximum of 12-calendar months from the last time it was inspected under the Progressive Inspection Program. Refer to Federal Aviation Regulation Part 91.409 (d) for detailed information.

(THIS PAGE INTENTIONALLY LEFT BLANK)

C. **Inspection Time Limitations.**

(1) Each inspection interval may be exceeded by 10 hours or can be performed early at any time prior to the regular interval as provided below:

(a) In the event of late compliance of any operation scheduled, the next operation in sequence retains a due point from the time the late operation was originally scheduled.

(b) In the event of early compliance of any operation scheduled, that occurs 10 hours or less ahead of schedule, the next phase due point may remain where originally set.

(c) In the event of early compliance of any operation scheduled, that occurs more than 10 hours ahead of schedule, the next phase due point must be rescheduled to establish a new due point from the time of early accomplishment.

D. **Procedures.**

(1) The following instructions are provided to aid in implementation of the Model 182 & T182 Series Progressive Care Program Schedule.

(a) Use the Progressive Care Program Inspection Chart, provided herein, for each airplane. The chart is to be placed in the airplane flight log book for use as a quick reference for pilots and maintenance personnel in determining when inspections are due and that they are performed within prescribed flight time intervals.

(b) Use the Progressive Care Program Component Overhaul and Replacement Log, provided herein, for each airplane. This log is to be kept with the airplane maintenance records and serves as a periodic reminder to maintenance personnel when various components are due for overhaul or replacement.

(c) To start the Progressive Care Program, begin conducting the inspections defined herein and refer to Federal Aviation Regulations Part 91.409 (d) for procedures to notify the Federal Aviation Administration of the intent to begin a progressive inspection program.

(d) Accomplish each inspection and maintenance item per the checklists on the operation sheets of the Progressive Care and Maintenance Schedule. Spaces have been provided for the mechanic's and inspector's signatures as required, as well as any remarks. These are to become part of the maintenance records for each airplane. Each inspection is to be logged in the airplane and/or engine log books. Refer to Federal Aviation Regulation Part 43 for the recommended entry statement.

PROGRESSIVE CARE PROGRAM
(MODEL 182 & T182 AIRPLANES)
COMPONENT OVERHAUL AND REPLACEMENT RECORD

COMPONENT	DATE	REASON FOR REPLACEMENT	REPLACEMENT PART NUMBER SERIAL NUMBER	NEXT OVERHAUL AIRPLANE HOURS DATE
	X			
	X			
	X			
	X			
	X			
	X			
	X			
	X			
	X			
	X			
	X			

PROGRESSIVE CARE PROGRAM
INSPECTION CHART

AIRPLANE MODELS: 182 & T182 **REGISTRATION NUMBER:**

INSPECTION POINTS	TIME		TIME	
	INSPECTION DUE	INSPECTION ACCOMPLISHED	INSPECTION DUE	INSPECTION ACCOMPLISHED
OPERATION 1				
OPERATION 2				
OPERATION 3				
OPERATION 4				

EXAMPLE:

The airplane in this example was placed on the Progressive Care Program after flying a total of 110 hours. At that point, a complete initial inspection of the airplane was performed. The following steps indicate what will have taken place up through an hourmeter reading of 261 hours.

1. After the initial inspection at 110 hours, the first Inspection Due Column was filled out to show the total flying time at which each of the four (4) operation inspections would be due.
2. As each inspection was performed, the total flying time was recorded in the Inspection Accomplished column. The next Inspection Due space for that particular operation is also filled in at this time. These times will always be 200 hours from the last due point providing the operation was actually accomplished within the ten (10) hours limit.
3. The sample airplane now has a total flying time of 261 hours and the inspection chart shows that a Phase 4 will be due at 310 hours.

INSPECTION POINTS	TIME		TIME	
	INSPECTION DUE	INSPECTION ACCOMPLISHED	INSPECTION DUE	INSPECTION ACCOMPLISHED
OPERATION 1	160	162	360	
OPERATION 2	210	209	409	
OPERATION 3	260	261	460	
OPERATION 4	310			

CESSNA PROGRESSIVE CARE
MODEL 182 & T182

OPERATION NO. 1

Registration No. ______ Airplane Model and SN __________ Airplane Time ______

			INSPECTION COMPLETED BY
B	15	Seat Tracks and Stops - Inspect seat tracks for condition and security of installation. Check seat track stops for damage and correct location. Ensure inspection of seat rails for cracks EACH 50 HOURS. Refer to Section 3.	
C	1	Wing Surfaces and Tips - Inspect for skin damage, loose rivets, and condition of paint.	
C	2	Wing Struts and Strut Fairings - Check for dents, cracks, loose screws and rivets, and condition of paint.	
C	7	Vertical and Horizontal Stabilizers, Tips and Tailcone - Inspect externally for skin damage and condition of paint.	
C	8	Vertical and Horizontal Stabilizers and Tailcone structure - Inspect bulkheads, spars, ribs, and skins for cracks, wrinkles, loose rivets, corrosion, or other damage. Inspect vertical and horizontal stabilizer attach bolts for looseness. Retorque as necessary. Check security of inspection covers, fairings, and tips.	
E	1	Ailerons and Hinges - Check condition, security and operation.	
E	2	Aileron Structure, Control Rods, Hinges, Balance Weights, Bellcranks, Linkage, Bolts, Pulleys, and Pulley Brackets - Check condition, operation, and security of attachment.	
E	5	Aileron Controls - Check freedom of movement and proper operation through full travel with and without flaps extended.	
F	1	Flaps - Check tracks, rollers, and control rods for security of attachment. Check operation.	
F	2	Flap Actuator Threads - Clean and lubricate. Refer to paragraph 2-46 for detailed instructions.	
G	1	Elevator Control - Check freedom of movement and proper operation through full travel with and without flaps extended.	
G	2	Elevator, Hinges, and Cable Attachment - Check condition, security, and operation.	
H	1	Elevator Trim Tab and Hinges - Check condition, security, and operation.	
I	1	Rudder - Inspect the rudder skins for cracks and loose rivets, rudder hinges for condition, cracks and security; hinge bolts, hinge bearings, hinge attach fittings, and bonding jumper for evidence of damage and wear, failed fasteners, and security. Inspect the rudder hinge bolts for proper safetying of nuts with cotter pins. Inspect balance weight for looseness and the supporting structure for damage.	
I	3	Rudder, Tips, Hinges, and Cable Attachment - Check condition, security, and operation.	
J	1	Cowling and Cowl Flaps - Inspect for cracks, dents, and other damage, security of cowl fasteners, and cowl mounted landing lights for attachment. Check cowl flaps for condition, security, and operation.	
J	2	Engine - Inspect for evidence of oil and fuel leaks. Wash engine and check for security of accessories.	

CESSNA PROGRESSIVE CARE
MODEL 182 & T182

OPERATION NO. 1

Registration No. _______ **Airplane Model and SN** ___________ **Airplane Time** _______

			INSPECTION COMPLETED BY
J	3	Engine, Propeller Controls, and Linkage - Check general condition, freedom of movement through full range. Check for proper travel, security of attachment, and for evidence of wear. Check friction locks for proper operation.	
J	4	Cowl Flap Controls - Check freedom of movement through full travel.	
J	5	Ignition Switch and Electrical Harness - Inspect for damage, condition, and security.	
J	6	Firewall Structure - Inspect for wrinkles, damage, cracks, sheared rivets, etc. Check cowl shock mounts for condition and security.	
J	7	Engine Shock Mounts, Engine Mount Structure, and Ground Straps - Check condition, security, and alignment.	
J	8	Induction System - Check security of clamps, tubes, and ducting. Inspect for evidence of leakage.	
J	9	Induction Air Filter - Remove and clean. Inspect for damage, and service per paragraph 2-24.	
J	10	Induction Airbox, Valves, Doors, and Controls - Remove air filter and inspect hinges, doors, seals, and attaching parts for wear and security. Check operation. Clean and inspect air filter and re-oil if flock-coated.	
J	11	Alternate Induction Air System - Check for obstructions, operation, and security.	
J	13	Alternator, Mounting Bracket, and Electrical Connections - Check condition and security. Check alternator belts for condition and proper adjustment. Refer to Paragraph 16-42 for belt tension.	
J	15	Oil Cooler - Check for obstructions, leaks, and security of attachment.	
J	16	Exhaust System - Inspect for cracks and security.Air leak check exhaust system. Refer to Section 11 and 11A, Paragraphs 11-98 and 11-75A, for inspection procedures	
J	17	Exhaust System (turbocharged engine) - Inspect couplings, seals, clamps, and expansion joints for cracks. Air leak check exhaust system.	
J	18	Auxiliary (Electric) Fuel Pump - Check pump and fittings for condition, operation, security. Remove and clean filter (as applicable).	
J	19	Engine-Driven Fuel Pump - Check for evidence of leakage, security of attachment, and general condition.	
J	21	Magnetos - Check external condition, security, and electrical leads for condition. Check timing to engine and internal timing if engine timing requires adjustment.	
J	23	Ignition Harness and Insulators - Check for proper routing, deterioration, and condition of terminals.	
J	24	Spark Plugs - Remove, clean analyze, test, gap, and rotate top plugs-to-bottom and bottom plugs-to-top.	
J	25	Cylinder Compression - Perform differential compression test.	
J	26	Carburetor - Drain and flush carburetor bowl, clean inlet strainer, and drain plug. Check general condition and security.	
J	27	Engine Primer - Check for leakage, operation, and security.	

CESSNA PROGRESSIVE CARE
MODEL 182 & T182

OPERATION NO. 1

Registration No. _______ Airplane Model and SN __________ Airplane Time ______

			INSPECTION COMPLETED BY
J	28	Hoses, Metal Lines, and Fittings - Inspect for signs of oil and fuel leaks. Check for abrasions, chafing, security, proper routing and support and for evidence of deterioration.	
J	29	Cold and Hot Air Hoses - Check condition, routing, and security.	
J	30	Engine Cylinders, Rocker Box Covers, and Pushrod Housings - Check for fin damage, cracks, oil leakage, security of attachment, and general condition.	
J	31	Turbocharger (if applicable) - a. Inspect turbocharger mounting bracket, ducting, linkage, and attaching parts for general condition, leakage or damage, and security of attachment. b. Check waste gate, actuator, controller, oil and vent lines, overboost relief valve, and compressor housing for leakage, apparent damage, security of attachment, and evidence of wear. Check waste gate return spring for condition and security.	
J	32	Turbocharger (if applicable) - a. Remove heat shields and inspect for burned areas, bulges or cracks. Remove tailpipe and ducting - inspect turbine for coking, carbonization, oil deposits, and turbine impellers for damage.	
J	33	Engine Baffles and Seals - Check condition and security of attachment.	
J	34	Engine Oil Change - Short Oil Filter (approximately 4.8 inches) a. Replace Filter. b. Add recommended grade aviation oil to replace oil lost in existing filter. Without Oil Filter - Drain oil sump and oil cooler, inspect and clean screens, and refill with recommended grade aviation oil.	
J	35	Long Oil Filter (approximately 5.8 inches) - Drain oil sump and oil cooler, replace filter element, refill with recommended grade aviation oil.	
J	36	Crankcase, Oil Sump, and Accessory Section - Inspect for cracks and evidence of oil leakage. Check bolts and nuts for looseness and retorque as necessary. Check crankcase breather lines for obstructions, security, and general condition.	
K	1	Integral Fuel Tanks - Check for evidence of leakage and condition of fuel caps, adapters, and placards.	
K	2	Fuel Bladders - Check for leaks and security, condition of fuel caps, adapters, and placards.	
K	3	Fuel System - Inspect plumbing and components for mounting and security.	
K	4	Fuel Tank or Bladder Drains - Drain water and sediment.	
K	5	Fuel Tank Vent Lines and Vent Valves - Check vents for obstruction and proper positioning. Check valves for operation.	
K	7	Fuel Strainer, Drain Valve, and Controls - Check freedom of movement, security, and proper operation. Disassemble, flush, and clean screen and bowl.	

CESSNA PROGRESSIVE CARE
MODEL 182 & T182

OPERATION NO. 1

Registration No. _______ Airplane Model and SN __________ Airplane Time _______

INSPECTION COMPLETED BY

L	1	Propeller Mounting - Check for security of installation.	
L	2	Propeller Blades - Inspect for cracks, dents, nicks, scratches, erosion, corrosion, or other damage.	
L	3	Spinner - Check general condition and attachment.	
L	4	Spinner and Spinner Bulkhead - Remove spinner, wash, and inspect for cracks and fractures.	
L	5	Propeller Mounting Bolts - Inspect mounting bolts and safety-wire for signs of looseness. Retorque mounting bolts as required.	
L	6	Propeller Hub - Check general condition.	
L	7	Propeller Governor and Control - Inspect for oil and grease leaks.	
L	8	Propeller Anti-ice Slip Rings, Brushes, and Boots - Inspect for condition, and security. Perform operational check.	
M	2	Heater Components, Inlets, and Outlets - Inspect all lines, connections, ducts, clamps, seals, and gaskets for condition, restriction, and security.	
M	4	Pitot Tube and Stall Warning Vane - Check for condition and obstructions.	
M	5	Pitot Tube Heater Element - Perform operational check.	
N	3	Vacuum Pump - Check for condition and security. Check vacuum system breather line for obstructions, condition, and security.	
O	4	Battery - Check general condition and security. Check level of electrolyte.	
O	5	Battery Box and Cables - Clean and remove any corrosion. Check cables for routing, support, and security of connections.	
O	7	Alternator Control Unit - Inspect wiring, mounting, condition, and wire routing.	
O	10	External Power Receptacle and Power Cables - Inspect for condition and security.	

CESSNA PROGRESSIVE CARE
MODEL 182 & T182

OPERATION NO. 1

SPECIAL INSPECTION AND YEARLY ITEMS
Please review each of these items for required compliance

			HOURS	YEARS	INSPECTION COMPLETED BY
B	11	Upholstery, Headliner, Trim, and Carpeting - Check condition and clean as required.	EACH 400	EACH 1	
D	3	Brake Lines, Wheel Cylinders, Hoses, Clamps, and Fittings - Check for leaks, condition, and security and hoses for bulges and deterioration. Check brake lines and hoses for proper routing and support.	EACH 400	EACH 1	
D	6	Wheel Fairings, Strut Fairings, and Cuffs - Check for cracks, dents, and condition of paint.	A		
D	11	Wheel Bearings - Clean, inspect and lube.	B		
E	4	Autopilot Rigging - Check per Avionics Installation Manual.	C		
H	5	Elevator Trim Tab Actuator - Clean, lubricate. .	D		
J	3	Engine, Propeller Controls, and Linkage - Check general condition, freedom of movement through full range. Check for proper travel, security of attachment, and for evidence of wear. Check friction locks for proper operation.		E	
J	9	Induction Air Filter - Remove and clean. Inspect for damage, and service per paragraph 2-24.	F		
J	12	Alternator - Check brushes, leads, commutator or slip ring for wear.		G	
J	14	Starter, Starter Solenoid, and Electrical Connections - Check for condition of starter brushes, brush leads, and commutator.		H	
J	20	Magnetos - Inspection lubrication and overhaul procedures.	I		
J	21	Magnetos - Check external condition, security, and electrical leads for condition. Check timing to engine and internal timing if engine timing requires adjustment.	J		
J	22	Magnetos - Timimg Procedures and intervals.	K		
J	28	Hoses, Metal Lines, and Fittings - Inspect for signs of oil and fuel leaks. Check for abrasions, chafing, security, proper routing and support and for evidence of deterioration.		L	
J	31	Turbocharger (if applicable) - a. Inspect turbocharger mounting bracket, ducting, linkage, and attaching parts for general condition, linkage or damage, and security of attachment. b. Check waste gate, actuator, controller, oil and vent lines, overboost relief valve, and compressor housing for leakage, apparent damage, security of attachment, and evidence of wear. Check waste gate return spring for condition and security	M		
J	34	Engine Oil Change - Short Oil Filter (approximately 4.8 inches) a. Replace Filter. b. Add recommended grade aviation oil to replace oil lost in existing filter Without Oil Filter - Drain oil sump and oil cooler, inspect and clean screens, and refill with recommended grade aviation oil	N		
J	35	Long Oil Filter (approximately 5.8 inches) - Drain oil sump and oil cooler, replace filter element, refill with recommended grade aviation oil	N		
K	1	Integral Fuel Tanks - Check for evidence of leakage and condition of fuel caps, adapters, and placards	O		
K	2	Fuel Bladders - Check for leaks and security, condition of fuel caps, adapters, and placards	O		

CESSNA PROGRESSIVE CARE
MODEL 182 & T182

OPERATION NO. 1

SPECIAL INSPECTION AND YEARLY ITEMS Please review each of these items for required compliance			HOURS	YEARS	INSPECTION COMPLETED BY
K	8	Fuel Quantity Indicators - Check for damage, security of installation, and perform accuracy test.		EACH 1	
L	7	Propeller Governor and Control - Inspect for oil and grease leaks.	P		
M	1	Ventilation System - Inspect clamps, hoses, and valves for condition and security.	400	EACH 1	
M	8	Oxygen Cylinder - Inspect for condition, check hydrostatic test date and perform hydrostatic test, if required.		EACH 5	
N	4	Vacuum System Air Filter - Inspect for damage, deterioration and contamination. Clean or replace, if required. NOTE: Smoking will cause premature filter clogging.	Q		
N	5	Vacuum System relief Valve - Inspect for condition and security.	R		
N	10	Airspeed Indicator, Vertical Speed Indicator, and Magnetic Compass - Calibrate.		EACH 2	
N	11	Altimeter and Static System - Inspect in accordance with FAR Part 91.411.		EACH 2	
O	4	Battery - Check general condition and security. Check level of electrolyte.	S		

CESSNA PROGRESSIVE CARE
MODEL 182 & T182

OPERATION NO. 1

Special Inspections Legends:

A. If the airplane is flown from surfaces with mud, snow, or ice, the main gear speed fairings should be checked that there is no accumulation which could prevent normal wheel rotation.
B. First 100 hours and each 500 hours thereafter. More often if operated under prevailing wet or dusty conditions.
C. Each 600 hours or 1 year, whichever comes first.
D. Lubrication of the actuator is required each 1000 hours or 3 years, whichever comes first. See figure 2-5 for grease specification.
E. Lubricate each 100 hours (except in extreme dusty conditions). These controls are not repairable and should be replaced every 1500 hours or whenever maximum linear movement exceeds 0.050 inch.
F. Clean filter per Paragraph 2-24. Replace paper filter at least each 500 hours.
G. Inspect each 500 hours.
H. For Prestolite starter only, inspect the commutator and brushes each 1500 hours.
I. After 500 hours of operation, perform the following checks:
   1. Inspect contact points for condition and adjust or replace as required.
   2. Inspect carbon brush, high-tension lead, and distributor block for condition and clean or replace as required.
   3. Inspect impulse coupling and pawls for condition and replace as required. Use light pressure only, do not force pin (or drill bit) when checking pawls.
   4. Inspect bearings and lubricate, replace bearings, if required.
   5. Lubricate contact point cam.
   6. Completely overhaul, or replace existing magneto with a new or rebuilt exchange magneto, at every engine overhaul.
   7. Overhaul and Maintenance Manual, Publication No. 1037C1-13, covering Model 4200/6200 series magnetos, is available from Cessna Supply Division.
J. Compliance with Bendix Service Bulletin 599D or latest revision is required.
K. At the first 25 hours, first 50 hours, first 100 hours, and thereafter at each 100 hours, the contact breaker point compartment and magneto-to-engine timing should be inspected and checked. If magneto-to-engine timing is correct within plus zero degrees to minus two degrees, internal timing need not be checked. If timing is out of tolerance, remove magneto and set internal timing, then install and time to the engine. Refer to Section 11 or 11A and the magneto manufacturers service instructions for magneto timing procedures.
L. Replace engine compartment rubber hoses (Cessna installed only) every five years or at engine overhaul, whichever occurs first. This does not include drain hoses. Hoses which are beyond these limits and are in a serviceable condition, must be placed on order immediately and then be replaced within 120 days after receiving the new hose(s) from Cessna. Replace drain hoses on condition. Engine flexible hoses (Continental or Lycoming installed) (Refer to Continental or Lycoming Maintenance Manual and Continental or Lycoming Engine Service Bulletins).
M. Replace turbocharger oil line check valves every 1000 hours. (Refer to Cessna Single Engine Service Bulletin SEB92-7.)
N. Continental engine (182): Add straight grade mineral oil if required. After 25 hours, drain and refill with ashless dispersant oil. Lycoming engine (T182): Add straight grade mineral oil if required. After 25 hours, drain and refill with straight grade mineral oil until a total of 50 hours have accumulated or oil consumption stabilizes, then change to ashless dispersant oil. Continental and Lycoming engines: After initial break-in (25 or 50 hours). If NOT equipped with an external filter, change oil and clean screens each 50 hours. If equipped with SMALL external filter, change filter each 50 hours and oil each 100 hours. If equipped with LARGE external filter, change oil and filter each 100 hours. In all cases, change oil at least each 6 months regardless of accumulated hours.
O. Each 1000 hours.
P. If leakage is evident, refer to McCauley Service Manual.
Q. Replace every 500 hours.
R. Replace filter each 100 hours.
S. Check electrolyte level and clean battery box each 100 hours or 90 days.

CESSNA PROGRESSIVE CARE
MODEL 182 & T182

OPERATION NO. 2

Registration No. _______ Airplane Model and SN __________ Airplane Time _______

INSPECTION COMPLETED BY

B	1	Fuselage Surface - Inspect for skin damage, loose rivets, condition of paint, and check pitot-static ports and drain holes for obstruction. Inspect covers and fairings for security.	
B	6	Emergency Locator Transmitter - Inspect for security of attachment and check operation by verifying transmitter output. Check cumulative time and useful life of batteries in accordance with FAR Part 91.207. Refer to Section 16 - Emergency Locator Transmitter - Checkout Interval.	
B	8	Pilot's and Copilot's Inertia Reels - Inspect for security of installation, proper operation, and evidence of damage.	
B	9	Seats, Seat Belts, and Shoulder Harnesses - Check general condition and security. Check operation of seat stops and adjustment mechanism. Inspect belts for condition and security of fasteners.	
B	10	Windows, Windshield, Doors, and Seals - Inspect general condition. Check latches, hinges, and seals for condition, operation, and security of attachment.	
B	12	Flight Controls - Check freedom of movement and proper operation through full travel with and without flaps extended. Check electric trim controls for operation (as applicable.)	
B	14	Portable Hand Fire Extinguisher - Inspect for proper operating pressure, condition, security of installation, and servicing date.	
B	15	Seat Tracks and Stops - Inspect seat tracks for condition and security of installation. Check seat track stops for damage and correct location. Ensure inspection of seat rails for cracks EACH 50 HOURS. Refer to Section 3.	
B	17	Fuel Line and Selector Valve Drain(s) - Remove plug and drain.	
C	9	Elevator/Rudder Downspring - Check structure, bolts, linkage, bellcrank, and push-pull tube for condition, operation, and security. Check cables for tension, routing, fraying, corrosion, and turnbuckle safety. Check travels if cables require tension adjustment or if stops are damaged.	
D	1	Brakes, Master Cylinders, and Parking Brake - Check master cylinders and parking brake mechanism for condition and security. Check fluid level and test operation of toe and parking brake.	
D	2	Main Gear Tubular Struts - Inspect for cracks, dents, corrosion, condition of paint or other damage. Check axles for condition and security.	
D	4	Wheels, Brake Discs, and Linings - Inspect for wear, cracks, warps, dents, or other damage. Check wheel through-bolts and nuts for looseness.	
D	5	Tires - Check tread wear and general condition. Check for proper inflation.	
D	6	Wheel Fairings, Strut Fairings, and Cuffs - Check for cracks, dents, and condition of paint.	
D	8	Nose Gear Steering Mechanism - Check for wear, security, and proper rigging.	

CESSNA PROGRESSIVE CARE
MODEL 182 & T182

OPERATION NO. 2

Registration No. _______ Airplane Model and SN __________ Airplane Time _______

INSPECTION COMPLETED BY

D	9	Nose Gear - Inspect torque links, steering rods, and boots for condition and security of attachment. Check strut for evidence of leakage and proper extension. Check strut barrel for corrosion, pitting, and cleanliness. Check shimmy damper and/or bungees for operation, leakage, and attach points for wear and security.	
D	10	Nose Gear Fork - Inspect for cracks, general condition, and security of attachment.	
D	12	Nose Gear Attachment Structure - Inspect for cracks, corrosion, or other damage and security of attachment.	
H	2	Elevator Trim System - Check cables, push-pull rods, bellcranks, pulleys, turnbuckles, fairleads, rub strips, etc. for proper routing, condition, and security.	
J	1	Cowling and Cowl Flaps - Inspect for cracks, dents, and other damage, security of cowl fasteners and cowl mounted landing lights for attachment. Check cowl flaps for condition, security, and operation.	
J	2	Engine - Inspect for evidence of oil and fuel leaks. Wash engine and check for security of accessories.	
J	3	Engine, Propeller Controls, and Linkage - Check general condition, freedom of movement through full range. Check for proper travel, security of attachment, and for evidence of wear. Check friction locks for proper operation.	
J	4	Cowl Flap Controls - Check freedom of movement through full travel.	
J	8	Induction System - Check security of clamps, tubes, and ducting. Inspect for evidence of leakage.	
J	11	Alternate Induction Air System - Check for obstructions, operation, and security.	
J	13	Alternator, Mounting Bracket, and Electrical Connections - Check condition and security. Check alternator belts for condition and proper adjustment. Refer to Paragraph 16-42 for belt tension.	
J	15	Oil Cooler - Check for obstructions, leaks, and security of attachment.	
J	16	Exhaust System - Inspect for cracks and security. Air leak check exhaust system. Refer to Section 11 and 11A, Paragraphs 11-98 and 11-75A, for inspection procedures.	
J	17	Exhaust System (turbocharged engine) - Inspect couplings, seals, clamps, and expansion joints for cracks. Air leak check exhaust system.	
J	28	Hoses, Metal Lines, and Fittings - Inspect for signs of oil and fuel leaks. Check for abrasions, chafing, security, proper routing and support and for evidence of deterioration.	
J	31	Turbocharger (if applicable) - a. Inspect turbocharger mounting bracket, ducting, linkage, and attaching parts for general condition, leakage or damage and security of attachment. b. Check waste gate, actuator, controller, oil and vent lines, overboost relief valve, and compressor housing for leakage, apparent damage, security of attachment, and evidence of wear. Check waste gate return spring for condition and security.	

CESSNA PROGRESSIVE CARE
MODEL 182 & T182

OPERATION NO. 2

Registration No. _______ **Airplane Model and SN** __________ **Airplane Time** _______
INSPECTION COMPLETED BY

J	33	Engine Baffles and Seals - Check condition and security of attachment.	
J	34	Engine Oil Change - Short Oil Filter (approximately 4 8 inches) a. Replace Filter b. Add recommended grade aviation oil to replace oil lost in existing filter. Without Oil Filter - Drain oil sump and oil cooler, inspect and clean screens, and refill with recommended grade aviation oil.	
K	4	Fuel Tank or Bladder Drains - Drain water and sediment.	
K	6	Fuel Selector Valve - Check controls for detent in each position, security of attachment, and for proper placarding.	
L	1	Propeller Mounting - Check for security of installation.	
L	2	Propeller Blades - Inspect for cracks, dents, nicks, scratches, erosion, corrosion, or other damage.	
L	3	Spinner - Check general condition and attachment.	
L	7	Propeller Governor and Control - Inspect for oil and grease leaks.	
L	8	Propeller Anti-ice Slip Rings, Brushes, and Boots - Inspect for condition, and security. Perform operational check.	
M	4	Pitot Tube and Stall Warning Vane - Check for condition and obstructions.	
M	5	Pitot Tube Heater Element - Perform operational check.	
N	1	Vacuum System - Inspect for condition and security.	
N	2	Vacuum System Hoses - Inspect for hardness, deterioration, looseness, or collapsed hoses.	
N	4	Vacuum System Air Filter - Inspect for damage, deterioration and contamination. Clean or replace, if required. NOTE. Smoking will cause premature filter clogging.	
N	5	Vacuum System relief Valve - Inspect for condition and security.	
N	6	Instruments - Check general condition and markings for legibility.	
O	2	Instrument, Cabin, Navigation, Beacon, Strobe, and Landing Lights - Check operation, condition of lens, and security of attachment.	
O	3	Circuit Breakers and Fuses - Check operation and condition. Check for required number of spare fuses.	
Q	1	Brakes - Test toe brakes and parking brake for proper operation.	

CESSNA PROGRESSIVE CARE
MODEL 182 & T182

OPERATION NO. 2

SPECIAL INSPECTION AND YEARLY ITEMS Please review each of these items for required compliance			HOURS	YEARS	INSPECTION COMPLETED BY
B	11	Upholstery, Headliner, Trim, and Carpeting - Check condition and clean as required.	EACH 400	EACH 1	
D	3	Brake Lines, Wheel Cylinders, Hoses, Clamps, and Fittings - Check for leaks, condition, and security and hoses for bulges and deterioration. Check brake lines and hoses for proper routing and support.	EACH 400	EACH 1	
D	6	Wheel Fairings, Strut Fairings, and Cuffs - Check for cracks, dents, and condition of paint.	A		
D	11	Wheel Bearings - Clean, inspect and lube.	B		
E	4	Autopilot Rigging - Check per Avionics Installation Manual.	C		
H	5	Elevator Trim Tab Actuator - Clean, lubricate.	D		
J	3	Engine, Propeller Controls, and Linkage - Check general condition, freedom of movement through full range. Check for proper travel, security of attachment, and for evidence of wear. Check friction locks for proper operation.		E	
J	9	Induction Air Filter - Remove and clean. Inspect for damage, and service per paragraph 2-24.	F		
J	12	Alternator - Check brushes, leads, commutator or slip ring for wear.		G	
J	14	Starter, Starter Solenoid, and Electrical Connections - Check for condition of starter brushes, brush leads, and commutator.		H	
J	20	Magnetos - Inspection lubrication and overhaul procedures.	I		
J	21	Magnetos - Check external condition, security, and electrical leads for condition. Check timing to engine and internal timing if engine timing requires adjustment.	J		
J	22	Magnetos - Timimg Procedures and intervals.	K		
J	28	Hoses, Metal Lines, and Fittings - Inspect for signs of oil and fuel leaks. Check for abrasions, chafing, security, proper routing and support and for evidence of deterioration.		L	
J	31	Turbocharger (if applicable) - a. Inspect turbocharger mounting bracket, ducting, linkage, and attaching parts for general condition, leakage or damage, and security of attachment. b. Check waste gate, actuator, controller, oil and vent lines, overboost relief valve, and compressor housing for leakage, apparent damage, security of attachment, and evidence of wear. Check waste gate return spring for condition and security.	M		
J	34	Engine Oil Change - Short Oil Filter (approximately 4.8 inches) a. Replace Filter. b. Add recommended grade aviation oil to replace oil lost in existing filter Without Oil Filter - Drain oil sump and oil cooler, inspect and clean screens, and refill with recommended grade aviation oil.	N		
J	35	Long Oil Filter (approximately 5.8 inches) - Drain oil sump and oil cooler, replace filter element, refill with recommended grade aviation oil.	N		
K	1	Integral Fuel Tanks - Check for evidence of leakage and condition of fuel caps, adapters, and placards.	O		
K	2	Fuel Bladders - Check for leaks and security, condition of fuel caps, adapters, and placards.	O		

CESSNA PROGRESSIVE CARE
MODEL 182 & T182

OPERATION NO. 2

SPECIAL INSPECTION AND YEARLY ITEMS
Please review each of these items for required compliance

			HOURS	YEARS	INSPECTION COMPLETED BY
K	8	Fuel Quantity Indicators - Check for damage, security of installation, and perform accuracy test.		EACH 1	
L	7	Propeller Governor and Control - Inspect for oil and grease leaks.	P		
M	1	Ventilation System - Inspect clamps, hoses, and valves for condition and security.	400	EACH 1	
M	8	Oxygen Cylinder - Inspect for condition, check hydrostatic test date and perform hydrostatic test, if required.		EACH 5	
N	4	Vacuum System Air Filter - Inspect for damage, deterioration and contamination. Clean or replace, if required. NOTE: Smoking will cause premature filter clogging.	Q		
N	5	Vacuum System relief Valve - Inspect for condition and security.	R		
N	10	Airspeed Indicator, Vertical Speed Indicator, and Magnetic Compass - Calibrate.		EACH 2	
N	11	Altimeter and Static System - Inspect in accordance with FAR Part 91.411.		EACH 2	
O	4	Battery - Check general condition and security. Check level of electrolyte.	S		

CESSNA PROGRESSIVE CARE
MODEL 182 & T182

OPERATION NO. 2

Special Inspections Legends:

A. If the airplane is flown from surfaces with mud, snow, or ice, the main gear speed fairings should be checked that there is no accumulation which could prevent normal wheel rotation.
B. First 100 hours and each 500 hours thereafter. More often if operated under prevailing wet or dusty conditions.
C. Each 600 hours or 1 year, whichever comes first.
D. Lubrication of the actuator is required each 1000 hours or 3 years, whichever comes first. See figure 2-5 for grease specification.
E. Lubricate each 100 hours (except in extreme dusty conditions). These controls are not repairable and should be replaced every 1500 hours or whenever maximum linear movement exceeds 0.050 inch.
F. Clean filter per Paragraph 2-24. Replace paper filter at least each 500 hours.
G. Inspect each 500 hours.
H. For Prestolite starter only, inspect the commutator and brushes each 1500 hours.
I. After 500 hours of operation, perform the following checks:
   1. Inspect contact points for condition and adjust or replace as required.
   2. Inspect carbon brush, high-tension lead, and distributor block for condition and clean or replace as required.
   3. Inspect impulse coupling and pawls for condition and replace as required. Use light pressure only, do not force pin (or drill bit) when checking pawls.
   4. Inspect bearings and lubricate, replace bearings, if required.
   5. Lubricate contact point cam.
   6. Completely overhaul, or replace existing magneto with a new or rebuilt exchange magneto, at every engine overhaul.
   7. Overhaul and Maintenance Manual, Publication No. 1037C1-13, covering Model 4200/6200 series magnetos, is available from Cessna Supply Division.
J. Compliance with Bendix Service Bulletin 599D or latest revision is required.
K. At the first 25 hours, first 50 hours, first 100 hours, and thereafter at each 100 hours, the contact breaker point compartment and magneto-to-engine timing should be inspected and checked. If magneto-to-engine timing is correct within plus zero degrees to minus two degrees, internal timing need not be checked. If timing is out of tolerance, remove magneto and set internal timing, then install and time to the engine. Refer to Section 11 or 11A and the magneto manufacturers service instructions for magneto timing procedures.
L. Replace engine compartment rubber hoses (Cessna installed only) every five years or at engine overhaul, whichever occurs first. This does not include drain hoses. Hoses which are beyond these limits and are in a serviceable condition, must be placed on order immediately and then be replaced within 120 days after receiving the new hose(s) from Cessna. Replace drain hoses on condition. Engine flexible hoses (Continental or Lycoming installed) (Refer to Continental or Lycoming Maintenance Manual and Continental or Lycoming Engine Service Bulletins).
M. Replace turbocharger oil line check valves every 1000 hours. (Refer to Cessna Single Engine Service Bulletin SEB92-7.)
N. Continental engine (182): Add straight grade mineral oil if required. After 25 hours, drain and refill with ashless dispersant oil. Lycoming engine (T182): Add straight grade mineral oil if required. After 25 hours, drain and refill with straight grade mineral oil until a total of 50 hours have accumulated or oil consumption stabilizes, then change to ashless dispersant oil. Continental and Lycoming engines: After initial break-in (25 or 50 hours). If NOT equipped with an external filter, change oil and clean screens each 50 hours. If equipped with SMALL external filter, change filter each 50 hours and oil each 100 hours. If equipped with LARGE external filter, change oil and filter each 100 hours. In all cases, change oil at least each 6 months regardless of accumulated hours.
O. Each 1000 hours.
P. If leakage is evident, refer to McCauley Service Manual.
Q. Replace every 500 hours.
R. Replace filter each 100 hours.
S. Check electrolyte level and clean battery box each 100 hours or 90 days.

CESSNA PROGRESSIVE CARE
MODEL 182 & T182

OPERATION NO. 3

Registration No. _______ Airplane Model and SN __________ AirplaneTime _______

INSPECTION COMPLETED BY

B	15	Seat Tracks and Stops - Inspect seat tracks for condition and security of installation. Check seat track stops for damage and correct location. Ensure inspection of seat rails for cracks EACH 50 HOURS. Refer to Section 3.	
C	1	Wing Surfaces and Tips - Inspect for skin damage, loose rivets, and condition of paint.	
C	2	Wing Struts and Strut Fairings - Check for dents, cracks, loose screws and rivets, and condition of paint.	
C	3	Wing Spar and Wing Strut Fittings - Check for evidence of wear. Check attach bolts for indications of looseness and retorque as required.	
C	4	Wing Structure - Inspect spars, ribs, skins, and stringers for cracks, wrinkles, loose rivets, corrosion, or other damage.	
C	5	Metal Lines, Hoses, Clamps, and Fittings - Check for leaks, condition, and security. Check for proper routing and support.	
C	6	Wing Access Plates - Check for damage and security of installation.	
C	7	Vertical and Horizontal Stabilizers, Tips and Tailcone - Inspect externally for skin damage and condition of paint.	
C	8	Vertical and Horizontal Stabilizers and Tailcone Structure - Inspect bulkheads, spars, ribs, and skins for cracks, wrinkles, loose rivets, corrosion, or other damage. Inspect vertical and horizontal stabilizer attach bolts for looseness. Retorque as necessary. Check security of inspection covers, fairings, and tips.	
E	1	Ailerons and Hinges - Check condition, security and operation.	
E	2	Aileron Structure, Control Rods, Hinges, Balance Weights, Bellcranks, Linkage, Bolts, Pulleys, and Pulley Brackets - Check condition, operation, and security of attachment.	
E	3	Ailerons and Cables - Check operation and security of stops. Check cables for tension, routing, fraying, corrosion, and turnbuckle safety. Check travel if cable tension requires adjustment or if stops are damaged. Check fairleads and rub strips for condition.	
E	5	Aileron Controls - Check freedom of movement and proper operation through full travel with and without flaps extended.	
F	1	Flaps - Check tracks, rollers, and control rods for security of attachment. Check operation.	
F	2	Flap Actuator Threads - Clean and lubricate. Refer to paragraph 2-46 for detailed instructions.	
F	3	Flap Structure, Linkage, Bellcranks, Pulleys, and Pulley Brackets - Check for condition, operation and security.	
F	4	Wing Flap Control - Check operation through full travel and observe Flap Position indicator for proper indication.	
F	5	Flaps and Cables - Check cables for proper tension, routing, fraying, corrosion, and turnbuckle safety. Check travel if cable tension requires adjustment.	
F	7	Flap Motor, Actuator, and Limit Switches (electric flaps) - Check wiring and terminals for condition and security. Check actuator for condition and security.	

CESSNA PROGRESSIVE CARE
MODEL 182 & T182

OPERATION NO. 3

Registration No. _______ Airplane Model and SN __________ AirplaneTime _______

INSPECTION COMPLETED BY

G	1	Elevator Control - Check freedom of movement and proper operation through full travel with and without flaps extended.	
G	2	Elevator, Hinges, and Cable Attachment - Check condition, security, and operation.	
H	1	Elevator Trim Tab and Hinges - Check condition, security, and operation.	
H	4	Elevator Trim Tab Stop Blocks - Inspect for damage and security.	
H	6	Elevator Trim Tab Actuator - Free-Play limits inspection. Refer to Section 9-9 for cleaning, inspection, and repair procedures.	
I	1	Rudder - Inspect the rudder skins for cracks and loose rivets, rudder hinges for condition, cracks and security; hinge bolts, hinge bearings, hinge attach fittings, and bonding jumper for evidence of damage and wear, failed fasteners, and security. Inspect the rudder hinge bolts for proper safetying of nuts with cotter pins. Inspect balance weight for looseness and the supporting structure for damage.	
I	3	Rudder, Tips, Hinges, and Cable Attachment - Check condition, security, and operation.	
I	4	Rudder - Check internal surfaces for corrosion, condition of fasteners, and balance weight attachment.	
J	1	Cowling and Cowl Flaps - Inspect for cracks, dents, and other damage, security of cowl fasteners, and cowl mounted landing lights for attachment. Check cowl flaps for condition, security, and operation.	
J	2	Engine - Inspect for evidence of oil and fuel leaks. Wash engine and check for security of accessories.	
J	3	Engine, Propeller Controls, and Linkage - Check general condition, freedom of movement through full range. Check for proper travel, security of attachment, and for evidence of wear. Check friction locks for proper operation.	
J	4	Cowl Flap Controls - Check freedom of movement through full travel.	
J	5	Ignition Switch and Electrical Harness - Inspect for damage, condition, and security.	
J	8	Induction System - Check security of clamps, tubes, and ducting. Inspect for evidence of leakage	
J	9	Induction Air Filter - Remove and clean. Inspect for damage, and service per paragraph 2-24	
J	10	Induction Airbox, Valves, Doors, and Controls - Remove air filter and inspect hinges, doors, seals, and attaching parts for wear and security. Check operation. Clean and inspect air filter and re-oil if flock-coated	
J	11	Alternate Induction Air System - Check for obstructions, operation, and security.	
J	13	Alternator, Mounting Bracket, and Electrical Connections - Check condition and security. Check alternator belts for condition and proper adjustment. Refer to Paragraph 16-42 for belt tension.	
J	15	Oil Cooler - Check for obstructions, leaks, and security of attachment.	

CESSNA PROGRESSIVE CARE
MODEL 182 & T182

OPERATION NO. 3

Registration No. _____ Airplane Model and SN __________ AirplaneTime _______

			INSPECTION COMPLETED BY
J	16	Exhaust System - Inspect for cracks and security. Air leak check exhaust system. Refer to Section 11 and 11A, Paragraphs 11-98 and 11-75A, for inspection procedures.	
J	17	Exhaust System (turbocharged engine) - Inspect couplings, seals, clamps, and expansion joints for cracks. Air leak check exhaust system.	
J	18	Auxiliary (Electric) Fuel Pump - Check pump and fittings for condition, operation, security. Remove and clean filter (as applicable).	
J	19	Engine-Driven Fuel Pump - Check for evidence of leakage, security of attachment, and general condition.	
J	21	Magnetos - Check external condition, security, and electrical leads for condition. Check timing to engine and internal timing if engine timing requires adjustment.	
J	23	Ignition Harness and Insulators - Check for proper routing, deterioration, and condition of terminals.	
J	24	Spark Plugs - Remove, clean analyze, test, gap, and rotate top plugs-to-bottom and bottom plugs-to-top.	
J	26	Carburetor - Drain and flush carburetor bowl, clean inlet strainer, and drain plug. Check general condition and security.	
J	27	Engine Primer - Check for leakage, operation, and security.	
J	28	Hoses, Metal Lines, and Fittings - Inspect for signs of oil and fuel leaks. Check for abrasions, chafing, security, proper routing and support and for evidence of deterioration.	
J	29	Cold and Hot Air Hoses - Check condition, routing, and security.	
J	30	Engine Cylinders, Rocker Box Covers, and Pushrod Housings - Check for fin damage, cracks, oil leakage, security of attachment, and general condition.	
J	31	Turbocharger (if applicable) a. Inspect turbocharger mounting bracket, ducting, linkage, and attaching parts for general condition, leakage or damage, and security of attachment. b. Check waste gate, actuator, controller, oil and vent lines, overboost relief valve, and compressor housing for leakage, apparent damage, security of attachment, and evidence of wear. Check waste gate return spring for condition and security.	
J	33	Engine Baffles and Seals - Check condition and security of attachment.	
J	34	Engine Oil Change Short Oil Filter (approximately 4.8 inches) - a Replace Filter. b. Add recommended grade aviation oil to replace oil lost in existing filter. Without Oil Filter - Drain oil sump and oil cooler, inspect and clean screens, and refill with recommended grade aviation oil	
J	35	Long Oil Filter (approximately 5.8 inches) - Drain oil sump and oil cooler, replace filter element refill with recommended grade aviation oil	

CESSNA PROGRESSIVE CARE
MODEL 182 & T182

OPERATION NO. 3

Registration No. _______ **Airplane Model and SN** __________ **AirplaneTime** _______

INSPECTION COMPLETED BY

J	36	Crankcase, Oil Sump, and Accessory Section - Inspect for cracks and evidence of oil leakage. Check bolts and nuts for looseness and retorque as necessary. Check crankcase breather lines for obstructions, security, and general condition.	
K	1	Integral Fuel Tanks - Check for evidence of leakage and condition of fuel caps, adapters, and placards.	
K	2	Fuel Bladders - Check for leaks and security, condition of fuel caps, adapters, and placards.	
K	3	Fuel System - Inspect plumbing and components for mounting and security.	
K	4	Fuel Tank or Bladder Drains - Drain water and sediment.	
K	5	Fuel Tank Vent Lines and Vent Valves - Check vents for obstruction and proper positioning. Check valves for operation.	
K	7	Fuel Strainer, Drain Valve, and Controls - Check freedom of movement, security, and proper operation. Disassemble, flush, and clean screen and bowl.	
L	1	Propeller Mounting - Check for security of installation.	
L	2	Propeller Blades - Inspect for cracks, dents, nicks, scratches, erosion, corrosion, or other damage.	
L	3	Spinner - Check general condition and attachment.	
L	4	Spinner and Spinner Bulkhead - Remove spinner, wash, and inspect for cracks and fractures.	
L	7	Propeller Governor and Control - Inspect for oil and grease leaks.	
L	8	Propeller Anti-ice Slip Rings, Brushes, and Boots - Inspect for condition, and security. Perform operational check.	
M	2	Heater Components, Inlets, and Outlets - Inspect all lines, connections, ducts, clamps, seals, and gaskets for condition, restriction, and security.	
M	4	Pitot Tube and Stall Warning Vane - Check for condition and obstructions.	
M	5	Pitot Tube Heater Element - Perform operational check.	
N	3	Vacuum Pump - Check for condition and security. Check vacuum system breather line for obstructions, condition, and security.	
O	4	Battery - Check general condition and security. Check level of electrolyte.	
O	5	Battery Box and Cables - Clean and remove any corrosion. Check cables for routing, support, and security of connections.	

CESSNA PROGRESSIVE CARE
MODEL 182 & T182

OPERATION NO. 3

		SPECIAL INSPECTION AND YEARLY ITEMS Please review each of these items for required compliance	HOURS	YEARS	INSPECTION COMPLETED BY
B	11	Upholstery, Headliner, Trim, and Carpeting - Check condition and clean as required.	EACH 400	EACH 1	
D	3	Brake Lines, Wheel Cylinders, Hoses, Clamps, and Fittings - Check for leaks, condition, and security and hoses for bulges and deterioration. Check brake lines and hoses for proper routing and support.	EACH 400	EACH 1	
D	6	Wheel Fairings, Strut Fairings, and Cuffs - Check for cracks, dents, and condition of paint.	A		
D	11	Wheel Bearings - Clean, inspect and lube.	B		
E	4	Autopilot Rigging - Check per Avionics Installation Manual.	C		
H	5	Elevator Trim Tab Actuator - Clean, lubricate.	D		
J	3	Engine, Propeller Controls, and Linkage - Check general condition, freedom of movement through full range. Check for proper travel, security of attachment, and for evidence of wear. Check friction locks for proper operation.		E	
J	9	Induction Air Filter - Remove and clean. Inspect for damage, and service per paragraph 2-24.	F		
J	12	Alternator - Check brushes, leads, commutator or slip ring for wear.		G	
J	14	Starter, Starter Solenoid, and Electrical Connections - Check for condition of starter brushes, brush leads, and commutator.		H	
J	20	Magnetos - Inspection lubrication and overhaul procedures.	I		
J	21	Magnetos - Check external condition, security, and electrical leads for condition. Check timing to engine and internal timing if engine timing requires adjustment.	J		
J	22	Magnetos - Timimg Procedures and intervals.	K		
J	28	Hoses, Metal Lines, and Fittings - Inspect for signs of oil and fuel leaks. Check for abrasions, chafing, security, proper routing and support and for evidence of deterioration.		L	
J	31	Turbocharger (if applicable) a. Inspect turbocharger mounting bracket, ducting, linkage, and attaching parts for general condition, linkage or damage, and security of attachment. b. Check waste gate, actuator, controller, oil and vent lines, overboost relief valve, and compressor housing for leakage, apparent damage, security of attachment, and evidence of wear. Check waste gate return spring for condition and security.	M		
J	34	Engine Oil Change - Short Oil Filter (approximately 4.8 inches) a. Replace Filter b. Add recommended grade aviation oil to replace oil lost in existing filter. Without Oil Filter - Drain oil sump and oil cooler, inspect and clean screens, and refill with recommended grade aviation oil.	N		
J	35	Long Oil Filter (approximately 5.8 inches) - Drain oil sump and oil cooler, replace filter element, refill with recommended grade aviation oil.	N		
K	1	Integral Fuel Tanks - Check for evidence of leakage and condition of fuel caps, adapters, and placards.	O		

CESSNA PROGRESSIVE CARE
MODEL 182 & T182

OPERATION NO. 3

SPECIAL INSPECTION AND YEARLY ITEMS
Please review each of these items for required compliance

			HOURS	YEARS	INSPECTION COMPLETED BY
K	2	Fuel Bladders - Check for leaks and security, condition of fuel caps, adapters, and placards.	O		
K	8	Fuel Quantity Indicators - Check for damage, security of installation, and perform accuracy test.		EACH 1	
L	7	Propeller Governor and Control - Inspect for oil and grease leaks.	P		
M	1	Ventilation System - Inspect clamps, hoses, and valves for condition and security.	400	EACH 1	
M	8	Oxygen Cylinder - Inspect for condition, check hydrostatic test date and perform hydrostatic test, if required.		EACH 5	
N	4	Vacuum System Air Filter - Inspect for damage, deterioration and contamination. Clean or replace, if required. NOTE: Smoking will cause premature filter clogging.	Q		
N	5	Vacuum System relief Valve - Inspect for condition and security.	R		
N	10	Airspeed Indicator, Vertical Speed Indicator, and Magnetic Compass - Calibrate.		EACH 2	
N	11	Altimeter and Static System - Inspect in accordance with FAR Part 91.411.		EACH 2	
O	4	Battery - Check general condition and security. Check level of electrolyte.	S		

CESSNA PROGRESSIVE CARE MODEL 182 & T182

OPERATION NO. 3

Special Inspections Legends:

A. If the airplane is flown from surfaces with mud, snow, or ice, the main gear speed fairings should be checked that there is no accumulation which could prevent normal wheel rotation.
B. First 100 hours and each 500 hours thereafter. More often if operated under prevailing wet or dusty conditions.
C. Each 600 hours or 1 year, whichever comes first.
D. Lubrication of the actuator is required each 1000 hours or 3 years, whichever comes first. See figure 2-5 for grease specification.
E. Lubricate each 100 hours (except in extreme dusty conditions). These controls are not repairable and should be replaced every 1500 hours or whenever maximum linear movement exceeds 0.050 inch.
F. Clean filter per Paragraph 2-24. Replace paper filter at least each 500 hours.
G. Inspect each 500 hours.
H. For Prestolite starter only, inspect the commutator and brushes each 1500 hours.
I. After 500 hours of operation, perform the following checks:
   1. Inspect contact points for condition and adjust or replace as required.
   2. Inspect carbon brush, high-tension lead, and distributor block for condition and clean or replace as required.
   3. Inspect impulse coupling and pawls for condition and replace as required. Use light pressure only, do not force pin (or drill bit) when checking pawls.
   4. Inspect bearings and lubricate, replace bearings, if required.
   5. Lubricate contact point cam.
   6. Completely overhaul, or replace existing magneto with a new or rebuilt exchange magneto, at every engine overhaul.
   7. Overhaul and Maintenance Manual, Publication No. 1037C1-13, covering Model 4200/6200 series magnetos, is available from Cessna Supply Division.
J. Compliance with Bendix Service Bulletin 599D or latest revision is required.
K. At the first 25 hours, first 50 hours, first 100 hours, and thereafter at each 100 hours, the contact breaker point compartment and magneto-to-engine timing should be inspected and checked. If magneto-to-engine timing is correct within plus zero degrees to minus two degrees, internal timing need not be checked. If timing is out of tolerance, remove magneto and set internal timing, then install and time to the engine. Refer to Section 11 or 11A and the magneto manufacturers service instructions for magneto timing procedures.
L. Replace engine compartment rubber hoses (Cessna installed only) every five years or at engine overhaul, whichever occurs first. This does not include drain hoses. Hoses which are beyond these limits and are in a serviceable condition, must be placed on order immediately and then be replaced within 120 days after receiving the new hose(s) from Cessna. Replace drain hoses on condition. Engine flexible hoses (Continental or Lycoming installed) (Refer to Continental or Lycoming Maintenance Manual and Continental or Lycoming Engine Service Bulletins).
M. Replace turbocharger oil line check valves every 1000 hours. (Refer to Cessna Single Engine Service Bulletin SEB92-7.)
N. Continental engine (182): Add straight grade mineral oil if required. After 25 hours, drain and refill with ashless dispersant oil. Lycoming engine (T182): Add straight grade mineral oil if required. After 25 hours, drain and refill with straight grade mineral oil until a total of 50 hours have accumulated or oil consumption stabilizes, then change to ashless dispersant oil. Continental and Lycoming engines: After initial break-in (25 or 50 hours). If NOT equipped with an external filter, change oil and clean screens each 50 hours. If equipped with SMALL external filter, change filter each 50 hours and oil each 100 hours. If equipped with LARGE external filter, change oil and filter each 100 hours. In all cases, change oil at least each 6 months regardless of accumulated hours.
O. Each 1000 hours.
P. If leakage is evident, refer to McCauley Service Manual.
Q. Replace every 500 hours.
R. Replace filter each 100 hours.
S. Check electrolyte level and clean battery box each 100 hours or 90 days.

CESSNA PROGRESSIVE CARE
MODEL 182 & T182

OPERATION NO. 4

Registration No. _______ Airplane Model and SN __________ Airplane Time _______

INSPECTION COMPLETED BY

A	1	Placards and Decals - Inspect presence, legibility, and security. Consult Pilot's Operating Handbook and FAA-Approved Airplane Flight Manual for required placards.	
B	1	Fuselage Surface - Inspect for skin damage, loose rivets, condition of paint, and check pitot-static ports and drain holes for obstruction. Inspect covers and fairings for security.	
B	2	Internal Fuselage Structure - Inspect bulkheads, doorposts, stringers, doublers, and skins for corrosion, cracks, buckles, and loose rivets, bolts and nuts.	
B	3	Control Wheel Lock - Check general condition and operation.	
B	4	Fuselage Mounted Equipment - Check for general condition and security of attachment.	
B	5	Antennas and Cables - Inspect for security of attachment, connection, and condition.	
B	6	Emergency Locator Transmitter - Inspect for security of attachment and check operation by verifying transmitter output. Check cumulative time and useful life of batteries in accordance with FAR Part 91.207. Refer to Section 16 - Emergency Locator Transmitter - Checkout Interval.	
B	7	Instrument Panel Shock Mounts, Ground Straps, and Covers - Inspect for deterioration, cracks, and security of attachment.	
B	8	Pilot's and Copilot's Inertia Reels - Inspect for security of installation, proper operation, and evidence of damage.	
B	9	Seats, Seat Belts, and Shoulder Harnesses - Check general condition and security. Check operation of seat stops and adjustment mechanism. Inspect belts for condition and security of fasteners.	
B	10	Windows, Windshield, Doors, and Seals - Inspect general condition. Check latches, hinges, and seals for condition, operation, and security of attachment.	
B	12	Flight Controls - Check freedom of movement and proper operation through full travel with and without flaps extended. Check electric trim controls for operation (as applicable.)	
B	14	Portable Hand Fire Extinguisher - Inspect for proper operating pressure, condition, security of installation, and servicing date.	
B	15	Seat Tracks and Stops - Inspect seat tracks for condition and security of installation. Check seat track stops for damage and correct location. Ensure inspection of seat rails for cracks EACH 50 HOURS. Refer to Section 3.	
B	16	Control Column - Inspect pulleys, cables, sprockets, bearings, chains, bungees, and turnbuckles for condition and security.	
B	17	Fuel Line and Selector Valve Drain(s) - Remove plug and drain.	
C	9	Elevator/Rudder Downspring - Check structure, bolts, linkage, bellcrank, and push-pull tube for condition, operation, and security. Check cables for tension, routing, fraying, corrosion, and turnbuckle safety. Check travels if cables require tension adjustment or if stops are damaged.	

CESSNA PROGRESSIVE CARE
MODEL 182 & T182

OPERATION NO. 4

Registration No. _______ Airplane Model and SN __________ Airplane Time _______

INSPECTION COMPLETED BY

D	1	Brakes, Master Cylinders, and Parking Brake - Check master cylinders and parking brake mechanism for condition and security. Check fluid level and test operation of toe and parking brake.	
D	2	Main Gear Tubular Struts - Inspect for cracks, dents, corrosion, condition of paint or other damage. Check axles for condition and security.	
D	4	Wheels, Brake Discs, and Linings - Inspect for wear, cracks, warps, dents, or other damage. Check wheel through-bolts and nuts for looseness.	
D	5	Tires - Check tread wear and general condition. Check for proper inflation.	
D	6	Wheel Fairings, Strut Fairings, and Cuffs - Check for cracks, dents, and condition of paint.	
D	7	Main landing Gear Attachment Structure - Check for damage, cracks, loose rivets, bolts and nuts and security of attachment.	
D	9	Nose Gear - Inspect torque links, steering rods, and boots for condition and security of attachment. Check strut for evidence of leakage and proper extension. Check strut barrel for corrosion, pitting, and cleanliness. Check shimmy damper and/or bungees for operation, leakage, and attach points for wear and security.	
D	12	Nose Gear Attachment Structure - Inspect for cracks, corrosion, or other damage and security of attachment.	
G	3	Elevator Control System - Inspect pulleys, cables, sprockets, bearings, chains, and turnbuckles for condition, security, and operation.	
H	2	Elevator Trim System - Check cables, push-pull rods, bellcranks, pulleys, turnbuckles, fairleads, rub strips, etc. for proper routing, condition, and security.	
H	3	Trim Controls and Indicators - Check freedom of movement and proper operation through full travel. Check pulleys, cables, sprockets, bearings, chains, bungees, and turnbuckles for condition and security. Check electric trim controls for operation as applicable.	
I	2	Rudder Pedals and Linkage - Check for general condition, proper rigging, and operation. Check for security of attachment.	
J	1	Cowling and Cowl Flaps - Inspect for cracks, dents, and other damage, security of cowl fasteners, and cowl mounted landing lights for attachment. Check cowl flaps for condition, security, and operation.	
J	2	Engine - Inspect for evidence of oil and fuel leaks. Wash engine and check for security of accessories.	
J	3	Engine, Propeller Controls, and Linkage - Check general condition, freedom of movement through full range. Check for proper travel, security of attachment, and for evidence of wear. Check friction locks for proper operation.	
J	4	Cowl Flap Controls - Check freedom of movement through full travel.	
J	8	Induction System - Check security of clamps, tubes, and ducting. Inspect for evidence of leakage.	
J	11	Alternate Induction Air System - Check for obstructions, operation, and security.	

CESSNA PROGRESSIVE CARE
MODEL 182 & T182

OPERATION NO. 4

Registration No. ______ Airplane Model and SN __________ Airplane Time _______

			INSPECTION COMPLETED BY
J	13	Alternator. Mounting Bracket, and Electrical Connections - Check condition and security Check alternator belts for condition and proper adjustment. Refer to Paragraph 16-42 for belt tension.	
J	15	Oil Cooler - Check for obstructions, leaks, and security of attachment.	
J	16	Exhaust System - Inspect for cracks and security. Air leak check exhaust system. Refer to Section 11 and 11A, Paragraphs 11-98 and 11-75A, for inspection procedures.	
J	17	Exhaust System (turbocharged engine) - Inspect couplings, seals, clamps, and expansion joints for cracks. Air leak check exhaust system.	
J	28	Hoses, Metal Lines, and Fittings - Inspect for signs of oil and fuel leaks. Check for abrasions, chafing, security, proper routing and support and for evidence of deterioration.	
J	31	Turbocharger (if applicable) a. Inspect turbocharger mounting bracket, ducting, linkage, and attaching parts for general condition, leakage or damage, and security of attachment. b. Check waste gate, actuator, controller, oil and vent lines, overboost relief valve, and compressor housing for leakage, apparent damage, security of attachment, and evidence of wear. Check waste gate return spring for condition and security.	
J	33	Engine Baffles and Seals - Check condition and security of attachment.	
J	34	Engine Oil Change Short Oil Filter (approximately 4.8 inches) a. Replace Filter. b. Add recommended grade aviation oil to replace oil lost in existing filter. Without Oil Filter - Drain oil sump and oil cooler, inspect and clean screens, and refill with recommended grade aviation oil.	
K	4	Fuel Tank or Bladder Drains - Drain water and sediment.	
K	6	Fuel Selector Valve - Check controls for detent in each position, security of attachment, and for proper placarding.	
L	1	Propeller Mounting - Check for security of installation.	
L	2	Propeller Blades - Inspect for cracks, dents, nicks, scratches, erosion, corrosion, or other damage.	
L	3	Spinner - Check general condition and attachment.	
L	7	Propeller Governor and Control - Inspect for oil and grease leaks.	
L	8	Propeller Anti-ice Slip Rings, Brushes, and Boots - Inspect for condition and security. Perform operational check.	
M	3	Cabin Heat and Ventilation Controls - Check freedom of movement through full travel. Check friction locks for proper operation.	
M	4	Pitot Tube and Stall Warning Vane - Check for condition and obstructions.	
M	5	Pitot Tube Heater Element - Perform operational check.	
M	6	Heated Windshield Panel - Check operation, security of installation, electrical wiring, and condition of storage bag.	

CESSNA PROGRESSIVE CARE
MODEL 182 & T182

OPERATION NO. 4

Registration No. _______ Airplane Model and SN __________ Airplane Time _______

INSPECTION COMPLETED BY

M	7	Oxygen System - Inspect masks, hoses, lines, and fittings for condition, routing, and support. Test operation and check for leaks.	
N	1	Vacuum System - Inspect for condition and security.	
N	2	Vacuum System Hoses - Inspect for hardness, deterioration, looseness, or collapsed hoses.	
N	4	Vacuum System Air Filter - Inspect for damage, deterioration and contamination. Clean or replace, if required. NOTE: Smoking will cause premature filter clogging.	
N	5	Vacuum System relief Valve - Inspect for condition and security.	
N	6	Instruments - Check general condition and markings for legibility.	
N	7	Instrument Lines, Fittings, Ducting, and Instrument Panel Wiring - Check for proper routing, support, and security of attachment.	
N	8	Static System - Inspect for security of installation, cleanliness, and evidence of damage.	
N	9	Navigation Indicators, Controls, and Components - Inspect for condition and security.	
N	12	Instrument Panel Mounted Avionics Units (Including Audio Panel, VHF Nav/Com (s), ADF, Transponder, DME, and Compass System) - Inspect for deterioration, cracks, and security of instrument panel mounts. Inspect for security of electrical connections, condition, and security of wire routing.	
N	13	Avionics Operating Controls - Inspect for security and proper operation of controls and switches and ensure that all digital segments will illuminate properly.	
N	14	Remote Mounted Avionics - Inspect for security of units and electrical connectors, condition and security of wire routing. Also check for evidence of damage and cleanliness.	
N	15	Microphones, Headsets, and Jacks - Inspect for cleanliness, security, and evidence of damage.	
O	1	General Airplane and System Wiring - Inspect for proper routing, chafing, broken or loose terminals, general condition, broken or inadequate clamps, and sharp bends in wiring.	
O	2	Instrument, Cabin, Navigation, Beacon, Strobe, and Landing Lights - Check operation, condition of lens, and security of attachment.	
O	3	Circuit Breakers and Fuses - Check operation and condition. Check for required number of spare fuses.	
O	6	Switch and Circuit Breaker Panel, Terminal Blocks, and Junction Boxes - Inspect wiring and terminals for condition and security.	
O	8	Switches - Check operation, terminals, wiring, and mounting for conditions, security, and interference.	

CESSNA PROGRESSIVE CARE
MODEL 182 & T182

OPERATION NO. 4

Registration No. ______ Airplane Model and SN ________ Airplane Time ______

			INSPECTION COMPLETED BY
O	9	Instrument Panel and Control Pedestal - Inspect wiring, mounting, and terminals for condition and security. Check resistance between stationary panel and instrument panel for proper ground.	
Q	1	Brakes - Test toe brakes and parking brake for proper operation.	

CESSNA PROGRESSIVE CARE
MODEL 182 & T182

OPERATION NO. 4

SPECIAL INSPECTION AND YEARLY ITEMS
Please review each of these items for required compliance

			HOURS	YEARS	INSPECTION COMPLETED BY
B	11	Upholstery, Headliner, Trim, and Carpeting - Check condition and clean as required.	EACH 400	EACH 1	
D	3	Brake Lines, Wheel Cylinders, Hoses, Clamps, and Fittings - Check for leaks, condition, and security and hoses for bulges and deterioration. Check brake lines and hoses for proper routing and support.	EACH 400	EACH 1	
D	6	Wheel Fairings, Strut Fairings, and Cuffs - Check for cracks, dents, and condition of paint.	A		
D	11	Wheel Bearings - Clean, inspect and lube.	B		
E	4	Autopilot Rigging - Check per Avionics Installation Manual.	C		
H	5	Elevator Trim Tab Actuator - Clean, lubricate.	D		
J	3	Engine, Propeller Controls, and Linkage - Check general condition, freedom of movement through full range. Check for proper travel, security of attachment, and for evidence of wear. Check friction locks for proper operation.		E	
J	9	Induction Air Filter - Remove and clean. Inspect for damage, and service per paragraph 2-24	F		
J	12	Alternator - Check brushes, leads, commutator or slip ring for wear.		G	
J	14	Starter, Starter Solenoid, and Electrical Connections - Check for condition of starter brushes, brush leads, and commutator.		H	
J	20	Magnetos - Inspection lubrication and overhaul procedures.	I		
J	21	Magnetos - Check external condition, security, and electrical leads for condition. Check timing to engine and internal timing if engine timing requires adjustment.	J		
J	22	Magnetos - Timimg Procedures and intervals.	K		
J	28	Hoses, Metal Lines, and Fittings - Inspect for signs of oil and fuel leaks. Check for abrasions, chafing, security, proper routing and support and for evidence of deterioration.		L	
J	31	Turbocharger (if applicable) a. Inspect turbocharger mounting bracket, ducting, linkage, and attaching parts for general condition, leakage or damage, and security of attachment. b. Check waste gate, actuator, controller, oil and vent lines, overboost relief valve, and compressor housing for leakage, apparent damage, security of attachment, and evidence of wear. Check waste gate return spring for condition and security.	M		
J	34	Engine Oil Change - Short Oil Filter (approximately 4.8 inches) a. Replace Filter b. Add recommended grade aviation oil to replace oil lost in existing filter. Without Oil Filter - Drain oil sump and oil cooler, inspect and clean screens, and refill with recommended grade aviation oil.	N		
J	35	Long Oil Filter (approximately 5.8 inches) - Drain oil sump and oil cooler, replace filter element, refill with recommended grade aviation oil.	N		
K	1	Integral Fuel Tanks - Check for evidence of leakage and condition of fuel caps, adapters, and placards.	O		

CESSNA PROGRESSIVE CARE
MODEL 182 & T182

OPERATION NO. 4

SPECIAL INSPECTION AND YEARLY ITEMS
Please review each of these items for required compliance

			HOURS	YEARS	INSPECTION COMPLETED BY
K	2	Fuel Bladders - Check for leaks and security, condition of fuel caps, adapters, and placards.	O		
K	8	Fuel Quantity Indicators - Check for damage, security of installation, and perform accuracy test.		EACH 1	
L	7	Propeller Governor and Control - Inspect for oil and grease leaks.	P		
M	1	Ventilation System - Inspect clamps, hoses, and valves for condition and security.	400	EACH 1	
M	8	Oxygen Cylinder - Inspect for condition, check hydrostatic test date and perform hydrostatic test, if required.		EACH 5	
N	4	Vacuum System Air Filter - Inspect for damage, deterioration and contamination. Clean or replace, if required. NOTE: Smoking will cause premature filter clogging.	Q		
N	5	Vacuum System relief Valve - Inspect for condition and security.	R		
N	10	Airspeed Indicator, Vertical Speed Indicator, and Magnetic Compass - Calibrate.		EACH 2	
N	11	Altimeter and Static System - Inspect in accordance with FAR Part 91.411.		EACH 2	
O	4	Battery - Check general condition and security. Check level of electrolyte.	S		

CESSNA PROGRESSIVE CARE
MODEL 182 & T182

OPERATION NO. 4

Special Inspections Legends:

A. If the airplane is flown from surfaces with mud, snow, or ice, the main gear speed fairings should be checked that there is no accumulation which could prevent normal wheel rotation.
B. First 100 hours and each 500 hours thereafter. More often if operated under prevailing wet or dusty conditions.
C. Each 600 hours or 1 year, whichever comes first.
D. Lubrication of the actuator is required each 1000 hours or 3 years, whichever comes first. See figure 2-5 for grease specification.
E. Lubricate each 100 hours (except in extreme dusty conditions). These controls are not repairable and should be replaced every 1500 hours or whenever maximum linear movement exceeds 0.050 inch.
F. Clean filter per Paragraph 2-24. Replace paper filter at least each 500 hours.
G. Inspect each 500 hours.
H. For Prestolite starter only, inspect the commutator and brushes each 1500 hours.
I. After 500 hours of operation, perform the following checks:
   1. Inspect contact points for condition and adjust or replace as required.
   2. Inspect carbon brush, high-tension lead, and distributor block for condition and clean or replace as required.
   3. Inspect impulse coupling and pawls for condition and replace as required. Use light pressure only, do not force pin (or drill bit) when checking pawls.
   4. Inspect bearings and lubricate, replace bearings, if required.
   5. Lubricate contact point cam.
   6. Completely overhaul, or replace existing magneto with a new or rebuilt exchange magneto, at every engine overhaul.
   7. Overhaul and Maintenance Manual, Publication No. 1037C1-13, covering Model 4200/6200 series magnetos, is available from Cessna Supply Division.
J. Compliance with Bendix Service Bulletin 599D or latest revision is required.
K. At the first 25 hours, first 50 hours, first 100 hours, and thereafter at each 100 hours, the contact breaker point compartment and magneto-to-engine timing should be inspected and checked. If magneto-to-engine timing is correct within plus zero degrees to minus two degrees, internal timing need not be checked. If timing is out of tolerance, remove magneto and set internal timing, then install and time to the engine. Refer to Section 11 or 11A and the magneto manufacturers service instructions for magneto timing procedures.
L. Replace engine compartment rubber hoses (Cessna installed only) every five years or at engine overhaul, whichever occurs first. This does not include drain hoses. Hoses which are beyond these limits and are in a serviceable condition, must be placed on order immediately and then be replaced within 120 days after receiving the new hose(s) from Cessna. Replace drain hoses on condition. Engine flexible hoses (Continental or Lycoming installed) (Refer to Continental or Lycoming Maintenance Manual and Continental or Lycoming Engine Service Bulletins).
M. Replace turbocharger oil line check valves every 1000 hours. (Refer to Cessna Single Engine Service Bulletin SEB92-7.)
N. Continental engine (182): Add straight grade mineral oil if required. After 25 hours, drain and refill with ashless dispersant oil. Lycoming engine (T182): Add straight grade mineral oil if required. After 25 hours, drain and refill with straight grade mineral oil until a total of 50 hours have accumulated or oil consumption stabilizes, then change to ashless dispersant oil. Continental and Lycoming engines: After initial break-in (25 or 50 hours). If NOT equipped with an external filter, change oil and clean screens each 50 hours. If equipped with SMALL external filter, change filter each 50 hours and oil each 100 hours. If equipped with LARGE external filter, change oil and filter each 100 hours. In all cases, change oil at least each 6 months regardless of accumulated hours.
O. Each 1000 hours.
P. If leakage is evident, refer to McCauley Service Manual.
Q. Replace every 500 hours.
R. Replace filter each 100 hours.
S. Check electrolyte level and clean battery box each 100 hours or 90 days.

CESSNA PROGRESSIVE CARE
MODEL 182 & T182

OPERATION NO. 4

	MECHANIC	INSPECTOR	REMARKS
10. Alternator and Electrical Connections - Check condition and security. Check alternator belts for condition and proper adjustment.			
11. Alternator Control Unit - Inspect wiring, mounting, condition, and wire routing.			
12. Firewall Structure - Inspect for wrinkles, damage, cracks, sheared rivets, etc. Check cowl shock mounts for condition and security.			
13. Engine Shock Mounts, Engine Mount Structure, and Ground Straps - Check condition, security, and alignment.			
14. Exhaust System (normally aspirated engine) - Inspect for cracks and security. Air leak check exhaust system.			
15. Exhaust System (turbocharged engine) - Inspect couplings, seals, clamps, and expansion joints for cracks, condition, and security. Air leak check exhaust system.			
16. Turbocharger (if applicable) - a. Inspect mounting brackets, ducting, linkage, and attaching parts for general condition, leakage or damage, and security of attachment.			
b. Check waste gate, actuator, controller, oil and vent lines, overboost relief valve, and compressor housing for leakage, apparent damage, security of attachment, and evidence of wear. Check waste gate return spring for condition and security.			
17. Turbocharger (if applicable) - a. Remove heat shields and inspect for burned areas, bulges or cracks. Remove tailpipe and ducting -- inspect turbine for coking, carbonization, oil deposits, and turbine impellers for damage.			
18. Heater Components - Inspect all components for condition and security.			
19. Vacuum Pump - Check for condition and security. Check vacuum system breather line for obstructions, condition, and security.			

Sheet 7 of 14

CESSNA PROGRESSIVE CARE
MODEL 182 & T182

OPERATION NO. 4

	MECHANIC	INSPECTOR	REMARKS
20. Fuel Strainer, Drain Valve, and Controls - Check freedom of movement, security, and proper operation. disassemble, flush, and clean screen and bowl.			
21. Auxiliary (Electric) Fuel Pump - Check pump and fittings for condition, operation, security. Remove and clean filter (as applicable).			
22. Engine-Driven Fuel Pump - Check for evidence of leakage, security of attachment, and general condition.			
23. Ignition Harness and Insulators - Check for proper routing, deterioration, and condition of terminals.			
24. Spark Plugs - Remove, clean analyze, test, gap, and rotate top plugs-to-bottom and bottom plugs-to-top.			
25. Carburetor - Drain and flush carburetor bowl and clean inlet strainer. Check general condition and security.			
26. Engine Oil Change -			
Short Oil Filter (approximately 4.8 inches) - a. Replace filter.			
b. Add recommended grade aviation oil to replace oil lost in existing filter.			
Without Oil Filter - Drain oil sump and oil cooler, inspect and clean screens, and refill with recommended grade aviation oil.			
27. Engine Oil Change -			
Long Oil Filter (approximately 5.8 inches) - Drain oil sump and oil cooler, replace filter element, refill with recommended grade aviation oil.			
28. Engine Primer - Check for leakage, operation, and security.			
29. Crankcase, Oil Sump, and Accessory Section - Inspect for cracks and evidence of oil leakage. Check bolts and nuts for looseness and retorque as necessary. Check crankcase breather lines for obstructions, security, and general condition.			

CESSNA PROGRESSIVE CARE
MODEL 182 & T182

OPERATION NO. 4

		MECHANIC	INSPECTOR	REMARKS
30.	Hoses, Metal Lines, and Fittings - Inspect for signs of oil and fuel leaks. Check for abrasions, chafing, security, proper routing and support and for evidence of deterioration.			
31.	Cold and Hot Air Hoses - Check condition, routing, and security.			
32.	Engine Cylinders, Rocker Box Covers, and Pushrod Housings - Check for fin damage, cracks, oil leakage, security of attachment, and general condition.			
33.	Cylinder Compression - Perform differential compression test.			
PROPELLER				
1.	Spinner - Check general condition and attachment.			
2.	Spinner and Spinner Bulkhead - Remove spinner, wash, and inspect for cracks and fractures.			
3.	Propeller Blades - Inspect for cracks, dents, nicks, scratches, erosion, corrosion, or other damage.			
4.	Propeller Anti-Ice Slip Rings, Brushes, and Boots - Inspect for condition and security. Perform operational check.			
5.	Propeller Mounting - Check for security of installation.			
6.	Propeller Mounting Bolts - Inspect mounting bolts and safety-wire for signs of looseness. Retorque mounting bolts as required.			
7.	Propeller Governor and Control - Inspect for oil and grease leaks.			
8.	Propeller Governor and Control - Check for security and operation of controls.			
9.	Propeller Hub - Check general condition.			

CESSNA PROGRESSIVE CARE
MODEL 182 & T182

OPERATION NO. 4

	MECHANIC	INSPECTOR	REMARKS

WINGS

1. Wing Surfaces and Tips - Inspect for skin damage, loose rivets, and condition of paint. ______
2. Placards and Decals - Inspect presence, legibility, and security. Consult Pilot's Operating Handbook and FAA-Approved Airplane Manual for required placards. ______
3. Wing Access Plates - Check for damage and security of installation. ______
4. Wing Struts and Strut Fairings - Check for dents, cracks, loose screws and rivets, and condition of paint. ______
5. Wing Spar and Wing Strut Fittings - Check for evidence of wear. Check attach bolts for indications of looseness and retorque as required. ______
6. Fuel Tank or Bladder Drains - Drain water and sediment. ______
7. Pitot Tube and Stall Warning Vane - Check for condition and obstructions. ______
8. Pitot Tube Heater Element (if installed) - Perform operational check. ______
9. Fuel Tank Vent Lines and Vent Valves - Check vents for obstruction and proper positioning. Check valves for operation. ______
10. Aileron Structure, Control Rods, Hinges, Balance Weights, Bellcranks, Linkage, Bolts, Pulleys, and Pulley Brackets - Check condition, operation, and security of attachment. ______
11. Ailerons and Hinges - Check condition, security, and operation. ______
12. Ailerons and Cables - Check operation and security of stops. Check cables for tension, routing, fraying, corrosion, and turnbuckle safety. **Check travel if cable tension requires adjustment or if stops are damaged. Check fairleads and rub strips for condition.** ______

CESSNA PROGRESSIVE CARE
MODEL 182 & T182

OPERATION NO. 4

	MECHANIC	INSPECTOR	REMARKS
13. Aileron Controls - Check freedom of movement and proper operation through full travel with and without flaps extended.			
14. Flap Structure, Linkage, Bellcranks, Pulleys, and Pulley Brackets - Check for condition, operation, and security.			
15. Flaps and Cables - Check cables for proper tension, routing, fraying, corrosion, and turnbuckle safety. Check travel if cable tension requires adjustment.			
16. Flap Motor, Actuator, and Limit Switches (electric flaps) - Check wiring and terminals for condition and security.			
17. Flaps - Check tracks, rollers, and control rods for security of attachment. Check operation.			
18. Flap Actuator Threads - Clean and lubricate.			
19. Fuel System - Inspect plumbing and components for mounting and security.			
20. Fuel Bladders - Check for leaks and security, condition of fuel caps, adapters, and placards.			
21. Integral Fuel Tanks - Check for evidence of leakage and condition of fuel caps and placards.			
22. Metal Lines, Hoses, Clamps, and Fittings - Check for leaks, condition, and security. Check for proper routing and support.			
23. Wing Structure - Inspect spars, ribs, skins, and stringers for cracks, wrinkles, loose rivets, corrosion, or other damage.			
24. General Airplane and System Wiring - Inspect for proper routing, chafing, broken or inadequate clamps, and sharp bends in wiring.			

Sheet 11 of 14

CESSNA PROGRESSIVE CARE
MODEL 182 & T182

OPERATION NO. 4

	MECHANIC	INSPECTOR	REMARKS
LANDING GEAR			
1. Nose Gear Attachment Structure - Inspect for cracks, corrosion, or other damage. Check for security of attachment.			
2. Nose Gear - Inspect torque links, steering rods, and boots for condition and security of attachment. Check strut for evidence of leakage and proper extension. Check strut barrel for corrosion, pitting, and cleanliness. Check shimmy damper and/or bungees for operation, leakage, and attach points for wear and security.			
3. Nose Gear Fork - Inspect for cracks, general condition, and security of attachment.			
4. Nose Gear Steering Mechanism - check for wear, security, and proper rigging.			
5. Tires - Check tread wear and general condition. Check for proper inflation.			
6. Wheels, Brake Discs, and Linings - Inspect for wear, cracks, warps, dents, or other damage. Check wheel through-bolts and nuts for evidence of looseness.			
7. Brakes, Master Cylinders, and Parking Brake - Check master cylinders and parking brake mechanism for condition and security. Check fluid level and test operation.			
8. Brakes - Test toe brakes and parking brake for proper operation.			
EMPENNAGE			
1. Vertical and Horizontal Stabilizers, Tips and Tailcone - Inspect externally for skin damage and condition of paint.			
2. Vertical and Horizontal Stabilizers and Tailcone Structure - Inspect bulkheads, spars, ribs, and skins for cracks, wrinkles, loose rivets, corrosion, or other damage. Inspect vertical and horizontal stabilizer attach bolts for looseness. Retorque as necessary. Check security of inspection covers, fairings, and tips.			

Sheet 12 of 14

CESSNA PROGRESSIVE CARE
MODEL 182 & T182

OPERATION NO. 4

	MECHANIC	INSPECTOR	REMARKS
3. Elevator, Hinges, and Cable Attachment - Check condition, security, and operation.			
4. Elevator Trim Tab and Hinges - Check condition, security, and operation.			
5. Elevator Trim Tab Actuator - Free-play limits inspection.			
6. Elevator Trim System - Check cables, push-pull rods, bellcranks, pulleys, turnbuckles, fairleads, rub strips, etc. for proper routing, condition, and security.			
7. Elevator/Rudder Downspring - Check structure, bolts, linkage, bellcrank, and push-pull tube for condition, operation,a nd security. Check cables for tension, routing, fraying, corrosion, and turnbuckle safety. Check travels if cables require tension adjustment or if stops are damaged.			
8. Rudder - Inspect the rudder skins for cracks and loose rivets, rudder hinges for condition, cracks and security; hinge bolts, hinge bearings, hinge attach fittings, and bonding jumper for evidence of damage and wear, failed fasteners, and security. Inspect the rudder hinge bolts for proper safetying of nuts with cotter pins. Inspect balance weight for looseness and the supporting structure for damage.			
9. Rudder, Tips, Hinges, and Cable Attachment - Check condition, security, and operation.			
10. Elevator Control System - Inspect pulleys, cables, sprockets, bearings, chains, and turnbuckles for condition, security, and operation.			
11. Rudder - Check internal surfaces for corrosion, condition of fasteners, and balance weight attachment.			
12. General Airplane and System Wiring - Inspect for proper routing, chafing, broken or loose terminals, general condition, broken or inadequate clamps, and sharp bends in wiring.			

Sheet 13 of 14

CESSNA PROGRESSIVE CARE
MODEL 182 & T182

OPERATION NO. 4

	MECHANIC	INSPECTOR	REMARKS

SPECIAL INSPECTION ITEMS

1. Check and accomplish all Special Inspection items due. ______

POST INSPECTION

1. Replace all fairings, doors, floorboard and wing access covers. Ground check engine, alternator charging rate (28 volts minimum), oil pressure/oil temperature, fuel flow indicator, fuel quantity indicator, rpm indicator, flight instruments, and general operating components. ______

SERVICE BULLETINS/AIRWORTHINESS DIRECTIVES

1. Check that all applicable Cessna Service Bulletins Service Newsletters, and Supplier Service Notices are complied with. ______
2. Check that all applicable Airworthiness Directives and Federal Aviation Regulations are complied with. ______
3. Ensure all Maintenance Record Entries required by Federal Aviation Regulations are completed before returning the airplane to service. ______

OPERATION NO. 4 COMPLETED

AIRPLANE MODEL/SERIAL ______ REGISTRATION NO. ______

AIRPLANE HOURS ______ DATE ______

I certify that this operation was performed on the above airplane and that this airplane is approved for return to service.

SUPERVISOR MECHANIC ______ AIRPLANE INSPECTOR ______

CERTIFICATE NO. ______ CERTIFICATE NO. ______

COMPANY NAME ______

ADDRESS ______ CITY ______ STATE ______

Sheet 14 of 14

SECTION 3

FUSELAGE

3-1. FUSELAGE.

3-2. WINDSHIELD AND WINDOWS.

3-3. DESCRIPTION. The windshield and windows are single-piece, acrylic panels, set in sealing strips strips and held by formed retaining strips, secured to fuselage with screws and rivets. H.B Fuller FS-4291 sealant is applied to all edges of the windshield and windows, with exception of wing root area. The wing root fairing has a heavy felt strip that completes the windshield sealing.

3-4. WINDSHIELD. (See figure 3-2.)

3-5. REMOVAL.

a. Remove magnetic compass. (See Section 16.)
b. Remove wing fairings.
c. Remove air vent tubes.

CAUTION

If windshield is to be reinstalled, be sure to protect windshield during removal.

d. With two people sitting in the airplane placing their feet against the windshield, just above the centerline, press upward on windshield forcing it out of lower retainers.
e. Clean sealer from inner sidewalls and bottom of retainers.

3-6. INSTALLATION.

a. If new windshield is to be installed, remove protective cover and clean, take care not to scratch windshield.
b. Apply new felt to edges of windshield.
c. Apply a strip of sealer (H.B. Fuller FS-4291) along the sides and bottom of felt.
d. Position bottom edge of windshield into lower retainer.
e. Using a piece of bent sheet metal (8 in. wide x length of top edge of windshield) placed under top edge of upper retainer, bow windshield and guide top edge of windshield into upper retainer using bent sheet metal in a shoe horn effect.
f. Install air vent tubes.
g. Install wing fairings.
h. Install magnetic compass. (See Section 16.)

3-7. WINDOWS.

3-8. MOVABLE. (See figure 3-3.)

3-9. DESCRIPTION. A movable window, hinged at the top, is installed in the left cabin door, and may also be installed in the right cabin door, as optional equipment. A rubber seal is cemented to the inside of the window frame, using 3M Co. EC-800 adhesive, or equivalent.

3-10. REMOVAL AND INSTALLATION.

a. Disconnect window stop (3).
b. Remove pins from window hinges.
c. To remove frame from plastic panel, drill out blind rivets at frame splice.
d. Reverse preceding steps for installation.
e. When replacing plastic panel in frame, ensure that sealing strip and an adequate coating of Presstite No. 579.6 sealing compound is used around all edges of panel.

3-11. WRAP-AROUND REAR.

3-12. DESCRIPTION. The rear window is a one-piece acrylic plastic panel, set in sealing strips, and held inplace by retaining strips.

3-13. REMOVAL AND INSTALLATION.

a. Remove upholstery as necessary to expose retainer strips inside cabin.
b. Drill out rivets as necessary to remove retainers on both sides and lower edge of window.
c. Remove window by starting at aft edge, and pulling window into cabin area.
d. Reverse preceding steps for installation.
e. When installing a new rear window, check fit and exercise care not to crack panel.
f. File or grind away excess plastic.
g. Install sealing strips, and apply an adequate coating of sealing compound, to prevent leaks.

3-14. OVERHEAD. (See figure 3-2.)

3-15. DESCRIPTION. Overhead cabin windows, located in the cabin top, may be installed. These windows are one-piece acrylic plastic panels, set in sealing strips, and held in place by retaining strips.

3-16. REMOVAL AND INSTALLATION.

a. Remove headliner and trim panels.
b. Drill out rivets as necessary to remove retainer strips, remove window.

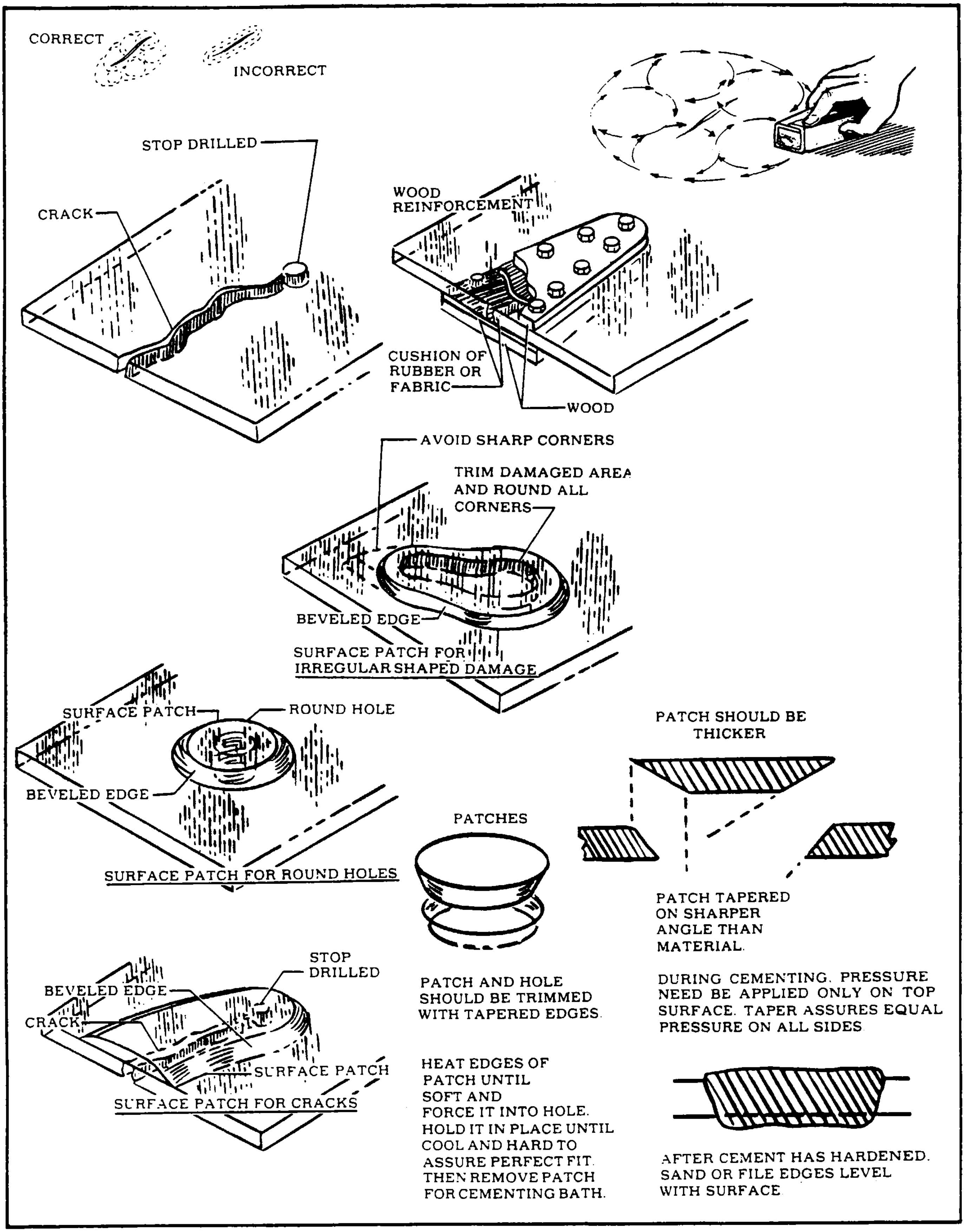


Figure 3-1. Repair of Windshield and Windows

c. Reverse preceding steps for installation.
d. When installing new window, check fit and exercise care not to crack panel.
e. File or grind away excess plastic.
f. Apply felt strips and apply an adequate coating of sealing compound, to prevent leaks.

3-17. FIXED. (See figure 3-2.)

3-18. DESCRIPTION. Fixed windows are mounted in sealing strips and sealing compound, and are held in place by various retainer strips.

3-19. REMOVAL AND INSTALLATION.
a. Remove upholstery and trim panels as necessary.
b. Drill out rivets securing retainers; remove window.
c. Reverse preceding steps for installation.
d. When installing new window, check fit and exercise care not to crack panel.
e. File or grind away excess plastic.
f. Apply felt strips and apply an adequate coating of sealing compound, to prevent leaks.

3-20. CLEANING AND WAXING. (Refer to Section 2.)

3-21. WINDSHIELD AND WINDOW INSTALLATION TECHNIQUES:

Special drills must be used when drilling holes in acrylic. Standard drills will cause the hole to be oversized, distorted, or excessively chipped.

Whenever possible, a coolant such as a plastic drilling wax should be used to lubricate the drill bit. Cessna recommends "Reliance" drill wax or Johnson No. 140 Stick Wax.

Drilled holes should be smooth with a finish of 125 rhr.

The feed and speed of the drill is critical. The following chart indicates drill speed for various thicknesses of acrylic.

Material Thickness	Drill Speed
1/16" to 3/16"	1500 to 4500 rpm
1/4" to 3/8"	1500 to 2000 rpm
7/16"	1000 to 1500 rpm
1/2"	500 to 1000 rpm
3/4"	500 to 800 rpm
1"	500 rpm

Specifications for the twist drill used to drill acrylic is as follows:

NOTES

Shallow holes - when hole depth to hole diameter ratio is less than 1.5 to 1, the drill shall have an included tip angle of 55 degrees to 60 degrees and a lip clearance angle of 15 degrees to 20 degrees.

Medium deep holes - when hole depth to hole diameter ratio is from 1.5 to 1 up to 3 to 1, the drill shall have an included tip angle of 60 degrees to 140 degrees and a lip clearance angle of 15 degrees to 20 degrees.

Deep holes - when hole depth to hole diameter ratio is greater than 3.0 to 1, the drill shall have an included tip angle of 140 degrees and a lip clearance of 12 degrees to 15 degrees.

Parts which must have holes drilled shall be backed up with a drill fixture. Holes may be drilled through the part from one side. However, less chipping around holes will occur if holes are drilled by drilling the holes from both sides. This is accomplished by using a drill with an acrylic backup piece on the opposite side. Remove the drill from the hole and switch the backup plate and finish drilling from the opposite side.

3-22. REPAIR. Replace extensively damaged transparent plastic, rather than repair whenever possible, since even a carefully patched part is not the equal of a new section, either optically or structurally. At the first sign of crack development, drill a small hole at the extreme end of the crack, as shown in figure 3-1. This serves to localize the cracks and also to prevent further splitting by distributing the strain over a large area. If the cracks are small, stopping them with drilled holes will usually suffice until replacement or more permanent repairs can be made. The following repairs are permissible; however, they are not to be located in the pilot's line of vision during landing or normal flight.
a. SURFACE PATCH. If a surface patch is to be installed, trim away the damaged area and round all corners. Cut a piece of plastic of sufficient size to cover the damaged area, and extend at least 3/4-inch on each side of the crack or hole. Bevel the edges, as shown in figure 3-1. If the section to be repaired is curved, shape the patch to the same contour by heating it in an oil bath at a temperature of 248°F to 302°F., or it may be heated on a hot plate until soft. Boiling water should not be used for heating. Coat the patch evenly with plastic solvent adhesive and place immediately over the hole. Maintain a uniform pressure of from 5 to 10 psi on the patch for a minimum of three hours. Allow the patch to dry 24 to 36 hours before sanding or polishing is attempted.
b. PLUG PATCH. In using inserted patches to repair holes in plastic structures, trim the holes to a perfect circle or oval, and bevel the edges slightly. Make the patch slightly thicker than the material being repaired, and similarly, bevel the edges. Install patches in accordance with procedures illustrated in figure 3-1. Heat the plug until soft and press into the hole without cement, and allow to cool in order to make a perfect fit. Remove the plug, coat the edges with adhesive, and then reinsert into the hole. Maintain a firm, light pressure until the cement has set, then sand or file the edges level with the surface; buff and polish to a clear finish.

3-23. SCRATCHES. Scratches on clear plastic surfaces can be removed by hand-sanding operations, followed by buffing and polishing, if the following steps are followed carefully.

a. Wrap a piece of No. 320 (or finer) sandpaper or abrasive cloth around a rubber pad or a wooden block. Rub surface around scratch with a circular motion, keeping abrasive constantly wet with clean water to prevent scratching surface further. Use minimum pressure and cover an area large enough to prevent formation of "bull's eyes" or other optical distortions.

CAUTION

Do not use a coarse grade of abrasive. Number 320 is of maximum coarseness.

b. Continue sanding operation, using progressively finer grade abrasives until scratches disappear.
c. When scratches have been removed, wash area thoroughly with clean water to remove all gritty particles. The entire sanded area will be clouded with minute scratches, which must be removed to restore transparency.
d. Apply fresh tallow or buffing compound to a motor-driven buffing wheel. Hold wheel against plastic surface, moving it constantly over damaged area until cloudy appearance disappears. A 2000-foot-per-minute surface speed is recommended to prevent overheating and distortion. (Example: 750 rpm polishing machine with a 10-inch buffing bonnet.)

NOTE

Polishing can be accomplished by hand, but will require a considerably longer period of time to attain the same result as produced by a buffing wheel.

e. When buffing is finished, wash area thoroughly, and dry with a soft, flannel cloth. Allow surface to cool, and inspect area, to determine if full transparency has been restored. Apply a thin coat of hard wax, and polish surface lightly with a clean flannel cloth.

NOTE

Rubbing plastic surface with a dry cloth will build up an electrostatic charge which attracts dirt particles, and may eventually cause scratching of surface. After wax has hardened, dissipate this charge by rubbing surface with a slightly damp chamois cloth. This will also remove dust particles which have collected while wax is hardening.

f. Minute hairline scratches can often be removed by rubbing with commercial automobile body cleaner, or fine-grade rubbing compound. Apply with a soft, clean, dry cloth or imitation chamois.

3-24. CRACKS. (See figure 3-1.)
a. When a crack appears, drill a hole at end of crack to prevent further spreading. Hole should be approximately 1/8-inch in diameter, depending on length of crack and thickness of material.
b. Temporary repairs to flat surfaces can be accomplished by placing a thin strip of wood over each side of surface, and inserting small bolts through wood and plastic. A cushion of sheet rubber or aircraft fabric should be placed between wood and plastic on both sides.

3-25. CABIN DOORS. (See figure 3-3.)

3-26. REMOVAL AND INSTALLATION. Removal of cabin doors is accomplished either by removing screws which attach hinges or stops, or by removing hinge pins, attaching hinges and door stops. If permanent hinge pins are removed, they may be replaced with clevis pins, secured with cotter pins, or new hinge pins may be installed by inserting pin through both hinge halves, and chucking a rivet set in a hand drill, hold one end of pin and form a head on opposite end. Reverse pin and repeat process. When fitting a new door that is not bonded, some trimming of door skin at edges, and some reforming with a soft mallet may be necessary to achieve a good fit. Reforming of bonded door flange by striking with a soft mallet, etc. is NOT permissible, due to possible damage to bonded areas.

3-27. CABIN DOOR WEATHERSTRIP. A hollow, fluted-type, rubber weatherstrip is cemented around all edges of the cabin door. When replacing weatherstrip, ensure that contact surfaces are clean and dry. Cut new weatherstrip to length using old weatherstrip as a guide. Cut small notch in butt ends of new weatherstrip to allow for drainage. Position splice with notch at door low point and apply a thin, even coat of EC-1300L adhesive (3-M Company) or equivalent to both surfaces. Allow to dry until tacky before pressing into place on door. Do not stretch weatherstrip around door corners.

3-28. WEDGES. Thru 18267715, wedges are installed at the upper forward edge of the door to aid in preventing air leaks at this point. Several attaching holes are located in the wedges. Holes giving best results should be selected.

3-29. DOOR LATCHES. (Thru 18267715.) (See figure 3-4.)

3-30. DESCRIPTION. The cabin door latch is a push-pull bolt type, utilizing a rotary clutch for positive bolt engagement. As the door is closed, teeth on underside of bolt engage teeth on clutch. The clutch gear rotates in one direction only and holds door until handle is moved to LOCK position, driving bolt into slot.

3-31. ADJUSTMENT. Vertical adjustment of the rotary clutch is afforded by slotted holes which ensures sufficient gear-to-bolt engagement, and proper alignment. The extension or retraction of the bolt (2) is controlled by adjusting bolts (10) in the slotted holes. Loosen screws sufficiently to move latch base forward on the door to retract bolt, and aft to extend bolt.

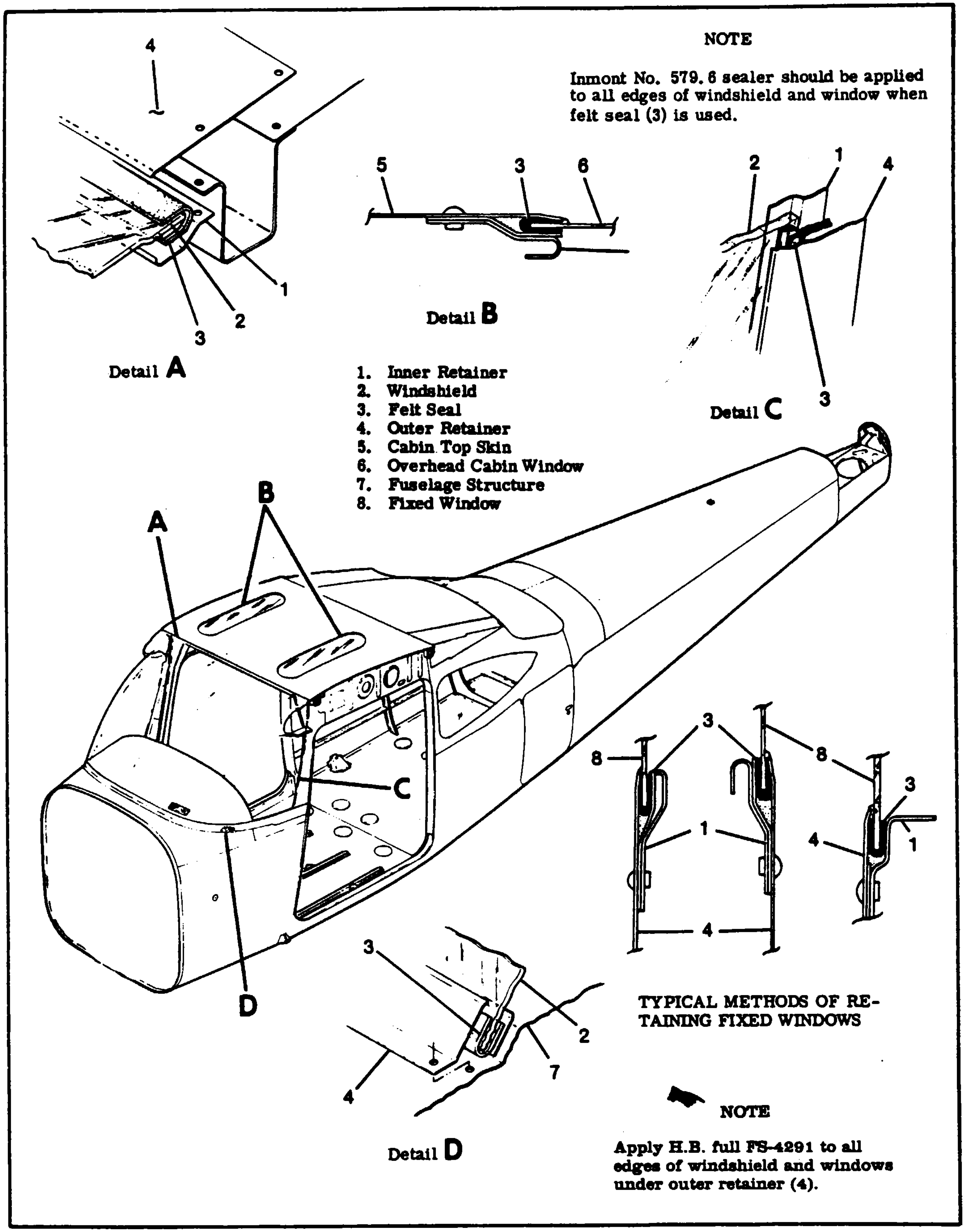
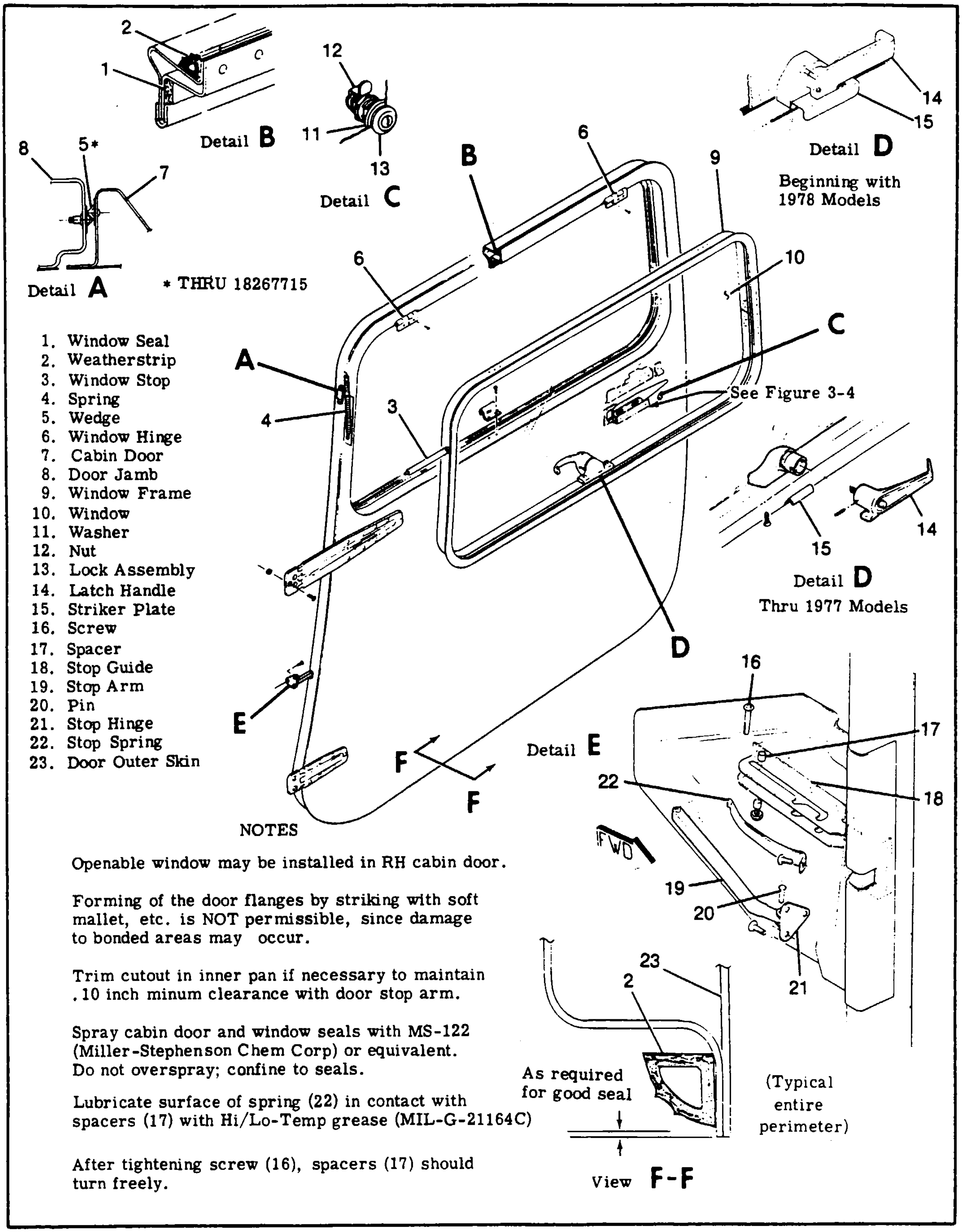


Figure 3-2. Windshield and Fixed Window Installation



1. Window Seal
2. Weatherstrip
3. Window Stop
4. Spring
5. Wedge
6. Window Hinge
7. Cabin Door
8. Door Jamb
9. Window Frame
10. Window
11. Washer
12. Nut
13. Lock Assembly
14. Latch Handle
15. Striker Plate
16. Screw
17. Spacer
18. Stop Guide
19. Stop Arm
20. Pin
21. Stop Hinge
22. Stop Spring
23. Door Outer Skin

NOTES

Openable window may be installed in RH cabin door.

Forming of the door flanges by striking with soft mallet, etc. is NOT permissible, since damage to bonded areas may occur.

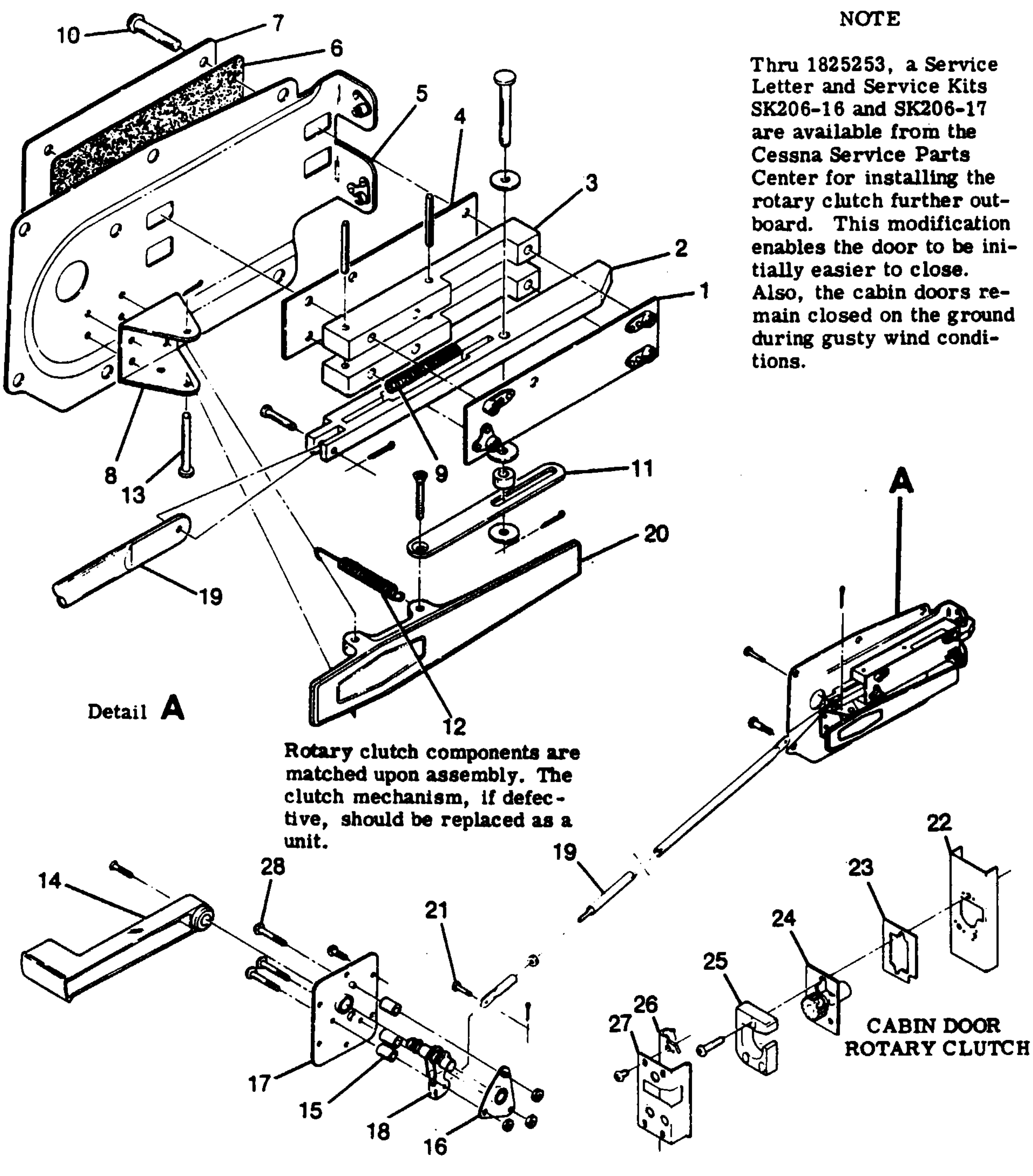
Trim cutout in inner pan if necessary to maintain .10 inch minum clearance with door stop arm.

Spray cabin door and window seals with MS-122 (Miller-Stephenson Chem Corp) or equivalent. Do not overspray; confine to seals.

Lubricate surface of spring (22) in contact with spacers (17) with Hi/Lo-Temp grease (MIL-G-21164C)

After tightening screw (16), spacers (17) should turn freely.

Figure 3-3. Cabin Door



NOTE

Thru 1825253, a Service Letter and Service Kits SK206-16 and SK206-17 are available from the Cessna Service Parts Center for installing the rotary clutch further outboard. This modification enables the door to be initially easier to close. Also, the cabin doors remain closed on the ground during gusty wind conditions.

1. Top Bolt Guide
2. Bolt
3. Side Bolt Guide
4. Base Bolt Guide
5. Latch Base Plate
6. Abrasive Pad
7. Lockplate
8. Bracket
9. Spring
10. Bolt Adjust Screw
11. Pull Bar
12. Spring
13. Pin
14. Inside Handle
15. Spacer
16. Plate Assembly
17. Support
18. Shaft Assembly
19. Bolt Push Rod
20. Outside Handle
21. Pin
22. Mounting Structure
23. Shim
24. Rotary Clutch
25. Guide
26. Door Post
27. Cover
28. Handle Adjust Screw

Figure 3-4. Door Latch and Rotary Clutch (Thru 18267715)

CAUTION

Close door carefully after adjustment and check clearance between bolt and door jamb and clutch engagement.

3-32. INDEXING INSIDE HANDLE. (Thru 18267715.) (See figure 3-4.) When inside door handle is removed, reinstall in relation to position of bolt (2), which is spring-loaded to CLOSE position. Index inside handle in accordance with the following procedures.

a. Temporarily install handle (14) on shaft assembly (18) approximately vertical.
b. Move handle (14) back and forth until handle centers in spring-loaded position.
c. Without rotating shaft assembly (18), remove handle and install door upholstery panel with door handle OPEN-CLOSE placard in place.
d. Ensure CLOSE index is at top.
e. Install handle (14) to align with CLOSE index on placard.
f. Ensure bolt (2) clears doorpost and teeth engage clutch gear when handle (14) is in CLOSE position. The inside door handle fits into the arm rest when it is moved to the locked position. Install the handle on the serated shaft so that the forward end on the handle is 8° 15' above the centerline of the handle shaft when in the locked position. A small amount of adjustment can be accomplished by loosening the shaft mounting bolts, and moving screw (28) in the slot to raise or lower forward end of the handle.

3-33. DOOR LATCHES. (Beginning with 18267716.) (See figure 3-5.)

3-34. DESCRIPTION. The cabin door latch consists of a two-piece nylon latch base, exterior handle, spring-loaded latch bolt/pull-bar assembly, and a spring-loaded catch/trigger pin assembly. The interior handle base plate assembly is directly connected to the cabin door latch by means of an adjustable push rod assembly. This push rod assembly has two clamps attached, 180° apart on the main rod. These clamps are used to operate a cable assembly that drives a cable pin from the upper aft end of the cabin door into the aft upper door sill, When the cabin door is open, the door latch exterior handle should be extended (out), held in this position by means of the spring-loaded latch catch engaged with the latch bolt through the beveled hole in the bolt. The push rod assembly will be moved forward, and the attached cable assembly will be retracted from the upper door sill with the cable pin recessed in the pin guide, located in the upper aft corner of the door. The interior handle, being directly connected by means of the push rod, will be moved approximately 15° aft of the vertical position. Closing the cabin door drives the trigger pin over the nylon actuator attached to the cover plate, located on the rear doorpost. As the trigger pin is driven forward, it disengages the latch catch from the latch bolt. The extended extension springs, attached to the latch handle and bolt/pull bar assembly, compress, pulling the latch handle in, and driving the latch bolt over the latch striker, located on the rear doorpost. Pushing the exterior handle flush with the fuselage skin. The push rod assembly, attached to the latch bolt/pull bar assembly, moves aft, which also drives the cable pin from the pin guide in the door into the upper aft door sill receptacle. The interior door handle has now moved from approximately 15° aft of vertical to approximately 45° forward of vertical. Pushing the interior handle to the horizontal position, flush with the arm rest, will overcenter the door latch, securing the door for flight. The cabin door latch assembly also incorporates a locking arm and locking pin, used with a key lock to secure the aircraft after use. With the cabin door closed, and the exterior latch handle flush, actuating the key lock drives the locking pin into the exterior latch handle, locking the aircraft. It is important to note that since the cabin door latch assembly and the interior handle fase plate assembly are directly connected by the push rod assembly, that any amount of force applied to the outside handle is subsequently applied to the inside handle. If the push rod assembly is not properly adjusted, it is possible to lock one's self out of the aircraft by applying too much force to the exterior handle when closing the cabin door. Therefore, it is important to adhere to all of the rigging and adjustment specifications pertaining to the preload forces of the interior door handle. Refer to the rigging and adjusting procedures in the following paragraphs.

3-35. INSTALLATION, RIGGING AND ADJUSTMENT PROCEDURES. (Beginning with 18267716.) (See figure 3-5.)

3-36. INSTALLATION OF LOCK ASSEMBLY ON LATCH ASSEMBLY. (Beginning with 18267716 and T18267717.) (See figure 3-5.)

a. Assemble locking arm (2) with pin assembly (5) by placing one washer (4) on each side of locking arm (2). Swage pin (5) so that there is a minimal amount of looseness between parts. Cut excessive material from pin (5).
b. Place pin (5) in 1/8-inch hole of base assembly (22).
c. Align .099-inch hole of locking arm (2) with .094-inch hole in latch base (22) and install pin.
d. Assemble cam assembly (24) to locking arm (2). Cam should be on latch side of locking arm. Use 3 washers (25) between cam and locking arm.

3-37. INSTALLATION OF LOCK ASSEMBLY. (Beginning with 18267716.) (See figure 3-5.)

NOTE

Install with latch in CLOSE position.

a. Install latch assembly between door pan and door skin.
b. Cable assembly should be forward of latch base attach plate. and inboard of latch base cup.
c. Extend latch handle through cutout in door skin. This will pull latch bolt back far enough to allow latch to fall into place.
d. Push latch assembly aft so that bolt (12) and push rod (13) extend through their respective holes.

e. Trip push rod (13) so that bolt (12) is fully extended and handle (20) is flush.

f. Secure latch to door pan with four NAS 220-5 screws through base assembly (22) and two AN525-10R6 screws through aft flange of door pan.

g. Ensure door skin fits properly around latch assembly, then drill eleven .128-inch holes to align with latch base.

NOTE

Do not oversize holes in the latch base and do not rivet base to skin at this time.

3-38. INSTALLATION OF CABLE ASSEMBLY. (Beginning with 18267716.) (See figure 3-5.)

a. On pin end of cable assembly (32), attach clamp (33) and nut (31), one-inch from end of casing, as shown in detail A.

b. Insert pin end of cable between door pan and door skin at aft end of door. Push pin end of cable to top of door.

c. Remove plug button (26) and align pin on cable with pin guide (28), and insert pin through guide. Access is gained through .875-inch hole (30).

d. Align clamp on cable casing with hole located one-inch below .875-inch hole, and install screw.

e. Check operation of cable. If sluggish operation of cable is encountered, add S1450-2A4-062 washers (34) as required to facilitate smoother cable operation.

3-39. RIGGING CABLE ASSEMBLY. (Beginning with 18267716.) (See figure 3-5.)

a. Pull excess slack out of cable (32). Attach clamp (33) and nut (31) to cable so that it aligns with .193-inch hole in door pan, and attach. (Refer to paragraph 3-31, step "d".)

NOTE

Make sure latch is in OPEN position before proceeding.

b. Cut casing of cable assembly approximately 2-inches from clamp bolt (43) on push rod assembly (44).

c. Insert core of cable through clamp bolt (43).

d. Pull core through clamp bolt so that pin (29) extends approximately 1/8-inch from door pan contour.

e. Cut core approximately one-inch forward of push rod clamp bolt (43).

f. Secure two nuts to push rod clamp bolt.

g. Operate latch several times to ensure that latch works freely. If latch binds up and will not work freely, remove cable core from clamp bolt (43) and operate latch. If cable operates easily without cable attachment, check cable for possible adjustments to facilitate ease of operation.

h. After cable operates freely, install cover assembly (42) and recheck cable for operation.

3-40. RIGGING INSIDE DOOR HANDLE. (Beginning with 18267716.) (See figure 3-5.)

a. With latch secured to door pan, attach push rod assembly (44) to pull bar (7) and secure with pin (8).

NOTE

Do not install cotter pin (9).

b. Ensure that latch is in CLOSED position.

c. By removing pin (8) that connects push rod to latch base assembly, rotate rod in or out (180°) for adjustment. Adjust rod so that it takes a load of 6 pounds to 12 pounds at the end of the inner handle to move it from closed position to overcenter position.

NOTE

Rod must be attached to latch assembly before rigging can be accomplished.

d. For fine adjustment for overcentering latch assembly, proceed as follows:

1. Cabin door must be installed and completely fitted to fuselage.

2. Cabin door latch must be in OPEN position. Latch must operate smoothly and freely.

3. Adjust striker plate (52) forward by installing shims (53) as required, so that there is a minimal clearance between latch bolt (12) and striker (52).

NOTE

This adjustment will ensure that when the door is opened from the outside, the bolt will engage the latch catch, and the exterior handle will stay open until the door is closed again.

NOTE

If cabin door is located too far forward such that the door latch will not operate, this will not allow latch assembly push rod (13) to ride up on actuator (47) and trigger the latch bolt (12). Install shims (48) as required beneath actuator (47), located on cover assembly (49).

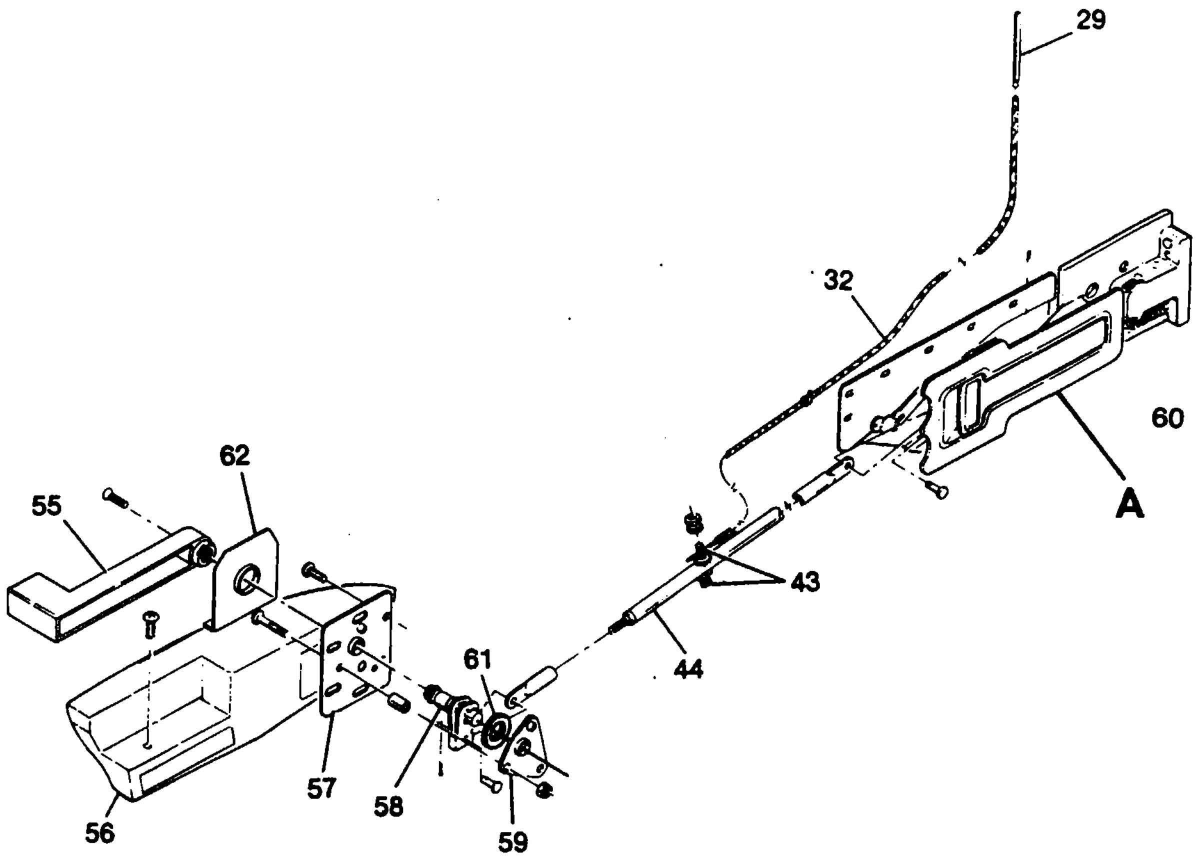
4. Close cabin door from inside the aircraft. When latch is overcentered, the exterior handle should pull flush. If it does not pull flush, the connecting push rod from the door latch to the inside handle assembly should be adjusted "out" (lengthened).

NOTE

When making this adjustment on the overcentering of the latch, it may be noticed that there is a sharp, loud canning noise when the inside handle is pushed down. It is preferred that the outside door handle be flush, even if the canning noise is noticeable.

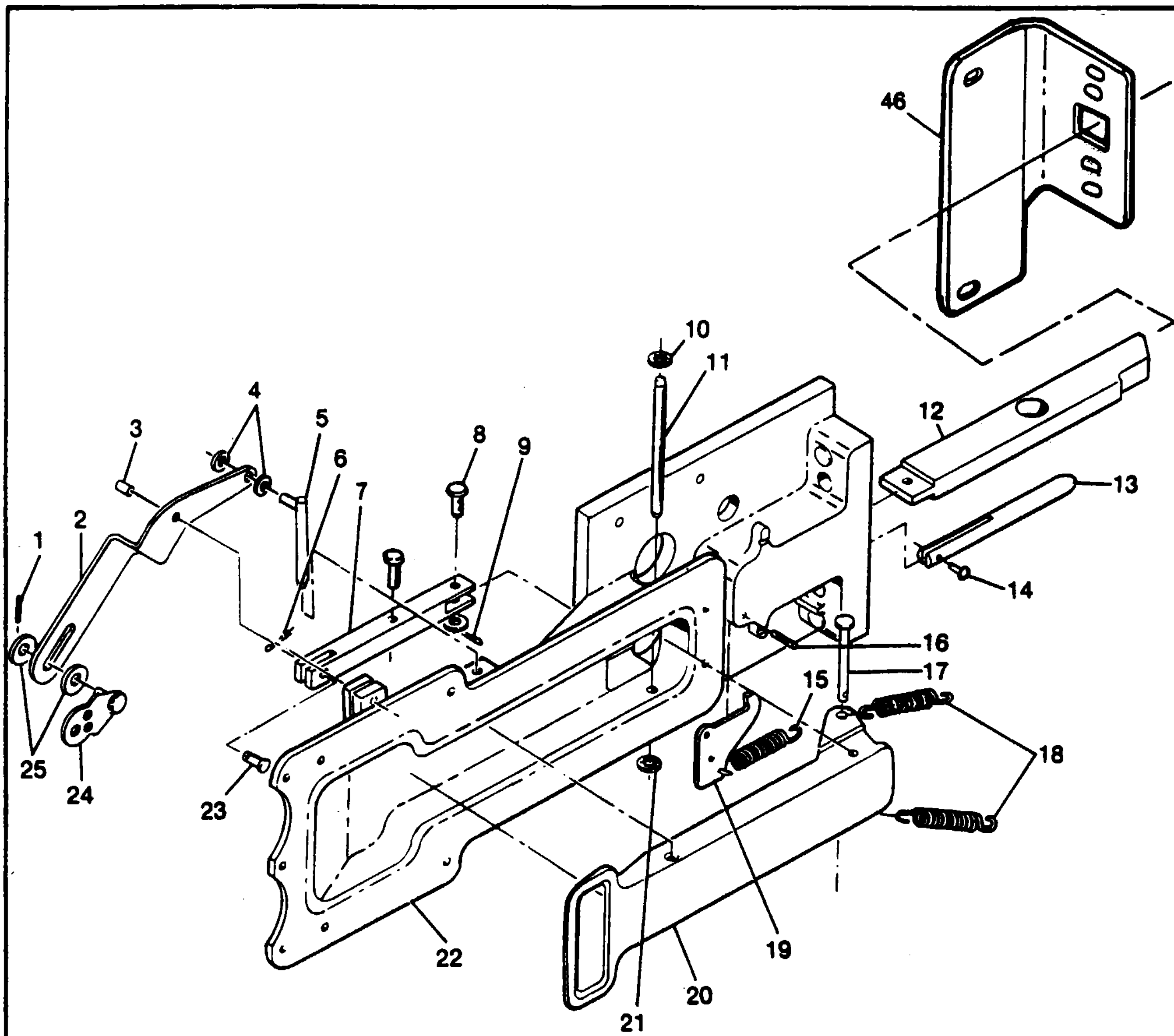
5. When adjusting push rod, it may need only be adjusted 1/2 turn. To accomplish this, base plate (45) should be removed.

6. To make 1/2 turn adjustment, remove smaller



29. Pin
32. Cable Assembly
43. Clamp Bolt
44. Push Rod Assembly
55. Inside Handle
56. Arm Rest
57. Support
58. Shaft Assembly
59. Plate Assembly
60. Door Latch Assembly
61. Shim
62. Escutcheon

Figure 3-5. Cabin Door Latch (Beginning with 18267716) (Sheet 1 of 3)



Detail A

1. Cotter Pin	14. Rivet
2. Locking Arm	15. Spring
3. Pin	16. Pin
4. Washer	17. Pin
5. Pin	18. Spring
6. Cotter Pin	19. Catch
7. Pull Bar	20. Outside Handle
8. Pin	21. Lock Washer
9. Cotter Pin	22. Latch Base Assembly
10. Lock Washer	23. Pin
11. Pin	24. Cam Assembly
12. Bolt	25. Washer
13. Push Rod	46. Latch Cover

Figure 3-5. Cabin Door Latch (Beginning with 18267716) (Sheet 2 of 3)

26. Plug Button
27. Door Structure
28. Pin Guide
29. Pin
30. .875-inch Access Hole
31. Self-Locking Clip-On Nut
32. Cable Assembly
33. Clamp
34. S1450-2A4-062 Washer
35. Screw
36. Screw
37. Washer
38. Nut
39. Door Skin
40. Casing
41. Tumblers
42. Cover Assembly
43. Clamp Bolt
44. Push Rod Assembly
45. Base Plate Assembly
47. Door Latch Actuator
48. Shim
49. Striker Plate Cover
50. Outer Channel
51. Inner Channel
52. Striker Plate
53. Striker Plate Shim
54. Doubler

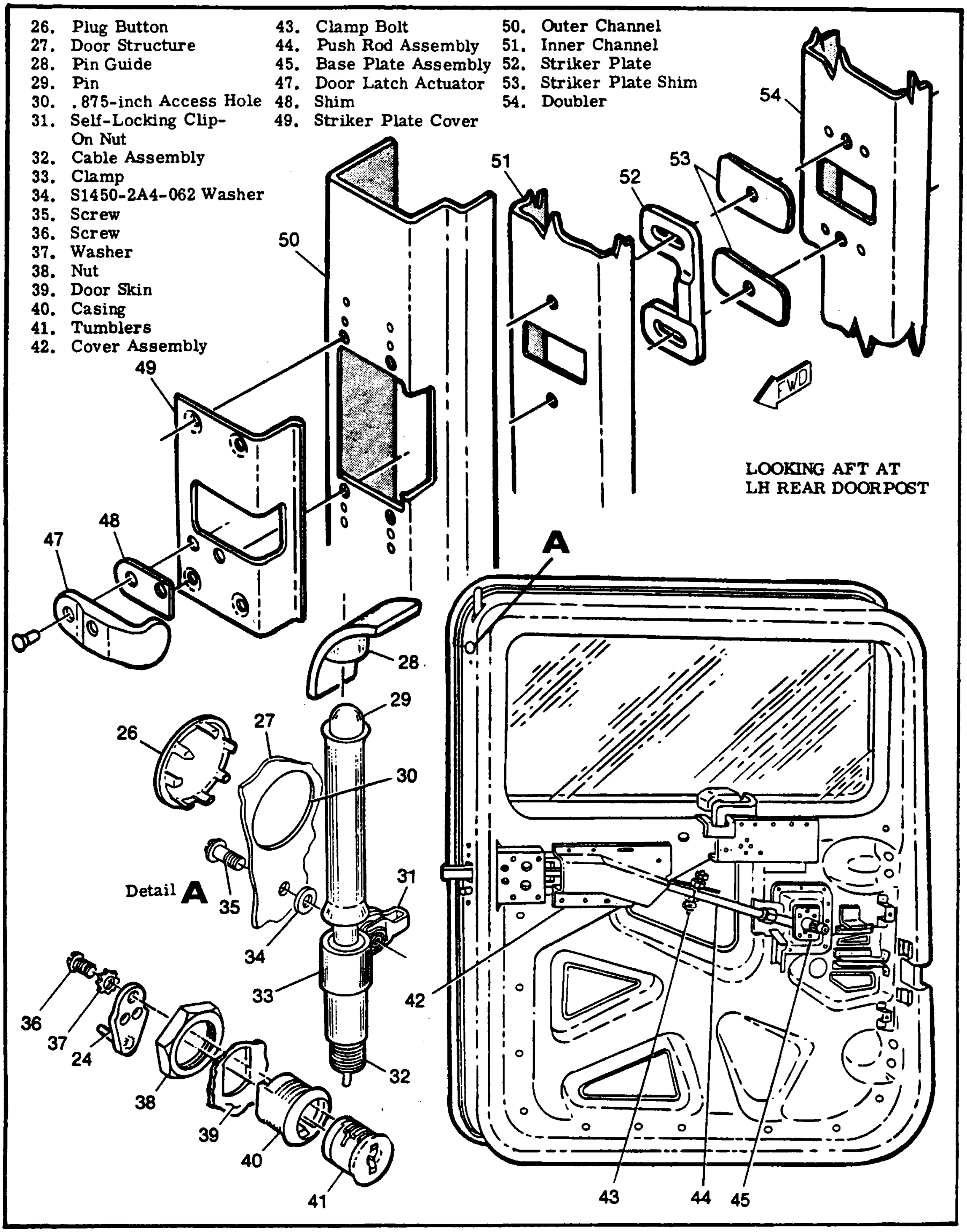


Figure 3-5. Cabin Door Latch (Beginning with 18267716) (Sheet 3 of 3)

end of push rod (44) and turn it over (180°). Then reinstall base plate assembly (45).

7. When closing cabin door from the outside, by using a large, sharp force on the outside handle, it is possible to overcenter the inside handle, thus locking one's self out. To prevent this from occuring, when adjusting the push rod in step "4", adjust push rod so there is a sufficient force (6 to 12 pounds) against the inside handle to prevent it from overcentering when closing the door from the outside.

8. Do not file, grind or sand any portion of bolt (12).

9. Recheck clamps that secure cable. There must not be any slippage between cable casing and clamp.

10. After overcenter adjustment has been made, install cotter pin (9) in clevis pin (8).

e. Rivet latch base (22) to door skin with MS20426A4-3 rivets.

f. Attach lock assembly casing (40) to door skin (39) with nut (38) provided.

g. Install tumblers (41) and attach cam (24) to tumblers with screw and lockwasher (36) and (37) provided.

NOTE

After installing cam (24), seal over head of screw (36) and washer (37) with RTV-102 (white) or RTV-103 (black) silicone rubber sealant (General Electric, Waterford, NY.)

h. Operate lock several times to ensure that all components function properly.

NOTE

Steps "f", "g" and "h" apply to LH door only.

3-41. REPLACING LOCK ASSEMBLY.

a. Remove lock cylinder from new housing.

b. Insert original key into new cylinder and file off any protruding tumblers flush with cylinder. Without removing key, check that cylinder rotates freely in housing.

c. Install lock assembly in door and check lock operation with door open.

d. Destroy new key and disregard code number on cylinder.

3-42. BAGGAGE DOOR. (See figure 3-6.)

3-43. REMOVAL AND INSTALLATION. (See figure 3-6.)

a. Disconnect door-stop chain (13).

b. Remove inside door handle, if installed.

c. Remove screws securing upholstery panel and remove panel.

d. Remove bolts securing door to hinges, or remove clevis pins securing hinges to brackets.

e. Reverse preceding steps for reinstallation.

3-44. SEATS. (See figure 3-7.)

3-45. DESCRIPTION. The seating arrangements consist of two individually adjustable four-way or six-way front seats for the pilot and copilot, and a split-backed fixed seat for the rear passengers. A child's seat, if installed, is located at the aft cabin bulkhead behind the rear seat.

3-46. PILOT AND COPILOT.

3-47. DESCRIPTION. The four-way seats may be moved forward or aft, and the seat back angle is infinitely adjustable. The six-way seats may be moved forward or aft, and are adjustable for height and seat back angle.

3-48. REMOVAL AND INSTALLATION.

a. Remove seat stops from rails.

b. Disengage seat belts by slipping buckle ends through seat belt retainer.

c. With vertical adjust seats installed, remove cabin vent/carpet retainer.

d. Crank vertical adjust seats to their maximum height.

e. Slide seat forward to disengage front rollers from seat rails.

f. Slide seat aft to disengage rear rollers from seat rails.

g. Lift seat out.

h. Reverse preceding steps for installation. Ensure all seat stops are properly installed.

WARNING

It is extremely important that pilot's seat stops are installed, since acceleration, and deceleration could possibly permit seat to become disengaged from seat rails and create a hazardous situation, especially during take-off and landing.

3-49. MECHANICAL LOCK CONTROL ASSEMBLY. (See figure 3-7, Sheets 1 and 4.)

3-50. DESCRIPTION. A mechanical lock control assembly is installed on pilot and copilot seats and on the rear seat assembly beginning with 18267301, F18200130 and T18267716. The front seat lock control is longer than the rear seat lock control. The lock control assembly facilitates seat reclining adjustment. When the control is activated, an internal spring is released, enabling the occupant to recline the seat to the desired angle. When the control is released, the internal spring expands, locking the seat in the desired reclined position. When the control is reactivated, the seat returns to the original vertical position.

3-51. ADJUSTMENT. (See figure 3-7, Sheets 1 and 4.) Rotate adjusting nut (2) to adjust control wire (4) output stroke after seat is installed.

3-52. REAR PASSENGERS' SEAT.

3-53. DESCRIPTION. The rear passengers' seat consists of a fixed, one-piece seat bottom with infinitely adjustable seat backs.

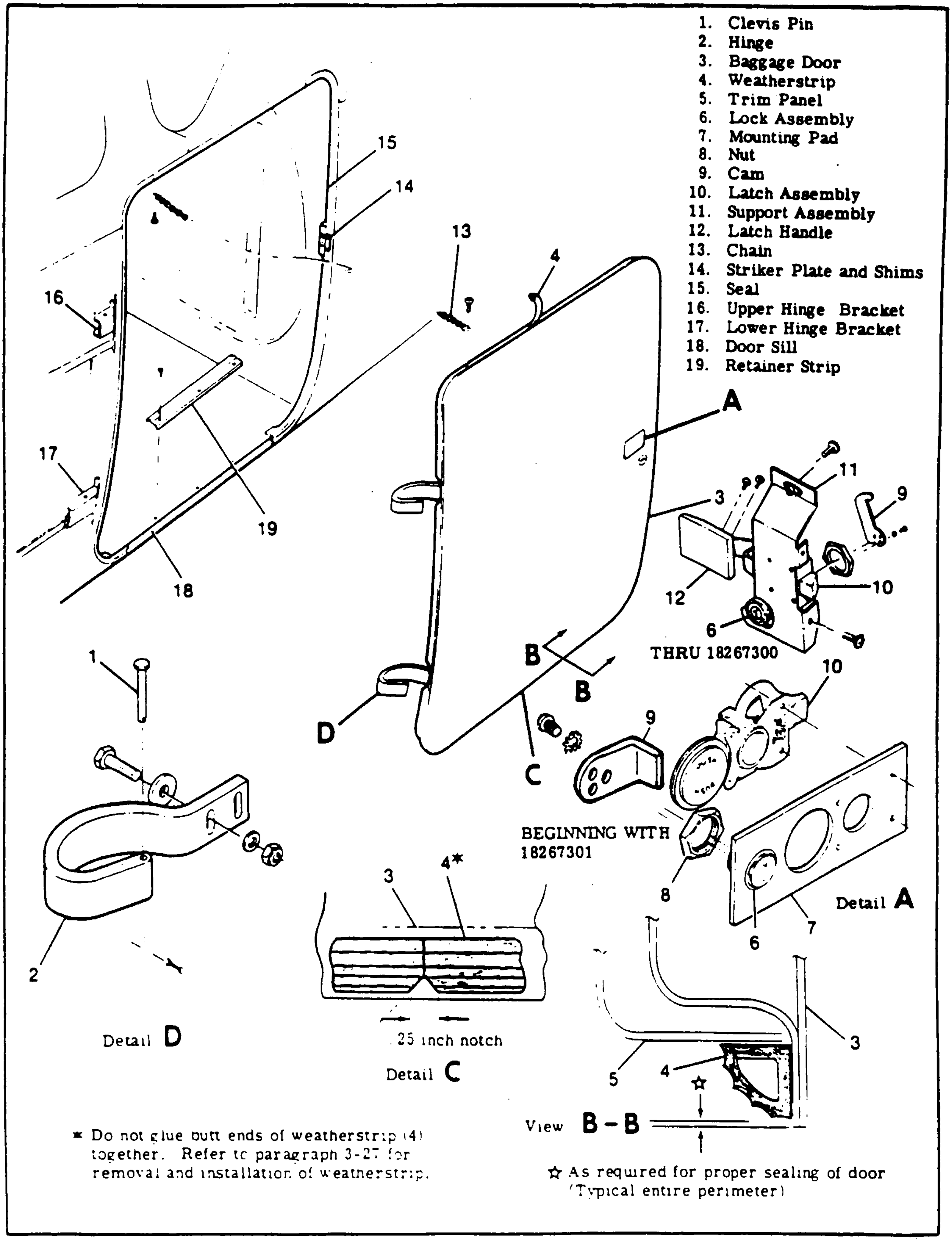
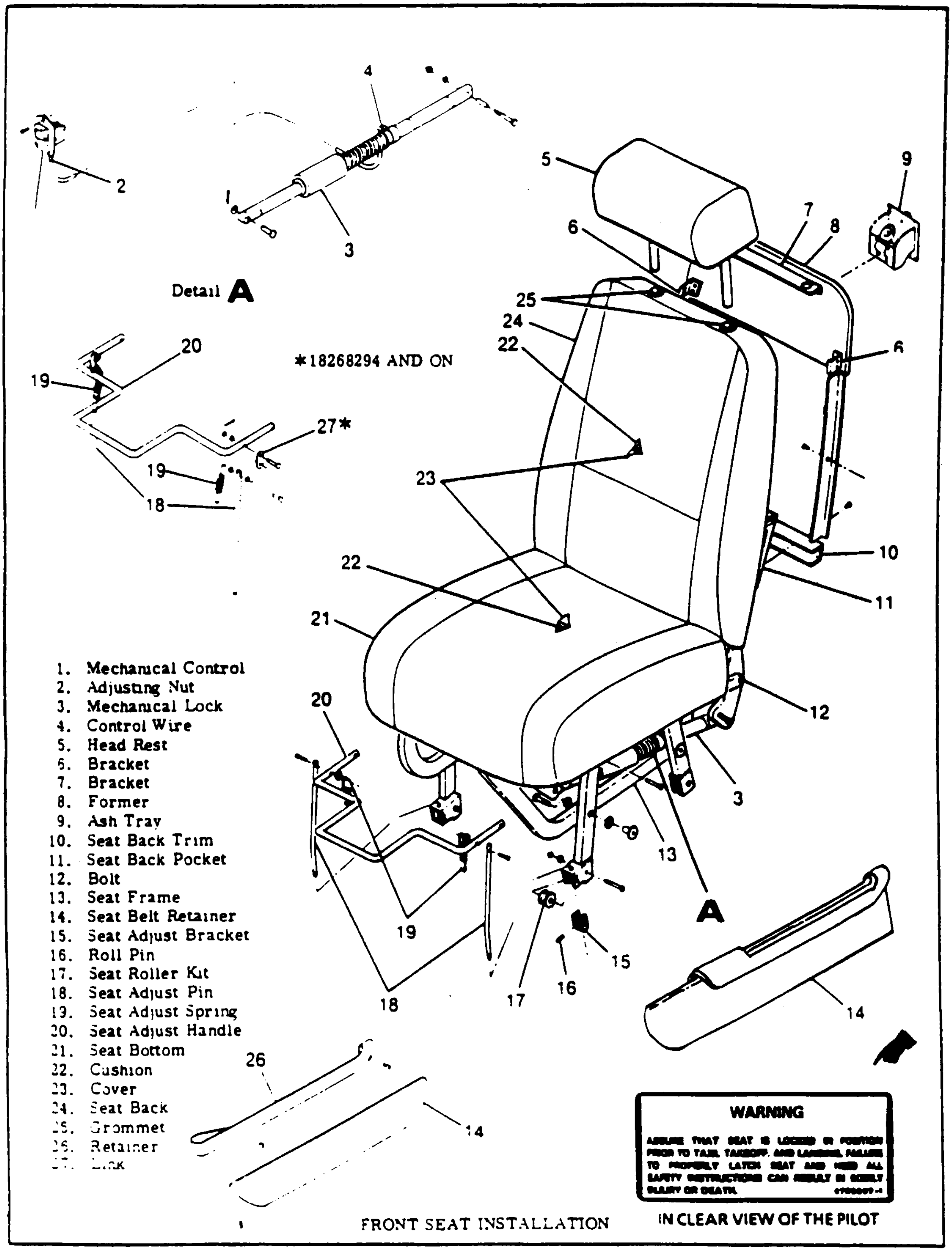


Figure 3-6. Baggage Door Installation



1. Mechanical Control
2. Adjusting Nut
3. Mechanical Lock
4. Control Wire
5. Head Rest
6. Bracket
7. Bracket
8. Former
9. Ash Tray
10. Seat Back Trim
11. Seat Back Pocket
12. Bolt
13. Seat Frame
14. Seat Belt Retainer
15. Seat Adjust Bracket
16. Roll Pin
17. Seat Roller Kit
18. Seat Adjust Pin
19. Seat Adjust Spring
20. Seat Adjust Handle
21. Seat Bottom
22. Cushion
23. Cover
24. Seat Back
25. Grommet
26. Retainer
27. Link

FRONT SEAT INSTALLATION

Figure 3-7 Seat Installation (Sheet 1 of 7)

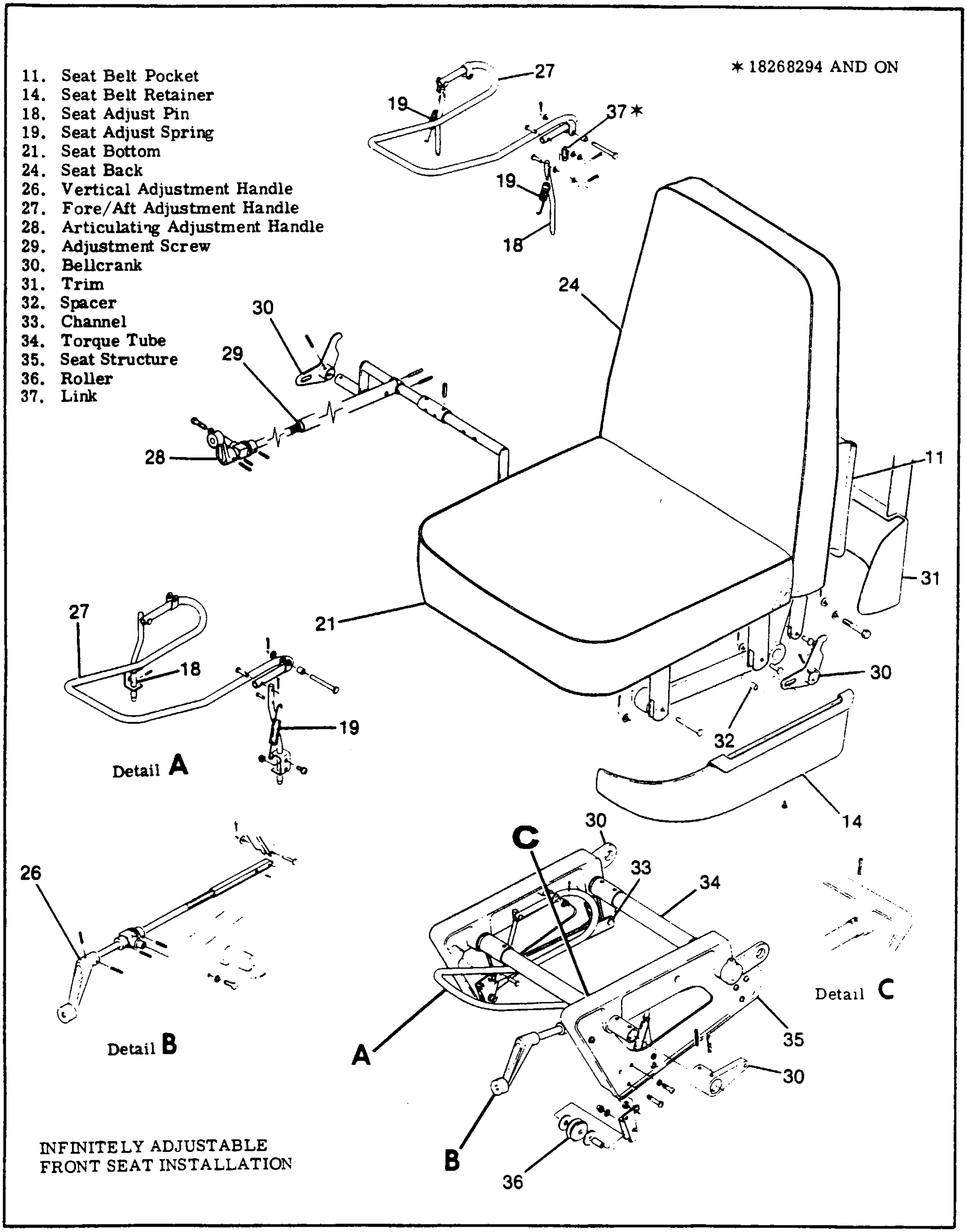
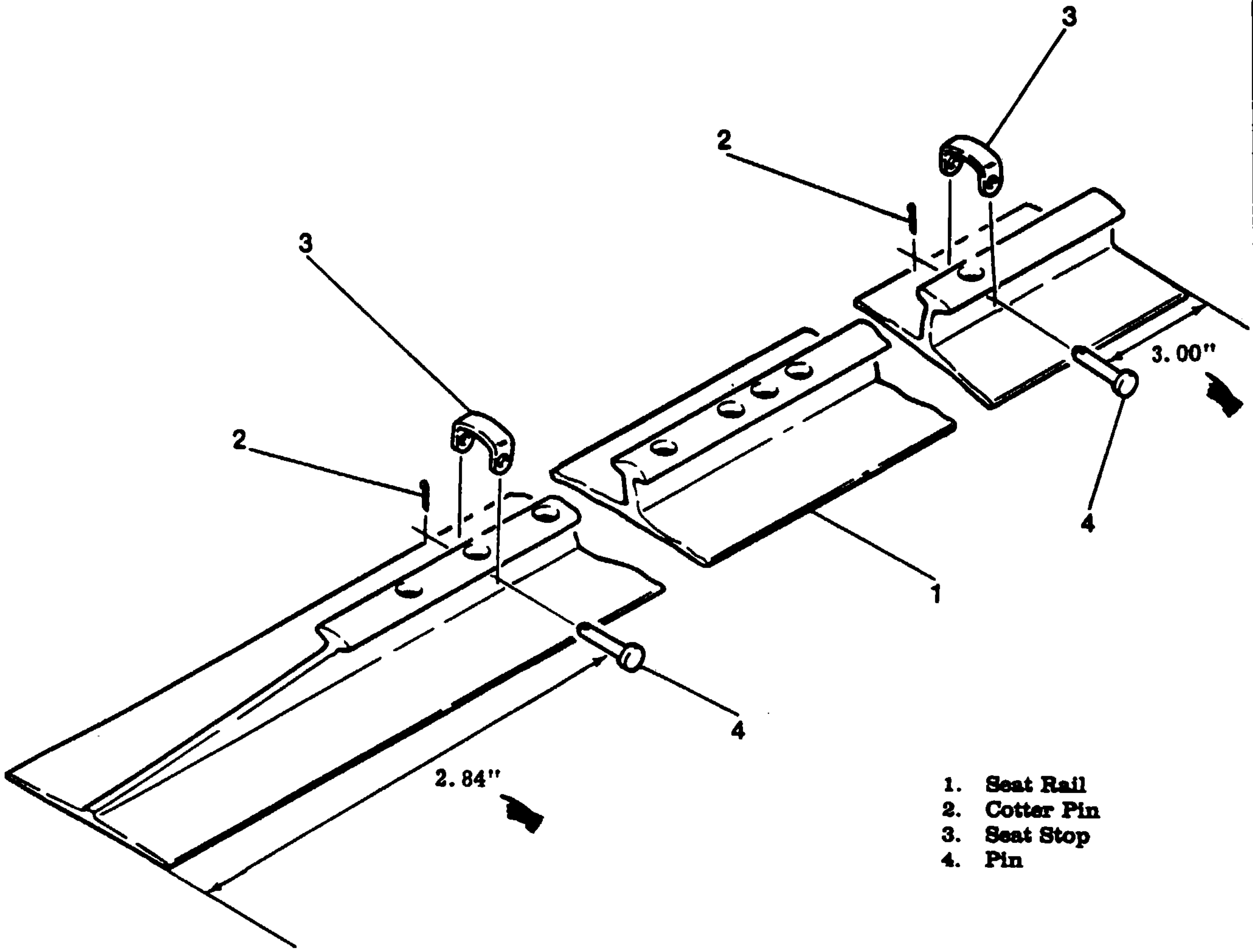


Figure 3-7. Seat Installation (Sheet 2 of 7)

SEAT STOP INSTALLATION
FOR MODEL 182 & T182 SERIES

NOTE

INSTALL SEAT STOPS IN FORWARD AND AFT HOLES OF INBOARD SEAT RAILS



1. Seat Rail
2. Cotter Pin
3. Seat Stop
4. Pin

WARNING

IT IS EXTREMELY IMPORTANT THAT PILOT'S SEAT STOPS ARE INSTALLED, SINCE ACCELERATION, AND DECELERATION COULD POSSIBLY PERMIT SEAT TO BECOME DISENGAGED FROM SEAT RAILS AND CREATE A HAZARDOUS SITUATION, ESPECIALLY DURING TAKEOFF AND LANDING.

Figure 3-7. Seat Installation (Sheet 3 of 7)

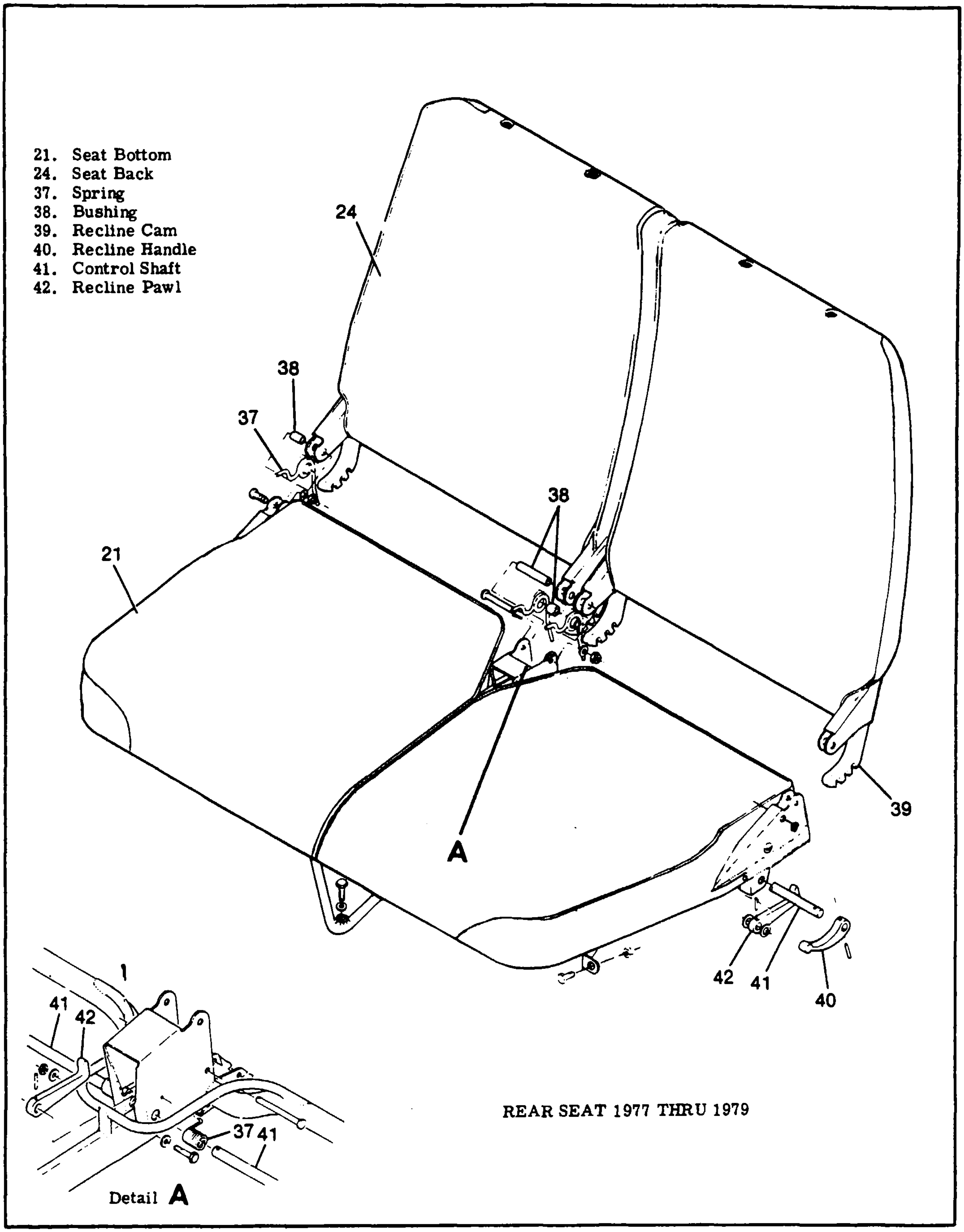
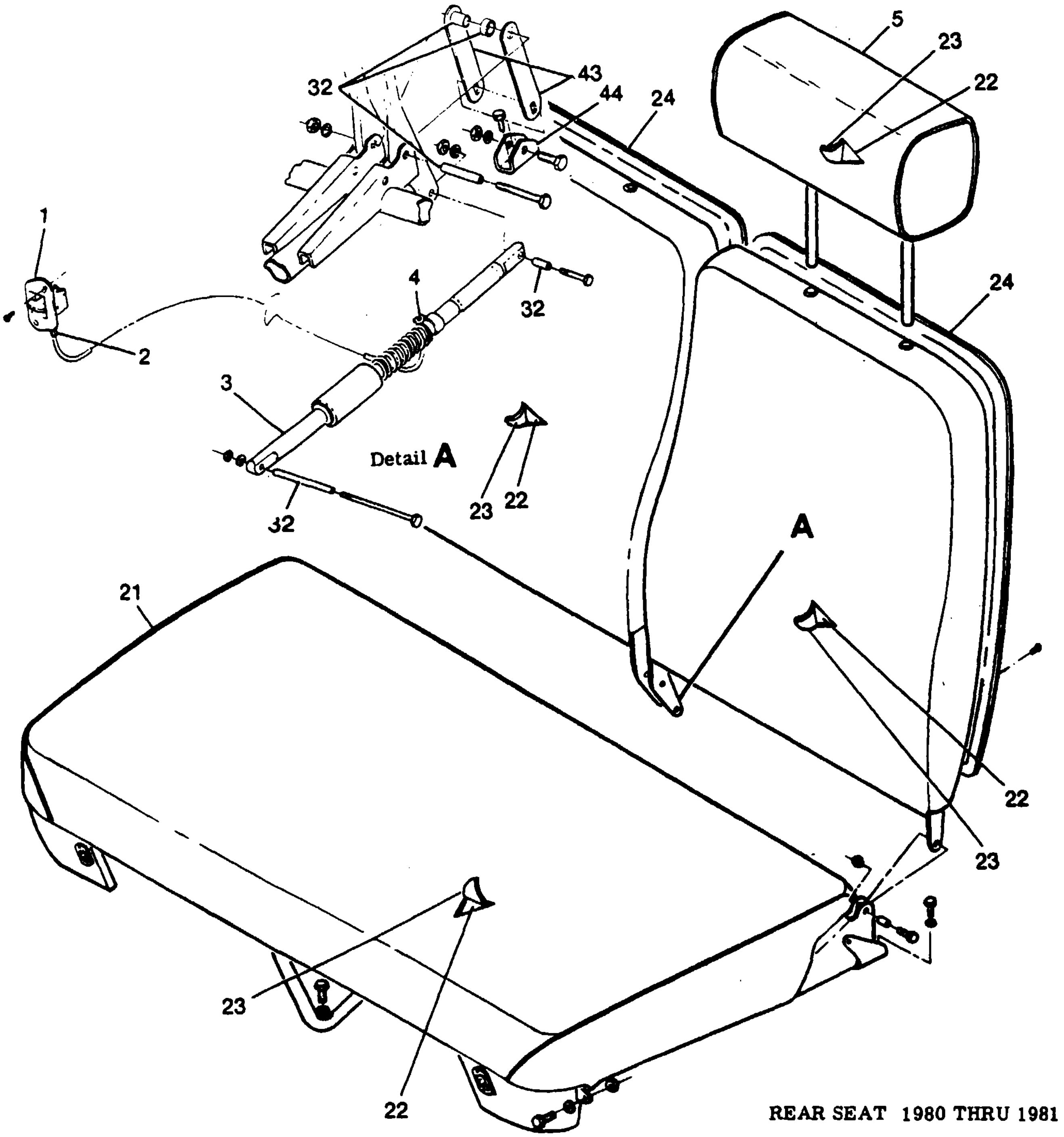
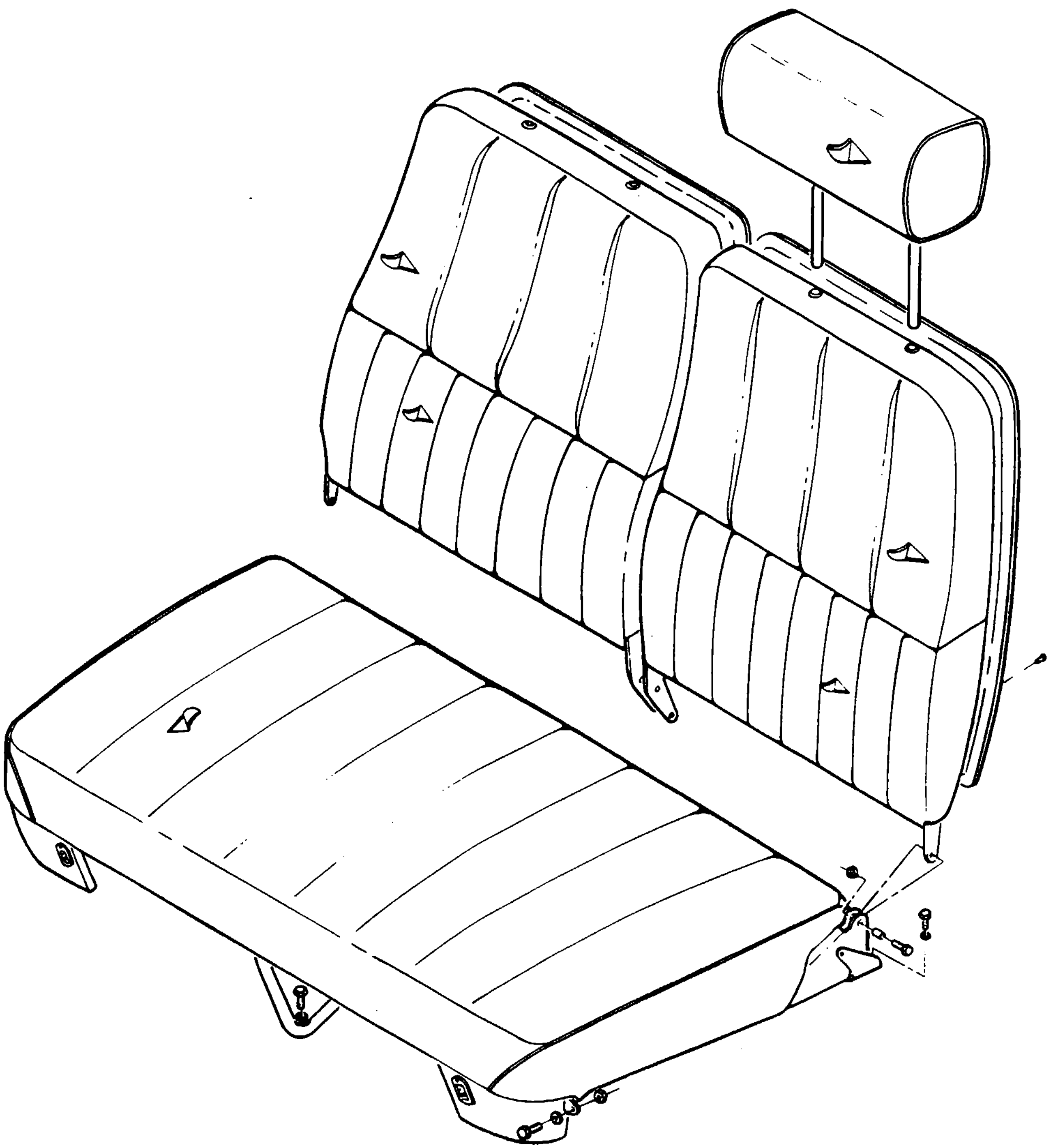


Figure 3-7. Seat Installation (Sheet 4 of 7)



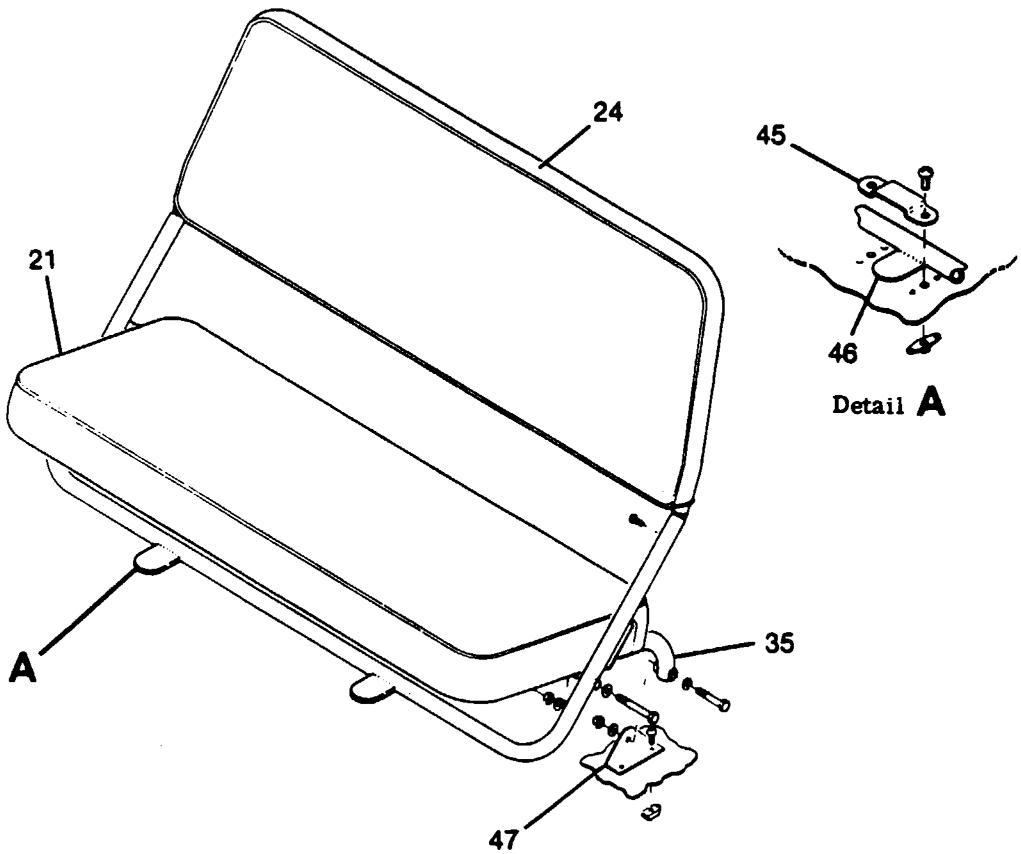
1. Mechanical Control
2. Adjusting Nut
3. Mechanical Lock
4. Control Wire
5. Head Rest
21. Seat Bottom
22. Cushion
23. Cover
24. Seat Back
32. Spacer
43. Link
44. Seat Fitting

Figure 3-7. Seat Installation (Sheet 5 of 7)



REAR SEAT, BEGINNING
WITH 1982 MODELS

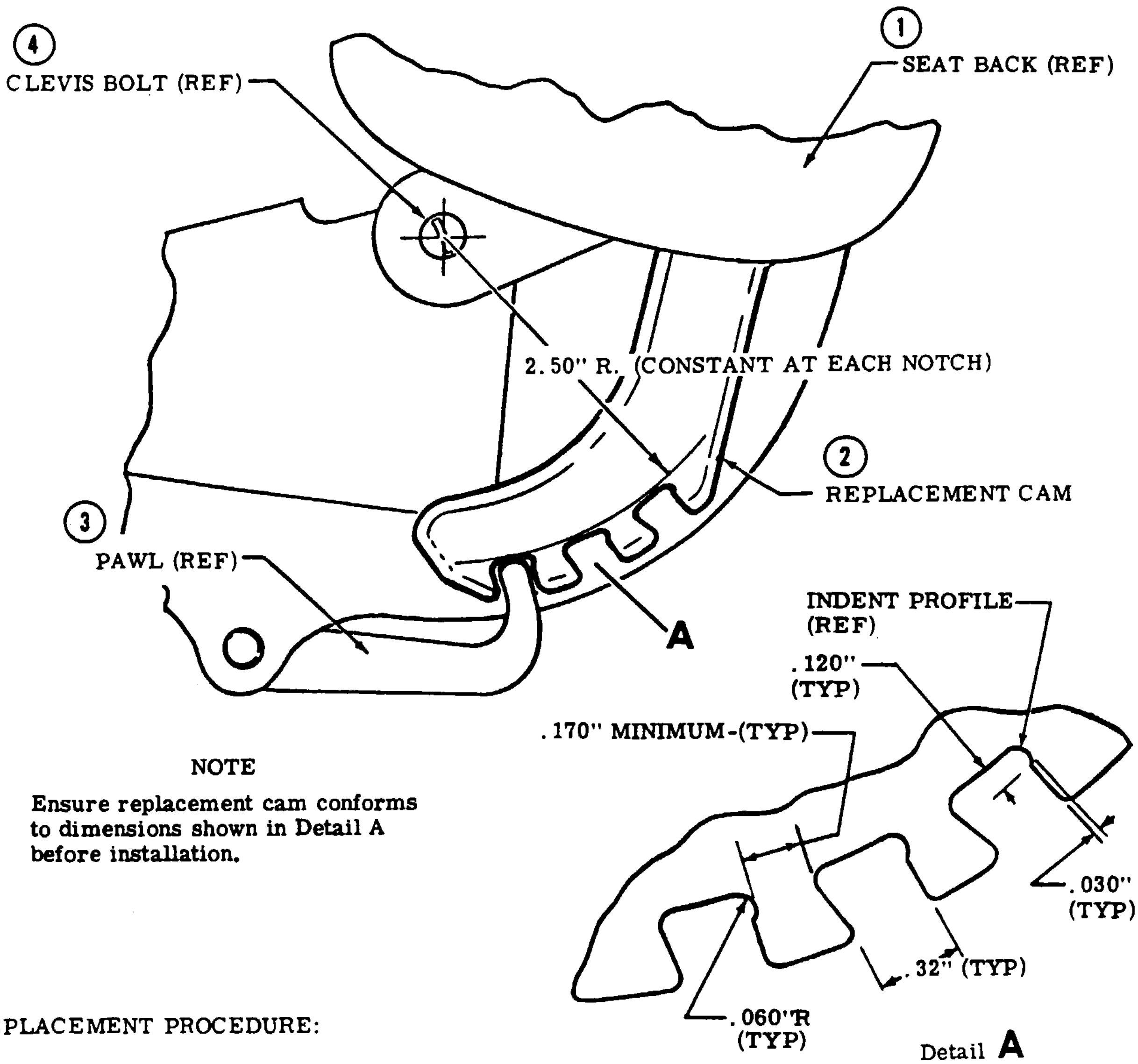
Figure 3-7. Seat Installation (Sheet 6 of 7)



21. Seat Bottom
24. Seat Back
35. Seat Structure
45. Bracket
46. Tongue
47. Hinge Bracket

AUXILIARY SEAT

Figure 3-7. Seat Installation (Sheet 7 of 7)



NOTE

Ensure replacement cam conforms to dimensions shown in Detail A before installation.

REPLACEMENT PROCEDURE:

a. Remove seat from aircraft.

b. Remove plastic upholstery panels from aft side of seat back, then loosen upholstery retaining rings and upholstery material as required to expose rivets retaining old cam assembly.

c. Drill out existing rivets and insert new cam assembly (2). Position seat back so pawl (3) engages first cam slot as illustrated.

d. Position cam so each slot bottom aligns with the 2.50" radius as illustrated.

e. Clamp securely in this position and check travel of cam. Pawl must contact bottom of each cam slot. Using existing holes in seat frame, drill through new cam and secure with MS20470AD6 rivets.

f. Reinstall upholstery, upholstery panels and seat.

Figure 3-8. Seat Back Cam Replacement

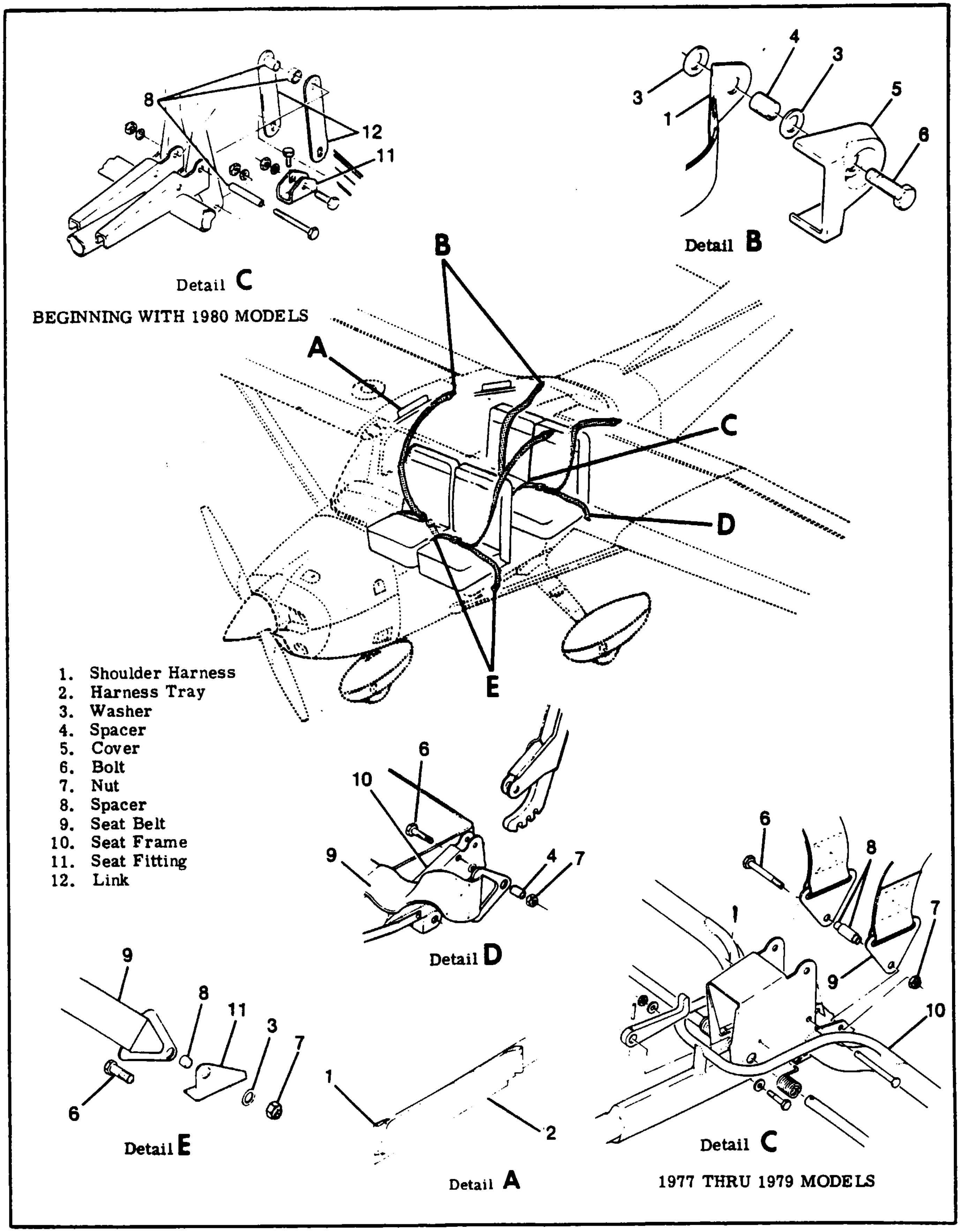
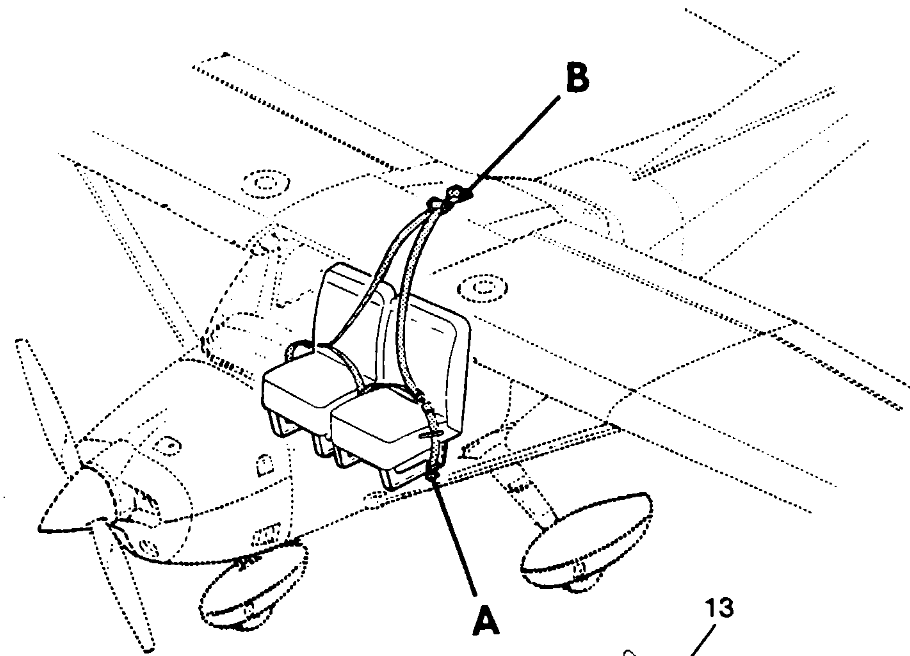
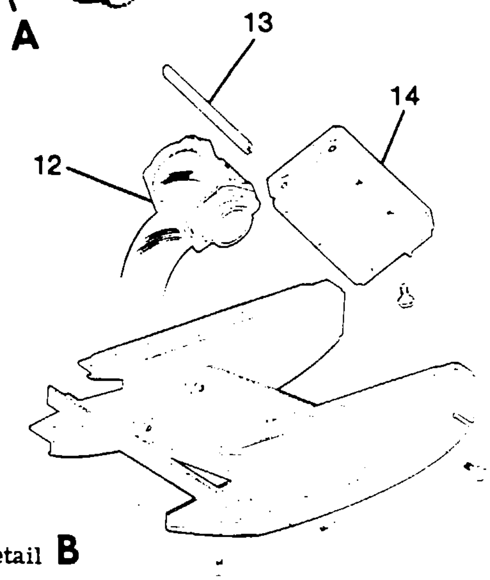


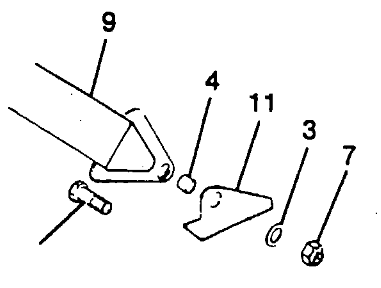
Figure 3-9. Seat Belt and Shoulder Harness Installation (Sheet 1 of 2)





3. Washer
4. Spacer
5. Cover
6. Bolt
7. Nut
9. Seat Belt
11. Floorboard Bracket
12. Inertia Reel Assembly
13. Trim
14. Attach Plate

Detail **B**



Detail **A**

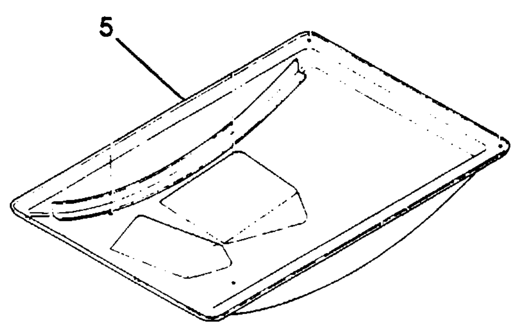


Figure 3-9. Seat Belt and Shoulder Harness Installation (Sheet 2 of 2)

3-54. REMOVAL AND INSTALLATION.
a. Remove bolts securing seat to cabin structure.
b. Lift seat out.
c. Reverse preceding steps for installation.

3-55. AUXILIARY SEAT. (See figure 3-7, Sheet 5.)

3-56. DESCRIPTION. The auxiliary seat consists of a fixed, one-piece seat bottom and a fixed, one-piece, seat back. The seat is secured to brackets mounted in the floorboard.

3-57. REMOVAL AND INSTALLATION.
a. Remove bolts securing seat to brackets mounted in floorboard.
b. Lift seat out.
c. Reverse preceding steps for installation.

3-58. SEAT REPAIR. Replacement of defective parts is recommended in seat repair. However, a cracked framework may be welded, provided the crack is not located in an area of stress concentration (close to a hinge or bearing point). The square tube framework is 6061 aluminum, heat-treated to a T-6 condition. Heliarc welding should be performed on this tubing, since torch welding will destroy the heat-treatment of the aluminum seat frame structure. Instructions for replacing defective cams on reclining seat frames are outlined in figure 3-8.

3-59. CABIN UPHOLSTERY. Due to the wide selection of fabrics, styles and colors, it is impractical to describe each particular type of upholstery. The paragraphs which follow, describe general procedures which may be used as a guide in removal and installation of cabin upholstery. Major work, if possible, should be performed by a mechanic experienced in upholstery replacement. However, if the work must be performed by a mechanic unfamiliar with upholstery practices, the mechanic should make carefully detailed notes during removal of each item to facilitate reinstallation or replacement.

NOTE

Repair kits are available for the repair of cracks in ABS, PBC, PVCP, graphite and fiberglass material. (Cessna Supply Division, P.O. Box 949, Wichita, KS 67201, 316/685-9111, Telex 417-489.)

3-60. MATERIALS AND TOOLS. Materials and tools will vary with the job to be performed. Scissors for trimming upholstery and a dull-bladed knife for wedging material beneath retainer strips are the only tools required for most trim and upholstery work. Industrial rubber cement should be used to hold soundproofing mats and fabric edges in place. For repair of glass-fiber constructed components, refer to Section 18 of this manual.

3-61. SOUNDPROOFING. The aircraft is insulated with spun glass, mat-type insulation and a sound-deadener compound applied to the inner surfaces of skin in most areas of the cabin and baggage compartment. All soundproofing material should be replaced in its original position any time it is removed. A soundproofing panel is placed in the gaps between wings and the fuselage, and is held in place by wing root fairings.

3-62. CABIN HEADLINERS. (See figure 3-11.)

3-63. REMOVAL AND INSTALLATION.
a. Remove sunvisors, all inside finish strips and plates, overhead console, upper doorpost shields and any other visible retainers securing the headliner.
b. Remove moulding from fixed windows.
c. Remove screws securing headliner and carefully take down the headliner.
d. Remove spun glass soundproofing panels above the headliner.

NOTE

The lightweight soundproofing panels are held in place with industrial rubber cement.

e. Reverse preceding steps for reinstallation.

NOTE

Before installation, check all items concealed by headliner for security. Use wide cloth tape to secure loose wires to fuselage skin and to seal openings in wing roots.

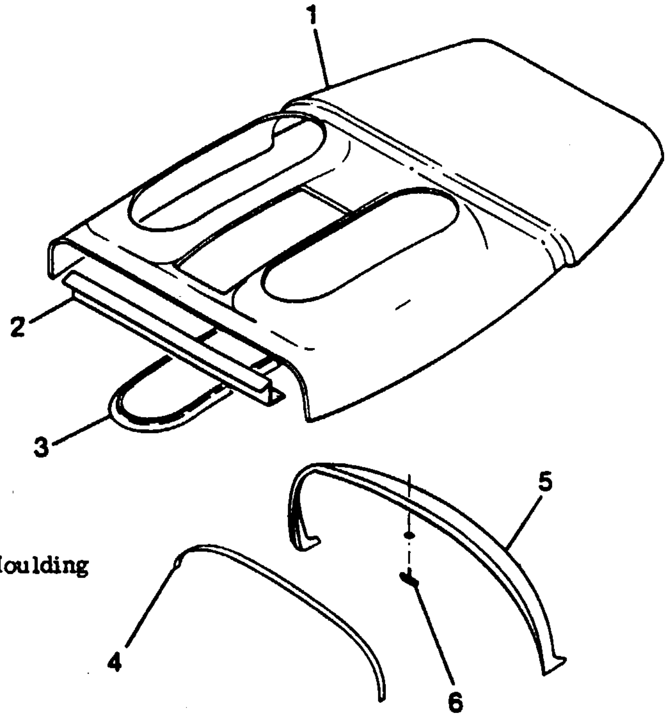
3-64. UPHOLSTERY SIDE PANELS. Removal of upholstery side panels may be accomplished by removing seats for access, then removing parts attaching side panels. Remove screws, retaining strips, arm rests and ash trays as required to free upholstery side panels. Automotive-type spring clips attach most door panels. A dull putty knife makes an excellent tool for prying clips loose. When installing side panels, do not over-tighten screws. Larger screws may be used in enlarged holes as long as area behind hole is checked for electrical wiring, fuel lines and other components which might be damaged by using a longer screw.

3-65. CARPETING. Cabin area and baggage compartment carpeting is held in place by Velcro fasteners for quick removal and inspection. When fitting a new carpet, use the old carpet for a pattern for trimming the carpet and for marking screw holes.

3-66. SAFETY PROVISIONS.

3-67. CARGO TIE-DOWNS. (See figure 3-12.) Cargo tie-downs are utilized to ensure that baggage cannot enter the seating area during flight. Methods of attaching tie-downs are shown in the figure. The eyebolt and nutplate can be located at various points in the baggage area. Sliding tie-down lugs also utilize eyebolts and attach to the seat rails. A baggage net can be secured to the aft cabin wall and floor for baggage security.

3-68. SEAT BELTS. (See figure 9.) Seat belts used with the pilot and copilot seats, or auxiliary seat, if installed, are attached to fittings in the floorboard. The buckle half is inboard of each seat, and the link half is outboard of each seat. Seat belts



1. Headliner
2. Retainer
3. Skylight Moulding
4. Tiara
5. Aft Upper Window Moulding
6. Coat Hook

Figure 3-10. Cabin Headliner Installation

for the rear seat are attached to the seat frame, with the link halves on the left and right sides of the seat bottom, and the buckles at the center of the seat bottom.

NOTE

A special seat belt shortener Service Kit is now available which repositions the belt buckle/shoulder harness connection. Repositioning of the buckle is recommended to prevent inadvertent loosening of the seat belt. (Refer to Service Information Letter SE82-43.)

3-69. SHOULDER HARNESSES. (See figure 3-10.) Integrated seat belt/shoulder harnesses with inertia reels may be installed in the pilot and copilot positions. The seat belt/shoulder harness installations extend from inertia reels located in the overhead console, marked PILOT and COPILOT, to attach points inboard of the two front seats. A separate seat belt and buckle is located outboard of the seats. Inertia reels allow complete freedom of body movement. However, in the event of sudden deceleration, they will lock automatically and protect the occupants.

3-70. GLIDER TOW-HOOK. A glider tow-hook, mounted in place of the tail tie-down ring is available through 18265965 and F18200064.

3-71. REAR VIEW MIRROR. (See figure 3-14.) A rear view mirror may be installed on the cowl deck above the instrument panel on aircraft thru 18266591.

3-72. SEAT RAIL INSPECTION. A special inspection of seat rails should be conducted each 50 hours. See figure 3-14 for inspection procedures.

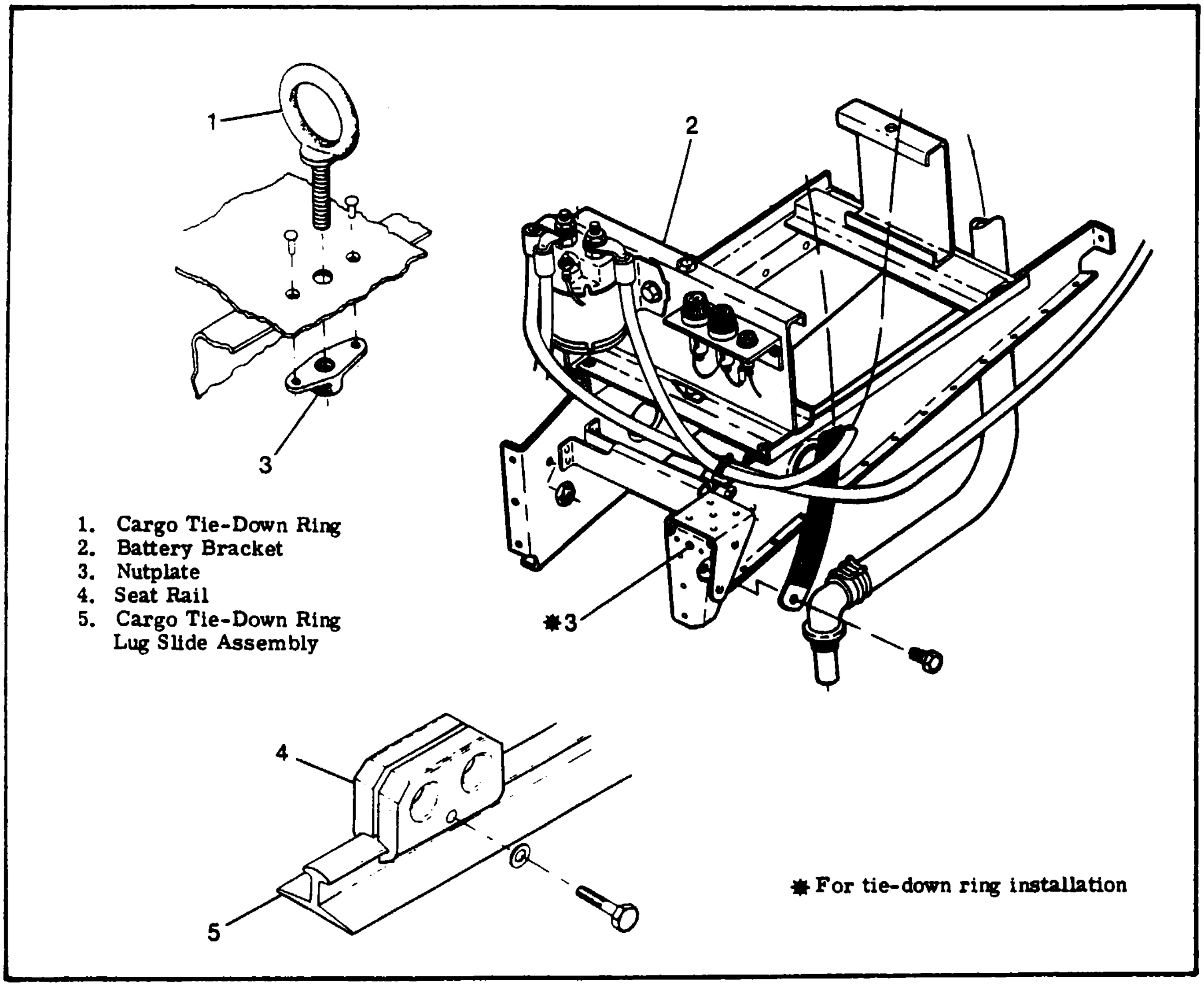


Figure 3-11. Cargo Tie-Downs Installation

SHOP NOTES:

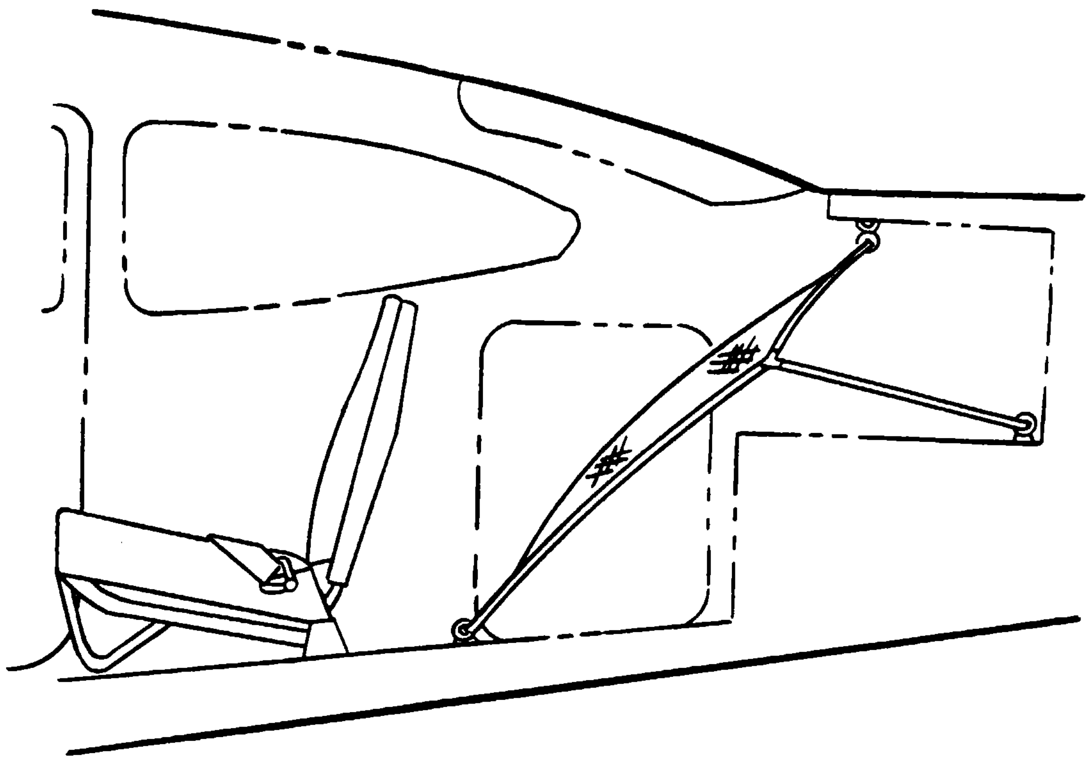
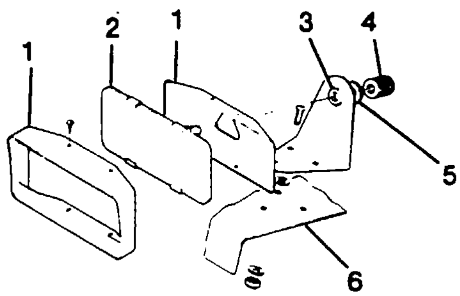


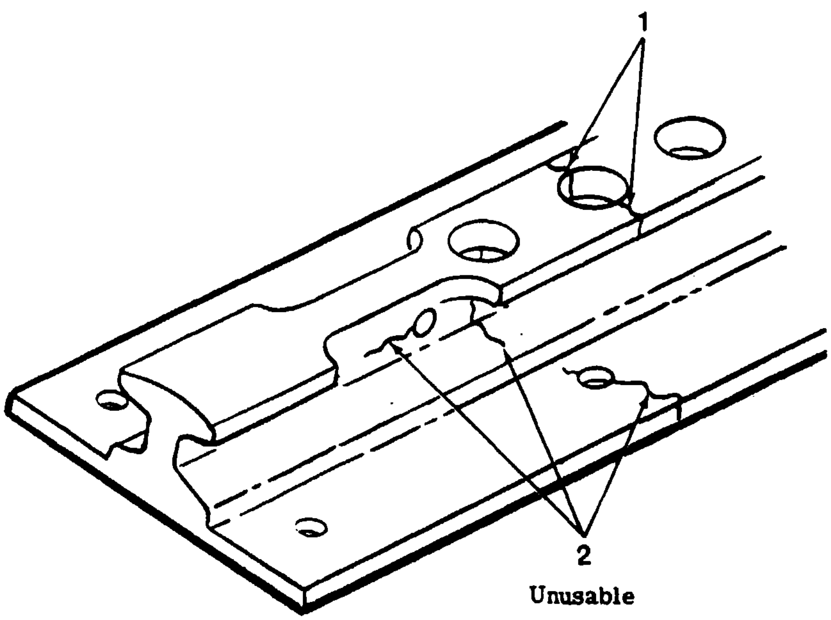
Figure 3-12. Cargo Net Installation



1. Cover
2. Mirror
3. Grommet
4. Nut
5. Washer
6. Deck Skin

Thru 18266591

Figure 3-13. Rear View Mirror Installation



REPLACE SEAT RAIL WHEN:

a. Any portion of web or lower flange is cracked, (index 2).
b. Any crack in crown of rail is in any direction other than right angle to length of rail.
c. Number of cracks on any one rail exceeds four, or any two cracks (index 1) are closer than one-inch.

NOTE

Use of seat rail cargo tie-downs is not permissible on seat rails with cracks.

Figure 3-14. Seat Rail Inspection

SECTION 4

WINGS AND EMPENNAGE

4-1. WINGS AND EMPENNAGE.

4-2. WINGS. (See figure 4-1.)

4-3. DESCRIPTION. Each all-metal wing panel is a semicantilever, semimonocoque type, with two main spars and suitable ribs for the attachment of the skin. Skin panels are riveted to ribs, spars and stringers to complete the structure. An all-metal, piano-hinged aileron, flap, and a detachable wing tip are mounted on each wing assembly. Navigation/strobe lights are mounted at each wing tip.

4-4. REMOVAL. Wing panel removal is most easily accomplished if four men are available to handle the wing. Otherwise, the wing should be supported with a sling or maintenance stand when the fastenings are loosened.

a. Remove wing root fairings and fairing plates.
b. Remove all wing inspection plates.
c. Drain fuel from cell of wing being removed.
d. Disconnect:
   1. Electrical wires at wing root disconnects.
   2. Fuel lines at wing root. (Observe precautions outlined in Section 12.)
   3. Pitot line (left wing only) at wing root.
e. Reduce aileron cable tension by loosening the turnbuckles, then disconnect cables at aileron bellcranks. Disconnect flap cables at turnbuckles above headliner, and pull cables into wing root area.

NOTE

To ease rerouting the cables, a guide wire may be attached to each cable before it is pulled free of the wing. Cable then may be disconnected from wire. Leave guide wire routed through the wing; it may be attached again to the cable during reinstallation and used to pull the cable into place.

f. Support wing at outboard end and disconnect strut at wing fitting. (Refer to paragraph 4-10.) Tie the strut up with wire to prevent it from swinging down and straining strut-to-fuselage fitting. Loosen lower strut fairing and slide fairing up the strut; the strut may then be lowered without damage.

NOTE

Tape flap in the streamlined position during removal to prevent damage, because the flap is unsecured.

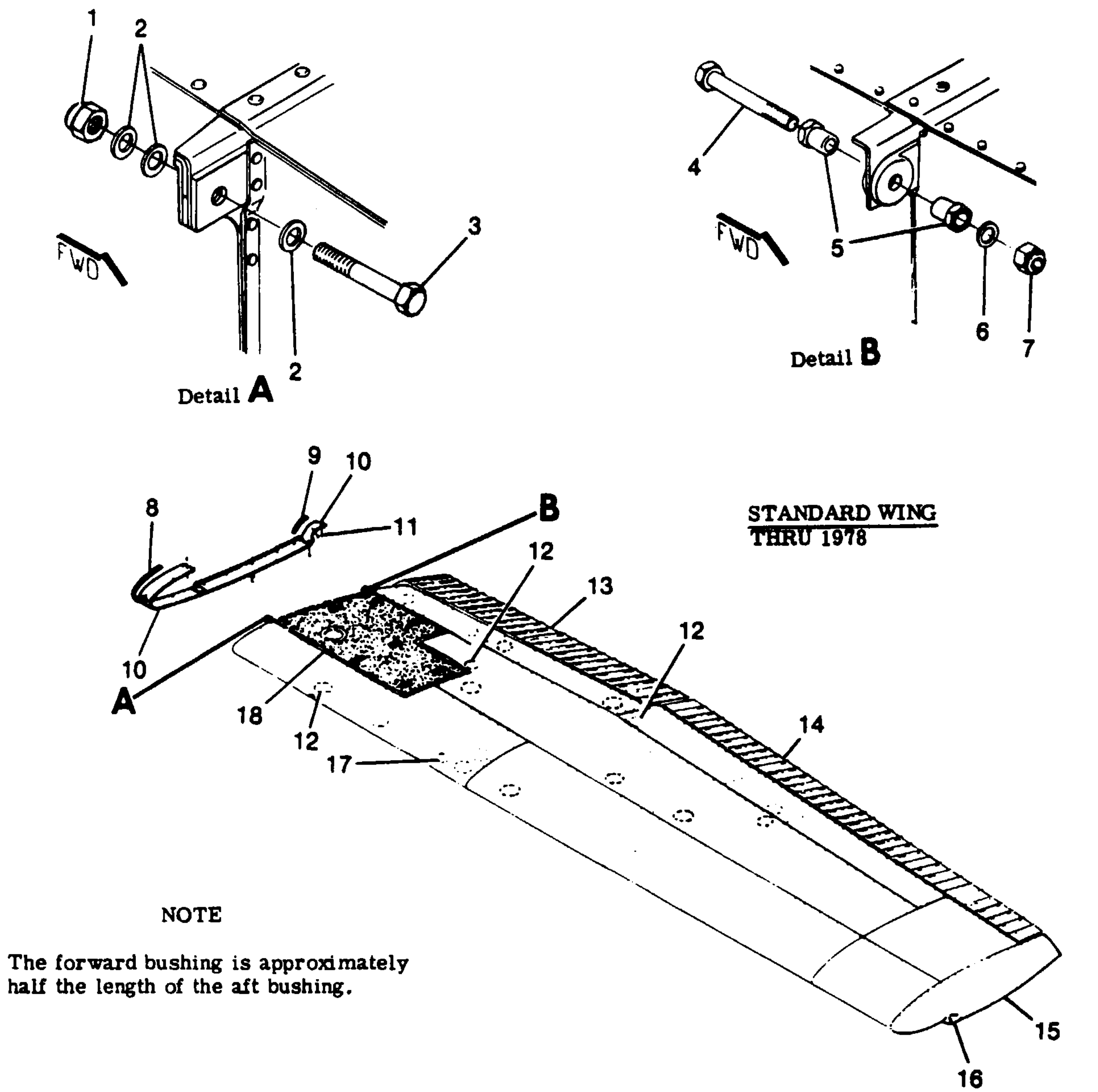
g. Mark position of wing attachment eccentric bushings (See figure 4-1); these bushings are used to rig out "wing heaviness."
h. Remove nuts, washers, bushings and bolts attaching wing spars to fuselage.

NOTE

It may be necessary to rock the wings slightly while pulling attaching bolts, or to use a long drift punch to drive out attaching bolts.

i. Remove wing and lay on padded stand.

4-5. REPAIR. A damaged wing panel may be repaired in accordance with instructions outlined in Section 18. Extensive repairs of wing skin or structure are best accomplished using the wing repair jig, which may be obtained from Cessna. The wing jig serves not only as a holding fixture, making work on the wing easier, but also assures the absolute alignment of the repaired wing.

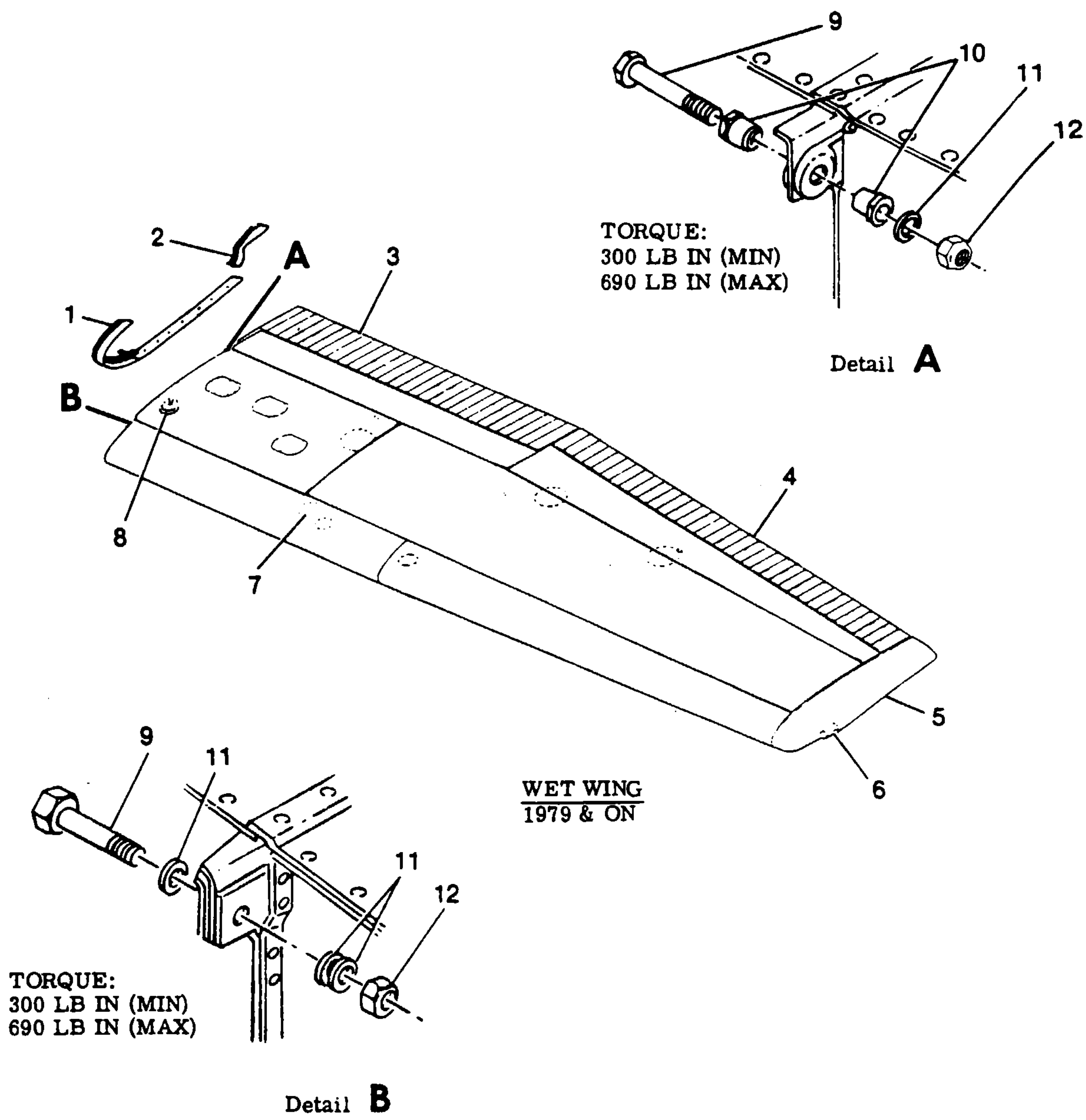


NOTE

The forward bushing is approximately half the length of the aft bushing.

1. Nut
2. Washer
3. Bolt
4. Bolt
5. Bushing
6. Washer
7. Nut
8. Rub Strip
9. Moulding
10. Fairing
11. Screw
12. Inspection Plate
13. Flap
14. Aileron
15. Wing Tip
16. Navigation/Strobe Light
17. Stall Warning Unit
18. Fuel Cell

Figure 4-1. Wing Installation (Sheet 1 of 2)



1. Fairing
2. Lower Rear Fairing
3. Wing Flap
4. Aileron
5. Wing Tip
6. Navigation and Strobe Lights
7. Courtesy Light
8. Fuel Filler Cap
9. Bolt
10. Eccentric Bushings
11. Washers
12. Nut

Figure 4-1. Wing Installation (Sheet 2 of 2)

4-6. INSTALLATION.

a. Hold wing in position and install bolts, bushings, washers and nuts attaching wing spars to fuselage fittings. Be sure eccentric bushings are positioned as marked.

b. Install bolts, spacers and nuts to secure upper and lower ends of wing strut to wing and fuselage fittings.

c. Route flap and aileron cables, using guide wires. (Refer to note in paragraph 4-4.)

d. Connect:

1. Electric wires at wing root disconnects.
2. Fuel lines at wing root. (Observe precautions outlined in Section 12).
3. Pitot line (if left wing is being installed.)
4. Cabin ventilator hose at wing root.

e. Rig aileron system (Section 6).

f. Rig flap system (Section 7).

g. Refill wing fuel cell and check for leaks. (Observe precautions outlined in Section 12).

h. Check operation of wing tip lights and landing and taxi lights.

i. Check operation of fuel quantity indicator.

j. Seal all openings common to fuselage root rib and adjacent to fuel cell with cloth backed waterproof tape. Tapes recommended for usage are; Polyken 224, 230 or 231. Permacel P-69, P-670 or P-672, or Tuck 92T.

NOTE

Be sure to insert soundproofing panel in wing gap, if such a panel was installed originally, before replacing wing root fairings.

k. Install wing root fairings.

l. Install all wing inspection plates, interior panels and upholstery.

4-7. ADJUSTMENT (CORRECTING "WING-HEAVY" CONDITION).

(See figure 4-1.) If considerable control wheel pressure is required to keep the wings level in normal flight, a "wing-heavy" condition exists.

a. Remove wing fairing strip on the "wing-heavy" side of the aircraft.

b. Loosen nut (7) and rotate bushings (5) simultaneously until the bushings are positioned with the thick sides of the eccentrics up. This will lower the trailing edge of the wing, and decrease "wing-heaviness" by increasing the angle-of-incidence of the wing.

CAUTION

Be sure to rotate the eccentric bushings simultaneously. Rotating them separately will destroy the alignment between the off-center bolt holes in the bushings, thus exerting a shearing force on the bolt, with possible damage to the hole in the wing spar fitting.

c. Tighten nut and reinstall fairing strip.

d. Test-fly the aircraft. If the "wing-heavy" condition still exists, remove fairing strip on the "lighter" wing, loosen nut, and rotate bushings simultaneously until the bushings are positioned with the thick side of the eccentrics down. This will raise the trailing edge of the wing, thus increasing "wing-heaviness" to balance heaviness in the opposite wing.

e. Tighten nut, install fairing strip, and repeat test flight.

4-8. WING STRUTS. (See figure 4-2.)

4-9. DESCRIPTION. Each wing has a single lift strut which transmits a part of the wing load to the lower portion of the fuselage. The strut consists of a streamlined tube riveted to two end fittings for attachment at the fuselage and wing.

4-10. REMOVAL AND INSTALLATION.

a. Remove screws from strut fairings and slide fairings along strut.

b. Remove fuselage and wing inspection plates at strut junction points.

c. Support wing securely, then remove nut and bolt securing strut to fuselage.

d. Remove nut, bolt and spacer used to attach strut to wing, then remove strut from aircraft.

e. Reverse preceding steps to install strut.

4-11. REPAIR.

a. For grooves in wing strut caused by strut fairings, the following applies.

1. If groove exceeds .010 inch in depth and is less than .75 inch from a rivet center, the strut should be replaced.
2. If groove exceeds .025 inch in depth and is more than .75 inch from a rivet center, the strut should be replaced.
3. If groove depth is less than .025 inch and is more than .75 inch from a rivet center, strut should be repaired by tapering gradually to the original surface and burnishing out to a smooth finish. The local area should be checked with dye penetrant to ensure that no crack has developed.

b. The following applies to wing struts with grooves worn in the lower trailing edge. This type damage can occur after extensive cabin door usage with a missing or improperly adjusted door stop which allows the door to bang against the aft edge of the strut at the lower end.

NOTE

Struts with a groove deeper than 50% of the original material thickness should be replaced. Lesser damage may be repaired as follows:

1. Without making the damage deeper, remove strut material on each side of groove to reduce notch effect of damage. Smooth and blend the surface to provide a gradual transition of strut tube material thickness in damaged area. The local area should be checked with dye penetrant to insure that no crack has developed.

2. Apply brush alodine or zink chromate primer and repaint area.

3. Re-rig the door stop and/or reform the lower portion of the door pan and skin inboard to prevent the door from rubbing the strut tube. If these actions prove to be ineffective, install some form of protective bumper, either on strut or lower portion of door, to prevent further damage. A short hard rubber strip bonded to the trailing edge of the strut where the door comes close to strut is a possibility.

c. Tie-downs and attaching parts may be replaced. If a wing strut is badly dented, cracked or deformed, it should be replaced.

4-12. FIN. (See figure 4-3.)

4-13. DESCRIPTION. The vertical fin is primarily of metal construction, consisting of ribs and spars covered with skin. Fin tips are of ABS construction. Hinge brackets at the fin rear spar attach the rudder.

4-14. REMOVAL. The vertical fin may be removed without first removing the rudder. However, for access and ease of handling, the rudder may be removed by following procedures outlined in Section 10.

a. Remove fairings on either side of fin.

b. Disconnect flashing beacon lead, tail navigation light lead, antennas and antenna leads, and rudder cables, if rudder has not been removed.

NOTE

The flashing beacon electrical lead that routes into the fuselage may be cut, then spliced (or quick-disconnects used) at installation.

c. Remove screws attaching dorsal to fuselage.

d. Remove bolts attaching fin rear spar to fuselage fitting.

e. Remove bolts attaching fin front spar to fuselage, and remove fin.

4-15. REPAIR. Fin repair should be accomplished in accordance with applicable instructions outlined in Section 18.

4-16. INSTALLATION. Reverse the procedures outlined in paragraph 4-14 to install the vertical fin. Be sure to check and reset rudder and elevator travel. If any stop bolts were removed or settings disturbed, the systems will have to be rigged. Refer to applicable sections in this manual for rigging procedures.

4-17. HORIZONTAL STABILIZER. (See figure 4-4.)

4-18. DESCRIPTION. The horizontal stabilizer is primarily of all-metal construction, consisting of ribs and spars covered with skin. Stabilizer tips are of ABS construction. A formed metal leading edge is riveted to the assembly to complete the structure. The elevator trim tab actuator is contained within the horizontal stabilizer. The underside of the stabilizer contains a covered opening which provides access to the actuator. Hinges are located on the rear spar assembly to support the elevators.

4-19. REMOVAL.

a. Remove elevators and rudder in accordance with procedures outlined in Sections 8 and 10.

b. Remove vertical fin in accordance with procedures outlined in paragraph 4-14.

c. Disconnect elevator trim control cables at cable ends and turnbuckle inside tailcone. Remove stop blocks, then remove pulleys which route the aft cables into horizontal stabilizer. Pull cables out of tailcone.

4-20. REPAIR. Horizontal stabilizer repair should be accomplished in accordance with applicable instructions outlined in Section 18.

4-21. INSTALLATION. Reverse procedures outlined in paragraph 4-19 to install the horizontal stabilizer. Rig elevator, elevator trim and rudder systems as outlined in Sections 8, 9 and 10 consecutively. Check operation of tail navigation light and flashing beacon.

4-22. STABILIZER ABRASION BOOTS.

NOTE

An Accessory Kit (AK182-217) is available from the Cessna Service Parts Center for installation of abrasion boots on aircraft not so equipped.

4-23. DESCRIPTION. The aircraft may be equipped with two extruded rubber abrasion boots, one on the leading edge of each horizontal stabilizer. These boots are installed to protect the stabilizer leading edge from damage caused by rocks thrown back by the propeller.

4-24. REMOVAL. The abrasion boots can be removed by loosening one end of the boot and pulling it off the stabilizer with an even pressure. Excess adhesive or rubber can be removed with Methyl-Ethyl-Ketone.

4-25. INSTALLATION. Install abrasion boots as outlined in the following procedures.

a. Trim boots to desired length.

b. Mask off boot area on leading edge of stabilizer with 1-inch masking tape, allowing 1/4-inch margin.

c. Clean metal surfaces of stabilizer, where boot is to be installed with Methyl-Ethyl-Ketone.

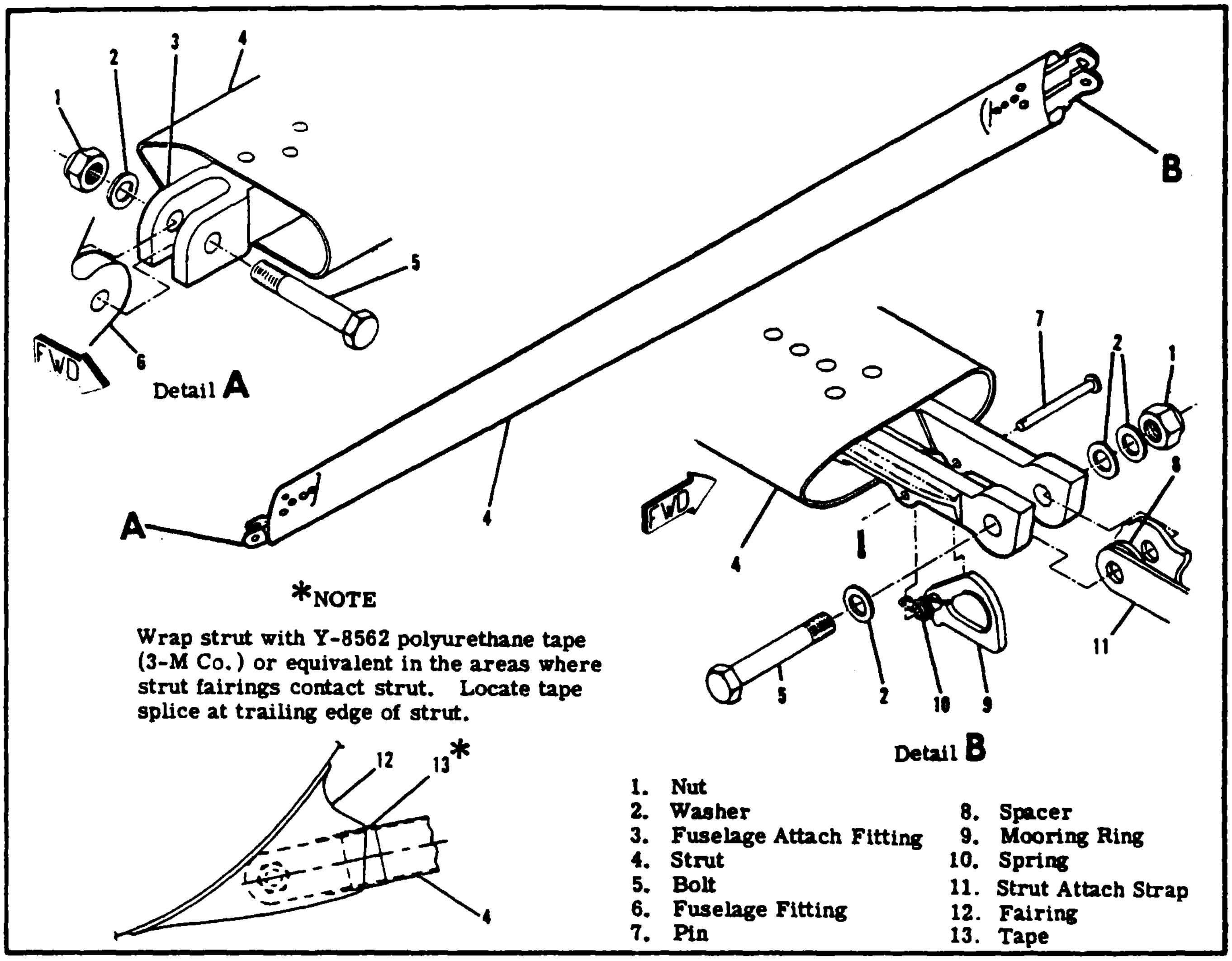


Figure 4-2. Wing Strut

d. Clean inside of abrasion boot with Methyl-Ethyl-Ketone and a Scotch brite pad to ensure complete removal of paraffin/talc. Then a normal wipedown with MEK on a cloth will leave surface suitable for bonding to the aluminum.

NOTE

Boots may be applied over epoxy primer, but if the surface has been painted, the paint shall be removed from the bond area. This shall be done by wiping the surfaces with a clean, lint-free rag, soaked with solvent, and then wiping the surfaces dry, before the solvent has time to evaporate, with a clean, dry lint-free rag.

e. Stir cement (EC-1300 Minnesota Mining and Manufacturing Co.) thoroughly.
f. Apply one even brush coat to the metal and the inner surface of the boot. Allow cement to air-dry for a minimum of 30 minutes, and then apply a second coat to each surface. Allow at least 30 minutes (preferably one-hour) for drying.
g. After the cement has thoroughly dried, reactivate the surface of the cement on the stabilizer and boot, using a clean, lint-free cloth, heavily moistened with toluol. Avoid excess rubbing which would remove the cement from the surfaces.
h. Position boot against leading edge, exercising care not to trap air between boot and stabilizer.

NOTE

Should boot be attached "off-course", pull it up immediately with a quick motion, and reposition properly.

i. Press or roll entire surface of boot to assure positive contact between the two surfaces.
j. Apply a coat of GACO N700A sealer, or equivalent, conforming to MIL-C-21067, along the trailing edges of the boots to the surface of the skin to form a neat, straight fillet.
k. Remove masking tape and clean stabilizer of excess material.
l. Mask to the edge of boot for painting stabilizer.

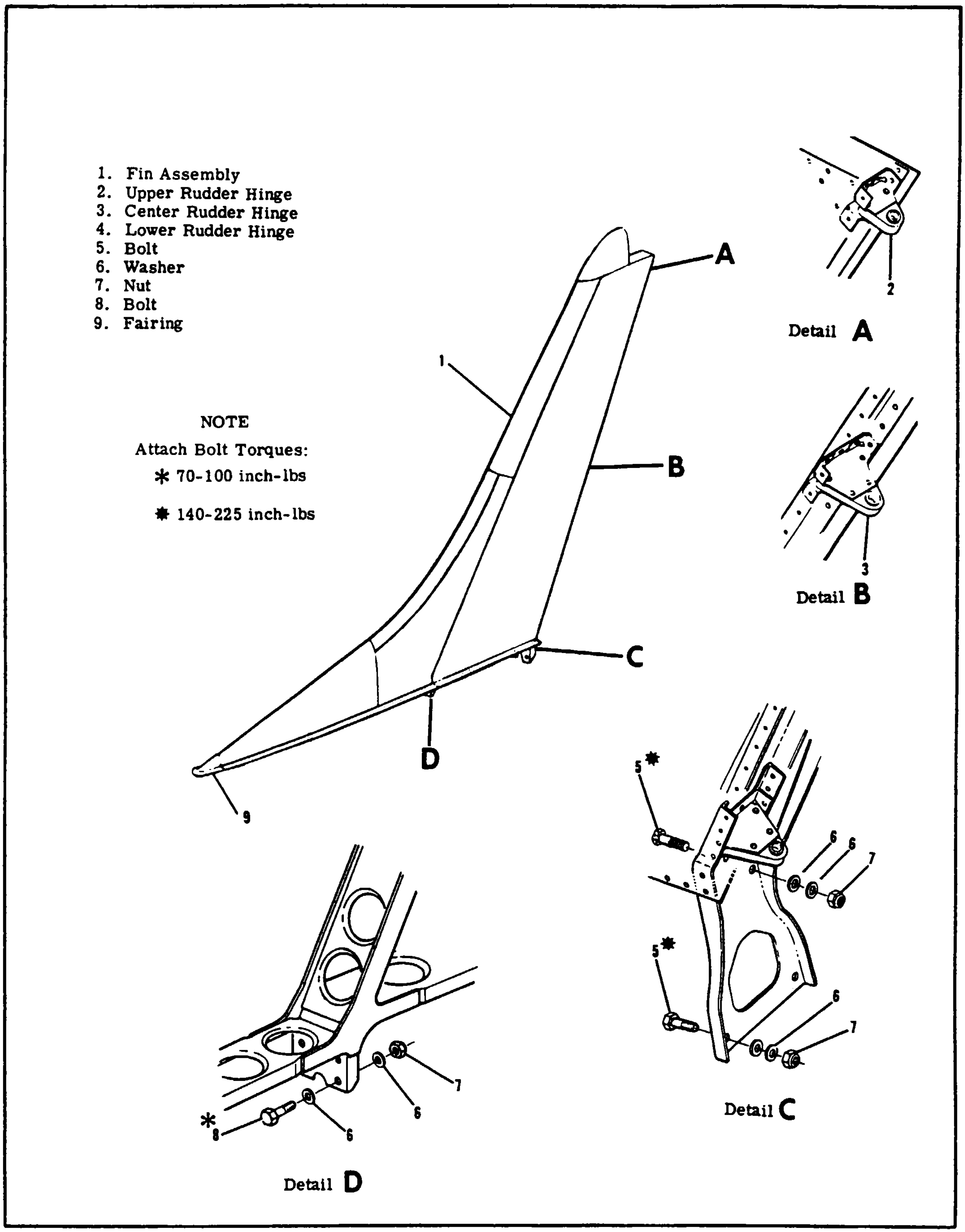
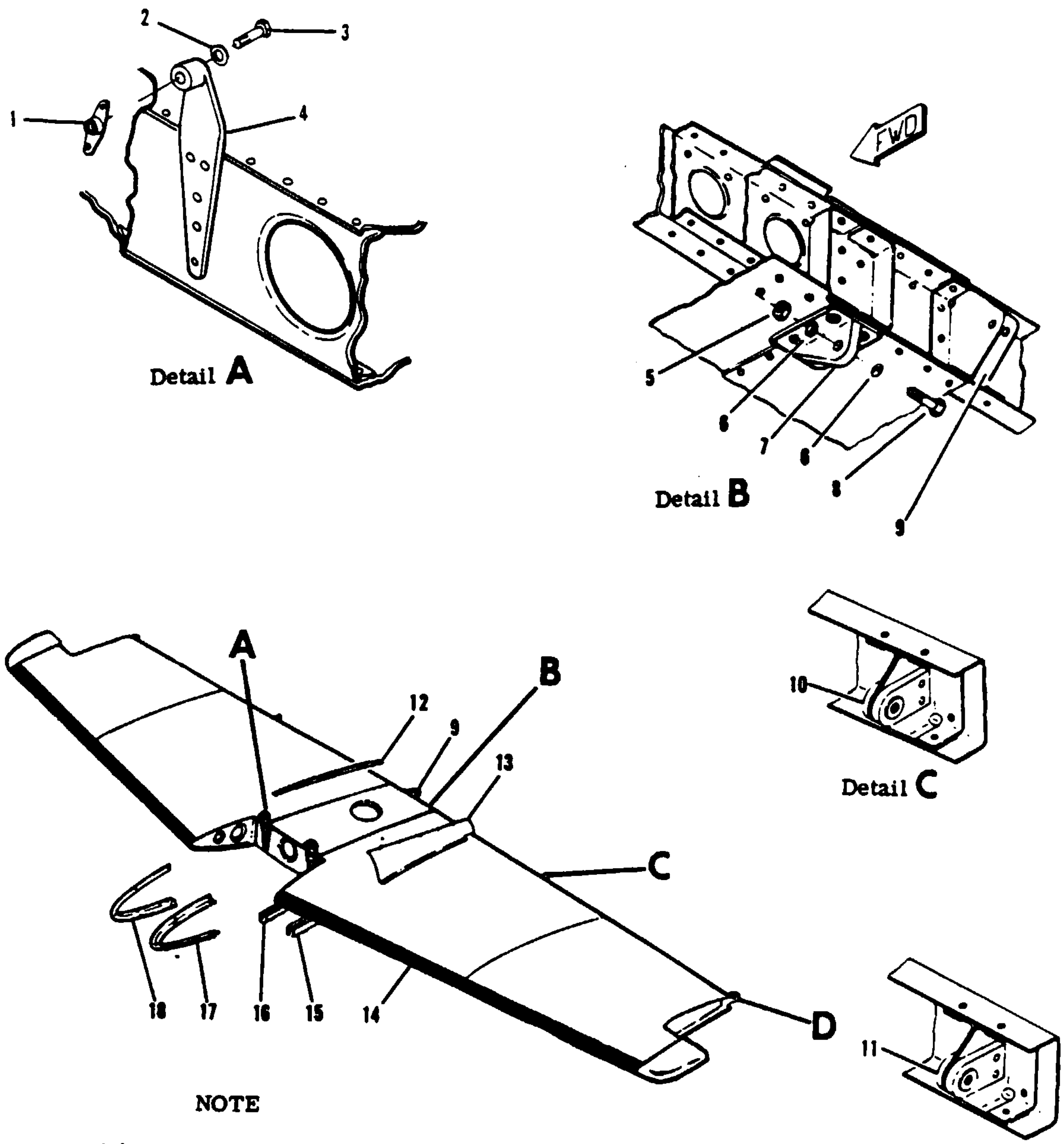


Figure 4-3. Vertical Fin



NOTE

A kit is available from the Cessna Service Parts Center for replacement of the abrasion boots.

1. Nutplate
2. Washer
3. Bolt
4. Bracket
5. Nut
6. Washer
7. Bracket
8. Bolt
9. Elevator Pylon Bracket
10. Elevator Inboard Hinge
11. Elevator Outboard Hinge
12. Upper Right Fairing
13. Upper Left Fairing
14. Abrasion Boot
15. Lower Left Moulding
16. Lower Right Moulding
17. Forward Left Fairing
18. Forward Right Fairing

Figure 4-4. Horizontal Stabilizer

SECTION 5
LANDING GEAR AND BRAKES

5-1. LANDING GEAR.

5-2. DESCRIPTION. These aircraft are equipped with non-retractable, tricycle landing gear, utilizing tubular spring-steel main landing gear struts. A bracket to attach a step to each strut is bonded to each strut. The main gear struts are enclosed by streamlined fairings. Wheel brake lines are routed through the fairings to each main wheel. Brake fairings and main wheel speed fairings are installed on these aircraft. Disc-type brakes and tube-type tires are installed on the axle at the lower end of the strut. The nose gear is a combination of a conventional air/oil (oleo) strut and fork, incorporating a shimmy dampener. The nose wheel is steerable with the rudder pedals up to a maximum pedal deflection, after which it becomes free-swiveling up to a maximum travel of 30 degrees right or left of center. Through use of the brakes, the aircraft can be pivoted about the outer wing strut fitting. A speed fairing is installed on the nose gear.

5-3. TROUBLE SHOOTING -- LANDING GEAR

TROUBLE	PROBABLE CAUSE	REMEDY
AIRCRAFT LEANS TO ONE SIDE.	Incorrect tire inflation.	Inflate to correct pressure.
	Loose or defective landing gear attaching parts.	Tighten or install new parts.
	Landing gear spring excessively sprung.	Install new landing gear spring strut.
	Bent axle(s).	Install new axle(s).
TIRES WEAR EXCESSIVELY.	Incorrect tire inflation.	Inflate to correct pressure.
	Wheels out of alignment.	Align wheels in accordance with paragraph 5-29.
	Landing gear spring excessively sprung.	Install new landing gear spring strut.
	Bent axle(s).	Install new axle(s).
	Dragging brakes.	Refer to paragraph 5-78.
	Loose or defective wheel bearings.	Install new bearings.
	Wheels out of balance.	Correct in accordance with paragraph 5-30.
WHEEL BOUNCE EVIDENT EVEN ON SMOOTH SURFACE.	Out of balance condition.	Correct in accordance with paragraph 5-30.

5-4. MAIN LANDING GEAR.

5-5. DESCRIPTION. The tubular, spring-steel main landing gear struts are attached to the aircraft at inboard and outboard forgings, located in the belly of the aircraft. A bracket is bonded to each strut for attachment of a step. Hydraulic brake lines are routed down the main gear struts. The axles, main wheels and brake assemblies are installed at the lower end of each strut.

5-6. MAIN GEAR STRUT REMOVAL. (See figure 5-1.)

NOTE

This procedure removes the landing gear as a complete assembly. Refer to applicable paragraph for removal of individual parts.

a. Remove floorboard access covers over inboard and outboard landing gear forgings (24) and (26).
b. Hoist or jack aircraft in accordance with procedures outlined in Section 2 of this manual.
c. Remove screws from fuselage fairing and slide down strut fairing for access to brake line.
d. Remove brake bleeder screw and drain hydraulic fluid from brake on gear being removed.
e. Disconnect brake line at fuselage fitting.
f. Remove snap ring (1) from strut-attaching pin (2).
g. Remove plug button (25) from belly of aircraft below gear forging.
h. Using a punch, drive attaching pin (2) upward out of inboard forging (26).
i. Pull strut outboard of forgings (24) and (26).

NOTE

To replace bushing from outboard forging (24), remove retaining ring at inboard end and slide bushing outboard from forging. (Refer to Section view A-A.)

5-7. MAIN GEAR STRUT INSTALLATION. (See figure 5-1.)

NOTE

The following procedure installs the landing gear as a complete assembly. Refer to applicable paragraphs for installation of individual components.

a. Install parts removed from strut.
b. Clean and polish machined surface on upper end of strut. Prime fitting (10) per note, if required.
c. Apply Universal Oil DYNAPLEX 21C REGULAR to unpainted area on upper end of strut.
d. Slide strut through bushing into inboard forging and align attaching pin holes.
e. Install attaching pin and snap ring.
f. Install access plates and plug button.
g. Remove caps or plugs and connect brake line.
h. Fill and bleed brake system in accordance with applicable paragraph.
i. Install fuselage fairing.
j. Reinstall carpet and seats.
k. Check wheel alignment.

5-8. STEP BRACKET. (See figure 5-3.)

NOTE

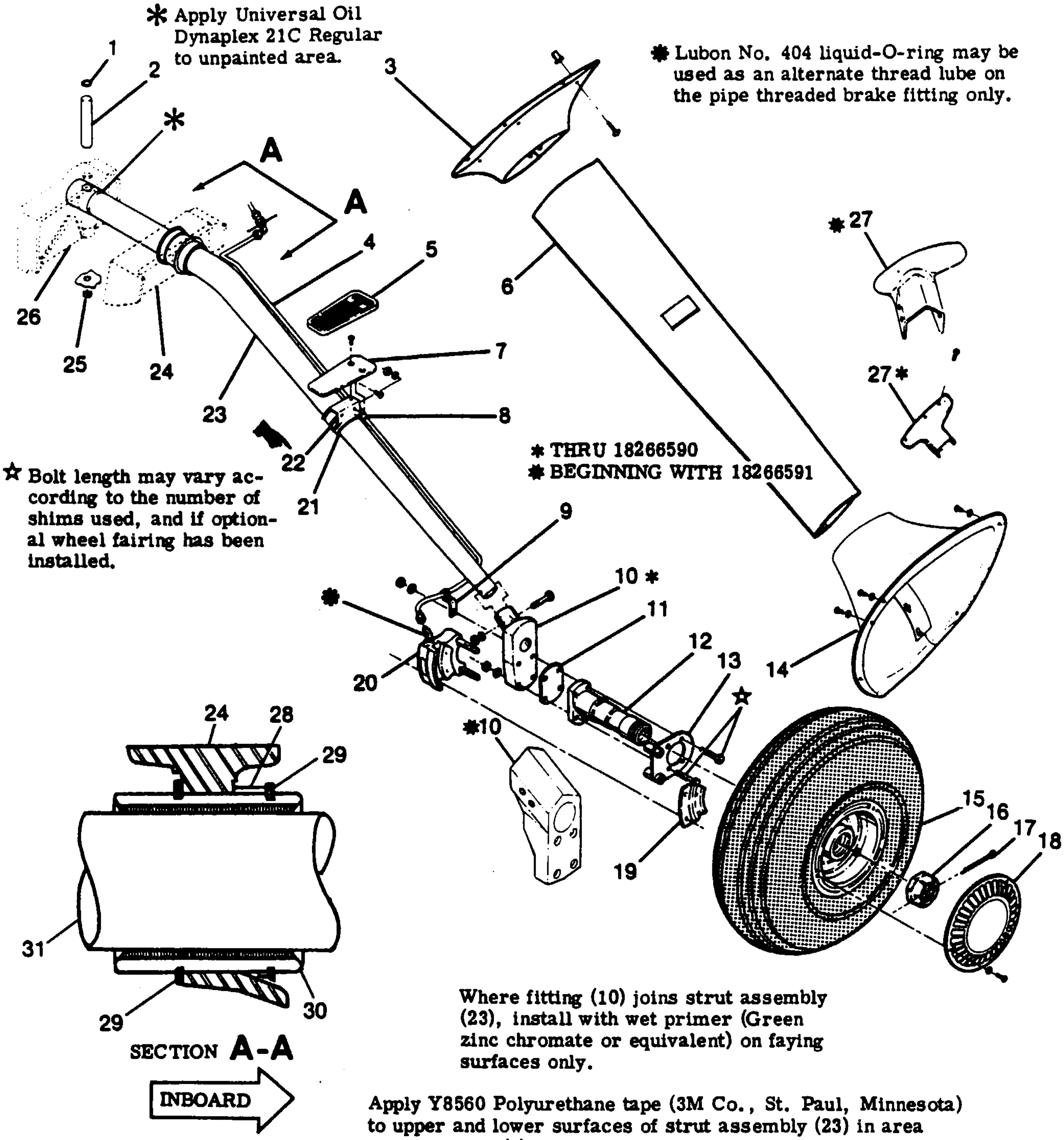
The step bracket is secured to the landing gear spring strut with EA9303, or a similar epoxy base adhesive.

a. Mark position of the bracket so that the new step bracket will be installed in approximately the same position on the strut.
b. Remove all traces of the original bracket and adhesive as well as any rust, paint or scale with a wire brush and coarse sandpaper.
c. Leave surfaces slightly roughened or abraded, but deep scratches or nicks should be avoided.
d. Clean surfaces to be bonded together thoroughly. If a solvent is used, remove all traces of the solvent with a clean, dry cloth. It is important that the bonding surfaces be clean and dry.
e. Check fit of step bracket on the strut. A small gap is permissible between bracket and strut.
f. Mix adhesive (EA9309) in accordance with manufacturer's directions.
g. Spread a coat of adhesive on bonding surfaces, and place step bracket in position on strut. Clamp bracket to ensure a good tight fit.
h. Form a small fillet of the adhesive at all edges of the bonded surfaces. Remove excess adhesive with lacquer thinner.
i. Allow the adhesive to cure thoroughly according to the manufacturer's recommendations before flexing the strut or applying loads to the step.
j. Paint the strut and step bracket after curing is completed.

5-9. LANDING GEAR FAIRINGS. (See figure 5-1.)

5-10. DESCRIPTION. The aircraft is equipped with fuselage fairings, attached to the fuselage and the tubular strut fairings with screws. The tubular strut fairings cover the tubular landing gear struts, and attach to the fuselage fairings at the upper end and to cover plates at the lower end. The cover plates attach to the tubular strut fairings at the upper end and are clamped to the tubular struts at the lower end. Brake fairings are installed at the lower end of the tubular strut fairings and are attached to the wheel speed fairings by screws around their outer perimeters. The speed fairings are installed over the wheels and are attached to mounting plates, attached to the axles. The wheel fairings are equipped with adjustable scrapers, installed in the lower aft part of the fairings, directly behind the wheels.

5-11. REMOVAL AND INSTALLATION OF MAIN GEAR FAIRINGS. (See figure 5-1.)
a. To remove brake fairing, proceed as follows:
1. Remove screws from perimeter of fairing.
2. Remove screws from nutplates holding two halves of fairing together; remove two fairing halves.
3. Reverse the preceding steps to install brake fairing.
b. To remove cover plates, proceed as follows:

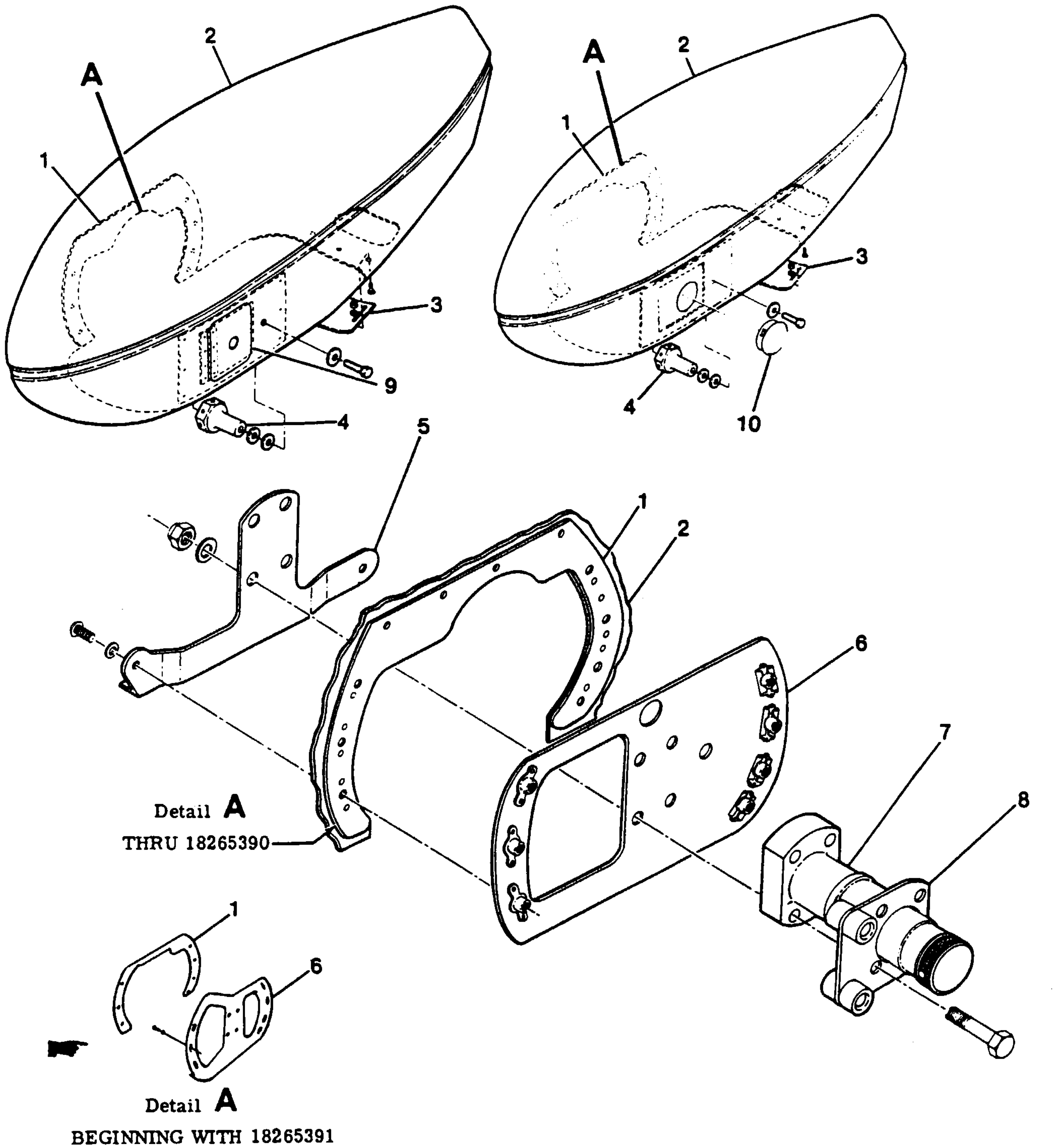


Where fitting (10) joins strut assembly (23), install with wet primer (Green zinc chromate or equivalent) on faying surfaces only.

Apply Y8560 Polyurethane tape (3M Co., St. Paul, Minnesota) to upper and lower surfaces of strut assembly (23) in area where fairing (6) will cause chafing.

1. Snap Ring
2. Strut-Attach Pin
3. Upper Fairing
4. Brake Line
5. Step Tread
6. Strut Fairing
7. Step Assembly
8. Hose
9. Bracket
10. Fitting
11. Shim
12. Axle
13. Torque Plate
14. Lower Fairing
15. Wheel Assembly
16. Axle Nut
17. Cotter Pin
18. Hub Cap
19. Back Plate
20. Brake Cylinder
21. Bracket
22. Sta-Strap
23. Strut Assembly
24. Outboard Forging
25. Plug Button
26. Inboard Forging
27. Cover Plate
28. Spacer
29. Retainer Ring
30. Bushing
31. Main Gear Spring

Figure 5-1. Main Landing Gear



1. Doubler
2. Speed Fairing
3. Scraper
4. Axle Nut
5. Stiffener
6. Mounting Plate
7. Axle
8. Torque Plate
9. Access Door
10. Plug Button

Figure 5-2. Main Landing Gear Fairing

1. Remove three screws attaching fairings to tubular strut fairing.
2. Remove bolt and nut attaching clamp to tubular spring-strut.
3. Spring clamp open to slide over tubular gear strut; remove cover plate.
4. Reverse the preceding steps to install cover plates.

c. To remove fuselage fairing, proceed as follows:
1. Remove screws attaching fairing to fuselage.
2. Remove screws at splice in fairing.
3. Work fairing off strut fairing.
4. Reverse the preceding steps to install fuselage fairing.

d. To remove tubular gear strut fairing, proceed as follows:
1. Remove brake fairing as outlined in step "a".
2. Remove cover plate as outlined in step "b".
3. Remove fuselage fairing as outlined in step "c".
4. Remove screws from nutplates on tubular gear strut fairing.
5. Spring fairing over tubular gear strut.
6. Reverse the preceding steps to install tubular gear strut fairing.

5-12. MAIN WHEEL SPEED FAIRING REMOVAL. (See figure 5-2.)

a. Remove wheel brake fairing (item 14, figure 5-1), by removing screws around perimeter of fairing, then by removing screws from nutplates holding two halves of brake fairing together.
b. Remove screws attaching stiffener (5) and inboard side of wheel speed fairing (2) to mounting plate (6), which is attached to the axle.
c. Remove bolt securing outboard side of fairing to axle nut.
d. Loosen scraper, if necessary, and work speed fairing from wheel.

5-13. MAIN WHEEL SPEED FAIRING INSTALLATION. (See figure 5-2.)

a. Work speed fairing down over wheel.
b. Install bolt securing outboard side of fairing to axle nut.
c. Install screws attaching stiffener (5) and inboard side of wheel speed fairing (2) to mounting plate (6), which is attached to the axle.
d. Install brake fairing (item 14, figure 5-1), by installing screws in nutplates holding two halves of brake fairing together, then installing screws around perimeter of fairing.
e. **After installation, check scraper-to-tire clearance for a minimum of 0.25-inch to a maximum of 0.50-inch. Elongated holes are provided in the scraper for clearance adjustments.**

CAUTION

Always check scraper-to-tire clearance after installing speed fairing, whenever a tire has been changed, and whenever scraper adjustment has been disturbed. If the aircraft is flown from surfaces with mud, snow, or ice, the speed fairing should be checked to make sure there is no accumulation which could prevent normal wheel rotation. Wipe fuel and oil from speed fairings to prevent stains and deterioration.

5-14. MAIN WHEEL AND TIRE ASSEMBLY. (See figure 5-4.)

5-15. DESCRIPTION. The aircraft may be equipped with either Cleveland or McCauley two piece wheel and tire assemblies, or, McCauley three piece (with hub and capscrews) wheel and tire assemblies. Separate disassembly, inspection and reassembly instructions are provided for each type.

5-16. REMOVAL.

NOTE

It is not necessary to remove the main wheel to reline the brakes or remove brake parts, other than the brake disc of the torque plate.

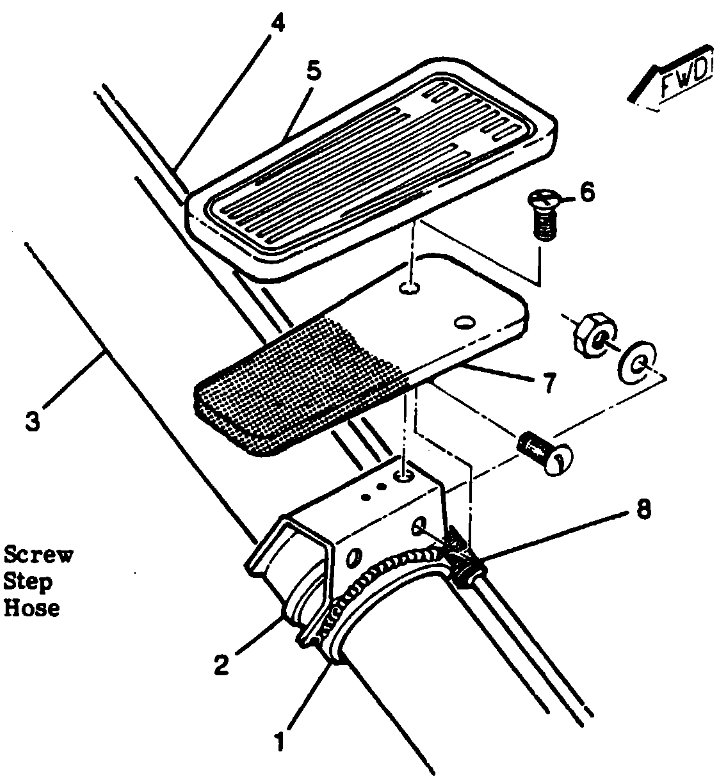
a. Using an individual jack pad, jack the wheel as outlined in Section 2.
b. Remove hub cap.
c. Remove cotter pin and axle nut.
d. Remove bolts and washers attaching back plate to brake assembly and remove back plate.
e. Pull wheel assembly from axle.

5-17. DISASSEMBLY OF CLEVELAND MAIN WHEEL AND TIRE ASSEMBLY. (See figure 5-4.)

a. Deflate tire and tube and break tire beads loose at wheel flanges.

NOTE

After installation of screw (6), cement entire forward half of step tread (5) to step (7) with EC1300 or equivalent. (Refer to shaded area.)



1. Step Support Assembly
2. Sta-Strap
3. Spring Strut
4. Brake Line
5. Step Tread
6. Screw
7. Step
8. Hose

Figure 5-3. Step Installation

CAUTION

Avoid damaging wheel flanges when breaking tire beads loose. A scratch, gouge or nick may cause wheel failure.

b. Remove thru-bolts and separate wheel halves, removing tire, tube and brake disc.
c. Remove grease seal rings, felts and bearing cones from wheel halves.

NOTE

Bearing cups are a press fit in the wheel halves and should not be removed unless new bearing cups are to be installed. To remove bearing cup, heat wheel half in boiling water for 15 minutes. Using an arbor press, if available, press out the bearing cup and press in new cup while wheel is still hot.

5-18. INSPECTION AND REPAIR OF CLEVELAND MAIN WHEEL AND TIRE ASSEMBLY. (See figure 5-4.)
a. Clean all metal parts and grease seal felts in cleaning solvent and dry thoroughly.
b. Inspect wheel halves for cracks. Cracked wheel halves must be rejected and new parts installed. Sand out nicks, gouges and corroded areas. When the protective coating has been removed, the area should be thoroughly cleaned, primed with zinc chromate and painted with aluminum lacquer.
c. Inspect brake discs in accordance with procedures outlined in paragraph 5-95.
d. Bearing cups and cones must be inspected carefully for damage and discoloration. After cleaning, pack bearing cone with clean aircraft wheel bearing grease before installation in the wheel half.

5-19. REASSEMBLY OF CLEVELAND MAIN WHEEL AND TIRE ASSEMBLY. (See figure 5-4.)
a. Insert thru-bolts through brake disc and position brake disc in the inner wheel half, using the thru-bolts to guide the disc. Assure that brake disc is seated in wheel half.
b. Insert tube in tire, aligning index marks on tire and tube.
c. Position tire and tube with inflation valve through hole in outboard wheel half. Place inner wheel half in position with thru-bolts in outboard wheel half. Apply light force to bring wheel halves together and assemble a washer and nut on thru-bolts. Tighten thru-bolts evenly to a torque of 90 lb in.

CAUTION

Uneven or improper torque of thru-bolt nuts may cause failure of bolts with resultant wheel failure.

d. Clean and repack wheel bearing cones with clean aircraft wheel bearing grease.
e. Assemble bearing cones, grease seal felts and rings into wheel halves.
f. Inflate tire to seat tire beads, then adjust pressure to amount specified in figure 1-1.

5-20. DISASSEMBLY OF McCAULEY MAIN WHEEL AND TIRE ASSEMBLY. (With hub and capscrews.) (See figure 5-4.)
a. Remove valve core and deflate tire and tube. Break tire beads loose from wheel flanges.

WARNING

Injury can result from attempting to remove wheel flanges with the tire and tube inflated. Avoid damaging wheel flanges when breaking tire beads loose. A scratch gouge or nick in wheel flanges could cause wheel failure.

b. Remove capscrews and washers.
c. Separate wheel flanges from wheel hub. Retain spacers between wheel flanges and wheel hub.
d. Remove wheel hub from tire and tube.
e. Remove retainer rings, grease seal retainers, grease seal felts and bearing cones from wheel hub.

NOTE

The bearing cups are a press fit in the wheel hub and should not be removed unless a new part is to be installed. To remove the bearing cup, heat wheel hub in boiling water for 30 minutes, or in an oven not to exceed 121°C (250°F). Using an arbor press, if available, press out bearing cup and press in new bearing cup while wheel hub is still hot.

5-21. INSPECTION AND REPAIR OF McCAULEY WHEEL AND TIRE ASSEMBLY. (With hub and capscrews.) (See figure 5-4.)
a. Clean all metal parts, grease seal felts and spacers in cleaning solvent and dry thoroughly.
b. Inspect wheel flanges and wheel hub for cracks. Discard cracked wheel flanges or hub and install new parts. Sand out nicks, gouges and corroded areas. When protective coating has been removed, clean the area thoroughly; prime with zinc chromate, and paint with aluminum lacquer.
c. Inspect brake discs in accordance with procedures outlined in paragraph 5-95.
d. Carefully inspect bearing cones and cups for damage and discoloration. After cleaning, pack bearing cones with clean aircraft wheel bearing grease (refer to Section 2) before installing in wheel hub.

5-22. REASSEMBLY OF McCAULEY MAIN WHEEL AND TIRE ASSEMBLY. (With hub and capscrews.)
a. Place wheel hub in tire and tube with tube inflation stem in cutout of wheel hub.
b. Place spacer and wheel flange on inboard side of wheel hub (opposite of tube inflation stem), then place washer under head of each capscrew and start capscrews into wheel hub threads.
c. Place spacer and wheel flange on other side and align valve stem in cutout in wheel flange.
d. Place washer under head of each capscrew and start capscrews into wheel hub threads.

CAUTION

Be sure that spacers and wheel flanges are seated on flange of wheel hub. Uneven or improper torque of capscrews can cause failure of capscrews, with resultant wheel failure.

e. Tighten capscrews evenly and torque to a value of 190-200 lb in.
f. Clean and pack bearing cones with clean aircraft wheel bearing grease. (Refer to Section 2 for grease type.)
g. Assemble bearing cones, grease seal felts and retainers into wheel hub.

CAUTION

Grease seal retainer (outboard) (4) and grease seal retainers (inboard) (12) are not interchangeable. The wheel hub will not mount on the axle if these parts are reversed.

Grease seal retainer (outboard) (2), grease seal felt (outboard) (3) and grease seal retainer (outboard) (4) are to be assembled in the hub on the side of the valve stem seat.

h. Inflate tire to seat tire beads, then adjust to correct tire pressure specified in figure 1-1.

5-23. DISASSEMBLY OF McCAULEY MAIN WHEEL AND TIRE ASSEMBLY. (Two-Piece Wheel.)
a. Completely deflate tire and tube and break loose tire beads. Extreme care must be exercised to prevent tire tool damage when removing tire from wheel halves (6).

WARNING

Serious injury can result from attempting to separate wheel halves with tire and tube inflated.

b. Remove nuts (10) and washers (9).
c. Remove thru-bolts (24) and washers (25).
d. Separate and remove wheel halves (6) from tire and tube.
e. Remove retaining rings (1), grease seal retainers (2) grease seal felts (3), grease seal retainers (4) and bearing cones (5) from both wheel halves (6).

NOTE

Bearing cups (races) (27) are a press fit in wheel halves (6), and should not be removed unless a new part is to be installed. To remove bearing cups, heat wheel half in boiling water for 30 minutes, or in an oven, not to excees 121°C (250°F). Using an arbor press, if available, press out bearing cup and press in a new bearing cup while wheel half is still hot.

5-24. INSPECTION AND REPAIR OF McCAULEY WHEEL AND TIRE ASSEMBLY. (Two-Piece Wheel.)

a. Clean all metal parts and grease seal felts in Stoddard solvent or equivalent, and dry thoroughly.

NOTE

A soft bristle brush may be used to remove hardened grease, dust or dirt.

b. Inspect wheel halves (6) for cracks or damage.
c. Inspect bearing cones (5), cups (27), retaining rings (1), grease seal retainers (2), grease seal felts (3) and grease seal retainers (4) for wear or damage.
d. Inspect thru-bolts (24) and nuts (10) for cracks in threads or cracks in radius under bolt head.
e. Replace cracked or damaged wheel half (6).
f. Replace damaged retainer rings (1) and seals (2), (3) and (4).
g. Replace worn or damaged bearing cups (27) and cones (5).
h. Replace any worn or cracked thru-bolts (24) or nuts (10).
i. Inspect brake discs in accordance with procedures outlined in paragraph 5-95.
j. Remove any corrosion or small nicks.
k. Repair reworked areas of wheel by cleaning thoroughly, then applying one coat of clear lacquer paint.
l. Pack bearings with grease specified in Section 2 of this manual.

5-25. REASSEMBLY OF McCAULEY MAIN WHEEL AND TIRE ASSEMBLY.) (Two-Piece Wheel.)

a. Assemble bearing cone (5), grease seal retainer (4), grease seal felt (3), grease seal retainer (2) and retaining ring (1) into each wheel half (6).
b. Insert tube in tire, aligning index marks on tire and tube.
c. Place wheel half (6) into tire and tube (side opposite valve stem), aligning base of valve stem in valve slot. With washer (25) under head of thru-bolt (24), insert bolt through wheel half (6).
d. Place wheel half (6) into other side of tire and tube, aligning valve stem in valve slot.
e. Insert washers (9) and nuts (10) on thru-bolts (24), and pre-torque to 10-15 lb. in.

CAUTION

Uneven or improper torque of the nuts can cause failure of the bolts with resultant wheel failure.

f. Prior to torquing nuts (10), inflate tube with approximately 10-15 psi air pressure to seat tire.

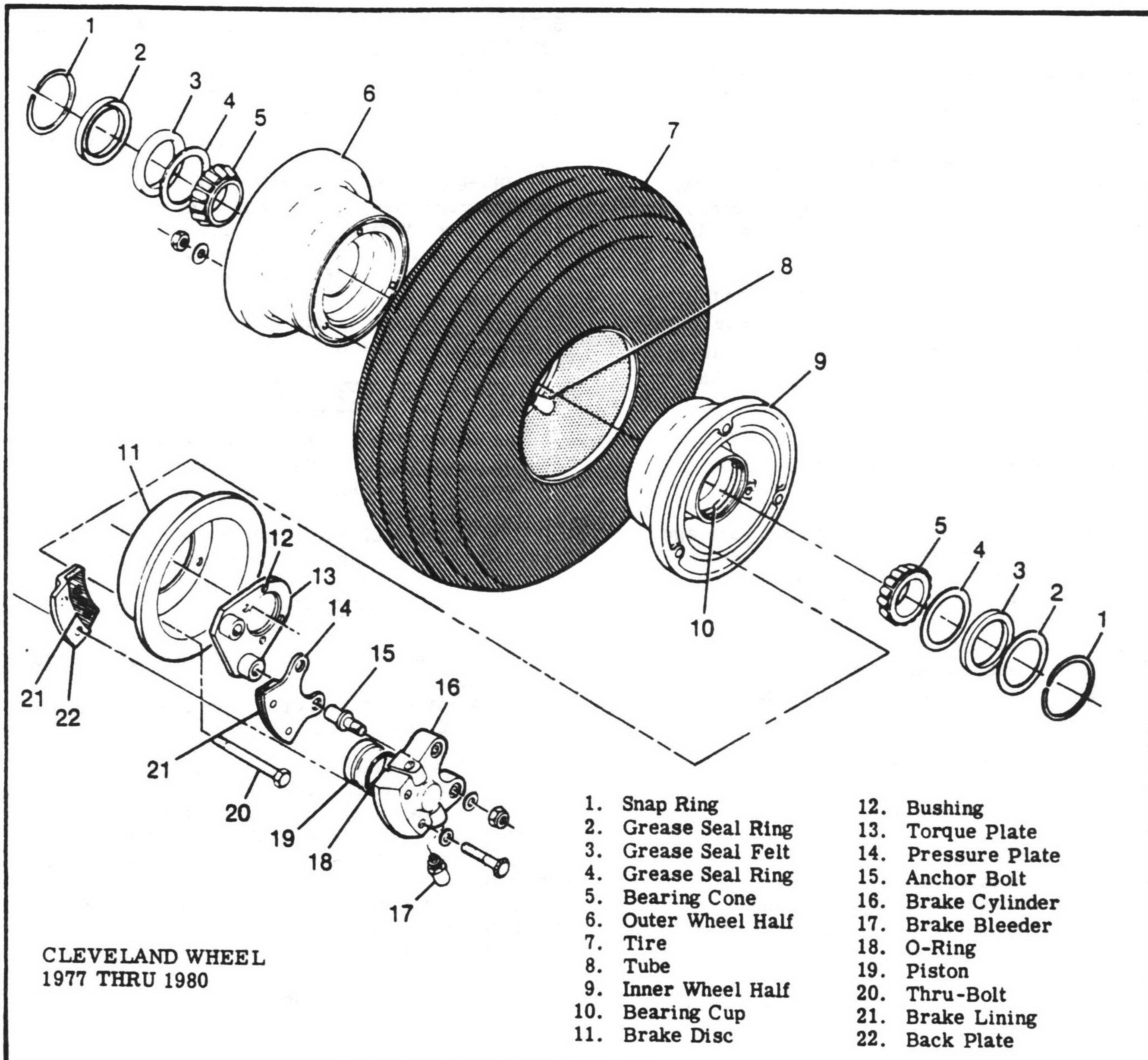
CAUTION

g. Dry torque all nuts (10) evenly to a torque value of 140-150 lb in.
h. Inflate tire to correct pressure specified in figure 1-1 of this manual.

5-26. INSTALLATION OF MAIN WHEEL

a. Place wheel assembly on axle.
b. Install axle nut and tighten axle nut until a slight bearing drag is obvious when the wheel is rotated. Back off axle nut to nearest castellation and install cotter pin.
c. Place brake back plate in position and secure with bolts and washers.
d. Install speed fairing as outlined in paragraph 5-13.
e. Remove jack and jack pad.

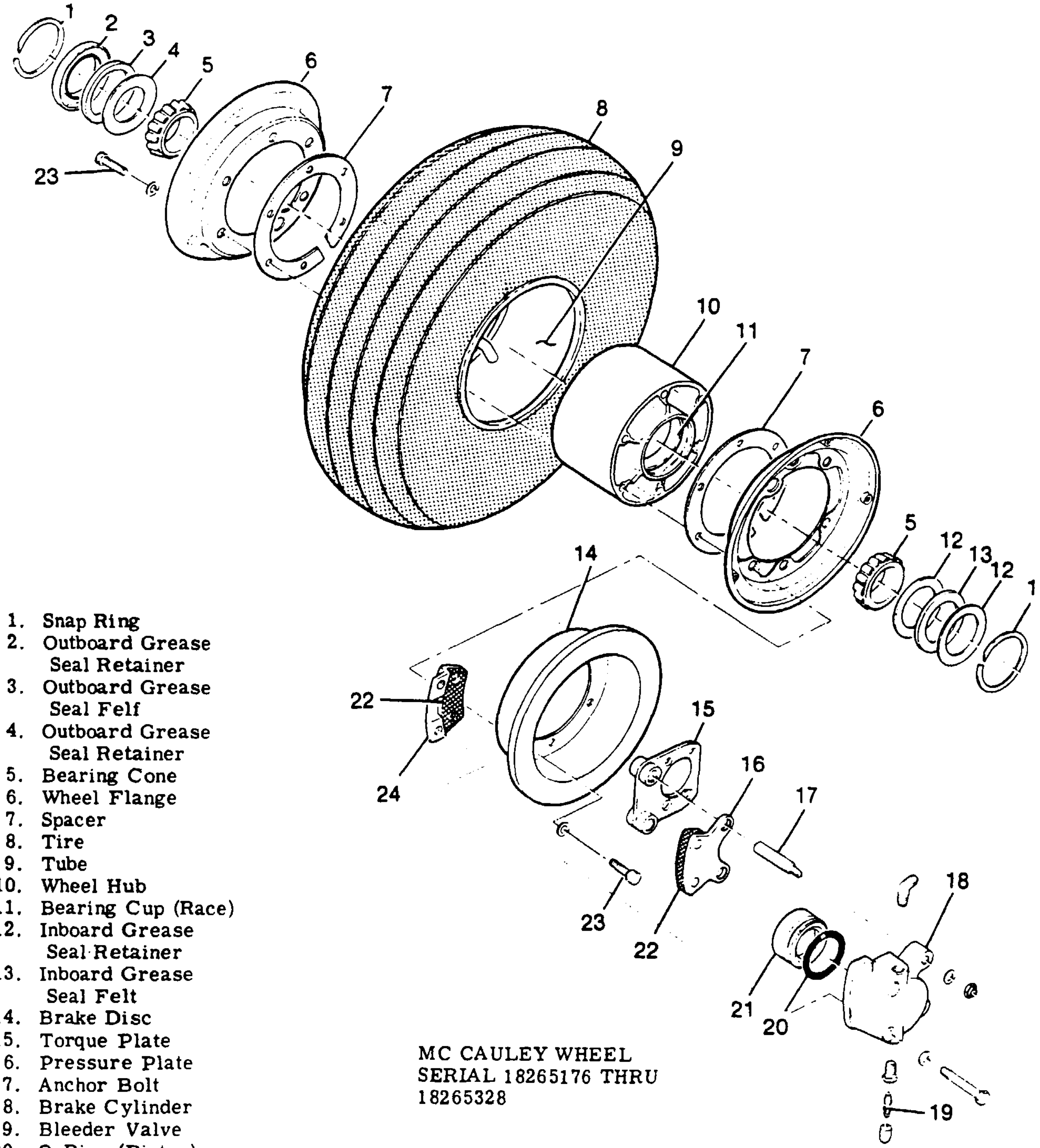
SHOP NOTES:



1. Snap Ring
2. Grease Seal Ring
3. Grease Seal Felt
4. Grease Seal Ring
5. Bearing Cone
6. Outer Wheel Half
7. Tire
8. Tube
9. Inner Wheel Half
10. Bearing Cup
11. Brake Disc
12. Bushing
13. Torque Plate
14. Pressure Plate
15. Anchor Bolt
16. Brake Cylinder
17. Brake Bleeder
18. O-Ring
19. Piston
20. Thru-Bolt
21. Brake Lining
22. Back Plate

Figure 5-4. Main Wheel and Brake Assembly (Sheet 1 of 4)

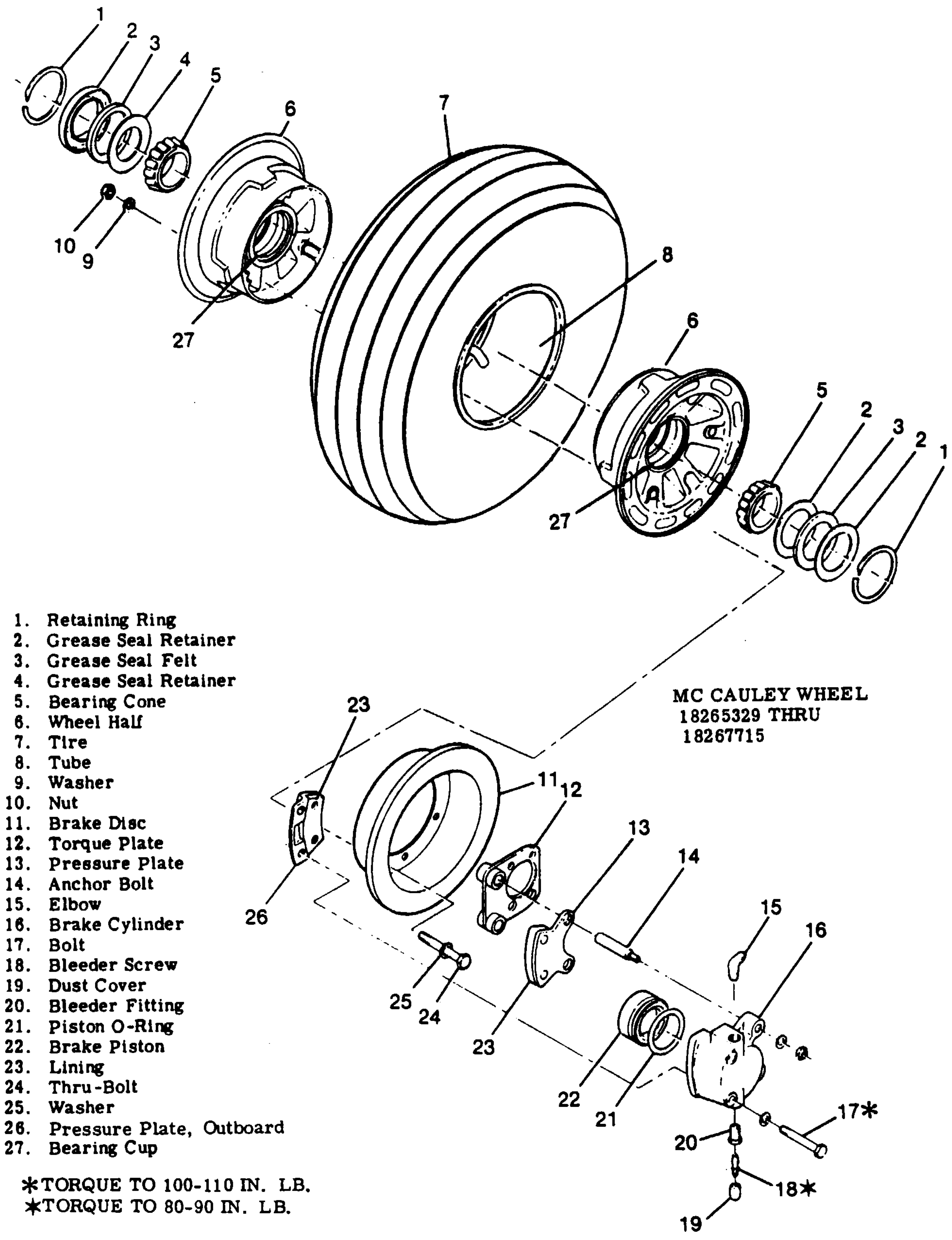
SHOP NOTES:



1. Snap Ring
2. Outboard Grease Seal Retainer
3. Outboard Grease Seal Felf
4. Outboard Grease Seal Retainer
5. Bearing Cone
6. Wheel Flange
7. Spacer
8. Tire
9. Tube
10. Wheel Hub
11. Bearing Cup (Race)
12. Inboard Grease Seal Retainer
13. Inboard Grease Seal Felt
14. Brake Disc
15. Torque Plate
16. Pressure Plate
17. Anchor Bolt
18. Brake Cylinder
19. Bleeder Valve
20. O-Ring (Piston)
21. Brake Piston
22. Brake Lining
23. Capscrew
24. Back Plate

MC CAULEY WHEEL
SERIAL 18265176 THRU
18265328

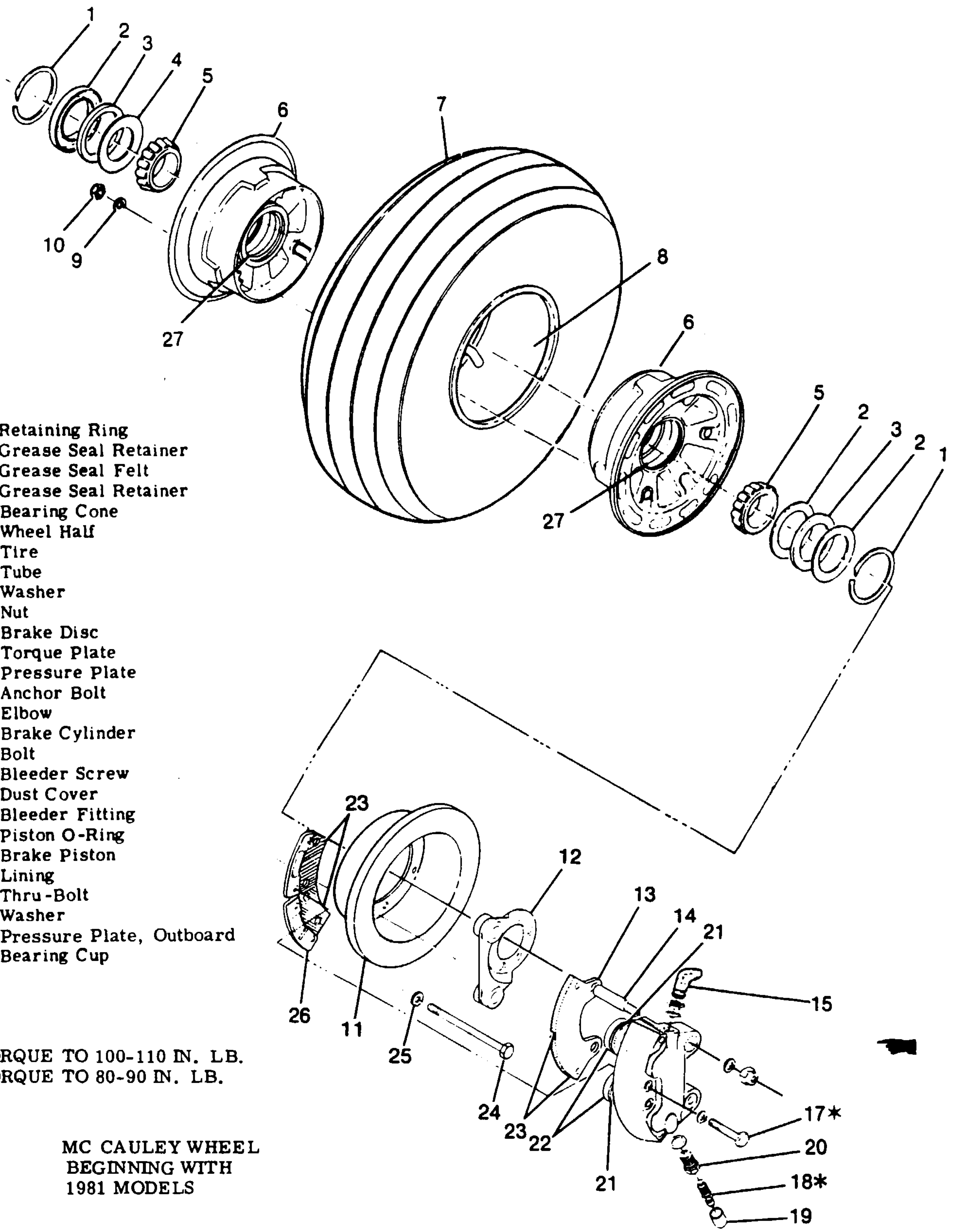
Figure 5-4. Main Wheel and Brake Assembly (Sheet 2 of 4)



1. Retaining Ring
2. Grease Seal Retainer
3. Grease Seal Felt
4. Grease Seal Retainer
5. Bearing Cone
6. Wheel Half
7. Tire
8. Tube
9. Washer
10. Nut
11. Brake Disc
12. Torque Plate
13. Pressure Plate
14. Anchor Bolt
15. Elbow
16. Brake Cylinder
17. Bolt
18. Bleeder Screw
19. Dust Cover
20. Bleeder Fitting
21. Piston O-Ring
22. Brake Piston
23. Lining
24. Thru-Bolt
25. Washer
26. Pressure Plate, Outboard
27. Bearing Cup

*TORQUE TO 100-110 IN. LB.
*TORQUE TO 80-90 IN. LB.

Figure 5-4. Main Wheel and Brake Assembly (Sheet 3 of 4)

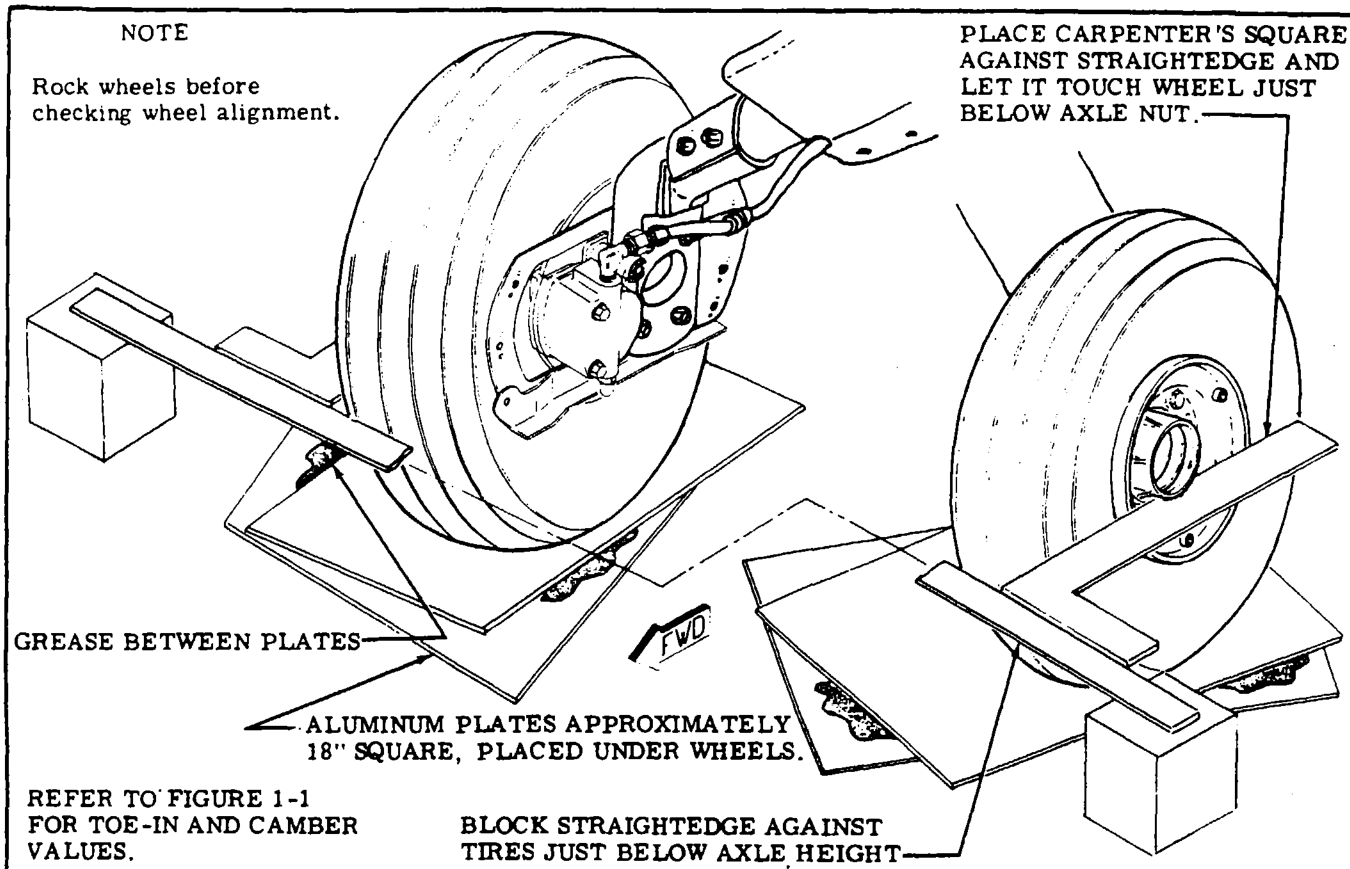


1. Retaining Ring
2. Grease Seal Retainer
3. Grease Seal Felt
4. Grease Seal Retainer
5. Bearing Cone
6. Wheel Half
7. Tire
8. Tube
9. Washer
10. Nut
11. Brake Disc
12. Torque Plate
13. Pressure Plate
14. Anchor Bolt
15. Elbow
16. Brake Cylinder
17. Bolt
18. Bleeder Screw
19. Dust Cover
20. Bleeder Fitting
21. Piston O-Ring
22. Brake Piston
23. Lining
24. Thru-Bolt
25. Washer
26. Pressure Plate, Outboard
27. Bearing Cup

* TORQUE TO 100-110 IN. LB.
* TORQUE TO 80-90 IN. LB.

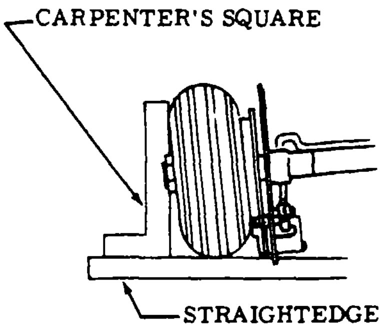
MC CAULEY WHEEL
BEGINNING WITH
1981 MODELS

Figure 5-4. Main Wheel and Brake Assembly (Sheet 4 of 4)



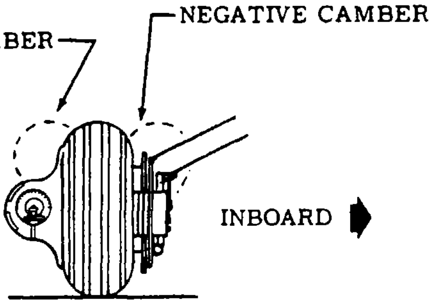
TOP VIEW OF TOE-IN CHECK

Measure toe-in at edges of wheel flange. Difference in measurements is toe-in for one wheel.



FRONT VIEW OF CAMBER CHECK

Measure camber by reading protractor level held vertically against outboard flanges of wheel.



NOTE

Setting toe-in and camber within these tolerances while the cabin and fuel tanks are empty will give approximately zero toe-in and zero camber at gross weight. Ideal setting is zero toe-in and zero camber at normal operating weight. Therefore, if normally operated at less than gross weight and abnormal tire wear occurs, realign the wheels to attain the ideal setting for the load conditions under which the aircraft normally operates. Refer to the following page for shims available and their usage. Always use the least number of shims possible to obtain the desired result.

Figure 5-5. Main Wheel Alignment (Sheet 1 of 2)

SHIM CHART

SHIM PART NO.	POSITION OF THICKEST CORNER OR EDGE OF SHIM	CORRECTION IMPOSED ON WHEEL			
		TOE-IN	TOE-OUT	POS. CAMBER	NEG. CAMBER
0541157-1	AFT FWD	.063" ----	---- .063"	0°4' ----	---- 0°4'
0541157-2	UP DOWN	---- .008"	.008" ----	0°28' ----	---- 0°28'
1241061-1	UP & FWD UP & AFT DOWN & FWD DOWN & AFT	---- .028" ---- .006"	.006" ---- .028" ----	2°44' 2°46' ---- ----	---- ---- 2°46' 2°44'
0441139-5	UP & FWD UP & AFT DOWN & FWD DOWN & AFT	---- .117" ---- .125"	.125" ---- .117" ----	0°10' 0°25' ---- ----	---- ---- 0°25' 0°10'
0441139-6	UP & FWD UP & AFT DOWN & FWD DOWN & AFT	---- .235" ---- .253"	.253" ---- .235" ----	0°21' 0°51' ---- ----	---- ---- 0°51' 0°21'
0541157-3	AFT FWD	.12" ----	---- .12"	---- 0°7'	0°7' ----

SHIM NO.	1241061-1	0441139-6	0441139-5	0541157-2	0541157-1	0541157-3
1241061-1	0	0	0	0	0	0
0441139-6	0	0	0	1	1	0
0441139-5	0	0	1	1	2	0
0541157-2	0	1	1	2	2	0
0541157-1	0	1	1	2	2	0
0541157-3	0	0	1	2	1	0
SHIM NO.	Max. number of shims to be used with shims in column 1.					
COLUMN 1	COLUMN 2					

Figure 5-5. Main Wheel Alignment (Sheet 2 of 2)

CAUTION

Always check scraper-to-tire clearance after installing speed fairings, whenever a tire has been changed, and whenever scraper adjustment has been disturbed. If the aircraft is flown from surfaces with mud, snow, or ice, the fairing should be checked to make sure there is no accumulation which could prevent normal wheel rotation. Refer to paragraph 5-13 for correct scraper-to-tire clearance.

5-27. REMOVAL OF MAIN WHEEL AXLE.

a. Remove speed fairing in accordance with paragraph 5-12.

b. Remove wheel in accordance with paragraph 5-16.

c. Disconnect, drain, and plug or cap hydraulic brake line at the wheel brake cylinder.

d. Remove nuts, washers and bolts securing axle, brake components and speed fairing mounting plate to strut-attach fitting.

NOTE

When removing axle from strut-attach fitting, note number and position of wheel alignment shims between axle and attach fitting. Mark shims or tape together carefully so they can be installed in exactly the same position to ensure wheel alignment is not disturbed.

5-28. INSTALLATION OF MAIN WHEEL AXLE.

a. Secure axle and brake components to strut-attach fitting, assuring that wheel alignment shims and speed fairing mounting plate are installed in their original positions.

b. Install wheel assembly on axle in accordance with paragraph 5-26.

c. Connect hydraulic brake line to wheel brake cylinder.

d. Fill and bleed affected brake system in accordance with applicable paragraph in this Section.

e. Install speed fairing in accordance with paragraph 5-13.

5-29. MAIN WHEEL ALIGNMENT. Correct main wheel alignment is obtained through the use of tapered shims between the flange of the axle and spring-strut. See figure 5-5 for procedures to follow in wheel alignment. Wheel shims and the correction imposed on the wheel by the shims are listed in the illustration.

NOTE

Failure to obtain acceptable wheel alignment through the use of the shims indicate a deformed main gear spring-strut or strut attaching bulkhead out of alignment.

5-30. WHEEL BALANCING. Since uneven tire wear is usually the cause of wheel unbalance, replacing the tire will probably correct this condition. Tire and tube manufacturing tolerances permit a specified amount of static unbalance. The light-weight point of the tire is marked with a red dot on the tire sidewall and the heavy-weight point of the tube is marked with a contrasting color line (usually near the inflation valve stem). When installing a new tire, place these marks adjacent to each other. If a wheel becomes unbalanced during service, it may be statically balanced. Wheel balancing equipment is available from the Cessna Supply Division.

5-31. NOSE GEAR. (See figures 5-6 and 5-10.)

5-32. DESCRIPTION. Basically, the nose gear is comprised of a steerable nose wheel, mounted in a fork, attached to an air/oil (oleo shock strut. On the Model 182, the shock strut is attached to the firwall with upper and lower strut fittings. On the Model T182, the steering bellcrank is attached to a bracket on the firewall, the trunnion is attached to brackets in the wheel tunnel area, and the drag link is attached to a forged fitting in the aft tunnel at Station 17.0.

SHOP NOTES:

5-33. TROUBLE SHOOTING -- NOSE GEAR

TROUBLE	PROBABLE CAUSE	REMEDY
TIRES WEAR EXCESSIVELY.	Loose nose gear torque links.	Check looseness and add shims as required or install new parts. (Refer to paragraph 5-56.)
NOSE WHEEL SHIMMY. (Also refer to Service Letter SE84-21.)	Nose gear strut attaching clamps loose.	Tighten nose gear strut attaching clamp bolts.
	Shimmy dampener needs fluid.	Service in accordance with Section 2.
	Defective shimmy dampener.	Repair or install new shimmy dampener.
	Loose or worn nose wheel steering linkage.	Tighten loose linkage or replace defective parts.
HYDRAULIC FLUID LEAKAGE FROM NOSE GEAR STRUT.	Defective nose gear strut seals or defective parts.	Overhaul strut in accordance with paragraphs 5-44 thru 5-50.
NOSE GEAR STRUT WILL NOT HOLD AIR PRESSURE.	Defective air filler valve or valve not tight.	Check gasket and tighten loose valve. Install new valve if defective.
	Defective nose gear strut seals.	Overhaul strut in accordance with paragraphs 5-44 thru 5-50.

5-34. NOSE GEAR REMOVAL (MODEL 182.) (See figure 5-6.)

a. Remove cowling for access.
b. Weight or tie down tail of aircraft to raise nose wheel off the floor.
c. Disconnect bungee and shimmy dampener from nose gear.
d. Remove air filler valve core and deflate strut completely and telescope strut to its shortest length.

WARNING

Be sure the strut is deflated completely before removing bolt at top of strut.

e. Remove bolt through upper forging and strut.
f. Either of two methods may be used to remove the strut from the aircraft. The following procedure outlines the removal of the nose gear strut along with the lower forging at the fuselage.
  1. Remove four bolts attaching lower forging to fuselage. Remove rudder bar shields from inside the cabin for access to the nuts.
  2. Pull strut assembly down, out of upper forging, to remove.

NOTE

An alternate method for strut removal is to remove and disconnect parts as required to slide the strut down through the lower forging, leaving the forging attached to the fuselage.

5-35. NOSE GEAR INSTALLATION (MODEL 182.) (See figure 5-6.)

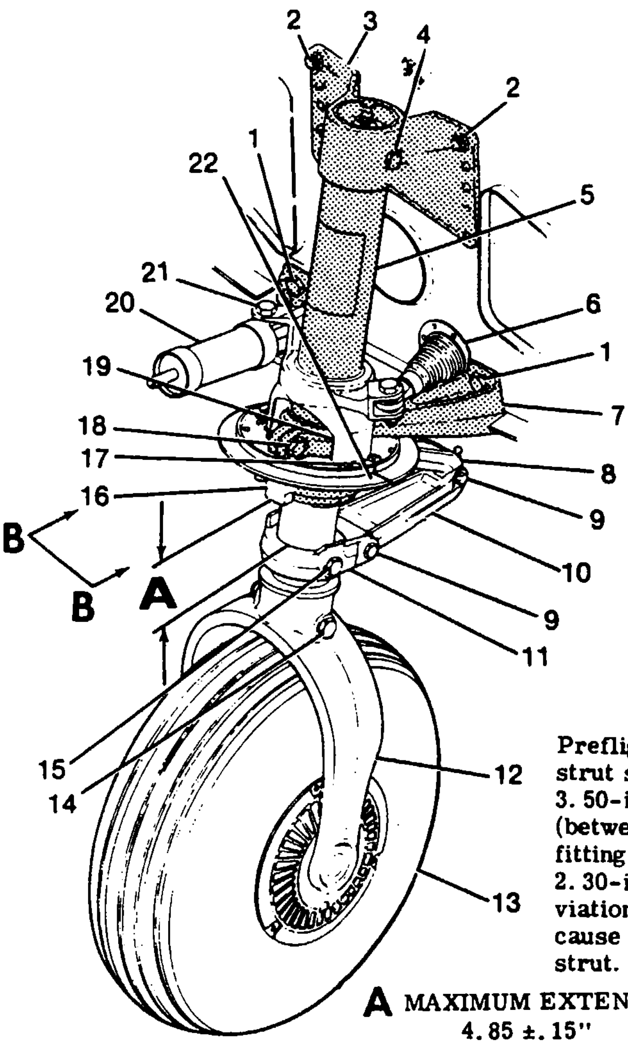
NOTE

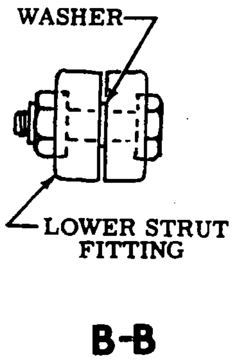
If the alternate method of removal was used (described in the note in the preceding paragraph) reversal of removal procedures will have to be followed.

a. Install strut up, through upper firewall attached forging.
b. Install four bolts attaching lower forging to fuselage.
c. Install rudder bar shields inside cabin after tightening nuts on bolts attaching lower forging.
d. Install bolt through upper forging and strut.
e. Install air filler valve core and inflate strut to value specified in figure 1-1 of this manual.
f. Check that washer is in lower strut fitting (refer to detail B-B). Tighten nut to bolt and torque to 140-225 lb in.
g. Reconnect bungee and shimmy dampener to nose gear.
h. Lower aircraft to ground and install cowling.

NOTE

Unshaded parts of the nose gear turn as the nose gear steering system is operated on the ground, but do not turn while airborne. As the lower strut extends, a centering block on the upper torque link contacts a flat spot on the bottom end of the upper strut, thus keeping the lower strut and wheel from turning.





NOTE

Preflight inspection of nose gear strut should reveal 1.75-inch to 3.50-inch of nose strut barrel (between torque link attachment fittings)showing (or approximately 2.30-inch after bouncing). Deviation from these dimensions are cause to check and service the strut.

1. Bolt
2. Bolt
3. Upper Forging
4. Bolt
5. Upper Strut
6. Steering Bungee
7. Lower Forging
8. Upper Torque Link
9. Bolt
10. Lower Torque Link
11. Torque Link Fitting
12. Nose Gear Fork
13. Wheel and Tire
14. Bolt
15. Bolt
16. Steering Collar
17. Screw
18. Bolt
19. Steering Torque Arm
20. Shimmy Dampener
21. Bolt
22. Closure Assembly

Figure 5-6. Nose Gear Installation (Model 182)

5-36. NOSE WHEEL SPEED FAIRING REMOVAL. (MODEL 182) (See figure 5-7.)

a. Weight or tie down tail of aircraft to raise nose wheel off floor.

b. Remove nose wheel axle stud.

c. Remove bolt securing cover plate and fairing to strut; remove cover plate.

WARNING

Do not remove bolt attaching tow bar spacers, unless strut has been completely deflated.

d. Slide speed fairing up and remove nose wheel. Loosen scraper if necessary.

e. Rotate speed fairing 90 degrees and work fairing down over the fork to remove.

5-37. NOSE WHEEL SPEED FAIRING INSTALLATION. (MODEL 182) (See figure 5-7.)

a. Rotate speed fairing 90 degrees and work fairing up over the fork; rotate fairing to correct position.

b. Slide fairing to correct position.

c. Tighten axle stud until a slight bearing drag is obvious when the wheel is rotated. Back off nut to the nearest castellation, and install cotter pins.

d. If shock strut was deflated, service after installation has been completed. Refer to servicing instructions in Section 2.

e. Adjust wheel scraper clearance in accordance with the following caution.

CAUTION

Always check scraper clearance after installing speed fairing, whenever a tire has been changed, and whenever scraper adjustment has been disturbed. Set clearance between tire and scraper for a minimum of 0.25-inch to a maximum of 0.50-inch. Elongated holes in the scraper are provided for adjustment. If the aircraft is flown from surfaces with mud, snow, or ice, the speed fairings should be checked to make sure there is no accumulation which could prevent normal wheel rotation. Wipe fuel and oil from speed fairing to prevent staining and deterioration of the fairing.

5-37A. NOSE WHEEL SPEED FAIRING REMOVAL. (MODEL T182.) (See figure 5-7.)

WARNING

Nose wheel fairing cover plate (3) is secured by the lower torque link attaching bolt. Maintain weight of airplane on nose gear while removing this bolt and cover plate.

a. Remove bolt securing cover plate (3) and fairing (1) to strut and remove cover plate. Reinstall torque link attach bolt.

b. Weight or tie down tail of airplane to raise nose wheel off the floor.

c. Remove nose wheel axle stud (6).

WARNING

Bolt (4) securing tow bar spacers (2) also holds strut cylinder base plug retaining spacer in place. Ensure spacer does not disengage from strut when removing bolt (4).

d. Remove bolt (4) securing speed fairing (1) and tow bar spacers (2) to strut.

e. Slide speed fairing up and remove nose wheel. Loosen scraper as necessary.

f. Rotate speed fairing 90 degrees and work fairing down over the fork to remove.

5-37. NOSE WHEEL SPEED FAIRING INSTALLATION. (MODEL T182) (See figure 5-7.)

a. Rotate speed fairing 90 degrees and work fairing up over nose gear fork to install.

b. Slide fairing up and install nose wheel; install axle stud (6).

c. Tighten axle stud nut until a slight bearing drag is obvious when the wheel is rotated. Back off nut to the nearest castellation, and install cotter pins.

d. Install bolt (4), tow bar spacers (2), washers, and nut attaching fairing to strut.

e. Adjust wheel scraper clearance in accordance with the following caution.

CAUTION

Always check scraper clearance after installing speed fairing, whenever a tire has been

SHOP NOTES:

changed, and whenever scraper adjustment has been disturbed. Set clearance between tire and scraper for a minimum of 0.25-inch to a maximum of 0.50-inch. Elongated holes are provided in the scraper for adjustment. If the airplane is flown from surfaces with mud, snow, or ice, the speed fairing should be checked to make sure there is no accumulation which could prevent normal wheel rotation. Wipe fuel and oil from speed fairing to prevent stains and deterioration.

f. Lower nose of airplane to floor.
g. Install cover plate and bolt attaching cover plate to strut.

5-38. NOSE WHEEL REMOVAL. (See figure 5-6.)
a. Weight or tie down tail of aircraft to raise the nose wheel off the floor.
b. Remove axle stud.
c. Pull nose wheel assembly from fork and remove axle tube from nose wheel.

NOTE

It may be necessary to loosen nose wheel fairing scraper to remove nose wheel.

5-39. NOSE WHEEL DISASSEMBLY. (See figure 5-8.)

WARNING

Serious injury can result from attempting to separate wheel halves with tire and tube inflated.

a. Completely deflate tire and tube and break loose tire beads. Extreme care must be exercised to prevent tire tool damage when removing tire from wheel halves (6).
b. Remove nuts (4) and washers (5).
c. Remove thru-bolts (8) and washers (5).
d. Separate and remove wheel halves (6) from tire and tube.
e. Remove retaining ring (1), grease seal retainer (2), felt grease seal (3), grease retainer (2) and bearing cone (9) from each wheel half (6).

NOTE

Bearing cups (races) (7) are a press fit in wheel half (6) and should not be removed unless a new part is to be installed. To remove bearing cups, heat wheel half in boiling water for 30 minutes, or in an oven, not to exceed 121°C (250°F). Using an arbor press, if available, press out bearing cup and press in a new bearing cup while wheel half is still hot.

5-40. NOSE WHEEL INSPECTION AND REPAIR. (See figure 5-8.)
a. Clean all metal parts and felt grease seals in Stoddard solvent or equivalent, and dry thoroughly.

NOTE

A soft bristle brush may be used remove hardened grease, dust or dirt.

b. Inspect wheel halves (6) for cracks or damage.
c. Inspect bearing cones (9), cups (7), retaining rings (1) and seals (2 and 3), for wear or damage.
d. Inspect thru-bolts (8) and nuts (4) for cracks in threads or cracks in radius.
e. Replace cracked or damaged wheel half (6).
f. Replace damaged retaining rings (1) and seals (2 and 3).
g. Replace any worn or cracked thru-bolts (8) or nuts (4).
h. Replace worn or damaged bearing cups (7) or cones (9).
i. Remove any corrosion or small nicks.
j. Repair reworked areas of wheel by cleaning thoroughly, then applying one coat of clear lacquer paint.
k. Pack bearings with grease specified in Section 2 of this manual.

5-41. NOSE WHEEL REASSEMBLY. (See figure 5-8.)
a. Assemble bearing cone (9), grease seal retainer (2), felt grease seal (3), grease seal retainer (2) and retaining ring (1) into both wheel halves (6).
b. Insert tube in tire, aligning index marks on tire and tube.
c. Place wheel half (6) into tire and tube (side opposite valve stem), aligning base of valve stem in valve slot. With washer (5) under head of thru-bolt (8), insert bolt through wheel half (6).
d. Place wheel half (6) into other side of tire and tube, aligning valve stem in valve slot.
e. Install washers (5) and nuts (4) on thru-bolts (8) and pre-torque to 10-50 lb. in.

CAUTION

Uneven or improper torque of the nuts can cause failure of the bolts with resultant wheel failure.

f. Prior to torquing nuts (4), inflate tube with approximately 10-15 psi air pressure to seat tire.

CAUTION

Do not use impact wrenches on thru-bolts or nuts.

g. Dry torque all nuts (4) evenly to the torque value specified in the figure.
h. Inflate tire to correct pressure specified in figure 1-1 of this manual.

5-42. NOSE WHEEL INSTALLATION. (See figure 5-6.)
a. Install axle tube in nose wheel.
b. Install nose wheel assembly in fork and install nose wheel axle stud.
c. Tighten axle stud nut until a slight bearing drag is obvious when the wheel is rotated. Back nut off to

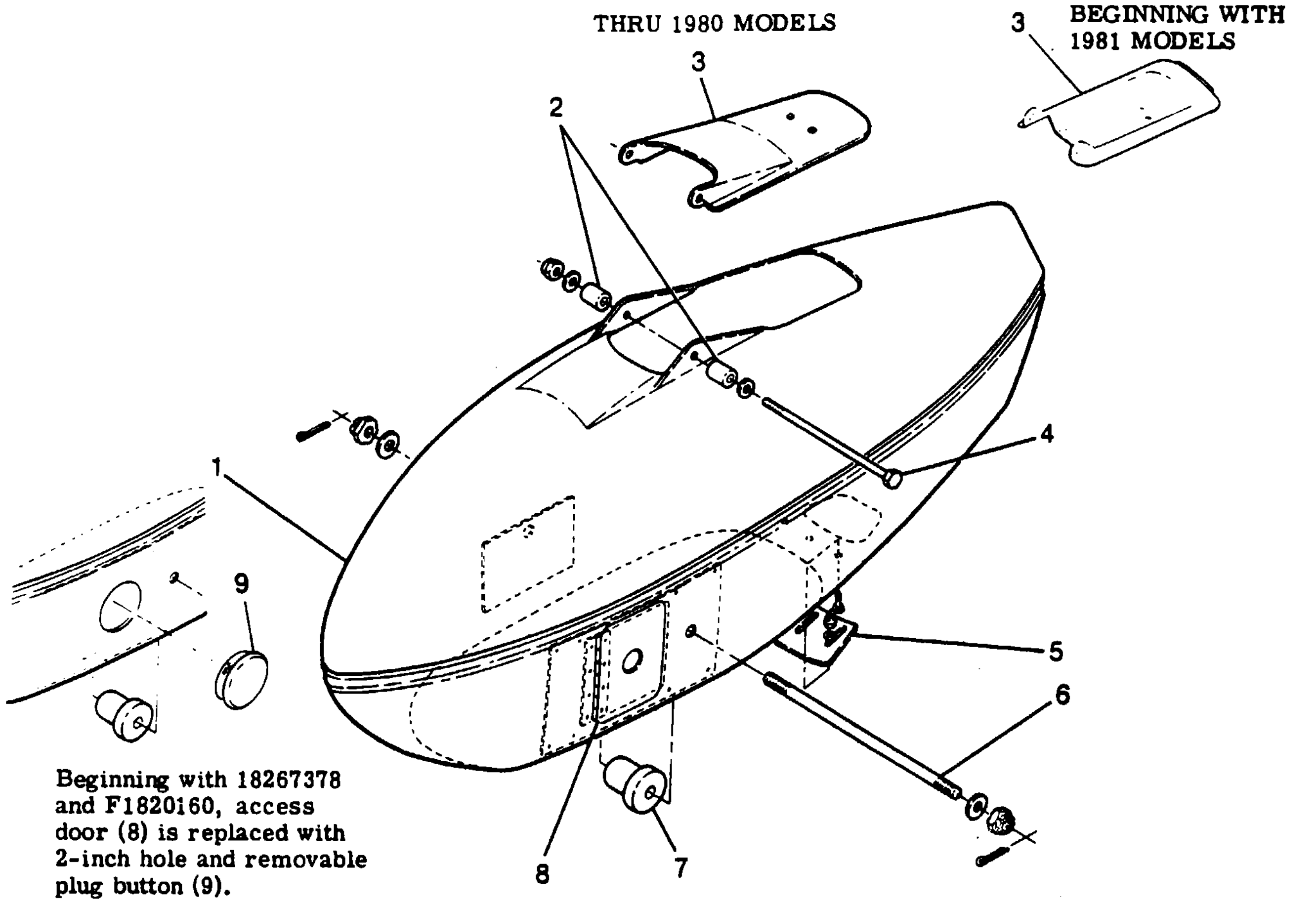


Figure 5-7. Nose Wheel Speed Fairing

the nearest castellation and insert cotter pins.

CAUTION

On aircraft equipped with speed fairings, always check scraper-to-tire clearance after installing speed fairing, whenever a tire has been changed or whenever scraper clearance has been disturbed. Set scraper clearance in accordance with dimensions given in paragraph 5-13.

5-43. WHEEL BALANCING. Since uneven tire wear is usually the cause of wheel unbalance, replacing the tire will probably correct this condition. Tire and tube manufacturing tolerances permit a specified amount of static unbalance. The light-weight point of the tire is marked with a red dot on the tire sidewall, and the heavy-weight point of the tube is marked with a contrasting color line (usually near the inflation valve stem). When installing a new tire, place these marks adjacent to each other. If a wheel shows evidence of unbalance during service, it may be statically balanced. Wheel balancing equipment is available from the Cessna Supply Division.

5-44. NOSE GEAR SHOCK STRUT DISASSEMBLY. (MODEL 182.) (See figure 5-9.)

NOTE

The following procedures apply to the nose gear shock strut after it has been removed from the aircraft and the speed fairing and the nose wheel have been removed. In many cases, separation of the upper and lower strut will permit inspection and parts installation without removal or complete disassembly of the strut.

WARNING

Be sure strut is completely deflated before removing lock ring in lower end of upper strut, or disconnecting torque links.

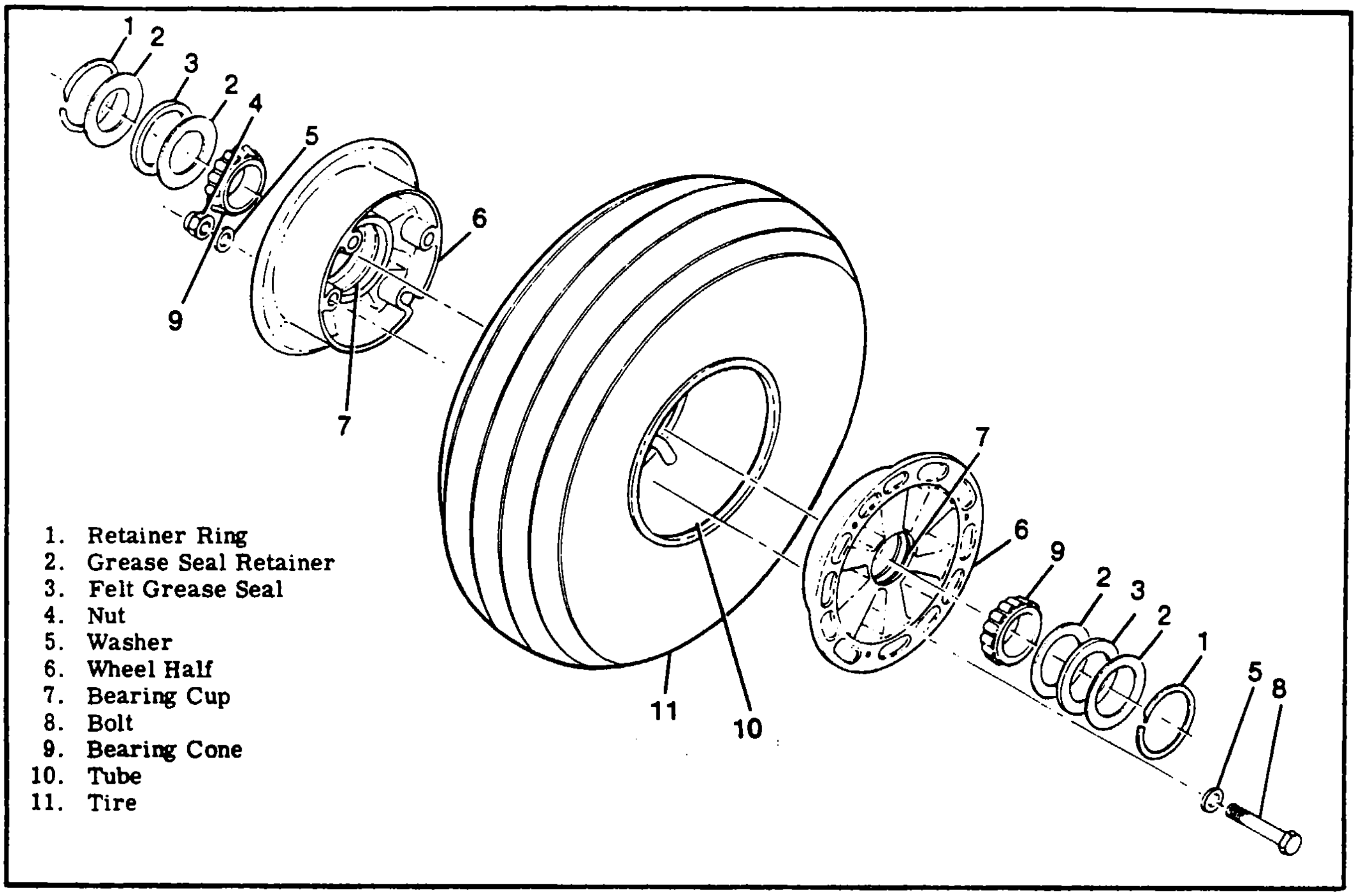


Figure 5-8. Nose Wheel and Tire Assembly

a. Deflate strut completely.
b. Remove shimmy dampener.
c. Remove torque links. (Note position of washers, shims and spacers.)
d. Remove screws, washers and nuts attaching closure assembly to collar assembly
e. Remove steering torque arm and lower forging if these items have not been removed previously.
f. Remove lock ring from groove inside lower end of upper strut. A small hole is provided at the lock ring groove to facilitate removal of the lock ring.

NOTE

Hydraulic fluid will drain from strut as lower strut is pulled from upper strut.

g. Use a straight, sharp pull to separate upper and lower struts. Invert lower strut and drain remaining hydraulic fluid.
h. Remove lock ring and bearing at top of lower strut.
i. Slide packing support ring, scraper ring, retaining ring, and lock ring from lower strut, noting relative position and top side of each ring; wire together if desired.
j. Remove O-rings and back-up rings from packing support ring.
k. Remove bolt securing torque link fitting and remove torque link fitting from lower strut.

NOTE

Bolt attaching torque link fitting also holds metering pin base plug in place.

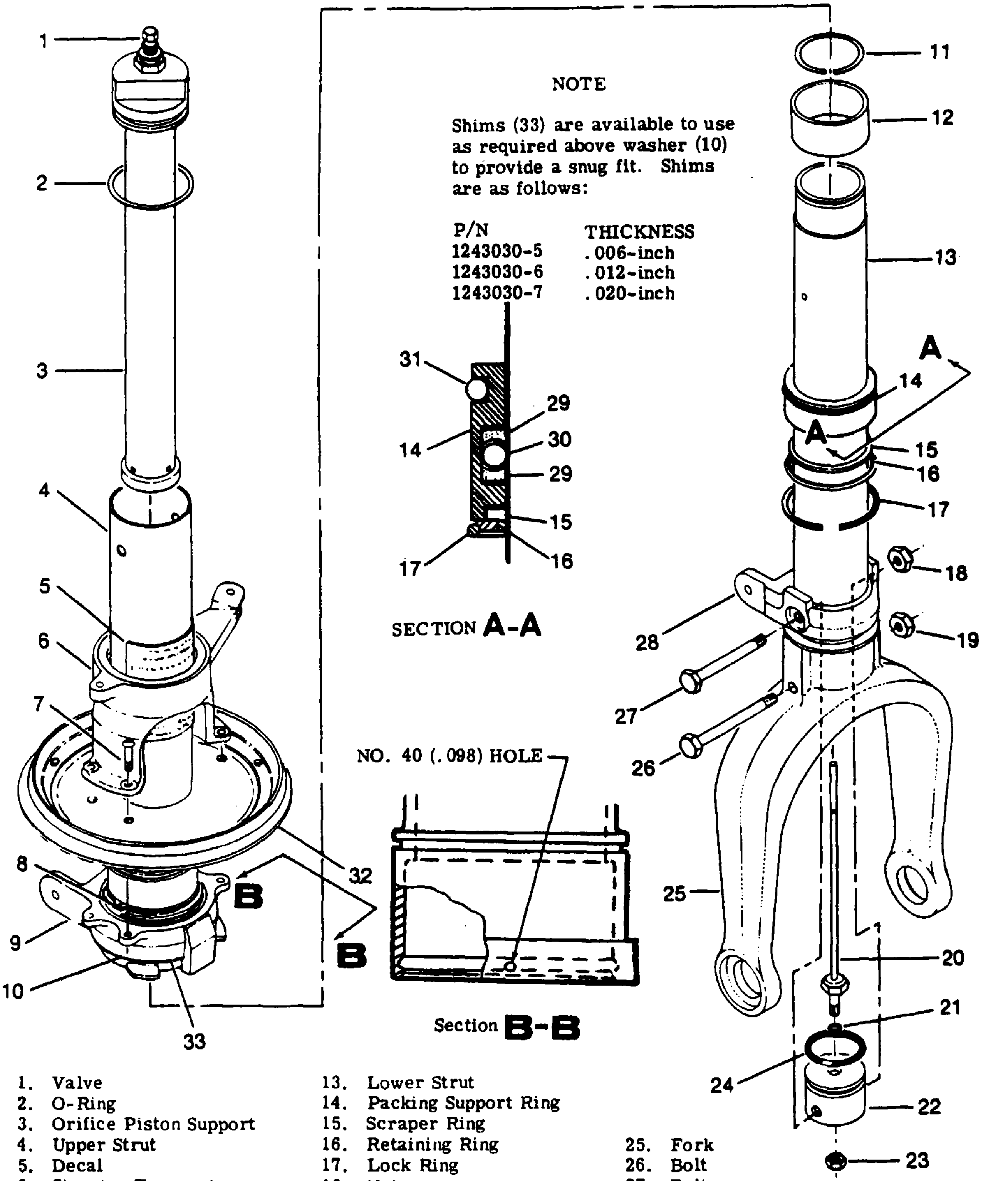
l. Push metering pin and base plug assembly from lower strut. Remove O-rings and metering pin from base plug.

NOTE

Lower strut and fork are a press fit, drilled on assembly. Separation of these parts is not recommended, except for installation of new parts.

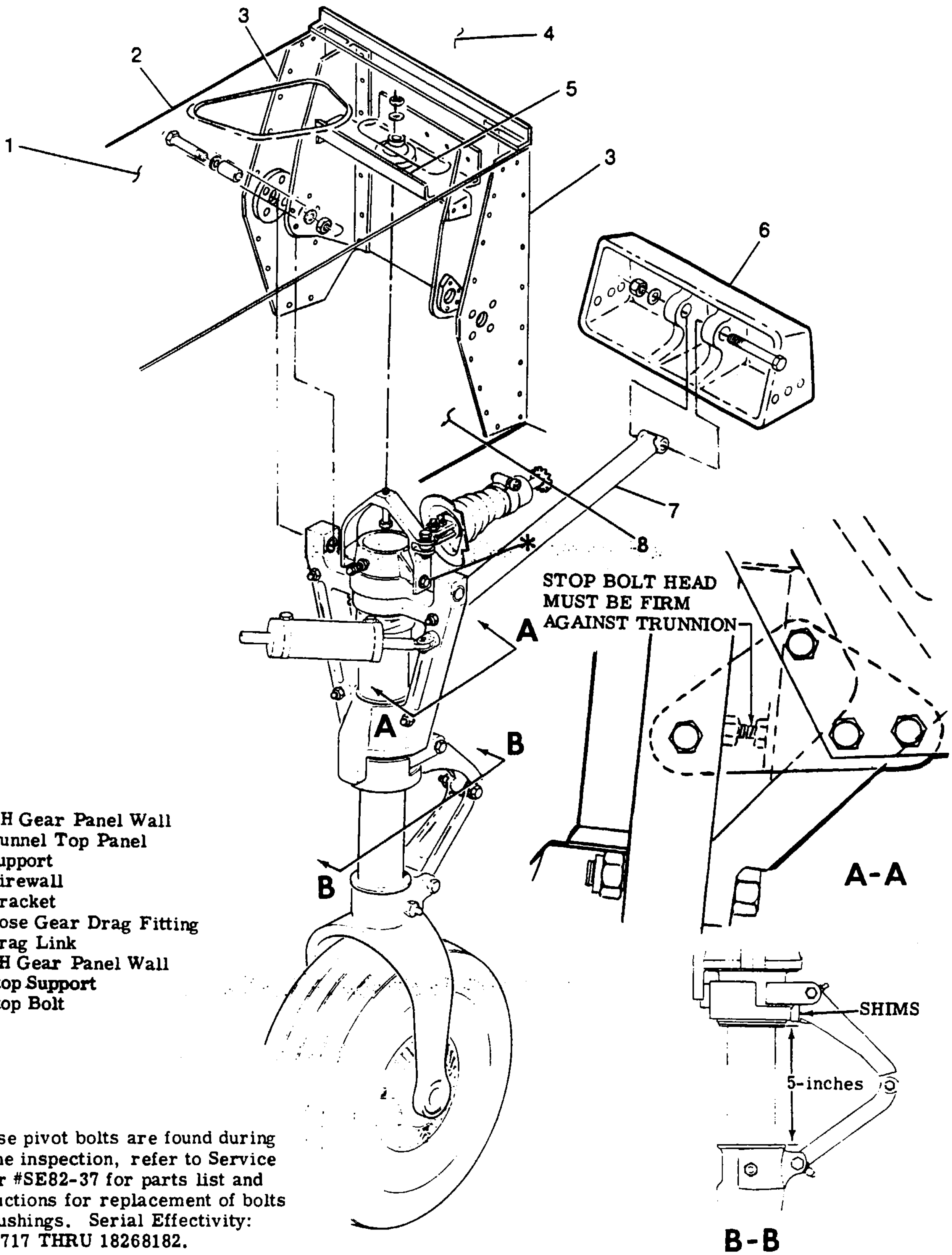
m. Remove retaining ring securing steering arm assembly on upper strut. Remove steering arm, shims and washer.
n. Push orifice support from upper strut and remove O-ring.

5-45. NOSE GEAR SHOCK STRUT INSPECTION AND REPAIR. (MODEL 182.) (See figure 5-9.)
a. Thoroughly clean all parts in cleaning solvent and inspect them carefully.
b. All worn or defective parts and all O-rings and back-up rings must be replaced with new parts.
c. Sharp metal edges should be smoothed with No. 40 emery paper, then cleaned with solvent.



1. Valve	13. Lower Strut	25. Fork
2. O-Ring	14. Packing Support Ring	26. Bolt
3. Orifice Piston Support	15. Scraper Ring	27. Bolt
4. Upper Strut	16. Retaining Ring	28. Torque Link Fitting
5. Decal	17. Lock Ring	29. Back-Up Ring
6. Steering Torque Arm	18. Nut	30. O-Ring
7. Screw	19. Nut	31. O-Ring
8. Retaining Ring	20. Metering Pin	32. Closure Assembly
9. Steering Collar	21. O-Ring	33. Shim (As Required)
10. Washer	22. Base Plug	
11. Lock Ring	23. Nut	
12. Bearing	24. O-Ring	

Figure 5-9. Nose Gear Shock Strut Breakdown (Model 182)



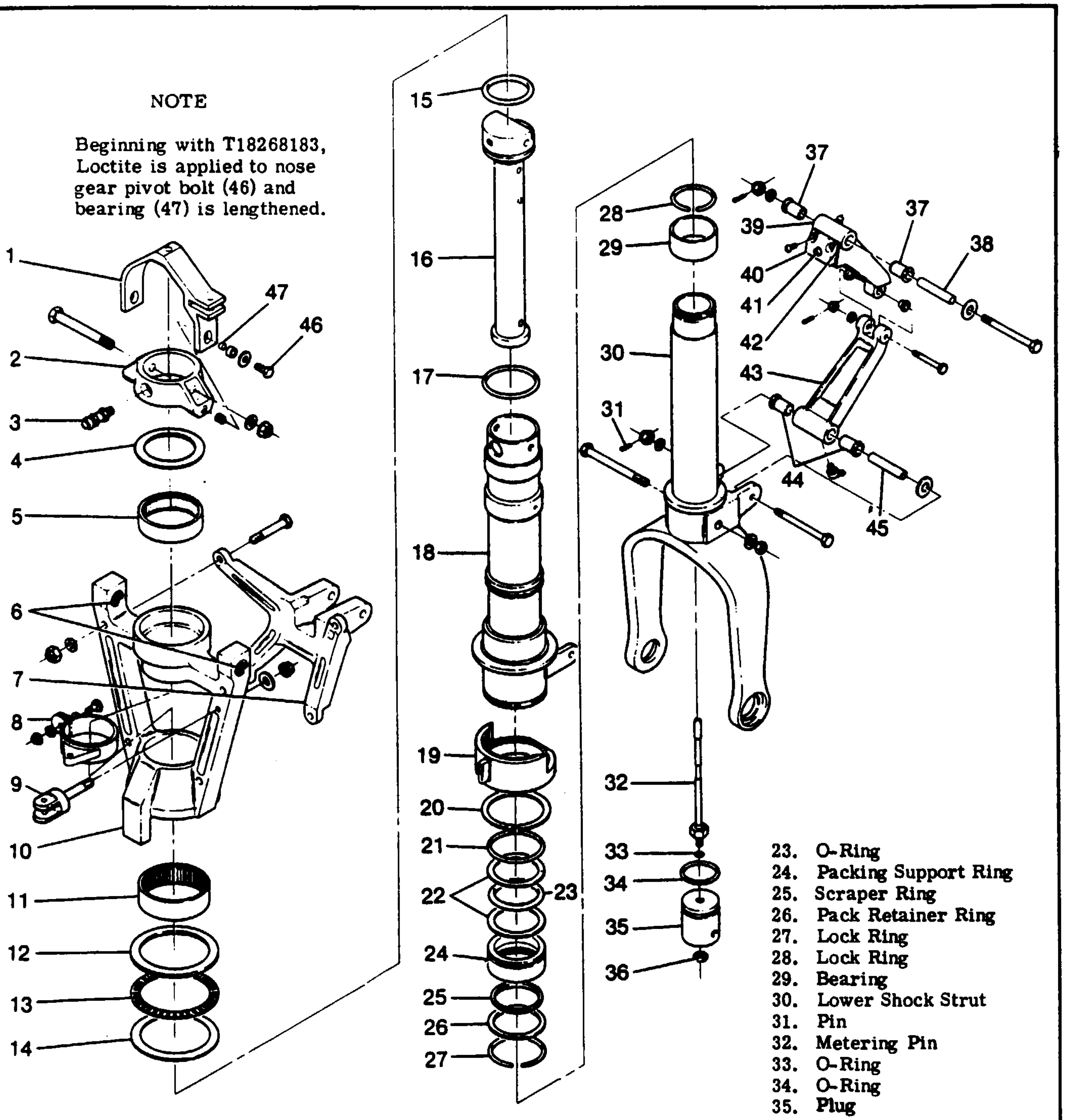
1. RH Gear Panel Wall
2. Tunnel Top Panel
3. Support
4. Firewall
5. Bracket
6. Nose Gear Drag Fitting
7. Drag Link
8. LH Gear Panel Wall
9. Stop Support
10. Stop Bolt

* If loose pivot bolts are found during routine inspection, refer to Service Letter #SE82-37 for parts list and instructions for replacement of bolts and bushings. Serial Effectivity: 18267717 THRU 18268182.

Figure 5-10. Nose Gear Shock Strut Assembly (Model T182)

NOTE

Beginning with T18268183, Loctite is applied to nose gear pivot bolt (46) and bearing (47) is lengthened.



1. Steering Bellcrank
2. Collar
3. Filler Valve
4. Washer
5. Bearing
6. Bearing
7. Actuator-Attach Fitting
8. Shimmy Dampener-Attach Clamp
9. Shimmy Dampener-Attach Clevis Bolt
10. Trunnion
11. Bearing
12. Race
13. Bearing
14. Race
15. Gasket
16. Head and Tube Assembly
17. O-Ring
18. Barrel Assembly
19. Collar Assembly
20. Snap Ring
21. Gasket
22. Back-Up Ring
23. O-Ring
24. Packing Support Ring
25. Scraper Ring
26. Pack Retainer Ring
27. Lock Ring
28. Lock Ring
29. Bearing
30. Lower Shock Strut
31. Pin
32. Metering Pin
33. O-Ring
34. O-Ring
35. Plug
36. Nut
37. Bushing
38. Spacer
39. Upper Torque Link
40. Centering Block
41. Squat Switch
42. Shim
43. Lower Torque Link
44. Bushing
45. Spacer
46. Pivot Bolt
47. Bearing

Figure 5-11. Nose Gear Shock Strut Breakdown (Model T182)

5-46. NOSE GEAR SHOCK STRUT REASSEMBLY. (MODEL 182.) (See figure 5-9.)

NOTE

Assemble these parts lubricated with a film of Petrolatum/VV-P-236, hydraulic fluid/MIL-H-5606 or Dow Corning DC-7.

a. Install washer (10) and shim(s) (33), if installed.
b. Lubricate needle bearings in steering collar (9), as described in Section 2 of this manual, and install steering collar (9) and retaining ring (8).
c. Check steering collar for snug fit against washer (10). Shims of variable thicknesses are available from the Cessna Supply Division to provide a snug fit for the collar against the washer.

NOTE

If shims are required, remove retaining ring and steering collar and add shims as necessary to provide a snug fit with steering collar retaining ring in place.

Part numbers of available shims and their thicknesses are listed as follows:

1243030-5	0.006-inch
1243030-6	0.012-inch
1243030-7	0.020-inch

d. Install O-ring (2) and filler valve (1) in orifice piston support (3), and install orifice piston support in upper strut (4).
e. Install O-ring (24) and metering pin (20) with O-ring (21) in base plug (22); secure with nut.

NOTE

If base plug is to be replaced, new part will need to be line-drilled to accept NAS5 bolt.

f. Install base plug assembly in lower strut fork assembly (13) and (25).
g. Install bolt (27) through upper hole in lower strut, through base plug (22), and secure with nut (18).
h. Install lock ring (17), retaining ring (16) and scraper ring (15), making sure they are installed in same positions as they were removed.
i. Install O-rings (30) and (31) and back-up rings in packing support ring (14): slide packing support ring over lower strut (13).
j. Install bearing (12) and lock ring (11) at upper end of lower strut assembly. Note top side of bearing.
k. Install upper strut assembly over lower strut assembly.
l. Install lock ring (17) in groove in lower end of upper strut. Position lock ring so that one of its ends covers the small access hole in the lock ring groove (Section view B-B.)
m. Install closure assembly (32) over upper strut (4).
n. Install steering torque arm over upper strut (4).
o. Line up holes in steering torque arm (6) and closure assembly (32) with holes in steering collar (9) and attach all three components with screws (7), washers and nuts.
p. Install torque links, positioning washers, shims and spacers exactly in positions as removed.
q. Install shimmy dampener.
r. After shock strut assembly is complete, install strut on aircraft as outlined in paragraph 5-27.
s. After strut is installed, fill and inflate shock strut in accordance with procedures outlined in Section 2 of this manual.

5-47. NOSE GEAR REMOVAL. (MODEL T182.) (See figure 5-10.)

a. Remove cowling and access panel aft of gear well to provide access to drag link.
b. Weight or tie down tail of aircraft to raise nose wheel off the floor.

NOTE

It is not necessary to deflate the nose gear strut to remove the nose gear.

c. Remove bolt attaching drag link to actuator-attach fitting (7).
d. Remove trunnion-attach bolts and steering bellcrank bolt.
e. Remove strut from aircraft.

5-48. NOSE GEAR SHOCK STRUT DISASSEMBLY. (MODEL T182.) (See figure 5-11.)

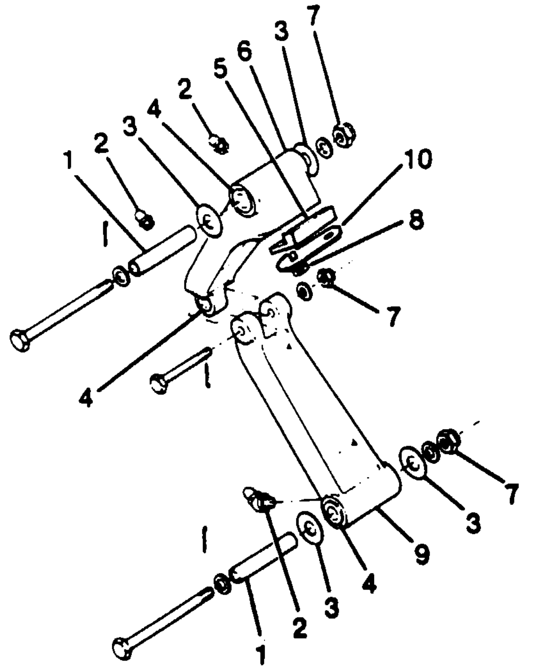
a. Bleed pressure from strut through valve (3).
b. Remove shimmy dampener from strut.
c. Remove torque links (39) and (43).
d. Remove bellcrank (1), collar (2) and valve (3) from top of strut assembly.
e. Remove flat snap ring (20) and collar (19) from lower end of outer barrel (18).
f. Remove wire lock ring (28) from groove at upper end of lower shock strut (30) and remove bearing (29) and packing support ring (24) from lower strut.
g. Remove plug (35) and metering pin (32) from lower strut by removing bolt through fork attached to lower strut (30).
h. Remove metering pin (32) from plug (35).

5-49. NOSE GEAR SHOCK STRUT INSPECTION AND REPAIR. (MODEL T182.) (See figure 5-11.)

a. Thoroughly clean all parts in cleaning solvent and inspect them carefully.
b. All worn or defective parts and all O-rings and back-up rings must be replaced with new parts.
c. Sharp metal edges should be smoothed with No. 40 emery paper, then cleaned with solvent.

5-50. NOSE GEAR SHOCK STRUT REASSEMBLY. (MODEL T182.) (See figure 5-11.)

a. Lubricate and install all new packings and back-up rings.
b. Lubricate bearings as required with MIL-G-23827A grease or equivalent.
c. Reassemble strut by reversing procedures outlined in paragraph 5-48. Beginning with T18268183, apply Loctite to nose gear pivot bolts (46).



NOTE

Tighten bolts (8) to 20-25 pound-inches, then safety bolts by bending tips of safety lug (10).

Tighten nuts (7) snugly, then tighten to align next castellation with cotter pin hole.

P/N S1450-6B14-010 washers (3) are available to use as required to remove any looseness.

Apply MIL-G-81322A General Purpose Grease to all grease fittings (2).

1. Spacer
2. Grease Fitting
3. Washer
4. Bushing
5. Stop Lug
6. Upper Torque Link
7. Nut
8. Bolt
9. Lower Torque Link
10. Safety Lug

Figure 5-12. Torque Links

5-51. NOSE GEAR INSTALLATION. (MODEL T182.) (See figure 5-10.)
a. Work strut into tunnel area so that legs of trunnion fit into slots of supports (3).
b. Align holes in trunnion with holes in RH and LH gear panel walls (1) and (8) and supports (3); install bolts, bushings, washers and nuts.
c. Install bolt through steering bellcrank and bracket (5).
d. Align holes in drag link (7) and fitting (6); install bolt, washer and nut.

NOTE

On installation of nose gear, stop bolts must be firm against trunnion.

5-52. TORQUE LINKS. (See figure 5-12.)

5-53. DESCRIPTION. Torque links keep the lower strut aligned with the nose gear steering system, but permit shock strut action.

5-54. REMOVAL OF TORQUE LINKS. (See figure 5-12.)

WARNING

Completely deflate strut before removing torque links.

a. Completely deflate shock strut.
b. Disconnect upper and lower attaching bolts, spacers, shims and nuts; remove torque links.

5-55. INSPECTION AND REPAIR OF TORQUE LINKS. (See figure 5-12.)
Torque link bushings should not be removed except for replacement of parts. Replace parts only if excessively worn.

5-56. INSTALLATION OF TORQUE LINKS. (See figure 5-12.)

NOTE

If bolts (8), safety lug (10) and stop lug (5) were removed upon installation, tighten bolts (8) to 20-25 pound-inches, then safety the bolts by bending tips of safety lug (10).

a. With shock strut completely deflated, install upper and lower torque link assemblies.
b. Install bolt attaching upper and lower assemblies.
c. Tighten nuts (7) snugly, then tighten to align next castellation with cotter pin hole in bolt.
d. Check upper torque link (6) and lower torque link (9) for looseness. If looseness is apparant, remove nuts (7) and bolts, and install washers (3) as necessary to take up any looseness. This will assist in preventing nose wheel shimmy.
e. Retighten nuts (7) snugly, then tighten to align next castellation with cotter pin hole in bolt; install cotter pin.
f. Fill and inflate shock strut in accordance with procedures outlined in Section 2 of this manual.

5-57. SHIMMY DAMPER. (See figure 5-13.)

5-58. DESCRIPTION. The shimmy damper offers resistance to shimmy by forcing hydraulic fluid through small orifices in a piston. The damper piston shaft is secured to a stationary part, and housing is secured to nose wheel steering torque arm assembly, which moves as nose wheel is turned, causing relative motion between damper shaft and housing.

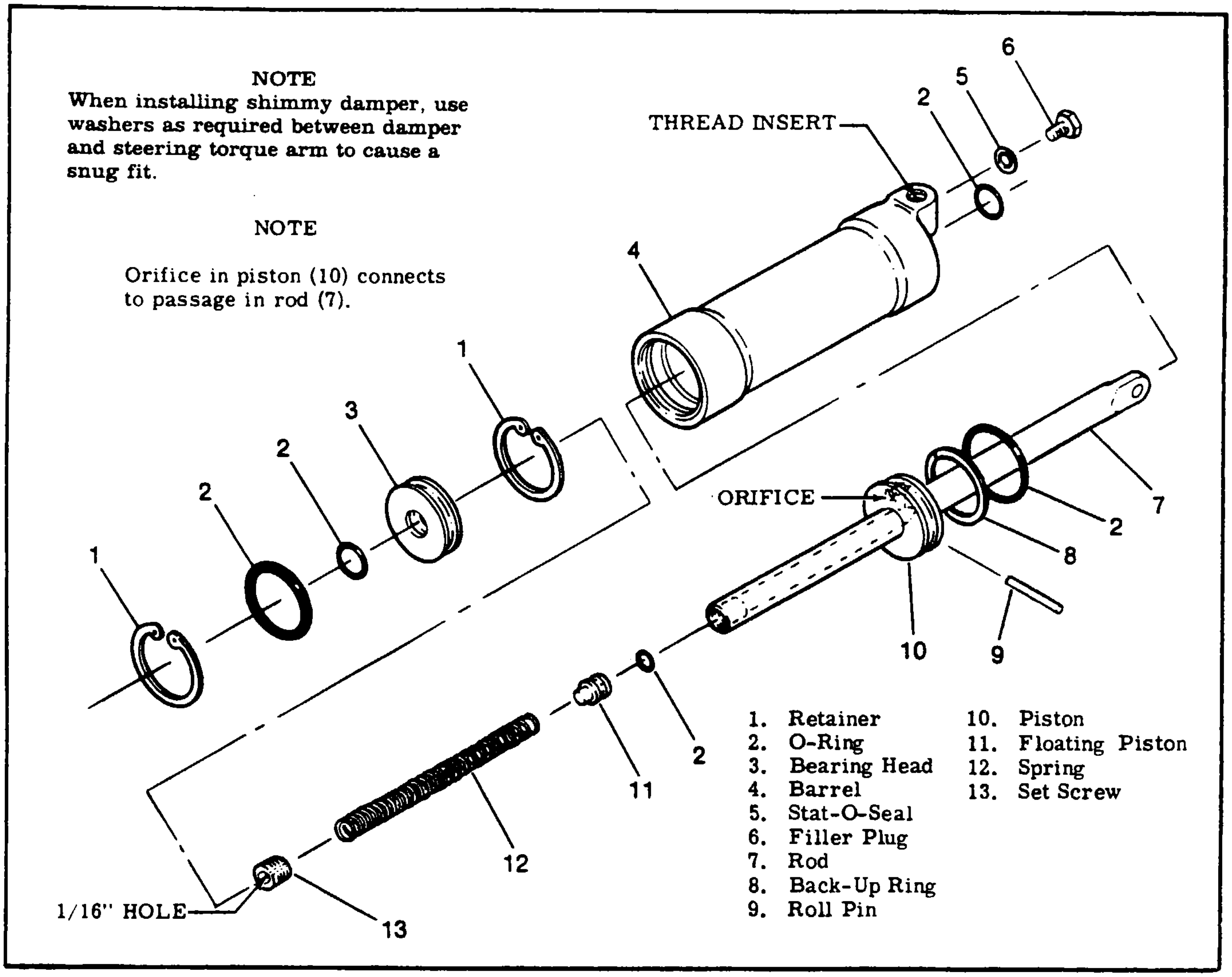


Figure 5-13. Shimmy Damper (Model 182)

5-59. REMOVAL OF SHIMMY DAMPER. (MODEL 182) (See figure 5-13.)

a. Cut safety-wire and remove pin and washers from damper piston shaft end.

b. Remove bolts and washers attaching housing to nose wheel steering torque arm.

c. Remove shimmy damper.

5-60. DISASSEMBLY AND REASSEMBLY OF SHIMMY DAMPER. (MODEL 182) (See figure 5-13.) Refer to figure during disassembly and assembly of shimmy damper. During reassembly, install all new O-rings. Lubricate all parts with clean hydraulic fluid. When damper is completely assembled, service in accordance with procedures outlined in Section 2 of this manual.

5-61. INSTALLATION OF SHIMMY DAMPER. (MODEL 182)

a. Attach shimmy damper housing to nose wheel steering torque arm with bolts and washers.

b. Attach damper piston shaft end with pin and washers; safety-wire pin. Beginning with 18268365, damper piston shaft end attaches with a bolt, nut, and cotter pin.

5-61A. REMOVAL OF SHIMMY DAMPER. (MODEL T182) (See figure 5-13A.)

a. Remove cotter pin, nut, and bolt securing piston rod (10) to nose gear trunnion clevis.

b. Remove cotter pin, nut, and bolt securing barrel (8) to nose gear strut clamp.

c. Remove shimmy damper.

5-61B. DISASSEMBLY AND REASSEMBLY OF SHIMMY DAMPER. (MODEL T182) (See figure 5-13A.) Refer to figure during disassembly and reassembly of shimmy damper. During reassembly, install all new packings, back-up rings, and O-rings. Lubricate all parts with hydraulic fluid (MIL-H-5606) before assembly. Following assembly, service shimmy damper in accordance with procedures outlined in Section 2 of this manual.

a. Attach shimmy damper to nose gear strut clamp and secure with bolt, nut, and cotter pin.

b. Attach shimmy damper piston rod (10) to nose gear trunnion clevis and secure with bolt, nut, and cotter pin.

5-62. NOSE WHEEL STEERING SYSTEM. (MODEL 182.) (See figure 5-14.)

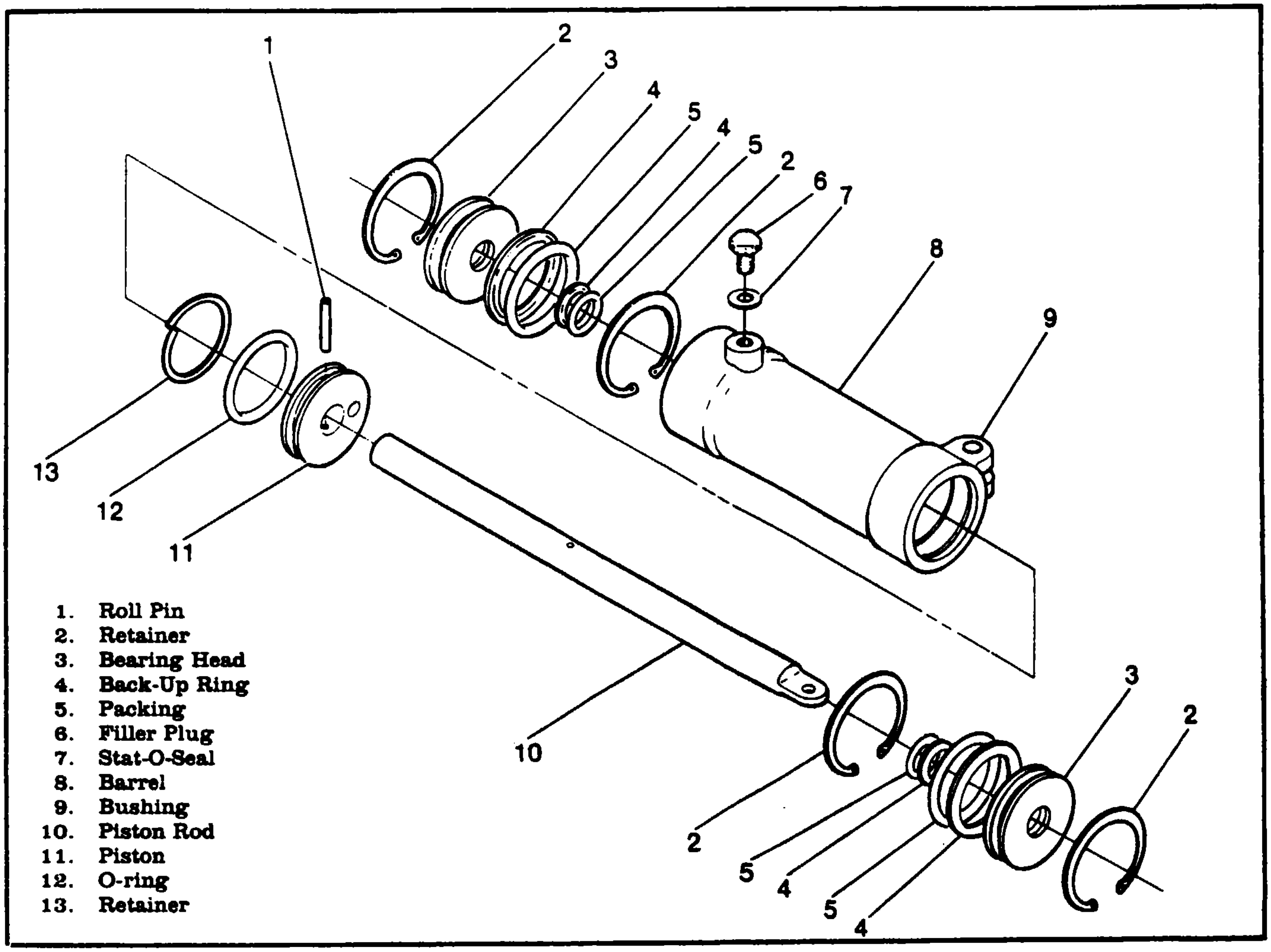


Figure 5-13A. Shimmy Damper (Model T182)

5-63. DESCRIPTION. Nose wheel steering is accomplished through the use of the rudder pedals. A steering bungee links the nose gear to a whiffletree (bellcrank) which is operated by push-pull rods connected to the rudder bars. Steering is afforded up to approximately 10 degrees each side of center. after which brakes may be used to gain a maximum deflection of 30 degrees right or left of center. A flexible boot is used to seal the fuselage entrance of the steering bungee. A sprocket-operated screw mechanism to provide rudder trim is incorporated at the aft end of the bungee. Refer to Section 10 of this manual for the rudder trim system.

5-64. NOSE WHEEL STEERING SYSTEM. (MODEL T182.) (See figure 5-15.)

5-65. DESCRIPTION. The nose wheel steering system links the rudder pedals to the nose wheel strut, affording steering control through use of the rudder pedals.

5-66. STEERING BUNGEE ASSEMBLY. (See figures 5-14 and 5-15.)

5-67. DESCRIPTION. The steering bungee assembly is spring-loaded, and should not be disassembled internally. The steering bungee assembly is connected to the steering torque arm on the nose gear strut by a bearing end assembly, and to the whiffletree (bellcrank) by a rod assembly on the Model 182. On the Model T182, thru 18268055, the steering bungee assembly is connected to the steering bellcrank on the nose gear strut by a bearing end assembly, and to the rudder bar assembly by a rod end assembly. On the Model T182, beginning with 18268056, the steering bungee assembly is connected to the steering bellcrank on the nose gear strut by a bearing end assembly, and to the rudder bar assembly by a barrel nut and two snap rings .

5-68. REMOVAL. (Model 182.) (See figure 5-14.)

a. Disconnect bearing end assembly (2) from steering torque arm (1) on nose gear strut.
b. Disconnect rod end assembly (9) from whiffletree (bellcrank) (5).
c. Remove sprocket (10) from chain assembly; remove steering bungee assembly (3).

5-69. INSTALLATION. (Model 182.) (See figure 5-14.)

a. Install chain assembly on sprocket (10).
b. Connect rod end assembly (9) to whiffletree (bellcrank) (5).
c. Connect bearing end assembly (2) to steering torque arm (1).

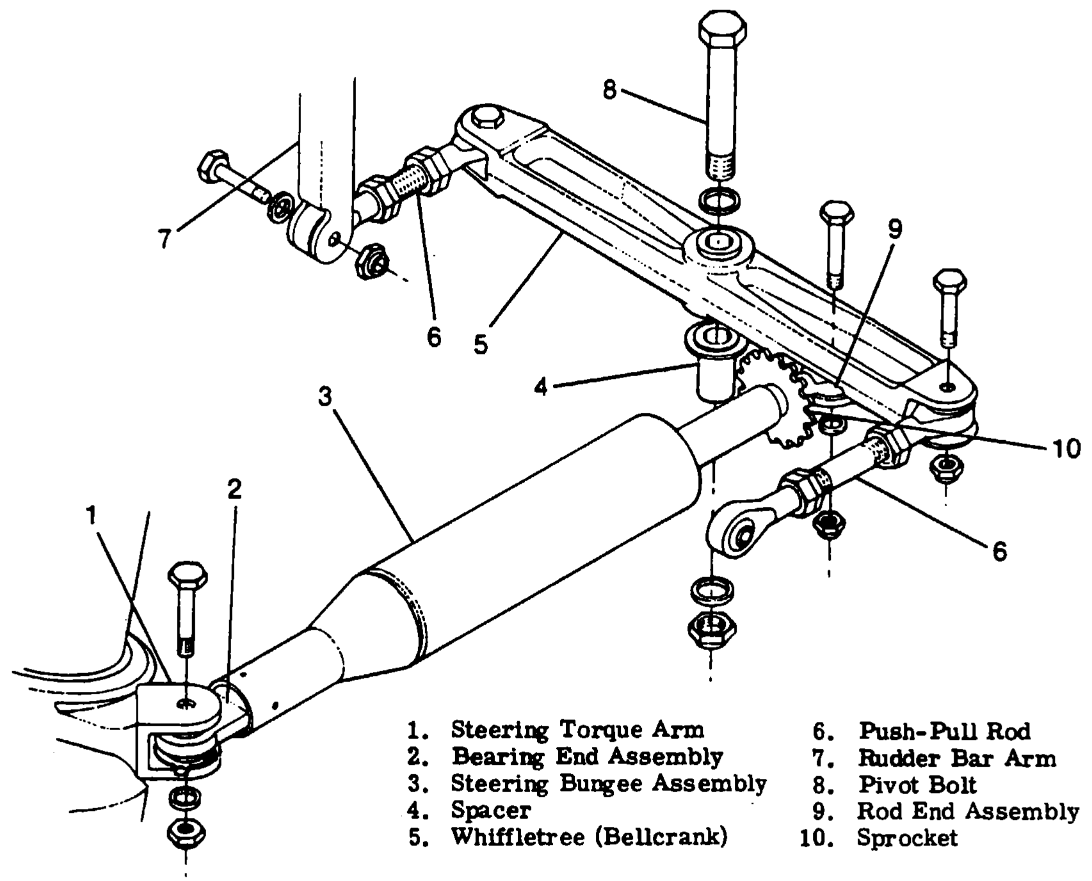


Figure 5-14. Nose Wheel Steering System (Model 182)

5-70. REMOVAL. (Model T182 thru 18268055.) (See figure 5-15.)

a. Disconnect bearing end assembly (3) from steering bellcrank (2) on nose gear strut.

b. Disconnect rod end assembly (6) from rudder bar assembly (7).

c. Remove sprocket (8) from chain assembly; remove steering bungee assembly (9).

5-71. INSTALLATION. (Model T182 thru 18268055.) (See figure 5-15.)

a. Install chain assembly on sprocket (8).

b. Connect rod end assembly (6) to rudder bar assembly (7).

c. Connect bearing end assembly (3) to steering bellcrank (2) on nose gear strut.

5-72. REMOVAL. (Model T182 beginning with 18268056.) (See figure 5-15.)

a. Disconnect bearing end assembly (3) from steering bellcrank (2) on nose gear strut.

b. Remove pin (14) and flex shaft (13) from shaft of steering bungee assembly (9).

c. Remove snap rings (12) and barrel nut (11), securing steering bungee assembly (9) to ears of rudder bar assembly (7).

d. Disconnect bearing end assembly (3) from steering bungee assembly (9).

5-73. INSTALLATION. (Model T182 beginning with 18268056.) (See figure 5-15.)

a. Install steering bungee assembly (9) such that shaft is positioned between ears of rudder bar assembly (7).

b. Install barrel nut (11) and two snap rings (12).

c. Connect bearing end assembly (3) to steering bellcrank (2) on nose gear strut.

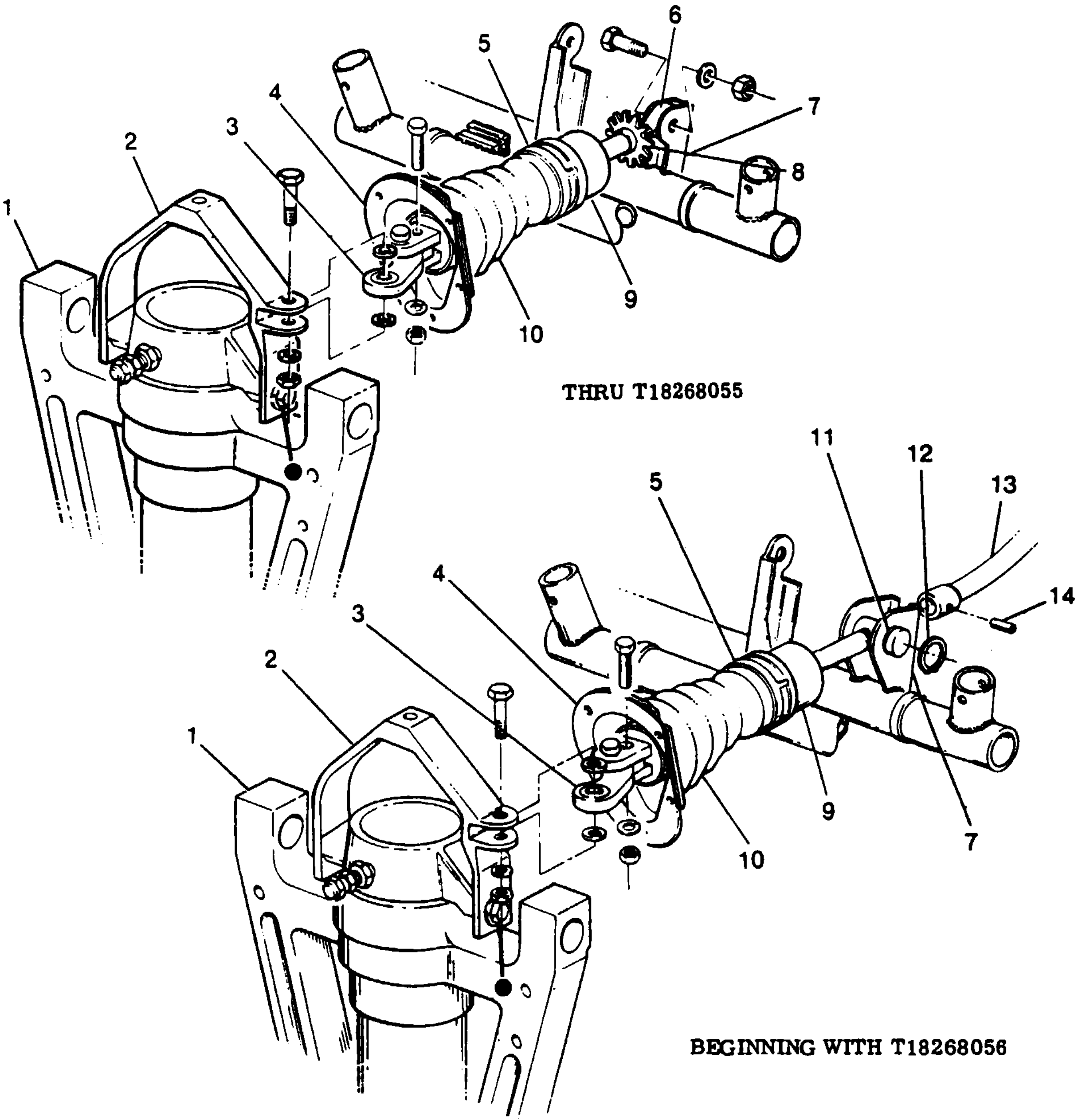
d. Install flex shaft (13) over shaft of steering bungee assembly (9); install pin (14).

5-74. REMOVAL AND INSTALLATION OF NOSE WHEEL STEERING SYSTEM COMPONENTS. (See figures 5-14 and 5-15.) Use the applicable figure as a guide in determining system component relationship and for removal and installation of system components.

5-75. RIGGING OF NOSE WHEEL STEERING SYSTEM. Since the nose wheel steering system is directly connected to the rudder control system, adjustment to one system would directly affect the other. Refer to Section 10 of this manual for rigging procedures for the rudder control system and the nose wheel steering system.

5-76. BRAKE SYSTEM.

5-77. DESCRIPTION. The hydraulic brake system is comprised of two master brake cylinders, located immediately forward of the rudder pedals, brake lines connecting each master cylinder to its wheel brake cylinder, and the single-disc, floating cylinder-type brake assembly, located at each main landing gear wheel.



1. Trunnion
2. Steering Bellcrank
3. Bearing End Assembly
4. Retainer
5. Clamp
6. Rod End Assembly
7. Rudder Bar Assembly
8. Sprocket
9. Steering Bungee Assembly
10. Boot
11. Barrel Nut
12. Snap Ring
13. Flex Shaft
14. Pin

● If loose pivot bolts are found during routine inspections, refer to Service Letter #SE 82-37 for parts list and instructions for replacement of bolts and bushings. Serial effectivity: T18267716 Thru T18268182.

Figure 5-15. Nose Wheel Steering System (Model T182)

5-78. TROUBLE SHOOTING -- BRAKE SYSTEM.

TROUBLE	PROBABLE CAUSE	REMEDY
DRAGGING BRAKES.	Brake pedal binding.	Lubricate pivot points; replace or repair defective parts.
	Weak or broken piston return spring in master cylinder.	Repair or replace mas'er cylinder.
	Parking brake control improperly adjusted.	Adjust properly.
	Insufficient clearance between lock-O-seal and piston in master cylinder.	Adjust clearance per paragraph 5-84.
	Restriction in hydraulic lines or in passage in master cylinder compensating sleeve.	Remove restrictions; flush brake system with hydraulic fluid Repair or replace master cylinder.
	Warped or badly scored brake disc.	Replace disc and linings.
	Damage or accumulated dirt restricting free movement of wheel brakes.	Clean and repair or replace brake parts.
BRAKES FAIL TO OPERATE.	Fluid low in master cylinder or wheel cylinder.	Fill system and bleed brakes.
	Faulty O-rings in master cylinder or wheel cylinder.	Replace O-rings.
	Faulty lock-O-seal in master cylinder.	Replace lock-O-seal.
	Excessive clearance between lock-O-seal and piston.	Adjust clearance per paragraph 5-84.
	Internal damage to hose and O-rings due to use of wrong type of hydraulic fluid.	Replace damaged parts. Flush system with denatured alcohol. Fill and bleed brake system.
	Pressure leak in system.	Tighten connection; repair or replace faulty parts.
	Brake linings worn out.	Replace linings.
	Oil or grease on brake linings or new linings just installed.	Clean linings with carbon tetrachloride.

5-79. BRAKE MASTER CYLINDER. (See figure 5-16.)

5-80. DESCRIPTION. The brake master cylinders, located immediately forward of the pilot's rudder pedals, are actuated by applying pressure at the top of the rudder pedals. A small reservoir is incorporated into each master cylinder for the fluid supply. When dual brakes are installed, mechanical linkage permits the copilot pedals to operate the master cylinders.

5-81. BRAKE MASTER CYLINDER REMOVAL.

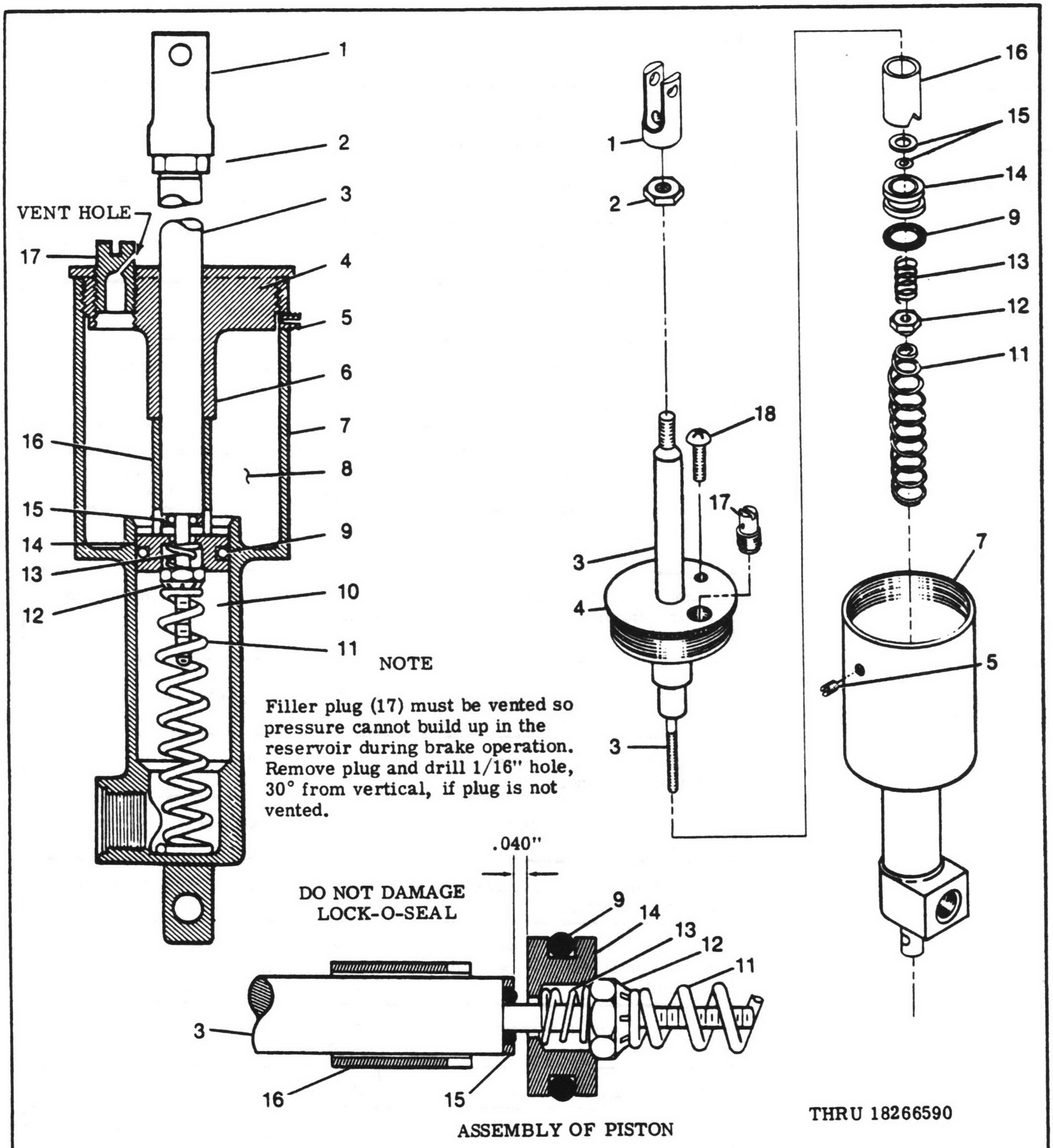
a. Remove bleeder screw at wheel brake assembly and drain hydraulic fluid from brake cylinders.

b. Remove front seats and rudder bar shield for access to brake master cylinders.

c. Disconnect parking brake linkage and disconnect brake master cylinders from rudder pedals.

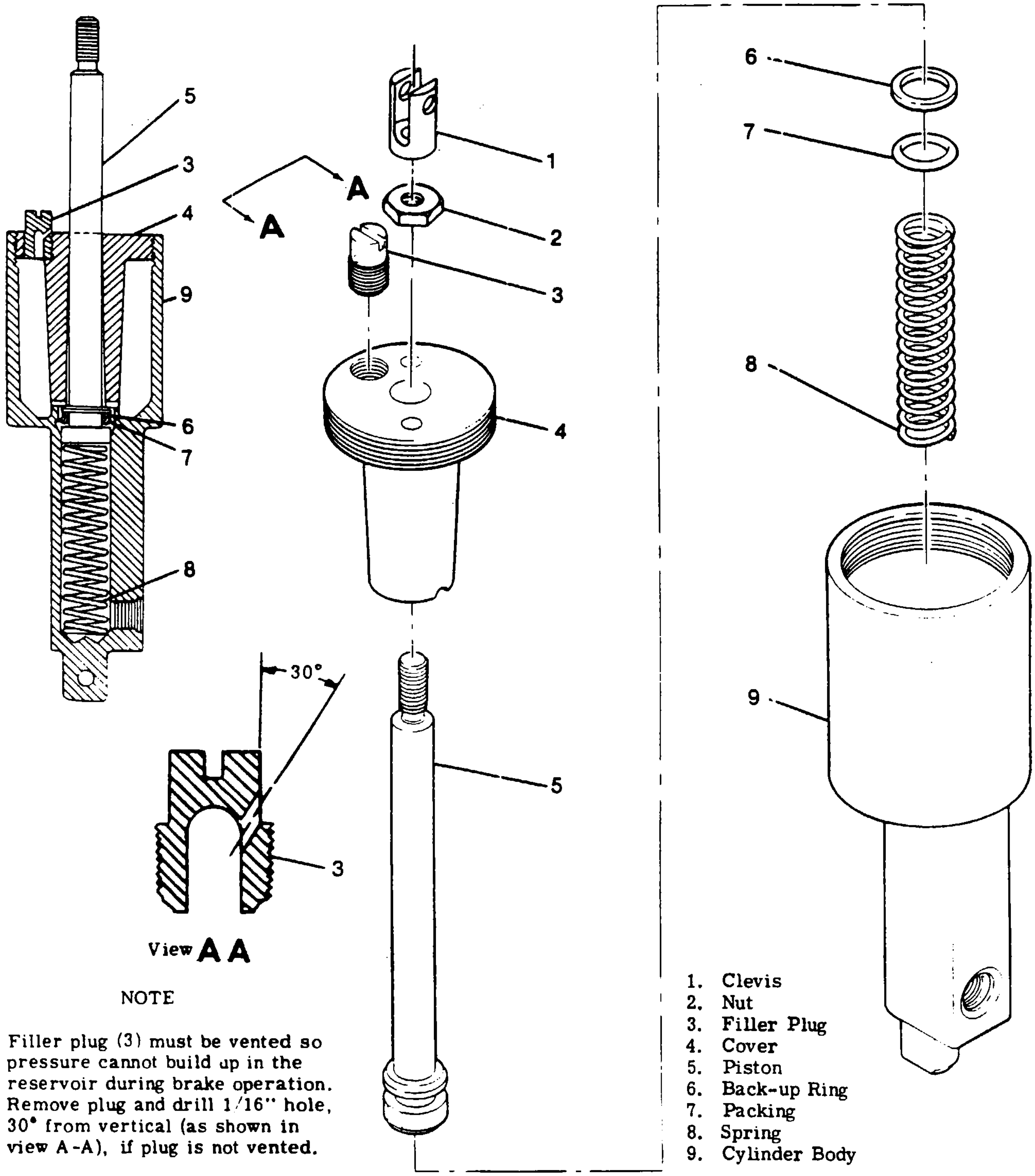
d. Disconnect hydraulic hose from brake master cylinders and remove cylinders.

e. Plug or cap hydraulic fittings, hose and lines,



1. Clevis	7. Body	13. Piston Spring
2. Jamb Nut	8. Reservoir	14. Piston
3. Piston Rod	9. O-Ring	15. Lock-O-Seal
4. Cover	10. Cylinder	16. Compensating Sleeve
5. Setscrew	11. Piston Return Spring	17. Filler Plug
6. Cover Boss	12. Nut	18. Screw

Figure 5-16. Brake Master Cylinder (Sheet 1 of 2)



NOTE

Filler plug (3) must be vented so pressure cannot build up in the reservoir during brake operation. Remove plug and drill 1/16" hole, 30° from vertical (as shown in view A-A), if plug is not vented.

1. Clevis
2. Nut
3. Filler Plug
4. Cover
5. Piston
6. Back-up Ring
7. Packing
8. Spring
9. Cylinder Body

BEGINNING WITH 18266591

Figure 5-16. Brake Master Cylinder (Sheet 2 of 2)

5-82. DISASSEMBLY. (Thru 18266590.) (See figure 5-16.)

a. Unscrew clevis (1) and jamb nut (2).
b. Remove screw (18) and washer (19).
c. Remove filler plug (17) and setscrew (5).
d. Unscrew cover (4) and remove up over piston rod (3).
e. Remove piston rod (3) and compensating sleeve (16).
f. Slide sleeve (16) up over rod (3).
g. Unscrew nut (12) from threads of piston rod (3).
h. Remove spring (13) and O-ring (9) from piston (14).
i. Remove Lock-O-Seal (15).

5-83. INSPECTION AND REPAIR. (Thru 18266590.) (See figure 5-16.) Repair is limited to installation of new parts, cleaning and adjusting. Refer to assembly paragraph for adjustment. Use clean hydraulic fluid (MIL-H-5606) as a lubricant during reassembly of the cylinders. Inspect Lock-O-Seal (Parker Seal Co. P/N 800-001-6) and replace if damaged. Replace all O-rings. Filler plug (17) must be vented so pressure cannot build up during brake operation. Remove plug and drill 1/16-inch hole, 30° from vertical, if plug is not vented.

5-84. REASSEMBLY. (Thru 18266590.) (See figure 5-16.)

a. Install Lock-O-Seal (15) at bottom of piston rod (3).
b. Install O-ring (9) in groove in piston (14); insert piston spring (13) into piston, and slide assembly up on bottom threaded portion of piston rod (3).
c. Run nut (12) up threads to spring (13). Tighten nut (12) enough to obtain 0.040±0.005-inch clearance between top of piston and bottom of Lock-O-Seal, as shown in the illustration.
d. Install piston return spring (11) into cylinder (10) portion of body (7).
e. Install piston rod (3) end through spring (11).
f. Slide compensating sleeve (16) over rod (3).
g. Install cover (4), washer (19) and screw (18).
h. Install jamb nut (2) and clevis (1).
i. Install filler plug (17), making sure vent hole is open.
j. Install setscrew (5).

5-85. DISASSEMBLY. (Beginning with 18266591.) (See figure 5-16.)

a. Unscrew clevis (1) and jamb nut (2).
b. Remove filler plug (3).

NOTE

A special tool, brake master cylinder wrench No. 34-101 is available from the Cessna Supply Division to accomplish the following step.

c. Unscrew cover (4) and remove up over piston (5).
d. Remove piston (5) and spring (8).
e. Remove packing (7) and back-up ring (8) from piston (5).

5-86. INSPECTION AND REPAIR, (Beginning with 18266591.) (See figure 5-16.) Repair is limited to installation of new parts and cleaning. Use clean hydraulic fluid (MIL-H-5606) as a lubricant during reassembly of the cylinder. Replace packing and back-up ring. Filler plug (3) must be vented so pressure cannot build up during brake operation. Remove plug and drill 1/16-inch hole 30° from vertical, if plug is not vented. See view A-A for location of vent hole.

5-87. REASSEMBLY. (Beginning with 18266591.) (See figure 5-16.)

a. Install spring (8) into cylinder body (9).
b. Install back-up ring (6) and packing (7) in groove of piston (5).
c. Install piston (5) in cylinder body (9).
d. Install cover (4) over piston (5) and screw cover into cylinder body (9).
e. Install nut (2) and clevis (1).
f. Install filler plug (3), making sure vent hole is open.

5-88. BRAKE MASTER CYLINDER INSTALLATION.

a. Connect hydraulic hoses to brake master cylinders and install cylinders.
b. Connect brake master cylinders to rudder pedals and connect parking brake linkage.
c. Install rudder bar shield and install front seats.
d. Install bleeder screw at wheel brake assembly and fill and bleed brake system in accordance with applicable paragraph in this Section.

5-89. HYDRAULIC BRAKE LINES.

5-90. DESCRIPTION. The brake lines are of rigid tubing, except for flexible hose used at the brake master cylinders. A separate line is used to connect each brake master cylinder to its corresponding wheel brake cylinder.

5-91. WHEEL BRAKE ASSEMBLIES. (See figure 5-4.)

5-92. DESCRIPTION. The wheel brake assemblies employ a floating brake assembly and a disc which is attached to the main wheel.

5-93. REMOVAL OF WHEEL BRAKE. (See figure 5-4.) Wheel brake assemblies can be removed by disconnecting the brake line (drain fluid when disconnecting line) and removing the brake back plate. The brake disc is removed after the wheel is removed and disassembled. To remove the torque plate. remove wheel and axle.

5-94. DISASSEMBLY OF WHEEL BRAKE. See figure 5-4 for a breakdwon of wheel brake parts. This figure may be used as a guide for disassembling the wheel brakes.

5-95. INSPECTION AND REPAIR OF WHEEL BRAKE.

a. Clean all parts except brake linings and O-rings in dry cleaning solvent and dry thoroughly.
b. Install all new O-rings. If O-ring reuse is necessary, wipe with a clean cloth saturated in hydraulic fluid and inspect for damage.

NOTE

Thorough cleaning is important. Dirt and chips are the greatest single cause of malfunctions in the hydraulic brake system.

c. Check brake lining for deterioration and maximum permissible wear. (Refer to applicable paragraph for maximum wear limit.)

d. Inspect brake cylinder bore for scoring. A scored cylinder will leak or cause rapid O-ring wear. Install a new brake cylinder if the bore is scored.

e. If the anchor bolts on the brake assembly are nicked or gouged, they shall be sanded smooth to prevent binding with the pressure plate or torque plate. When new anchor bolts are to be installed, press out old bolts and install new bolts with a soft mallet.

f. Inspect brake discs. Sand smooth small nicks and scratches. If excessively warped or scored, the brake discs should be replaced with new parts. The chart in figure 5-18 lists wheel assemblies and corresponding brake discs. The original thickness and the minimum allowable thickness of each disc are shown. Replace the disc if the thickness is below the allowable minimum dimension.

5-96. REASSEMBLY OF WHEEL BRAKE. (See figure 5-4.)

NOTE

Lubricate parts with clean hydraulic fluid during brake assembly.

a. Use figure 5-4 as a guide during reassembly.

5-97. INSTALLATION OF WHEEL BRAKE.

a. Place brake assembly in position with pressure plate in place.

NOTE

If torque plate was removed, install as the axle is installed, or install on axle. If the brake disc was removed, install as wheel is assembled.

5-98. CHECKING BRAKE LINING WEAR. New brake lining should be installed when the existing lining has worn to a thickness of 3/32-inch. A 3/32-inch thick strip of material held adjacent to each lining can be used to determine amount of wear. The shank end of a drill bit of the correct size can also be used to determine wear of brake linings.

5-99. INSTALLATION OF BRAKE LINING. (See figure 5-4.)

a. Remove bolts securing back plate, and remove back plate.

b. Pull brake cylinder out of torque plate and slide pressure plate off anchor bolts.

c. Place back plate on a table with lining side down flat. Center a 9/64-inch (or slightly smaller) punch in the rolled rivet, and hit the punch sharply with a hammer. Punch out all rivets securing the linings to the back plate and pressure plate in the same manner.

NOTE

A rivet setting kit, Part No. 199-1, is available from Cessna Parts Distribution (CPD 2). This kit consists of an anvil and punch.

d. Clamp the flat side of the anvil in a vise.

e. Align new lining on back plate and place brake rivet in hole with rivet head in the lining. Place the head against the anvil.

f. Center rivet setting punch on lips of rivet. While holding back plate down firmly against lining, hit punch with hammer to set rivet. Repeat blows on punch until lining is firmly against back plate.

g. Realign the lining on the back plate and install and set rivets in the remaining holes.

h. Install a new lining on pressure plate in the same manner.

i. Position pressure plate on anchor bolts and place cylinder in position so that anchor bolts slide into the torque plate.

j. Install back plate with bolts and washers.

5-100. BLEEDING BRAKE SYSTEM.

NOTE

Bleeding with a clean hydraulic pressure source connected to the wheel cylinder is recommended.

a. Remove brake master cylinder filler plug and screw flexible hose with appropriate fitting into the filler hole at the top of the brake master cylinder.

b. Immerse opposite end of flexible hose into a container with enough hydraulic fluid to cover end of the hose.

c. Connect a clean hydraulic pressure source, such as a hydraulic hand pump or Hydro-Fill unit to the bleeder valve in the wheel cylinder.

d. As fluid is pumped into the system, observe the immersed end of the hose at the master brake cylinder for evidence of air bubbles being forced from the brake system. When bubbling has ceased, remove bleeder source from wheel cylinder and tighten the bleeder valve.

5-101. BRAKE LINING BURN-IN. The brake pads are equipped with either a non-asbestos organic lining or an iron based metallic lining. These materials must be properly conditioned (glazed) in order to provide maximum performance and service life. This is accomplished by a brake burn-in.

a. Non-asbestos organic lining.

1. Taxi airplane for 1500 feet with engine at 1700 RPM applying brake pedal force as needed to develop a 5 to 9 knots taxi speed.

1. Rudder Pedal Support Bracket
2. Hose
3. Master Cylinder
4. Cable Assembly
5. Brake Line
6. Tube
7. Angle-Parking Brake Support
8. Handle
9. Clamp
10. Housing
11. Spring
12. Tube
13. Positioning Pin
14. Positioning Rack
15. Cable
16. Pulley
17. Bellcrank
18. Cotter Pin

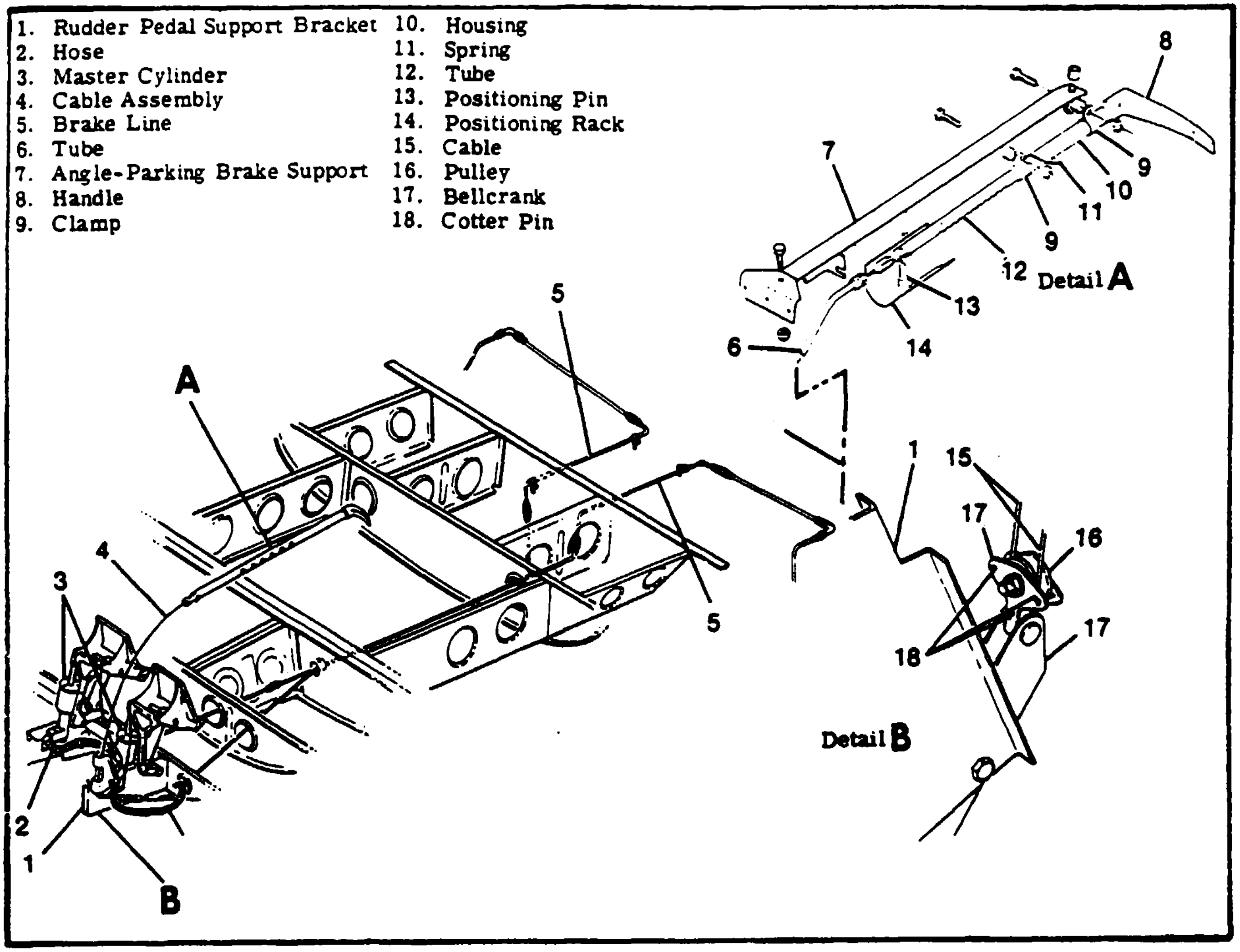


Figure 5-17. Parking Brake System

CESSNA WHEEL NO.	CLEVELAND NO.	McCAULEY NO.	DISC NO.	THICKNESS ORIGINAL	THICKNESS MINIMUM ALLOWABLE
C163001-0104	40-113		164-04000	0.218	0.205
C163002-0101		D-30063	B-30007	0.218	0.190
C163003-0102		D-30580	B-30195	0.218	0.190
C163004-0104		D-30291-6	B-30440	0.218	0.190
C163005-0101		D-30600-1	C-30615-1	0.218	0.190
C163006-0101		D-30600-1	C-30615-1	0.235	0.190
C163006-0103		D-30660-3	C-30615-3	0.35	0.33

Figure 5-18. Brake Disc Minimum Allowable Thickness Chart

2. Allow brakes to cool for 10 to 15 minutes.
3. Apply brakes and check to see if a high throttle static run up may be held with normal pedal force. If so, burn-in is completed.
4. If static run up cannot be held, repeat steps 1 through 3 as needed to successfully hold.

b. Iron based metallic lining.
1. Perform two consecutive full stop braking applications from 30 to 35 knots. Do not allow the brake discs to cool substantially between stops.

5-102. PARKING BRAKE SYSTEM. (See figure 5-17.)

5-103. DESCRIPTION. The parking brake system consists of a handle and ratchet mechanism, connected by a cable to linkage at the brake master cylinders. Pulling out on the handle depresses both brake master cylinder piston rods and the handle ratchet locks the handle in this position until the handle is turned and released.

5-104. REMOVAL AND INSTALLATION. (See figure 5-17.) See the figure for relative location of system components. The illustration may be used as a guide during removal and installation of components.

5-105. INSPECTION AND REPAIR OF SYSTEM COMPONENTS. Inspect lines for leaks, cracks, dents, chafing, improper radius, security, corrosion, deterioration, obstructions and foreign matter. Check brake master cylinders and repair as outlined in applicable paragraph in this Section. Check parking brake handle and ratchet for proper operation and release. Replace worn or damaged parts.

SECTION 6

AILERON CONTROL SYSTEM

TABLE OF CONTENTS	Page No. Aerofiche/Manual

6-1. AILERON CONTROL SYSTEM. (See figure 6-1.)

6-2. DESCRIPTION. The aileron control system is comprised of push-pull rods, bellcranks, cables, pulleys, cable drums and components forward of the instrument panel, all of which link the control wheels to the ailerons.

6-3. TROUBLE SHOOTING.

NOTE

Due to remedy procedures in the following trouble shooting chart it may be necessary to re-rig system, refer to paragraph 6-18.

TROUBLE	PROBABLE CAUSE	REMEDY
LOST MOTION IN CONTROL WHEEL.	Loose control cables.	Check cable tension. Adjust cables to proper tension.
	Broken pulley or bracket, cable off pulley or worn rod end bearings.	Check visually. Replace worn or broken parts, install cables correctly.
RESISTANCE TO CONTROL WHEEL MOVEMENT.	Cables too tight.	Check cable tension. Adjust cables to proper tension.
	Pulleys binding or cable off.	Observe motion of the pulleys. Check cables visually. Replace defective pulleys. Install cables correctly.
	Bellcrank distorted or damaged.	Check visually. Replace defective bellcrank.
	Defective quadrant assembly.	Check visually. Replace defective quadrant.
	Clevis bolts in system too tight.	Check connections where used. Loosen, then tighten properly and safety.

6-3. TROUBLE SHOOTING (Cont).

TROUBLE	PROBABLE CAUSE	REMEDY
CONTROL WHEELS NOT LEVEL WITH AILERONS NEUTRAL.	Improper adjustment of cables.	Refer to paragraph 6-18.
	Improper adjustment of aileron push-pull rods.	Adjust push-pull rods to obtain proper alignment.
DUAL CONTROL WHEELS NOT COORDINATED.	Cables improperly adjusted.	Refer to paragraph 6-18.
INCORRECT AILERON TRAVEL.	Push-pull rods not adjusted properly.	Refer to paragraph 6-18.
	Incorrect adjustment of travel stop bolts.	Refer to paragraph 6-18.

6-4. CONTROL COLUMN. (See figure 6-2.)

6-5. DESCRIPTION. Rotation of the control wheel rotates four bearing roller assemblies (3) on the end of the control wheel tube (13), which in turn, rotates a square control tube assembly (15) inside and extending from the control wheel tube (13). Attached to this square tube (15) is a quadrant (24) which operates the aileron system. This same arrangement is provided for both control wheels. Synchronization of the control wheels is obtained by the interconnect cable (29), turnbuckle (30) and adjustment terminals (27). The forward end of the square control tube (15) is mounted in a bearing block (21) on firewall (31) and does not move fore-and-aft, but rotates with the control wheel. The four bearing roller assemblies (3) on the end of the control wheel tube reduce friction as the control wheel is moved fore-and-aft for elevator system operation. A sleeve weld assembly (5), containing bearings which permit the control wheel tube to rotate within it, is secured to the control wheel tube by a sleeve and retaining ring in such a manner it moves fore-and-aft with the control wheel tube. This movement allows the push-pull tube (16) attached to the sleeve weld assembly (5) to operate an elevator arm assembly (18), to which one elevator cable (20) is attached. A torque tube (19) connects this arm assembly (18) to the one on the opposite end of the torque tube (19), to which the other elevator cable is attached. When dual controls are installed, the copilot's control wheel is linked to the aileron and elevator control systems in the same manner as the pilot's control wheel.

6-6. REMOVAL AND INSTALLATION. (See figure 6-2.)

a. PILOT'S CONTROL COLUMN.

1. Slide cover (1) toward instrument panel to expose adapter (35). Remove screws securing adapter (35) to control wheel tube assembly (13) and remove control wheel assembly.
2. Disconnect electrical wiring to map light and mike switch at connector (39) if installed. Slide cover (1) off control wheel tube assembly (13).
3. Remove decorative cover from instrument panel.
4. Remove screw securing adjustable glide plug (14) to control tube assembly (15) and remove plug and glide assembly.
5. Disconnect push-pull tube (16) at sleeve weld assembly (5).
6. Remove screws securing support plate (10) at instrument panel.

NOTE

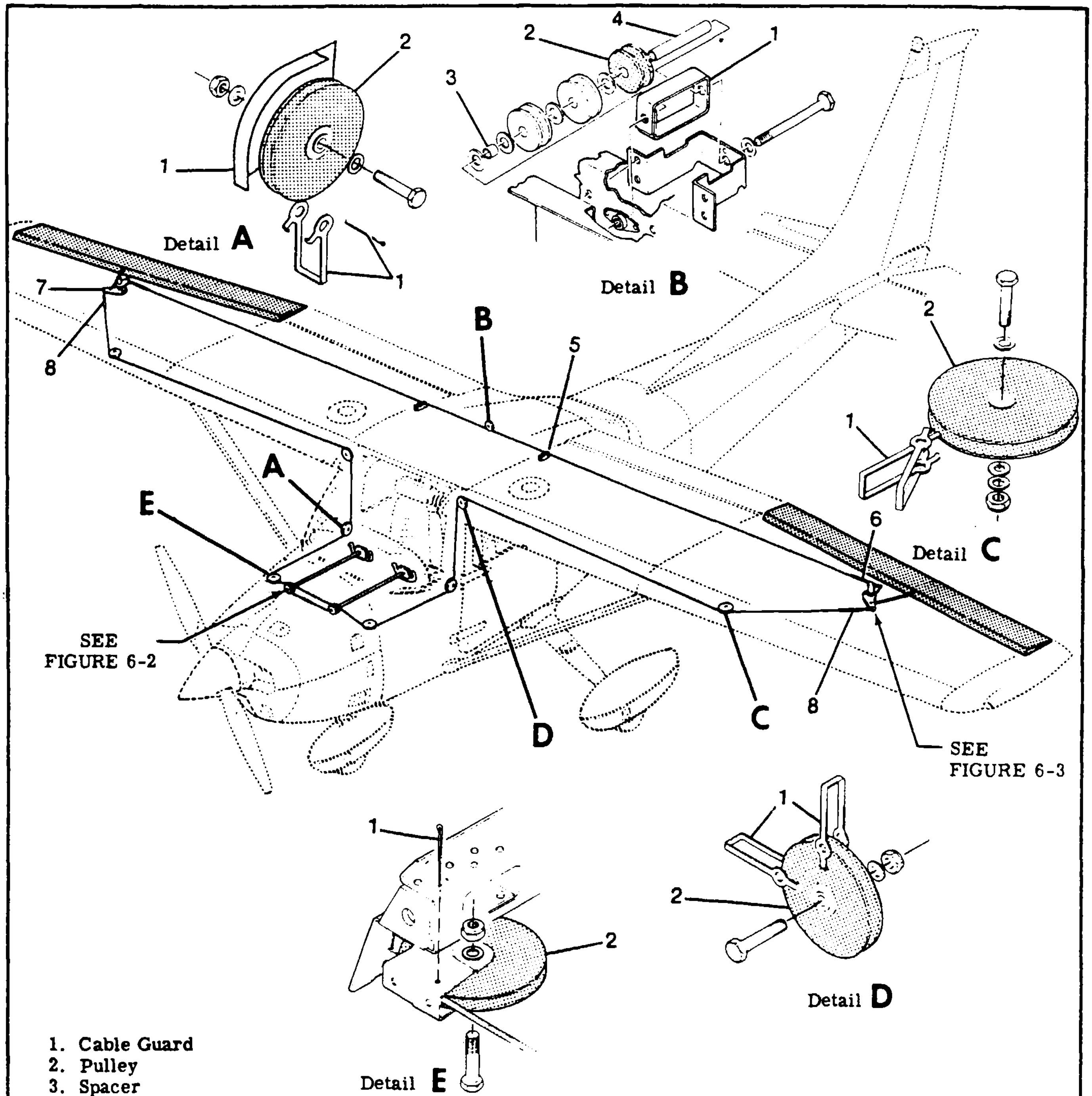
To ease removal of control wheel tube assembly (13), snap ring (9) may be removed from its locking groove to allow sleeve weld assembly (5) additional movement.

7. Using care, pull control wheel tube assembly (13) aft and work assembly out through instrument panel.

NOTE

If removal of control tube assembly (15) or quadrant (24) is necessary, proceed to step 8.

8. Remove safety wire and relieve direct cable tension at turnbuckles (index 8, figure 6-1).
9. Remove safety wire and relieve interconnect cable tension at turnbuckle (30).
10. Remove safety wire and remove roll pin (28) through quadrant (24) and control tube assembly (15).



1. Cable Guard
2. Pulley
3. Spacer
4. Bushing
5. Rub Strip
6. Turnbuckle (Carry-Thru)
7. Bellcrank
8. Turnbuckle (Direct)

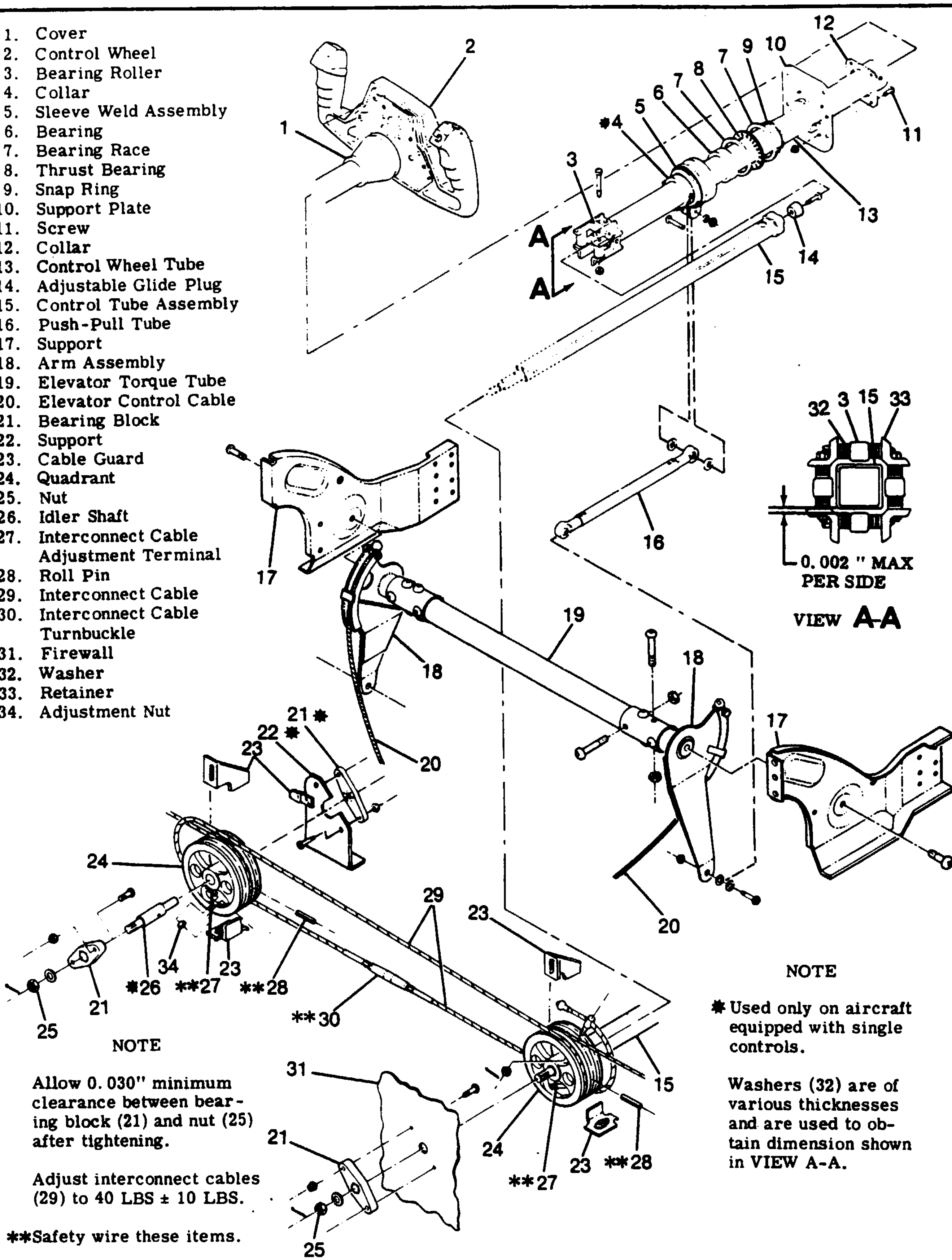
CAUTION

MAINTAIN SPECIFIED CONTROL CABLE TENSION

CABLE TENSION:
40 LBS ± 10 LBS ON AILERON CARRY-THRU CABLE (AT AVERAGE TEMPERATURE FOR THE AREA.)
REFER TO FIGURE 1-1 FOR TRAVEL.

Figure 6-1. Aileron Control System

1. Cover
2. Control Wheel
3. Bearing Roller
4. Collar
5. Sleeve Weld Assembly
6. Bearing
7. Bearing Race
8. Thrust Bearing
9. Snap Ring
10. Support Plate
11. Screw
12. Collar
13. Control Wheel Tube
14. Adjustable Glide Plug
15. Control Tube Assembly
16. Push-Pull Tube
17. Support
18. Arm Assembly
19. Elevator Torque Tube
20. Elevator Control Cable
21. Bearing Block
22. Support
23. Cable Guard
24. Quadrant
25. Nut
26. Idler Shaft
27. Interconnect Cable Adjustment Terminal
28. Roll Pin
29. Interconnect Cable
30. Interconnect Cable Turnbuckle
31. Firewall
32. Washer
33. Retainer
34. Adjustment Nut



NOTE

Allow 0.030" minimum clearance between bearing block (21) and nut (25) after tightening.

Adjust interconnect cables (29) to 40 LBS ± 10 LBS.

**Safety wire these items.

NOTE

* Used only on aircraft equipped with single controls.

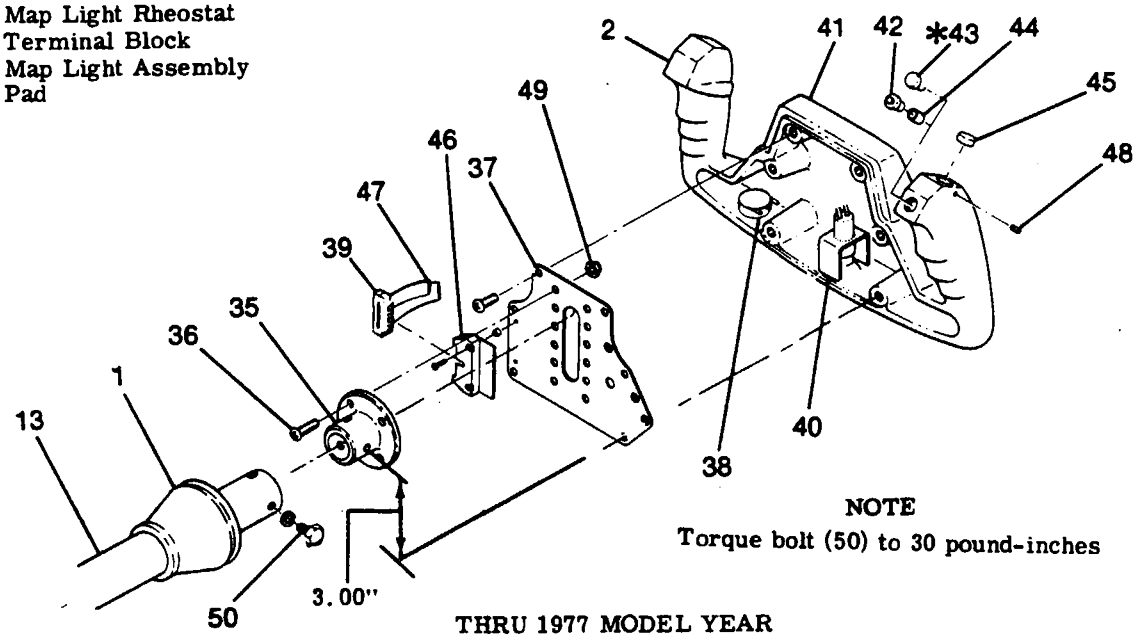
Washers (32) are of various thicknesses and are used to obtain dimension shown in VIEW A-A.

Figure 6-2. Control Column Installation (Sheet 1 of 2)

1. Cover
2. Control Wheel
13. Control Wheel Tube
35. Adapter
36. Screw
37. Plate
38. Map Light Rheostat
39. Terminal Block
40. Map Light Assembly
41. Pad

*NOTE

Plug (43) is used when mike switch (42) is not installed

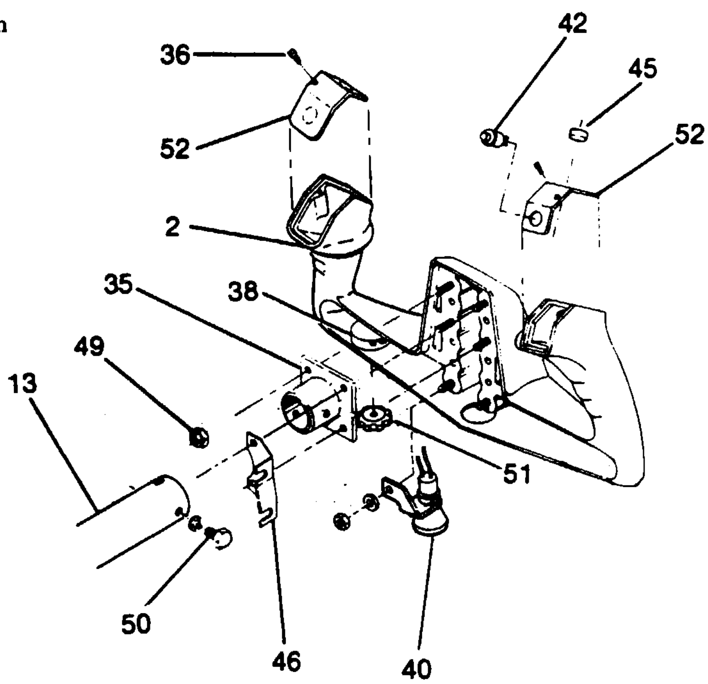


NOTE

Torque bolt (50) to 30 pound-inches

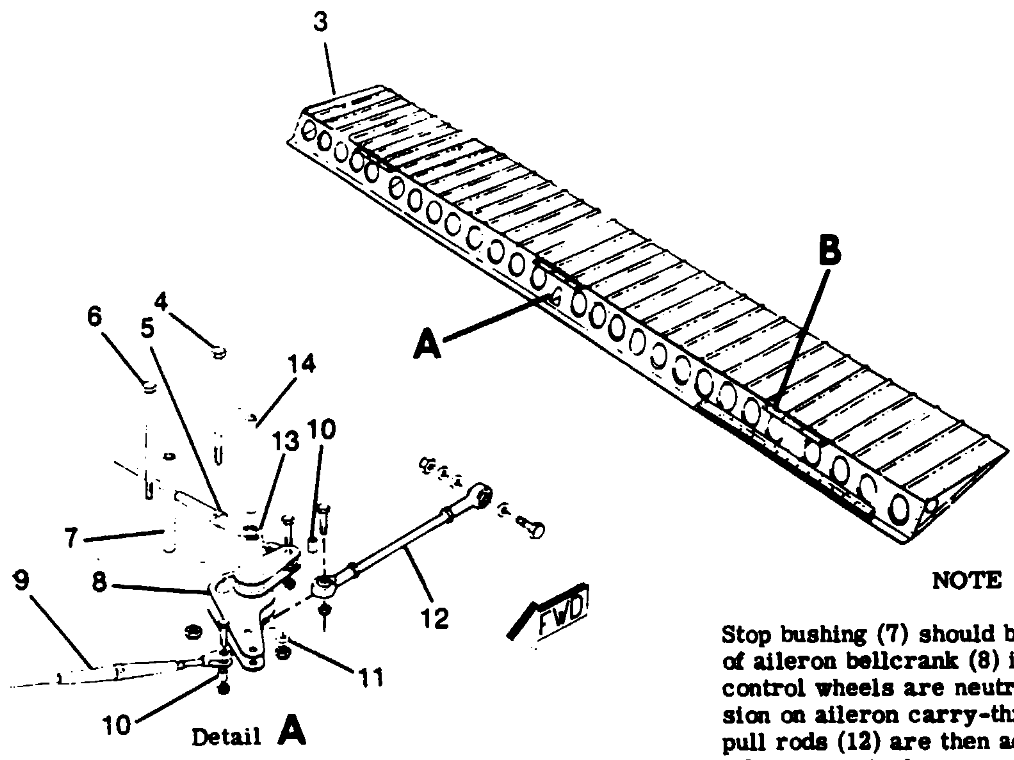
THRU 1977 MODEL YEAR

42. Mike Switch
43. Plug
44. Insulator
45. Plug
46. Bracket
47. Cable
48. Setscrew
49. Nut
50. Bolt
51. Knob
52. Escutcheon



BEGINNING WITH 1978 MODEL YEAR

Figure 6-2. Control Column Installation (Sheet 2 of 2)



NOTE

Stop bushing (7) should be centered in slots of aileron bellcrank (8) in each wing when control wheels are neutral, with correct tension on aileron carry-thru cable (5). Push-pull rods (12) are then adjusted to rig the ailerons neutral.

Carry-thru cable turnbuckle (5) may be located at either the right or left aileron bellcrank.

Brass washers (11) may be used as required between lower end of bellcrank and wing channel to shim out excess clearance.

1. Not Used
2. Not Used
3. Aileron
4. Pivot Bolt
5. Turnbuckle (Carry-Thru)
6. Bolt
7. Stop Bushing
8. Bellcrank
9. Turnbuckle (Direct)
10. Bushing
11. Brass Washer
12. Push-Pull Rod
13. Needle Bearing
14. Bushing

Figure 6-3. Aileron Installation (Sheet 1 of 2)

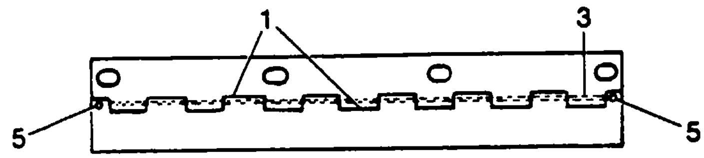
11. Remove pin, nut (25) and washer from control tube assembly (15) protruding through bearing block (21) on forward side of firewall (31).
12. Using care, pull control tube assembly (15) aft and remove quadrant (24).
13. Reverse the preceding steps for reinstallation. Safety wire all items previously safetied, check rigging of aileron and elevator control systems and rig, if necessary, in accordance with paragraph 6-18 and 8-14 respectively.

b. COPILOT'S CONTROL COLUMN.
1. Complete steps 1, 2, 3, 5, 6, 8, 9, 10 and 11 of subparagraph "a."
2. Using care, pull control tube assemblies (13 and 15) aft and remove quadrant (24).
3. Remove radios, radio dust covers, cooling pans and associated equipment as necessary to work control wheel tube assembly (13) out from under instrument panel.
4. Complete step 13 of subparagraph "a."

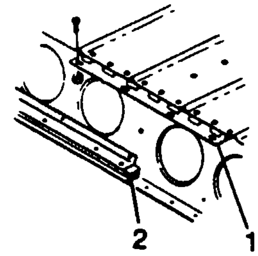
6-7. REPAIR. Worn, damaged or defective shafts, bearings, drums, cables or other components should be replaced. Refer to Section 2 for lubrication requirements.

6-8. AILERON BELLCRANK. (See figure 6-3.)

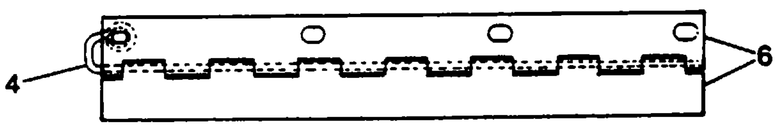
6-9. REMOVAL.
a. Remove access plate inboard of each bellcrank (8) on underside of wing.
b. Remove safety wire and relieve cable tension at turnbuckle (5).
c. Disconnect control cables from bellcrank (8). Retain all spacers and bushings.
d. Disconnect push-pull rod (12) at bellcrank.
e. Remove nuts, washers and bolts securing bellcrank stop bushing (7) and bellcrank (8) to wing structure.
f. Remove bellcrank through access opening, using care that bushing (14) is not dropped from bellcrank.



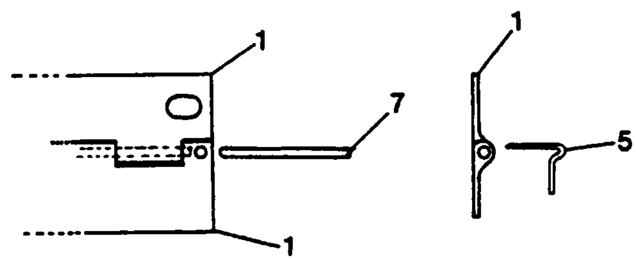
18265176 THRU 18268446
F18200026 THRU 18200169



Detail **B**



18268447 AND ON



Detail **C**

1. Hinge
2. Balance Weight
3. Hinge Pin
4. Hinge Pin
5. MS24665 Cotter Pin
6. Hinge
7. .089 Diameter Drill Rod

NOTES

Install loop of hinge pin (4) on outboard end of hinge.

The following method may be utilized to check wear on aileron hinges used prior to 18268447. Refer to Service Letter SE83-18 for specific serials effected.

1. Remove cotter pins (5) from both ends of hinge (1).
2. Push drill rod (7) or number 43 drill bit into hinge pin hole beyond holes from which cotter pins (5) were removed.
3. Bend one leg of cotter pin (5) back and attempt to install the other leg past drill rod (7) or number 43 drill bit. If leg of cotter pin (5) GOES, replace hinge (7). If NO GO condition exists, hinges are not worn sufficiently to require replacement.
4. Remove drill rod (7) and replace new cotter pins (5) in hinges (1).

Figure 6-3. Aileron Installation (Sheet 2 of 2)

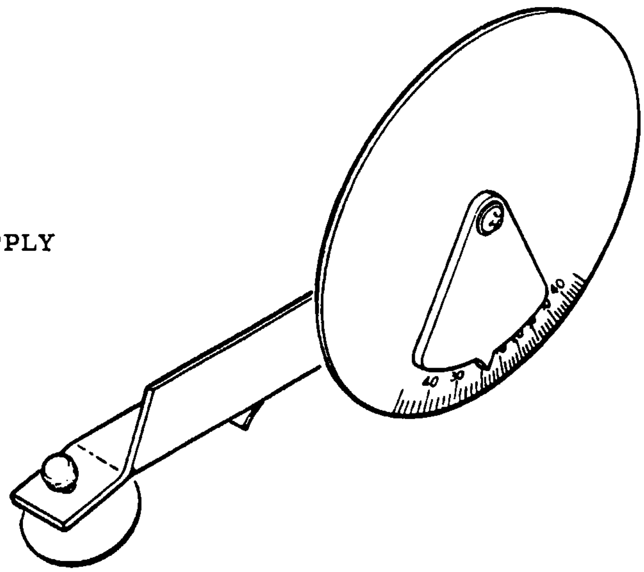


Figure 6-4. Inclinometer for Measuring Control Surface Travel

NOTE

Brass washers (11) may be used as shims between lower end of bellcrank and wing structure. Retain these shims. Tape open ends of bellcrank to prevent dust and dirt from entering bellcrank needle bearings (13).

6-10. REPAIR. Repair of bellcranks consists of replacement of defective parts. If needle bearings are dirty or in need of lubrication, clean thoroughly and lubricate as outlined in Section 2.

6-11. INSTALLATION.
a. Place bushing (14) and stop bushing (7) in bellcrank (8) and position bellcrank in wing.
b. Install brass washers (11) between lower end of bellcrank (8) and wing structure to shim out excess clearance.
c. Install bellcrank pivot bolt (4).
d. Position bellcrank stop-bushing (7) and install attaching bolt (6).
e. Connect control cables to bellcrank.
f. Connect push-pull rod (12) to bellcrank.
g. Re-rig aileron system in accordance with paragraph 6-18, safety turnbuckle (5) and reinstall all items removed for access.

6-12. CABLES AND PULLEYS. (See figure 6-1.)

6-13. REMOVAL AND INSTALLATION.
a. Remove access plates, wing root fairings and upholstery as required.
b. Remove safety wire and relieve cable tension at turnbuckles (8).
c. Disconnect cables from aileron bellcranks (7) and quadrants (index 24, figure 6-2).
d. Remove cable guards and pulleys as necessary to work cables free of aircraft.

NOTE

To ease routing of cables, a length of wire may be attached to end of cable before being withdrawn from aircraft. Leave wire in place, routed through structure; then attach cable being installed and use to pull cable into position.

e. After cable is routed in position, install pulleys and cable guards. Ensure cable is positioned in pulley groove before installing guard.
f. Re-rig aileron system in accordance with paragraph 6-18, safety turnbuckles and install access plates, fairings and upholstery removed in step "a."

6-14. AILERONS. (See figure 6-3.)

6-15. REMOVAL.
a. Disconnect push-pull rod (12) at aileron.
b. Remove screws and nuts attaching aileron hinges (1) to trailing edge of wing.
c. Using care, pull aileron out and down to slide hinges from under wing skin and auxiliary spar reinforcements.

6-16. INSTALLATION.
a. Position aileron hinges between skin and auxiliary spar reinforcements and install screws and nuts attaching hinges to trailing edge of wing.
b. Attach push-pull rod (12) to aileron.

NOTE

If rigging was correct and push-pull rod adjustment was not disturbed, it should not be necessary to re-rig system.

c. Check aileron travel and alignment, re-rig if necessary, in accordance with paragraph 6-18.

6-17. REPAIR. Aileron repair may be accomplished in accordance with instructions outlined in Section 18. Before installation, ensure balance weights and hinges are securely attached.

6-18. RIGGING. (See figure 6-1.)

a. Remove safety wire and relieve cable tension at turnbuckles (6 and 8).

b. Disconnect push-pull rods at bellcranks (7).

c. Adjust interconnect cable turnbuckle (index 30, figure 6-2) and adjustment terminals (index 27, figure 6-2) to remove cable slack, acquire proper tension (40 ± 10 pounds) and position control wheels level (synchronized).

d. Tape a bar across both control wheels to hold them in neutral position.

e. Adjust direct cable turnbuckles (8) and carry-thru cable turnbuckle (6) so bellcrank stop-bushings (index 7, figure 6-3) are centered in both bellcrank slots with 40±10 pounds tension on carry-thru cable. Disregard tension on direct cables.

f. Adjust push-pull rods (index 12, figure 6-3) at each aileron until ailerons are neutral with reference to trailing edge of wing flaps. Be sure wing flaps are full UP when making this adjustment.

g. With ailerons in neutral position (streamlined), mount an inclinometer on trailing edge of one aileron and set to 0°. (Refer to figure 6-4 for inclinometer.)

h. Remove bar from control wheels and check degree of travel as specified in figure 1-1. If travel is not within specified limits, readjust push-pull rods and cables as necessary.

i. Ensure all turnbuckles are safetied, all cables and cable guards are properly installed, all jam nuts are tight and replace all items removed for access.

WARNING

Be sure ailerons move in the correct direction when operated by the control wheel.

SHOP NOTES:

SECTION 7

WING FLAP CONTROL SYSTEM

TABLE OF CONTENTS	Page No. Aerofiche/Manual

7-1. WING FLAP CONTROL SYSTEM. (See figure 7-1.)

7-2. DESCRIPTION. The wing flap control system is comprised on an electric motor and transmission assembly, drive pulleys, push-pull rods, cables and a follow-up control. Power from the motor and transmission assembly is transmitted to the flaps by a system of drive pulleys, cables and push-pull rods. Electrical power to the motor is controlled by two microswitches mounted on a floating arm assembly, by a camming lever and a follow-up control. As the flap control lever is moved to the desired flap setting, the attached cam trips one of the microswitches, activating the flap motor. As the flaps move to the position selected, the floating arm is rotated by the follow-up control until the active microswitch clears the cam breaking the circuit and stopping the motor. To reverse flap direction, the control lever is moved in the opposite direction causing the cam to trip the second microswitch which reverses the flap motor. The follow-up control moves the switch mounting arm until the second switch clears the cam, shutting off the flap motor. Limit switches on flap actuator assembly prevent over-travel of the flaps in the full UP or DOWN positions.

7-3. OPERATIONAL CHECK.

a. Operate flaps through their full range of travel observing the uneven travel or jumpy motion, binding or lost motion. Ensure flaps are moving together through their full range of travel.

b. Check for positive shut-off of motor at flap travel extremes to prevent damage to actuator assembly.

c. With flaps full UP, mount an inclinometer on one flap and set to 0°. Lower flaps to full DOWN position and check flap angle as specified in figure 1-1. Check approximate mid-range percentage setting against degrees as indicated on inclinometer. Repeat the same procedure for the opposite flap.

NOTE

An inclinometer for measuring control surface travel is available from the Cessna Supply Division. See figure 6-4.

d. Remove access plates adjacent to flap drive pulleys and attempt to rock pulleys to check for bearing wear.

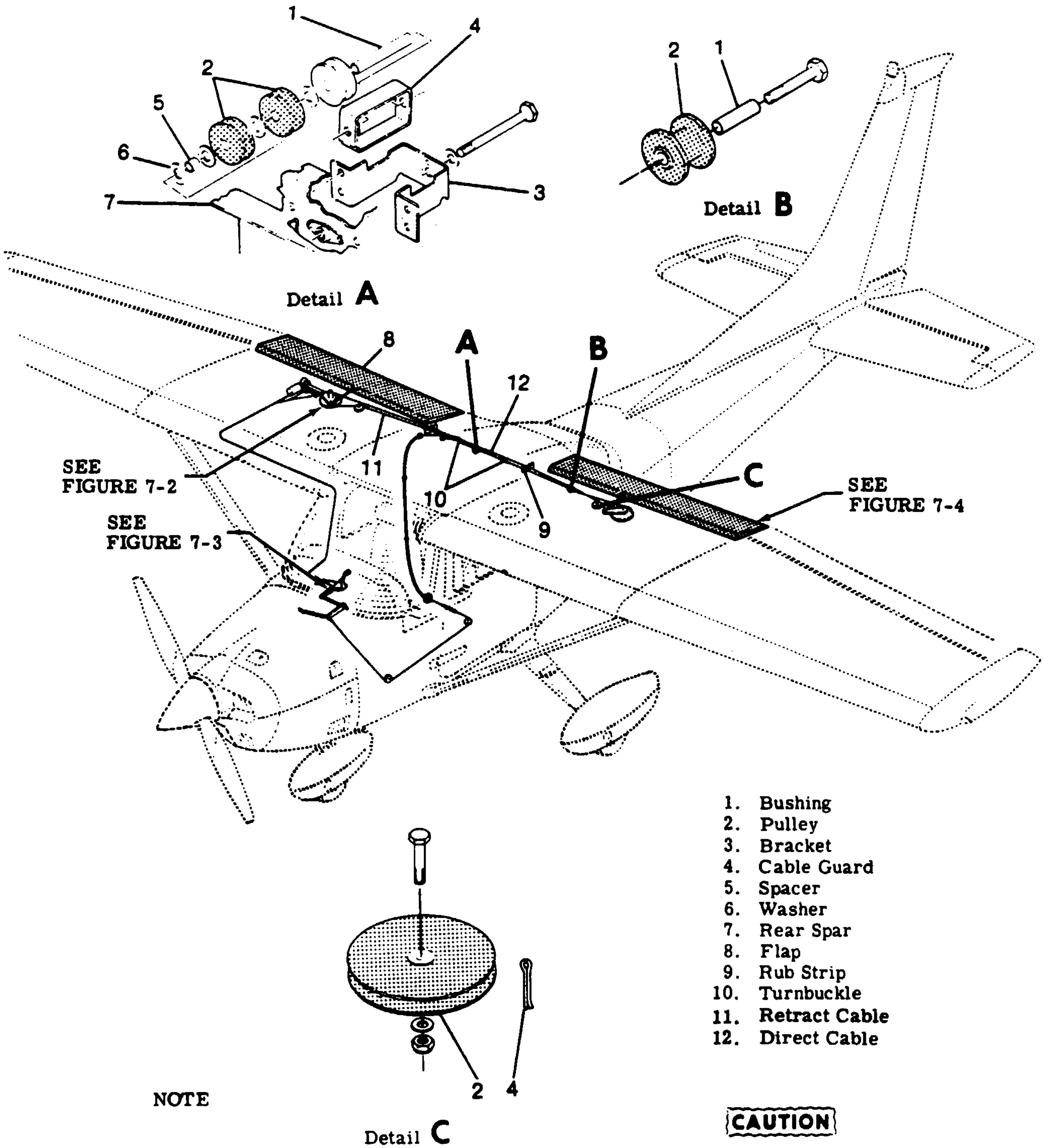
e. Inspect flap rollers and tracks for evidence of binding or defective parts.

7-4. TROUBLE SHOOTING.

NOTE

Due to remedy procedures in the following trouble shooting chart it may be necessary to re-rig system, refer to paragraphs 7-18 and 7-19.

TROUBLE	PROBABLE CAUSE	REMEDY
BOTH FLAPS FAIL TO MOVE.	Tripped circuit breaker.	Reset and check continuity. Replace breaker if defective.
	Defective switch.	Place jumper across switch. Replace switch if defective.
	Defective motor.	Remove and bench test. Replace motor if defective.
	Broken or disconnected wires.	Run continuity check of wiring. Connect or repair wiring as necessary.
	Disconnected or defective transmission.	Connect transmission. Remove, bench test and replace transmission if defective.
	Defective limit switch.	Check continuity of switches. Replace switches found defective.
	Follow-up control disconnected or slipping.	Secure control or replace if defective.
BINDING IN SYSTEM AS FLAPS ARE RAISED AND LOWERED.	Cables not riding on pulleys.	Open access plates and observe pulleys. Route cables correctly over pulleys.
	Bind in drive pulleys.	Check drive pulleys in motion. Replace drive pulleys found defective.
	Broken or binding pulleys.	Check pulleys for free rotation or breaks. Replace defective pulleys.
	Frayed cable.	Check condition of cables. Replace defective cables.
	Flaps binding on tracks.	Observe flap tracks and rollers. Replace defective parts.
LEFT FLAP FAILS TO MOVE.	Disconnected or broken cable.	Check cable tension. Connect or replace cable.
	Disconnected push-pull rod.	Attach push-pull rod.
FLAPS FAIL TO RETRACT.	Disconnected or defective flaps UP operating switch.	Check continuity of switch. Connect or replace switch.
FLAPS FAIL TO EXTEND.	Disconnected or defective flaps DOWN operating switch.	Check continuity of switch. Connect or replace switch.



1. Bushing
2. Pulley
3. Bracket
4. Cable Guard
5. Spacer
6. Washer
7. Rear Spar
8. Flap
9. Rub Strip
10. Turnbuckle
11. Retract Cable
12. Direct Cable

NOTE

Shaded pulleys used in this system only.

CAUTION

MAINTAIN SPECIFIED CONTROL CABLE TENSION

CABLE TENSION: 30 LBS ± 10 LBS (AT AVERAGE TEMPERATURE FOR THE AREA.) REFER TO FIGURE 1-1 FOR TRAVEL.

Figure 7-1. Wing Flap Control System

7-4. TROUBLE SHOOTING (Cont).

TROUBLE	PROBABLE CAUSE	REMEDY
INCORRECT FLAP TRAVEL.	Incorrect rigging.	Refer to paragraph 7-18.

7-5. FLAP MOTOR AND TRANSMISSION ASSEMBLY.

7-6. REMOVAL AND INSTALLATION. (See figure 7-2.)

a. Run flaps to full DOWN position.
b. Disconnect battery ground cable and insulate terminal as a safety precaution.
c. Remove access plates beneath flap motor and transmission assembly in right wing.

NOTE

Flap motor (9), transmission (7), hinge assembly (10), and actuating tube (5) are removed from the aircraft as a unit. On aircraft equipped with long range fuel tanks, it may be easier to detach motor and transmission assembly from other components before removing from wing.

d. Remove bolt (20) securing actuating tube (5) to drive pulley (13).
e. Screw actuating tube (5) in toward transmission (7) as far as possible by hand.
f. Remove bolt (1) securing flap motor hinge (10) to wing. Retain brass washer between hinge and wing structure for use on reinstallation.
g. Disconnect motor electrical leads at quick-disconnects.
h. Disconnect wiring at limit switches (23 and 26).
i. Carefully work assembly from wing through access opening.
j. Reverse preceding steps for reinstallation. If hinge assembly (10) was removed from the transmission (7) for any reason, ensure that short end of hinge is reinstalled toward the top.
k. Use Loctite grade CV adhesive on threads of setscrew (6) and collar (24) whenever actuating tube (5) is removed. Torque setscrew to 40 inch-pounds.
l. Complete operational check as outlined in paragraph 7-3 and rerig system in accordance with paragraph 7-18 and 7-19.

7-7. REPAIR. Repair consists of replacement of motor, transmission, actuating tube and associated hardware. Bearings in hinge assembly may also be replaced. Lubricate as outlined in Section 2.

7-8. FLAP CONTROL LEVER. (See figure 7-3.)

7-9. REMOVAL AND INSTALLATION.

a. Remove follow-up control torque tube (17) from switch mounting arm (24).
b. Remove flap operating switches (23 and 25) from switch mounting arm (24). DO NOT disconnect electrical wiring at switches.
c. Remove knob (15) from control lever (14).
d. Remove remaining items by removing bolt (28). Use care not to drop parts into tunnel area.
e. Reverse the preceding steps for reinstallation. Do not overtighten bolt (28) causing lever (14) to bind. Rig system in accordance with paragraphs 7-18 and 7-19.

7-10. DRIVE PULLEYS. (See figure 7-2.)

7-11. REMOVAL AND INSTALLATION.

a. Remove access plate adjacent to drive pulley (13) in right wing.
b. Unzip or remove headliner as necessary for access to turnbuckles (index 4, figure 7-1), remove safety wire and loosen turnbuckles.
c. Remove bolt (19) securing flap push-pull rod (14) to drive pulley (13) and lower RIGHT flap gently.
d. Remove bolt (20) securing actuating tube (5) to drive pulley (13) and lower LEFT flap gently. Retain bushing.
e. Remove cable locks (12) securing control cables to drive pulley (13). Tag cables for reference on reinstallation.
f. Remove bolt (11) attaching drive pulley (13) to wing structure.
g. Using care, remove drive pulley through access opening, being careful not to drop bushing. Retain brass washer between drive pulley and wing structure for use on reinstallation. Tape open ends of drive pulley after removal to protect bearings.
h. To remove left wing drive pulley, use this same procedure omitting step "d".
i. Reverse the preceding steps for reinstallation. Rig system in accordance with paragraph 7-18, safety turnbuckles and reinstall all items removed for access.

7-12. REPAIR. Repair is limited to replacement of bearings. Cracked, bent or excessively worn drive pulleys must be replaced. Lubricate bearings as outlined in Section 2.

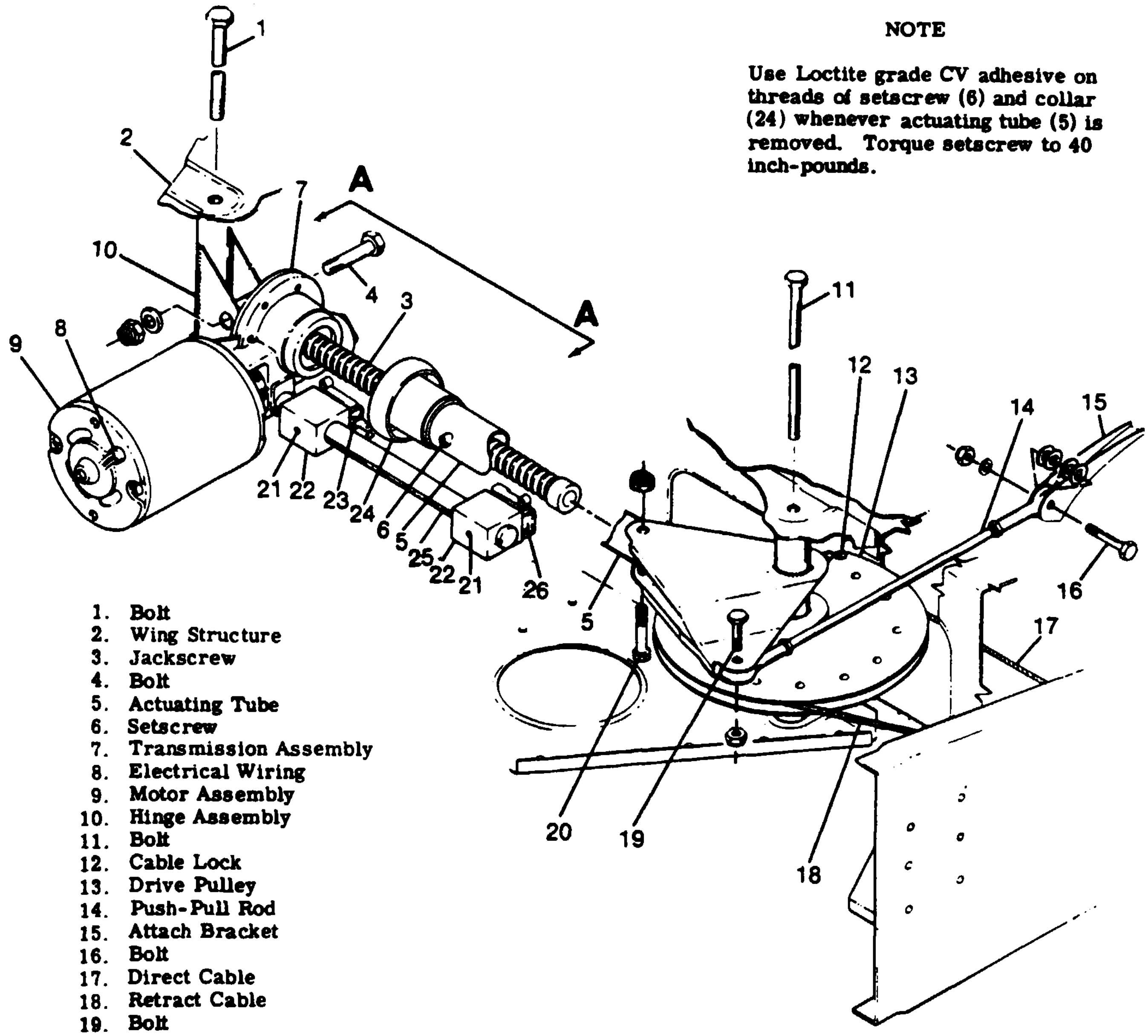
7-13. FLAPS. (See figure 7-4.)

7-14. REMOVAL AND INSTALLATION.

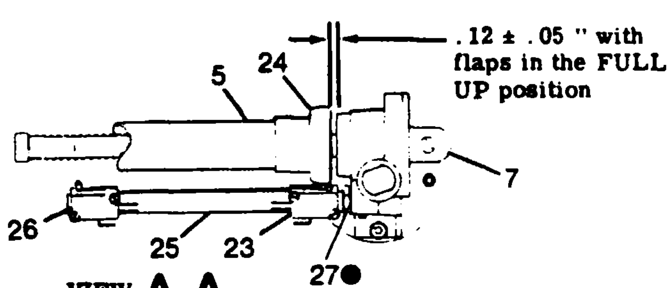
a. Run flaps to full DOWN position.
b. Remove access plates (1) from top leading edge of flap.
c. Disconnect push-pull rod (6) at flap bracket (7).
d. Remove bolts (5) at each flap track. As flap is removed from wing, all washers, rollers and bushings will fall free. Retain these for reinstallation.
e. Reverse the preceding steps for reinstallation. If push-pull rod (6) adjustment is not disturbed, rerigging of system should not be necessary. Check flap travel and rig in accordance with paragraph 7-18, if necessary.

NOTE

Use Loctite grade CV adhesive on threads of setscrew (6) and collar (24) whenever actuating tube (5) is removed. Torque setscrew to 40 inch-pounds.



1. Bolt
2. Wing Structure
3. Jackscrew
4. Bolt
5. Actuating Tube
6. Setscrew
7. Transmission Assembly
8. Electrical Wiring
9. Motor Assembly
10. Hinge Assembly
11. Bolt
12. Cable Lock
13. Drive Pulley
14. Push-Pull Rod
15. Attach Bracket
16. Bolt
17. Direct Cable
18. Retract Cable
19. Bolt
20. Bolt
21. Set Screw
22. Switch Adjustment Block
23. Up-Limit Switch
24. Switch Actuating Collar
25. Support
26. Down-Limit Switch
27. Nut

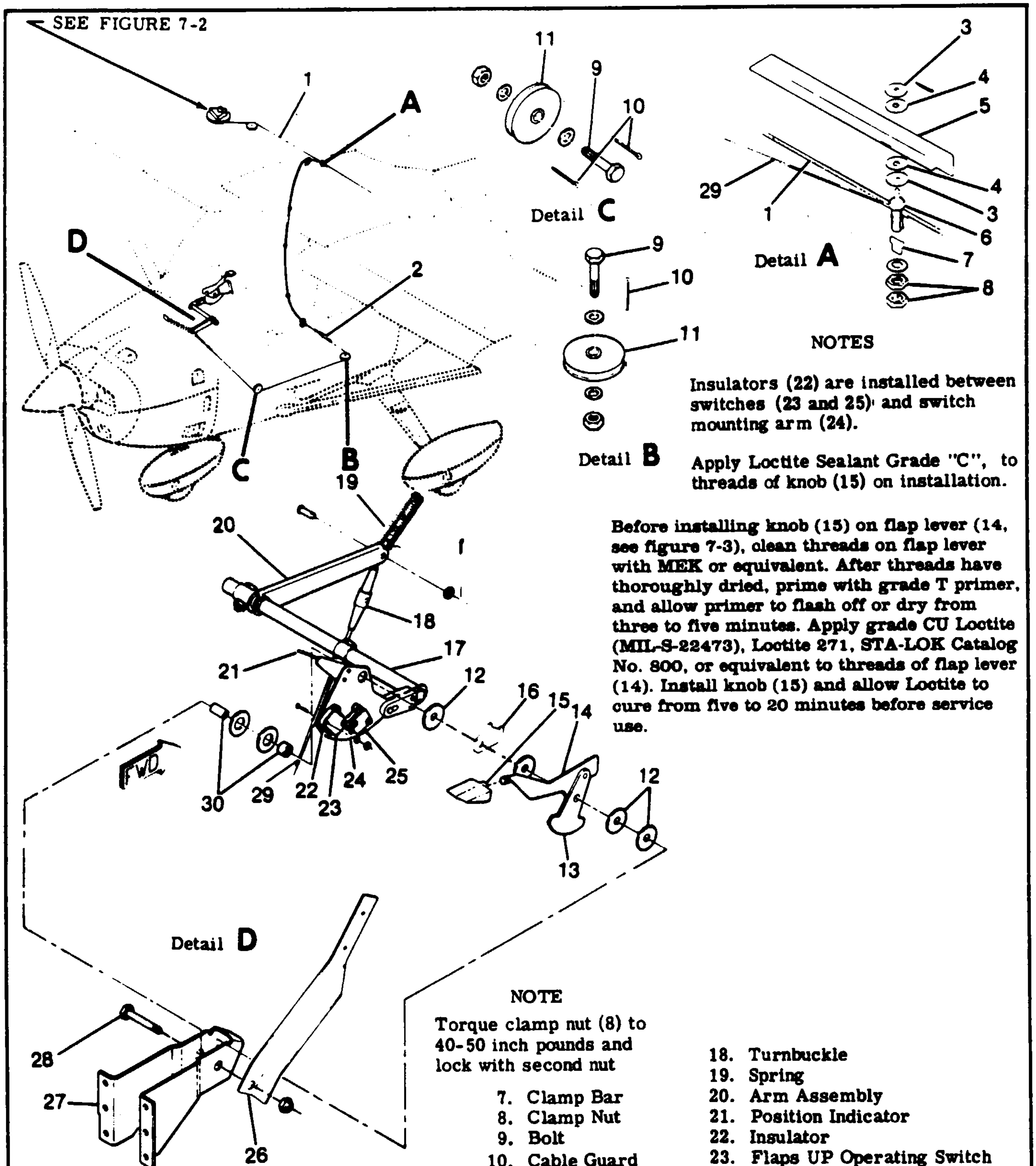


VIEW A-A

NOTE

● Use Locktite No. 601 or equivalent.

Figure 7-2. Flap Motor and Transmission Installation



NOTES

Insulators (22) are installed between switches (23 and 25) and switch mounting arm (24).

Apply Loctite Sealant Grade "C", to threads of knob (15) on installation.

Before installing knob (15) on flap lever (14, see figure 7-3), clean threads on flap lever with MEK or equivalent. After threads have thoroughly dried, prime with grade T primer, and allow primer to flash off or dry from three to five minutes. Apply grade CU Loctite (MIL-S-22473), Loctite 271, STA-LOK Catalog No. 800, or equivalent to threads of flap lever (14). Install knob (15) and allow Loctite to cure from five to 20 minutes before service use.

NOTE

Torque clamp nut (8) to 40-50 inch pounds and lock with second nut

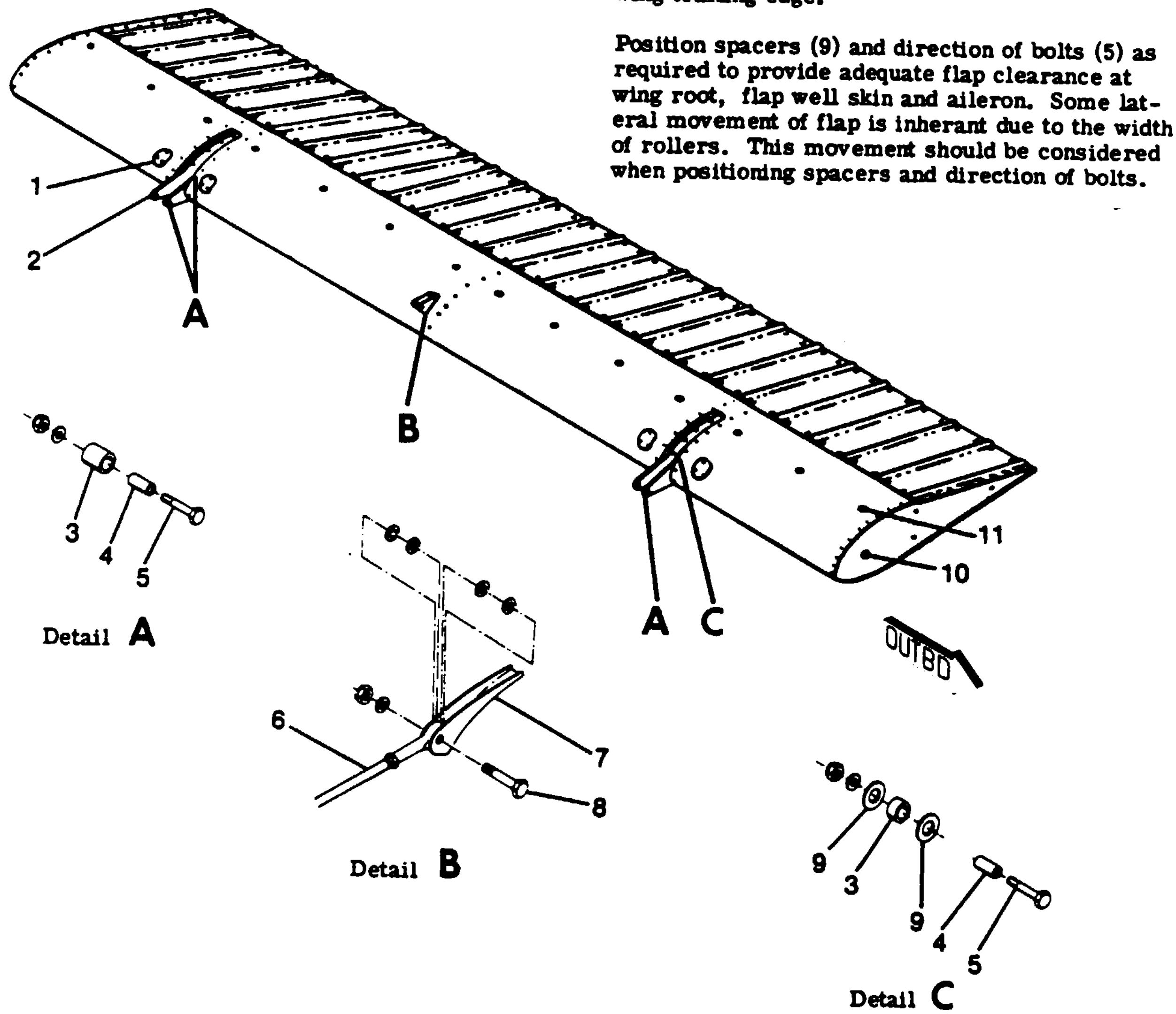
1. Retract Cable
2. Clevis
3. Metal Washer
4. Teflon Washer
5. Guide
6. Clamp Assembly
7. Clamp Bar
8. Clamp Nut
9. Bolt
10. Cable Guard
11. Pulley
12. Washer
13. Cam
14. Control Lever
15. Knob
16. Bracket
17. Torque Tube
18. Turnbuckle
19. Spring
20. Arm Assembly
21. Position Indicator
22. Insulator
23. Flaps UP Operating Switch
24. Switch Mounting Arm
25. Flaps Down Operating Switch
26. Support
27. Bracket
28. Bolt
29. Follow-Up Cable
30. Bushing

Figure 7-3. Flap Control Lever and Follow-Up Installation

NOTE

Bushings (4), rollers (3) and spacers (9) are first positioned through slots in flap tracks, then are secured to the flap roller supports (2) with attaching bolts, washers and nuts. Nylon plug buttons (11) prevent wing flap from chafing wing trailing edge.

Position spacers (9) and direction of bolts (5) as required to provide adequate flap clearance at wing root, flap well skin and aileron. Some lateral movement of flap is inherant due to the width of rollers. This movement should be considered when positioning spacers and direction of bolts.



1. Cover Plate
2. Flap Support
3. Roller Assembly
4. Bushing
5. Bolt
6. Push-Pull Rod
7. Flap Bracket
8. Bolt
9. Spacer
10. Plug Button
11. Nylon Plug Button

NOTE

Beginning with Serial 18268475, cover plates (1) are attached to flaps with recessed head screws.

Figure 7-4. Flap Installation

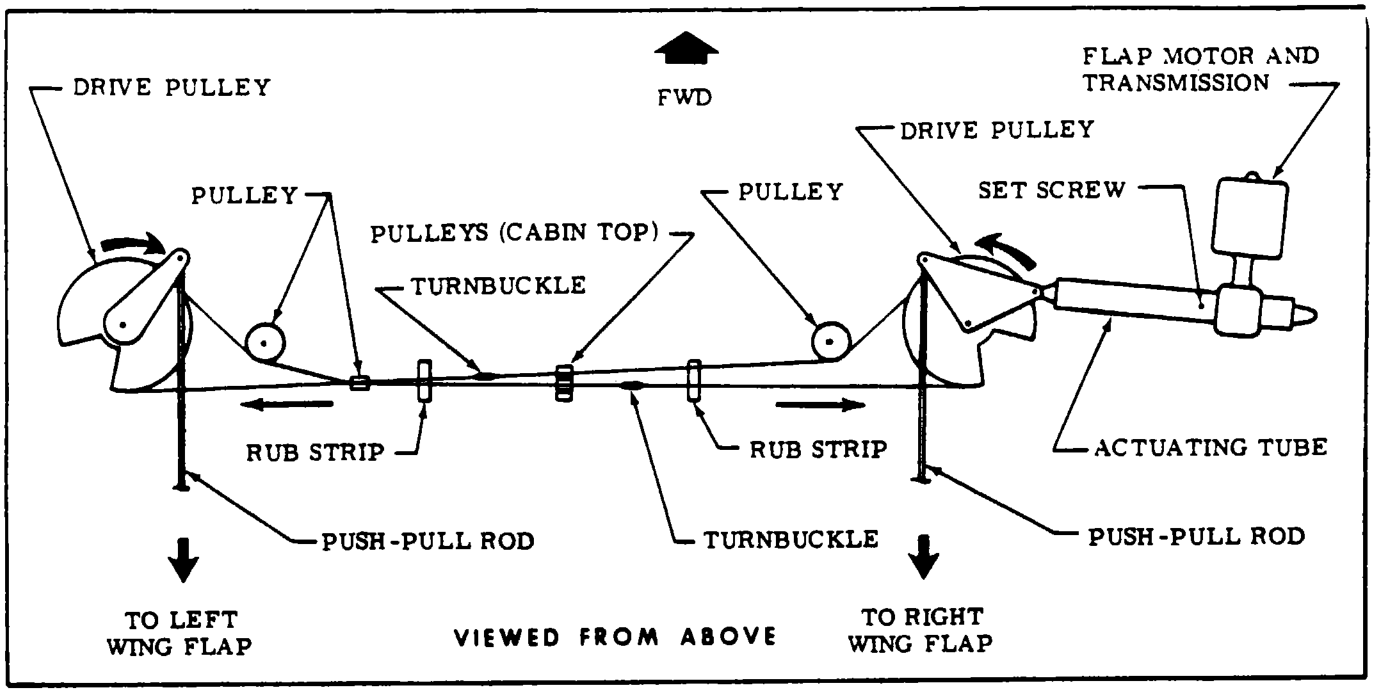


Figure 7-5. Flap System Schematic

7-15. REPAIR. Flap repair may be accomplished in accordance with instructions outlined in Section 18.

7-16. CABLES AND PULLEYS. (See figure 7-1.)

7-17. REMOVAL AND INSTALLATION.

a. Remove access plates, fairings, headliner and upholstery as necessary for access.

b. If retract cable (11) is to be removed, disconnect follow-up cable at clamp (index 6, figure 7-3).

c. Remove safety wire, relieve cable tension, disconnect turnbuckles (6) and carefully lower LEFT flap.

d. Disconnect cables at drive pulleys. remove cable guards and pulleys as necessary to work cables free of aircraft.

NOTE

To ease routing of cables, a length of wire may be attached to the end of cable being withdrawn from the aircraft. Leave wire in place, routed through structure; then attach the cable being installed and use wire to pull cable into posi ion.

e. Reverse the preceding steps for reinstallation.

f. After cables are routed in position, install pulleys and cable guards. Ensure cables are positioned in pulley grooves before installing guards.

g. Re-rig flap system in accordance with paragraph 7-18 and safety turnbuckles.

h. Re-rig follow-up system in accordance with paragraph 7-19 and reinstall all items removed in step "a."

7-18. RIGGING-FLAPS. (See figure 7-2.)

a. Unzip or remove headliner as necessary for access to turnbuckles (index 10, figure 7-1).

b. Remove safety wire, relieve cable tension, disconnect turnbuckles and carefully lower LEFT flap.

c. Disconnect push-pull rods (14) at drive pulleys (13) in both wings and lower RIGHT flap gently.

d. Disconnect actuating tube (5) from drive pulley (13).

NOTE

If control cables are not connected to left and right drive pulleys, actuating tube (5) and push-pull rods (14) must be disconnected before installing cables. If drive pulleys (13) are not installed. attach control cables before installing drive pulleys in the wings as illustrated in figure 7-5.

e. The 3/32 inch retract cable connects to the forward side of the right drive pulley and to the aft side of the left drive pulley. The 1/8 inch direct cable connects to the aft side of the right drive pulley and to the forward side of the left drive pulley.

f. Adjust both push-pull rods (14) to 8.83±.12 inches between centers of rod end bearings, and then tighten locknuts on both ends. Connect push-pull rods to flaps and drive pulleys.

NOTE

Temporarily connect cables at turnbuckles (index 10, figure 7-1) and test flaps by hand to ensure both flaps extend and retract together. If they will not, the cables are incorrectly attached to the drive pulleys. Ensure that the right drive pulley rotates clockwise, when viewed from below, as the flaps are extended. Tag cables for reference and disconnect turnbuckles again.

g. Screw actuating tube (5) IN toward transmission (7) by hand to .12±.05 inches between switch actuating collar (24) and transmission as illustrated in VIEW A-A. Loosen setscrew (6) securing actuating tube (5) to switch actuating collar (24), hold actuating collar to maintain .12±.05", hold RIGHT flap in the full UP position and adjust actuating tube (5) IN or OUT as necessary to align with attachment hole in drive pulley (13). Tighten setscrew (6) in accordance with procedures outlined in the following note and secure tube to drive pulley with bolt (20).

NOTE

Apply Loctite grade CV sealant to threads of setscrew (6) and torque to 40 inch-pounds.

If actuating tube (5) is too long to allow attachment to drive pulley after completion of step "g", proceed to step "h".

h. Disconnect push-pull rod (14) at drive pulley (13), then connect actuating tube (5) to drive pulley.

i. Manually hold RIGHT flap in full UP position and readjust push-pull rod (14) to align with attachment hole in drive pulley. Connect push-pull rod and tighten locknuts.

NOTE

The right flap and actuator must be correctly rigged before cables and left flap can be rigged.

j. Mount an inclinometer on trailing edge of RIGHT flap.

NOTE

An inclinometer for measuring control surface travel is available from the Cessna Supply Division. See figure 6-4.

k. With right flap in full UP position, loosen setscrew (21) and slide UP - limit switch (23) and adjustment block (22) assembly on support (25) to activate switch (23). When switch (23) is activated, power is interrupted to flap motor (9) during normal operation. After switch (23) is properly adjusted, tighten setscrew (21).

l. Move right flap to full DOWN position, loosen setscrew (21) on DOWN - limit switch (26), and move switch (26) on support (25) until switch (26) activates Adjust this switch action to correspond with maximum flap extension as specified in figure 1-1. After switch is properly adjusted, tighten setscrew (21).

m. Run RIGHT flap to full UP position, manually hold LEFT flap full UP and connect control cables at turnbuckles (index 10, figure 7-1). Remove reference tags previously installed in step "f" as turnbuckles are connected.

n. With flaps full UP, adjust turnbuckles to obtain 30±10 pounds tension on cables. Adjust retract cable first.

NOTE

Ensure cables are positioned in pulley grooves and cable ends are positioned correctly at drive pulleys before tightening turnbuckles.

o. Disconnect push-pull rod at left drive pulley. Run motor to extend flaps approximately 20° and check tension on each flap cable. If necessary, readjust turnbuckles to maintain 30±10 pounds tension on each cable and safety turnbuckles.

p. Fully retract right flap. Manually hold left flap in full up position and readjust push-pull rod to align with attaching hole in drive pulley. Connect push-pull rod and tighten locknuts.

q. After completion of steps "a" thru "p", operate flaps and check for positive shut-off of flap motor through several cycles. Check for specified flap travel with inclinometer mounted on each flap separately.

NOTE

Since the flap rollers may not bottom in the flap tracks with flaps fully extended, some free play may be noticed in this position.

SHOP NOTES:

7-19. RIGGING-FLAP CONTROL LEVER AND FOLLOW-UP. (See figure 7-3.)

a. Run flaps to full UP position.
b. Remove upholstery and headliner as necessary.
c. Secure follow-up cable (29) to retract cable (1) with clamp assembly (6). Torque clamp nut (27) to 40-50 inch-pounds and lock with a second nut.
d. Pull all slack from follow-up control cable and with position indicator (21) in full UP position, connect turnbuckle (18) to follow-up cable.
e. Connect spring (19) to arm assembly (20).
f. Make minor cable length adjustments using turnbuckle (18) to position indicator at 0° flaps.
g. With control lever (14) in full up position, adjust switches (23 and 25) in slotted holes until cam (13) is centered between switch rollers. Be sure control lever (14) is in full up position during this adjustment.
h. Mount an inclinometer on trailing edge of one flap and set to 0°. Turn master switch ON and move control lever to 10° position. If flap travel is more than 10±2°, adjust flaps DOWN operating switch (25) away from cam (13) and recycle flaps. If flap travel is less than 10±2°, adjust flaps DOWN operating switch (25) closer to cam (13) and recycle flaps.

NOTE

An inclinometer for measuring control surface travel is available from the Cessna Service Parts Center. See figure 6-4.

i. Repeat step "h" for 20° flap position (flap travel: 20±2°).
j. Adjust flaps UP operating switch (23) in slotted holes for .062 inch clearance between switch roller and cam (13) when the flaps DOWN operating switch has just opened in the 10° and 20° position.

NOTE

Flap travel on UP cycle may deviate a maximum of 4° from indicated position.

k. Turn master switch ON and run flaps through several cycles, stopping at various mid-range settings and checking that cable tension is within limits. Retract cable tension may increase to 90 pounds when flaps are fully retracted.
l. Check all rod ends and clevis ends for sufficient thread engagement, all jam nuts are tight and reinstall all items removed for access.
m. Flight test aircraft and check that follow-up control operates smoothly in flight.

SHOP NOTES:

SECTION 8

ELEVATOR CONTROL SYSTEM

8-1. ELEVATOR CONTROL SYSTEM. (See figure 8-1.)

8-2. DESCRIPTION. The elevators are operated by power transmitted through fore-and-aft movement of the pilot or copilot control wheels. The system is comprised of control columns, an elevator torque tube, cables and pulleys. The elevator control cables, at their aft ends, are attached to a bellcrank mounted on a bulkhead in the tailcone. A push-pull tube connects this bellcrank to the elevator arm assembly, installed between the elevators. An elevator trim tab is installed in the trailing edge of the right elevator and is described in Section 9.

8-3. TROUBLE SHOOTING.

NOTE

Due to remedy procedures in the following trouble shooting chart it may be necessary to re-rig system, refer to paragraph 8-14.

TROUBLE	PROBABLE CAUSE	REMEDY
NO RESPONSE TO CONTROL WHEEL FORE-AND-AFT MOVEMENT.	Forward or aft end of push-pull tube disconnected.	Attach push-pull tube correctly.
	Cables disconnected.	Attach cables and rig system in accordance with paragraph 8-14.

8-3. TROUBLE SHOOTING (Cont).

TROUBLE	PROBABLE CAUSE	REMEDY
BINDING OR JUMPY MOTION FELT IN MOVEMENT OF ELEVATOR SYSTEM.	Defective bellcrank or arm assembly pivot bearings or push-pull tube attach bearings.	Replace defective parts.
	Cables slack.	Adjust to tension specified in figure 8-1.
	Cables not riding correctly on pulleys.	Route cables correctly over pulleys.
	Nylon grommet on instrument panel binding.	Replace grommet.
	Defective control column bearing rollers.	Replace defective rollers.
	Defective control column torque tube bearings.	Replace defective bearings.
	Control guide on aft end of control square tube adjusted too tightly.	Loosen screw and tapered plug in end of control tube enough to eliminate binding.
	Defective elevator hinges.	Replace defective hinges.
	Defective pulleys or cable guards.	Replace defective parts and install guards properly.
ELEVATORS FAIL TO ATTAIN PRESCRIBED TRAVEL.	Stops incorrectly set.	Rig in accordance with paragraph 8-14.
	Cables tightened unevenly.	Rig in accordance with paragraph 8-14.
	Interference at instrument panel.	Rig in accordance with paragraph 8-14.

8-4. CONTROL COLUMN. (See figure 6-2.)
Section 6 outlines removal, installation and repair of control column.

8-5. ELEVATORS. (See figure 8-2.)

8-6. REMOVAL AND INSTALLATION.
a. Remove stinger.
b. Disconnect trim tab push-pull tube (6) at tab actuator.

NOTE

If trim system is not moved and actuator screw is not turned, re-rigging of trim system should not be necessary after re-installation of elevator.

c. Remove bolts (13) securing elevator torque tubes (3) to arm assembly (4).
d. Remove bolts (14) from elevator hinges.
e. Using care, remove elevator.
f. To remove left elevator use same procedure, omitting step "b".
g. Reverse the preceding steps for reinstallation.

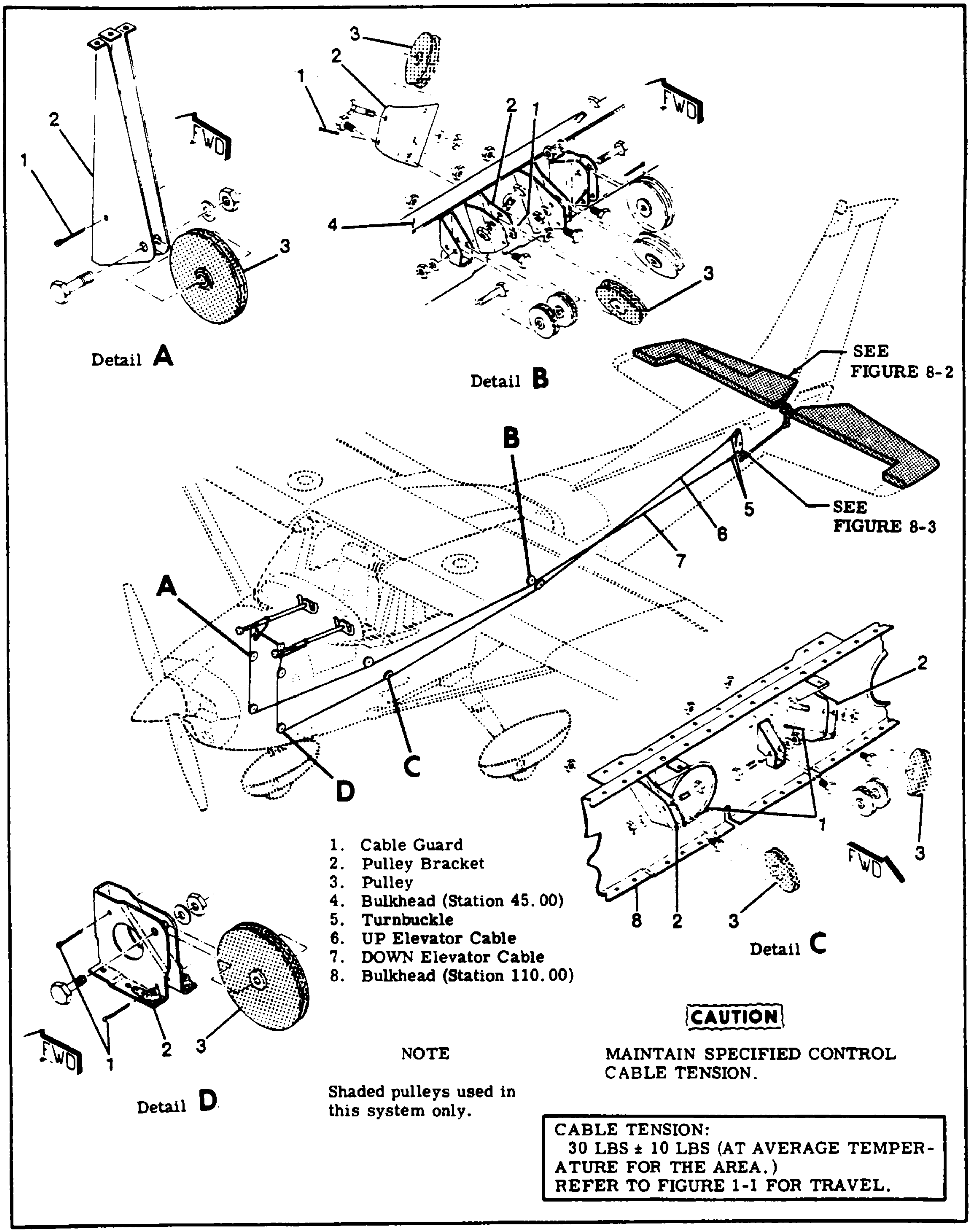
8-7. REPAIR. Repair may be accomplished as outlined in Section 18. Hinge bearings may be replaced as necessary. If repair has affected static balance, check and rebalance as required.

8-8. BELLCRANK. (See figure 8-3.)

8-9. REMOVAL AND INSTALLATION.
a. Remove access plate below bellcrank on tailcone.

CAUTION

Position a support stand under tail tie-down ring to prevent the tailcone from dropping while working inside.



1. Cable Guard
2. Pulley Bracket
3. Pulley
4. Bulkhead (Station 45.00)
5. Turnbuckle
6. UP Elevator Cable
7. DOWN Elevator Cable
8. Bulkhead (Station 110.00)

NOTE

Shaded pulleys used in this system only.

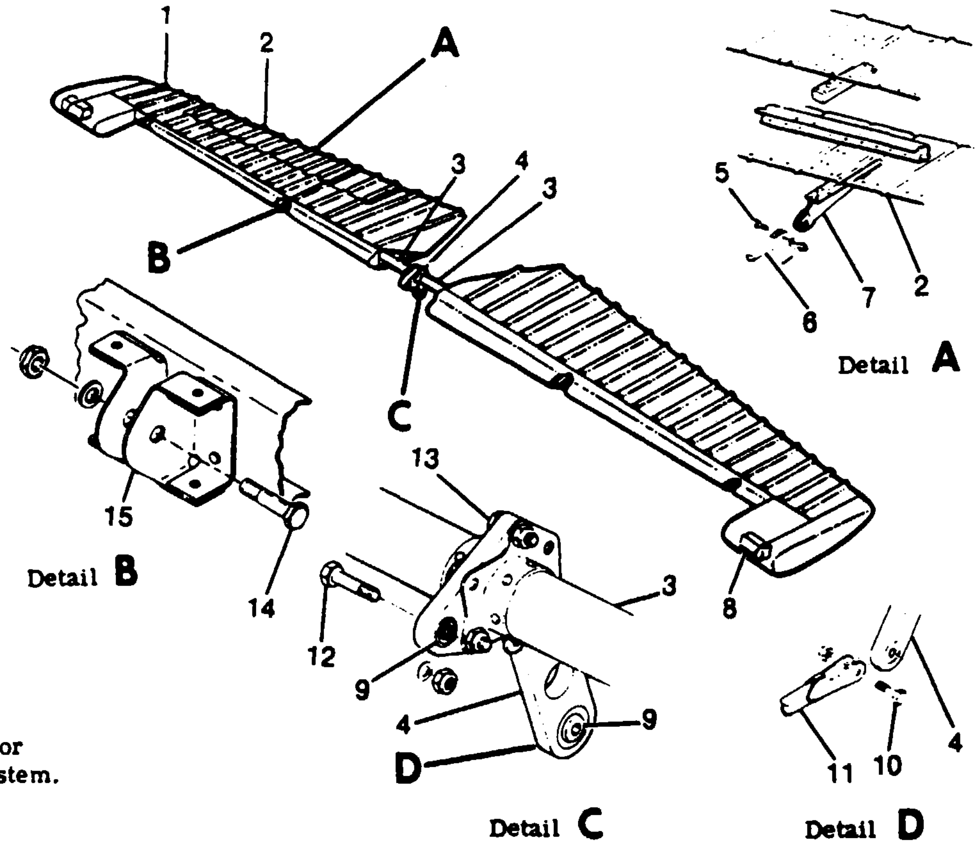
CAUTION

MAINTAIN SPECIFIED CONTROL CABLE TENSION.

CABLE TENSION:
30 LBS ± 10 LBS (AT AVERAGE TEMPERATURE FOR THE AREA.)
REFER TO FIGURE 1-1 FOR TRAVEL.

Figure 8-1. Elevator Control System

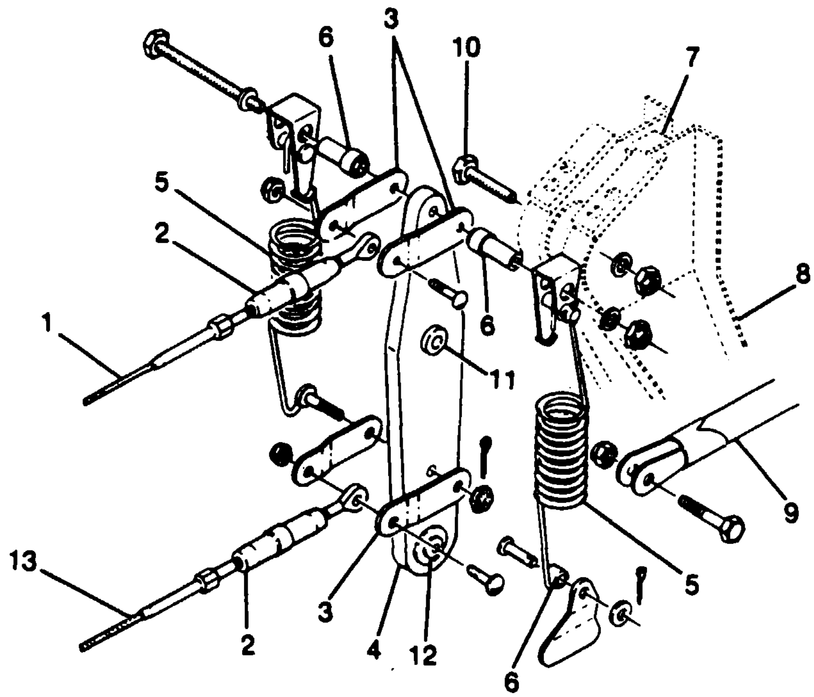
1. Elevator
2. Trim Tab
3. Torque Tube
4. Arm Assembly
5. Bolt
6. Push-Pull Tube
7. Horn Assembly
8. Balance Weight
9. Bearing
10. Bolt
11. Push-Pull Tube
12. Bolt
13. Bolt
14. Bolt
15. Hinge Bracket



NOTE

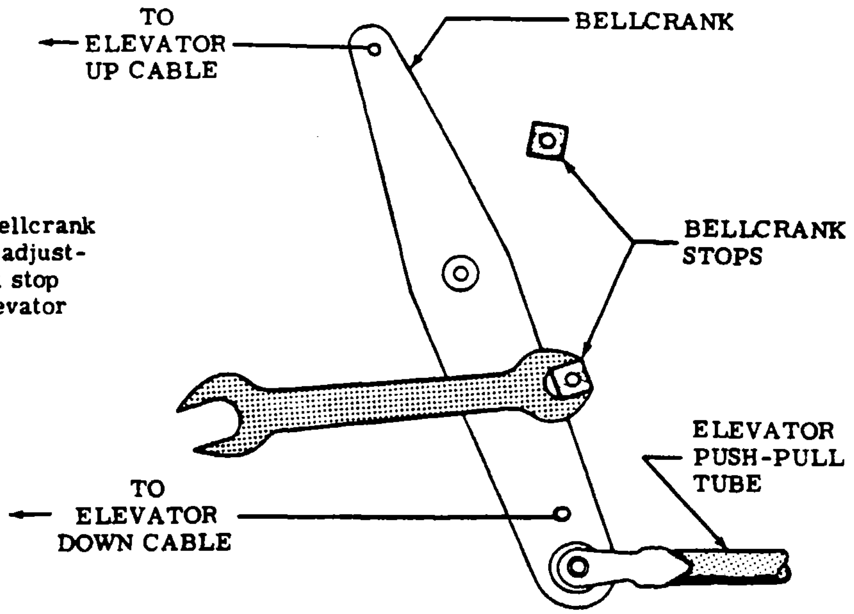
Refer to Section 9 for trim tab control system.

Figure 8-2. Elevator Installation



1. UP Elevator Cable
2. Turnbuckle
3. Link
4. Bellcrank
5. Spring
6. Spacer
7. Stop Block
8. Bracket
9. Push-Pull Tube
10. Pivot Bolt
11. Bushing
12. Bearing
13. DOWN Elevator Cable

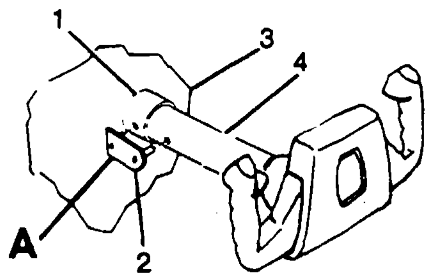
Figure 8-3. Elevator Bellcrank Installation



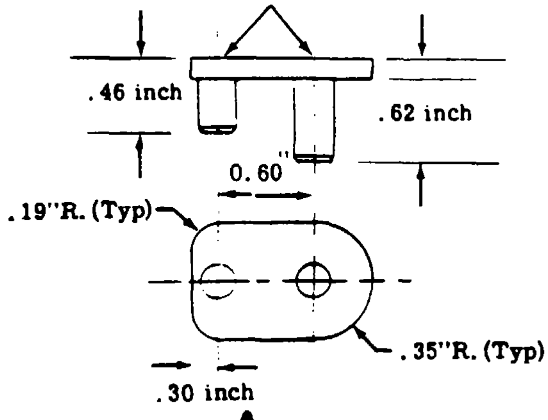
NOTE

Holes are drilled off center in bellcrank stops to provide elevator travel adjustments. 90° rotation of bellcrank stop provides approximately 1° of elevator travel.

Figure 8-4. Elevator Bellcrank Travel Stop Adjustment



1. Support
2. Neutral Rigging Tool
3. Instrument Panel
4. Pilot's Control Column



Detail A

Fabricate from 0.125" steel plate, 0.209" dia. drill rod for short pin, and 0.250" dia. drill rod for long pin, according to dimensions shown.

Figure 8-5. Control Column Neutral Position Rigging Tool

b. Remove safety wire, relieve cable tension at turnbuckles (2) and disconnect turnbuckle eyes at bellcrank links (3).
c. Disconnect elevator down-springs (5) at bellcrank (4).
d. Disconnect push-pull tube (9) at bellcrank (4).
e. Remove pivot bolt (10) attaching bellcrank (4) to brackets (8). Remove bellcrank.
f. Reverse the preceding steps for reinstallation. Rig system in accordance with paragraph 8-14, safety turnbuckles and reinstall all items removed for access.

8-10. ARM ASSEMBLY. (See figure 8-2.)

8-11. REMOVAL AND INSTALLATION.
a. Remove stinger.
b. Remove bolt (10) securing push-pull tube (11) to arm assembly (4).
c. Remove bolts (13) attaching elevator torque tubes (3) to arm assembly (4).
d. Remove pivot bolt (12) securing arm assembly (4) and slide assembly from between elevator torque tubes.
e. Reverse the preceding steps for reinstallation and reinstall all items removed for access.

8-12. CABLES AND PULLEYS. (See figure 8-1.)

8-13. REMOVAL AND INSTALLATION.

CAUTION

Position a support stand under tail tie-down ring to prevent the tailcone from dropping while working inside.

a. Remove seats, upholstery and access plates as necessary.
b. Remove safety wire and relieve cable tension at turnbuckles (5).
c. Disconnect cables at control column arm assemblies (index 18, figure 6-2).
d. Disconnect cables at bellcrank links (index 3, figure 8-3).
e. Remove cable guards and pulleys as necessary to work cables free of aircraft.

NOTE

To ease routing of cables, a length of wire may be attached to the end of cable being withdrawn from aircraft. Leave wire in place, routed through structure; then attach the cable being installed and pull cable into position.

f. After cable is routed in position, install pulleys and cable guards. Ensure cable is positioned in pulley groove before installing guards.
g. Re-rig system in accordance with paragraph 8-14, safety turnbuckles and reinstall all items removed in step "a".

8-14. RIGGING. (See figure 8-3.)

CAUTION

Position a support stand under tail tie-down ring to prevent the tailcone from dropping while working inside.

a. Streamline elevators, mount an inclinometer on one elevator and set to 0°.

NOTE

An inclinometer for measuring control surface travel is available from the Cessna Supply Division. See figure 6-4.

b. Lock control column in neutral position per figure 8-5.
c. Adjust bellcrank stop blocks (7) at brackets (8) to degree of travel specified in figure 1-1.

NOTE

The bellcrank stop blocks (7) are four-sided bushings, drilled off-center so they may be rotated to any one of four positions to attain correct elevator travel. Each 90-degree rotation of the stop, changes the elevator travel approximately one degree.

d. Adjust turnbuckles (2) equally to tension specified in figure 8-3.
e. Check sponge at control column in both UP and DOWN positions and if necessary, readjust turnbuckles (2) to prevent the control column from hitting the instrument panel or firewall.
f. Safety turnbuckles and reinstall all items removed for access.

WARNING

Be sure elevators move in the correct direction when operated by the control wheel.

SHOP NOTES:

SECTION 9

ELEVATOR TRIM TAB CONTROL SYSTEM

TABLE OF CONTENTS	Page No. Aerofiche/Manual

9-1. ELEVATOR TRIM TAB CONTROL SYSTEM.

9-2. DESCRIPTION. The elevator trim tab, located on the trailing edge of the right elevator, is controlled by a trim wheel mounted in the pedestal. Power to operate the tab is transmitted from the trim control wheel by means of roller chains, cables, an actuator and a push-pull tube. A mechanical pointer, adjacent to the trim wheel indicates tab position. A "nose-up" setting results in a tab-down position. An electric trim assist system may also be installed. This system is described in paragraph 9-20.

9-3. TROUBLE SHOOTING.

NOTE

Due to remedy procedures in the following trouble shooting chart it may be necessary to re-rig system, refer to paragraph 9-18.

TROUBLE	PROBABLE CAUSE	REMEDY
TRIM CONTROL WHEEL MOVES WITH EXCESSIVE RESISTANCE.	Cable tension too high.	Check and adjust tension as specified in figure 9-1.
	Pulleys binding or rubbing.	Open access plates and check visually. Install cables correctly.
	Cables not in place on pulleys.	Open access plates and check visually. Install cables correctly.
	Trim tab hinge binding.	Disconnect actuator and move tab to check resistance. Lubricate or replace hinge as necessary.
	Defective trim tab actuator.	Remove chain from actuator sprocket and operate actuator manually. Replace actuator if defective.
	Rusty chain.	Check visually. Replace chain.
	Damaged sprocket.	Check visually. Replace sprockets.
	Bent sprocket shaft.	Observe motion of sprockets. Replace bent sprocket shafts.

9-3. TROUBLE SHOOTING (Cont).

TROUBLE	PROBABLE CAUSE	REMEDY
LOST MOTION BETWEEN CONTROL WHEEL AND TRIM TAB.	Cable tension too low.	Check and adjust tension as specified in figure 9-1.
	Broken pulley.	Open access plates and check visually. Replace defective pulley.
	Cable not in place on pulleys.	Open access plates and check visually. Install cables correctly.
	Worn trim tab actuator.	Remove and replace worn actuator.
	Actuator attachment loose.	Check actuator for security. Tighten as necessary.
TRIM INDICATOR FAILS TO INDICATE CORRECT TRIM POSITION.	Indicator incorrectly engaged on wheel track.	Check visually and reset indicator as necessary.
INCORRECT TRIM TAB TRAVEL.	Stop blocks loose or incorrectly adjusted.	Adjust stop blocks on cables. Refer to figure 9-2.

9-4. TRIM TAB. (See figure 9-1.)

9-5. REMOVAL AND INSTALLATION.

a. Disconnect push-pull tube (25) from horn assembly (26).

NOTE

If trim system is not moved and actuator screw is not turned, re-rigging of system should not be necessary after installation of tab.

b. Drill out rivets securing trim tab hinge to elevator and remove trim tab.

NOTE

After tab has been removed and if hinge pin is to be removed, it is necessary to spread the crimped ends of the hinge before driving out pin. When a pin has been installed, crimp ends of hinge to prevent pin from working out.

c. Reverse the preceding steps for reinstallation. Rig system if necessary in accordance with paragraph 9-18.

9-6. TRIM TAB ACTUATOR. (See figure 9-1.)

9-7. REMOVAL AND INSTALLATION.

a. Relieve cable tension at turnbuckle (10).

CAUTION

Position a support stand under the tail tie-down ring to prevent tailcone from dropping while working inside.

b. Remove access plate beneath actuator.
c. Disconnect push-pull tube (25) at actuator (6).
d. Remove chain guard (20) and disengage chain from actuator sprocket (21).
e. Remove screws attaching clamps (22) to bracket (19) and remove actuator (6) through access opening.
f. Reverse the preceding steps for reinstallation. Rig system in accordance with paragraph 9-18, safety turnbuckle and reinstall all items removed for access.

9-8. DISASSEMBLY. (See figure 9-3.)

a. Remove actuator in accordance with paragraph 9-7.
b. Disassemble actuator assembly (1) as illustrated in Detail A as follows:
   1. Remove chain guard (3) if not previously removed in step "e" of paragraph 9-7.
   2. Using suitable punch and hammer, remove roll pins (8) securing sprocket (5) to screw (9) and remove sprocket from screw.
   3. Unscrew threaded rod end (15) and remove rod end from actuator.
   4. Remove roll pins (10) securing bearings (6) and (14) at the housing ends.
   5. Lightly tap screw (9) toward the sprocket end of housing, remove bearing (6) and collar (7).

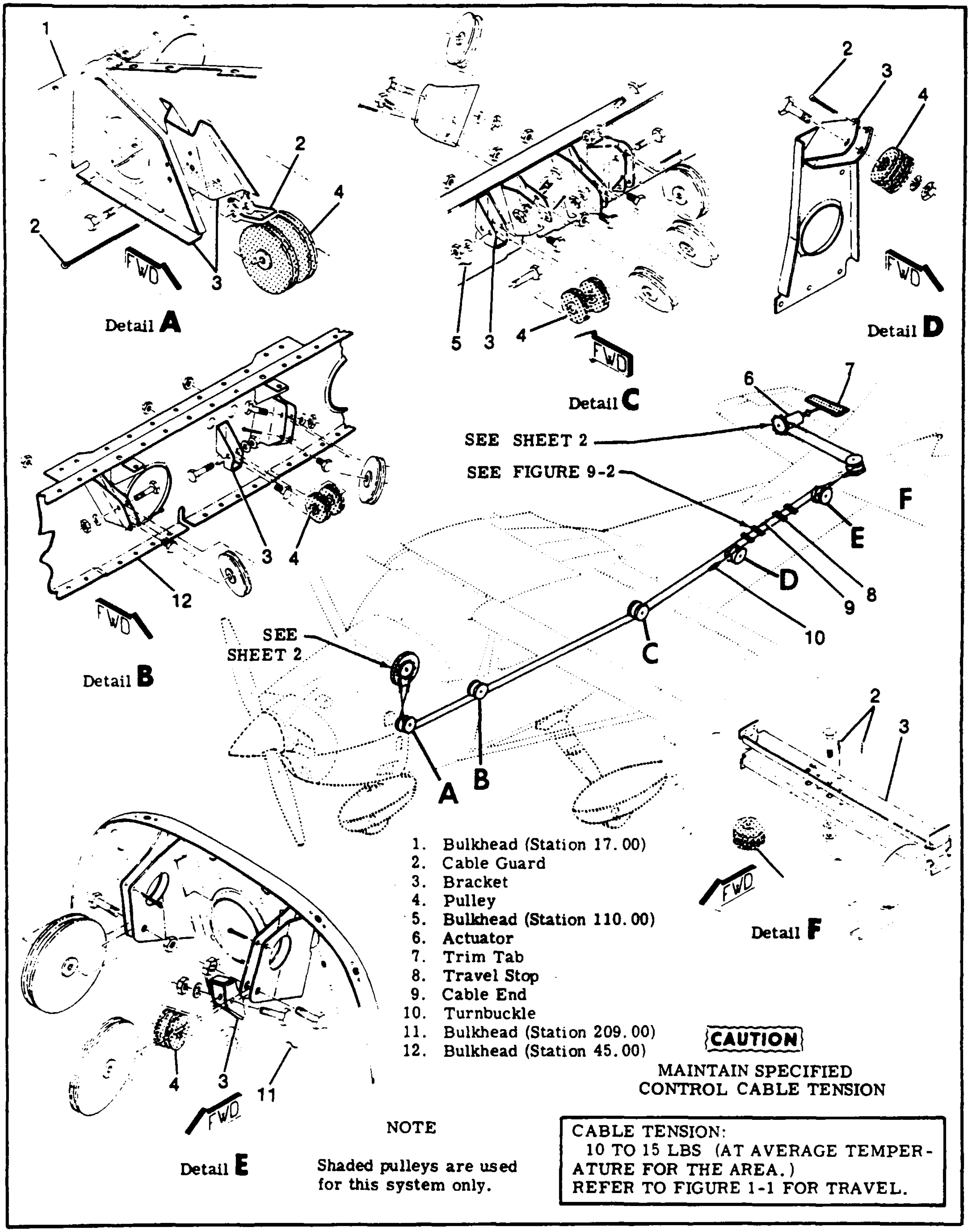
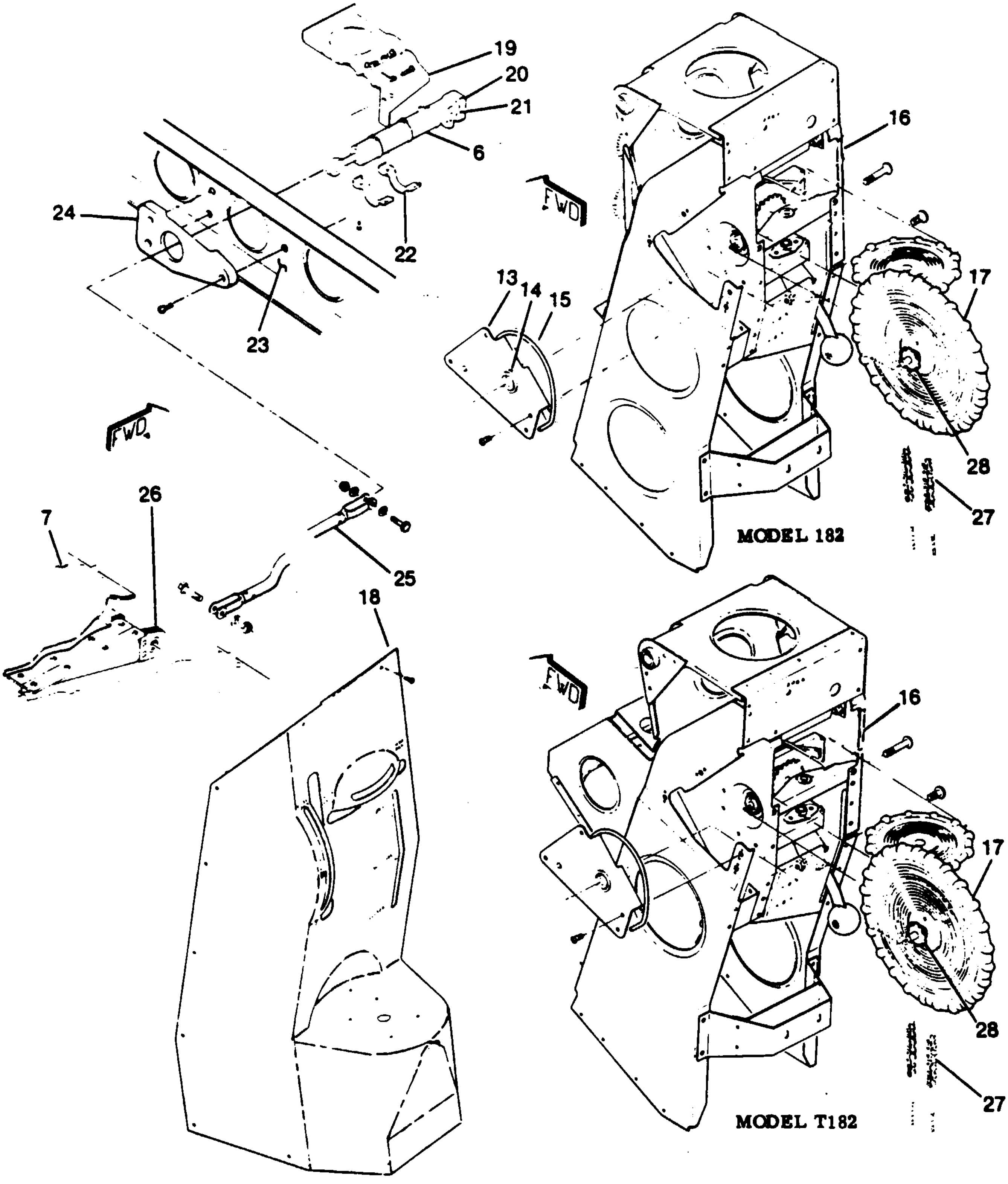
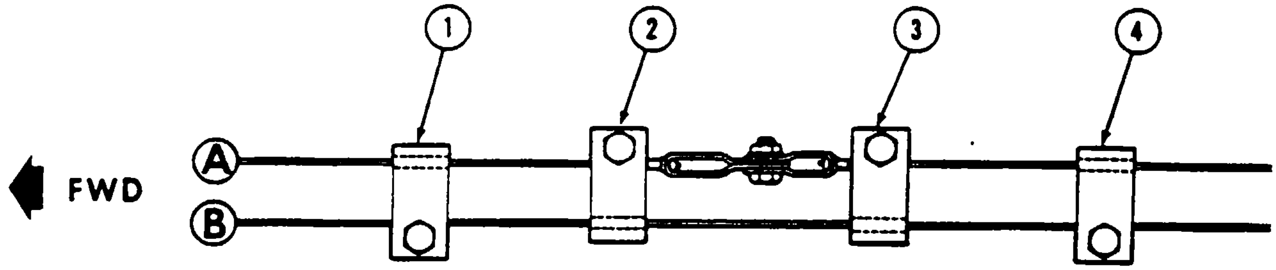


Figure 9-1. Elevator Trim Tab Control System (Sheet 1 of 2)



6. Actuator
7. Trim Tab
13. Retainer
14. Bearing
15. Trim Indicator
16. Pedestal Structure
17. Trim Wheel
18. Pedestal Cover
19. Support Bracket
20. Chain Guard
21. Sprocket
22. Clamp
23. Stabilizer Rear Spar
24. Brace
25. Push-Pull Tube
26. Horn Assembly
27. Roller Chain
28. Sprocket

Figure 9-1. Elevator Trim Tab Control System (Sheet 2 of 2)



1. With elevators in neutral. set trim tab to neutral (streamlined).
2. Position stop blocks (2 and 3) against cable ends and secure to cable A.
3. Place inclinometer on trim tab and lower to degree specified in figure 1-1.
4. Position stop block (4) against stop block (3) and secure to cable B.
5. Raise trim tab to specified degree. place stop block (1) against stop block (2) and secure to cable B.

Figure 9-2. Elevator Trim Tab Travel Stop Adjustment

6. Lightly tap screw (9) in the opposite direction from sprocket end, remove bearing (14), O-ring (13) and collar (7).
7. It is not necessary to remove retaining rings (11).

9-9. CLEANING, INSPECTION AND REPAIR. (See figure 9-3.)

a. DO NOT remove bearing (16) from threaded rod end (15) unless replacement of bearing is necessary.
b. Clean all component parts, except bearing (16), by washing in Stoddard solvent or equivalent. Do not clean sealed bearing (16).
c. Inspect all component parts for obvious indications of damage such as stripped threads, cracks, deep nicks and dents.
d. Check bearings (6 and 14), screw (9) and threaded rod end (15) for excessive wear and scoring. Dimensions of the parts are as follows:

BEARING (6)	
INSIDE DIAMETER	0.373" MIN.
INSIDE DIAMETER	0.374" MAX.
BEARING (14)	
INSIDE DIAMETER	
SMALL HOLE	0.248" MIN.
SMALL HOLE	0.249" MAX.
LARGE HOLE	0.373" MIN.
LARGE HOLE	0.374" MAX.
THREADED ROD END (15)	
OUTSIDE DIAMETER (SHANK)	0.245" MIN.
	0.246" MAX.
SCREW (9)	
OUTSIDE DIAMETER	0.369" MIN.
	0.370" MAX.

NOTE

Relative linear movement between internal threaded screw (9) and bearing (14) should be 0.004 to 0.010 inch at room temperature.

e. Examine threaded rod end (15) and screw (9) for damaged threads or dirt particles that may impair smooth operation.
f. Check sprocket (5) for broken, chipped and/or worn teeth.
g. Check bearing (16) for smoothness of operation.
h. DO NOT attempt to repair damaged or worn parts of the actuator assembly. Discard all defective items and install new parts during reassembly.

9-10. REASSEMBLY. (See figure 9-3.)

a. Always discard the following items and install new parts during reassembly.
   1. Bearings (6 and 14)
   2. Roll Pins (8 and 10)
   3. O-Ring (13)
   4. Nuts (2).
b. During reassembly, lubricate collars (7), screw (9) and threaded rod end (15) in accordance with Section 2.
c. Press sprocket (5) into the end of screw (9), align roll pin holes and install new roll pins (8).
d. Slip bearing (6) and collar (7) on screw (9) and slide them down against sprocket (5).
e. Insert screw (9), with assembled parts, into housing (12) until bearing (6) is flush with the end of housing.

NOTE

When inserting screw (9) into housing (12) locate the sprocket (5) at the end of housing which is farther away from the groove for retaining ring (11).

The bearings (6 and 14) are not pre-drilled and must be drilled on assembly. The roll pins (10) are 3/32 inch in diameter, therefore, requiring a 3/32 (0.094) inch drill.

f. With bearing (6) flush with end of housing (12), carefully drill bearing so the drill will emerge from the hole on the opposite side of housing (12).
DO NOT ENLARGE HOLES IN HOUSING.
g. Press new roll pins (10) into pin holes.
h. Insert collar (7), new O-ring (13) and bearing (14) into opposite end of housing (12).
i. Complete steps "f" and "g" for bearing (14).
j. If a new bearing (16) is required, a new bearing may be pressed into the boss. Be sure force bears against the outer race of bearing.
k. Screw the threaded rod end (15) into screw (9).
l. Install retaining rings (11), if they were removed.
m. Test actuator assembly by rotating sprocket (5) with fingers while holding threaded rod end (15). The threaded rod end should travel in and out smoothly with no indication of binding.
n. Reinstall actuator assembly in accordance with paragraph 9-7.

9-11. TRIM TAB FREE-PLAY INSPECTION.
a. Place elevator and trim tab in neutral position and secure elevator from movement.
b. Determine maximum amount of allowable free-play using procedures shown in figure 9-2A.
c. Using moderate hand pressure (up and down), measure free-play at trailing edge of trim tab.
d. If trim tab free-play is less than maximum allowable, the system is within prescribed limits.
e. If trim tab free-play is more than maximum allowable, check the following items for looseness while moving trim tab up and down.
1. Check push-pull tube to trim tab horn assembly attachment for looseness.
2. Check push-pull tube to actuator assembly threaded rod end attachment for looseness.
3. Check actuator assembly threaded rod end for looseness in the actuator assembly with push-pull tube disconnected.
f. If looseness is apparent while checking steps e-1 and e-2, repair by installing new parts.
g. If looseness is apparent while checking step e-3, refer to paragraphs 9-6 through 9-10. Recheck trim tab free-play.

9-12. TRIM TAB CONTROL WHEEL. (See figure 9-1.)

9-13. REMOVAL AND INSTALLATION.
a. Relieve cable tension at turnbuckle (10).

CAUTION

Position a support stand under the tail tie-down ring to prevent tailcone from dropping while working inside.

b. Remove pedestal cover (18) in accordance with paragraph 9-16.
c. Remove screws attaching control wheel retainer (13) to left side of pedestal structure (16).
d. Remove retainer (13) and indicator (15), using care not to drop trim wheel (17).
e. Disengage roller chain (27) from sprocket (28) and trim wheel (17).

NOTE

Removal of the sprocket (7) from control wheel shaft is not recommended except for replacement of parts.

f. Reverse the preceding steps for reinstallation. Rig system in accordance with paragraph 9-18, safety turnbuckle and reinstall all items removed for access.

9-14. CABLES AND PULLEYS. (See figure 9-1.)

9-15. REMOVAL AND INSTALLATION.
a. Remove seats, upholstery, pedestal cover and access plates as necessary.

CAUTION

Position a support stand under the tail tie-down ring to prevent tailcone from dropping while working inside.

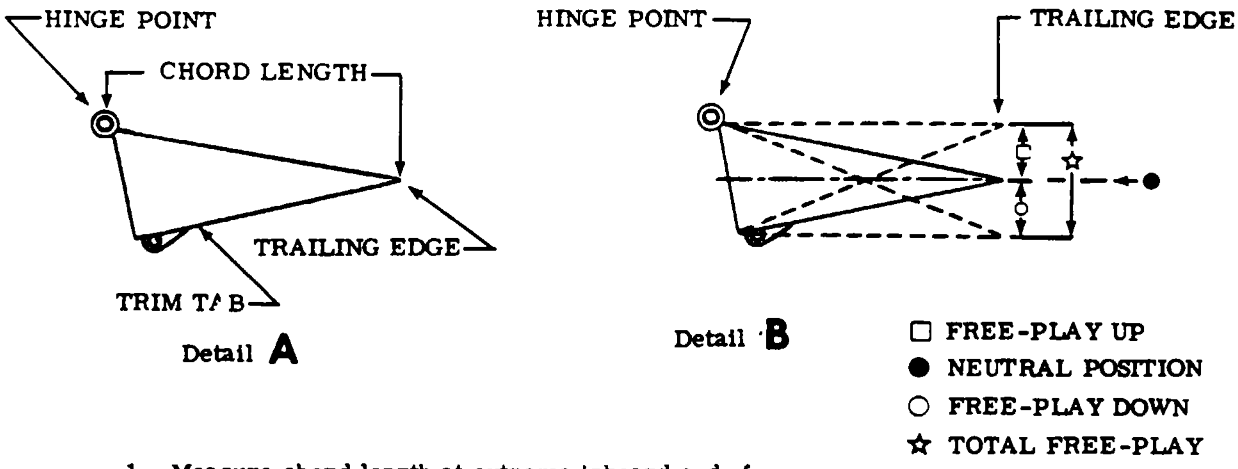
b. Remove travel stop blocks (8) from control cables.
c. Disconnect control cables at turnbuckles (10) and at cable ends (9).
d. Remove cable guards and pulleys as necessary to work cables free of aircraft. Disengage roller chains from sprockets to ease cable removal.

NOTE

To ease routing of cables, a length of wire may be attached to end of the cable before being withdrawn from aircraft. Leave wire in place, routed through structure; then attach the cable being installed and pull cable into position.

e. After cable is routed in position, install pulleys and cable guards. Ensure cable is positioned in pulley groove before installing guards. Ensure roller chains are positioned correctly over sprockets.
f. Re-rig system in accordance with paragraph 9-18, safety turnbuckle and reinstall all items removed in step "a".

9-16. PEDESTAL COVER. (See figure 9-1.)



1. Measure chord length at extreme inboard end of trim tab as shown in detail A.
2. Mulitiply chord length by 0.025 to obtain maximum allowable free-play.
3. Measure free-play at same point on trim tab that chord length was measured.
4. Total free-play must not exceed maximum allowable. See detail B.

Figure 9-2A. Trim Tab Free-Play Inspection.

SHOP NOTES:

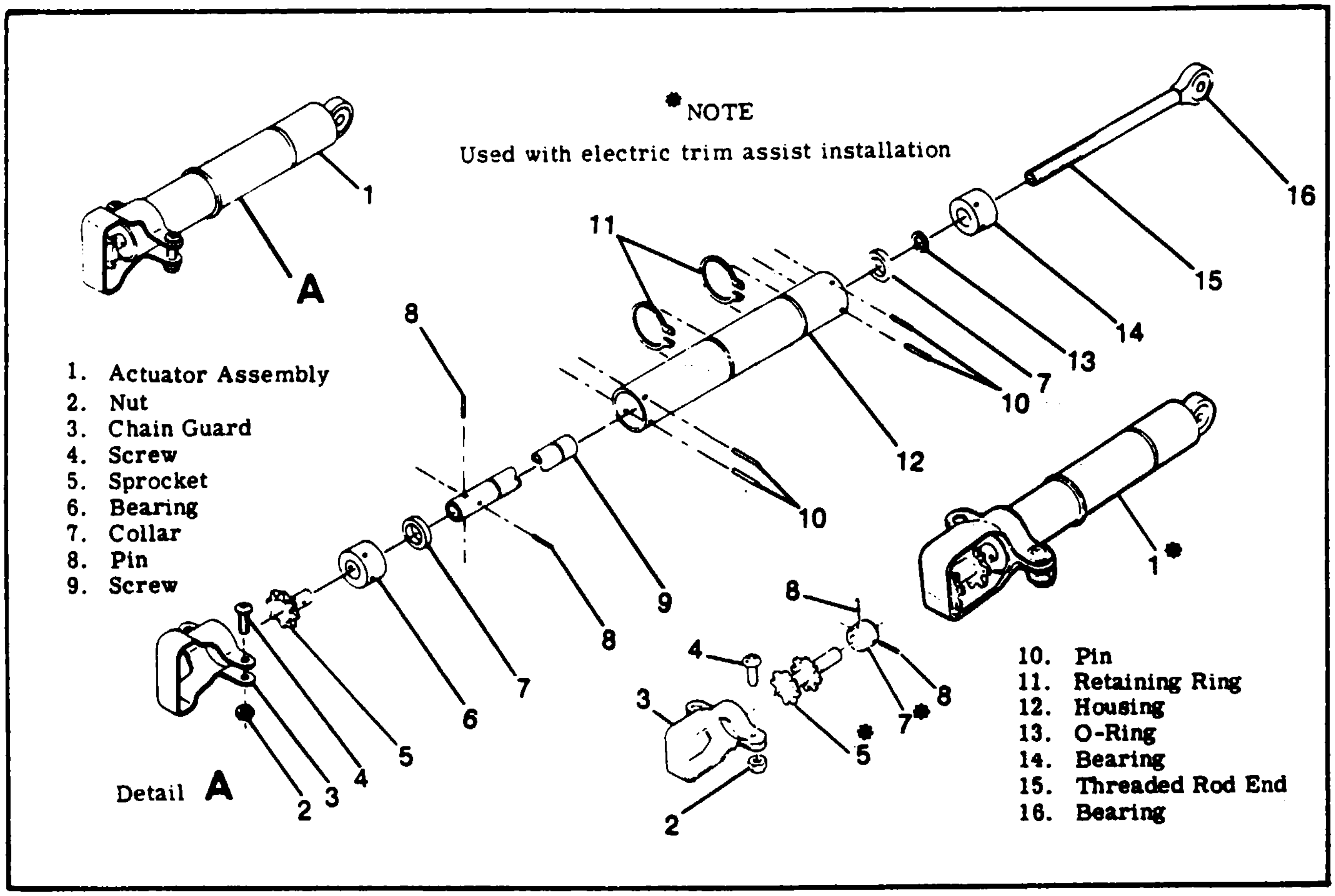


Figure 9-3. Elevator Trim Tab Actuator Assembly

9-17. REMOVAL AND INSTALLATION.

a. Remove fuel selector valve handle and placard.
b. Remove mike and remove mike mounting bracket.
c. Remove cowl flap control knob.
d. Disconnect electrical wiring to pedestal lights.
e. Remove screws securing pedestal cover to structure and remove cover.
f. Reverse the preceding steps for reinstallation.

9-18. RIGGING. (See figure 9-1.)

CAUTION

Position a support stand under the tail tie-down ring to prevent tailcone from dropping while working inside.

a. Remove rear baggage compartment wall and access plates as necessary.
b. Loosen travel stop blocks (8) on trim tab cables.
c. Disconnect push-pull tube (25) from actuator (6).
d. Check cable tension and readjust turnbuckle (10) if necessary.

NOTE

If chains and/or cables are being installed, permit actuator screw to rotate freely as chains and cables are connected. Adjust cable tension and safety turnbuckle (10).

e. Rotate trim control wheel (17) full forward (nose down). Ensure pointer (15) does not restrict wheel movement. If necessary, reposition pointer using a thin screwdriver to pry trailing leg of pointer out of groove.

NOTE

Full forward (nose down) position of trim wheel is where further movement is prevented by the chain or cable ends contacting sprockets or pulleys.

f. With elevator and trim tab both in neutral (streamlined), mount an inclinometer on tab and set to 0°. Disregard counterweight areas of elevators when streamlining. These areas are contoured so they will be approximately 3° down at cruising speed.

NOTE

An inclinometer for measuring control surface travel is available from the Cessna Supply Division. See figure 6-4.

g. Rotate actuator screw in or out as required to place trim tab up with a maximum of 2° overtravel, with actuator screw connected to push-pull tube (25).

h. Rotate trim wheel to position trim tab up and down. readjusting actuator screw as required to obtain overtravel in both directions.
i. Position stop blocks and adjust as illustrated in figure 9-2 to degree of trim tab travel specified in figure 1-1.
j. Install pedestal cover and adjust trim tab pointer to the center of the "TAKE-OFF" triangle with the trim tab set at 0°.
k. Safety turnbuckle and reinstall all items removed in step "a."

9-19. ELECTRIC ELEVATOR TRIM INSTALLATION. (See figure 9-4.)

9-20. DESCRIPTION. An electric elevator trim assist system may be installed consisting of 2 switches mounted on the pilot's control wheel. a circuit breaker mounted in the center instrument pedestal. fuselage wiring running aft to the 12 Volt D.C. electric drive assembly and a chain connecting the drive assembly to an additional sprocket mounted on the standard elevator trim actuator. The electric drive assembly includes a motor. sprockets and a chain driven solenoid type adjustable clutch. The electric drive assembly chain connects to the FORWARD sprocket of the trim tab actuator while the manual trim chain connects to the AFT sprocket of the actuator. When the clutch of the drive assembly is not energized. the drive assembly "free wheels" and. therefore. has no effect on manual operation.

WARNING

Be sure trim tab moves in correct direction when operated by the trim control wheel. Nose down trim corresponds to tab up position.

9-21. REMOVAL AND INSTALLATION. (See figure 9-4.)
a. Remove covers (12) beneath tab actuator assembly (6) and drive assembly.
b. Disconnect electrical connectors (13 and 14) and relieve tension on drive chain (8) at turnbuckle (9).
c. Remove chain guard (10) from tab actuator.
d. Remove mounting bolts from drive assembly and tab actuator and remove units from the aircraft.
e. Reverse preceding steps for reinstallation. Check system rigging in accordance with paragraph 9-24.
f. Reinstall all items removed for access.

9-22. TROUBLE SHOOTING.

TROUBLE	PROBABLE CAUSE	REMEDY
SYSTEM INOPERATIVE.	Circuit breaker out.	Check visually. Reset breaker.
	Defective circuit breaker.	Check continuity. Replace defective breaker.
	Defective wiring.	Check continuity. Repair wiring.
	Defective trim switch.	Check continuity. Replace defective switch.
	Defective trim motor.	Remove and bench test. Replace defective motor.
TRIM MOTOR OPERATING - TRIM TAB FAILS TO MOVE.	Defective clutch solenoid.	Check continuity. Replace solenoid.
	Improperly adjusted clutch tension.	Check and adjust spanner nuts for proper tension.
	Disconnected or broken cable.	Operate manual trim wheel. Connect or replace cable.
	Defective actuator.	Check actuator operation. Replace actuator.

9-23. CLUTCH ADJUSTMENT. (See figure 9-4.)
a. Remove access covers (12) below drive assembly.
b. Remove safety wire and relieve drive chain tension at turnbuckle (9).
c. Disconnect electric motor by unplugging electrical connectors (13) leading to motor assembly.
d. Remove mounting bolts from drive assembly. It is necessary to remove unit from aircraft to make necessary adjustments to clutch.

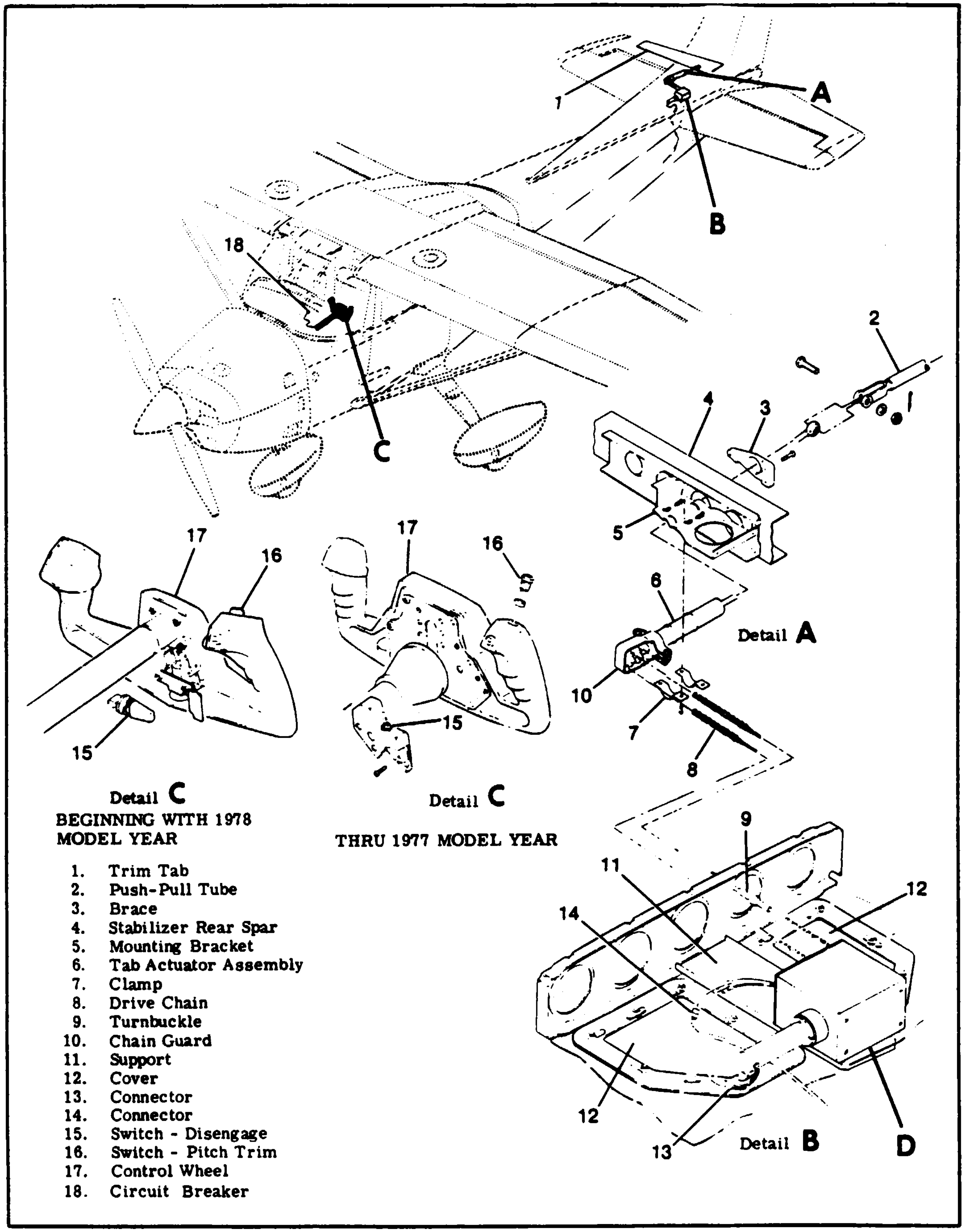


Figure 9-4. Electric Trim Installation (Sheet 1 of 2)

19. Screw
20. Rub Strip
21. Cover Assembly
22. Shaft Assembly
23. Nut
24. Washer
25. Spring Washer
26. Washer Assembly
27. Chain
28. Sprocket
29. Shaft
30. Washer
31. Mounting Plate Assembly
32. Housing
33. Cover
34. Sprocket
35. Mounting Plate
36. Motor
37. Pin
38. Chain
39. Bushing
40. Sprocket
41. Clutch Assembly

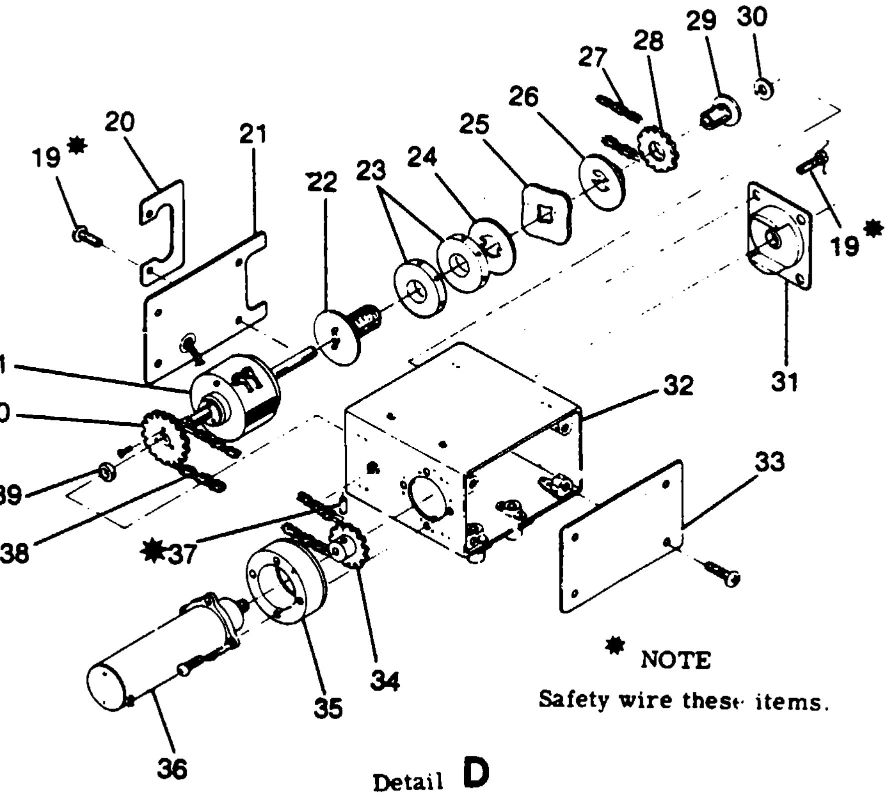


Figure 9-4. Electric Trim Installation (Sheet 2 of 2)

NOTE

Step c isolates the motor assembly from the remainder of the electric trim system so it cannot be engaged during clutch adjustment.

e. Remove screws securing covers (20) and (21) to housing (32) and slide the cover down over electrical wiring far enough to expose the clutch assembly.
f. Ensure the electric trim circuit breaker on the pedestal cover is pushed in and place master switch in ON position.
g. Place disengage switch (15) in ON position.
h. Operate pitch trim switch (16) UP or DOWN to energize the solenoid clutch (41).
i. Attach a spring scale to drive chain and slowly pull scale till clutch slippage occurs.

NOTE

During step i, attach scale to drive chain (38) so that sprocket rotates clockwise as viewed from the drive end to ensure proper clutch adjustment.

j. Repeat steps h and i several times to break initial friction of clutch.
k. Repeat step i verly slowly while watching indicator on spring scale. Slippage should occur between 29.1 and 32.9 pounds.
l. If tension is not within tolerance. loosen OUTSIDE spanner nut (23) which acts as a lock.
m. Tighten INSIDE spanner nut to increase clutch tension and loosen nut to decrease clutch tension.
n. When clutch tension is within tolerance. tighten outside spanner nut against inside nut.
o. Connect electrical wiring removed in step 3. and reinstall drive assembly in aircraft.
p. Rerig trim system in accordance with paragraph 9-24 and reinstall all items removed for access.

9-24. RIGGING - ELECTRIC TRIM ASSIST. (See figure 9-4.)

a. The standard manual elevator trim system MUST be rigged in accordance with paragraph 9-18 before rigging electric trim assist.
b. Move elevator trim tab to full "NOSE UP" position.
c. Locate NAS228 terminal of turnbuckle (9) at a point 0.75 inch from drive assembly housing.
d. Adjust AN155 barrel until chain deflection between sprockets is approximately 0.25 inch.
i. Resafety turnbuckle and reinstall all items removed for access.

9-25. VOLTAGE REGULATOR ADJUSTMENT. (24V ELECTRICAL SYSTEM) (See figure 9-4.)

a. Remove access cover (39).

b. Connect an external power source of 27.5 volts dc continuous to the aircraft electrical system, or if an external power supply is not available, run the aircraft engine at approximately 1000 RPM to maintain the normal operating aircraft voltage.

c. Disconnect the electrical power leads to the motor by unplugging the connectors installed in the RED and BLACK wire leading to the motor assembly.

d. Connect one lead of a dc voltmeter capable of measuring the aircraft voltage to either the RED or BLACK wire leading to the motor and the other voltmeter lead to a good aircraft ground.

e. Operate the electric trim switch to the Nose UP and Nose DOWN positions and check voltage present at the RED and BLACK wires.

f. Adjust CTR 1 and CTR 2 adjustment screws on the voltage regulator counterclockwise (CCW), then slowly turn adjustment screws clockwise (CW) until a 13.5 volt output is obtained for both (RED and BLACK) leads.

g. Remove voltmeter and reconnect the motor assembly power leads. Be sure to connect RED to RED and BLACK to BLACK when reconnecting leads.

h. Check to see if full "NOSE UP" to full "NOSE DOWN" and full "NOSE DOWN" to full "NOSE UP" cycle time is 41±3 seconds.

CAUTION

The trim motor should be allowed to cool between voltage regulator adjustments for approximately 5 minutes if several actuations of the motor becomes necessary during adjustment.

i. Readjust voltage regulator as required to obtain 41±3 seconds cycle time.

NOTE

If trim tab travel time exceeds 44 seconds, lubricate and "free up" elevator trim system as required per section 2.

j. Check trim system for proper operation and reinstall all items removed for access.

SHOP NOTES:

SECTION 10

RUDDER AND RUDDER TRIM CONTROL SYSTEMS

TABLE OF CONTENTS	Page No. Aerofiche/Manual

10-1. RUDDER CONTROL SYSTEM. (See figure 10-1.)

10-2. DESCRIPTION. Rudder control is maintained through use of conventional rudder pedals which also control nose wheel steering. The system is comprised of the rudder pedals installation, cables and pulleys, all of which link the pedals to the rudder and nose wheel steering.

10-3. TROUBLE SHOOTING.

NOTE

Due to remedy procedures in the following trouble shooting chart it may be necessary to re-rig system, refer to paragraph 10-11.

TROUBLE	PROBABLE CAUSE	REMEDY
RUDDER DOES NOT RESPOND TO PEDAL MOVEMENT.	Broken or disconnected cables.	Open access plates and check visually. Connect or replace cables.

10-3. TROUBLE SHOOTING (Cont).

TROUBLE	PROBABLE CAUSE	REMEDY
BINDING OR JUMPY MOVEMENT OF RUDDER PEDALS.	Cables too tight.	See figure 10-1 for cable tension. Rig system in accordance with paragraph 10-11.
	Cables not riding properly on pulleys.	Open access plates and check visually. Route cables correctly over pulleys.
	Binding, broken or defective pulleys or cable guards.	Open access plates and check visually. Replace defective pulleys and install guards properly.
	Pedal bars need lubrication.	Refer to Section 2.
	Defective rudder bar bearings.	If lubrication fails to eliminate binding. Replace bearing blocks.
	Defective rudder hinge bushings.	Check visually. Replace defective bushings.
	Clevis bolts too tight.	Check and readjust bolts to eliminate binding.
	Steering rods improperly adjusted.	Rig system in accordance with paragraph 10-11.
LOST MOTION BETWEEN RUDDER PEDALS AND RUDDER.	Insufficient cable tension.	See figure 10-1 for cable tension. Rig system in accordance with paragraph 10-11.
INCORRECT RUDDER TRAVEL.	Incorrect rigging.	Rig in accordance with paragraph 10-11.

10-4. RUDDER PEDAL ASSEMBLY. (See figure 10-2.)

10-5. REMOVAL AND INSTALLATION.

a. Remove carpeting, shields and soundproofing from the rudder pedal and tunnel areas as necessary for access.

b. Disconnect brake master cylinders (15) and parking brake cables at pilot's rudder pedals.

c. Remove rudder pedals (2) and brake links (5).

d. Remove fairing from either side of vertical fin, remove safety wire and relieve cable tension by loosening turnbuckles (index 10, figure 10-1).

e. Disconnect cables (6 and 7) from rudder bar arms (8).

f. On 182 disconnect wiffletree push-pull rods (index 14, figure 10-5) at rudder bar arms (13). On T182 disconnect nose steering bungee rod end (index 21, figure 10-6) from rudder bar arm (17).

g. Remove bolts securing bearing blocks (10) and carefully work rudder bars out of tunnel area. Beginning with 1982 Model T182 disconnect forward end of steering bungee from nose gear steering bell-crank, then after disconnecting flex shaft (23) unscrew steering bungee from barrel nut.

NOTE

The two inboard bearing blocks contain clearance holes for the rudder bars at one end and a bearing hole at the other. Tag these bearing blocks for reference on reinstallation.

h. Reverse the preceding steps for reinstallation. Lubricate rudder bar assemblies as outlined in Section 2. Rig system in accordance with paragraph 10-11, safety turnbuckles and reinstall all items removed for access.

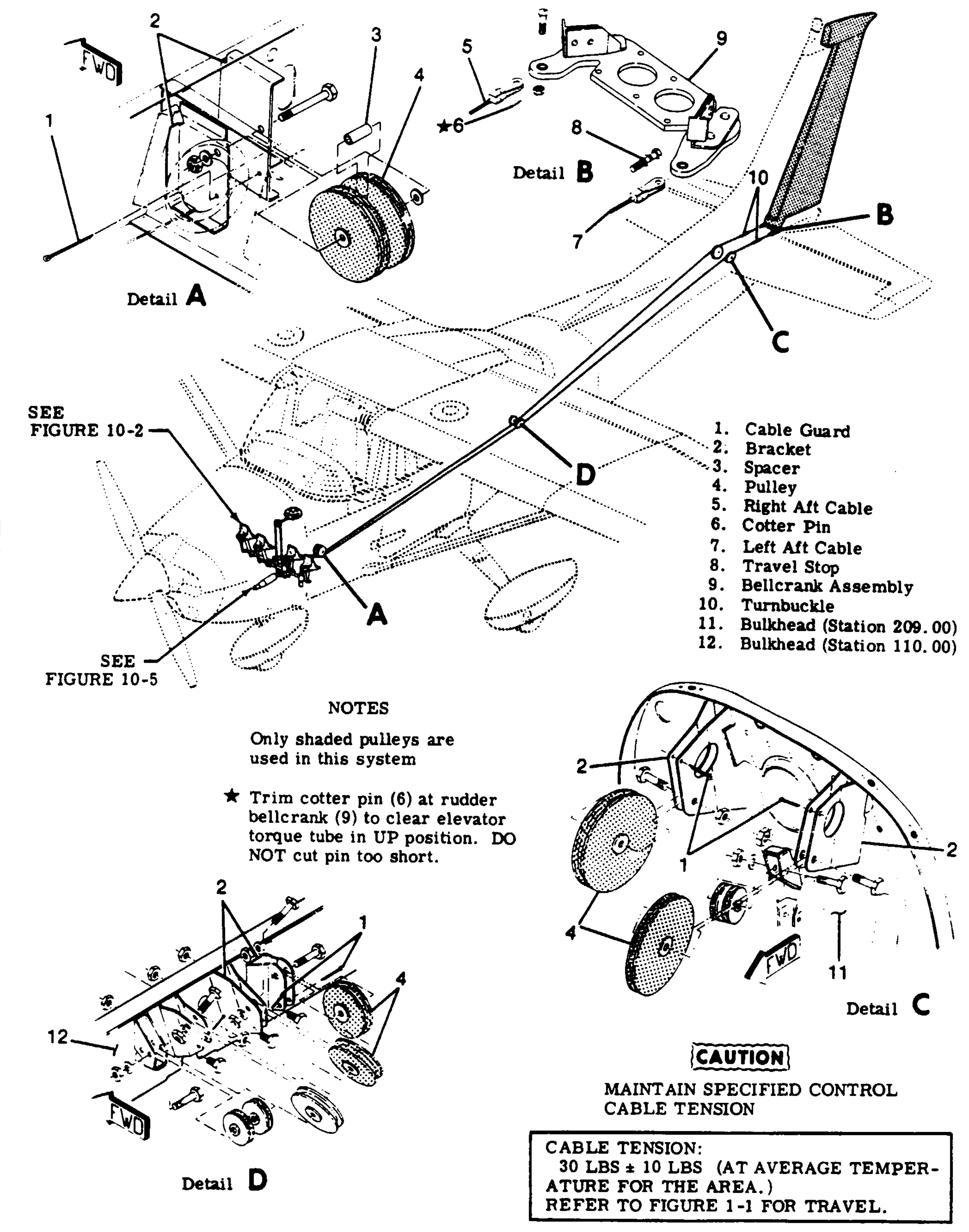
10-6. RUDDER. (See figure 10-3.)

10-7. REMOVAL AND INSTALLATION.

a. Disconnect tail navigation light.

b. Remove stinger.

c. Remove fairing from either side of vertical fin, remove safety wire and relieve cable tension by loosening turnbuckles (index 10, figure 10-1.)



1. Cable Guard
2. Bracket
3. Spacer
4. Pulley
5. Right Aft Cable
6. Cotter Pin
7. Left Aft Cable
8. Travel Stop
9. Bellcrank Assembly
10. Turnbuckle
11. Bulkhead (Station 209.00)
12. Bulkhead (Station 110.00)

NOTES

Only shaded pulleys are used in this system

★ Trim cotter pin (6) at rudder bellcrank (9) to clear elevator torque tube in UP position. DO NOT cut pin too short.

CAUTION

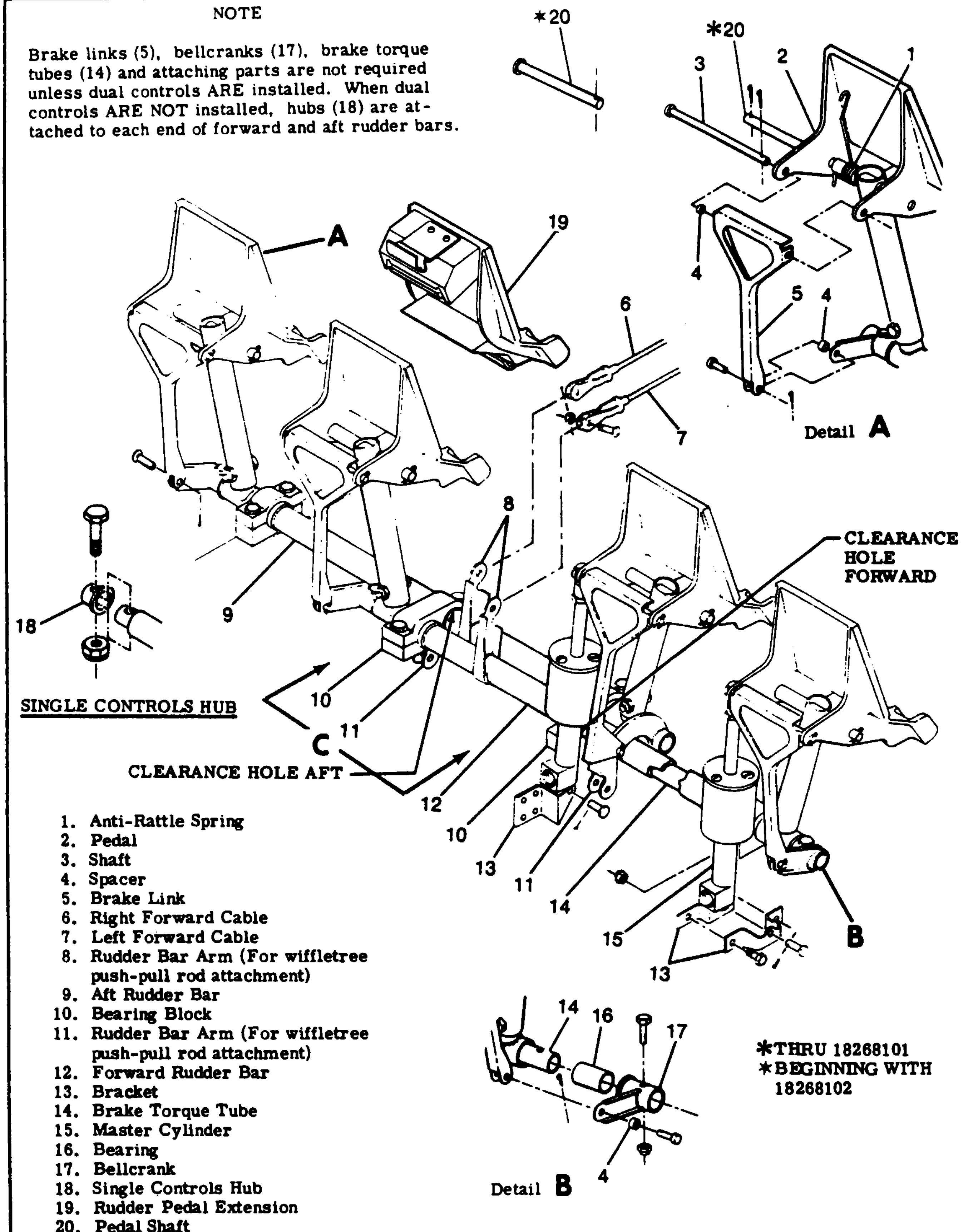
MAINTAIN SPECIFIED CONTROL CABLE TENSION

CABLE TENSION: 30 LBS ± 10 LBS (AT AVERAGE TEMPERATURE FOR THE AREA.) REFER TO FIGURE 1-1 FOR TRAVEL.

Figure 10-1. Rudder Control System

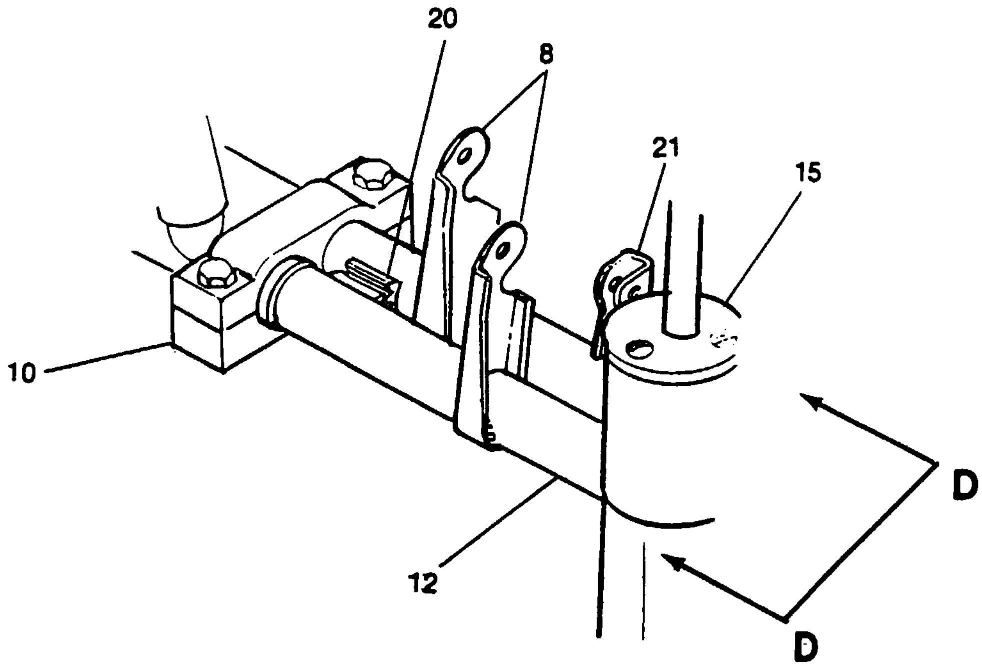
NOTE

Brake links (5), bellcranks (17), brake torque tubes (14) and attaching parts are not required unless dual controls ARE installed. When dual controls ARE NOT installed, hubs (18) are attached to each end of forward and aft rudder bars.

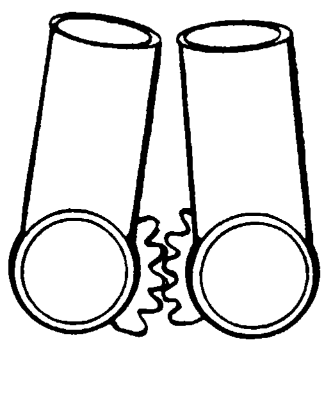


1. Anti-Rattle Spring
2. Pedal
3. Shaft
4. Spacer
5. Brake Link
6. Right Forward Cable
7. Left Forward Cable
8. Rudder Bar Arm (For wiffletree push-pull rod attachment)
9. Aft Rudder Bar
10. Bearing Block
11. Rudder Bar Arm (For wiffletree push-pull rod attachment)
12. Forward Rudder Bar
13. Bracket
14. Brake Torque Tube
15. Master Cylinder
16. Bearing
17. Bellcrank
18. Single Controls Hub
19. Rudder Pedal Extension
20. Pedal Shaft

Figure 10-2. Rudder Pedals Installation (Sheet 1 of 2)



Detail C



VIEW D-D

MODEL T182

Figure 10-2. Rudder Pedals Installation (Sheet 2 of 2)

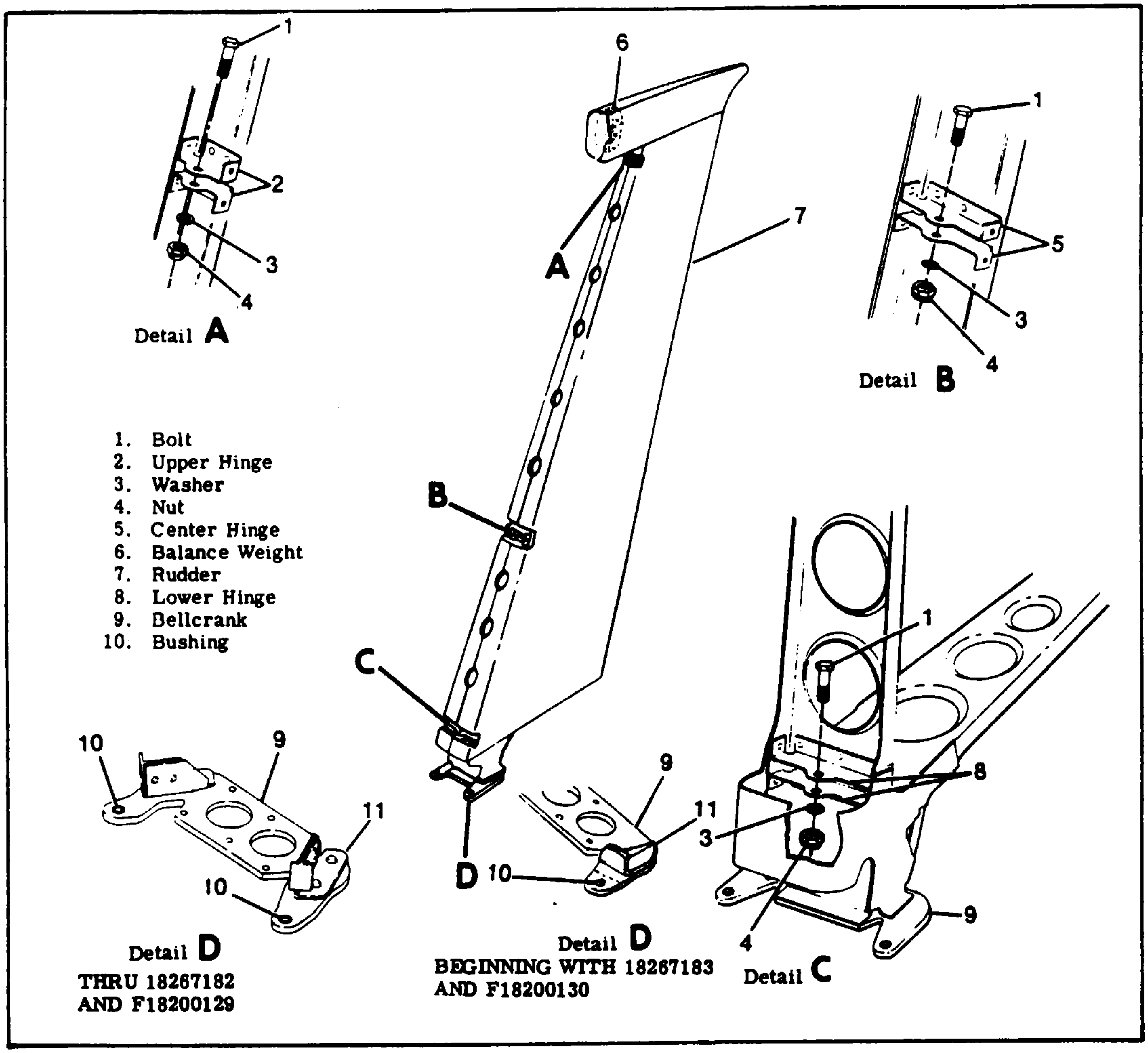


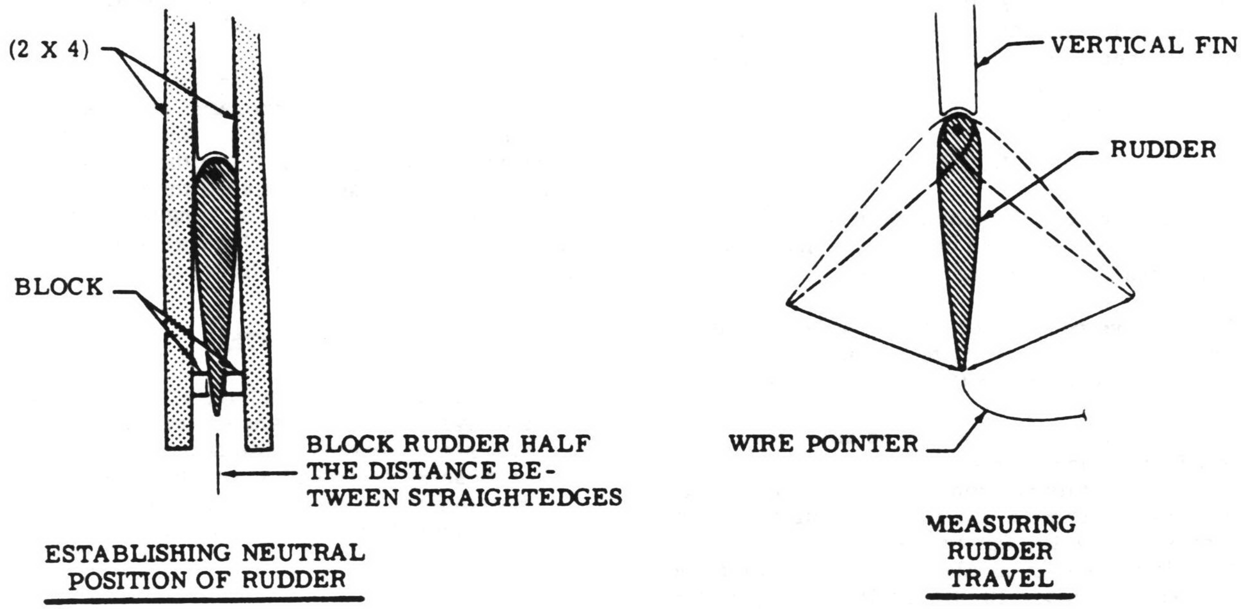
Figure 10-3. Rudder Installation

d. Disconnect cables (index 5 and 7, figure 10-1) from rudder bellcrank.
e. With rudder supported, remove all hinge bolts, and using care, lift rudder free of vertical fin.
f. Reverse the preceding steps for reinstallation. Rig system in accordance with paragraph 10-11, safety turnbuckles and reinstall all items removed for access.

10-8. REPAIR. Repair may be accomplished as outlined in Section 18.

10-9. CABLES AND PULLEYS. (See figure 10-1.)

10-10. REMOVAL AND INSTALLATION.
a. Remove seats, upholstery and access plates as necessary.
b. Relieve cable tension at turnbuckles (10) and disconnect cables.
c. Disconnect cables (index 6 and 7, figure 10-2) from rudder bar arms.
d. Remove cable guards and pulleys as necessary to work cables free of aircraft.



1. Establish neutral position of rudder by clamping straightedge (such as wooden 2 × 4) on each side of fin and rudder and blocking trailing edge of rudder half the distance between straightedges as shown.
2. Tape a length of soft wire to the stinger in such a manner that it can be bent to index at the lower corner of the rudder trailing edge.
3. Using soft lead pencil, mark rudder at point corresponding to soft wire indexing point (neutral).
4. Remove straightedges and blocks.
5. Hold rudder against right, then left, rudder stop. Measure distance from pointer to pencil mark on rudder in each direction of travel. Distance should be between 8.12" and 8.72".

Figure 10-4. Checking Rudder Travel

NOTE

To ease routing of cables, a length of wire may be attached to end of the cable before being withdrawn from aircraft. Leave wire in place, routed through structure; then attach cable being installed and pull the cable into position.

e. Reverse the preceding steps for reinstallation.
f. After cable is routed in position, install pulleys and cable guards. Ensure cable is positioned in pulley grooves before installing guards.
g. Re-rig system in accordance with paragraph 10-11, safety turnbuckles and reinstall all items removed in step "a."

10-11. RIGGING.
a. MODEL 182. (See figure 10-5.)
1. Adjust travel stop bolts (index 8, figure 10-1) to attain correct rudder travel as specified in figure 1-1. Figure 10-4 illustrates correct travel and one method of checking.
2. Loosen adjustable idler sprocket (25) and disengage chain from sprockets (9 and 19).
3. Disconnect steering bungee adjustable rod end (26) from wiffletree (14).
4. Remove fairing from either side of vertical fin, remove safety wire and relieve cable tension at turnbuckles (index 10, figure 10-1).
5. Clamp rudder pedals in neutral position and center wiffletree (14) by adjusting push-pull rods (12). Wiffletree is centered when the bolts in each end are the same distance from the bulkhead just forward of the wiffletree. Tighten jam nuts.
6. Maintaining rudder pedals in neutral position, adjust turnbuckles (index 10, figure 10-1) to specified tension with the rudder offset one degree to the right, (5/16 inch at lower trailing edge). Safety turnbuckles.

NOTE

After completing the preceding steps, the rudder control system is rigged. The rudder control system MUST be correctly rigged prior to rigging the rudder trim and nosewheel steering system. Refer to paragraph 10-15 for rigging the rudder trim and nosewheel steering system.

b. MODEL T182. (See figure 10-6.)

1. Adjust travel stop bolts (index 8, figure 10-1) to attain correct rudder travel as specified in figure 1-1. Figure 10-4 illustrates correct travel and one method of checking.

NOTE

Beginning with 1982 models omit steps 2 and 3. Disconnect forward end of steering bungee from nose gear steering bellcrank.

2. Remove bolt in slotted hole of bearing mount (2) and disconnect spring (5) to release tension on chain (3). disengage chain (3) from sprocket (4 and 16).

3. Disconnect steering bungee adjustable rod end (21) from rudder bar arm (17).

4. Remove fairing from either side of vertical fin, remove safety wire and relieve cable tension at turnbuckles (index 10, figure 10-1).

5. Clamp rudder pedals in neutral position, adjust turnbuckles (index 10, figure 10-1) to specified tension with the rudder offset one degree to the right, (5/16 inch at lower trailing edge). Safety turnbuckles.

10-12. RUDDER TRIM AND NOSEWHEEL STEERING SYSTEM. (See figure 10-5.)

10-13. DESCRIPTION. A screw mechanism to provide rudder trim is incorporated at the aft end of the steering bungee. The trim system is operated by a trim control wheel, mounted in the pedestal. Nosewheel steering is accomplished through use of the rudder pedals. The steering bungee is connected to the rudder pedal bar arms through a wiffletree on the 182, and is connected direct on the T182.

NOTE

The rudder control system, rudder trim control system and nosewheel steering systems are interconnected. Adjustments to any one of these systems will affect the others. For maintenance to the nose gear steering, other than rigging, refer to Section 5.

10-14. TROUBLE SHOOTING.

NOTE

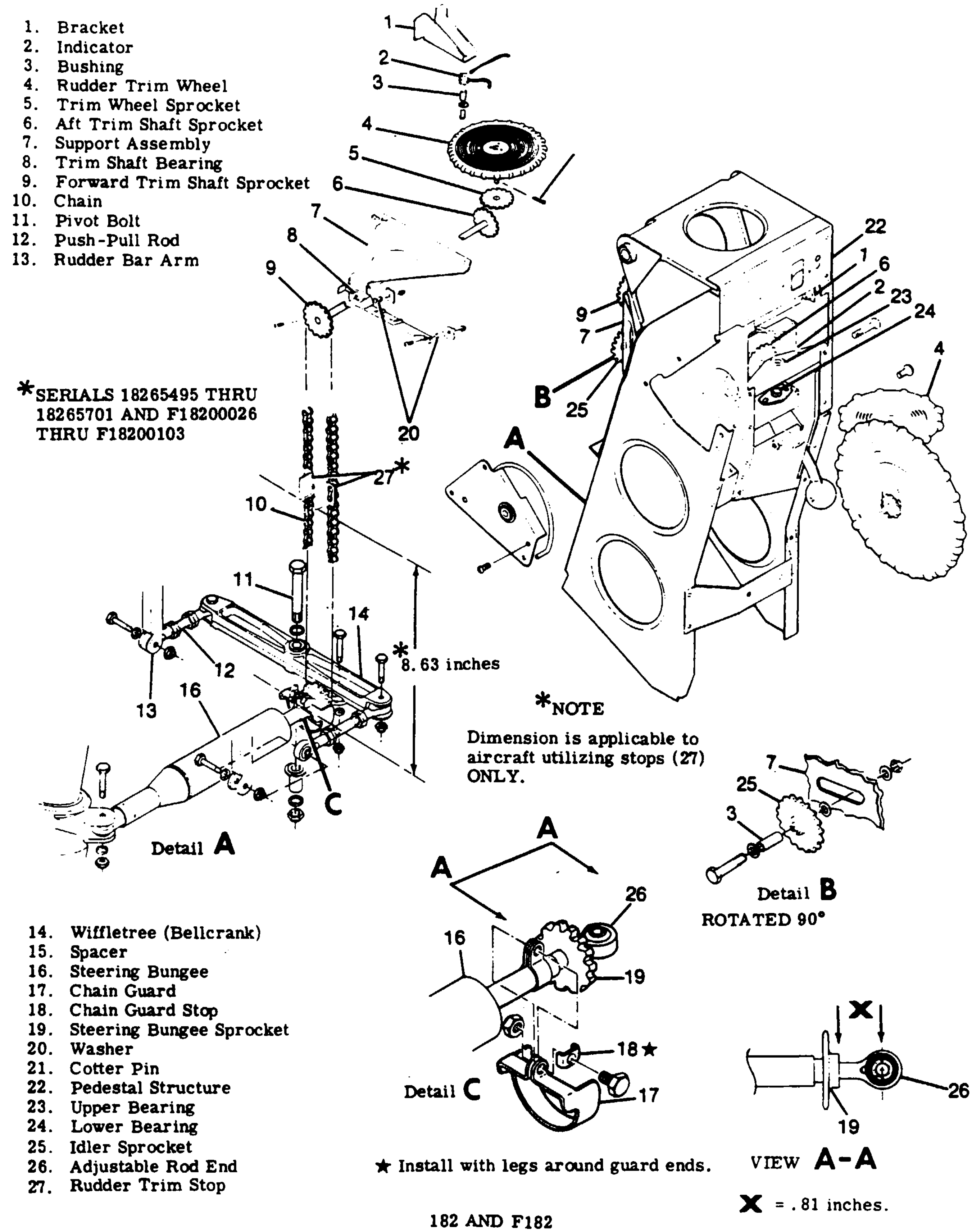
This trouble shooting chart should be used in conjunction with the trouble shooting chart in paragraph 10-3.

NOTE

Due to remedy procedures in the following trouble shooting chart it may be necessary to re-rig system, refer to paragraph 10-15.

TROUBLE	PROBABLE CAUSE	REMEDY
FALSE READING ON TRIM POSITION INDICATOR.	Improper rigging.	Refer to paragraph 10-15.
	Worn, bent or disconnected linkage.	Check visually. Repair or replace parts as necessary.
HARD OR SLUGGISH OPERATION OF TRIM WHEEL.	Worn, bent or binding linkage.	Check visually. Repair or replace parts as necessary.
	Incorrect rudder cable tension.	Check and adjust rudder cable tension.
FULL TRIM TRAVEL NOT OBTAINED.	Rudder trim system improperly rigged.	Refer to paragraph 10-15.

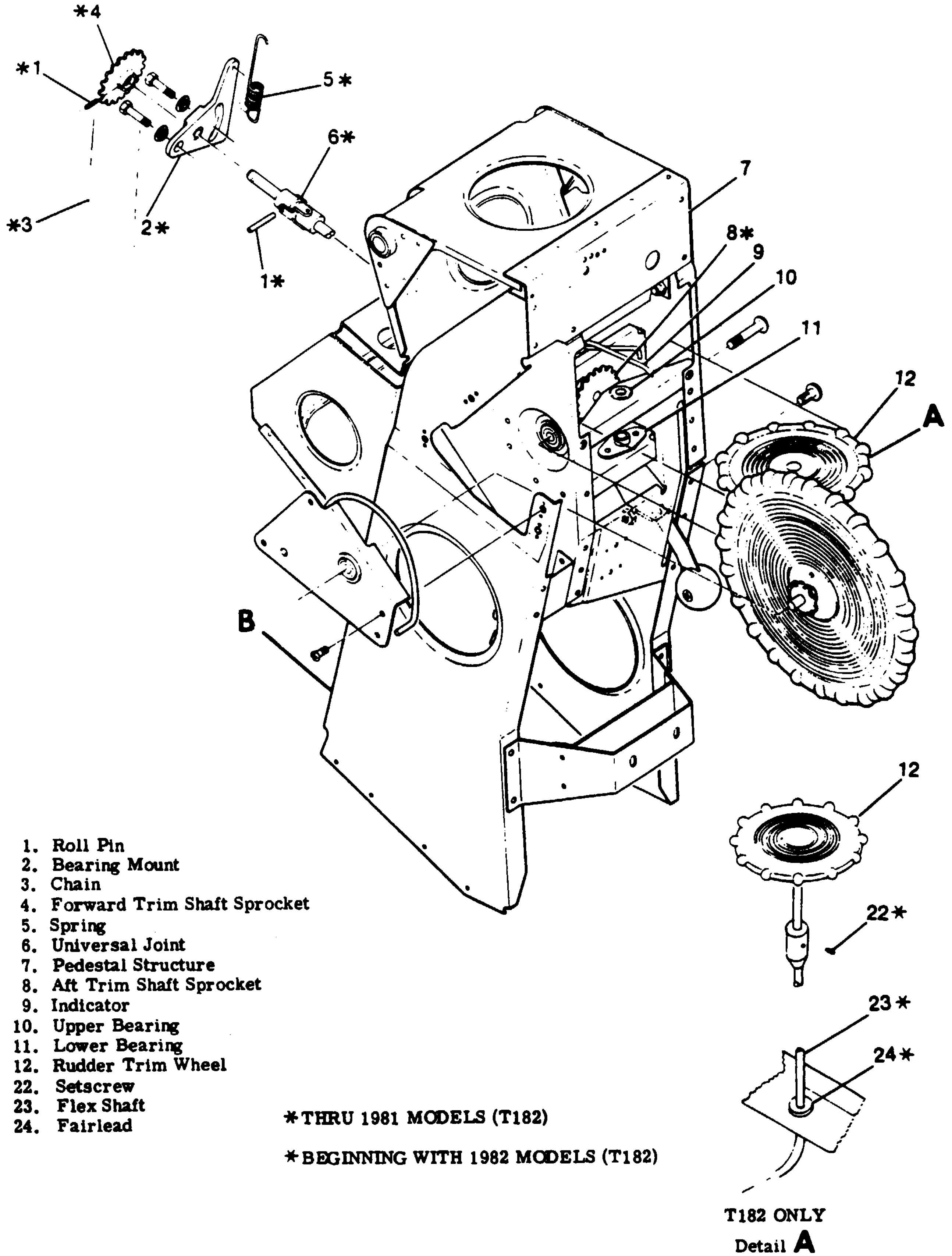
1. Bracket
2. Indicator
3. Bushing
4. Rudder Trim Wheel
5. Trim Wheel Sprocket
6. Aft Trim Shaft Sprocket
7. Support Assembly
8. Trim Shaft Bearing
9. Forward Trim Shaft Sprocket
10. Chain
11. Pivot Bolt
12. Push-Pull Rod
13. Rudder Bar Arm



14. Wiffletree (Bellcrank)
15. Spacer
16. Steering Bungee
17. Chain Guard
18. Chain Guard Stop
19. Steering Bungee Sprocket
20. Washer
21. Cotter Pin
22. Pedestal Structure
23. Upper Bearing
24. Lower Bearing
25. Idler Sprocket
26. Adjustable Rod End
27. Rudder Trim Stop

182 AND F182

Figure 10-5. Rudder Trim Control System



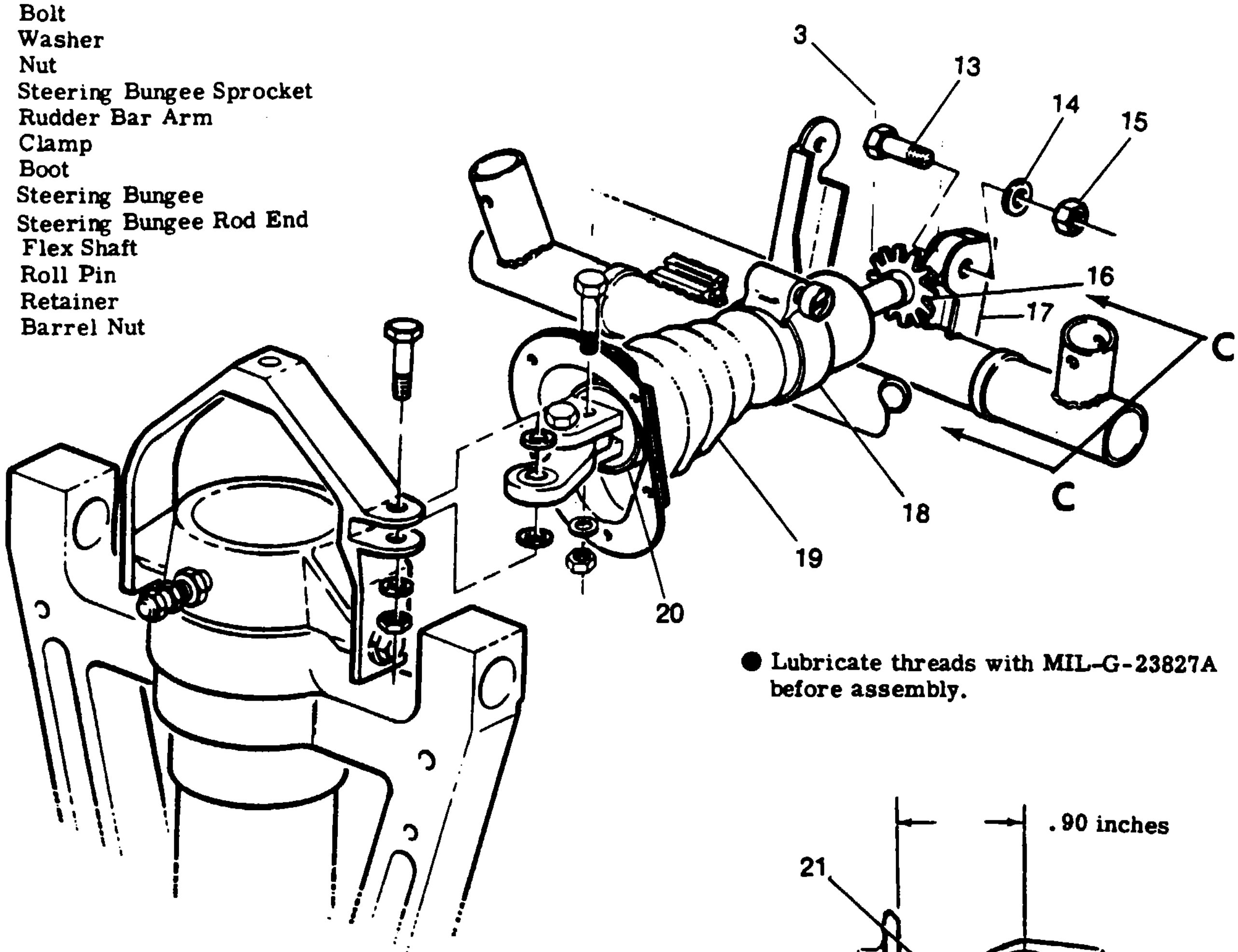
1. Roll Pin
2. Bearing Mount
3. Chain
4. Forward Trim Shaft Sprocket
5. Spring
6. Universal Joint
7. Pedestal Structure
8. Aft Trim Shaft Sprocket
9. Indicator
10. Upper Bearing
11. Lower Bearing
12. Rudder Trim Wheel
22. Setscrew
23. Flex Shaft
24. Fairlead

*THRU 1981 MODELS (T182)

*BEGINNING WITH 1982 MODELS (T182)

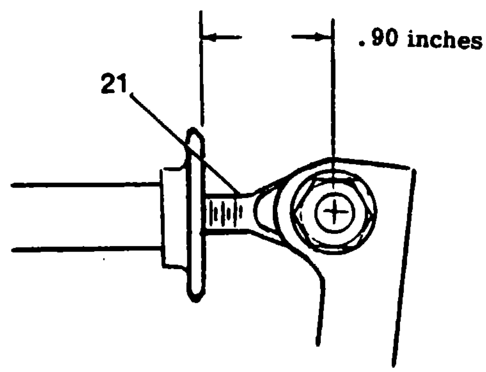
Figure 10-6 T 182 Rudder Trim Control System (Sheet 1 of 2)

3. Chain
13. Bolt
14. Washer
15. Nut
16. Steering Bungee Sprocket
17. Rudder Bar Arm
18. Clamp
19. Boot
20. Steering Bungee
21. Steering Bungee Rod End
23. Flex Shaft
25. Roll Pin
26. Retainer
27. Barrel Nut

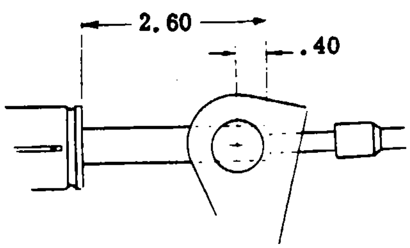


Detail B

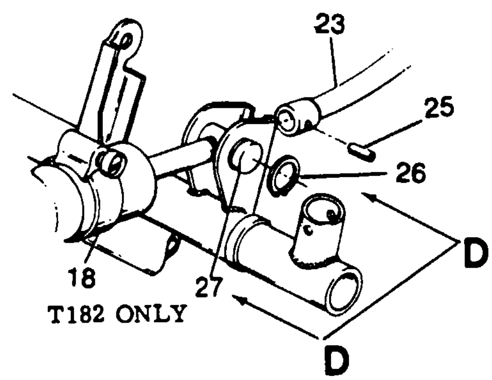
● Lubricate threads with MIL-G-23827A before assembly.



VIEW C-C



VIEW D-D



T182 ONLY

Figure 10-6 T 182 Rudder Trim Control System (Sheet 2 of 2)

10-15. RIGGING.

a. MODEL 182 (See figure 10-5.)

NOTE

The rudder control system MUST be rigged in accordance with paragraph 10-11 prior to rigging the rudder trim and nosewheel steering system.

1. After completing step "6" of paragraph 10-11, part a. tie down or weight tail to raise nose wheel free of ground.
2. Extend strut and ensure nose gear is centered against external centering stop. (See Section 5.)
3. With rudder pedals clamped in neutral position, adjust steering bungee rod end (26) to .81 (+.00, -.06) inch from the sprocket hub (19). Maintaining this adjustment, rotate the sprocket (19) in or out as required to align rod end with attaching hole inain attaching hole in wiffletree (14) and install. (See figure 10-5, view A-A.)
4. Rotate trim control wheel (4) until indicator (2) is centered in pedestal slot (neutral).
5. Without moving sprocket (19), engage chain on sprockets (9 and 19).

NOTE

For serials F18200026 through F18200103 and 18265495 thru 18265701, the trim chain (10) incorporates two stops (27) to limit travel. On aircraft equipped with these stops, engage chain as shown in Detail A, figure 10-5.

6. Adjust idler sprocket (25) to allow approximately one half inch deflection at chain mid point and tighten sprocket.
7. Lower nose wheel to ground, remove clamps from rudder pedals, tighten all jam nuts and reinstall all items removed for access.

WARNING

Make sure rudder moves in the correct direction when operated by the rudder pedals and the trim control wheel.

b. MODEL T182. (See figure 10-6.)

NOTE

The rudder control system MUST be rigged in accordance with paragraph 10-11 prior to rigging the rudder trim and nosewheel steering systems.

THRU 1981 MODELS.

1. After completing step "5" of paragraph 10-11, part b., tie down or weight tail to raise nosewheel free of ground.
2. Extend strut and ensure nose gear is centered against external centering stop. (Refer to Section 5).
3. With rudder pedals clamped in neutral position, adjust steering bungee rod end (21) to .90 inch from the sprocket hub (16). Maintaining this adjustment, rotate the sprocket (16) in or out as required to align rod end with attaching hole in rudder bar arm (17) and install. (See figure 10-6 view C-C.)
4. Rotate trim control wheel (12) until indicator (9) is centered in pedestal slot (neutral).
5. Without moving sprocket (16), engage chain on sprockets (4 and 16).
6. Install spring (5) and bolt in slotted hole of bearing mount (2).
7. Lower nosewheel to ground, remove clamps from rudder pedals, tighten all jam nuts and reinstall all items removed for access.

BEGINNING WITH 1982 MODELS.

8. After completing step "5" of paragraph 10-11, part b., tie down or weight tail to raise nosewheel free of ground.
9. Extend strut and ensure nose gear is centered against external centering stop. (Refer to Section 5).
10. With rudder pedals clamped in neutral position, adjust bungee shaft and barrel nut to dimensions shown in view D-D. Maintaining this position, slip flex shaft end on bungee rod end and secure with roll pin. Safety roll pin.
11. Loosen setscrew (22) and position rudder trim wheel so that indicator is in center track and aligned with ends of outer and inner tracks.
12. Install setscrew (22) so dog engages hole in shaft of trim tab control wheel. Seal with Locktite 242 or equivalent.
13. Center indicator with respect to console cover by bending wire pointer. Do not cause wire to "jump tracks".
14. Lower nosewheel to ground, remove clamps from rudder pedals, tighten all jam nuts and reinstall all items removed for access.

WARNING

Make sure rudder moves in the correct direction when operated by the rudder pedals and the trim control wheel.

SECTION 11

ENGINE

(NORMALLY ASPIRATED)

WARNING

When performing any inspection or maintenance that requires turning on the master switch, installing a battery, or pulling the propeller through by hand, treat the propeller as if the ignition switch were ON. Do not stand, nor allow anyone else to stand, within the arc of the propeller, since a loose or broken wire, or a component malfunction, could cause the propeller to rotate.

TABLE OF CONTENTS — Page No. Aerofiche/Manual

11-1. ENGINE COWLING.

11-2. DESCRIPTION. The engine cowling is divided into two major removable segments. The upper cowling segment has two access doors, one at the upper front provides access to the oil filler neck and one at the left aft side provides access to the oil dipstick and remote strainer drain control. Controllable cowl flaps are attached to the trailing edge of the lower cowl segment to aid in controlling the engine temperature. Screws fasten the upper and lower segments together at the nose cap. Quick-release fasteners are used along the parting surfaces and the aft end, allowing the removal of either segment individually. Cowl-mounted landing and taxi lights are mounted in the lower cowling nose cap. The cowling attaches to shock mounts, which in turn, are fastened to the fuselage.

11-3. REMOVAL AND INSTALLATION.

a. Disconnect cowl flap control clevises at cowl flaps.

b. Remove screws securing upper and lower cowling segments together at the nose cap.

c. Release the quick-release fasteners attaching the cowling to the fuselage and at the parting surfaces of the upper and lower segments.

d. Disconnect the landing and taxi light wires at the quick-disconnects.

e. Disconnect air induction duct on lower cowl segment at airbox and carefully remove cowling.

f. Reverse the preceding steps for reinstallation Ensure the baffle seals are turned in the correct direction to confine and direct air flow around the engine. The vertically installed seals must fold forward and the side seals must fold upwards. Check cowl flap rigging and re-rig, if necessary, in accordance with paragraph 11-9.

11-4. CLEANING AND INSPECTION. Wipe the inner surfaces of the cowling segments with a clean cloth saturated with cleaning solvent (Stoddard or equivalent). If the inside surface of the cowling is coated heavily with oil or dirt, allow solvent to soak until foreign material can be removed. Wash painted surfaces of the cowling with a solution of mild soap and water and rinse thoroughly. After washing, a coat of wax may be applied to the painted surfaces to prolong paint life. After cleaning, inspect cowling for dents, cracks, loose rivets and spot welds. Repair all defects to prevent spread of damage.

11-5. REPAIR. If cowling skins are extensively damaged, new complete sections of the cowling should be installed. Standard insert-type patches may be used for repair if repair parts are formed to fit contour of cowling. Small cracks may be stop-drilled and small dents straightened if they are reinforced on the inner surface with a doubler of the same material as the cowling skin. Damaged reinforcement angles should be replaced with new parts. Due to their small size, new reinforcement angles are easier to install than to repair the damaged part.

11-6. COWL FLAPS.

11-7. DESCRIPTION. Cowl flaps are provided to aid in controlling engine temperature. Two cowl flaps, operated by a single control in the cabin, are located at the aft edge of the lower cowl segment.

11-8. REMOVAL AND INSTALLATION. (Refer to figure 11-1.)

a. Place cowl flap control lever (11) in the OPEN position.
b. Disconnect cowl flap control clevises (6) from cowl flap shock-mounts (7).
c. Remove safety wire securing hinge pins to cowl flaps, pull pins from hinges and remove flaps.
d. Reverse the preceding steps for reinstallation. Rig cowl flaps, if necessary, in accordance with paragraph 11-9.

11-9. RIGGING. (Refer to figure 11-1.)

a. Disconnect cowl flap control clevises (6) from cowl flap shock-mounts (7).
b. Check to make sure that the flexible controls reach their internal stops in each direction. Mark controls so that full travel can be readily checked and maintained during the remaining rigging procedures.
c. Place cowl flap control lever (11) in the CLOSED position. If the control lever cannot be placed in the closed position, loosen clamp (3) at upper end of controls and slip housings in clamp or adjust controls at upper clevis (10) to position control lever in bottom hole of position bracket (9).
d. With the control lever in CLOSED position, hold one cowl flap closed, streamlined with trailing edge of lower cowl. Loosen jam nut and adjust clevis (6) on the control to hold cowl flap in this position and install bolt.

NOTE

If the lower control clevis (6) cannot be adjusted far enough to streamline flap and still maintain sufficient thread engagement, loosen the lower control housing clamp (4) and slide housing in clamp as necessary. Be sure threads are visible in clevis inspection holes.

e. Repeat the preceding step for the opposite cowl flap.
f. When cowl flaps are lowered they should be open $13° +3° -1°$ measured with an inclinometer held against the cowl flap.
g. Check that all clamps and jam nuts are tight.

11-10. ENGINE.

11-11. DESCRIPTION. An air cooled, wet-sump, six-cylinder, horizontally-opposed, direct-drive, carbureted, Continental 0-470 series engine driving a constant-speed propeller is used to power the aircraft. The cylinders, numbered from rear to front are staggered to permit a separate throw on the crankshaft for each connecting rod. The right rear cylinder is number 1 and cylinders on the right side are identified by odd numbers 1, 3 and 5. The left rear cylinder is number 2 and the cylinders on the left side are identified as numbers 2, 4 and 6. Refer to paragraph 11-12 for engine data. For repair and overhaul of the engine, accessories and propeller, refer to the appropriate publications issued by their manufacturer's. These publications are available from the Cessna Supply Division.

11-12 ENGINE DATA.

Aircraft Series	182 SKYLANE Series
MODEL (Continental)	0-470-U
Rated Horsepower at RPM	230 at 2400
Number of Cylinders	6 Horizontally-Opposed
Displacement	470 Cubic Inches
Bore	5.00 Inches
Stroke	4.00 Inches
Compression Ratio	8.6:1
Magnetos	Slick No. 662 Ending with 18267300 Slick No. 6210 Beginning with 18267301
Right Magneto	Fires 24° BTC, Lower Left, Upper Right
Left Magneto	Fires 24° BTC, Upper Left, Lower Right
Firing Order	1-6-3-2-5-4
Spark Plugs	18 mm (Refer to Continental Service Bulletin M77-10 for factory approved spark plugs and required gap.)
Torque	330 ± 30 inch-lbs.
Carburetor (Marvel-Schebler)	MA4-5
Tachometer	Mechanical Drive
Oil Sump Capacity	12 U.S. Quarts
With External Filter	13 U.S. Quarts
Oil Pressure (PSI)	
Normal	30-60
Minimum Idling	10
Maximum (Cold Oil Starting)	100
Connection Location	Between No. 2 and No. 4 Cyl.
Oil Temperature	
Normal Operating	Within Green Arc
Maximum	Red Line (240°F)
Probe Location	Below Oil Cooler
Cylinder Head Temperature	
Normal Operating	Within Green Arc
Maximum	Red Line (460°F)
Probe Location	Lower side of Number 3 Cylinder thru 18267715 Lower side of Number 5 Cylinder 18267716 thru 18268160 Lower side of Number 3 Cylinder 18268161 and On
Economy Mixture Indicator (EGT)	
Probe Location	Right Hand Exhaust Collector
Direction of Crankshaft Rotation (Viewed from Rear)	Clockwise
Dry Weight-With Accessories	438 lbs. (Weight is approximate and will vary with optional accessories installed.)

11-13. TIME BETWEEN OVERHAUL (TBO). Teledyne Continental Motors recommends engine overhaul at 1500 hours operating time for the O-470 series engines. Refer to Continental Aircraft Engine Service Bulletin M80-22. and to any superseding bulletins, revisions or supplements thereto, for further recommendations. At the time of overhaul, engine accessories should be overhauled. Refer to Section 13 for propeller and governor overhaul periods.

11-14. OVERSPEED LIMITATIONS. The engine must not be operated above specified maximum continuous RPM. However, should inadvertant overspeed occur, refer to Continental Aircraft Engine Service Bulletin M75-16, and to any superseding bulletins, revisions or supplements thereto, for further recommendations.

SHOP NOTES:

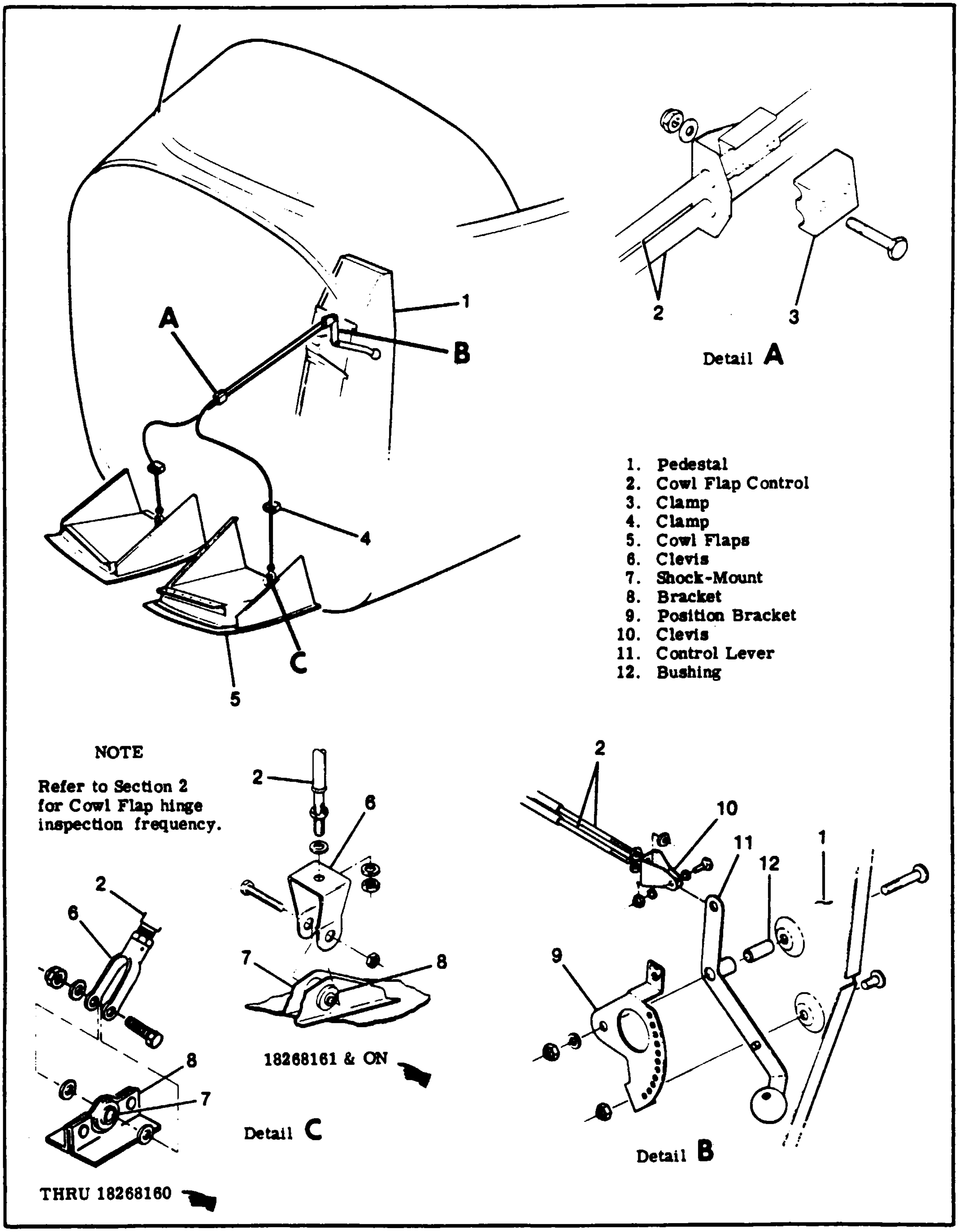


Figure 11-1. Cowl Flaps Installation

11-15. TROUBLE SHOOTING.

TROUBLE	PROBABLE CAUSE	REMEDY
ENGINE WILL NOT START.	Improper use of starting procedure.	Refer to Pilot's Operating Handbook
	Fuel tanks empty.	Visually inspect cells. Fill with proper grade and quantity of gasoline.
	Mixture control in the IDLE CUT-OFF position.	Move control to the full RICH position.
	Fuel selector valve in OFF position.	Place selector valve in the ON position to a cell known to contain gasoline.
	Defective carburetor.	Repair or replace carburetor.
	Carburetor screen or fuel strainer plugged.	Remove carburetor and clean thoroughly. Refer to paragraph 11-59.
	Vaporized fuel. (Most likely to occur in hot weather with a hot engine).	Refer to Pilot's Operating Handbook
	Engine flooded.	Refer to Pilot's Operating Handbook
	Water in fuel system.	Open fuel strainer drain and check for water. If water is present, drain fuel cell sumps, lines, strainer and carburetor.
	Defective aircraft fuel system.	Refer to Section 12.
	Fuel contamination.	Drain all fuel and flush out fuel system. Clean all screens, fuel lines, strainer and carburetor.
	Defective ignition system.	Refer to paragraph 11-78.
	Defective magneto switch or grounded magneto leads.	Check continuity. Repair or replace switch or leads.
	Spark plugs fouled.	Remove, clean and regap plugs. Test harness cables to persistently fouled plugs. Replace if defective.

11-15. TROUBLE SHOOTING (Cont).

TROUBLE	PROBABLE CAUSE	REMEDY
ENGINE STARTS BUT DIES, OR WILL NOT IDLE.	Idle stop screw or idle mixture incorrectly adjusted.	Refer to paragraph 11-60.
	Carburetor idling jet plugged.	Clean carburetor and fuel strainer. Refer to paragraph 11-59.
	Spark plugs fouled or improperly gapped.	Remove, clean and regap plugs. Replace if defective.
	Water in fuel system.	Open fuel strainer drain and check for water. If water is present, drain fuel cell sumps, lines, strainer and carburetor.
	Defective ignition system.	Refer to paragraph 11-78.
	Vaporized fuel. (Most likely to occur in hot weather with a hot engine).	Refer to Pilot's Operating Handbook
	Induction air leaks.	Check visually. Correct the cause of leaks.
	Manual primer leaking.	Disconnect primer outlet line. If fuel leaks through primer, repair or replace primer.
	Leaking float valve or float level set too high.	Perform an idle mixture check. Attempt to remove any rich indication with the idle mixture adjustment. If the rich indication cannot be removed, the float valve is leaking or the float level is set too high. Replace defective parts, reset float level.
	Defective carburetor.	If engine will start when primed but stops when priming is discontinued, with mixture control in full RICH position, the carburetor is defective. Repair or replace carburetor.
	Defective engine.	Check compression. Listen for unusual engine noises. Engine repair is required.
	Propeller control set in high pitch position (low rpm).	Use low pitch (high RPM) position for all ground operation.
	Defective fuel system.	Refer to Section 12.
ENGINE RUNS ROUGHLY, WILL NOT ACCELERATE PROPERLY, OR LACKS POWER.	Restriction in aircraft fuel system.	Refer to Section 12.
	Worn or improperly rigged throttle or mixture control.	Check visually. Replace worn linkage. Rig properly.

11-15. TROUBLE SHOOTING (Cont).

TROUBLE	PROBABLE CAUSE	REMEDY
ENGINE RUNS ROUGHLY, WILL NOT ACCELERATE PROPERLY, OR LACKS POWER. (Cont.)	Spark plugs fouled or improperly gapped.	Remove, clean and regap plugs. Replace if defective.
	Defective ignition system.	Refer to paragraph 11-78.
	Defective or badly adjusted accelerating pump in carburetor.	Check setting of accelerating pump linkage and adjust as necessary.
	Float level set too low.	Check and reset float level.
	Defective carburetor.	Repair or replace carburetor.
	Defective engine.	Check compression. Listen for unusual engine noises. Engine repair is required.
	Restricted carburetor air filter.	Check visually. Clean in accordance with Section 2.
	Cracked engine mount.	Inspect and repair or replace mount as required.
	Defective mounting bushings.	Inspect and install new bushings as required.
	Propeller control in high pitch (low rpm) position.	Use low pitch (high RPM) position for all ground operations.
	Fuel contamination.	Check all screens in fuel system. Drain all fuel and flush out system. Clean all screens, lines, strainer and carburetor.
POOR IDLE CUT-OFF.	Worn or improperly rigged mixture control.	Check that idle cut-off stop on carburetor is contacted. Replace worn linkage. Rig properly.
	Manual primer leaking.	Disconnect primer outlet line. If fuel leaks through primer, it is defective. Repair or replace primer.
	Defective carburetor.	Repair or replace carburetor.

11-16. STATIC RUN-UP PROCEDURES. In a case of suspected low engine power, a static RPM run-up should be conducted as follows:

a. Run up engine, using take-off power and mixture settings, with the aircraft facing 90° right and then left to the wind direction.

b. Record the RPM obtained in each run-up position.

NOTE

Daily changes in atmospheric pressure, temperature and humidity will have a slight effect on static run-up.

c. Average the results of the RPM obtained, it should be within 50 RPM of 2380 RPM.

d. If the average results of the RPM obtained are lower than stated above, the following recommended checks may be performed to determine a possible deficiency.

1. Check governor control for proper rigging. It should be determined that the governor control arm travels to the high RPM stop on the governor and that the high RPM stop screw is adjusted properly. (Refer to Section 13 for procedures.)

NOTE

If verification of governor operation is necessary, the governor may be removed from the engine and a flat plate installed over the engine pad. Run up engine to determine that governor was adjusted properly.

2. Check carburetor heat control for proper rigging. If partially open it would cause a slight power loss.

3. Check magneto timing, spark plugs and ignition harness for settings and condition.

4. Check condition of induction air filter. Clean if required.

5. Perform an engine compression check. Refer to engine manufacturer's service manual.

11-17. REMOVAL. If an engine is to be placed in storage or returned to the manufacturer for overhaul, proper preparatory steps should be taken for corrosion prevention prior to beginning the removal procedure. Refer to Section 2 for storage preparation. The following engine removal procedure is based upon the engine being removed from the aircraft with the engine mount attached to the firewall.

NOTE

Tag each item when disconnected to aid in identifying wires, hoses, lines and control linkages when engine is reinstalled. Likewise, shop notes made during removal will often clarify reinstallation. Protect openings, exposed as a result of removing or disconnecting units, against entry of foreign material by installing covers or sealing with tape.

a. Place all cabin switches in the OFF position.

b. Place fuel selector valve in the OFF position.

c. Remove engine cowling in accordance with paragraph 11-3.

d. Disconnect battery cables and insulate terminals as a safety precaution.

e. Drain fuel strainer and lines with strainer drain control.

SHOP NOTES:

NOTE

During the following procedures, remove any clamps or lacings which secure controls, wires, hoses or lines to the engine, engine mount or attached brackets, so they will not interfere with engine removal. Some of the items listed can be disconnected at more than one place. It may be desirable to disconnect some of these items at other than the places indicated. The reason for engine removal should be the governing factor in deciding at which point to disconnect them. Omit any of the items which are not present on a particular engine installation.

f. Drain the engine oil sump and oil cooler.
g. Disconnect magneto primary lead wires at magnetos.

WARNING

The magnetos are in a SWITCH ON condition when the switch wires are disconnected. Ground the magneto points or remove the high tension wires from the magnetos or spark plugs to prevent accidental firing.

h. Remove the spinner and propeller in accordance with Section 13. Cover exposed end of crankshaft flange and propeller flange to prevent entry of foreign material.
i. Disconnect throttle and mixture controls at carburetor. Remove clamps attaching controls to engine and pull controls aft clear of engine. Use care to avoid bending controls too sharply. Note EXACT position, size and number of attaching washers and spacers for reference on reinstallation.
j. Disconnect propeller governor control at governor. Note EXACT position, size and number of attaching washers for reference on reinstallation. Remove clamps attaching control to engine and pull control aft clear of engine.
k. Disconnect all hot and cold air flexible ducts and remove.
l. Remove exhaust system in accordance with paragraph 11-97.
m. Disconnect carburetor heat control from arm on airbox. Remove clamps and pull control clear of engine.
n. Disconnect wires and cables as follows:
1. Disconnect tachometer drive shaft at adapter.

CAUTION

When disconnecting starter cable do not permit starter terminal bolt to rotate. Rotation of the bolt could break the conductor between bolt and field coils causing the starter to be inoperative.

2. Disconnect starter electrical cable at starter.
3. Disconnect cylinder head temperature wire at probe.
4. Disconnect carburetor air temperature wires at quick-disconnects.
5. Disconnect electrical wires and wire shielding ground at alternator.
6. Disconnect exhaust gas temperature wires at quick-disconnects.
7. Remove all clamps and lacings attaching wires or cables to engine and pull wires and cables aft to clear engine.

o. Disconnect lines and hoses as follows:
1. Disconnect vacuum hose at vacuum pump.
2. Disconnect oil breather and vacuum system oil separator vent lines where secured to the engine.

WARNING

Residual fuel and oil draining from disconnected lines and hoses constitutes a fire hazard. Use caution to prevent accumulation of such fuel and oil when lines or hoses are disconnected.

3. Disconnect oil temperature bulb below cooler.
4. Disconnect primer line at firewall fitting.
5. Disconnect fuel supply hose at fuel strainer.
6. Disconnect oil pressure line at firewall fitting.
7. Disconnect manifold pressure line at firewall.

p. Carefully check the engine again to ensure ALL hoses, lines, wires, cables, clamps and lacings are disconnected or removed which would interfere with the engine removal. Ensure all wires, cables and engine controls have been pulled aft to clear the engine.

SHOP NOTES:

CAUTION

Place a suitable stand under tail tie-down ring before removing engine. The loss of engine weight will cause the aircraft to be tail heavy.

q. Attach a hoist to the lifting lug at the top center of the engine crankcase. Lift engine just enough to relieve the weight from the engine mount pads.
r. Remove bolts attaching engine to engine mount pads and slowly hoist engine and pull it forward. Checking for any items which would interfere with the engine removal. Balance the engine by hand and carefully guide the disconnected parts out as the engine is removed.
s. Remove engine shock-mount pads and bonding straps.

11-18. CLEANING. Clean engine in accordance with instructions in Section 2.

11-19. ACCESSORIES REMOVAL. Removal of engine accessories for overhaul or for engine replacement involves stripping the engine of parts, accessories and components to reduce it to the bare engine. During the removal process, removed items should be examined carefully and defective parts should be tagged for repair or replacement with new components.

NOTE

Items easily confused with similar items should be tagged to provide a means of identification when being installed on a new engine. All openings exposed by the removal of an item should be closed by installing a suitable cover or cap over the opening. This will prevent entry of foreign material. If suitable covers are not available, tape may be used to cover the openings.

11-20. INSPECTION. For specific items to be inspected, refer to the engine manufacturer's manual.
a. Visually inspect the engine for loose nuts, bolts, cracks and fin damage.
b. Inspect baffles, baffle seals and brackets for cracks, deterioration and breakage.
c. Inspect all hoses for internal swelling, chafing through protective plies, cuts, breaks, stiffness, damaged threads and loose connections. Excessive heat on hoses will cause them to become brittle and easily broken. Hoses and lines are most likely to crack or break near the end fittings and support points.
d. Inspect for color bleaching of the end fittings or severe discoloration of the hoses.

NOTE

Avoid excessive flexing and sharp bends when examining hoses for stiffness.

e. Refer to Section 2 for replacement intervals for flexible fluid carrying hoses in the engine compartment.
f. For major engine repairs, refer to the engine manufacturer's overhaul and repair manual.

11-21. BUILD-UP. Engine build-up consists of installation of parts, accessories and components to the basic engine to build up an engine unit ready for installation on the aircraft. All safety wire, lockwashers, nuts, gaskets and rubber connections should be new parts.

11-22. INSTALLATION. Before installing the engine on the aircraft, install any items which were removed from the engine or aircraft after the engine was removed.

NOTE

Remove all protective covers, plugs, caps and identification tags as each item is connected or installed. Omit any items not present on a particular engine installation.

a. Hoist the engine to a point near the engine mount.
b. Install engine shock-mount pads and bonding straps as illustrated in figure 11-2.
c. Carefully lower engine slowly into place on the engine mount. Route controls, lines, hoses and wires in place as the engine is positioned on the engine mount pads.

NOTE

Be sure engine shock-mount pads, spacers and washers are in place as the engine is lowered into position.

d. Install engine-to-mount bolts, then remove the hoist and support stand placed under tail tie-down fitting. Torque bolts to 450-500 lb-in.
e. Route throttle, mixture and propeller controls to their respective units and connect. Secure controls in position with clamps.
f. Route carburetor heat control to airbox and connect. Secure control in position with clamps.

NOTE

Throughout the aircraft fuel system, from the fuel cells to the carburator, use NS-40 (RAS-4) (Snap-On-Tools Corp., Kenosha, Wisconsin), MIL-T-5544 (Thread Compound Antiseize, Graphite Petrolatum), USP Petrolatum or engine oil as a thread lubricator or to seal a leaking connection. Apply sparingly to male threads, exercising extreme caution to avoid "stringing" sealer across the end of the fitting. Always ensure that a compound, the residue from a previously used compound, or any other foreign material cannot enter the system.

g. Connect lines and hoses as follows:
1. Connect manifold pressure line at firewall fitting.
2. Connect oil pressure line at firewall fitting.
3. Connect fuel supply hose at fuel strainer.
4. Connect primer line at firewall fitting.
5. Connect oil temperature bulb below cooler.
6. Connect oil breather and vacuum system oil separator vent lines where secured to the engine.
7. Connect vacuum hose at vacuum pump.

h. Connect wires and cables as follows:
1. Connect electrical wires and wire shielding ground at alternator.
2. Connect cylinder head temperature wire at probe.

CAUTION

When connecting starter cable, do not permit starter terminal bolt to rotate. Rotation of the bolt could break the conductor between bolt and field coils causing the starter to be inoperative.

3. Connect starter electrical cable at starter.
4. Connect tachometer drive shaft at adapter. Be sure drive cable engages drive in adapter. Hand tighten then torque 1/4 turn.
5. Connect exhaust gas temperature wires and carburetor air temperature wires at quick-disconnects.
6. Install clamps and lacings securing wires and cables to engine, engine mount and brackets.

i. Install exhaust system in accordance with paragraph 11-97.
j. Connect all hot and cold air flexible ducts.
k. Install propeller and spinner in accordance wtih instructions outlined in Section 13.
l. Complete a magneto switch ground-out and continuity check, then connect primary lead wires to the magnetos. Remove the temporary ground or connect spark plug leads, whichever procedure was used during removal.

WARNING

Be sure magneto switch is in OFF position when connecting switch wires to magnetos.

m. Clean and install induction air filter in accordance with Section 2.
n. Service engine with proper grade and quantity of engine oil. Refer to Section 2 if engine is new, newly overhauled or has been in storage.
o. Check all switches are in the OFF position and connect battery cables.
p. Rig engine controls in accordance with paragraphs 11-84, 11-85, 11-86, and 11-87.
q. Inspect engine installation for security, correct routing of controls, lines, hoses and electrical wiring, proper safetying and tightness of all components.
r. Install engine cowling in accordance with paragraph 11-3. Rig cowl flaps in accordance with paragraph 11-9.
s. Perform an engine run-up and make final adjustments on the engine controls.

11-23. FLEXIBLE FLUID HOSES.

11-24. LEAK TEST. Refer to Section 2 for leak test interval. Perform leak check as follows:
a. Examing the exterior of hoses for evidence of leakage or wetness.
b. Hoses found leaking should be replaced.
c. Refer to paragraph 11-20 for detailed inspection procedures for flexible hoses.

11-25. REPLACEMENT.
a. Hoses should not be twisted on installation. Pressure applied to a twisted hose may cause failure or loosening of the nut.
b. Provide as large a bend radius as possible.
c. Hoses should have a minimum of one-half inch clearance from other lines, ducts, hoses or surrounding objects or be butterfly clamped to them.
d. Rubber hoses will take a permanent set during extended use in service. Straightening a hose with a bend having a permanent set will result in hose cracking. Care should be taken during removal so that hose is not bent excessively, and during reinstallation to assure hose is returned to its original position.
e. Refer to Advisory Circular 43.13-1, Chapter 10, for additional installation procedures for flexible fluid hose assemblies.

11-26. ENGINE BAFFLES.

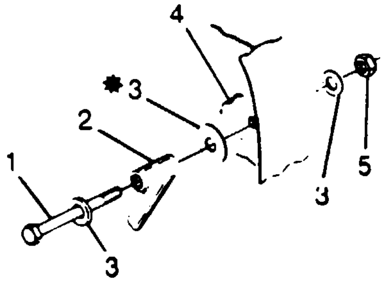
11-27. DESCRIPTION. The sheet metal baffles installed on the engine direct the flow of air around the cylinders and other engine components to provide optimum cooling. These baffles incorporate rubber-asbestos composition seals at points of contact with the engine cowling and other engine components to help confine and direct the airflow to the desired area. It is very important to engine cooling that the baffles and seals are in good condition and installed correctly. The vertical seals must fold forward and the side seals must fold upwards. Removal and installation of the various baffle segments is possible with the cowling removed. Be sure that any new baffles seal properly.

11-28. CLEANING AND INSPECTION. The engine baffles should be cleaned with a suitable solvent to remove oil and dirt.

NOTE

The rubber-asbestos seals are oil and grease resistant but should not be soaked in solvent for long periods.

Inspect baffles for cracks in the metal and for loose and/or torn seals. Repair or replace any defective parts.



MOUNT-TO-FIREWALL

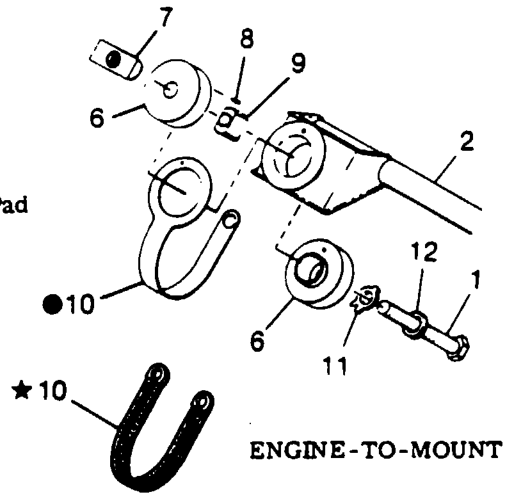
TORQUE MOUNT-TO-FIREWALL BOLTS TO 160-190 LB-IN.

* Washer (3) is installed on the lower mounts only.

1. Bolt
2. Engine Mount
3. Washer
4. Firewall
5. Nut
6. Shock Mount Pad
7. Barrel Nut
8. Roll Pin
9. Spacer
10. Ground Strap
11. Lockwasher
12. Washer

● THRU 18268106

★ 18268107 & ON



ENGINE-TO-MOUNT

TORQUE ENGINE-TO-MOUNT BOLTS TO 450-500 LB-IN

Figure 11-2. Engine Mount Details

11-29. REMOVAL AND INSTALLATION. Removal and installation of the various baffle segments is possible with the cowling removed. Be sure that any replaced baffles and seals are installed correctly and that they seal to direct the airflow in the correct direction. Various lines, hoses, wires and controls are routed through some baffles. Make sure that these parts are reinstalled correctly after installation of baffles.

11-30. REPAIR. Repair of an individual segment of engine baffle is generally impractical, since, due to the small size and formed shape of the part, replacement is usually more economical. However, small cracks may be stop-drilled and a reinforcing doubler installed. Other repairs may be made as long as strength and cooling requirements are met. Replace sealing strips if they do not seal properly.

11-31. ENGINE MOUNT. (See figure 11-2.)

11-32. DESCRIPTION. The engine mount is composed of sections of steel tubing welded together and reinforced with gussets. The mount is fastened to the fuselage at four points. The engine is attached to the engine mount with shock-mount assemblies which absorb engine vibrations. Each engine mount pad has a small hole for a locating pin which serves as a locating dowel for the engine shock-mounts.

11-33. REMOVAL AND INSTALLATION.

a. Remove engine in accordance with paragraph 11-17.

b. Remove bolts from upper and lower mount-to-fuselage structure and carefully remove engine mount.

c. Reverse the preceding steps for reinstallation. Torque bolts to 160-190 lb-in. Reinstall engine in accordance with paragraph 11-22.

11-34. REPAIR. Refer to Section 18 of this manual for repair procedures.

11-35. PAINTING. Refer to Section 19 of this manual for painting procedures.

11-36. ENGINE SHOCK-MOUNT PADS. (See figure 11-2.) The bonded rubber and metal shock-mounts are designed to reduce transmission of engine vibrations to the airframe. The rubber pads should be wiped clean with a clean dry cloth.

NOTE

Do not clean the rubber pads and dampener assembly with any type of cleaning solvent.

Inspect the metal parts for cracks and excessive wear due to aging and deterioration. Inspect the rubber pads for separation between the pad and metal backing, swelling, cracking or a pronounced set of the pad. Install new parts for all parts that show evidence of wear or damage.

11-37. ENGINE OIL SYSTEM.

11-38. DESCRIPTION. A wet-sump, pressure-lubricating oil system is employed in the engine. Refer to applicable engine manual for specific details regarding engine oil system.

WARNING

The U.S. Environmental Protection Agency advises that mechanics and other workers who handle engine oil are advised to minimize skin contact with used oil and promptly remove used oil from the skin. In a laboratory study, mice developed skin cancer after skin was exposed to used engine oil twice a week without being washed off, for most of their life span. Substances found to cause cancer in laboratory animals may also cause cancer in humans.

11-39. TROUBLE SHOOTING.

TROUBLE	PROBABLE CAUSE	REMEDY
NO OIL PRESSURE.	No oil in sump.	Check with dipstick. Fill sump with proper grade and quantity of oil. Refer to Section 2.
	Oil pressure line broken, disconnected or pinched.	Inspect pressure lines. Replace or connect lines as required.
	Oil pump defective.	Remove and inspect. Examine engine. Metal particles from damaged pump may have entered engine oil passages.
	Defective oil pressure gage.	Check with a known good gage. If second reading is normal, replace gage.
	Oil congealed in gage line.	Disconnect line at engine and gage; flush with kerosene. Pre-fill with kerosene and install.
	Relief valve defective.	Remove and check for dirty or defective parts. Clean and install; replace valve if defective.
LOW OIL PRESSURE.	Low oil supply.	Check with dipstick. Fill sump with proper grade and quantity of oil. Refer to Section 2.
	Low viscosity oil.	Drain sump and refill with proper grade and quantity of oil.
	Oil pressure relief valve spring weak or broken.	Remove and inspect spring. Replace weak or broken spring.
	Defective oil pump.	Check oil temperature and oil level. If temperature is higher than normal and oil level is correct, internal failure is evident. Remove and inspect. Examine engine. Metal particles from damaged pump may have entered oil passages.
	Secondary result of high oil temperature.	Observe oil temperature gage for high indication. Determine and correct reason for high oil temperature.
	Dirty oil screens.	Remove and clean oil screens.

11-39. TROUBLE SHOOTING (Cont).

TROUBLE	PROBABLE CAUSE	REMEDY
HIGH OIL PRESSURE.	High viscosity oil.	Drain sump and refill with proper grade and quantity of oil.
	Relief valve defective.	Remove and check for dirty or defective parts. Clean and install; replace valve if defective.
	Defective oil pressure gage.	Check with a known good gage. If second reading is normal, replace gage.
LOW OIL TEMPERATURE.	Defective oil temperature gage or temperature bulb.	Check with a known good gage. If second reading is normal, replace gage. If reading is similar, the temperature bulb is defective. Replace bulb.
	Oil cooler thermostatic bypass valve defective or stuck.	Remove valve and check for proper operation. Replace valve if defective.
HIGH OIL TEMPERATURE.	Oil cooler air passages clogged.	Inspect cooler core. Clean air passages.
	Oil cooler oil passages clogged.	Drain oil cooler and inspect for sediment. Remove cooler and flush thoroughly.
	Thermostatic bypass valve damaged or held open by solid matter.	Feel front of cooler core with hand. If core is cold, oil is bypassing cooler. Remove and clean valve and seat. If still inoperative, replace.
	Low oil supply.	Check with dipstick. Fill sump with proper grade and quantity of oil. Refer to Section 2.
	Oil viscosity too high.	Drain sump and refill with proper grade and quantity of oil.
	Prolonged high speed operation on the ground.	Hold ground running above 1500 rpm to a minimum.
	Defective oil temperature gage.	Check with a known good gage. If second reading is normal. Replace gage.
	Defective oil temperature bulb.	Check for correct oil pressure, oil level and cylinder head temperature. If they are correct, check oil temperature gage for being defective; if similar reading is observed, bulb is defective. Replace bulb.

11-39. TROUBLE SHOOTING (Cont).

TROUBLE	PROBABLE CAUSE	REMEDY
HIGH OIL TEMPERATURE (Cont.)	Secondary effect of low oil pressure.	Observe oil pressure gage for low indication. Determine and correct reason for low oil pressure.
	Oil congealed in cooler.	This condition can occur only in extremely cold temperatures. If congealing is suspected, use an external heater or a heated hangar to warm the congealed oil.
OIL LEAK AT FRONT OF ENGINE.	Damaged crankshaft seal.	Replace. Also refer to Service Newsletter SNL85-8, Feb. 15, 1985.
OIL LEAK AT PUSH ROD HOUSING.	Damaged push rod housing oil seal.	Replace.

11-40. FULL-FLOW OIL FILTER. SERIAL 182-65176 THRU 18267401; F18200026 THRU 18200129.

11-41. DESCRIPTION. An external oil filter may be installed on the engine. The filter and filter adapter replace the regular engine oil pressure screen. The filter adapter incorporates a bypass valve which will open allowing pressure oil from the oil pump to flow to the engine oil passages if the filter element should become clogged.

11-42. REMOVAL AND INSTALLATION. (See figure 11-3.)

NOTE

Filter element replacement kits are available from the Cessna Supply Division.

a. Remove engine cowling in accordance with paragraph 11-3.
b. Remove both safety wires from filter can and unscrew hollow stud (1) to detach filter assembly from adapter (9) as a unit. Remove filter assembly from aircraft and discard gasket (8). Oil will drain from filter as assembly is removed from adapter.
c. Press downward on hollow stud (1) to remove from filter element (5) and can (4). Discard metal gasket (2) on stud (1).
d. Lift lid (7) off filter can (4) and discard lower gasket (6).
e. Pull filter element (5) out of filter can (4).

NOTE

Before discarding removed filter element (5), remove the outer perforated paper cover; using a sharp knife, cut through the folds of the filter element at both ends. Then, carefully unfold the pleated element and examine the material trapped in the element for evidence of internal engine damage, such as chips or particles from bearings. In new or newly overhauled engines, some small particles or metallic shavings might be found, these are generally of no consequence and should not be confused with particles produced by impacting, abrasion or pressure. Evidence of internal damage found in the oil filter element justifies further examination to determine the cause.

f. Wash lid (7), hollow stud (1) and filter can (4) in solvent and dry with compressed air.

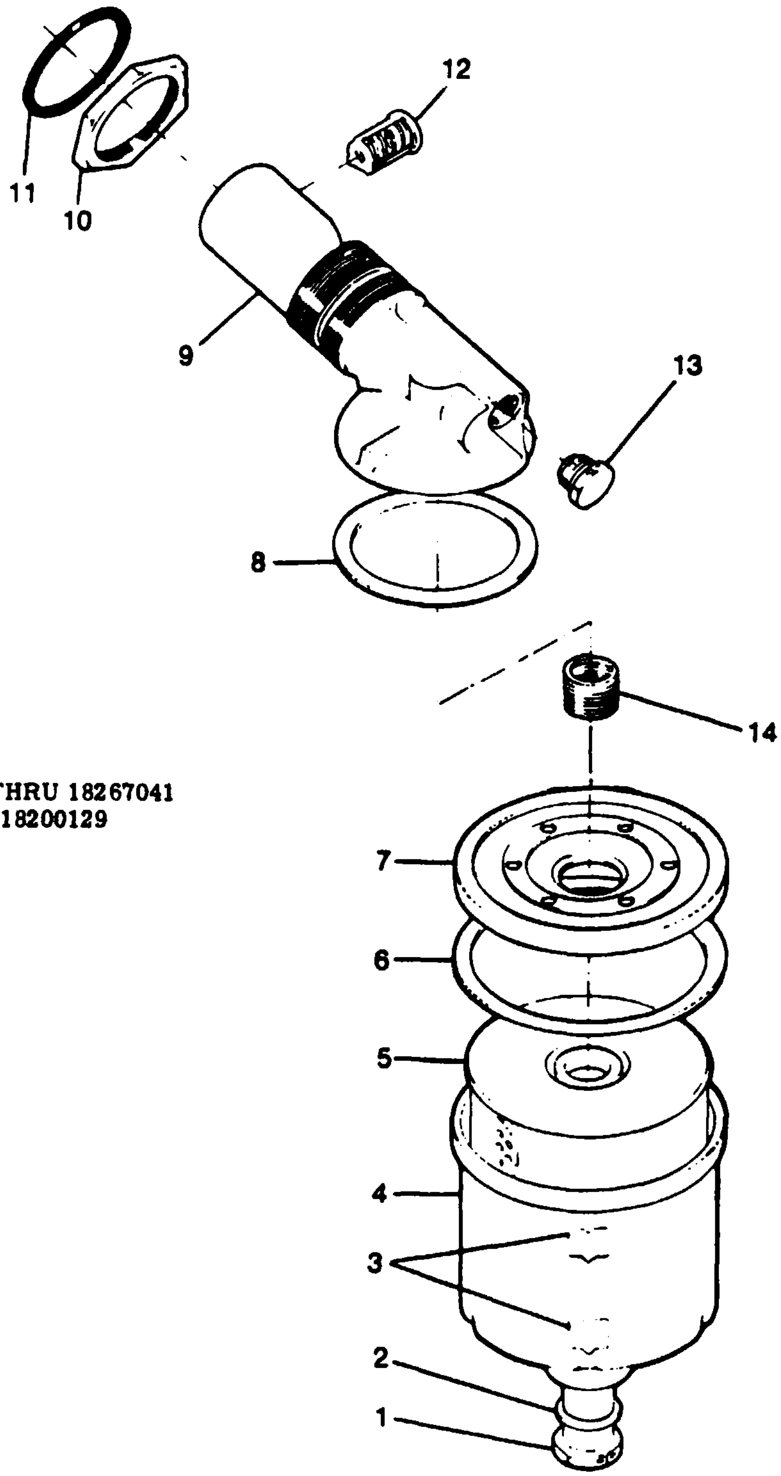
NOTES

When installing a new filter element (5), it is important that all gaskets are clean, lubricated and positioned properly, and that the correct amount of torque is applied to the hollow stud (1). If the stud is under-torqued, oil leakage will occur. If the stud is over-torqued, the filter can might possibly be deformed, again causing oil leakage.

- Lubricate all rubber grommets in the new filter element, lid gaskets and metal gasket with clean engine oil or general purpose grease before installation. Dry gaskets may cause false torque readings, again resulting in oil leakage.

NOTE

Do NOT substitute automotive gaskets for any gaskets used in this assembly. Use only approved gaskets listed in the Parts Catalogs.



SERIAL 18265176 THRU 18267041
F18200026 THRU F18200129

1. Hollow Stud
2. Metal Gasket
3. Safety Wire Tabs
4. Can
5. Filter Element
6. Lower Gasket
7. Lid
8. Upper Gasket
9. Adapter
10. Adapter Nut
11. O-Ring
12. Bypass Valve
13. Plug
14. Thread Insert

Figure 11-3. Full Flow Oil Filter

- Before assembly, place a straightedge across bottom of filter can. Check for distortion or out-of-flat condition greater than 0.010 inch. Install a new filter can if either of these conditions exist.

- After installing a new gasket on lid, turn lid over. If gaskets falls, try a different gasket and repeat test. If this gasket falls off, install a new lid.

g. Inspect the adapter gasket seat for gouges, deep scratches, wrench marks and mutilation. If any of these conditions are found, install a new adapter.
h. Place a new filter element (5) in can (4) and insert the hollow stud (1) with a new metal gasket (2) in place, through the filter can and element.
i. Position a new gasket (6) inside flange of lid (7) and place lid in position on filter can.
j. With new gasket (8) on face of lid, install filter can assembly on adapter (9). While holding filter can to prevent turning, tighten hollow stud (1) and torque to 20-25 lb-ft (240-300 lb-in), using a torque wrench.
k. Install all parts removed for access and service the engine with the proper grade and quantity of engine oil. One additional quart of oil is required each time the filter element is changed.
l. Start engine and check for proper oil pressure. Check for oil leakage after warming up the engine.
m. Again check for oil leakage after engine has been run at high power setting (preferably a flight around the field).
n. Check to make sure filter can has not been making contact with any adjacent parts due to engine torque.
o. While engine is still warm, recheck torque on hollow stud (1), then safety stud to lower tab (3) on filter can and safety adapter (9) to upper tab on filter can.

11-43. FILTER ADAPTER.

11-44. REMOVAL. (See figure 11-3.)
a. Remove filter assembly in accordance with paragraph 11-38.

NOTE

A special wrench adapter for adapter nut (10) (Part No. SE-709) is available from the Cessna Supply Division. or one may be fabricated as shown in figure 11-5. Remove any engine accessory that interferes with removal of the adapter.

b. Note angular position of adapter (9), then remove safety wire and loosen adapter nut (10).
c. Unscrew adapter and remove from engine. Discard adapter O-ring (11).

11-45. DISASSEMBLY, INSPECTION AND REASSEMBLY. Figure 11-3 shows the relative position of the internal parts of the filter adapter and may be used as a guide during installation of parts. The bypass valve is to be installed as a complete unit, with the valve being staked in three places. The heli-coil type insert (14) in the adapter may be replaced, although special tools are required. Follow instructions of the tool manufacturer for their use. Inspect threads on adapter and in engine for damage. Clean adapter in solvent and dry with compressed air. Ascertain that all passages in the adapter are open and free of foreign material. Also, check that bypass valve is seated properly.

11-46. INSTALLATION.
a. Assemble adapter nut (10) and new O-ring (11) on adapter (9) in sequence illustrated in figure 11-3.
b. Lubricate O-ring on adapter with clean engine oil. Tighten adapter nut until O-ring is centered in its groove on the adapter.
c. Apply anti-seize compound sparingly to the adapter threads, then simultaneously screw adapter and adapter nut into engine until O-ring seats against engine boss without turning adapter nut (10). Rotate adapter to approximate angular position noted during removal. Do not tighten adapter nut at this time.
d. Temporarily install filter assembly on adapter, and position so adequate clearance with adjacent parts is attained. Maintaining this position of the adapter, tighten adapter nut to 50-60 lb-ft (600-700 lb-in) and safety. Use a torque wrench, extension and adapter as necessary when tightening adapter nut.
e. Using new gaskets, install filter assembly as outlined in paragraph 11-42. Be sure to service the engine oil system.

SHOP NOTES:

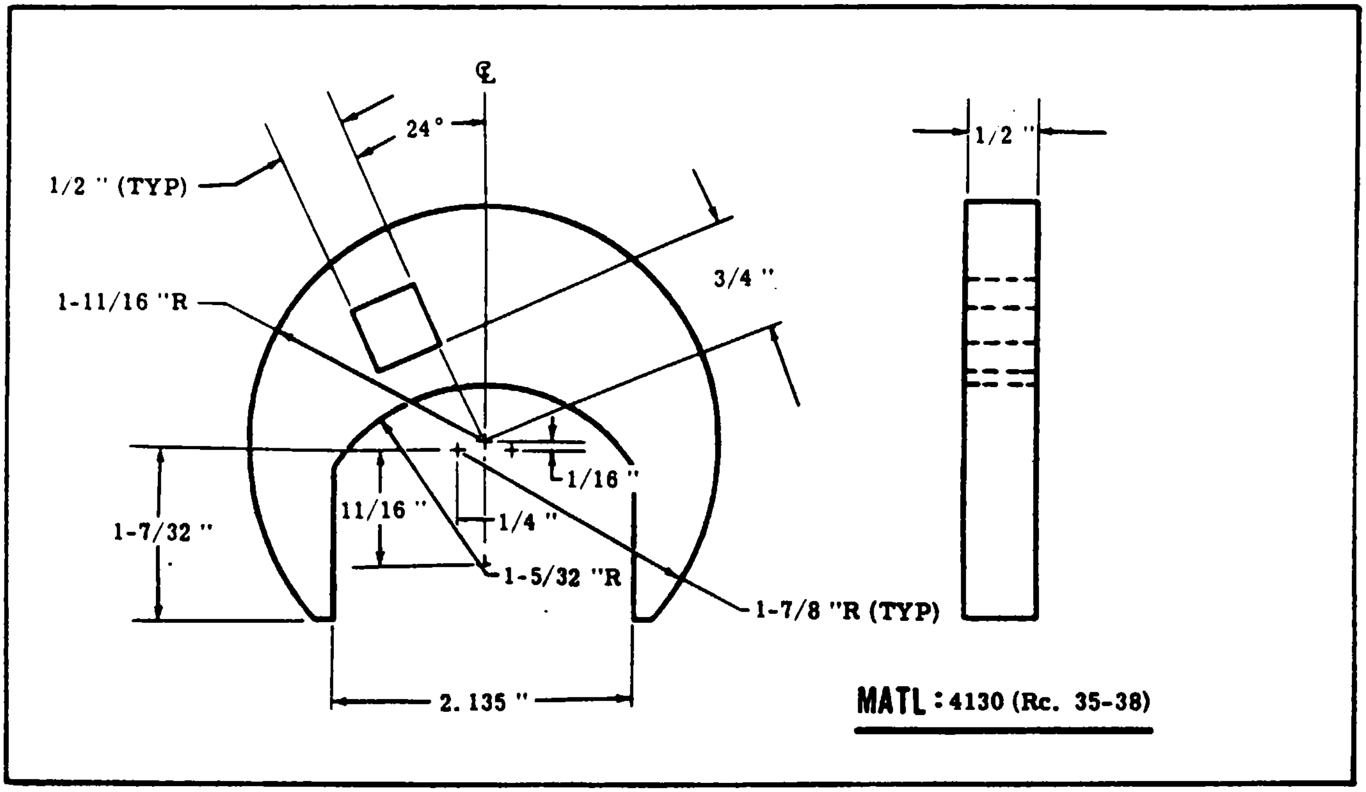


Figure 11-4. Oil Filter Adapter Wrench Fabrication

11-47. FULL-FLOW OIL FILTER. SERIAL 182-67042 & ON; F18200130 THRU F18200169.

11-48. DESCRIPTION. An external oil filter may be installed on the engine. The filter and filter adapter replace the regular engine oil pressure screen. The filter is a throw-away type spin-on filter which has an internal bypass valve.

11-49. REMOVAL AND INSTALLATION. (See figure 11-5.)
a. Remove engine cowling in accordance with paragraph 11-3.
b. Remove safety wire (7) from filter, (6).
c. Unscrew filter from adapter, (3).

NOTE

Teledyne Continental Motors recommends that the spin-on filter be inspected. Refer to Continental Aircraft Engine Service Bulletin M74-2, dated 16 January 1974.

d. Before installing oil filter (6) lightly lubricate filter gasket (8) with a thin coating of Dow Corning Compound, DC-4, apply by brushing or wiping lubricant on to base gasket.
e. Install spin-on filter, (6), on the stud and torque to 18-20 lb-ft or 3/4 to 1 full turn after gasket makes contact.
f. Safety wire filter to adapter.
g. Install all parts removed for access and service the engine with the proper grade and quantity of engine oil. One additional quart of oil is required each time the filter element is changed.
h. Start engine and check for proper oil pressure. Check for oil leakage after warming up the engine.
m. Again check for oil leakage after engine has been run at high power setting (preferably a flight around the field).
i. Check to make sure filter can has not been making contact with any adjacent parts due to engine torque.
j. While engine is still warm, recheck filter (6), to assure proper tightness.

11-50. FILTER ADAPTER.

11-51. REMOVAL. (See figure 11-5.)
a. Remove filter assembly in accordance with paragraph 11-49.

NOTE

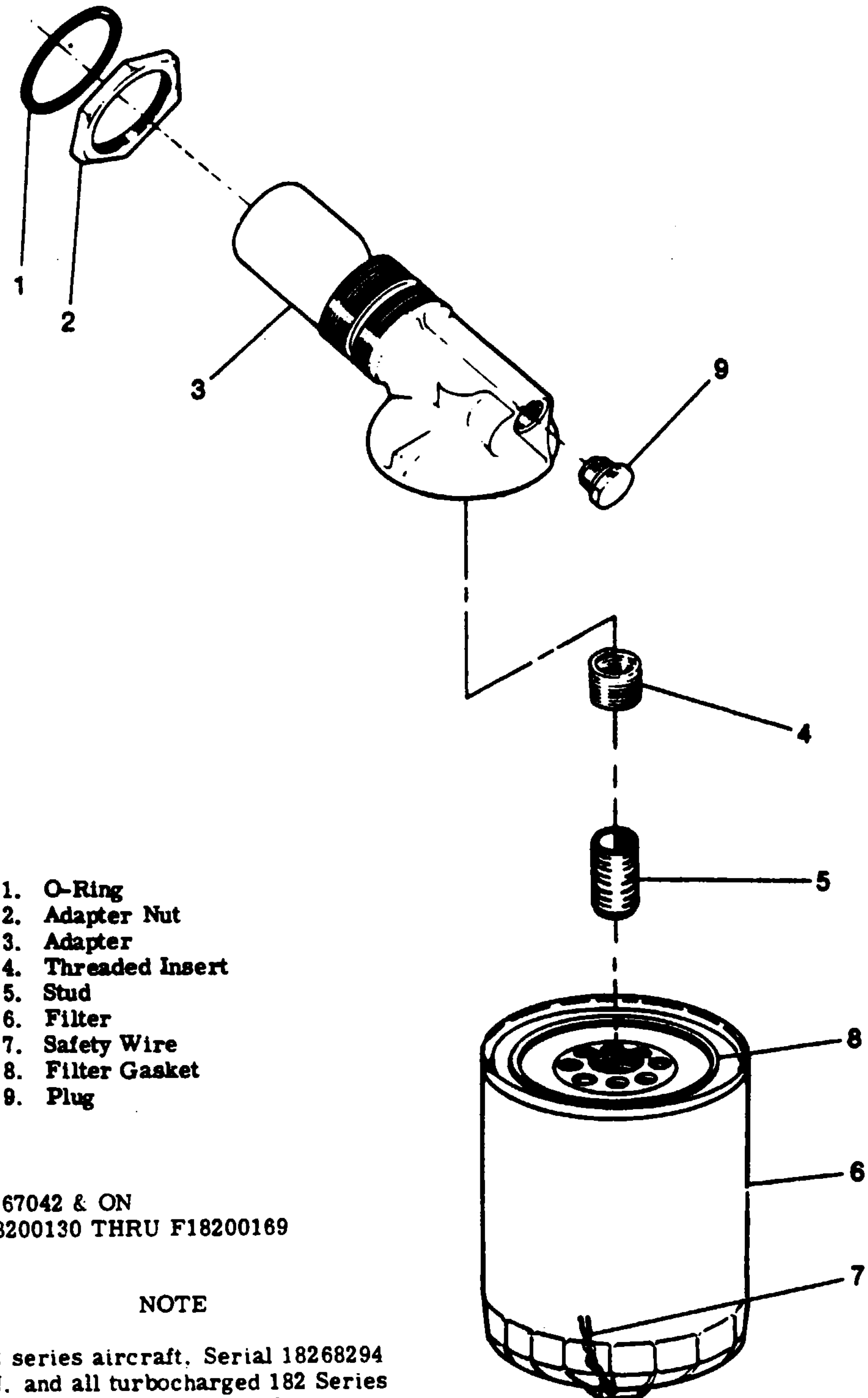
A special wrench adapter for adapter nut (2) (Part No. SE-709) is available from the Cessna Supply Division. or one may be fabricated as shown in figure 11-4. Remove any engine accessory that interferes with removal of the adapter.

b. Note angular position of adapter (3), then remove safety wire and loosen adapter nut (2).
c. Unscrew adapter and remove from engine. Discard adapter O-ring (1).

11-52. DISASSEMBLY, INSPECTION, AND REASSEMBLY. Figure 11-5 shows the relative position of the internal parts of the filter adapter and may be used as a guide during installation of parts.

NOTE

Do NOT substitute automotive gaskets for any gaskets used in this assembly. Use only approved gaskets listed in the Parts Catalogs.



1. O-Ring
2. Adapter Nut
3. Adapter
4. Threaded Insert
5. Stud
6. Filter
7. Safety Wire
8. Filter Gasket
9. Plug

SERIAL 18267042 & ON
F18200130 THRU F18200169

NOTE

All 182 series aircraft, Serial 18268294 and ON, and all turbocharged 182 Series aircraft, Serial 18267716 and ON, are equipped with full-flow oil filters.

Figure 11-5. Full Flow Oil Filter

The heli-coil type insert (4) in the adapter may be replaced, although special tools are required. Follow instructions of the tool manufacturer for their use. Inspect threads on adapter and in engine for damage. Clean adapter in solvent and dry with compressed air. Ascertain that all passages in the adapter are open and free of foreign matter.

11-53. INSTALLATION.

a. Assemble adapter nut (2) and new O-ring (1) on adapter (3) in sequence illustrated in figure 11-3.

b. Lubricate O-ring on adapter with clean engine oil. Tighten adapter nut until O-ring is centered in its groove on the adapter.

c. Apply anti-seize compound sparingly to the adapter threads, then simultaneously screw adapter and adapter nut into engine until O-ring seats against engine boss without turning adapter nut (2). Rotate adapter to approximate angular position noted during removal. Do not tighten adapter nut at this time.

d. Temporarily install filter assembly on adapter, and position so adequate clearance with adjacent parts is attained. Maintaining this position of the adapter, tighten adapter nut to 600 to 700 in-lb and safety. Use a torque wrench, extension and adapter as necessary when tightening adapter nut.

e. Install filter assembly as outlined in paragraph 11-49. Be sure to service the engine oil system.

11-54. OIL COOLER.

11-55. DESCRIPTION. A non-congealing oil cooler may be installed on the aircraft. The cooler is mounted on the right forward side of the engine crankcase directly in front of number five cylinder and has no external oil lines. Ram air passes through the oil cooler and is discharged into the engine compartment. Oil circulating through the engine is allowed to circulate continuously through warm-up passages to prevent the oil from congealing when operating in low temperatures. On the standard and non-congealing oil coolers, as the oil increases to a certain temperature, the thermostat valve closes, causing the oil to be routed to all of the cooler passages for cooling. Oil returning to the engine from the cooler is routed through the internally drilled oil passages.

11-56. ENGINE FUEL SYSTEM.

11-57. DESCRIPTION. The engine is equipped with a carburetor mounted at the lower side of the engine. The carburetor is of the plain-tube fixed-jet type and has such features as an enclosed accelerating pump mechanism, simplified fuel passages to prevent vapor locking, idle cut-off to prevent starting of the engine accidentally and manual mixture control for leaning. For overhaul and repair of the carburetor, refer to the manufacturer's overhaul and repair manual.

11-58. CARBURETOR.

11-59. REMOVAL AND INSTALLATION.

a. Place fuel selector valve in the OFF position.

b. Remove engine cowling in accordance with paragraph 11-3.

c. Drain fuel from strainer and lines with strainer drain control.

d. Remove airbox in accordance with paragraph 11-64.

e. Disconnect throttle and mixture controls at carburetor. Note EXACT position, size and number of attaching washers and spacers for reference on reinstallation.

f. Disconnect and cap or plug fuel line at carburetor.

g. Remove safety wire, nuts and washers attaching carburetor to intake manifold and remove carburetor and mounting gasket.

h. Reverse the preceding steps for reinstallation. Use new gaskets when installing carburetor. Rig controls in accordance with paragraphs 11-84, 11-85, and 11-86. (Check carburetor throttle arm to idle stop arm attachment for security and proper safetying at each normal engine inspection in accordance with figure 11-7.)

11-60. IDLE SPEED AND MIXTURE ADJUSTMENTS. Idle speed and mixture adjustment should be accomplished after the engine has been warmed up. Since idle RPM may be affected by idle mixture adjustment, it may be necessary to readjust idle RPM after setting the idle mixture correctly.

a. Set the throttle stop screw (idle RPM) to obtain 600±25 RPM, with throttle control pulled full out against idle stop.

NOTE

Engine idle speed may vary among different engines. An engine should idle smoothly, without excessive vibration and the idle speed should be high enough to maintain idling oil pressure and to preclude any possibility of engine stoppage in flight when the throttle is closed.

b. Advance throttle to increase engine speed to approximately 1000 RPM

c. Pull mixture control knob slowly and steadily toward the idle cut-off position, observing tachometer, then return control full IN (RICH) position before engine stops.

d. Adjust mixture adjusting screw at upper end of carburetor intake throat to obtain a slight and momentary gain of 25 RPM maximum at 1000 RPM engine speed as mixture control is moved from full IN (RICH) toward idle cut-off position. Return control to full IN (RICH) to prevent engine stoppage.

e. If mixture is set too LEAN, engine speed will drop immediately, thus requiring a richer mixture.

Turn adjusting screw OUT (counterclockwise) for a richer mixture.

f. If mixture is set too RICH, engine speed will increase above 25 RPM, thus requiring a leaner mixture. Turn adjusting screw IN (clockwise) for a leaner mixture.

NOTE

After each adjustment to the idle mixture, run engine up to approximately 2000 RPM to clear engine of excess fuel to obtain a correct idle speed.

11-61. INDUCTION AIR SYSTEM.

11-62. DESCRIPTION. Ram air enters the induction air system through a filter at the front of the lower cowling and is ducted to the airbox at the carburetor. From the induction airbox the filtered air is directed to the inlet of the carburetor, mounted on the lower side of the engine, through the carburetor, where fuel is mixed with the air, to the intake manifold. From the intake manifold, the fuel-air mixture is distributed to each cylinder by separate intake pipes. The intake pipes are attached to the manifold with hoses and clamps and to the cylinder with a four bolt flange sealed with a gasket. A butterfly valve, located in the airbox, may be operated manually from the cabin to permit the selection of either cold or heated air. When the induction air door is closed, heated air is drawn from a shroud on the left exhaust stack assembly.

11-63. AIRBOX.

11-64. REMOVAL AND INSTALLATION.

a. Remove engine cowling in accordance with paragraph 11-3.

b. Disconnect flexible duct from left side of airbox.

c. Disconnect boot from forward end of airbox.

d. Disconnect carburetor heat control at arm on right side of airbox and remove clamp securing control to airbox.

e. Remove mounting bolt safety wire, remove bolts and gasket and carefully remove airbox.

f. Reverse the preceding steps for reinstallation. Rig carburetor heat control in accordance with paragraph 11-86.

11-65. CLEANING AND INSPECTION. Clean metal parts of the induction air box with Stoddard solvent or equivalent. Inspect for cracks, dents, loose rivets, etc. Minor cracks may be stop-drilled. In case of continued or severe cracking, replace air box. Inspect gaskets and install new gaskets, if damaged. Check manually-operated air door for ease of operation and proper rigging.

11-65A. INSTALLATION OF INLET DUCTS. When cutting duct assembly to length, the support wire should be cut back far enough to bend back (minimum bend radius 1/8 inch) under the clamp and protrude 1/4 inch. Do not break the bond between wire and fabric. Before tightening clamps, make sure there is no twist or torque on hose. If hose is wrapped with MIL-Y-1140 cord in place of wire support, the same installation procedure applies except; MIL-Y-1140 has no minumum bend radius requirement.

The minimum installed bend radius for wire supported hose in the plane of bend is as follows:

1. Neoprene, one-ply hose -1/4 diameter of the maximum hose dimension.

2. Neoprene, two-ply hose and silicone, one-ply hose -1/3 diameter of the maximum hose dimension.

4. Silicone, two-ply hose - 1/2 diameter of the maximum hose dimension.

11-66. INDUCTION AIR FILTER.

11-67. DESCRIPTION. An induction air filter, mounted at the induction air inlet on the front of the lower cowling, removes dust particles from the ram air entering the engine.

11-68. REMOVAL AND INSTALLATION.

a. Remove screws securing filter cover, release the quick-release fasteners securing the filter assembly and lift filter out of nose cap.

b. Reverse the preceding steps for reinstallation.

11-69. CLEANING AND INSPECTION. Clean and inspect filter in accordance with instructions in Section 2.

NOTE

If air filter gasket becomes loose, bond with EC-1300L or equivalent.

11-70. IGNITION SYSTEM.

11-71. DESCRIPTION. The ignition system is comprised of two magnetos, two spark plugs in each cylinder, an ignition wiring harness, an ignition switch mounted on the instrument panel and required wiring between the ignition switch and magnetos.

SHOP NOTES:

11-72. TROUBLE SHOOTING.

TROUBLE	PROBABLE CAUSE	REMEDY
ENGINE FAILS TO START.	Defective ignition switch.	Check switch continuity. Replace if defective.
	Spark plugs defective, improperly gapped or fouled by moisture or deposits.	Clean, regap and test plugs. Replace if defective.
	Defective ignition harness.	If no defects are found by a visual inspection, check with a harness tester. Replace defective parts.
	Magneto "P" lead grounded.	Check continuity. "P" lead should not be grounded in the ON position, but should be grounded in OFF position. Repair or replace "P" lead.
	Failure of impulse coupling.	Impulse coupling pawls should engage at cranking speeds. Listen for loud clicks as impulse couplings operate. Remove magnetos and determine cause. Replace defective magneto.
	Defective magneto.	Refer to paragraph 11-78.
	Broken drive gear.	Remove magneto and check magneto and engine gears. Replace defective parts. Make sure no pieces of damaged parts remain in engine or engine disassembly will be required.
ENGINE WILL NOT IDLE OR RUN PROPERLY.	Spark plugs defective, improperly gapped or fouled by moisture or deposits.	Clean, regap and test plugs. Replace if defective.
	Defective ignition harness.	If no defects are found by a visual inspection, check with a harness tester. Replace defective parts.
	Defective magneto.	Refer to paragraph 11-78.
	Impulse coupling pawls remain engaged.	Listen for loud clicks as impulse coupling operates. Remove magneto and determine cause. Replace defective magneto.
	Spark plugs loose.	Check and install properly.

11-73. MAGNETOS.

11-74. DESCRIPTION. The magnetos contain a conventional two-pole rotating magnet (rotor), mounted in ball bearings. Driven by the engine through an impulse coupling at one end, the rotor shaft operates the breaker points at the other end of the shaft. The nylon rotor gear drives a nylon distributor gear which transfers high tension current from the wedge-mounted coil to the proper outlet in the distributor block. A coaxial capacitor is mounted in the distributor block housing to serve as the condenser as well as a radio noise suppressor. Both nylon gears are provided with timing marks for clockwise or counterclockwise rotation. The distributor gear and distributor block have timing marks, visible through the air vent holes, for timing to the engine. A timing hole is provided in the bottom of the magneto adjacent to the magneto flange. A timing pin or 6-penny nail can be inserted through this timing hole into the mating hole in the rotor shaft to lock the magneto approximately in the proper firing position. The breaker assembly is accessible only after removing the screws fastening the magneto halves together and disconnecting the capacitor slip terminal. Do not separate magneto halves while it is installed on the engine or internal timing may be disturbed.

11-75. REMOVAL.

a. Remove engine cowling in accordance with paragraph 11-3.

b. Tag for identification and remove high tension wires from the magneto being removed.

WARNING

The magneto is in a SWITCH ON condition when the switch wire is disconnected. Remove the high tension wires from magneto or disconnect spark plug leads from the spark plugs to prevent accidental firing.

c. Disconnect switch wire from condenser terminal at magneto. Tag wire for identification so it may be installed correctly.

d. Rotate propeller in direction of normal rotation until No. 1 cylinder is coming up on its compression stroke.

NOTE

To facilitate the installation of a replacement magneto, it is good practice to position the crankshaft at the advanced firing angle for No. 1 cylinder during step "d." Any standard timing device or method can be used, or if the magneto being removed is correctly timed to the engine, the crankshaft can be rotated to a position at which the breaker points will be just opening to fire No. 1 cylinder.

e. Remove magneto retainer clamps, nuts and washers and pull magneto from crankcase mounting pad.

NOTE

As the magneto is removed from its mounting, be sure that the drive coupling rubber bushing and retainer do not become dislodged from the gear hub and fall into the engine.

11-76. INTERNAL TIMING.

a. Whenever the gear on the rotor shaft or the cam (which also serves as the key for the gear) has been removed, be sure that the gear and cam are installed so the timing mark on the gear aligns with the "O" etched on the rotor shaft.

b. When replacing breaker assembly or adjusting contact breaker points, place a timing pin (or 0.093 inch 6-penny nail) through the timing hole in the bottom of the magneto next to the flange and into the mating hole in the rotor shaft. Adjusting contact breaker points so they are just starting to open in this position will give the correct point setting. Temporarily assemble the magneto halves and capacitor slip terminal and use a timing light to check that the timing marks, visible through the ventilation plug holes are approximately aligned.

NOTE

The side of the magneto with the manufacturer's insignia has a red timing mark and the side opposite to the insignia has a black timing mark viewed through the vent plug holes. The distributor gear also has a red timing mark and a black timing mark. These marks are used for reference only when installing magneto on the engine. Do not place red and black lines together on the same side.

c. Whenever the large distributor gear and rotor gear have been disengaged, they must be engaged with their timing marks aligned for correct rotation. Align the timing mark on the rotor gear with the "RH" on the distributor gear. Care must be taken to keep these two gears meshed in this position until the magneto halves are assembled.

11-77. INSTALLATION AND TIMING TO ENGINE. The magneto MUST be installed with its timing marks correctly aligned, with the number one cylinder on its compression stroke and with number one piston at its advanced firing position. Refer to paragraph 11-12 for the advanced firing position of number one piston.

WARNING

The magneto is grounded through the ignition switch, therefore, any time the switch (primary) wire is disconnected from the magneto, the magneto is in a switch ON or HOT condition. Before turning the propeller by hand, remove the high tension wires from the magneto or disconnect all spark plug leads to prevent accidental firing of the engine.

To locate the compression stroke of number one cylinder, remove the lower spark plugs from each cylinder except number one cylinder. Remove the top plug from number one cylinder. Place thumb of one hand over the number one cylinder spark plug hole and rotate the crankshaft in the direction of normal rotation until the compression stroke is indicated by positive pressure inside the cylinder lifting the thumb off the spark plug hole. After the compression stroke is obtained, locate number one piston at its advanced firing position. Locating the advanced firing position of number one cylinder may be obtained by use of a timing disc and pointer, Timrite, protractor and piston locating gage or external engine timing marks alignment.

NOTE

External engine timing marks are located on a bracket attached to the starter adapter, with a timing mark on the alternator drive pulley as the reference point.

In all cases, it must be definitely determined that the number one cylinder is at the correct firing position and on the compression stroke, when the crankshaft is turned in its normal direction of rotation. After the engine has been placed in the correct firing position, install and time the magneto to the engine in the following manner.

NOTE

Install the magneto drive coupling retainer and rubber bushings into the magneto drive gear hub slot. Insert the two rubber bushings into the retainer with the chamfered edges facing toward the front of the engine.

a. Turn the magneto shaft until the timing marks visible through the ventilation plug holes are aligned (red-to-red or black-to-black) and insert a timing pin (or 0.093 inch 6-penny nail) through the timing hole in the bottom of the magneto next to the flange and into the mating hole in the rotor shaft. This locks the magneto approximately in the firing position while installing on the engine.

NOTE

If the magneto drive gear was disengaged during magneto removal, hold the magneto in the horizontal position it will occupy when installed, make certain that the drive gear coupling slot is aligned with the magneto coupling lugs. If it is not aligned, pull the magneto drive gear out of mesh with its drive gear and rotate it to the aligned angle, then push it back into mesh. DO NOT WITHDRAW THE MAGNETO DRIVE GEAR FROM ITS OIL SEAL.

b. After magneto gasket is in place, position the magneto on the engine and secure, then remove the timing pin from the magneto. Be sure to remove this pin before turning the propeller.

c. Connect a timing light to the capacitor terminal at the front of the magneto and to a good ground.

d. Turn propeller back a few degrees (opposite of normal rotation) to close the contact points.

NOTE

Do not turn the propeller back far enough to engage the impulse coupling or the propeller will have to be turned in normal direction of rotation until the impulse coupling releases, then backed up to slightly before the firing position.

e. Slowly advance the propeller in the normal direction of rotation until the timing light indicates the contact points breaking. Magneto mounting clamps may be loosened so that the magneto may be shifted to break the points at the correct firing position.

f. Tighten magneto mounting nuts and recheck timing.

g. Repeat steps "a" through "f" for the other magneto.

h. After both magnetos have been timed, check synchronization of both magnetos. Magnetos must fire at the same time.

i. Remove timing devices from magneto and engine.

j. Connect spark plug leads to their correct magneto outlets.

NOTE

The No. 1 magneto outlet is the one closest to the ventilation plug on the side of the magneto having the manufacturer's insignia. The magneto fires at each successive outlet in clockwise direction. Connect No. 1 magneto outlet to No. 1 cylinder spark plug lead, No. 2 outlet to the next cylinder to fire, etc. Engine firing order is listed in paragraph 11-12.

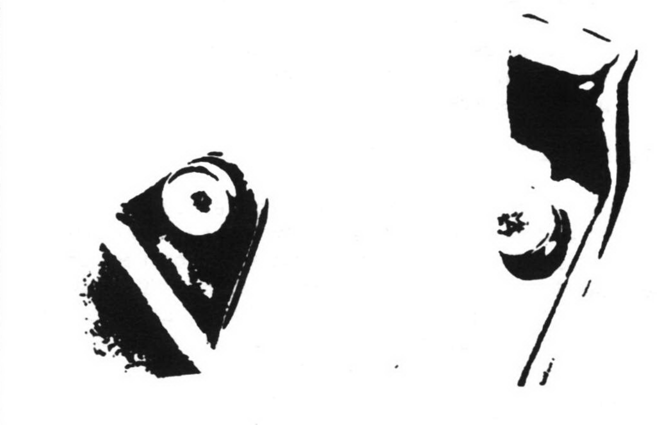
k. Connect toggle switch (primary) lead to the capacitor terminal on the magneto.

NOTE

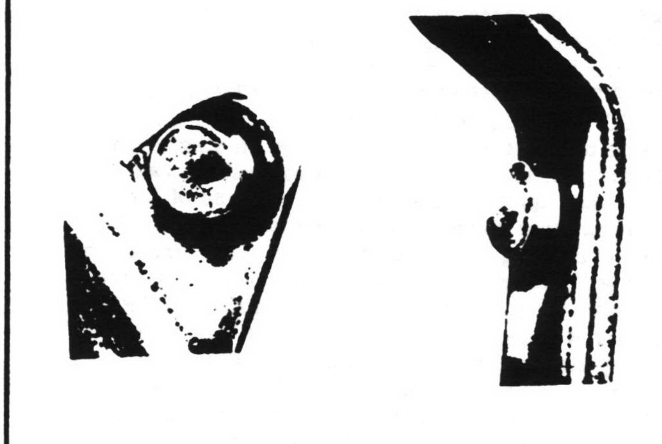
Magneto (primary) lead nut torque range is 13-15 in.-lbs. Exceeding this torque range could result in possible condenser damage.

l. Inspect magneto installation and install engine cowling in accordance with paragraph 11-3.

11-78. MAINTENANCE. Refer to Section 2 for inspection intervals for the breaker compartment. Refer to Section 2 for intervals for checking magneto-to-engine timing. If timing is 24° (plus 0°, minus 2°),



THESE CONTACT POINTS ARE USABLE



THESE CONTACT POINTS NEED REPLACEMENT

Figure 11-6. Magnito Contact Breaker Points

internal timing need not be checked. If timing is out of tolerance, remove magneto and set internal timing, then install and time to the engine. In the event the magneto internal timing marks are off more than plus or minus five degrees when the breaker points open to fire number one cylinder, remove the magneto and check the magneto internal timing. Whenever the magneto halves are separated the breaker point assembly should always be checked. As long as internal timing and magneto-to-engine timing are within the preceding tolerances, it is recommended that the magneto be checked internally only at 500 hour intervals. It is normal for contact points to burn and the cam to wear a comparable amount so the magneto will remain in time within itself. This is accomplished by having a good area making contact on the surface between the points and the correct amount of spring pressure on the cam. The area on the points should be twenty-five percent of the area making contact. The spring pressure at the cam should be 10.5 to 12.5 ounces. When the contact points burn, the area becomes irregular, which is not detrimental to the operation of the points unless metal transfer is too great which will cause the engine to misfire. Figure 11-6 illustrates good and bad contact points. A small dent will appear on the nylon insulator between the cam follower and the breaker bar. This is normal and does not require replacement.

NOTE

If ignition trouble should develop, spark plugs and ignition wiring should be checked first. If the trouble definitely is associated with a magneto, use the following to help disclose the source of trouble without overhauling the magneto.

a. Moisture Check.

1. Remove magneto from engine and remove screws securing the magneto halves together, disconnect capacitor slip terminal and remove distributor. Inspect for moisture.

2. Check distributor gear finger and carbon brush for moisture.

3. Check breaker point assembly for moisture, especially on the surfaces of the breaker points.

4. If any moisture is evident in the preceding places, wipe with a soft, dry, clean, lint-free cloth.

b. Breaker Compartment Check.

1. Check all parts of the breaker point assembly for security.

2. Check breaker point surfaces for evidence of excessive wear, burning, deep pits and carbon deposits. Breaker points may be cleaned with a hard-finish paper. If breaker point assembly is defective, install a new assembly. Make no attempt to stone or dress the breaker points. Clean new breaker points with clean, unleaded gasoline and hard-finish paper before installing.

3. Check capacitor mounting bracket for cracks or looseness.

4. Check the carbon brush on the distributor gear for excessive wear. The brush must extend a minimum of 1/32 inch beyond the end of the gear shaft. The spring which the carbon brush contacts should be bent out approximately 20 degrees from vertical, since spring pressure on the brush holds the distributor gear shaft against the thrust bearing in the distributor cap.

5. Oil the bearings at each end of the distributor gear shaft with a drop of SAE 20 oil. Wipe excess oil from parts.

6. Make sure internal timing is correct and reassemble magneto. Install and properly time magneto to engine.

11-79. MAGNETO CHECK. Advanced timing settings in some cases, is the result of the erroneous practice of bumping magnetos up in timing in order to reduce RPM drop on single ignition. NEVER ADVANCE TIMING BEYOND SPECIFICATIONS IN ORDER TO REDUCE RPM DROP. Too much importance is being attached to RPM drop on single ignition. RPM drop on single ignition is a natural characteristic of dual ignition design. The purpose of the following magneto check is to determine that all cylinders are firing. If all cylinders are not firing, the engine will run extremely rough and cause for investigation will be quite apparent. The amount of RPM drop is not necessarily significant and will be influenced by ambient air temperature, humidity, airport altitude, etc. In fact, absence of RPM drop should be cause for suspicion that the magneto timing has been bumped up and is set in advance of the setting specified. Magneto checks should be performed on a comparative basis between individual right and left magneto performance.

a. Start and run engine until the oil and cylinder head temperature is in the normal operating range.
b. Place the propeller control in the full low pitch (high rpm) position.
c. Advance engine speed to 1700 RPM.
d. Turn the ignition switch to the "R" position and note the RPM drop, then return the switch to "BOTH" position to clear the opposite set of plugs.
e. Turn the switch to the "L" position and note the rpm drop, then return the switch to the "BOTH" position.
f. The rpm drop should not exceed 150 RPM on either magneto or show greater than 50 RPM differential between magnetos. A smooth RPM drop-off past normal is usually a sign of a too lean or too rich mixture. A sharp rpm drop-off past normal is usually a sign of a fouled plug, a defective harness lead or a magneto out of time. If there is doubt concerning operation of the ignition system, RPM checks at a leaner mixture setting or at higher engine speeds will usually confirm whether a deficiency exists.

NOTE

An absence of RPM drop may be an indication of faulty grounding of one side of the ignition system, a disconnected ground lead at magneto or possibly the magneto timing is set too far in advance.

11-80. SPARK PLUGS. Two spark plugs are installed in each cylinder and screw into helicoil type thread inserts. The spark plugs are shielded to prevent spark plug noise in the radios and have an internal resistor to provide longer terminal life. Spark plug service life will vary with operating conditions. A spark plug that is kept clean and properly gapped will give better and longer service than one that is allowed to collect lead deposits and is improperly gapped.

NOTE

Refer to Section 2 for inspection intervals. Remove, clean, inspect and regap all spark plugs at these intervals. At this time, install lower spark plugs in upper portion of cylinders and install upper spark plugs in lower portion of cylinders. Since deterioration of lower spark plugs is usually more rapid than that of the upper spark plugs, rotating helps prolong spark plug life.

11-81. ENGINE CONTROLS.

11-82. DESCRIPTION. The throttle, mixture, propeller and carburetor heat controls are of the push-pull type. The propeller and mixture controls are equipped to lock in any position desired. To move the control, the spring-loaded button, located in the end of the control knob, must be depressed. When the button is released, the control is locked. The propeller and mixture controls also have a vernier adjustment. Turning the control knob in either direction will change the control setting. The vernier is primarily for precision control setting. The throttle control has neither a locking button nor a vernier adjustment, but contains a knurled friction knob which is rotated for more or less friction as desired. The friction knob prevents vibration induced "creeping" of the control. The carburetor heat control has no locking device.

NOTE

Some controls have intricate parts that will fall out and possibly be lost if the control is pulled from the housing while it is disconnected.

11-83. RIGGING. When adjusting any engine control, it is important to check that the control slides smoothly throughout its full travel, that it locks securely if equipped with a locking device and the arm or lever which it operates moves through its full arc of travel.

CAUTION

Some engine controls have a small retaining ring brazed (or attached with epoxy resin) near the threaded end (engine end) of the control. The purpose of these retaining rings is to prevent inadvertent withdrawal of and possible damage to the knob end of the controls while jam nuts and rod ends are removed.

- Whenever engine controls are being disconnected, pay particular attention to the EXACT position, size and number of attaching washers and spacers. Be sure to install attaching parts as noted when connecting controls.

11-84. THROTTLE CONTROL.

NOTE

Before rigging throttle control shown in figure 11-7, check that staked connection (7) between rigid conduit (6) and flexible conduit (5) is secure. If any indication of looseness, (total linear movement exceeds .050 in.) or breakage is apparent, replace the throttle control before continuing with the rigging procedure.

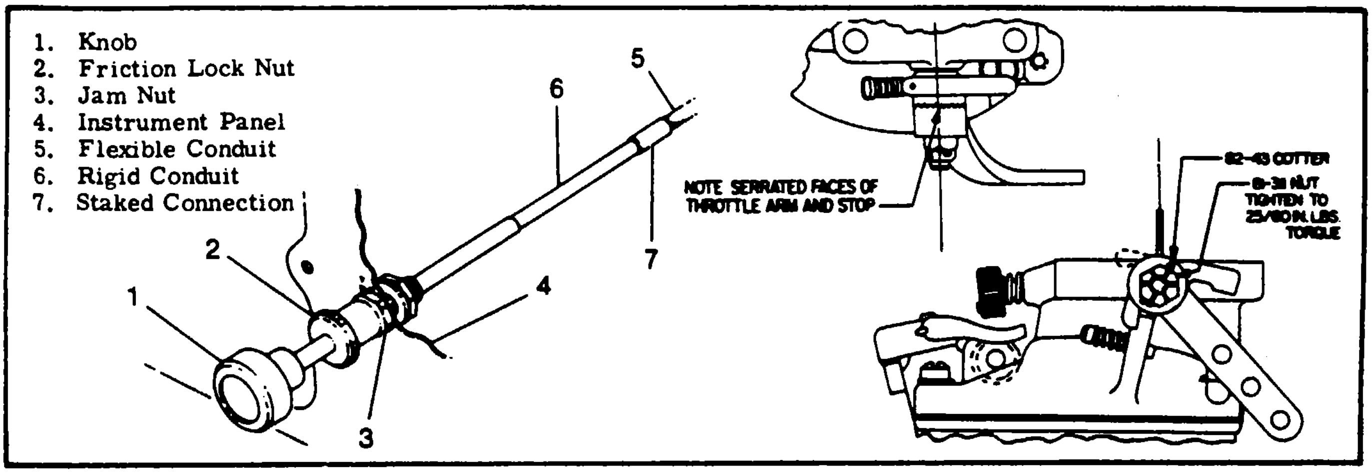


Figure 11-7. Throttle Control and Throttle Arm to Idle Stop Attachment

a. Pull throttle control out (idle position) and remove throttle control knob (1).
b. Screw jam nut (3) all the way down (clockwise) and install throttle knob. Screw the knob securely against the jam nut. Do not back jam nut out. This will prevent bottoming and possible damage to the staked connection.
c. Disconnect throttle control at the carburetor throttle arm, push throttle control in until jam nut hits friction lock (2) while the friction lock is loose, then pull control out approximately 1/8 inch for cushion. Note position of large washer at carburetor end of control. Install washer in same position when connecting control to arm.
d. Tighten friction lock (2), being careful not to change position of the throttle.
e. Move throttle arm on carburetor to full open, adjust rod end at end of throttle control to fit and connect to arm on carburetor.
f. Release friction lock and check full travel of arm on carburetor. If further adjustment is required, make all adjustment at the carburetor end of control. DO NOT change jam nut (3) setting.
g. Tighten rod end locknuts at carburetor end of control. Be sure to maintain sufficient thread engagement between rod end and control.

NOTE

Refer to Section 2 for lubrication, inspection and/or replacement interval

11-85. MIXTURE CONTROL.
a. Push mixture control full in, then pull it out approximately 1/8 inch for cushion.
b. Loosen clamp securing the control to the engine.
c. Shift control housing in the clamp so that the mixture arm on the carburetor is in the full open position (RICH). Tighten the clamp in this position.
d. Unlock and pull mixture control full out. Check that idle mixture arm on carburetor is full closed (IDLE CUT-OFF).
e. Check that the bolt and nut at the mixture arm on carburetor secures the control wire and that the bolt will swivel in the arm. Torque 15 in-lbs. minimum.
f. Bend the wire tip 90°(degrees) to prevent it from being withdrawn if the attaching nut should become loose.
g. When installing a new control, it may be necessary to shorten the wire and/or control housing.
h. The mixture arm on the carburetor must contact the stops in each direction, and the control should have approximately 1/8 inch cushion when pushed in.

NOTE

Refer to Section 2 for lubrication, inspection and/or replacement interval.

11-86. CARBURETOR HEAT CONTROL.
a. Loosen clamp securing the control to the bracket on the airbox.
b. Push control full in, then pull it out approximately 1/8 inch from panel for cushion.
c. Shift control housing in its clamp so that the valve in the airbox is seated in the full open position. Tighten clamp in this position.
d. Pull out on the control and check that the air valve inside the airbox seats in the opposite direction.
e. Check that bolt and nut on the air valve lever secures the control wire and that the bolt will swivel in the lever.
f. Bend the wire tip 90 degrees to prevent it from being withdrawn if the attaching nut should become loose.

NOTE

Refer to the inspection chart in Section 2 for inspection and/or replacement interval for the carburetor heat control.

11-87. PROPELLER CONTROL. Refer to Section 13.

11-88. STARTING SYSTEM.

11-89. DESCRIPTION. The automatically-engaged starting system employs an electrical starter motor mounted to a 90-degree adapter. A solenoid is activated by the ignition switch on the instrument panel When the solenoid is activated, its contacts close and electrical current energizes the motor. Initial rotation of the motor engages the starter through an overrunning clutch in the starter adapter, which incorporates worm reduction gears. The starter motor is located just aft of the right rear cylinder.

CAUTION

Never operate the starter motor more than 12 seconds at a time. Allow starter motor to cool between cranking periods to avoid overheating. Longer cranking periods without cooling time will shorten the life of the starter motor.

11-90. TROUBLE SHOOTING.

TROUBLE	PROBABLE CAUSE	REMEDY
STARTER WILL NOT OPERATE.	Defective master switch or circuit.	Check continuity. Install new switch or wires.
	Defective starter switch or switch circuit.	Check continuity. Install new switch or wires.
	Defective starter motor.	Check electrical power to motor. Repair or replace starter motor.
STARTER MOTOR RUNS, BUT DOES NOT TURN CRANK-SHAFT.	Defective overrunning clutch or drive.	Check visually. Install new starter adapter.
	Starter motor shaft broken.	Check visually. Install new starter motor.
STARTER MOTOR DRAGS.	Low battery.	Check battery. Charge or install new battery.
	Starter switch or relay contacts burned or dirty.	Install serviceable unit.
	Defective starter motor power cable.	Check visually. Install new cable.
	Loose or dirty connections.	Remove, clean and tighten all terminal connections.
	Defective starter motor.	Check starter motor brushes, brush spring tension, thrown solder on brush cover. Repair or install new starter motor.
	Dirty or worn commutator.	Check visually. Clean and turn commutator.
STARTER EXCESSIVELY NOISY.	Worn starter pinion.	Remove and inspect. Replace starter drive.
	Worn or broken teeth on crankshaft gears.	Check visually. Replace crankshaft gear.

11-91. PRIMARY MAINTENANCE. The starting circuit should be inspected at regular intervals, the frequency of which should be determined by the amount of service and conditions under which the equipment is operated. Inspect the battery and wiring. Check battery for fully charged condition, proper electrolyte level with approved water and terminals for cleanliness. Inspect wiring to be sure that all connections are clean and tight and that the wiring insulation is sound. Check that the brushes slide freely in their holders and make full contact on the commutator. When brushes are worn to one-half of their original length, install new brushes (compare brushes with new brushes). Check the commutator for uneven wear, excessive glazing or evidence of excessive arcing. If the commutator is only slightly dirty, glazed or discolored, it may be cleaned with a strip of No. 00 or No. 000 sandpaper. If the commutator is rough or worn, it should be turned in a lathe and the mica undercut. Inspect the armature shaft for rough bearing surfaces. New brushes should be properly seated when installing by wrapping a strip of No. 00 sandpaper around the commutator (with sanding side out) 1-1/4 to 1-1/2 times maximum. Drop brushes on sandpaper covered commutator and turn armature slowly in the direction of normal rotation. Clean sanding dust from motor after sanding operations.

11-92. STARTER MOTOR.

11-93. REMOVAL AND INSTALLATION.

a. Remove engine cowling in accordance with paragraph 11-3.

CAUTION

When disconnecting starter electrical cable, do not permit terminal bolt to rotate. Rotation of the bolt could break the conductor between bolt and field coils causing the starter to be inoperative.

b. Disconnect battery cables and insulate as a safety precaution.
c. Disconnect electrical cable at starter motor.
d. Remove nuts and washers securing motor to starter adapter and remove motor. Refer to engine manufacturer's overhaul manual for adapter removal.
e. Reverse the preceding steps for reinstallation. Install a new O-ring seal on motor, then install motor. Be sure motor drive engages with the adapter drive when installing.

11-94. EXHAUST SYSTEM.

11-95. DESCRIPTION. The exhaust system consists of two exhaust stack assemblies, for the left and right bank of cylinders. Each cylinder has a riser pipe attached to the exhaust port. The three risers at each bank of cylinders are joined together into a collector pipe forming an exhaust stack assembly. The center riser on each bank is detachable, but the front and aft risers are welded to the collector pipe. Each exhaust stack assembly connects to the muffler beneath the engine. The muffler is enclosed in a shroud which captures exhaust heat which is used to heat the cabin.

The tailpipe is welded to the muffler. A shroud is attached to the left exhaust stack to provide heated air for the carburetor heat source.

11-96. ECONOMY MIXTURE INDICATOR (EGT) Refer to Section 15.

11-97. REMOVAL AND INSTALLATION. (Refer to figure 11-8.)

a. Remove engine cowling in accordance with paragraph 11-3.

b. Disconnect ducts from heater shroud on muffler assembly.

c. Disconnect duct from shroud on left exhaust stack assembly.

NOTE

If the aircraft is equipped with a carburetor heat shroud modification kit, SK182-78, the shroud is attached to the engine mounts and must be removed before removing the exhaust system from the engine. Effected Serials include: 18265176 thru 18268320 and F18200026 thru F18200169.

d. Remove nuts, bolts and clamps attaching stack assemblies to the muffler.

e. Loosen nuts attaching exhaust stacks to the cylinders and remove muffler assembly.

f. Remove nuts attaching exhaust stack assemblies to the cylinders and remove exhaust stacks and gaskets.

g. Reverse the preceding steps for reinstallation. Install a new gasket between each riser and its mounting pad on each cylinder, regardless of apparent condition of those removed. Torque exhaust stack nuts at cylinders to 100-110 in-lbs.

11-98. INSPECTION. Since exhaust systems of this type are subject to burning, cracking and general deterioration from alternate thermal stresses and vibrations, inspection is important and should be accomplished every 50 hours of operation. Also, a thorough inspection of the engine exhaust system should be made to detect cracks causing leaks which could result in loss of engine power. To inspect the engine exhaust system, proceed as follows:

a. Remove engine cowling as required so that ALL surfaces of the exhaust assemblies can be visually inspected.

NOTE

Especially check the areas adjacent to welds and slip joints. Look for gas deposits in surrounding areas, indicating that exhaust gases are escaping through a crack or hole or around the slip joints.

b. After visual inspection, an air leak check should be made on the exhaust system as follows:

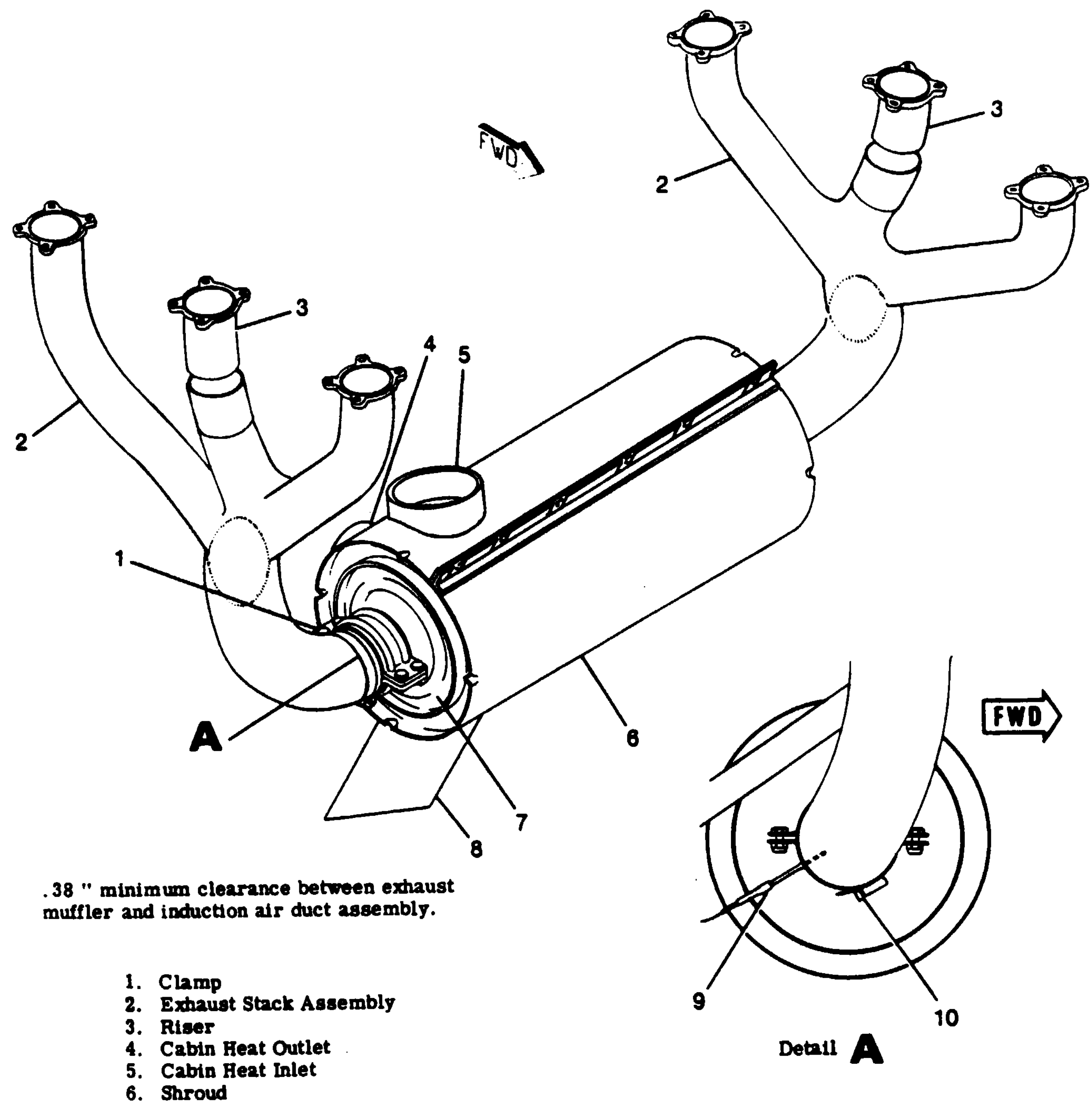
1. Attach the pressure side of an industrial vacuum cleaner to the tailpipe opening, using a rubber plug to effect a seal as required.

NOTE

The inside of vacuum cleaner hose should be free of any contamination that might be blown into the engine exhaust system.

2. With vacuum cleaner operating, all joints in the exhaust system may be checked manually by feel, or by using a soap and water solution and watching for bubbles. Forming of bubbles is considered acceptable, if bubbles are blown away system is not considered acceptable.

c. Where a surface is not accessible for a visual inspection, or for a more positive test, the following procedure is recommended.



.38 " minimum clearance between exhaust muffler and induction air duct assembly.

1. Clamp
2. Exhaust Stack Assembly
3. Riser
4. Cabin Heat Outlet
5. Cabin Heat Inlet
6. Shroud
7. Muffler
8. Tailpipe
9. EGT Probe
10. Clamp

Figure 11-8. Exhaust System

1. Remove exhaust stack assemblies.
2. Use rubber expansion plugs to seal openings.
3. Using a manometer or gage, apply approximately 1-1/2 psi (3 inches of mercury) air pressure while each stack assembly is submerged in water. Any leaks will appear as bubbles and can be readily detected.
4. It is recommended that exhaust stacks found defective be replaced before the next flight.

d. After installation of exhaust system components perform the inspection in step "b" of this paragraph to ascertain that system is acceptable.

11-99. EXTREME WEATHER MAINTENANCE.

11-100. COLD WEATHER. Cold weather starting will be made easier by the installation of an engine primer system and a ground service receptacle. The primer system is manually operated from the cabin. Fuel is supplied by a line from the fuel strainer to the plunger. Operating the primer forces fuel to the engine. With an external power receptacle installed, an external power source may be connected to assist in cold weather starting. Refer to Section 16 for use of the external power receptacle.

The following may also be used to assist engine starting in extreme cold weather. After the last flight of the day, drain the engine oil into a clean container so the oil can be preheated. Cover the engine to prevent ice or snow from collecting inside the cowling. When preparing the aircraft for flight or engine runup after these conditions have been followed, preheat the drained engine oil.

WARNING

Do not heat the oil above 121°C (250°F). A flash fire may result. Before pulling the propeller through, ascertain that the magneto switch is in the OFF position to prevent accidental firing of the engine.

After preheating the engine oil, gasoline may be mixed with the heated oil in a ratio of 1 part gasoline to 12 parts engine oil before pouring into the engine oil sump. If the free air temperature is below minus 29°C (-20°), the engine compartment should be preheated by a ground heater. Pre-heating the engine compartment is accomplished by inducing heated air up through the engine cowl flaps; thus heating up both the cylinders and oil. After the engine compartment has been pre-heated, inspect all engine drain and vent lines for presence of ice. After this procedure has been complied with, pull propeller through several revolutions by hand before attempting to start the engine.

CAUTION

Due to the desludging effect of the diluted oil, engine operation should be observed closely during the initial warm-up of the engine. Engines that have considerable amount of operational hours accumulated since their last dilution period may be seriously affected by the dilution process. This will be caused by the diluted oil dislodging sludge and carbon deposits within the engine. This residue will collect in the oil sump and possibly clog the screened inlet to the oil sump. Small deposits may actually enter the oil sump and be trapped by the main oil filter screen. Partial or complete loss of engine lubrication may result from either condition. If these conditions are anticipated after oil dilution, the engine should be run for several minutes at normal operating temperatures and then stopped and inspected for evidence of sludge and carbon deposits in the oil sump and oil filter screen. Future occurrence of this condition can be prevented by diluting the oil prior to each engine oil change. This will also prevent the accumulation of the sludge and carbon deposits.

11-101. HOT WEATHER. Refer to Pilot's Operating Handbook.

11-102. SEACOAST AND HUMID AREAS. In salt water areas special care should be taken to keep the engine, accessories and airframe clean to prevent oxidation. In humid areas, fuel and oil should be checked frequently and drained of condensation to prevent corrosion.

11-103. GROUND SERVICE RECEPTACLE. Refer to Section 16.

SHOP NOTES:

SECTION 11A

ENGINE (TURBOCHARGED)

WARNING

When performing any inspection or maintenance that required turning on the master switch, installing a battery, or pulling the propeller through by hand, treat the propeller as if the ignition switch were ON. Do not stand, nor allow anyone else to stand, within the arc of the propeller, since a loose or broken wire, or a component malfunction, could cause the propeller to rotate.

NOTE

For additional information covering turbocharger and component maintenance, overhaul and trouble-shooting refer to the manufacturer's overhaul manual.

11A-1. ENGINE COWLING.

11A-2. DESCRIPTION. The engine cowling is divided into major removable segments. The upper RH segment has an oil dipstick and remote fuel strainer drain control access door. The upper center cowl skin has the oil filler neck access door, and the lower LH panel contains the turbocharger access door. Controllable cowl flaps are integral with the lower trailing edge of cowl skin. They are hinged at the front edge, and controlled manually to maintain efficient engine operating temperature. The upper center and lower cowl segments are screw fastened at the nose cap, but RH and LH segments use quick release fasteners all around for easy access. Landing and taxi lights are mounted in the nose cap lower cowling.

11A-3. REMOVAL AND INSTALLATION.

a. Remove screws securing upper center and lower cowling segments to the nose cap.
b. Release the quick-release fasteners attaching the cowling to the fuselage and at the parting surfaces of the center and lower segments.
c. Disconnect the landing and taxi light wires at the quick-disconnects and carefully remove cowling.
d. Reverse the preceding steps for reinstallation. Ensure the baffle seals are turned in the correct direction to confine and direct air flow around the engine. The vertical installed seals must fold forward and the side seals must fold upwards.

11A-4. CLEANING AND INSPECTION. Wipe the inner surfaces of the cowling segments with a clean cloth saturated with cleaning solvent (Stoddard or equivalent). If the inside surface of the cowling is coated heavily with oil or dirt, allow solvent to soak until foreign material can be removed. Wash painted surfaces of the cowling with a solution of mild soap and water and rinse thoroughly. After washing, a coat of wax may be applied to the painted surfaces to prolong paint life. After cleaning, inspect cowling for dents, cracks, loose rivets and spot welds. Repair all defects to prevent spread of damage.

11A-5. REPAIR. (Refer to Section 17.)

11A-6. COWL FLAPS.

11A-7. DESCRIPTION. Cowl flaps are provided to aid in controlling engine temperature. Two cowl flaps, operated by a single control in the cabin, are located at the aft edge of the lower cowl segment.

NOTE

Refer to Section 2 for cowl flap hinge inspection frequency.

11A-8. REMOVAL AND INSTALLATION. (Refer to figure 11A-1.)

a. Place cowl flap control lever (11) in the OPEN position.
b. Disconnect cowl flap control clevises (6) from cowl flap shock-mounts (7).
c. Remove safety wire securing hinge pins to cowl flaps, pull pins and remove flaps.
d. Reverse the preceding steps for reinstallation. Rig cowl flaps, if necessary, in accordance with paragraph 11A-9.

11A-9. RIGGING. (See figure 11A-1.)

a. Disconnect cowl flap control clevises (6) from cowl flap shock-mounts (7).
b. Check to make shure that flexible controls reach their internal stops in each direction. Mark controls so that full travel can be readily checked and maintained during remaining rigging procedures.
c. Place cowl flap control lever (11) in CLOSED position. If the control lever cannot be placed in closed position, adjust controls at upper clevis (10) to position control lever in bottom hole of position bracket (9).
d. With control lever in CLOSED position, hold one cowl flap closed, streamlined with trailing edge of lower cowl. Loosen jam nut and adjust clevis (6) on the control to hold cowl flap in this position. Retighten jam nut and install bolt through clevis and shock-mount.

NOTE

Be shure threads are visible in clevis inspection holes.

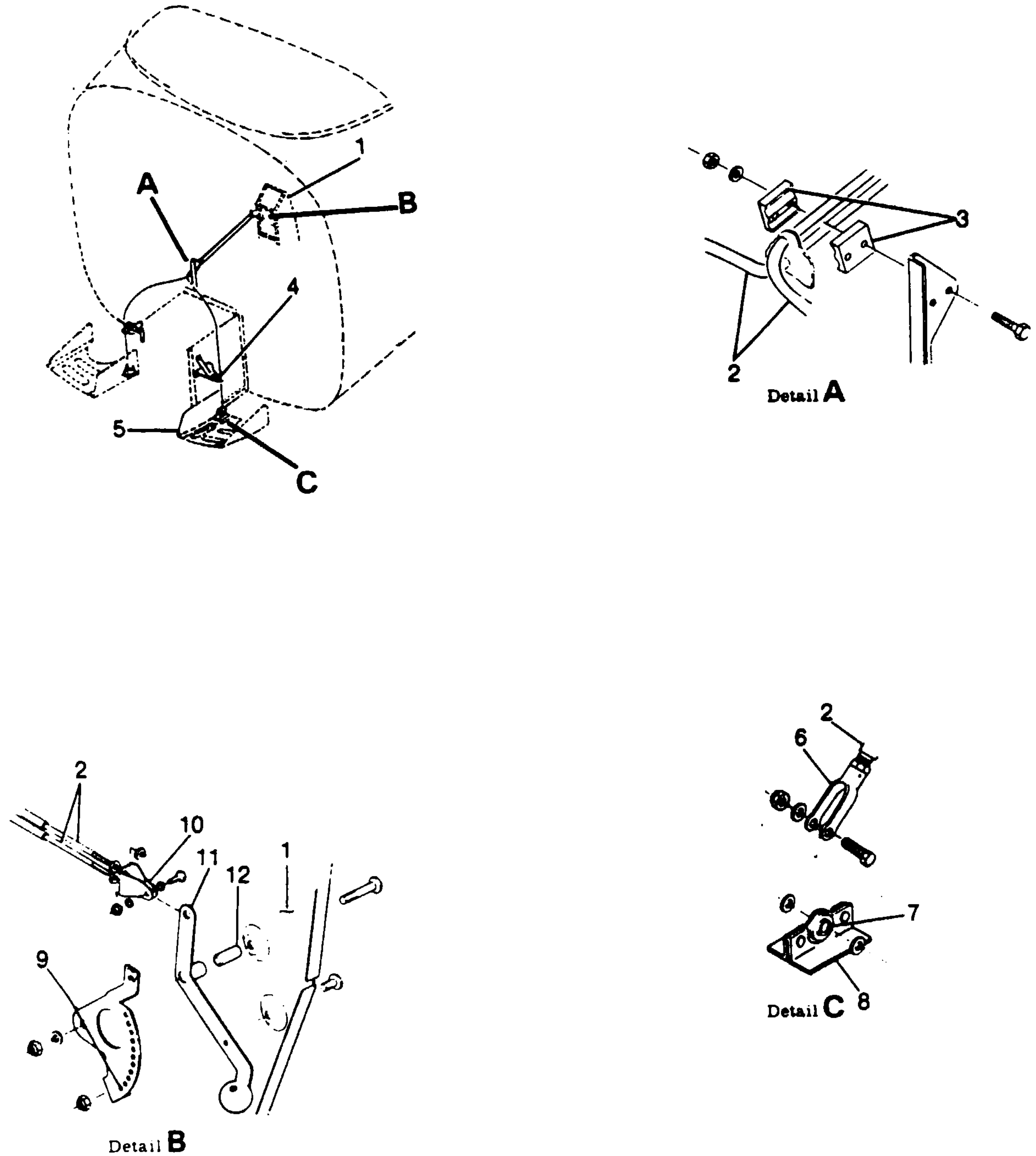
e. Repeat preceding step for the opposit cowl flap.
f. Check that all clamps and jam nuts are tight.
g. Check for ease of operation.

11A-10. ENGINE.

11A-11. DESCRIPTION. An air cooled, wet-sump, six-cylinder, horizontally-opposed, direct-drive, carbureted, Turbocharged Avco Lycoming O-540-L3C5D engine, driving a constant-speed propeller, is used to power the aircraft. The cylinders, numbered from front to rear, are staggered to permit a separate throw on the crankshaft for each connecting rod. The right front cylinder is number 1 and cylinders on the right side are identified by odd numbers 1, 3 and 5. The left front cylinder is number 2 and the cylinders on the left side are identified as number 2, 4 and 6. Refer to paragraph 11A-12 for engine data. For repair and overhaul of the engine turbocharger, accessories and propeller, refer to the appropriate publications issued by their manufacturers. These publications are available from the Cessna Supply Division.

11A-12. TIME BETWEEN OVERHAUL (TBO). Avco Lycoming recommends engine overhaul at 2000 hours operating time for the O-540-L3C5D series engines. Refer to Avco Lycoming Service Instruction 1009, and to any superseding instructions, revisions or supplements thereto, for further recommendations. At the time of overhaul, engine accessories should be overhauled. Refer to Section 13 for propeller and governor overhaul periods.

11A-13. OVERSPEED LIMITATIONS. The engine must not be operated above specified maximum continuous RPM. However, should inadvertent overspeed occur, refer to Avco Lycoming Service Bulletin 369F, and to any superseding bulletins, revisions or supplements thereto, for further recommendations.

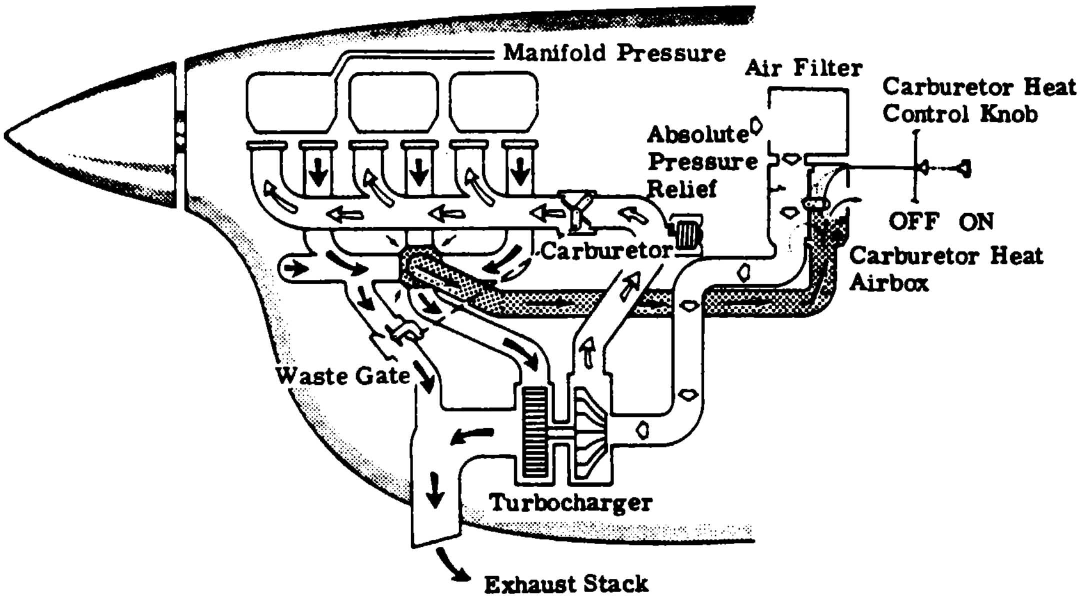


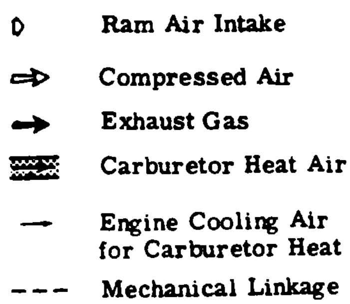
1. Pedestal
2. Cowl Flap Control
3. Clamp
4. Retainer
5. Cowl Flaps
6. Clevis
7. Shock - Mount
8. Bracket
9. Position Bracket
10. Clevis
11. Control Lever
12. Bushing

Figure 11A-1. Cowl Flap Installation

11A-14. ENGINE DATA.

AIRCRAFT Series	T182 SKYLANE
MODEL (Lycoming)	O-540-L3C5D
Rated Horsepower at RPM	235 at 2400 to 20,000 Feet
Number of Cylinders	6 Horizontally-Opposed
Displacement	541.5 Cubic Inches
Bore	5.125 Inches
Stroke	4.375 Inches
Compression Ratio	8.5:1
Magnetos	Bendix D6LN-2031
Right Magneto	Fires 23° BTC, Upper Left, Lower Right
Left Magneto	Fires 23° BTC, Lower Left, Upper Right
Firing Order	1-4-5-2-3-6
Spark Plugs	18mm (Refer to Avco Lycoming Service Instruction No. 1042 for factory approved spark plugs and required gap.)
Torque	330 ± 30 LB-IN.
Carburetor (Marvel-Schebler)	HA-6
Tachometer	Mechanical Drive
Oil Sump Capacity	8 U.S. Quarts
With External Filter	9 U.S. Quarts
Oil Pressure (PSI)	
Normal	60-90
Minimum Idling	25
Maximum (Cold Oil Starting)	100
Oil Temperature	
Normal Operating	160°F - 245°F
Maximum	Red Line (245°F)
Probe Location	Accessory Housing
Cylinder Head Temperature	
Normal Operating	200°F - 500°F
Maximum	Red Line (500°F)
Probe Location	Lower Side of Number 5 Cylinder
Economy Mixture Indicator (EGT)	
Probe Location	Left Hand Exhaust Collector
Direction of Crankshaft Rotation (Viewed from Rear)	Clockwise
Dry Weight-With Accessories	430 LB (Weight is approximate and will vary with optional accessories installed.)





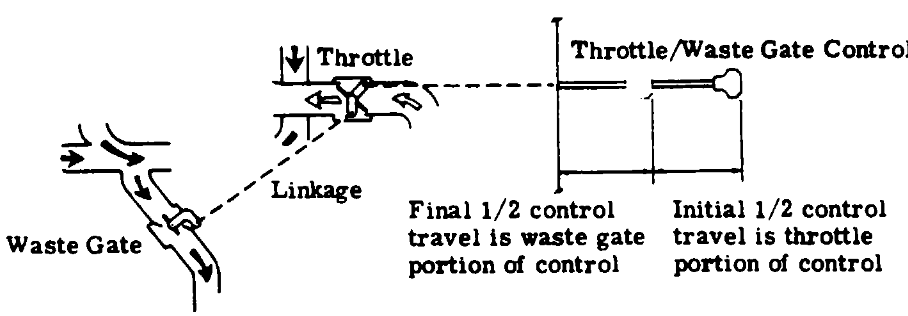


Figure 11A-2. Turbocharger - Airflow Schematic

11A-15. TROUBLE SHOOTING.

TROUBLE	PROBABLE CAUSE	REMEDY
ENGINE WILL NOT START.	Improper starting procedure.	Review starting procedure. Refer to Pilot's Operating Handbook.
	Fuel cells empty.	Visually inspect cells. Fill with proper grade and quantity of gasoline.
	Mixture control in the IDLE CUT-OFF position.	Move control to the full RICH position.
	Fuel selector valve in OFF position.	Place selector valve in the ON position to a cell known to contain gasoline.
	Engine flooded.	Refer to Pilot's Operating Handbook.
	Water in fuel system.	Open fuel strainer drain and check for water. If water is present, drain fuel cell sumps, lines, strainer and carburetor.
	Carburetor screen or fuel strainer plugged.	Remove carburetor and clean thoroughly. Refer to Section 12 for fuel strainer cleaning.
	Fuel contamination.	Drain all fuel and flush out fuel system. Clean all screens, fuel lines, strainer and carburetor.
	Defective carburetor.	Repair or replace carburetor.
	Vaporized fuel. (Most likely to occur in hot weather with a hot engine.)	Refer to Pilot's Operating Handbook.
	Defective aircraft fuel system.	Refer to Section 12.
	Defective ignition system.	Refer to paragraph 11A-57.
	Defective magneto switch or grounded magneto leads.	Check continuity. Repair or replace switch or leads.
	Spark plugs fouled.	Remove, clean and regap plugs. Test harness cables to persistently fouled plugs. Replace if defective.
ENGINE STARTS BUT DIES, OR WILL NOT IDLE.	Water in fuel system.	Open fuel strainer drain and check for water. If water is present, drain fuel cell sumps, lines, strainer and carburetor.
	Propeller control set in high pitch position (low RPM)	Use low pitch (high RPM) position for all ground operation.

11A-15. TROUBLE SHOOTING (Cont.)

TROUBLE	PROBABLE CAUSE	REMEDY
ENGINE STARTS BUT DIES. OR WILL NOT IDLE (cont).	Vaporized fuel. (Most likely to occur in hot weather with a hot engine.)	Refer to Pilot's Operating Handbook
	Induction air leaks.	Check visually. Correct the cause of leaks.
	Idle stop screw or idle mixture incorrectly adjusted.	Refer to paragraph 11A-49.
	Carburetor idling jet plugged.	Clean carburetor and fuel strainer. Refer to Section 12 for fuel strainer.
	Spark plugs fouled or improperly gapped.	Remove, clean and regap plugs. Replace if defective.
	Manual primer leaking.	Disconnect primer outlet line. If fuel leaks through primer, repair or replace primer.
	Defective ignition system.	Refer to paragraph 11A-57.
	Fuel boost pump.	Check fuel pressure.
	Leaking float valve or float level set too high.	Perform an idle mixture check. Attempt to remove any rich indication with the idle mixture adjustment. If the rich indication cannot be removed, the float valve is leaking or the float level is set too high. Replace defective parts. reset float level.
	Defective carburetor.	If engine will start when primed but stops when priming is discontinued. with mixture control in full RICH position. the carburetor is defective. Repair or replace carburetor.
	Defective fuel system.	Refer to Section 12.
	Turbocharger wheels rubbing.	Replace turbocharger.
	Improperly adjusted or defective waste gate.	Refer to paragraph 11A-67
	Leak in turbocharger discharge pressure system.	Correct cause of leaks. Repair or replace damaged parts.
	Malfunctioning turbocharger.	Check operation. listen for unusual noise. Check operation of waste gate valve and for exhaust system defects. Tighten loose connections.
	Defective engine.	Check compression. Listen for unusual engine noises. Engine repair is required.

11A-15. TROUBLE SHOOTING (Cont).

TROUBLE	PROBABLE CAUSE	REMEDY
ENGINE RUNS ROUGHLY. WILL NOT ACCELERATE PROPERLY, OR LACKS POWER.	Restriction in aircraft fuel system.	Refer to Section 12.
	Worn or improperly rigged throttle or mixture control.	Check visually. Replace worn linkage. Rig properly.
	Fuel pump output low.	Check fuel pressure.
	Restricted induction air filter.	Check visually. Clean in accordance with Section 2.
	Propeller control in high pitch (low RPM) position.	Use low pitch (high RPM) position for all ground operations.
	Fuel contamination.	Check all screens in fuel system. Drain all fuel and flush out system. Clean all screens, lines, strainer and carburetor.
	Low upper deck pressure.	Check absolute pressure relief valve.
	Float level set too low.	Check and reset float level.
	Spark plugs fouled or improperly gapped.	Remove, clean and regap plugs. Replace if defective.
	Defective ignition system.	Refer to paragraph 11A-57.
	Defective carburetor.	If engine will start when primed but stops when priming is discontinued, with mixture control in full RICH position, the carburetor is defective. Repair or replace carburetor.
	Cracked engine mount.	Inspect and repair or replace mount as required.
	Defective mounting bushings.	Inspect and install new bushings as required.
	Defective engine.	Check compression. Listen for unusual engine noises. Engine repair is required.
POOR IDLE CUT-OFF.	Worn or improperly rigged mixture control.	Check that idle cut-off stop on carburetor is contacted. Replace worn linkage. Rig properly.
	Manual primer leaking.	Disconnect primer outlet line. If fuel leaks through primer, it is defective. Repair or replace primer.
	Defective carburetor.	Repair or replace carburetor.

11A-15. TROUBLE SHOOTING (Cont).

TROUBLE	PROBABLE CAUSE	REMEDY
ENGINE LACKS POWER. REDUCTION IN MAXIMUM MANIFOLD PRESSURE.	Carburetor heat on.	Check control.
	Improperly adjusted waste gate.	Refer to paragraph 11A-67.
	Loose or damaged exhaust system.	Inspect entire exhaust system. Refer to paragraph 11A-72.
	Malfunctioning turbocharger.	Check for unusual noise in turbocharger. If malfunction is suspected, remove exhaust and/or air inlet connections and check turbine and compressor wheels for damaged blades. Check shaft bearing. Replace turbocharger if damage is noted.
	Leak in induction system.	Check visually. Correct the cause of leaks.

11A-16. STATIC RUN-UP PROCEDURES. If low engine RPM is encountered, or suspected. a static run-up should be conducted according to the following procedures.

a. Run engine. using takeoff power and mixture settings. first with airplane facing 90° right to prevailing wind. and second with airplane facing 90° left to prevailing wind direction.

b. Record the maximum RPM obtained in each instance. for analysis.

NOTE

Daily changes in atmospheric pressure. temperature. and humidity will have a slight affect on static run-up.

c. Average the results of the RPM readings. The average should be within 50 RPM of 2350 RPM.

d. If the average reading is lower than minimum limit. the following checks may be performed to determine probable discrepancy.

1. Check condition of induction air filter; clean if required.

2. Check carburetor heat control for proper adjustment. If it is partially open. it would cause RPM drop (slight power loss).

3. Check governor control for proper rigging. The control arm should be limited by high RPM stop on governor and the high RPM stop screw adjusted so the above average RPM is within tolerance. Refer to Section 13 for adjustment procedures.

NOTE

If verification of governor operation is necessary. the governor may be removed from the engine. and a flat plate installed over mount pad. Run up engine to determine that governor was adjusted properly.

4. Check magneto timing, spark plugs, and ignition harness for settings and condition.

5. Perform an engine compression check. Refer to engine manufacturer's service manual for procedures and requirements.

11A-17. REMOVAL. If an engine is to be placed in storage or returned to the manufacturer for overhaul. proper preparatory steps should be taken for corrosion prevention prior to beginning the removal procedure. Refer to Section 2 for storage preparation. The following engine removal procedure is based upon the engine being removed from the aircraft with the engine mount attached to the firewall.

NOTE

Tag each item when disconnected to aid in identifying wires. hoses. lines and control linkages when engine is reinstalled. Likewise. shop notes made during removal will often clarify reinstallation. Protect openings. exposed as a result or removing or disconnecting units. against entry of foreign material by installing covers or sealing with tape.

a. Attach a tail stand of suitable capacity.

b. Place all cabin switches in the OFF position.

c. Place fuel selector valve in the OFF position.

d. Remove engine cowling in accordance with paragraph 11A-3.

e. Disconnect battery cables and insulate terminals as a safety precaution.

f. Drain fuel strainer and lines with strainer drain control.

NOTE

During the following procedures, remove any clamps or lacings which secure controls, wires, hoses or lines to the engine, engine mount or attached brackets, so they will not interfere with engine removal. Some of the items listed can be disconnected at more than one place. It may be desirable to disconnect some of these items at other than the places indicated. The reason for engine removal should be the governing factor in deciding at which point to disconnect them. Omit any of the items which are not present on a particular engine installation.

g. Drain the engine oil sump and oil cooler.
h. Disconnect magneto primary lead wires at magnetos.

WARNING

The magnetos are in a SWITCH ON condition when the switch wires are disconnected. Ground the magneto points or remove the high tension wires from the magnetos or spark plugs to prevent accidental firing.

i. Remove the spinner and propeller in accordance with Section 13. Cover exposed end of crankshaft flange and propeller flange to prevent entry of foreign material.
j. Disconnect throttle and mixture controls at carburetor. Remove clamps attaching controls to engine and pull controls aft clear of engine. Use care to avoid bending controls too sharply. Note EXACT position, size and number of attaching washers and spacers for reference on reinstallation.
k. Disconnect propeller governor control at governor. Note EXACT position, size and number of attaching washers for reference on reinstallation. Remove clamps attaching control to engine and pull control aft clear of engine.
l. Disconnect all hot and cold air flexible ducts and remove.
m. Remove exhaust system in accordance with paragraph 11A-69.
n. Disconnect carburetor heat control from arm on airbox. Remove clamps and pull control clear of engine.
o. Disconnect wires and cables as follows:
   1. Tachometer drive shaft at adapter.

CAUTION

When disconnecting starter cable do not permit starter terminal bolt to rotate. Rotation of the bolt could break the conductor between bolt and field coils causing the starter to be inoperative.

   2. Starter electrical cable at starter.
   3. Cylinder head temperature wire at probe.
   4. Carburetor air temperature wires at quick-disconnects.
   5. Electrical wires and wire shielding ground at alternator.
   6. Exhaust gas temperature wire at quick-disconnect.
   7. Remove all clamps and lacings attaching wires or cables to engine, and pull wires and cables aft to clear engine.

p. Disconnect lines and hoses as follows:
   1. Vacuum hose at vacuum pump.
   2. Oil breather vent lines where secured to the engine.

WARNING

Residual fuel and oil draining from disconnected lines and hoses constitutes a fire hazard. Use caution to prevent accumulation of such fuel and oil when lines or hoses are disconnected.

   3. Oil temperature bulb.
   4. Primer line at engine fitting.
   5. Fuel supply hose at fuel strainer.
   6. Oil pressure line at engine fitting.
   7. Manifold pressure line at engine.

q. Carefully check the engine again to ensure ALL hoses, lines, wires, cables, clamps and lacings which would interfere with the engine removal are disconnected or removed. Ensure all wires, cables and engine controls have been pulled aft to clear the engine.

CAUTION

Place suitable stand under tail tie-down ring before removing engine. The loss of engine weight will cause the aircraft to be tail heavy.

r. Attach a hoist to the lifting lug at the top center of the engine crankcase. Lift engine just enough to relieve the weight from the engine mount pads.
s. Remove bolts attaching engine to engine mount pads and slowly hoist engine and pull it forward. Check for any items which would interfere with the engine removal. Balance the engine by hand and carefully guide the disconnected parts out as the engine is removed.
t. Remove engine shock-mount pads and bonding straps.

11A-18. CLEANING. Refer to Section 2.

11A-19. ACCESSORIES REMOVAL. Removal of engine accessories for overhaul or for engine replacement involves stripping parts, accessories and components from the engine to reduce it to the bare engine. During the removal process, items removed should be tagged for repair or replacement as required.

NOTE

Items easily confused with similar items should be tagged to provide a means of identification when being installed on a new engine. All openings exposed by the removal of an item should be closed by installing a suitable cover, cap or tape over the opening. This will prevent entry of foreign material.

11A-20. INSPECTION. For specific items to be inspected, refer to the engine manufacturer's manual.

a. Visually inspect the engine for loose nuts, bolts, cracks and fin damage.

b. Inspect baffles, baffle seals and brackets for cracks, deterioration and breakage.

c. Inspect all hoses for internal swelling, chafing through protective plys, cuts, breaks, stiffness, damaged threads and loose connections. Excessive heat on hoses will cause them to become brittle and easily broken. Hoses and lines are most likely to crack or break near the end fittings and support points.

d. Inspect for color bleaching of the end fittings or severe discoloration of the hoses.

NOTE

Avoid excessive flexing and sharp bends when examining hoses for stiffness.

e. Refer to Section 2 for replacement intervals for flexible fluid carrying hoses in the engine compartment.

f. For major engine repairs, refer to the engine manufacturer's overhaul and repair manual.

11A-21. BUILD-UP. Engine build-up consists of installation of parts, accessories and components to the basic engine to build up an engine unit ready for installation on the aircraft. All safety wire, lockwashers, nuts, gaskets and rubber connections should be new parts.

11A-22. INSTALLATION. Before installing the engine on the aircraft, install any items which were removed from the engine or aircraft after the engine was removed.

NOTE

Remove all protective covers, plugs, caps and identification tags as each item is connected or installed. Omit any items not present on a particular engine installation.

a. Hoist the engine to a point near the engine mount.

b. Install engine shock-mount pads as illustrated in figure 11A-3.

c. Carefully lower engine slowly into place on the engine mount. Route controls, lines, hoses and wires in place as the engine is positioned on the engine mount pads.

NOTE

Be sure engine shock-mount pads, spacers and washers are in place as the engine is lowered into position.

d. Install engine-to-mount bolts, torque bolts to 450-500 lb-in. then remove the hoist and support stand placed under tail tie-down fitting.

e. Route throttle, mixture and propeller controls to their respective units and connect. Secure controls in position with clamps.

f. Route carburetor heat control to airbox and connect. Secure control in position with clamps.

NOTE

The manufacturer recommends that NS-40 (RAS-4) (Snap-On-Tools Corp., Kenosha. Wisc.), MIL-T-5544 (Thread Compound Antiseize, Graphite Petrolatum). USP Petrolatum or engine oil be used as a thread lubricant and to seal fittings. Apply sparingly to male threads omitting first two threads on the fitting. Use care so lubricant does not string across the opening. Be sure area is clean to prevent fuel contamination.

g. Connect lines and hoses as follows:

1. Manifold pressure line at engine fitting.
2. Oil pressure line at engine fitting.
3. Fuel supply hose at fuel strainer.
4. Primer line at engine fitting.
5. Oil temperature bulb.
6. Oil breather vent line where secured to the engine.
7. Vacuum hose at vacuum pump.

h. Connect wires and cables as follows:

1. Electrical wires and wire shielding ground at alternator.
2. Cylinder head temperature wire at probe. (Do not exceed 4 lb-in torque.)

CAUTION

When connecting starter cable, do not permit starter terminal bolt to rotate. Rotation of the bolt could break the conductor between bolt and field coils causing the starter to be inoperative.

3. Starter electrical cable at starter.
4. Tachometer drive shaft at adapter. Be sure drive cable engages drive in adapter. Torque housing attach nut to 100 lb-in.
5. Exhaust gas temperature wire and carburetor air temperature wires at quick-disconnects.
6. Install clamps and lacings securing wires and cables to engine, engine mount and brackets.

i. Install exhaust system in accordance with paragraph 11A-74.

j. Connect all hot and cold air flexible ducts.

k. Install propeller and spinner in accordance with instructions outlined in Section 13.

l. Complete a magneto switch ground-out and continuity check, then connect primary lead wires to the magnetos. Remove the temporary ground or connect spark plug leads, whichever procedure was used during removal.

WARNING

Be sure magneto switch is in OFF position when connecting switch wires to magnetos.

m. Clean and install induction air filter in accordance with Section 2.

n. Service engine with proper grade and quantity of engine oil. Refer to Section 2 if engine is new, newly overhauled or has been in storage.

o. Be sure all switches are in the OFF position, and connect battery cables.
p. Rig engine controls in accordance with paragraphs 11A-67, 11A-68, 11A-69 and 11A-71).
q. Inspect engine installation for security, correct routing of controls, lines, hoses and electrical wiring, proper safetying and tightness of all components.
r. Install engine cowling in accordance with paragraph 11A-3. Rig cowl flaps in accordance with paragraph 11A-9.
s. Perform an engine run-up and make final adjustments on the engine controls.

11A-23. FLEXIBLE FLUID HOSES.

11A-24. LEAK TEST. Refer to Section 2 for leak test interval. Perform leak check as follows:
a. Examine the exterior of hoses for evidence of leakage or wetness.
b. Hoses found leaking should be replaced.
c. Refer to paragraph 11-17 for detailed inspection procedures for flexible hoses.

11A-25. REPLACEMENT.
a. Hoses should not be twisted on installation. Pressure applied to a twisted hose may cause failure or loosening of the nut.
b. Provide as large a bend radius as possible.
c. Hoses should have a minimum of one-half inch clearance from other lines, ducts, hoses or surrounding objects or be butterfly clamped to them.
d. Rubber hoses will take a permanent set during extended use in service. Straightening a hose with a bend having a permanent set will result in hose cracking. Care should be taken during removal so that hose is not bent excessively, and during reinstallation to assure hose is returned to its original position.
e. Refer to AC 43.13-1, Chapter 10, for additional installation procedures for flexible fluid hose assemblies.

11A-26. ENGINE BAFFLES.

11A-27. DESCRIPTION. The sheet metal baffles installed on the engine direct the flow of air around the cylinders and other engine components to provide optimum cooling. These baffles incorporate rubber-asbestos composition seals at points of contact with the engine cowling and other engine components to help confine and direct the airflow to the desired area. It is very important that the baffles and seals are in good condition and installed correctly. The vertical seals must fold forward and the side seals must fold upwards. Removal and installation of the various baffle segments is possible with the cowling removed. Be sure that any new baffles seal properly.

11A-28. CLEANING AND INSPECTION. The engine baffles should be cleaned with a suitable solvent to remove oil and dirt.

NOTE

The rubber-asbestos seals are oil and grease resistant but should not be soaked in solvent for long periods.

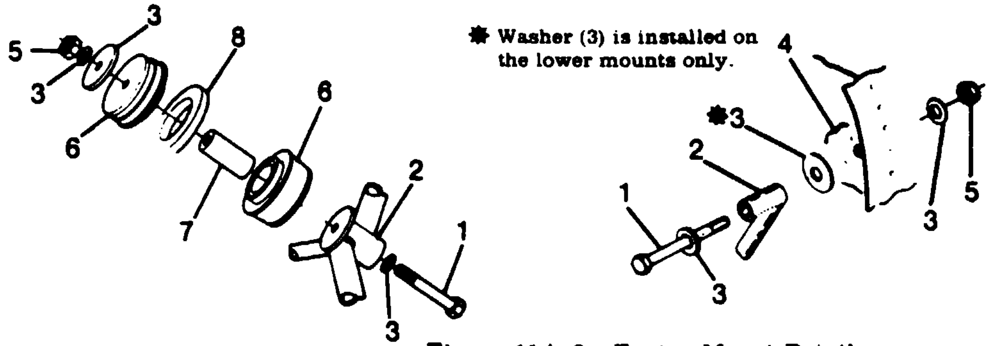
Inspect baffles for cracks in metal and for loose and/or torn seals. Repair or replace any defective parts.

11A-29. REMOVAL AND INSTALLATION. Removal and installation of the various baffle segments are possible with the cowling removed. Be sure that any replaced baffles and seals are installed correctly and that they seal to direct the airflow in the correct direction. Various lines, hoses, wires and controls are routed through some baffles. Make sure that these parts are reinstalled correctly after installation of baffles.

11A-30. REPAIR. Repair of an individual segment of engine baffle is generally impractical, due to the small size and formed shape of the part, replacement is usually more economical. However, small cracks may be stop-drilled and a reinforcing doubler installed. Other repairs may be made as long as strength and cooling requirements are met. Replace sealing strips if they do not seal properly.

11A-31. ENGINE MOUNT. (Refer to figure 11A-3.)

11A-32. DESCRIPTION. The engine mount is composed of sections of steel tubing welded together and reinforced with gussets. The mount is fastened to the fuselage at four points. The engine is attached to the engine mount with shock-mount assemblies which absorb engine vibrations. Each engine mount pad has a small hole for a locating pin which serves as a locating dowel for the engine shock-mounts.



1. Bolt
2. Engine Mount
3. Washer
4. Firewall
5. Nut
6. Mounting
7. Damper
8. Engine

Figure 11A-3. Engine Mount Details

11A-33. REMOVAL AND INSTALLATION.
a. Remove engine in accordance with paragraph 11A-17.
b. Remove bolts from upper and lower mount-to-fuselage structure and carefully remove engine mount.
c. Reverse the preceding steps for reinstallation. Reinstall engine in accordance with paragraph 11A-22.

NOTE

Torque engine-to-mount bolts to 450-500 lb-in. Torque mount-to-firewall bolts to 160-190 lb-in.

11A-34. REPAIR. (Refer to Section 17.)

11A-35. PAINTING. (Refer to Section 18.)

11A-36. ENGINE SHOCK-MOUNT PADS. (Refer to figure 11A-3.) The bonded rubber and metal shock-mounts are designed to reduce transmission of engine vibrations to the airframe. The rubber pads should be wiped clean with a clean dry cloth.

11A-37. ENGINE OIL SYSTEM.

11A-38. DESCRIPTION. A wet-sump, pressure-lubricating oil supply is employed in the engine. The engine is equipped with an external replaceable oil filter and a noncongealing oil cooler.

WARNING

The U.S. Environmental Protection Agency advises that mechanics and other workers who handle engine oil are advised to minimize skin contact with used oil and promptly remove used oil from the skin. In a laboratory study, mice developed skin cancer after skin was exposed to used engine oil twice a week without being washed off, for most of their life span. Substances found to cause cancer in laboratory animals may also cause cancer in humans.

11A-39. TROUBLE SHOOTING. (Refer to Section 11.)

11A-40. FULL-FLOW OIL FILTER.

11A-41. DESCRIPTION. An external replaceable oil filter is standard equipment on this engine. The filter is a throw-away spin-on filter which has an internal bypass valve.

11A-42. REMOVAL AND INSTALLATION.

NOTE

Replacement filters are available from the Cessna Supply Division.

a. Remove cowling in accordance with paragraph 11A-3.
b. Remove safety wire from filter.
c. Unscrew filter from adapter.
d. Before installing oil filter apply a thin coating of Dow Corning Compound, DC-4, on the base gasket by brushing or wiping.
e. Install spin-on filter and torque to 18-20 lb-ft or 3/4 to 1 full turn after gasket makes contact.
f. Safety wire filter.

11A-43. OIL COOLER.

11A-44. DESCRIPTION. The external oil cooler is mounted on the right aft engine baffle. Flexible hoses carry the oil to and from the cooler. Ram air passes through the cooler coil and is discharged into the engine compartment. At each engine oil change, drain the oil cooler. Refer to Section 2 for servicing instructions.

11A-45. ENGINE FUEL SYSTEM.

11A-46. DESCRIPTION. The engine is equipped with a carburetor mounted on the lower aft end of the engine. The carburetor has a manual altitude mixture control. For overhaul and repair of the carburetor, refer to the manufacturer's overhaul and repair manual.

11A-47. CARBURETOR.

11A-48. REMOVAL AND INSTALLATION.
a. Place fuel selector valve in the OFF position.
b. Remove engine cowling in accordance with paragraph 11A-3.
c. Drain fuel from strainer and lines with strainer drain control.
d. Disconnect throttle and mixture controls at the carburetor. Note EXACT position, size and number of attaching washers and spacers for reference on reinstallation.
e. Disconnect and cap or plug fuel line at carburetor.
f. Remove safety wire, nuts and washers attaching carburetor to engine, and remove carburetor and mounting gasket.
g. For overhaul and cleaning procedures refer to the manufacturer's overhaul and repair manual.
h. Reverse the preceding steps for reinstallation, using new gaskets. Rig throttle/waste gate and mixture controls in accordance with paragraphs 11A-67 and 11A-68.

11A-49. IDLE SPEED AND MIXTURE ADJUSTMENTS. Idle speed and mixture adjustment should be accomplished after the engine has been warmed up. Since idle RPM may be affected by idle mixture adjustment, it may be necessary to readjust idle RPM after setting the idle mixture correctly.
a. Set the throttle stop screw (idle RPM) to obtain 600±25 RPM, with throttle control pulled full out against idle stop.

NOTE

Engine idle speed may vary among different engines. An engine should idle smoothly, without excessive vibration and the idle speed should be high enough to maintain idling oil pressure and to preclude any possibility of engine stoppage in flight when the throttle is closed.

b. Advance throttle to increase engine speed to approximately 1000 RPM.
c. Pull mixture control knob slowly and steadily toward the idle cut-off position, observing tachometer, then return control full IN (RICH) position before engine stops.
d. Adjust mixture adjusting screw at upper end of carburetor intake throat to obtain a slight and momentary gain of 25 RPM maximum at 1000 RPM engine speed as mixture control is moved from full IN (RICH) toward idle cut-off position. Return control to full IN (RICH) to prevent engine stoppage.
e. If mixture is set too LEAN, engine speed will drop immediately, thus requiring a richer mixture. Turn adjusting screw OUT (counterclockwise) for a richer mixture.
f. If mixture is set too RICH, engine speed will increase above 25 RPM, thus requiring a leaner mixture. Turn adjusting screw IN (clockwise) for a leaner mixture.

NOTE

After each adjustment to the idle mixture, run engine up to approximately 2000 RPM to clear engine of excess fuel to obtain a correct idle speed.

11A-50. INDUCTION AIR SYSTEM. Ram air enters the induction air system through an intake port and a filter on the aft left side of the cowling. It is ducted to the airbox, and onward to the turbocharger compressor section, located under and to the left of engine. After compression, the air is forced through the carburetor, where fuel is intermixed and then to the intake manifold through the throttle valve. The mixture is distributed to each cylinder as demanded through separate intake pipes. A butterfly valve, located in the airbox may be operated manually from the cockpit to permit selection of carburetor heated air, which in this application is also alternate air selection. When carburetor heat is selected, heated air is drawn from a shroud on the left exhaust stack assembly.

11A-57. FILTER REMOVAL AND INSTALLATION.
a. Remove upper left cowling according to paragraph 11A-3.
b. Release the four quick-release fasteners securing the filter assembly to the airbox.
c. Reverse the preceding steps for installation.

11A-52. CLEANING AND INSPECTION. Clean and inspect filter in accordance with instructions in Section 2.

NOTE

If filter gasket becomes loose, bond with EC-1300L or equivalent.

11A-53. AIRBOX REMOVAL AND INSTALLATION.
a. Remove upper left cowl in accordance with paragraph 11A-3.
b. Disconnect flexible compressor inlet (upper) duct at airbox.
c. Disconnect flexible carburetor heat (lower) duct from airbox.
d. Disconnect carburetor heat control wire from control arm on airbox, and remove clamp.
e. Remove clamp attaching air filter box to airbox.
f. Remove screw attaching upper airbox support to firewall stiffener.
g. Remove four screws attaching airbox to firewall and remove airbox, retaining washers for installation.
h. Reverse the preceding steps for reinstallation. Rig carburetor heat control according to paragraph 11A-69.

11A-54. CLEANING AND INSPECTION. Clean metal parts of the induction airbox with Stoddard solvent or equivalent. Inspect for cracks, dents, loose rivets, etc. Minor cracks may be stop-drilled. In case of continued or severe cracking, replace airbox. Inspect gaskets and install new gaskets, if damaged. Check manually-operated air door for ease of operation and proper rigging.

11A-54A. INSTALLATION OF INLET DUCTS. When cutting duct assembly to length, the support wire should be cut back far enough to bend back (minimum bend radius 1/8 inch) under the clamp and protrude 1/4 inch. Do not break the bond between wire and fabric. Before tightening clamps, make sure there is no twist or torque on hose. If hose is wrapped with MIL-Y-1140 cord in place of wire support, the same installation procedures applies except; MIL-Y-1140 has no minumum bend radius requirement.

The minimum installed bend radius for wire supported hose in the plane of bend is as follows:

1. Neoprene, one-ply hose -1/4 diameter of the maximum hose dimension.

2. Neoprene, two-ply hose and silicone, one-ply hose -1/3 diameter of the maximum hose dimension.

4. Silicone, two-ply hose - 1/2 diameter of the maximum hose dimension.

11A-55. IGNITION SYSTEM.

11A-56. DESCRIPTION. The ignition system is comprised of dual magnetos, two spark plugs in each cylinder, an ignition wiring harness, an ignition switch mounted on the instrument panel and required wiring between the ignition switch and magnetos.

11A-57. TROUBLE SHOOTING. (Refer to Section 11.)

11A-58. MAGNETOS.

11A-59. DESCRIPTION. The Bendix D-2000 series magneto consists of two electrically independent ignition circuits. The magneto uses an impulse coupling to provide reliable ignition at engine cranking speed. Suppression of breaker contact point arcing is accomplished by feed-thru type capacitors mounted in the magneto cover which forms a part of the magneto harness assembly.

11A-60. REMOVAL AND INSTALLATION.

WARNING

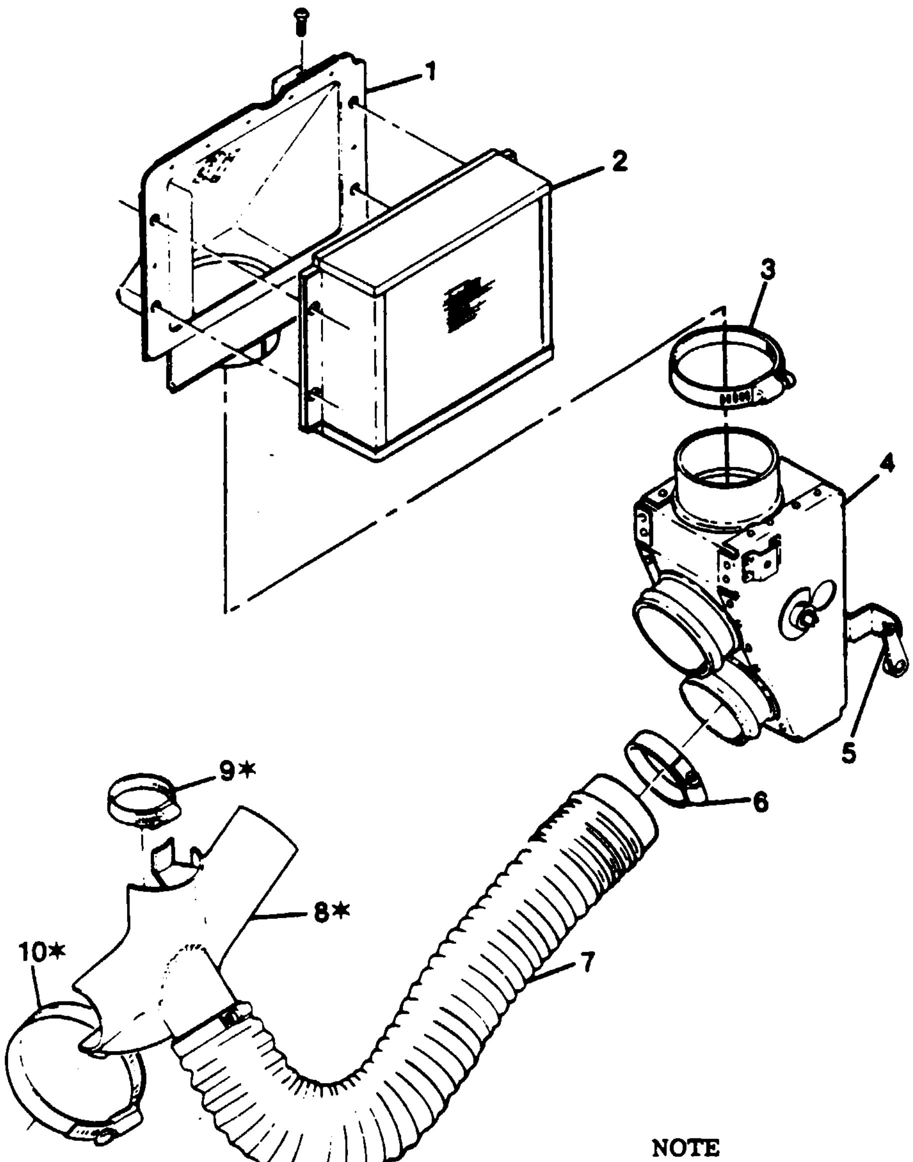
The magneto is in a SWITCH ON condition when the switch wire is disconnected. Therefore, ground the breaker contact points or disconnect the high-tension wires from magneto to spark plugs.

a. Remove engine cowling in accordance with paragraph 11-3.
b. Remove the eight screws securing the high-tension outlet cover to the magneto. The "P" leads may be disconnected for additional clearance if necessary.

NOTE

It is a good practice to position No. 1 cylinder at its approximate advanced firing position before removing the magneto.

c. Remove nuts, washers and clamps attaching the magneto to the engine accessory housing. Note the approximate angular position at which the magneto is installed, then remove the magneto.
d. Reverse the preceding steps for reinstallation and time magneto-to-engine in accordance with paragraph 11A-62.



1. Air Filter Box
2. Air Filter Assembly
3. Air Box Inlet Clamp
4. Air Box
5. Carburetor Heat Selector Valve Arm
6. Clamp
7. Carburetor Heat Inlet Duct
8. Carburetor Heat Shroud
9. Upper Shroud Clamp
10. Lower Shroud Clamp

NOTE

If the aircraft is equipped with a modified carburetor heat shroud (8), refer to Service Kit #SK182-78 for installation instructions.

*Not used with modified heat shroud.

Figure 11A-4. Carburetor Heat and Air Filter Installation

11A-61. INTERNAL TIMING. (MAGNETO REMOVED FROM ENGINE.)

NOTE

A magneto, correctly timed internally, will have the red painted tooth of the large distributor gears approximately centered in the timing windows, the L ("E" gap) mark on the rotor shaft in alignment with the pointer and both sets of breaker contacts opening, all at the same time.

a. Remove breaker contact point assembly cover, if installed, by removing the cover screws, pulling cover directly aft away from housing and disconnecting both capacitor leads from breaker contact assemblies.
b. Remove timing inspection hole plugs from magneto.
c. Slowly turn the rotor shaft until the red painted tooth of the large distributor gear for each side is approximately centered in the inspection windows with the L ("E" gap) mark on the rotor aligned with the pointer. Lock the rotor in this EXACT position using Bendix Rotor Holding Tool, Part No. 11-8465 or equivalent.

NOTE

Position the 11-8465 Rotor Holding Tool on drive end of rotor shaft in the 4 o'clock position so that any shaft deflection caused by clamping action will be in a plane parallel to the breaker contacts.

d. Connect the timing light (Bendix Part No. 11-9110 or equivalent) black lead to any unpainted surface of the magneto. Connect the red lead to the left breaker contact terminal and the green lead to the right breaker contact terminal.
e. Carefully adjust the LEFT breaker contacts to just begin to open (light will go out) with the timing pointer within the width of the L ("E" gap) mark.
f. Repeat step "e" for the RIGHT breaker contacts.
g. Loosen the rotor holding tool and turn rotor shaft in normal direction of rotation until cam followers of contact assemblies are on the high point of cam lobes. Contact point clearance should be 0.016±0.002 inch and 0.016±0.004 inch on LEFT and RIGHT contacts respectively. If dimensions do not fall within limits, readjust contact points and recheck to be sure the points just begin to open when the timing pointer is within the width of the L ("E" gap) mark.

NOTES

Wire feeler gages are recommended when checking contact point clearance.

No attempt should be made to stone or dress contact points.

If the above conditions are met and within the tolerance, the magneto is timed internally and ready for installation. If the above conditions are not within tolerance, proceed to step "h".

h. While holding the rotor shaft, loosen the screw securing breaker contact cam to rotor shaft and back screw out approximately half way. Place the end of a broad bladed screwdriver between the bottom of the cam and housing. Strike the screwdriver handle with a sharp downward blow to "pop" the cam loose from taper of shaft.
i. Rotate cam until breaker contact cam followers are on the high point of cam lobes. Adjust breaker points to obtain a clearance of 0.016±0.004 inch on LEFT and RIGHT contacts respectively. Tighten breaker contact securing screws to 20-25 lb-in.
j. Repeat step "c."
k. While holding rotor shaft in this EXACT position, rotate the breaker contact cam in the opposite direction of rotation a few degrees BEYOND where the breaker contacts close, then rotate cam in the normal direction of rotation until the breaker contacts just begin to open. Point opening should be determined by the use of a timing light. (Bendix Part No. 11-9110 or equivalent.)
l. While holding cam in this EXACT POSITION, push cam on rotor shaft as far as possible with the fingers. Tighten cam securing screw thereby drawing the cam down evenly and tightly. Torque cam securing screw to 16-20 lb-in.

NOTE

Extreme care must be exercised in this operation. If cam adjustment is changed in the slightest degree, the timing of the magneto will be thrown off. Do not drive cam on rotor shaft with a mallet or other instrument.

m. Recheck timing to make sure both sets of breaker contacts begin to open within the width of the L ("E" gap) mark and that the contact point clearance is in accordance with dimensions in step "g".

NOTE

When reinstalling the inspection hole plugs, make sure the ventilated plugs are installed in the ends of the magneto. Torque plugs to 12-15 lb-in.

11A-62. MAGNETO-TO-ENGINE-TIMING. The magneto must be installed with its timing marks carefully aligned, with number one cylinder on its compression stroke and with the number one position of number one piston. To locate the compression stroke of the number one cylinder, remove the lower spark plug from number 2, 3, 4, 5, and 6 cylinders. Remove the upper spark plug from number 1 cylinder. Place the thumb of one hand over the spark plug hole of number one cylinder and rotate crankshaft in the direction of normal rotation until the compression stroke is indicated by positive pressure inside the cylinder lifting the thumb off the spark plug hole. After the compression stroke is attained, locate number one piston at its advanced firing position. Locating the advanced firing position of number one piston may be obtained by rotating the crankshaft opposite to its normal direction of rotation until it is approximately 30 degrees before top dead center

(BTC) on the compression stroke of number one cylinder. Rotate crankshaft in a normal direction to align the timing mark on the front face of the starter ring gear support with the drilled hole in the starter, making sure the final motion of the ring gear is in the direction of normal rotation.

NOTE

An accurate top center indicator which screws into a spark plug mounting hole, and a pendulum pointer mounted on a 360-degree timing disc may also be used to locate the advanced firing position. The timing disc should be adapted to fit over the end of the propeller spinner in such a manner that it may be rotated as necessary. In all cases, it must be definitely determined that the number one cylinder is at the correct firing position and on the compression stroke when the engine is turned in its normal direction of rotation.

After the engine has been placed in the correct firing position, install the magneto to the engine in the following manner:

a. Remove the timing window plug from the most convenient side of the magneto housing.
b. Remove the rotor viewing location plug from the top center of the housing.
c. Turn the rotating magnet drive shaft in the normal direction of magneto rotation until the red painted tooth of the large distributor gear is centered in the timing hole (hole at each side of magneto).
d. Also observe at this time that the built in pointer just ahead of the rotor viewing window aligns with the L "E" gap) mark on the rotor.
e. Install the magneto-to-engine gasket on the magneto flange.

Do not attach harness spark plug leads to the spark plugs until all magneto-to-engine timing procedures are completed and the switch leads ("P" leads) are connected.

f. Remove the engine-to-magneto drive gear train backlash by turning magneto drive opposite to normal rotation as far as possible.
g. With the No. 1 cylinder at its correct firing position and on the compression stroke. hold the magneto as close to its No. 1 firing position as possible (red tooth in center of window and pointer over L ("E" gap) mark on rotor and install magneto to the engine. Loosely tighten magneto in position.

NOTE

To facilitate connection of a timing light to the switch lead ("P" lead) terminals. short adapter leads may be fabricated. These can be made by using two switch lead terminals and two short pieces of insulated wire. Install the fabricated adapter leads in the switch lead outlet terminals of the cover.

h. Attach the red lead of the timing light (Bendix Part No. 11-9110 or equivalent) to the left switch lead adapter, the green lead of the timing light to the right switch lead adapter and the black lead of the timing light to the magneto housing (common ground).

NOTE

An internal timing tolerance is allowed when adjusting the two main breakers. Therefore, one of the main breakers may open slightly before the other. Magneto-to-engine timing should be accomplished using the first main breaker to open as the reference point when the engine is in the firing position for No. 1 cylinder. This will ensure that ignition created by either spark plug will not occur prior to the desired engine firing point.

i. Turn the entire magneto in direction of rotor rotation, right-hand rotation to right and left-hand rotation to left, until one of the timing lights just goes off. Then tighten the magneto mounting clamps evenly in this position.
k. Back the engine up approximately 10° and then carefully "bump" the engine forward while observing the timing lights.
l. At the No. 1 cylinder firing position, one of the timing lights should go off. Continue turning the engine in its normal direction of rotation until the other timing light goes off. This should be not more than 3 engine degrees later than the first light. If not, repeat steps "i" thru "k" until these conditions are obtained.
m. Make sure the magneto clamps are tightened securely, recheck timing once more and remove timing equipment.
n. Reinstall inspection plugs and torque plugs to 12-15 lb-in.

11A-63. MAINTENANCE. At the first 25-hour inspection. first 50-hour inspection, first 100-hour inspection and thereafter at each 100-hour inspection, the contact breaker point compartment and magneto-to-engine timing should be inspected and checked. If magneto-to-engine timing is correct within plus zero and minus two degree. internal timing need not be checked. If timing is out of tolerance. remove magneto and set internal timing (paragraph 11-62). then install and time to engine.

NOTE

If engine operating troubles develop which appear to be caused by the ignition system, it is advisable to check the spark plugs and ignition harness first before working on the magnetos. If the trouble appears definitely associated with a magneto. the following may be used to help disclose the source of trouble without overhauling the magneto.

a. Moisture check.

1. Remove contact breaker point assembly cover and inspect cover, cables and capacitor for moisture in the area.

2. Inspect distributor block high tension outlets for moisture.

3. If any moisture is evident, lightly wipe with a soft, dry, clean, lint-free cloth.

CAUTION

Do not use gasoline or any other solvent, as these will remove the wax coating on some parts and cause an electrical leak.

b. Breaker contact compartment check.

1. Check all parts of the contact breaker assembly for security. Check distributor block high-tension outlet springs for evidence of spark erosion and proper height. The end of spring should not be more than 0.422 inch from top of tower.

2. Check breaker contact assembly points for excessive wear, burning, deep pits and carbon deposits. Breaker points may be cleaned with a hard finish paper. If breaker points are found defective, install a new assembly. Make no attempts to stone or dress breaker points. Clean new breaker points with clean unleaded gasoline and hard finish paper before installing.

3. Check condition of the cam follower felt. Squeeze felt between thumb and finger. If fingers are not moistened with oil, re-oil using 2 or 3 drops of lubricant (Bendix Part No. 10-86527 or equivalent). Allow approximately 30 minutes for felt to absorb the lubricant. Blot off excess lubricant with a clean, lint-free cloth. Too much lubricant could foul breaker points and cause excessive burning.

4. Check capacitors for looseness in the magneto cover of the harness assembly and for any physical damage. If equipment is available, check the capacitors for leakage, series resistance and capacitance. The capacitance should be 0.34 to 0.41 microfarads.

NOTE

Spring in capacitor outlet may cause an indication of a short to ground if an adapter lead is not used.

c. If the trouble has not been corrected after accomplishing the moisture and breaker contact compartment check, check magneto-to-engine timing in accordance with paragraph 11A-62. If timing is incorrect, remove magneto and adjust internal timing in accordance with paragraph 11A-61.

d. Reinstall magneto and time to engine in accordance with paragraph 11A-62.

e. If the trouble has not been corrected, magneto overhaul or replacement is indicated.

11A-64. MAGNETO CHECK.

a. Start and run engine until the oil and cylinder head temperatures are in the normal operating ranges.

b. Advance engine speed to 1700 RPM.

c. Turn the ignition switch to the "R" position and note the RPM drop, then return the switch to the "BOTH" position to clear the opposite set of plugs.

d. Turn the switch to the "L" position and note the RPM drop, then return the switch to the "BOTH" position.

e. The RPM drop should not exceed 175 RPM on either magneto setting or show greater than 50 RPM differential between magneto settings. A smooth RPM drop-off past normal is usually a sign of a too lean or too rich mixture. A sharp RPM drop-off past normal is usually a sign of a fouled plug, a defective harness lead or a magneto out of time. If there is doubt concerning operation of the ignition system, RPM checks at a leaner mixture setting or at higher engine speeds will usually confirm whether a deficiency exists.

NOTE

An absence of RPM drop may be an indication of faulty grounding of one side of the ignition system, a disconnected ground lead at magneto or possibly the magneto timing is set too far in advance.

11A-65. SPARK PLUGS. Two 18-mm spark plugs are installed in each cylinder and screw into helicoil type thread inserts. The spark plugs are shielded to prevent spark plug noise in the radios and have an internal resistor to provide longer terminal life. Spark plug life will vary with operating conditions. A spark plug that is kept clean and properly gapped will give better and longer service than one that is allowed to collect lead deposits and is improperly gapped.

NOTE

Refer to Section 2 for inspection interval. Remove, clean, inspect and regap all spark plugs at each inspection. Install lower spark plugs in upper portion of cylinders and install upper spark plugs in lower portion of cylinders. Since deterioration of lower spark plugs is usually more rapid than that of the upper spark plugs, rotating helps prolong spark plug life.

11A-66. ENGINE CONTROLS

11A-67. THROTTLE AND WASTE GATE CONTROL (See figure 11A-5).

a. Install washer (34) and throttle shaft extension (32) on throttle shaft (4) tighten finger tight, then install spring pin (33) making certain it does not protrude beyond the edge of the extension.

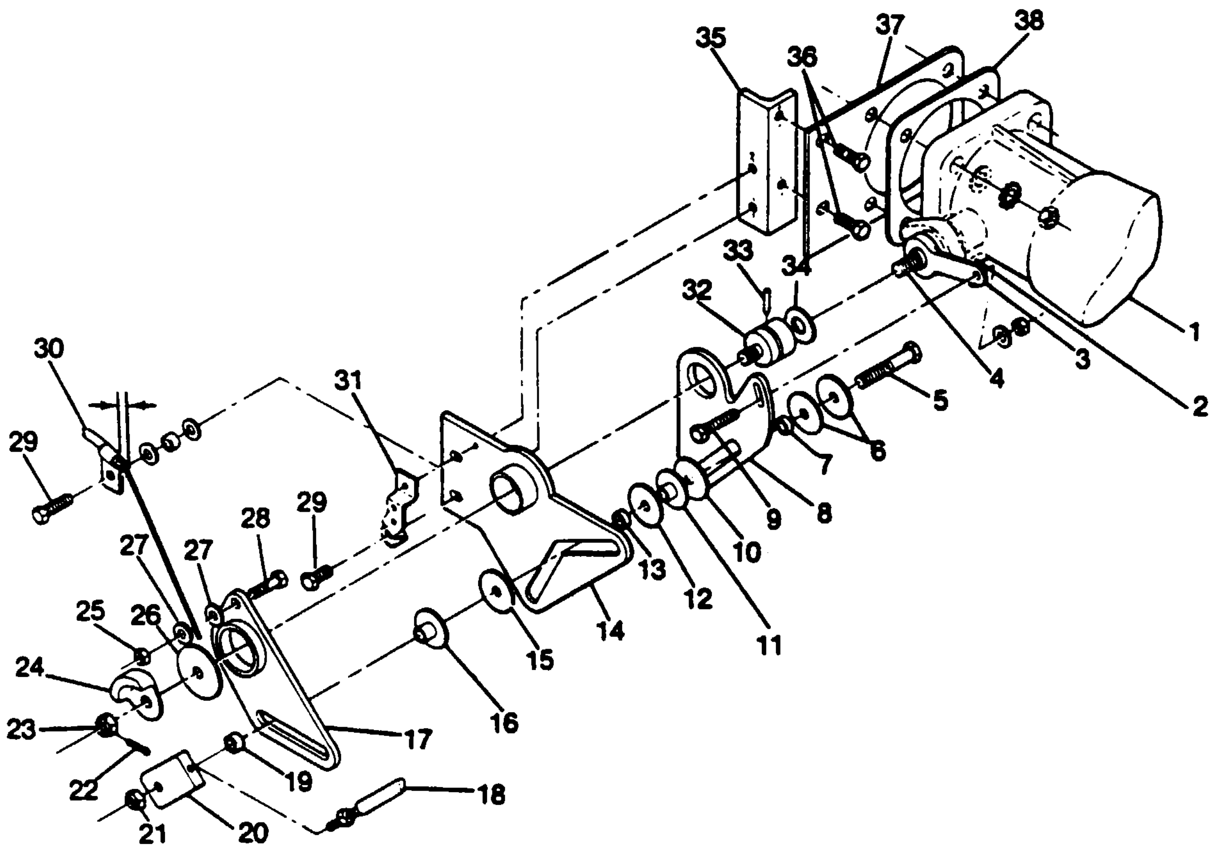
b. Assemble bolt (5) through levers (8, 14 and 17) in the exact order as shown in figure 11A-5, and screw throttle control rod end (20) on bolt (5) with lock nut.

NOTE

Make sure nylon washers are on retainer and not between AN960 washers and retainers.

c. Be sure that washers (26), cam (24) and castellated nut (23) are properly installed.

d. Install throttle arm bolt (9) through lever (8) and throttle arm (3).

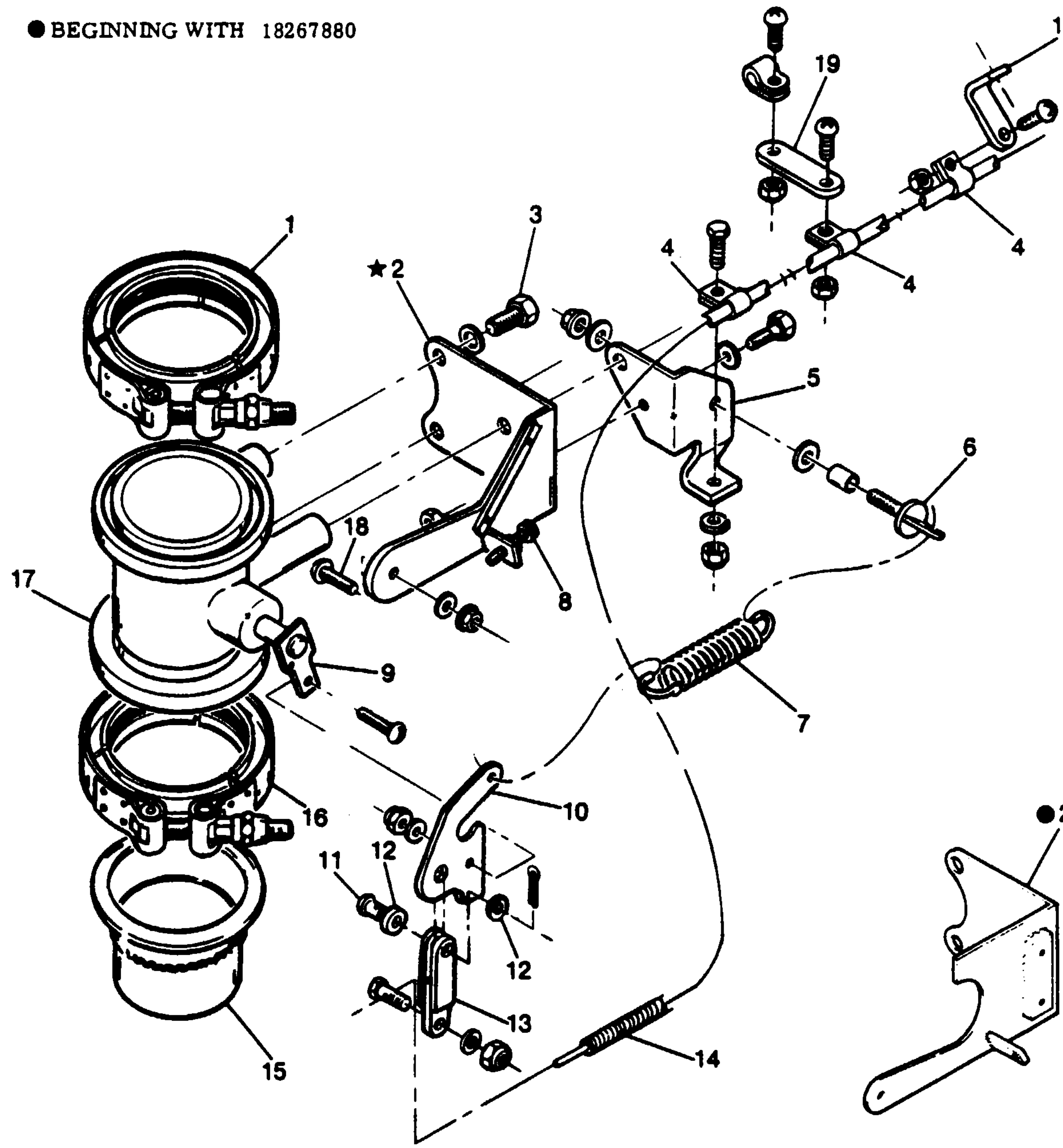


1. Carburetor
2. Idle Adjusting Screw
3. Throttle Arm
4. Throttle Shaft
5. Bolt
6. Washers
7. Bearing
8. Lever Slotted Throttle
9. Bolt
10. Washer
11. Retainer
12. Washer
13. Bearing
14. Bracket
15. Washer
16. Retainer
17. Lever
18. Throttle Control
19. Bearing
20. Throttle Control Rod End
21. Nut
22. Cotter Pin
23. Castellated Nut
24. Cam (nonfunctional)
25. Nut
26. Washer
27. Washer
28. Clamp
29. Bolt
30. Waste Gate Control Cable
31. Switch Mount (nonfunctional)
32. Throttle Shaft Extension
33. Spring Pin
34. Washer
35. Support Assembly
36. Bolts
37. Mount
38. Gasket

Figure 11A-5. Throttle to Carburetor and Waste Gate Installation

★THRU 18267879

● BEGINNING WITH 18267880



1. Waste Gate Inlet Clamp
2. Limiting Adjustment Bracket
3. Mount Bolts
4. Control Retainer
5. Return Spring Bracket
6. Return Spring Eye Bolt
7. Return Spring
8. Maximum Stop Screw (Min Bypass)
9. Waste Gate Valve Arm
10. Waste Gate Valve Arm Extension Lever
11. Pin
12. Washers
13. Control Arm
14. Waste Gate Control Cable
15. Waste Gate Exhaust Pipe
16. Waste Gate Clamp
17. Waste Gate Valve (Exhaust Bypass)
18. Minimum Stop Screw (Max Bypass)
19. Cable Brackets

Figure 11A-6. Waste Gate Assembly

e. Assemble support (35) and mount (37) using bolts (36), do not tighten until entire unit is assembled and freedom of movement is assured.
f. Install switch bracket (31).

NOTE

Lubricate waste gate control cable (30) with molybdenum disulfide (MIL-M-7866) suspended in petroleum distilate.

g. Install waste gate control (30) with bolts (28 and 29).
h. See figure 11A-6. Waste gate control arm (10) must be against minimum stop screw adjustment (8) and wire must not be bent. Ensure 0.072" clearence exists between butterfly valve and throat while arm rests against the adjustable stop.
i. Install throttle control (18) so approximatley 1/8" cushion exists at each end of travel of the cockpit throttle control.

NOTE

Slots are provided to allow free movement alignment tighten bolts in proper sequence to prevent binding. If after complete assembly the return spring will not return the arm readjustment is necessary.

j. After free movement is obtained, follow the following bolt tightening sequence.

1. Tighten throttle arm bolt (9), torque 20-30 in-lbs.
2. Throttle rod bolt (5) tighten as soon as all levers (8, 14 and 17), washers (6, 10, 12 and 15), bearings (7, 13 and 19) and retainers (11 and 16) are installed.
3. Tighten castellated nut (23) and install cotter pin (22) after throttle rod bolt.
4. Tighten stationary lever bolts (29) before support mount bolts.
5. Tighten support mount bolts (36) only after adjustment is complete and free movement is assured.

11A-68. MIXTURE CONTROL.
a. Push mixture control full in, then pull it out approximately 1/8 inch for cushion.
b. Loosen clamp securing the control to the engine.
c. Shift control housing in the clamp so that the mixture arm on the carburetor is in the full open position (RICH). Tighten the clamp in this position.
d. Unlock and pull mixture control full out. Check that idle mixture arm on carburetor is full closed (IDLE CUT-OFF).
e. Check that the bolt and nut at the mixture arm on carburetor secures the control wire and that the bolt will swivel in the arm.
f. Bend the wire tip 90 degrees to prevent it from being withdrawn if the attaching nut should become loose.
g. When installing a new control, it may be necessary to shorten the wire and/or control housing.
h. The mixture arm on the carburetor must contact the stops in each direction, and the control should have approximately 1/8 inch cushion when pushed in.

NOTE

Refer to the inspection chart in Section 2 for inspection, lubrication and/or replacement interval for the mixture control.

11A-69. CARBURETOR HEAT CONTROL.
a. Loosen clamp securing the control to the bracket on engine.
b. Push control full in, then pull it out approximately 1/8 inch from panel for cushion.
c. Shift control housing in its clamp so that the valve in the airbox is seated in the full open position. Tighten clamp in this position.
d. Pull out on the control and check that the air valve inside the airbox seats in the opposite direction.
e. Check that bolt and nut on the air valve lever secures the control wire and that the bolt will swivel in the lever.
f. Bend the wire tip 90 degrees to prevent it from being withdrawn if the attaching nut should become loose.

NOTE

Refer to the inspection chart in Section 2 for inspection, lubrication and/or replacement interval for the carburetor heat control.

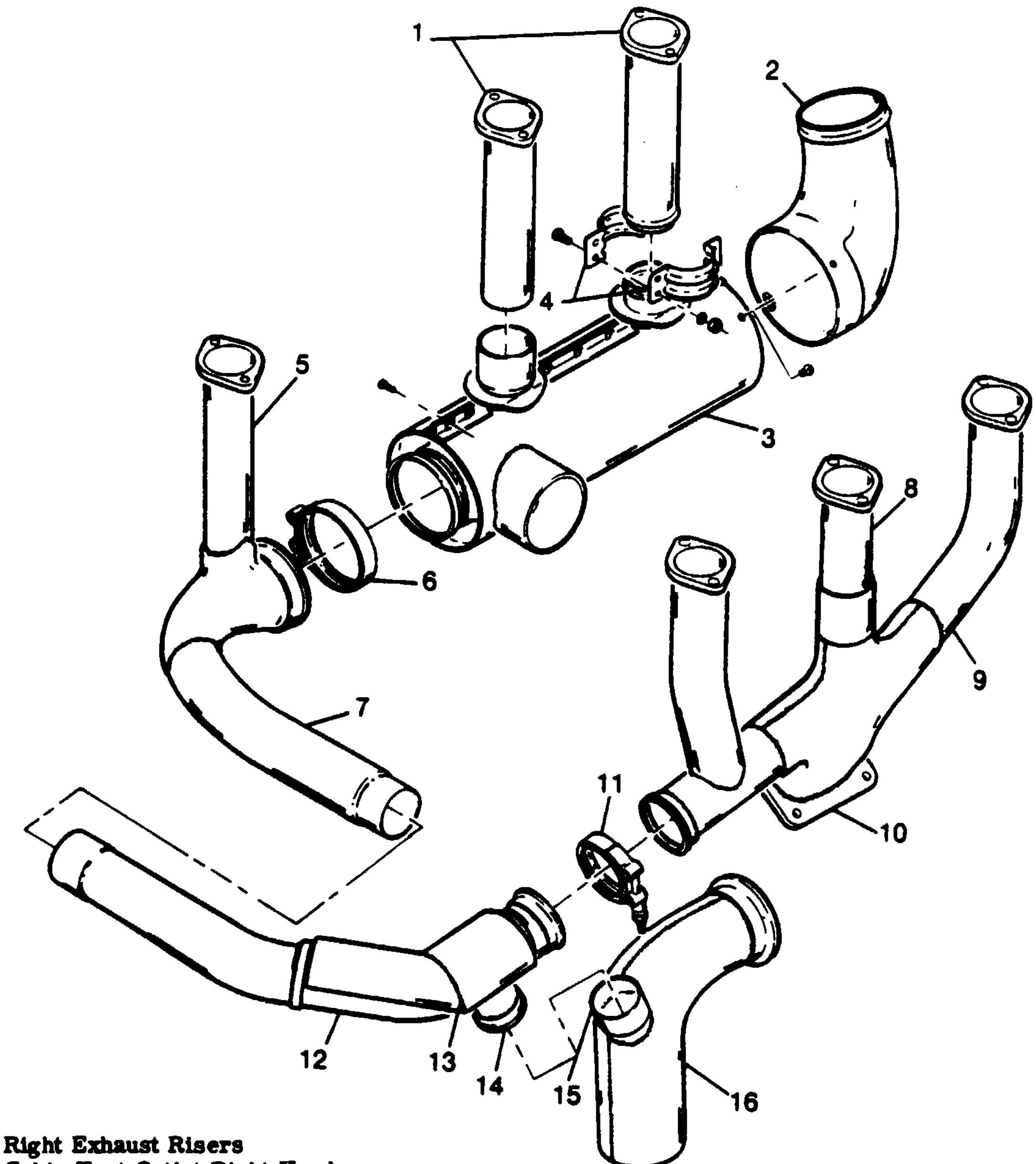
11A-70. PROPELLER CONTROL. (Refer to Section 13.)

11A-71. STARTING SYSTEM (Refer to Section 11.)

11A-72. EXHAUST SYSTEM.

11A-73. DESCRIPTION. The exhaust system consists of a single pipe for each cylinder, two short stacks, a crossover tube, a Y connector, the turbine section of the turbocharger, a waste gate, and a single exhaust outlet. The single pipes collect exhaust gases from each respective cylinder, and route it to the two stacks, one for the set of odd numbered cylinders and one for the set of even numbered cylinders. The left bank, even numbered, exhaust gases are used to drive the turbine wheel of the turbocharger, which in turn drives the compressor wheel. The right bank, odd numbered, exhaust is routed through the crossover around the front of the engine to the Y connection, which directs exhaust to the waste gate. All excess exhaust gases bypass the turbine wheel of the turbocharger through the waste gate. Manual linkage connects the waste gate valve to the carburetor throttle linkage. As the throttle is moved toward the open position, the waste gate is operated mechanically.

11A-74. REMOVAL AND INSTALLATION. (See figure 11A-7.)
a. Remove engine cowling in accordance with paragraph 11A-3.
b. Disconnect ducts from heater shroud on muffler assembly.
c. Disconnect duct from shroud on left exhaust stack assembly.
d. Remove nuts, bolts and clamps attaching stack assemblies to the turbocharger.



1. Right Exhaust Risers
2. Cabin Heat Outlet Right Hand
3. Shroud Right Hand
4. Clamp Half Right Hand
5. Exhaust Stack Assy Right Hand
6. Exhaust Stack Clamp
7. Crossover Pipe
8. Left Exhaust Riser
9. Exhaust Stack Assy Left Hand
10. Turbocharger Mount
11. Exhaust Stack Clamp Left Hand
12. Crossover Pipe
13. Heat Guard
14. Waste Gate Inlet
15. Tail Pipe

Figure 11A-7. Exhaust System Installation

e. Remove nuts attaching exhaust stack assemblies to the cylinders and remove exhaust stacks and gaskets.

f. Reverse the preceding steps for reinstallation. Install a new gasket between each riser and its mounting pad on each cylinder, regardless of apparent condition of those removed. Torque exhaust stack nuts at cylinders to 100-110 in-lbs.

11A-75. INSPECTION. Since exhaust systems of this type are subject to burning. cracking and general deterioration from alternate temperature extremes and vibrations, inspection is important and must be accomplished every 50 hours of operation. To inspect the engine exhaust system, proceed as follows:

a. Remove engine cowling as required so that ALL surfaces of the exhaust assemblies can be visually inspected.

NOTE

Especially check the areas adjacent to welds and slip joints. Look for gas deposits in surrounding areas. indicating that exhaust gases are escaping through a crack or hole or around the slip joints.

b. After visual inspection, an air leak check should be made on the exhaust system as follows:

1. Attach the pressure side of an industrial vacuum cleaner to the tailpipe opening. using a rubber plug to effect a seal as required.

NOTE

The inside of vacuum cleaner hose should be free of any contamination that might be blown into the engine exhaust system.

2. With vacuum cleaner operating. all joints in the exhaust system may be checked manually by feel, or by using a soap and water solution and watching for bubbles. Forming of bubbles is considered acceptable; if bubbles are blown away, system is not considered acceptable.

c. Where a surface is not accessible for a visual inspection. or for a more positive test, the following procedure is recommended.

1. Remove exhaust stack assemblies.
2. Use rubber expansion plugs to seal openings.
3. Using a manometer or gage, apply approximately 1-1/2 psi (3 inches of mercury) air pressure while each stack assembly is submerged in water. Any leaks will appear as bubbles and can be readily detected.
4. It is recommended that exhaust stacks found defective be replaced before the next flight.

d. After installation of exhaust system components perform the inspection in step "b" of this paragraph to ascertain that system is acceptable.

11A-76. TURBOCHARGER (See figure 11A-8.)

NOTE

For additional information covering turbocharger and component maintenance, overhaul and trouble shooting refer to the Manufacturer's Overhaul Manual.

11A-77. DESCRIPTION. The turbocharger is an exhaust gas-driven compressor, or air pump, which provides high velocity air to the engine intake manifold. The turbocharger is composed of a turbine wheel, compressor wheel, turbine housing and compressor housing. The turbine, compressor wheel and interconnecting drive shaft comprise one complete assembly and are the only moving parts in the turbocharger. Turbocharger bearings are lubricated with filtered oil supplied from the engine oil system. Engine exhaust gas enters the turbine housing to drive the turbine wheel. The turbine wheel, in turn, drives the compressor wheel, producing a high velocity of air in the engine induction system. Exhaust gas is then dumped overboard through the exhaust outlet of the turbine housing and exhaust tailpipe. Ram air is drawn into the compressor through the induction air filter and is forced out of the compressor housing through the carburetor, to intake manifold. This high velocity air enters the carburetor where fuel is added, and flow is limited by the throttle valve setting. During the transient interval from low to high RPM, the absolute pressure relief valve functions to limit maximum pressure available to the carburetor by releasing surplus to engine compartment atmosphere. It also presets a maximum available manifold pressure. Actual available manifold pressure is regulated by the turbocharger speed, controlled by the wastegate bypass action or directly by the operator.

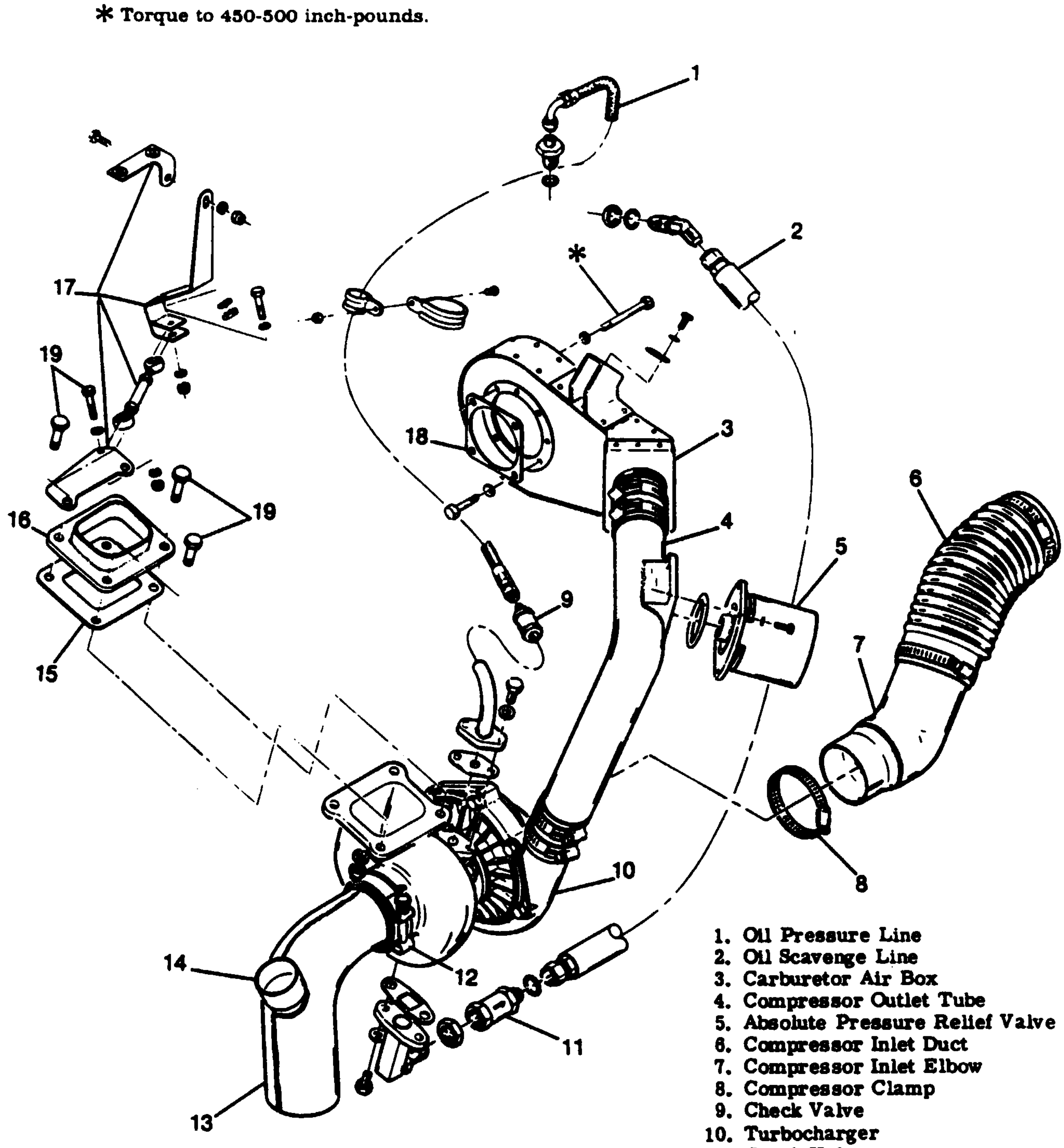
CAUTION

This turbocharged engine installation is equipped with an overboost control valve which functions as a safety device. but is not an automatic controller.

Consequently, it is necessary that the pilot observe and control the manifold pressure. particularly during takeoff. climb and power changes in flight.

The slight overboosting of manifold pressure beyond established maximums which is occasinally experienced during initial takeoff roll or during a power change in flight is not considered detrimental to the engine as long as it does not exceed 2 inches and is momentary.

OVERBOOST EXCEEDING 2 INCHES beyond established maximum is excessive and can result in engine damage. Refer to Lycoming Service Bulletin No. 369F and all revisions or supplements thereto.



1. Oil Pressure Line
2. Oil Scavenge Line
3. Carburetor Air Box
4. Compressor Outlet Tube
5. Absolute Pressure Relief Valve
6. Compressor Inlet Duct
7. Compressor Inlet Elbow
8. Compressor Clamp
9. Check Valve
10. Turbocharger
11. Check Valve
12. Turbine Outlet Clamp
13. Tail Pipe
14. Waste Gate Connection
15. Gasket
16. Exhaust Manifold
17. Turbocharger Mount Brackets
18. Carburetor Inlet Gasket
19. Turbocharger Mount Bolts

Figure 11A-8. Turbocharger Installation

11A-78. REMOVAL AND INSTALLATION (See figure 11A-8.)

a. Remove engine cowling as required.
b. Remove waste gate to tailpipe clamp at (14).
c. Loosen clamp (12) at turbine exhaust outlet and work tailpipe (13) from turbine outlet, and cover to prevent entrance of foreign material.
d. Loosen clamps (8) and remove air inlet, elbow (7) and duct (6) from turbocharger compressor section (10), and cover both parts to prevent damage.
e. Disconnect oil pressure (1) and scavenge lines (2) from turbocharger (10), plug and cap all openings. Remove all clamps and ties as necessary.
f. Remove four bolts (19) attaching turbine to LH exhaust manifold (16).
g. Carefully remove turbocharger from engine compartment. at aft LH side near the firewall.
h. Reverse the preceding steps for reinstallation. Always use a new gasket between turbocharger and exhaust manifold.

NOTE

Install all hardware in exact removal sequence.

i. Refer to paragraph 11A-67 for waste gate control linkage installation and adjustment.

11A-79. ECONOMY MIXTURE INDICATOR (EGT). (Refer to Section 15.)

11A-80. EXTREME WEATHER MAINTENANCE.

11A-81. COLD WEATHER. Cold weather starting is made easier by the use of the engine primer system and installation of a ground service receptacle. Operating the primer forces fuel to the engine. With an external power receptacle installed, an external power source may be connected to assist in cold weather starting. Refer to Section 16 for use of the external power receptacle.

The following may also be used to assist engine starting in extreme cold weather. After the last flight of the day. drain the engine oil into a clean container so the oil can be preheated. Cover the engine to prevent ice or snow from collecting inside the cowling. When preparing the aircraft for flight or engine runup after these conditions have been followed. preheat the drained engine oil.

WARNING

Do not heat the oil above 121°C (250°F). or a flash fire may result. Before pulling the propeller through. ascertain that the magneto switch is in the OFF position. or that primary lead is grounded to prevent accidental firing of the engine.

After preheating the engine oil. gasoline may be mixed with the heated oil in a ratio of 1 part gasoline to 12 parts engine oil before pouring into the engine oil sump. If the free air temperature is below minus 20°C (-20°F), the engine compartment should be preheated by a ground heater. Pre-heating the engine compartment is accomplished by inducing heated air up through the cowl flap openings; thus heating both the oil and the cylinders. After the engine compartment has been preheated, inspect all engine drain and vent lines for presence of ice. After this procedure has been complied with, pull propeller through several revolutions by hand before attempting to start the engine.

CAUTION

Due to the desludging effect of the diluted oil, engine operation should be observed closely during the initial warm-up of the engine. Engines that have considerable amount of operational hours accumulated since their last dilution period may be seriously affected by the dilution process. This will be caused by the diluted oil dislodging sludge and carbon deposits within the engine. This residue will collect in the oil sump and possibly clog the screened inlet to the oil sump. Small deposits may actually enter the oil sump and be trapped by the main oil filter screen. Partial or complete loss of engine lubrication may result from either condition. If these conditions are anticipated after oil dilution, the engine should be run for several minutes at normal operating temperatures and then stopped and inspected for evidence of sludge and carbon deposits in the oil sump and oil filter screen. Future occurrence of this condition can be prevented by diluting the oil prior to each engine oil change. This will also prevent the accumulation of the sludge and carbon deposits.

11A-82. HOT WEATHER. Refer to Pilot's Operating Handbook.

11A-83. SEACOAST AND HUMID AREAS. In salt water areas special care should be taken to keep the engine, accessories and airframe clean to prevent oxidation. In humid areas. fuel and oil should be checked frequently. and condensation drained to prevent corrosion.

11A-84. DUSTY AREAS. Dust induced into the intake system of the engine is probably the greatest single cause of early engine wear. When operating in high dust conditions, service the induction air filter daily as outlined in Section 2. Also change engine oil and lubricate airframe items more often than specified.

11A-85. GROUND SERVICE RECEPTACLE. Refer to Section 16.

SECTION 12

FUEL SYSTEM

12-1. FUEL SYSTEM.

12-2. **DESCRIPTION.** A rubberized bladder-type fuel (cell) tank, or an integral fuel tank is located in the inboard bay of each wing. When the fuel system is in operation, depending upon the aircraft's configuration, gravity, an electric or engine-driven fuel pump, draws the fuel from the tanks through the tank strainers, a selector valve, fuel strainer, electric or engine-driven fuel pump to the carburetor. In the 1977 through 1978 Models, system ventilation is provided by vented fuel caps and a vent line and check valve extends from the left wing tank and emerges through the lower wing skin adjacent to the wing strut. Beginning with 1979 Models, a vent line and check valve is also used on the right wing tank. The forward fuel lines from the right and left tanks are also utilized as vapor return lines and are teed into a tank crossover vent line connected to the right and left vent lines. The fuel strainer has a quick-drain valve on the bottom of the bowl and is used to remove water and sediment from the system. Fuel sump drain valves (one in each tank) are located in the bottom, inboard end of each fuel tank and are provided for draining trapped water and sediment. Integral fuel tank equipped aircraft 18265176 and On, incorporating SK182-100 have four additional quick-drain valves installed in each fuel bay.

12-3. **PRECAUTIONS.** Observe the following general precautions and rules during fueling, defueling, tank or integral fuel bay purging, repairing, assembly or disassembly of system components and electrical system checks and repairs on the airplane fuel system:

WARNING

During all fueling procedures, fire fighting equipment must be available. Attach a ground wire from approved ground stakes to the mooring eyebolt on LH and RH wing struts or mooring ring on LH and RH wings. Ground fuel nozzle to airplane during fueling operations.

a. Plugs or caps should be placed on all disconnected hoses, lines and fittings to prevent residual fuel drainage, thread damage, or entry of dirt or foreign material into fuel system.

12-4. TROUBLE SHOOTING.

TROUBLE	PROBABLE CAUSE	REMEDY
NO FUEL FLOW TO CARBURETOR	Fuel selector valve not turned on.	Turn valve on.
	Fuel cells empty.	Service with proper grade and amount of fuel.
	Fuel line disconnected or broken.	Connect or repair fuel lines.
	Fuel cell outlet screens plugged.	Remove and clean screens and flush out fuel cells.
	Defective fuel selector valve.	Repair or replace selector valve.
	Inlet elbow or inlet screen in carburetor plugged.	Clean or replace.
	Plugged fuel strainer.	Remove and clean strainer and screen.
	Fuel line plugged.	Clean or replace fuel line.
FUEL STARVATION AFTER STARTING	Partial fuel flow from the preceding causes.	Use the preceding remedies.
	Plugged fuel vent.	Refer to paragraph 12-24.
	Water in fuel.	Drain fuel cell sumps, lines and strainer.
NO FUEL QUANTITY INDICATION	Fuel cell empty.	Service with proper grade and amount of fuel.
	Open or defective circuit breaker.	Reset. Replace if defective.
	Loose connections or open circuit.	Tighten connections; repair or replace wiring.
	Defective fuel quantity indicator or transmitter.	Refer to Section 15.
PRESSURIZED FUEL CELL	Plugged bleed hole in fuel vent.	Refer to paragraph 12-24.
NO FUEL TO CARBURETOR	Mechanical fuel pump defective.	Repair or replace mechanical fuel pump.
	Auxilary fuel pump circuit breaker open.	Reset circuit breaker.
	Auxilary fuel pump circuitry defective.	Repair or replace fuel pump or pump wiring.

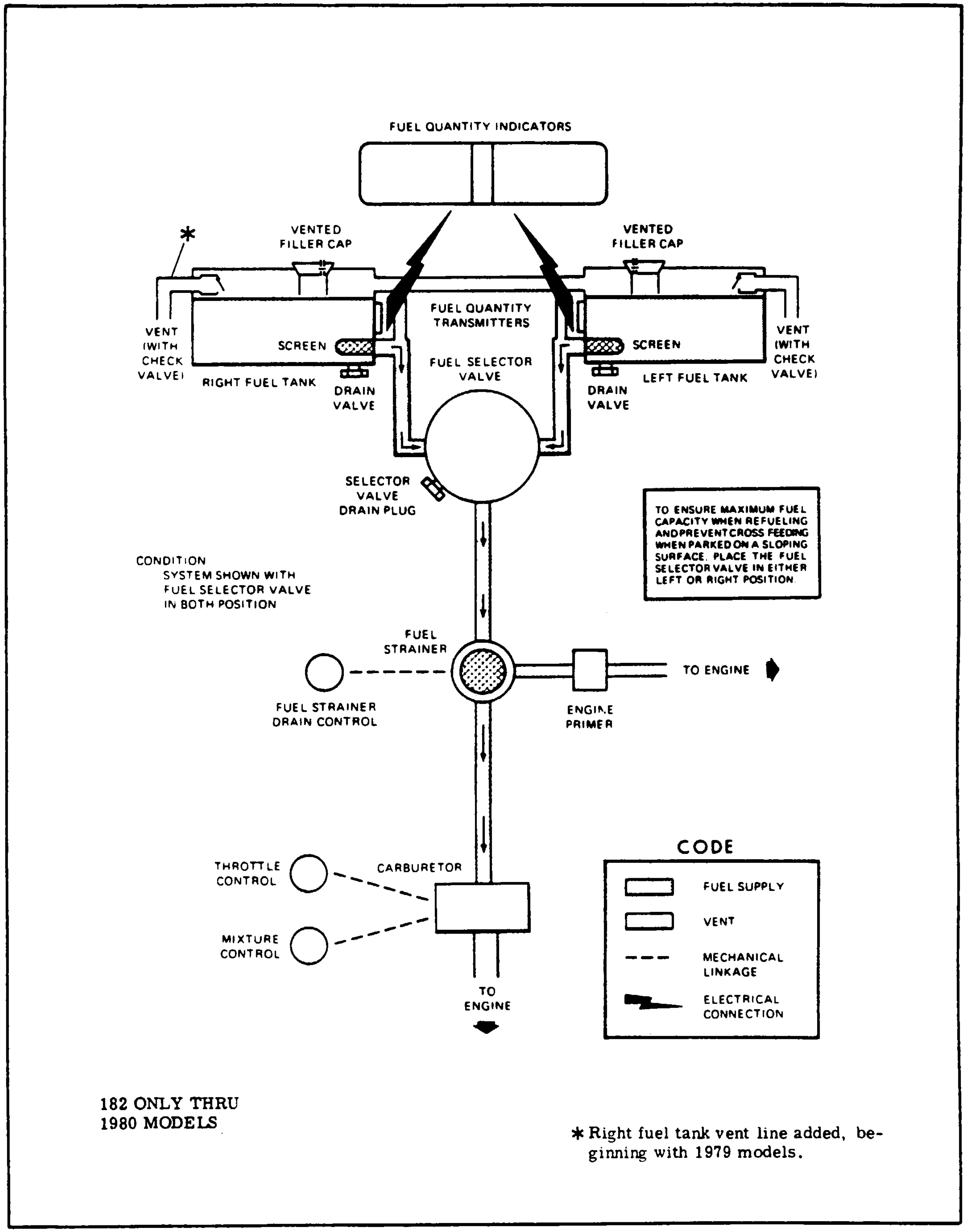


Figure 12-1. Fuel System Schematic (Sheet 1 of 4)

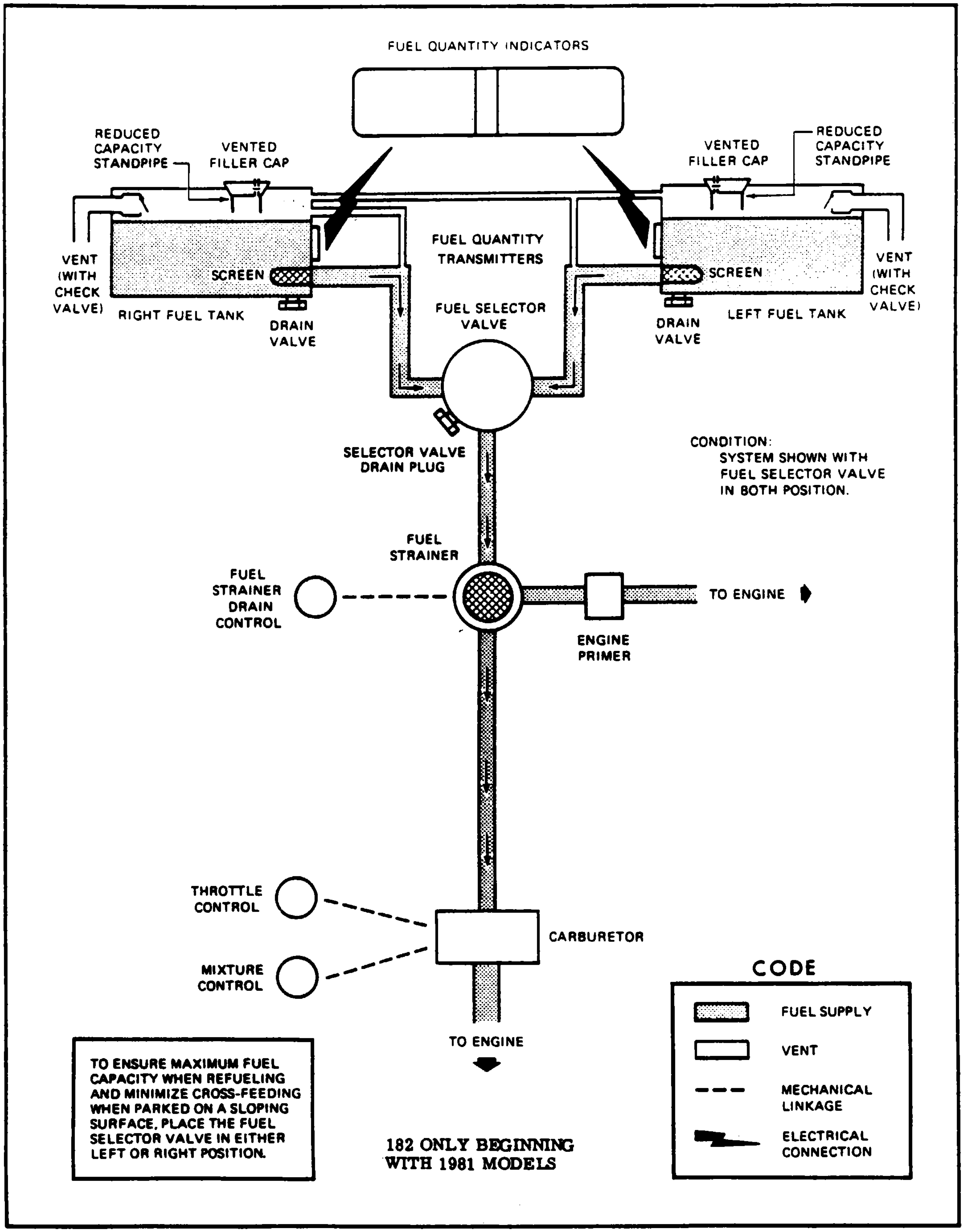


Figure 12-1. Fuel System Schematic (Sheet 2 of 4)

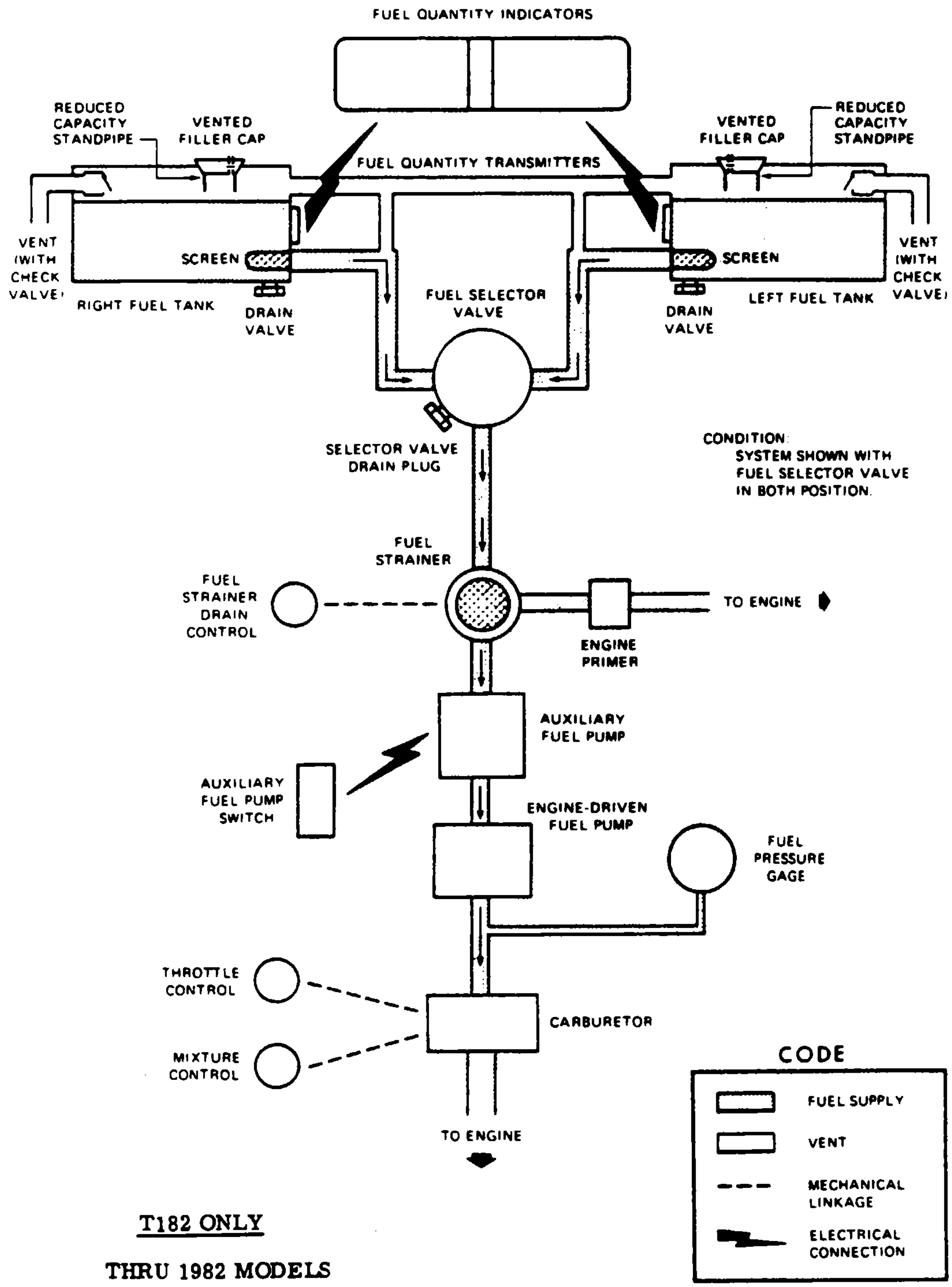


Figure 12-1. Fuel System Schematic (Sheet 3 of 4)

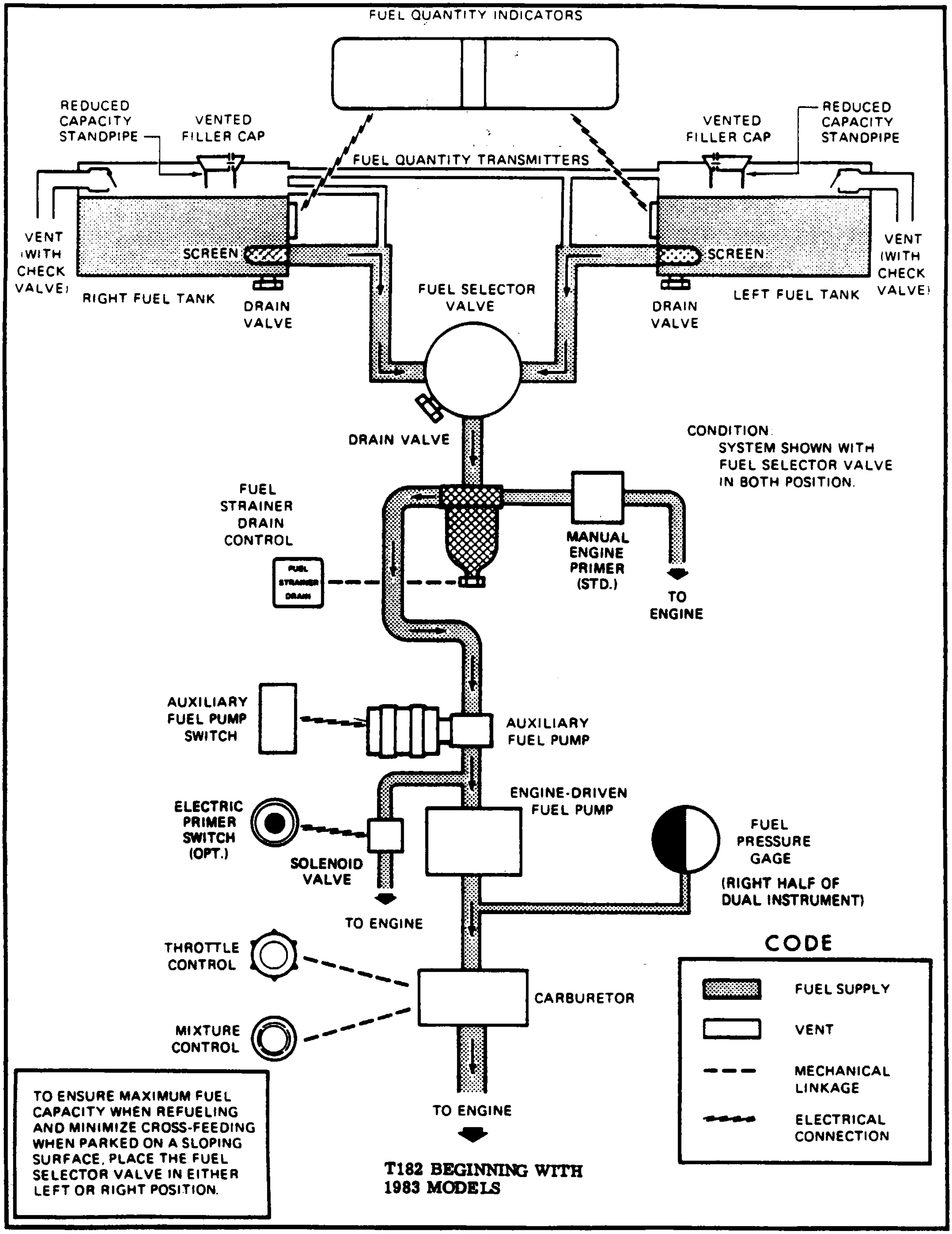
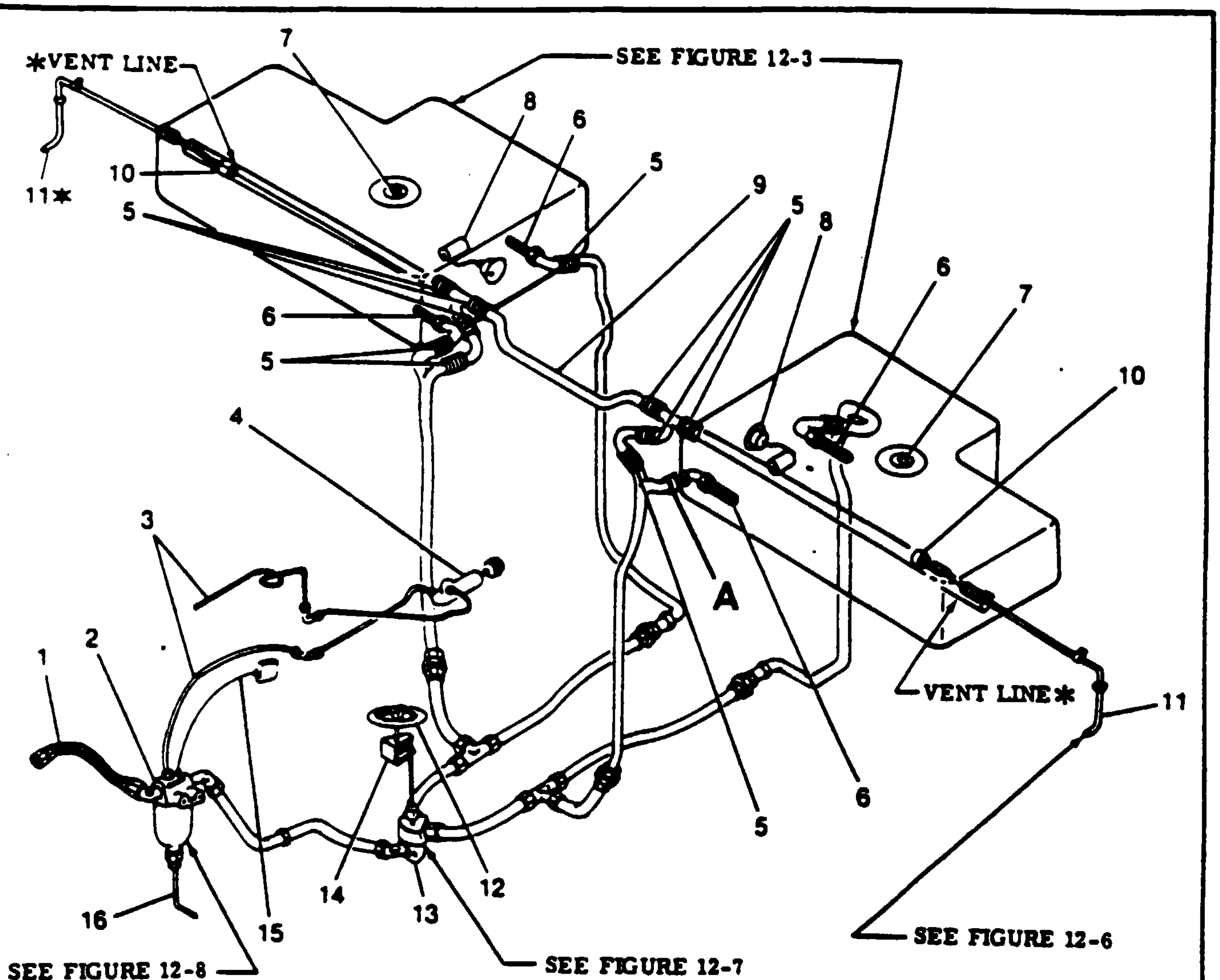


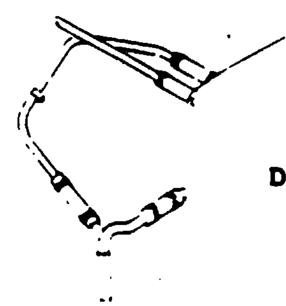
Figure 12-1. Fuel System Schematic (Sheet 4 of 4)



WARNING

IN CLEAR VIEW OF THE PILOT

182 ONLY



Detail **A**

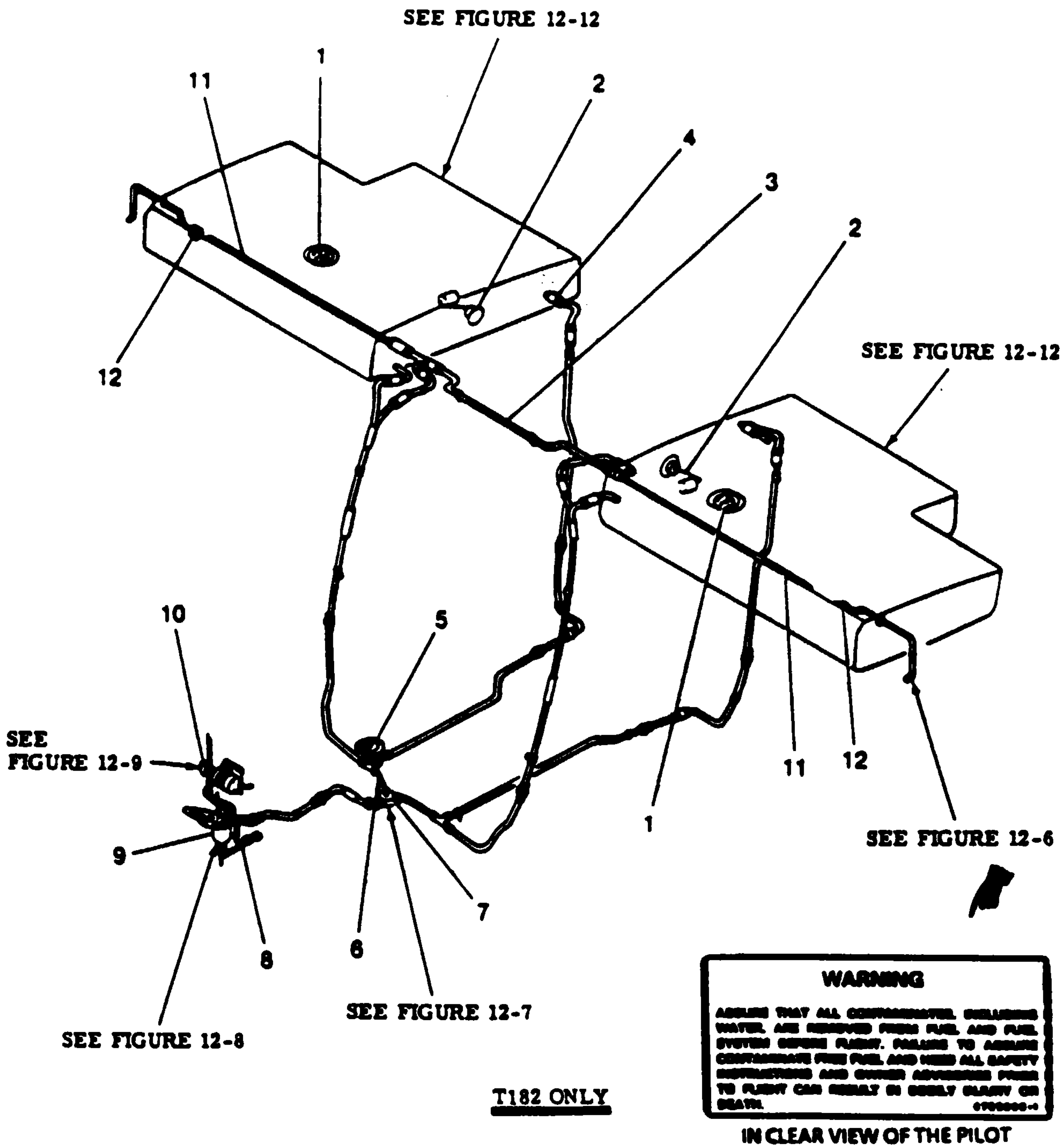
* LONG RANGE INSTALLATIONS ONLY

* RH vent valve (10) and vent line (11) added.
18266591 & ON
F18200095 THRU F18200169

18267716 & ON

1. Hose
2. Fuel Strainer
3. Primer Line
4. Primer
5. Hose
6. Finger Strainer
7. Fuel Filler Cap
8. Fuel Quantity Transmitter
9. Crossover Vent Line
10. Fuel Vent Valve
11. Vent Line
12. Placard
13. Fuel Selector Valve
14. Gear and Shaft Assembly
15. Strainer Drain Control
16. Drain Line

Figure 12-2. Fuel System (Sheet 1 of 2)



1. Fuel Filler Cap
2. Fuel Quantity Transmitter
3. Crossover Vent Line
4. Hose
5. Placard
6. Gear and Shaft Assembly
7. Fuel Selector Valve
8. Drain Line
9. Fuel Strainer
10. Auxiliary Electric Fuel Pump
11. Vent Line
12. Fuel Vent Valve

Figure 12-2. Fuel System (Sheet 2 of 2)

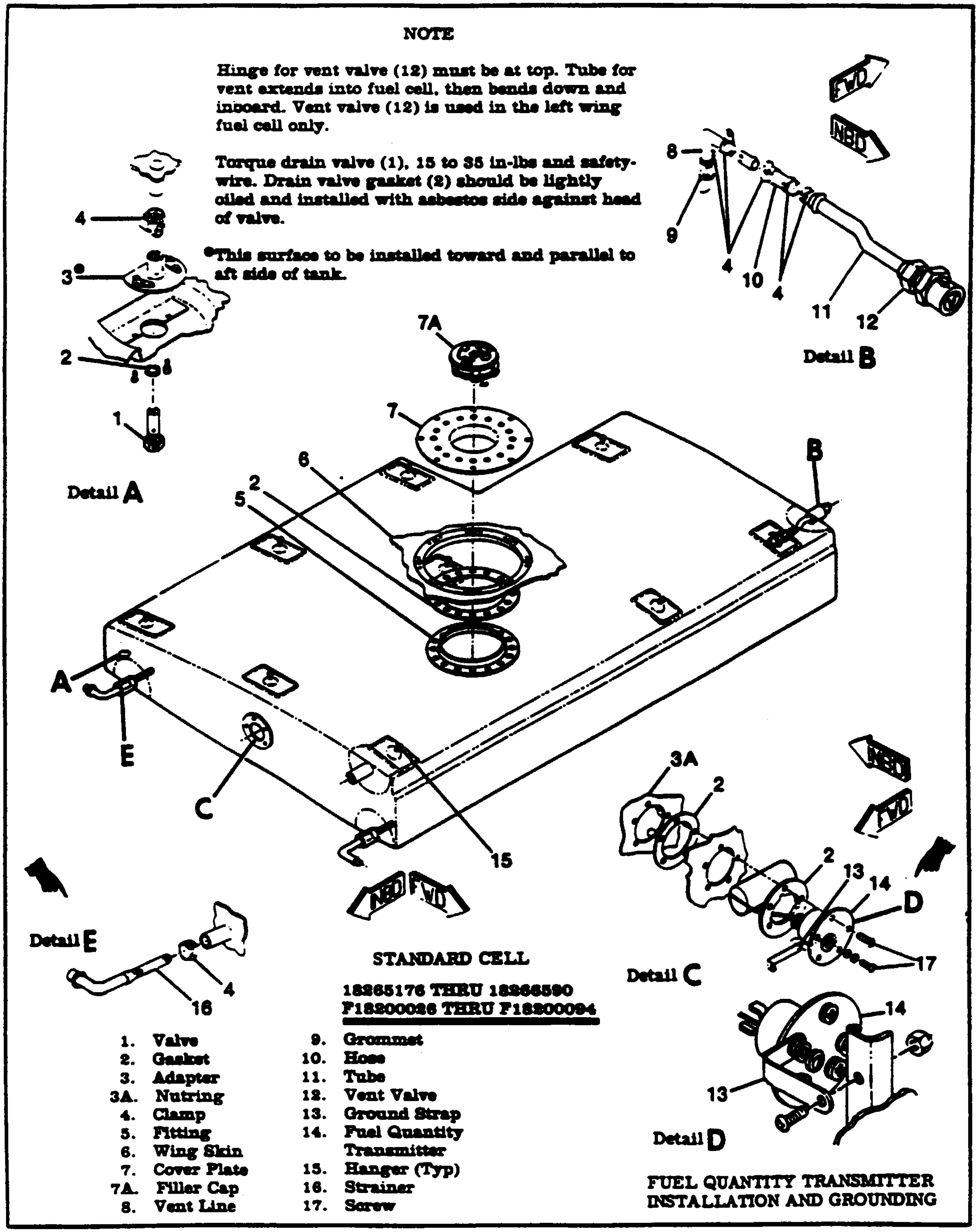


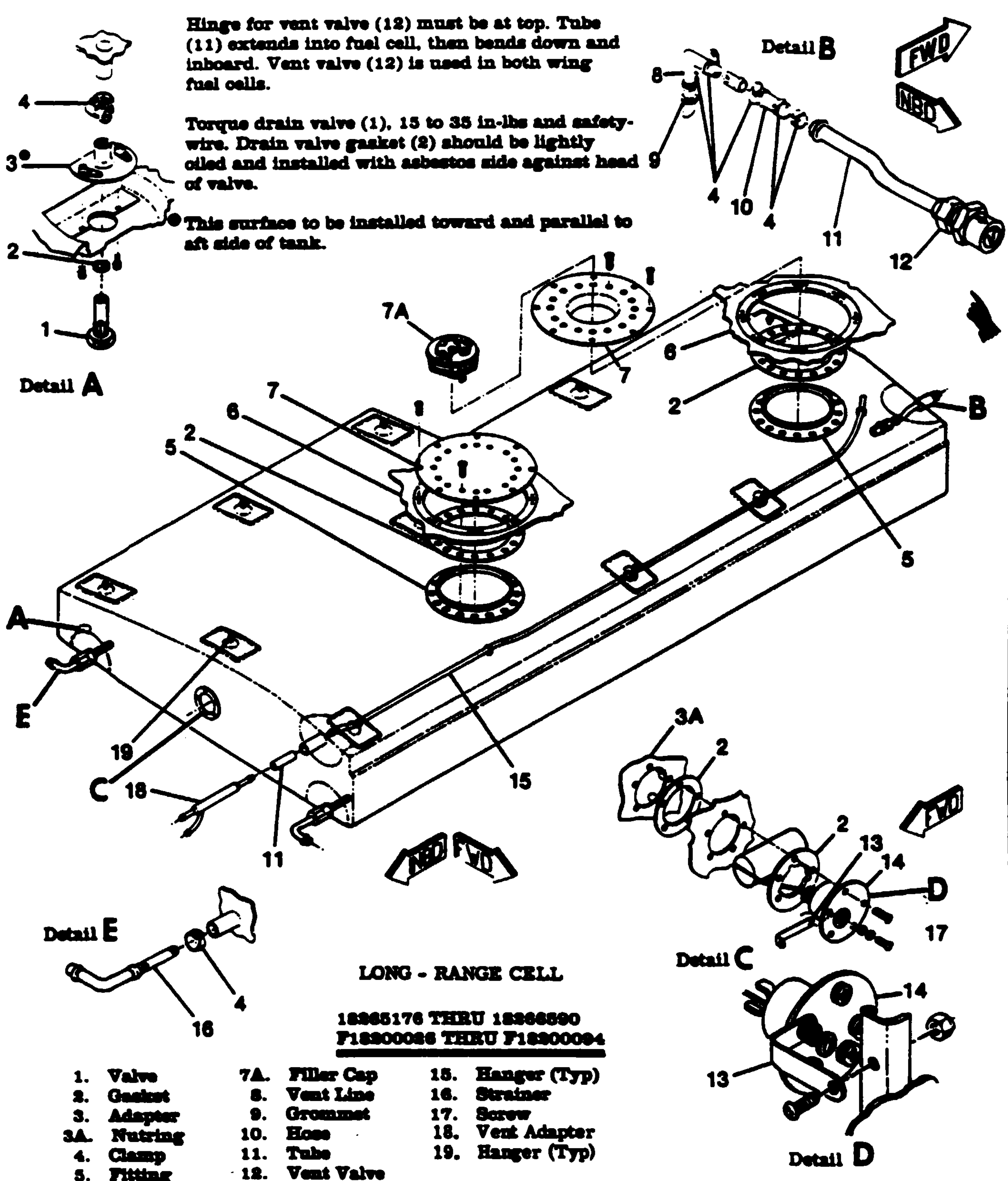
Figure 12-3. Fuel Cell Installation (Sheet 1 of 2)

NOTE

Hinge for vent valve (12) must be at top. Tube (11) extends into fuel cell, then bends down and inboard. Vent valve (12) is used in both wing fuel cells.

Torque drain valve (1), 15 to 35 in-lbs and safety-wire. Drain valve gasket (2) should be lightly oiled and installed with asbestos side against head of valve.

● This surface to be installed toward and parallel to aft side of tank.



18265176 THRU 18266590
F18200026 THRU F18200094

1. Valve
2. Gasket
3. Adapter
3A. Nutring
4. Clamp
5. Fitting
6. Wing Skin
7. Cover Plate
7A. Filler Cap
8. Vent Line
9. Grommet
10. Hose
11. Tube
12. Vent Valve
13. Ground Strap
14. Fuel Quantity Transmitter
15. Hanger (Typ)
16. Strainer
17. Screw
18. Vent Adapter
19. Hanger (Typ)

FUEL QUANTITY TRANSMITTER INSTALLATION AND GROUNDING

Figure 12-3. Fuel Cell Installation (Sheet 2 of 2)

12-5. FUEL CELLS.

12-6. DESCRIPTION. Rubberized, bladder-type fuel cells are installed in the inboard bay of each wing panel. These cells are secured by fasteners to prevent collapse of the flexible cells.

12-7. GENERAL PRECAUTIONS. When storing, inspecting or handling rubberized, bladder-type fuel cells, the following precautions should be observed:

a. Fold cells as smoothly and lightly as possible with a minimum number of folds. Place protective wadding between folds.

b. Wrap cell in moisture-proof paper and place in a suitable container. Do not crowd cell in container. Use wadding to prevent movement.

c. Stack boxed cells to allow access to oldest cell first. Do not allow stacks to crush bottom boxes. Leave cells in boxes until used.

d. Storage area must be cool, +30°F to 85°, and free of exposure to sunlight, dirt and damage.

e. Used cells must be cleaned with soap and warm water prior to storage. Dry and package as outlined in the preceding steps.

f. Do not carry cells by fittings. Maintain original cell contours or folds when refolding for boxing.

12-8. FUEL CELL REMOVAL.

a. Drain fuel from applicable cell.

NOTE

Prior to removal of cell, drain fuel, purge with fresh air, and swab out to remove all traces of fuel.

b. Remove wing root fairings and disconnect fuel lines at wing root.

c. Remove clamps from forward and aft fuel cell bosses at wing root and carefully work fuel strainers and lines from cell bosses.

d. Disconnect electrical lead and ground strap from fuel quantity transmitter and carefully work transmitter from fuel cell and wing rib.

e. Remove screws attaching drain adapter to lower surface of wing.

f. Remove clamps attaching crossover vent line to fuel cells and work vent line out of cell being removed. In aircraft equipped with long-range cells, remove vent extension tube from inside cell. Vent extension tube is attached to the crossover vent bars on the cell.

g. Remove fuel filler adapter and gaskets by removing screws attaching adapter to wing and fuel cell. On aircraft equipped with long-range cells, remove cover plate and gaskets, and remove nylon vent tube from inside cell.

h. Working through filler neck opening, loosen snap fasteners. Tilt snap fasteners slightly when pulling cell free, to prevent tearing rubber.

i. Collapse and carefully fold cell for removal, then work cell out of fuel bay through filler opening in upper wing surface. Use care when removing to prevent damage to cell.

j. Unfold cell and remove fittings, snap fasteners and fuel sump drain adapter.

12-9. FUEL CELL REPAIR.

NOTE

For fuel cell repair information, refer to Cessna Service News Letter dated August 28, 1970. For minor repair, a fuel cell repair kit is available from Goodyear, complete with required materials and instructions.

12-10. FUEL CELL INSTALLATION. Before installation fuel cell compartment must be thoroughly clean, and devoid of sharp objects, protrusions, and edges.

a. Inspect compartment to ensure that it is clean and safe.

b. Be sure that rubberized cell is warm enough to be flexible for working through filler neck.

c. Place cell in compartment, develope to full size, and attach fasteners. Install new gaskets where they are used.

d. On aircraft equipped with long-range cells, install nylon vent tube inside cell, inserting tube through four hangers in top of cell. If a replacement cell is being installed, use nylon vent tube removed from old cell and/or order tube from applicable Parts Catalog.

e. When tightening screw-type clamps on the standard fuel cell (BTC-39 construction), apply a maximum torque of 20 inch-pounds to clamp screws. On the extended range fuel cell (BTC-67 construction), apply a maximum torque of 30-35 inch-pounds to clamp screws. A light application of #10 engine oil to metal tube aids installation into nipple fittings.

f. When installing filler adapter, cover plate and fuel quantity transmitter to the wing and fuel cell, tighten attaching screw evenly. The sealing or compression surfaces must be assembled when absolutely dry (NO SEALING PASTE IS TO BE USED).

g. After installation has been completed, cell should be inspected for final fit within compartment, making certain that cell is extended out to the structure and no corners are folded in.

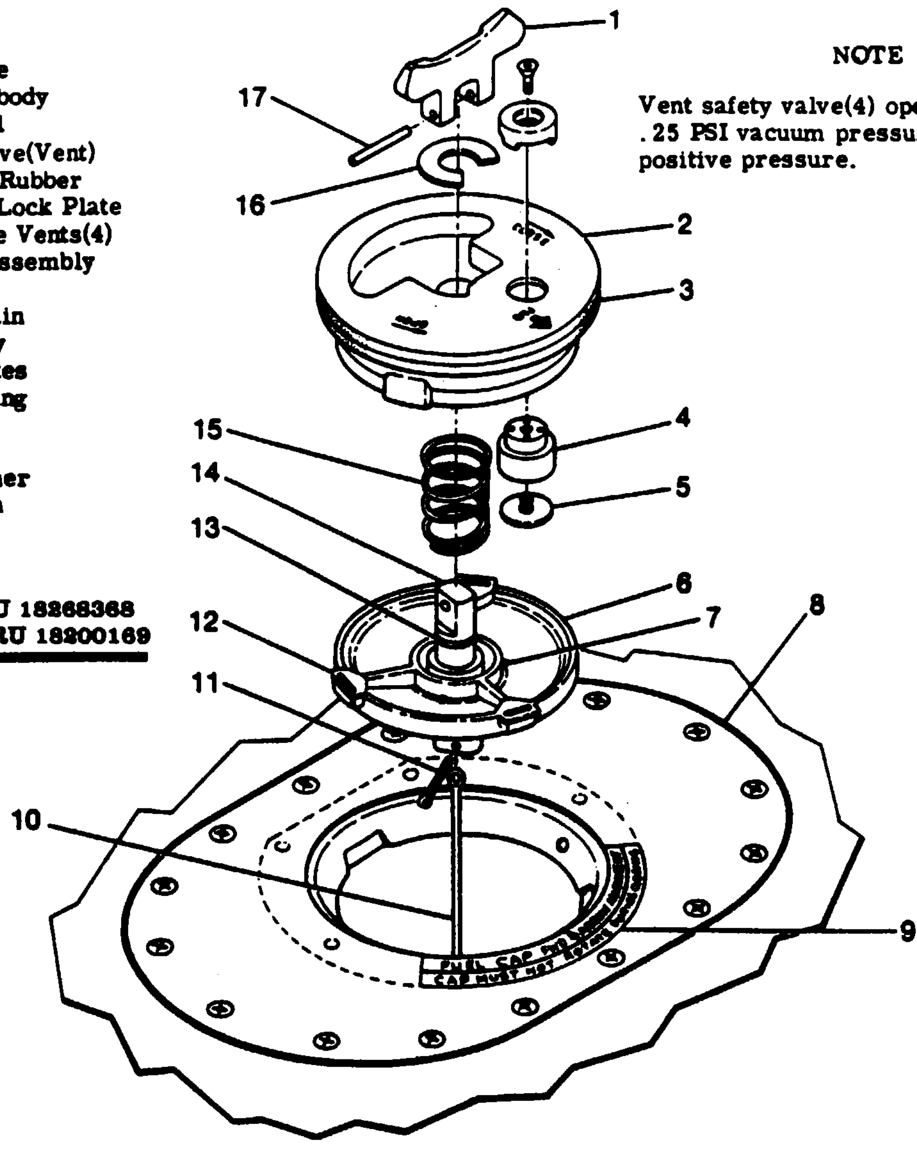
h. The final inspection, prior to closing the cell, should be a close check to insure that cell is free of foreign matter such as lint, dust, oil or any installation equipment. If a cell is not thoroughly clean, it should be cleaned with a lint-free cloth, soaked in water, alcohol or kerosene. NO OTHER SOLVENT SHALL BE USED.

12-11. VENTED FUEL FILLER CAPS.

12-12. DESCRIPTION. The filler cap assemblies may be constructed of either metal of red plastic. Both cap assemblies incorporate a vent safety valve that provides vacuum and pressure relief for their respective fuel tanks. It is important that both type caps to be cleaned on as required basis, if proper filler cap sealing is to be maintained. Beginning with 18268434 flush-type filler caps are replaced by LSE type caps.

1. Cap handle
2. Fuel Cap body
3. Outer Seal
4. Check Valve(Vent)
5. Umbrella Rubber
6. Fuel Cap Lock Plate
7. Lock Plate Vents(4)
8. Adapter Assembly
9. Placard
10. Safety Chain
11. Cotter Key
12. Metal Plates
13. Stem O-Ring
14. Stem
15. Spring
16. Split Washer
17. Handle Pin

18265176 THRU 18268368
F18200026 THRU 18200169



NOTE

Vent safety valve(4) opens at or before .25 PSI vacuum pressure, and 5.0 PSI positive pressure.

Figure 12-4. Fuel Filler Cap - Plastic or Metal

12-13. METAL "FLUSH-TYPE" FILLER CAPS. Except for minor differences in construction and weight, metal fuel filler caps perform the same functions as red plastic fuel filler caps. The caps are interchangeable and will fit the same adapter assembly.

12-14. INSPECTION.

NOTE

If fuel collects in the handle well it could indicate stem O-ring leakage. Fuel collecting around perimeter of cap could indicate cap O-ring or check valve leakage.

a. Remove fuel cap from adapter (8), remove safety chain (11) from cap and cover or plug fuel opening to keep out foreign matter.

b. Remove nut (10) and, observing position of lock plate (6) in relation to stem (14) disassemble cap.

c. Note resiliency of O-rings (3 & 13) and condition of grooves. If the O-rings (3 & 13) have deteriorated they must be replaced.

12-15. CLEANING.

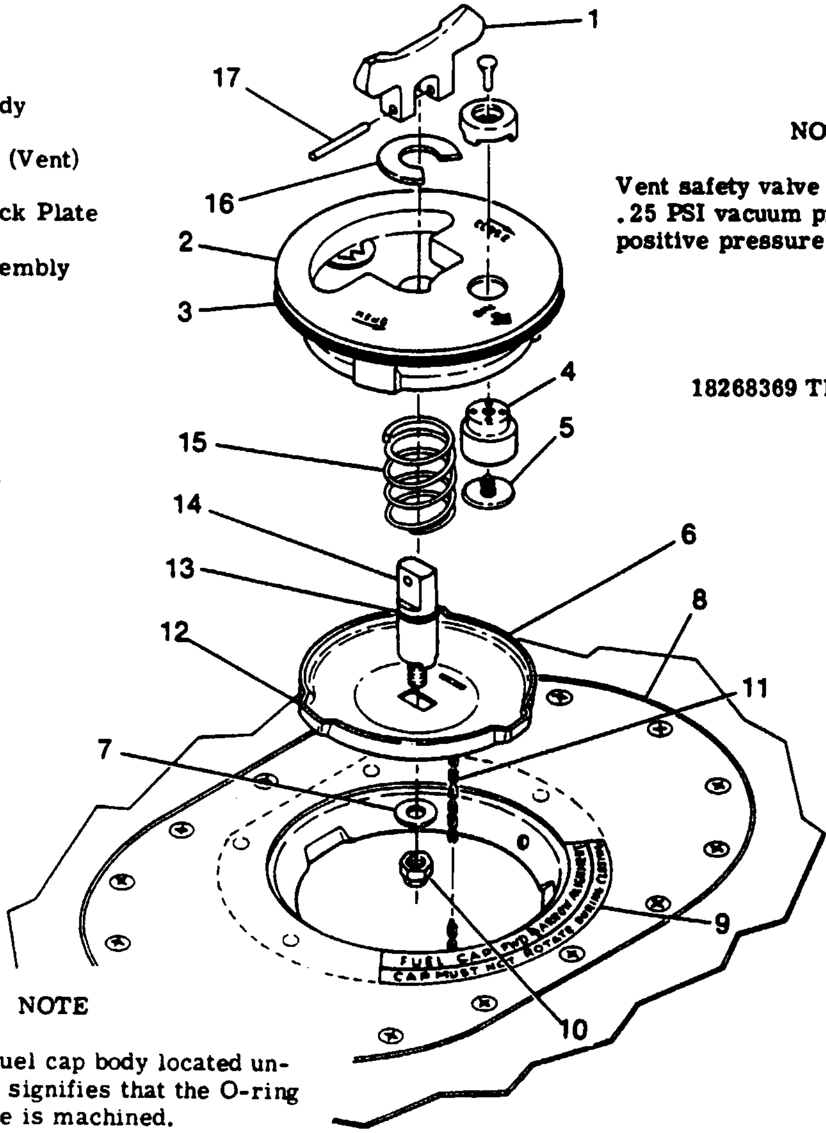
a. Using a cotton swab and Stoddard solvent or equivalent, gently lift edges of rubber umbrella (5) and clean stainless steel seat and umbrella removing all contaminates. Using a second swab wipe seat and umbrella thoroughly, removing all cotton fibers. Repeat until swabs show no discoloration.

b. If O-ring grooves appear contaminated, clean with Stoddard solvent or equivalent and cotton swabs.

c. Ascertain that all vent holes in check valve are unobstructed.

d. Clean cap body and lock plate, check for defects.

1. Handle
2. Fuel Cap Body
3. O-Ring
4. Check Valve (Vent)
5. Umbrella
6. Fuel Cap Lock Plate
7. Washer
8. Adapter Assembly
9. Placard
10. Nut
11. Safety Chain
12. Lug
13. O-Ring
14. Stem
15. Spring
16. Split Washer
17. Handle Pin



NOTE

Vent safety valve (4) opens at or before .25 PSI vacuum pressure, and 5.0 PSI positive pressure.

18268369 THRU 18268432

NOTE

A letter M on the fuel cap body located under the handle (1), signifies that the O-ring (3) mounting groove is machined.

Figure 12-5. Fuel Filler Cap - Metal (Sheet 1 of 2)

e. If the umbrella continues to leak or is deteriorated it must be replaced.

f. To remove umbrella, lubricate the umbrella stem with (MIL-H-5606) hydraulic fluid to prevent tearing the stem.

g. To replace the umbrella, lubricate the umbrella stem with (MIL-H-5606) hydraulic fluid and use a small blunt tool to insert the retaining knob on the umbrella stem into the check valve body to prevent damaging the stem.

12-16. REASSEMBLY.

a. Place split washer (16) in cap well correctly.

b. With handle (1) and O-ring installed on stem (14), insert stem (14) through split washer (16) on cap body (2).

c. Place spring (15) on stem (14).

d. Position cap handle (1) to full "OPEN" position.

e. Place lock plate (6) on threaded end of stem (14) and align all three lugs (12) with three guide bosses on the cap body (2).

f. Check that square hole in bottom of lock plate (6) is aligned with square surface on threaded end of stem (14).

NOTE

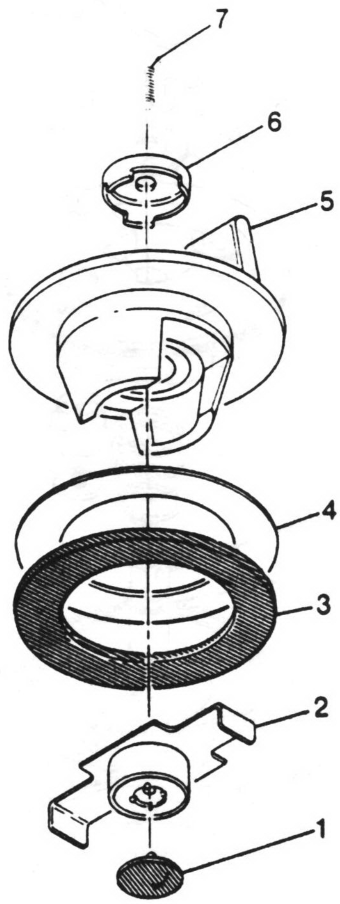
It is possible to install the lock plate (6) 180° out of the desired position, if the alignment procedures in steps "d" and "f" are not followed. If the cap will not fit when assembled, remove the lock plate (6) and reassemble after rotating it 180°.

g. Compress the lock plate (6) and fuel cap body (2) and secure with washer (7) and nut (10).

h. Connect fuel cap assembly to safety chain (11) and reinstall in tank.

1. Umbrella
2. Check Valve
3. Gasket
4. Frictionless Washer
5. Body
6. Cover
7. Screw

18268433 AND ON



NOTE

Check valve (2) shall open at or before 4.0 inches of water vacuum pressure, and be able to withstand 0.5 PSI positive pressure without leakage.

NOTE

Check condition of gasket (3) and frictionless washer (4). Replace gasket and washer if worn or fuel leaks between adapter and gasket (3).

Figure 12-5. Fuel Filler Cap - LSE (Sheet 2 of 2)

12-16A. CLEANING LSE FUEL FILLER CAPS.

a. Disconnect safety chain and remove RH filler cap from fuel tank adapter.

b. Plug fuel tank opening to keep dirt and foreign matter from contaminating the tank.

NOTE

Check condition of gasket (3) ana frictionless washer (4). Replace gasket and washer if worn or fuel leaks between adapter and gasket (3).

c. Using cotton swabs and Stoddard solvent or equivalent, gently lift edges of rubber umbrella and clean seat and umbrella, removing all contaminants. Using a second swab, wipe seat and umbrella thoroughly, removing all cotton fibers. Repeat until swabs show no discoloration.

d. If the umbrella continues to leak or is deteriorated, remove and replace. To remove the umbrella, lubricate the umbrella stem with (MIL-H-5606) hydraulic fluid to prevent tearing the stem. When installing the new umbrella, lubricate the stem with (MIL-H-5606) hydraulic fluid and use a small blunt tool to insert the retaining knob on the umbrella into the check valve body.

12-17. RED PLASTIC "FLUSH-TYPE" FILLER CAPS. A red plastic "Flush-Type" vented filler cap may be used. Extra care is required when reinstalling plastic filler caps in the fuel filler adapter assembly. An improperly installed filler cap could cause a loss of fuel from the tanks during flight.

12-18. INSPECTION.

NOTE

If fuel collects in the handle well it could indicate stem O-ring leakage. Fuel collecting around perimeter of cap could indicate cap outer seal or check valve leakage.

a. Remove fuel cap from adapter (8), remove safety chain (10) from cap and cover or plug fuel opening to keep out foreign matter.
b. Rotate cap handle (1) to the "OPEN" position, compress cap body (2) and lock plate (6) to expose the .125 inch diameter handle pin (17).
c. Using a small wire push out the handle pin (17).
d. Note resilience of O-ring (13) and outer seal (3) and condition of grooves. If the O-ring (13) or the outer seal (3) have deteriorated they must be replaced.
e. Note condition of tabs on lock plate (6) for signs of abnormal wear, if such wear is evident replace the complete cap assembly.

12-19. CLEANING.
a. Using a cotton swab and Stoddard solvent or equivalent, gently lift edges of rubber umbrella (5) and clean stainless steel seat and umbrella removing all contaminates. Using a second swab wipe seat and umbrella thoroughly, removing all cotton fibers. Repeat until swabs show no discoloration.
b. If O-ring or outer seal grooves appear contaminated, clean with Stoddard solvent or equivalent and cotton swabs.
c. Ascertain that all vent holes in check valve are unobstructed.
d. Clean cap body and lock plate, check for defects.
e. If the umbrella continues to leak or is deteriorated it must be replaced.
f. To remove umbrella, lubricate the umbrella stem with (MIL-H-5606) hydraulic fluid to prevent tearing the stem.
g. To replace umbrella, lubricate the umbrella stem with (MIL-H-5606) hydraulic fluid and use a small blunt tool to insert the retaining knob on the umbrella stem into the check valve body to prevent damaging the stem.

12-20. REASSEMBLY.

NOTE

If fuel was observed leaking around the cap periphery prior to disassembly and the leakage was not due to a bad O-ring or outer seal an additional split washer (16) may be added for a total of two, prior to reassemblying cap. To make sure that these washers are not installed upside down, check to see that edges of the split parallel the respective sides of the cap well. The addition of a washer under the cap handle will increase tne effort required to upcap the fuel tank.

a. Install spring (15) on stem (14).
b. Install fuel cap body (2) on stem (14).
c. Check that three metal plates (12) on top rim of lock plate (6) are aligned with three guide bosses on fuel cap body (2).

CAUTION

It is possible to install the handle pin in the pin hole 180° out of the desired position, if the alignment procedure in step "c" is not followed. If the handle (1) is not installed properly the FWD arrow on the cap will not align with the arrow on the placard (9) when the cap is reinstalled.

d. Compress cap body (2) and lock plate (6), install split washer(s) (16) as required.
e. Install cap handle (1) on stem (14) so that the handle (1) will be in the open position.
f. Insert handle pin (17) through handle (1) and stem (14).
g. Connect fuel cap assembly to safety chain (10) and reinstall fuel cap. Make certain that the arrow on the fuel cap body (2) and the arrow on the placard (9) align.

12-20A. LEAK TESTING METAL OR RED PLASTIC FILLER CAPS.

The following procedure may be used to detect fuel filler cap leakage.
a. Service the aircraft with approved fuel filling each bay.
b. Place the fuel selector in the OFF position.
c. Plug one of the fuel bay vent lines (where it protrudes beneath the wing) with a small rubber plug or tape.
d. Connect a rubber hose to the other vent. Then tee into this hose a pressure measuring device, such as a water manometer, manifold pressure gage or airspeed indicator.
e. Blow into the open end of the hose. The pressure must not exceed .7 psi which equals 20 inches of water on a water manometer, or 1.43 inches Hg on a manifold pressure gage, or 174 Kts on an airspeed indicator.

WARNING

Do not inhale fuel vapor while blowing into the rubber hose.

f. It may take several applications of pressure to to bring the bay to the desired pressure level.

WARNING

Do not apply regulated or unregulated air pressure fron an air compressor to the fuel vent. Over inflation and major structural damage will occur if more than .7 psi is applied.

g. Pinch or close the rubber hose to sustain pressure in the fuel bay.

h. Apply a soap solution to the fuel filler caps and inspect for leakage around the rubber seal to filler neck junction, the fuel cap vent, and the fuel cap handle stem. Load the cap sideways in all directions by pressing on the fuel cap vent housing by hand.

NOTE

No leakage is permissible. If leaks are present, replace the cap with a new unit or repair in accordance with Cessna Service Information Letter SE 80-59 Supplement #1, dated June 23, 1980.

CAUTION

Care must be exercised in removing the fuel filler caps until the system has been depressurized.

i. After replacement or repair of either fuel filler cap, repeat the inspection.

j. Remove the rubber hose, unplug or remove the tape from the other fuel vent, and place the fuel selector in the desired position.

12-21. FUEL QUANTITY TRANSMITTERS. Refer to Section 15 for a detailed description, operation, and maintenance procedure.

12-22. FUEL VENTS.

12-23. DESCRIPTION. A vent line is installed in the outboard end of each fuel bay and extends overboard through the lower wing skin. The inboard end of the vent line extends into the fuel cell, then bends down and inboard. A vent valve is installed on the inboard end of the vent line inside the fuel cell, and a crossover line connects the cells together. On aircraft equipped with long-range cells, a nylon vent tube is attached to the crossover line at the inboard end of each cell. This vent tube extends into the fuel cell, and is suspended by four hangers in the top of the cell.

12-24. CHECKING. Fuel vents can become plugged as evidenced by field experience, and can cause fuel starvation of the engine. If the bleed hole in the vent valve becomes plugged, then over pressurization can occur due to normal temperature variation. This would usually occur then the airplane engine is not operating. The following procedure should be used to check the fuel vent and bleed system.

a. Attach a rubber tube to the end of vent line beneath the wing.

b. Plug vent on opposite wing from one being tested.

c. Slightly pressurize the cell, if air can enter the cell, the vent line is open.

d. After cell is slightly pressurized, insert end of rubber tube into a container of water and watch for a continuous stream of bubbles, which indicates the bleed hole in valve assembly is open and relieving pressure.

e. After completion of step "c", blow into tube again to slightly pressurize the cell. Crimp rubber tube to retain pressure within the cell. Loosen, but do not remove filler cap on opposite wing to check cell crossover line. If pressure escapes from filler cap, crossover line is open. Remove rubber tube from end of vent line beneath the wing after completion of check.

NOTE

Remember that a plugged vent line or bleed hole can cause either fuel starvation or the pressurization of cells by fuel expansion.

f. Any fuel vent found plugged or restricted must be corrected prior to returning aircraft to service.

NOTE

The fuel vent line protruding beneath the wing near the wing strut must be correctly aligned to avoid possible icing of the vent tube. Dimensions are shown in figure 6.

12-24A. ADJUSTMENT. On aircraft serials 182-66591 and on, uneven fuel flow from the integral fuel bays, when the aircraft fuel selector valve is positioned to feed from both fuel bays, can be caused by unequal pressures in the fuel venting system. When uneven fuel flow is observed, the venting system may be checked and unequal pressures in the system corrected by using the following procedures:

NOTE

The following procedure should be accomplished during a sequence of routine flight operations. Special flights for the sole purpose of checking and adjusting fuel tank feed rates are not recommended.

a. Inspect the venting system to insure the lines are open, connections secure and that the system is functioning properly.

b. Park the aircraft on level ground and select the 'both' position on the fuel selector. Leave the aircraft parked until the tank levels are equal or fill both tanks.

c. With the fuel selector in the 'both' position, take off and climb to an altitude where the air is smooth.

d. Trim the aircraft for straight and level flight. Make sure the aircraft is free of any 'yaw' by trimming the rudder to center the ball of the turn coordinator. Cruise at the top of the green band on manifold pressure for a period of at least one hour.

e. At the end of the hour and while still in straight and level flight, take note of the fuel tank levels as indicated on the fuel gauge.

f. If the fuel tank levels are greater than 5 gallons apart, land the aircraft and perform the following procedure:

1. Bend the underwing vent of the tank which had the highest level outboard 1/4".

2. Bend the underwing vent of the tank which had the lowest level inboard 1/4", providing the vent is not squarely behind the strut. Repeat the first five steps.

CAUTION

At least one of the vent tubes should remain behind the strut to insure that icing cannot block both vents.

g. No adjustment need be performed when satisfactory equalization of fuel tank feeding is obtained.

12-25. FUEL SELECTOR VALVE. (See figure 12-7.)

12-26. DESCRIPTION. A four-position selector valve is located under the floorboard aft and left of the pedestal. The selector valve positions are labeled: LEFT, BOTH ON, RIGHT, and OFF. Valve repair is limited to replacement of component parts (see figure 12-7). Serial 18265176 thru 18268055; controls consist of: handle, gear assembly, drive shaft, and attaching parts. Serial 18268056 thru 18268434; controls consist of handle, shaft, and attaching parts. Beginning with 18268435 controls consist of: handle , shaft, roll pin, spring, collar and attaching parts. The handle must be pushed down to allow the roll pin to clear a lock ring slot before rotating shaft through the four operating positions.

12-27. REMOVAL AND INSTALLATION. (See figure 12-7.)

a. Drain all fuel from wing tanks, fuel strainer, lines and selector valve, observing precautions outlined in paragraph 12-3.
b. Remove selector valve handle (15) and pedestal cover.
c. Peel back carpet as required to gain access to inspection plates aft of pedestal structure.
d. Disconnect drive shaft assembly (18) at selector valve (21).
e. Disconnect and cap inlet and outlet fuel lines to valve.
f. Remove screws attaching valve to mounting bracket (19) and withdraw valve.
g. Reverse preceding steps for installation. Service aircraft in accordance with Section 2, turn fuel selector valve to ON position and check for leaks.
h. Replace items removed for access.

12-28. DISASSEMBLY. (See figure 12-7.)

a. Remove fuel selector valve in accordance with paragraph 12-27.
b. Remove screws (1) securing cover (2) to valve body (7) and carefully remove cover. Discard O-rings (23) and (6), but retain ball (3) and spring (4) for reinstallation.
c. Slowly withdraw rotor (5) from valve body.

NOTE

Removal of rotor (5) will allow seal (8), O-ring (9), washer (10) and spring (11) (one each installed in both inlet ports) to spring free.

d. Remove washer (24), plug (13) and O-ring (12).

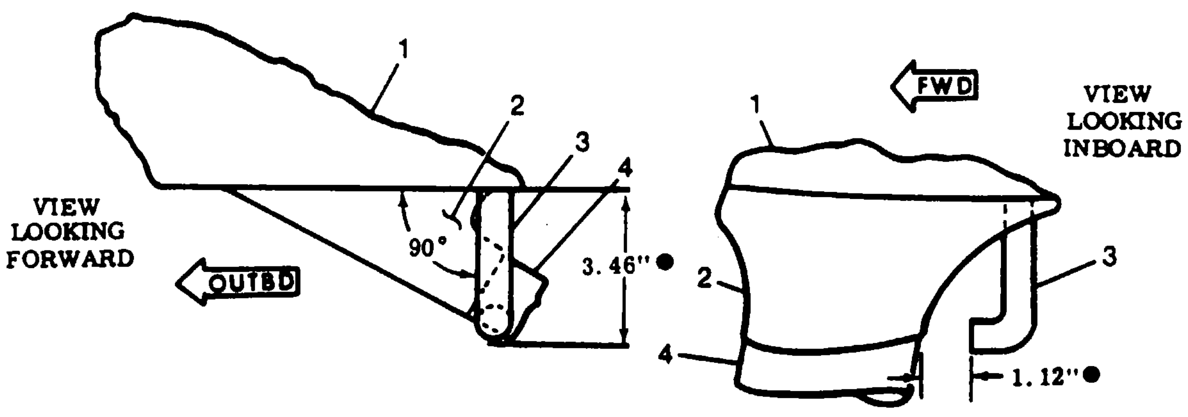
12-29. CLEANING, INSPECTION AND REPAIR.

NOTE

Repair of damaged or worn parts of the selector valve assembly is NOT authorized and therefore, is limited to replacement of component parts only.

a. Clean disassembled parts by washing in Stoddard solvent or equivalent. Blow parts dry using clean compressed air.
b. Inspect all parts for obvious wear or damage as follows:
   1. Check detent holes in cover (2) for excessive wear and examine bearing surfaces with rotor (5).
   2. Inspect shaft and bearing surfaces of rotor (5) for removal of black anodized finish indicating wear. Check for internal corrosion of drilled passages.
   3. Examine valve body (7) for wear, cracks, distortion and internal corrosion. Any damage to thread surfaces at inlet and outlet ports or cover attach screw holes is cause for rejection.

SHOP NOTES:



NOTE

1. Wing
2. Fairing
3. Vent
4. Strut

It is permissible on aircraft with integral fuel cells to reposition either the left hand or right hand vent outboard from position shown to balance fuel bay venting; one vent must remain in the position illustrated for icing protection.

●These dimensions also apply to systems with left wing vent only.

Figure 12-6. Fuel Vent Location.

12-30. REASSEMBLY. (See figure 12-7.)

NOTE

Reassembly of selector valve is facilitated by mounting in a bench vise or equivalent bench support, making sure valve body (7) is protected from damage. Fabrication of spring compressors (14) (two required) is recommended before reassembly. Replace "O"-rings (6, 9 and 23) whenever rotor is removed from valve body.

a. Ensure all component parts are clean, then coat sparingly with lightweight engine oil.
b. Insert washer (24) and springs (11) into body (7).
c. With spring compressors (14) in place as shown in Section A-A, figure 12-7, compress springs (11) and install washers (10), new "O"-rings (9) and seals (8) into inlet ports.
d. Holding springs compressed, carefully insert rotor (5) into valve body (7). Release spring compressors and check for proper seating of seals to rotor.
e. Insert new "O"-ring (6) into recess at top of valve body (7).
f. Place new "O" ring (23) over shaft of rotor.
g. Lubricate spring (4) and ball (3) with lubricant conforming to Military Specification VV-P-236 (USP Petrolatum or equivalent), inserting spring into hole in top of rotor.
h. Place ball on spring and turn rotor as required to index one of the detent holes in cover (2).
i. Attach cover (2) and test rotation of rotor shaft for ease of operation and positive detent engagement.
j. Replace plug (13) using new "O"-ring (12).
k. Reinstall selector valve in accordance with paragraph 12-27.

12-31. FUEL STRAINER. (See figure 12-8.)

12-32. DESCRIPTION. The fuel strainer is mounted at the firewall in the lower engine compartment and is equipped with a quick-drain valve which provides a means of draining trapped water and sediment from the fuel system. The quick-drain control is located adjacent to the oil dipstick and is accessible through the oil dipstick door.

NOTE

The fuel strainer can be disassembled, cleaned and reassembled without removing the assembly from the aircraft.

12-33. REMOVAL AND INSTALLATION. (See figure 12-8.)
a. Remove cowling as necessary to gain access to strainer.
b. With selector valve in "OFF" position, drain fuel from strainer and lines with strainer quick-drain control.
c. Disconnect and cap or plug all fuel lines and controls from strainer. (Observe precautions in paragraph 12-3.)
d. Remove bolts attaching assembly to firewall and remove strainer.
e. Reverse the preceding steps for installation. With selector valve in "ON" position check for leaks and proper operation of quick-drain valve.

12-34. DISASSEMBLY AND ASSEMBLY. (See figure 12-8.)
a. With selector valve in "OFF" position, drain fuel from bowl and lines with quick-drain control.

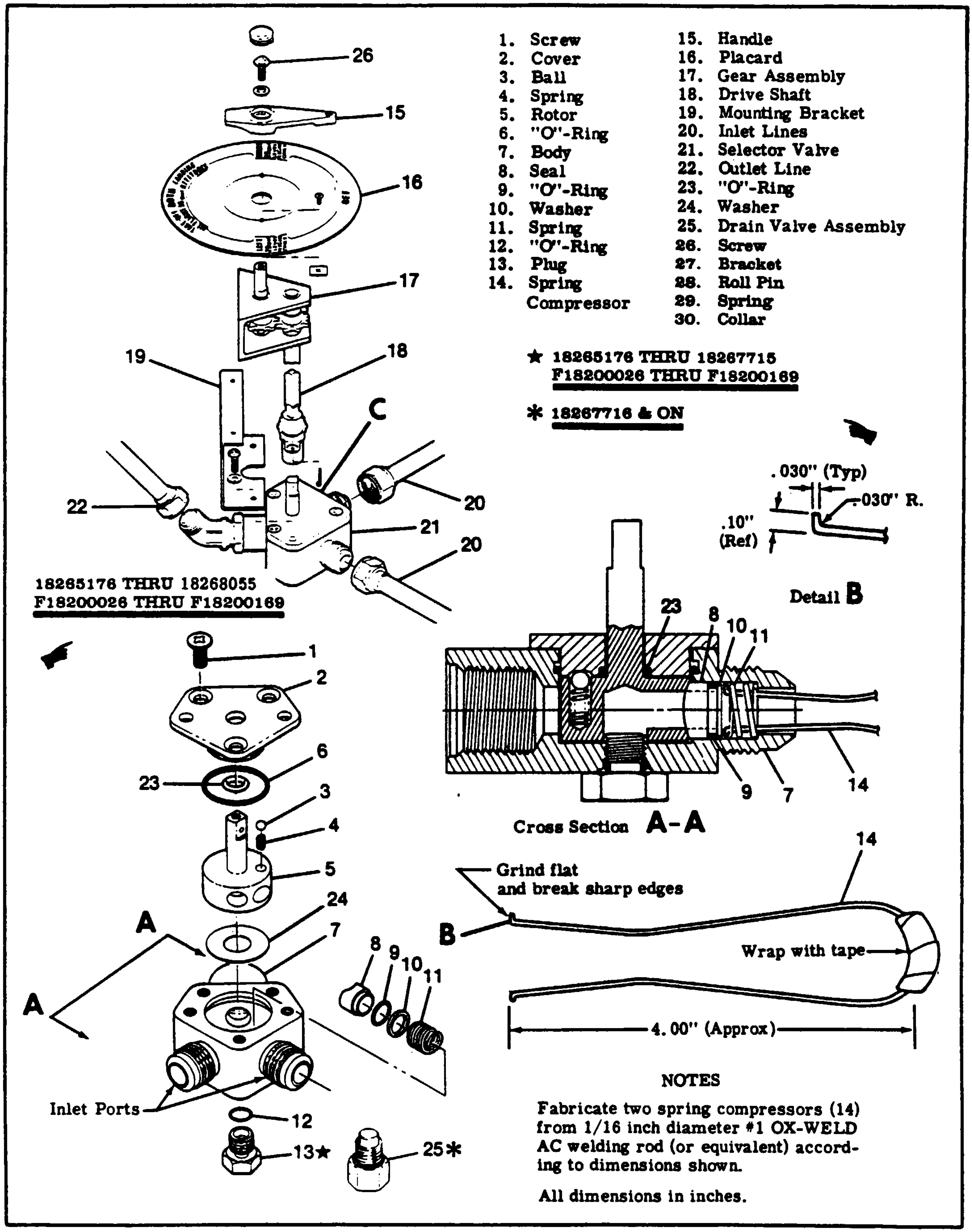
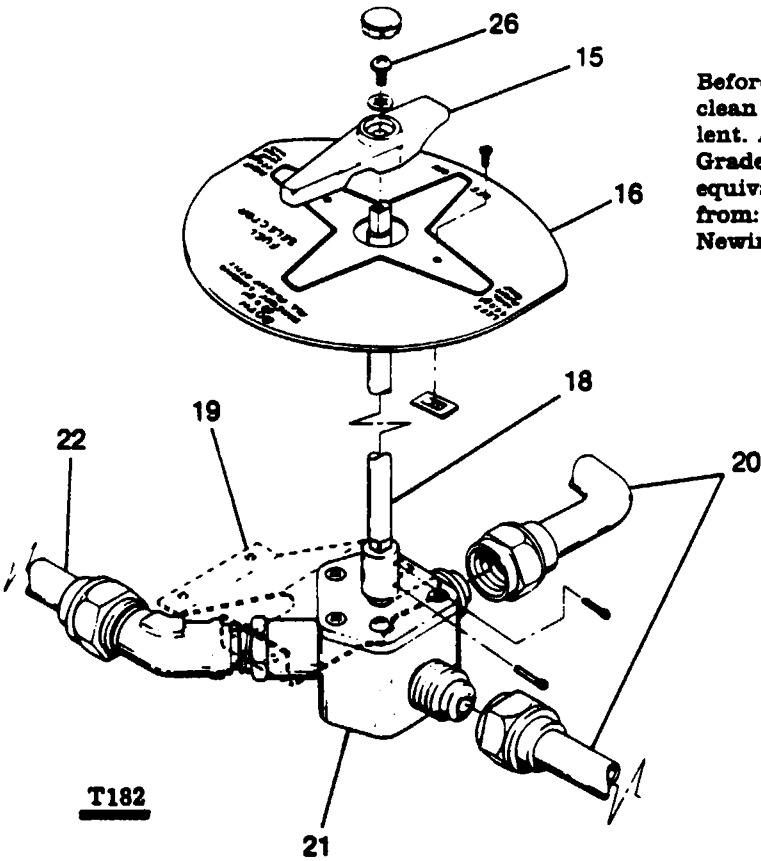


Figure 12-7. Fuel Selector Valve and Controls (Sheet 1 of 3)

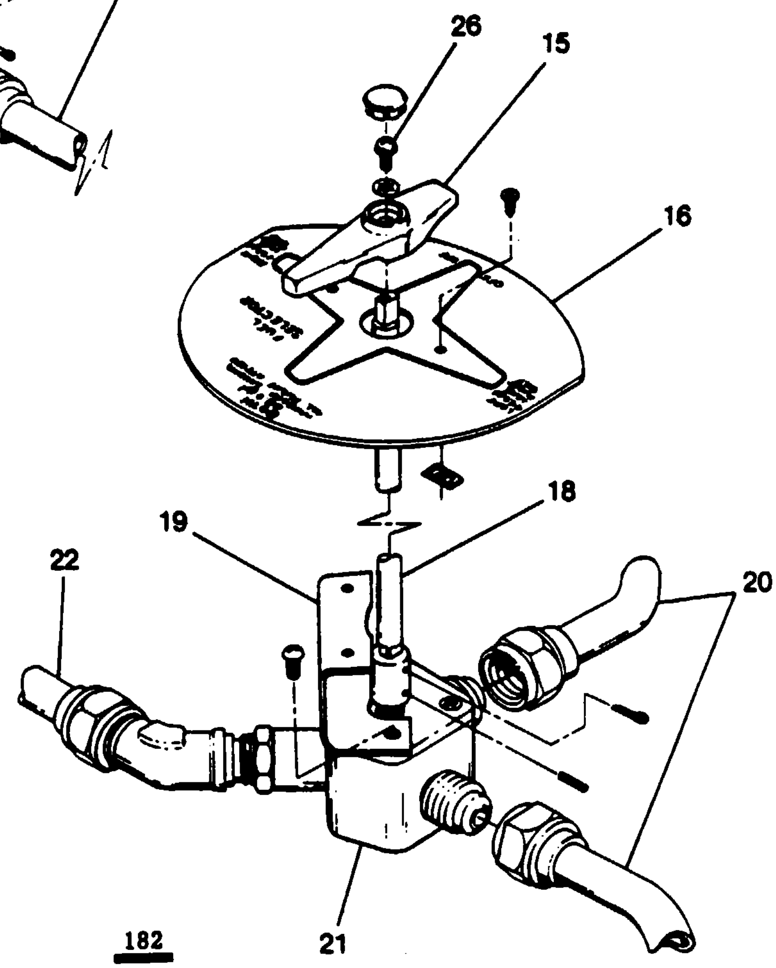
NOTE

Before installing screw (26) on drive shaft (18), clean threads of screw (26) with MEK or equivalent. After threads have thoroughly dried, apply Grade CV Loctite Catalog 85 or 83, Loctite 242, or equivalent. Loctite products may be obtained from: Loctite Corp., 705 Mountain Rd. Newington, CT 06111.



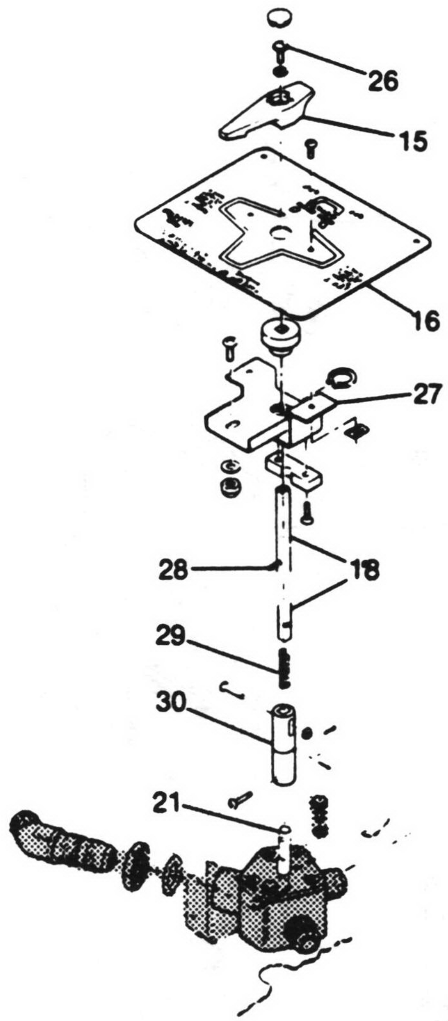
T182

18268056 THRU 18268434



182

Figure 12-7. Fuel Selector Valve and Controls (Sheet 2 of 3)



18268435 AND ON

NOTES

Roll pin (28) must be bonded to shaft (18) with EA9316, EA9309 or EA9314. These products may be purchased from Hystol Div. Dexter Corp., Willow Pass Rd; Pittsburg, CA 94565. Equivalent product, EC2216, may be purchased from 3M Co., St. Paul, MN 55119. Clean roll (28) and shaft (18) with MEK, and thoroughly dry parts before applying bonding agent. At 75°F, bond cures to 80% ultimate tensile strength within 24 hours. Accelerated cure times are as follows:

(a) Five minutes at 250°F.
(b) Ten minutes at 200°F.

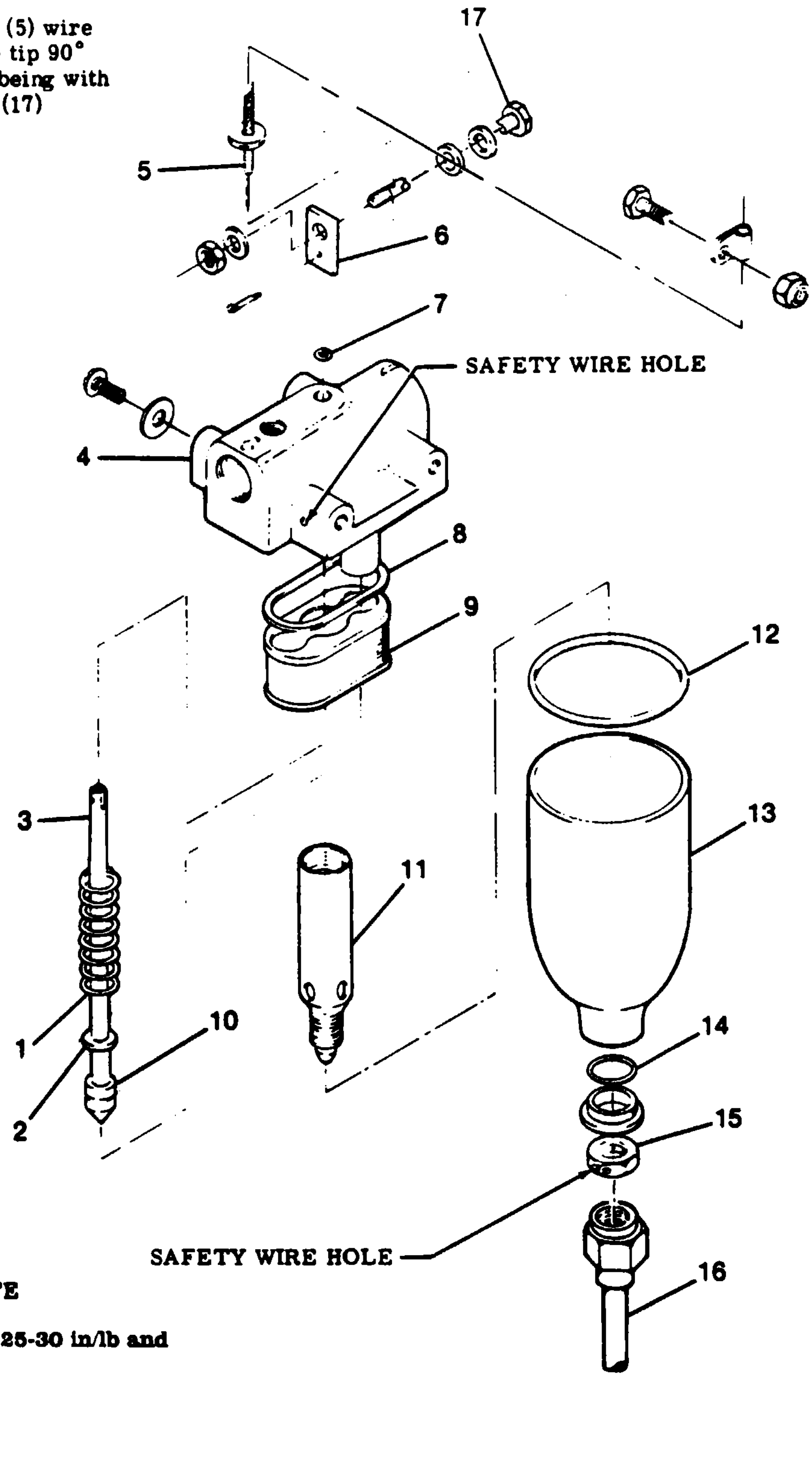
Before installing screw (26) on drive shaft (18), clean threads of screw (26) with MEK or equivalent. After threads have thoroughly dried, apply Grade CV Loctite Catalog 85 or 83, Loctite 242, or equivalent. Loctite products may be obtained from: Loctite Corp., 705 Mountain Rd, Newington, CT 06111.

Figure 12-7. Fuel Selector Valve and Controls (Sheet 3 of 3)

NOTE

After inserting drain control (5) wire through clamp (17) bend wire tip 90° (degrees) to prevent it from being with drawn if the attaching clamp (17) should come loose.

1. Spring
2. Washer
3. Plunger
4. Top
5. Drain Control
6. Plate
7. O-Ring
8. Gasket
9. Filter
10. Collar
11. Standpipe
12. O-Ring
13. Bowl
14. O-Ring
15. Nut
16. Drain Line
17. Clamp



NOTE

Torque nut (15) to 25-30 in/lb and safety-wire.

Figure 12-8. Fuel Strainer

b. Remove drain tube, safety wire, nut and washer at bottom of filter bowl and remove bowl.
c. Carefully unscrew standpipe and remove.
d. Remove filter screen and gasket. Wash filter screen and bowl with solvent (Federal Specification P-S-661, or equivalent) and dry with compressed air.
e. Using a new gasket between filter screen and top assembly, install screen and standpipe. Tighten standpipe only finger tight.
f. Using all new O-rings, install bowl. Note that step-washer at bottom of bowl is installed so that step seats against O-ring. Connect drain tube.
g. With selector valve in "ON" position, check for leaks and proper operation of quick-drain valve.
h. Safety wire bottom nut to top assembly. Wire must have right hand wrap, at least 45 degrees.

12-35. PRIMING SYSTEM.

12-36. DESCRIPTION. The priming system is comprised of a plunger-type manually-operated primer, which draws fuel from the strainer and forces it through a tee fitting to the aft end of each intake manifold. Injecting the fuel into each manifold primes both banks of cylinders.

12-37. REMOVAL AND INSTALLATION.
a. With selector valve in "OFF" position, drain fuel from strainer and lines with quick-drain control.
b. Disconnect and cap or plug all fuel lines at primer. (Observe precautions in paragraph 12-3.)
c. Unscrew knurled nut and remove plunger from pump body.
d. Remove pump body from instrument panel.

NOTE

Visually inspect primer lines for crushed, kinked or broken condition. Ensure proper clamping to prevent fatigue due to vibration and chafing.

e. Prior to installing a primer, check for proper pumping action and positive fuel shut-off in the locked position.
f. Reverse the preceding steps for installation. With selector valve in "BOTH" position, check for leaks and proper pumping action.

12-38. AUXILIARY ELECTRIC FUEL PUMP - T182.

12-39. DESCRIPTION. On turbocharged aircraft an auxiliary electric fuel pump is used to ensure adequate fuel flow. See figure 12-9.

12-40. REMOVAL AND INSTALLATION.
a. Place fuel selector valve in OFF position.
b. Make sure that Master Switch and Auxiliary Fuel Pump Switch are OFF.
c. Remove fuel lines from pump, observing precautions cautions in paragraph 12-3.
d. Disconnect wire at connector.
e. Remove two mount bolts, retaining hardware for installation.
f. Reverse preceding steps for installation, and check check pump operation when repair is completed.

12-40A. PRIMING SYSTEM (T182 OPTIONAL).

12-40B. DESCRIPTION. The optional electric primer consists of a sol'noid valve, switch, circuit breaker, and necessary plumbing. The solenoid valve is mounted on a tee attached to the outlet side of the auxiliary fuel pump. A line to the engine driven pump is attached to the other side of the tee. The primer functions in conjunction with the auxiliary electric fuel pump. With the auxiliary electric fuel pump on, and the primer switch depressed, the solenoid valve opens allowing fuel to flow to the cylinders.

12-41. INTEGRAL FUEL BAY.

12-41A. DESCRIPTION. Beginning Serial 18266591. The integral fuel bay is a sealed portion of the inboard wing structure between the front and rear wing spars, extending approximately five feet into each wing. This type construction reduces overall weight as well as increasing the strength of the wing.

12-42. FUEL LEAK CLASSIFICATION. Fuel leaks which do not constitute a flight hazard are stains, seeps and heavy seeps NOT in an enclosed area. However, they should be repaired when the aircraft is grounded for other maintenance. Fuel leaks which constitute a flight hazard are running leaks in any area, seeps, heavy seeps, or stains in an enclosed area, such as the wing leading edge, the sections of wing inboard and outboard of the fuel bay and the area between the rear fuel spar and the main spar. These leaks must be repaired before that bay is used for another flight. The wet or stained spot on the wing in the area of the bay is an indication of the intensity of the leak. Fuel leak classifications are shown in figure 12-10.

NOTE

Stains and seeps that are not considered a flight hazard must be inspected after each flight to insure that they have not grown in intensity to the point of causing a flight hazard.

1. Hose (Fuel Outlet)
2. Fitting
3. Jam Nut
4. O-Ring
5. Fitting
6. Hose (Fuel Inlet)
7. Fitting
8. Drain Line
9. Fuel Pump
10. Mount Bracket
11. Screw
12. Clamp

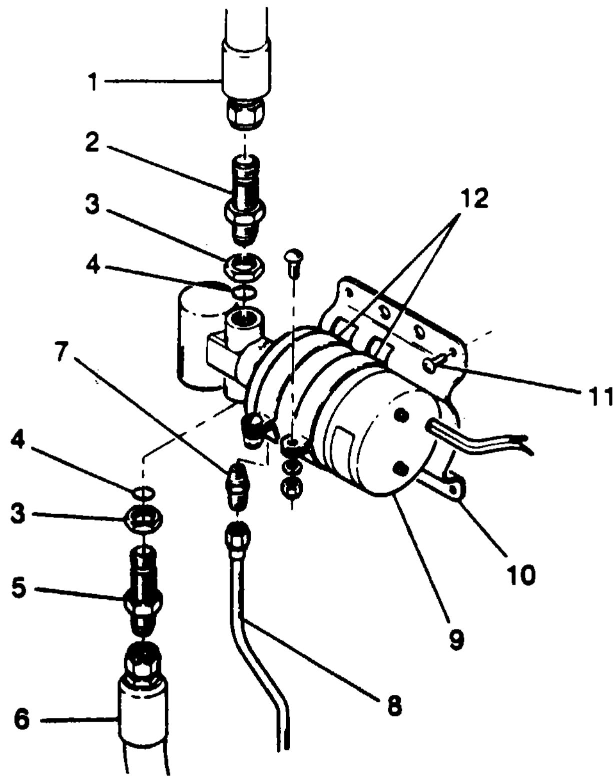


Figure 12-9. Auxiliary Fuel Pump on Turbo Equipped Airplanes.

If a leak causing a flight hazard should occur at a place where there are no facilities available to make an acceptable repair, it is recommended that the leaking bay be drained and some suitable material placed over the leak, if it is within an enclosed area of the wing, to eliminate escaping fumes. By switching the fuel selector valve to the other bay, the aircraft can then be flown to a base where the fuel leak can be repaired.

12-43. FUEL BAY PURGING.

WARNING

Purge fuel bays with an inert gas prior to repairing fuel leaks, to preclude the possibility of explosions.

The following procedure may be used to purge the bay with argon or carbon dioxide.

a. Ground the aircraft to a suitable ground stake.

b. Place fuel selector in the OFF position, and leave in this position throughout all remaining steps.

c. Drain all fuel from bay being repaired. (Observe the precautions in paragraph 12-3.)

d. Remove access door and insert hose into bay.

e. Allow inert gas to flow into bay for several minutes (time dependent upon hose size, rate of flow, etc.) to remove all fuel vapors.

Since argon or carbon dioxide are heavier than air, these gases will remain in the bay during the repair. The repair shall be made using non-sparking tools (air motors, plastic scrapers, etc.)

NOTE

Portable vapor detectors are available to determine presence of explosive mixtures and are calibrated for leaded fuel. These detectors can be used to determine when it is safe to make repairs.

12-44. INTEGRAL FUEL BAY SEALANT. Two kinds of sealants are used, one to seal the fuel bay and the other to seal the access doors and fuel quantity transmitter adapter. The access door sealant is more pliable and will not adhere to metal as firmly as the bay sealant does. This permits the access doors and fuel quantity transmitter adapter to be removed without damage to them. Service Kits SK210-56 (6-ounce tube) and SK210-101 (2.5-ounce tube), which are available from the Cessna Supply Division, contain these sealants with the proper quantity of accelerator for each sealant. The sealants can be identified by color. The bay sealant is white and its accelerator is a black paste. The access door sealant is grey and its accelerator is a clear liquid.

WARNING

The accelerators contain heavy metal peroxides. Keep away from heat and flame. Use only in a well-ventilated area. Avoid skin and eye contact. WEAR EYE SHIELDS. In case of eye contact, flush with water and get prompt medical attention.

12-45. MIXING SEALANT. Use all the accelerator and sealant in the container when mixing, to insure the proper ratio of accelerator to sealant. Stir the accelerator to absorb all floating liquid before it is mixed with the sealant. The accelerator can then be poured into the container of sealant for mixing; otherwise, a wax-free container must be used. Stir accelerator and sealant until it becomes a uniform mixture. Do not allow air bubbles to mix in. If this occurs, work air bubbles out.

12-46. SEALING DURING AND AFTER STRUCTURAL REPAIR.

CAUTION

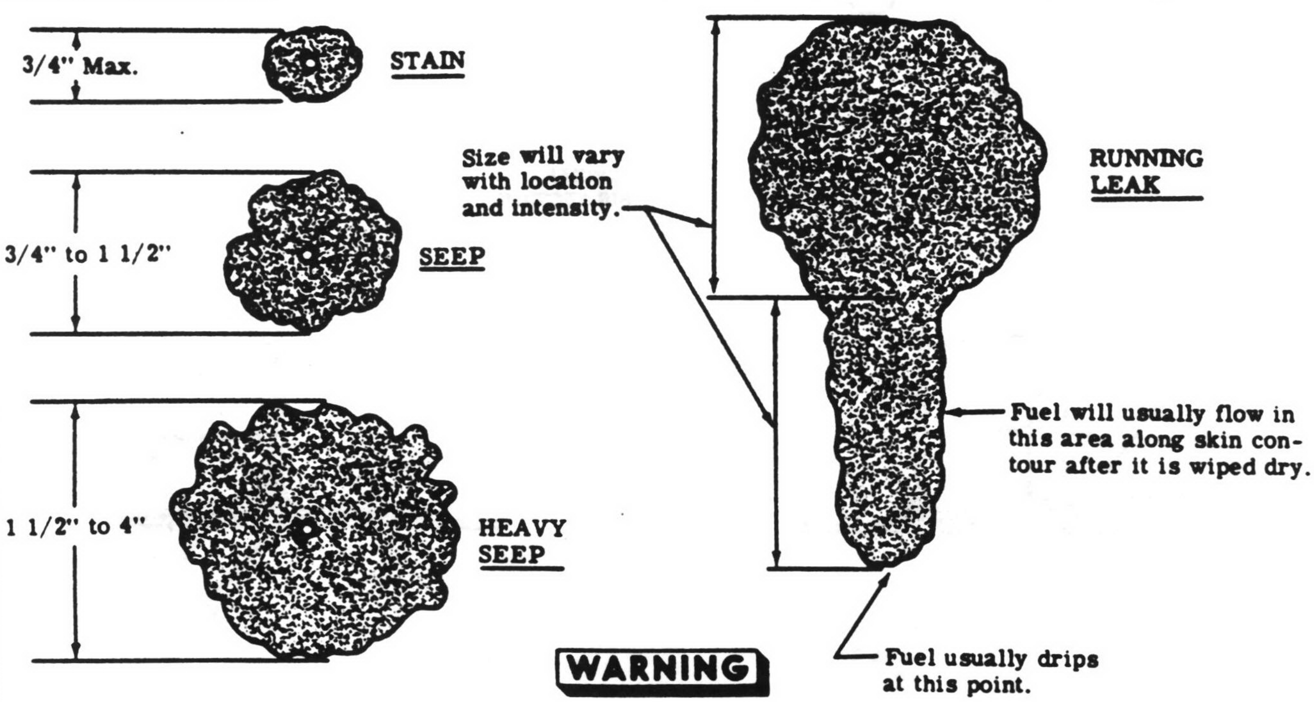
Protect drains and fuel outlet screens when applying sealants. DO NOT plug drain channels in hat section stiffeners. (See figure 12-12.)

Any repair that breaks the fuel bay seal will necessitate resealing of that area of the bay. Repair parts that need sealing must be installed and riveted during the sealing operation. All joints within the boundary of the bay, but which do not provide a direct fuel path out of the bay, such as stringers and rib flanges within the bay, must be fay surface sealed only. Joints which provide a direct fuel path out of the bay area, such as fuel spar flanges and inboard and outboard rib flanges, must be fay surface sealed and fillet sealed on the fuel side. Fay surface sealing is applying sealant to one mating part before assembly. Enough sealant must be applied so it will squeeze out completely around the joint when the parts are riveted or fastened together. The fillet seal is applied after the joint is fay surface sealed and riveted or fastened together. Fillet sealing is applying sealant to the edge of all riveted joints, joggles, bend reliefs, voids, rivets or fasteners through the boundary of the bay and any place that could produce a fuel leak. The fay sealant need not be cured before the fillet seal is applied, but the squeezed out sealant, to which the fillet sealant is applied, must be free of dirt and contamination. Fillets laid on intersecting joints shall be joined together to produce a continuous fillet. Filler sealant must be pressed into the joint, working out all entrapped air. The best method of applying sealant is with an extrusion gun. Then work the sealant into the joint with a small paddle, being careful to eliminate all air bubbles.

NOTE

During structural repair, parts must be predrilled, countersunk or dimpled and cleaned before being sealed and positioned for final installation.

a. Remove all existing sealant from area to be



WARNING

REFER TO PARAGRAPH 12-43 FOR FUEL BAY PURGING WHICH SHOULD BE ACCOMPLISHED BEFORE REPAIRING FUEL BAYS.

Figure 12-10. Classification of Fuel Leaks

NOTE

Refer to paragraph 12-46.

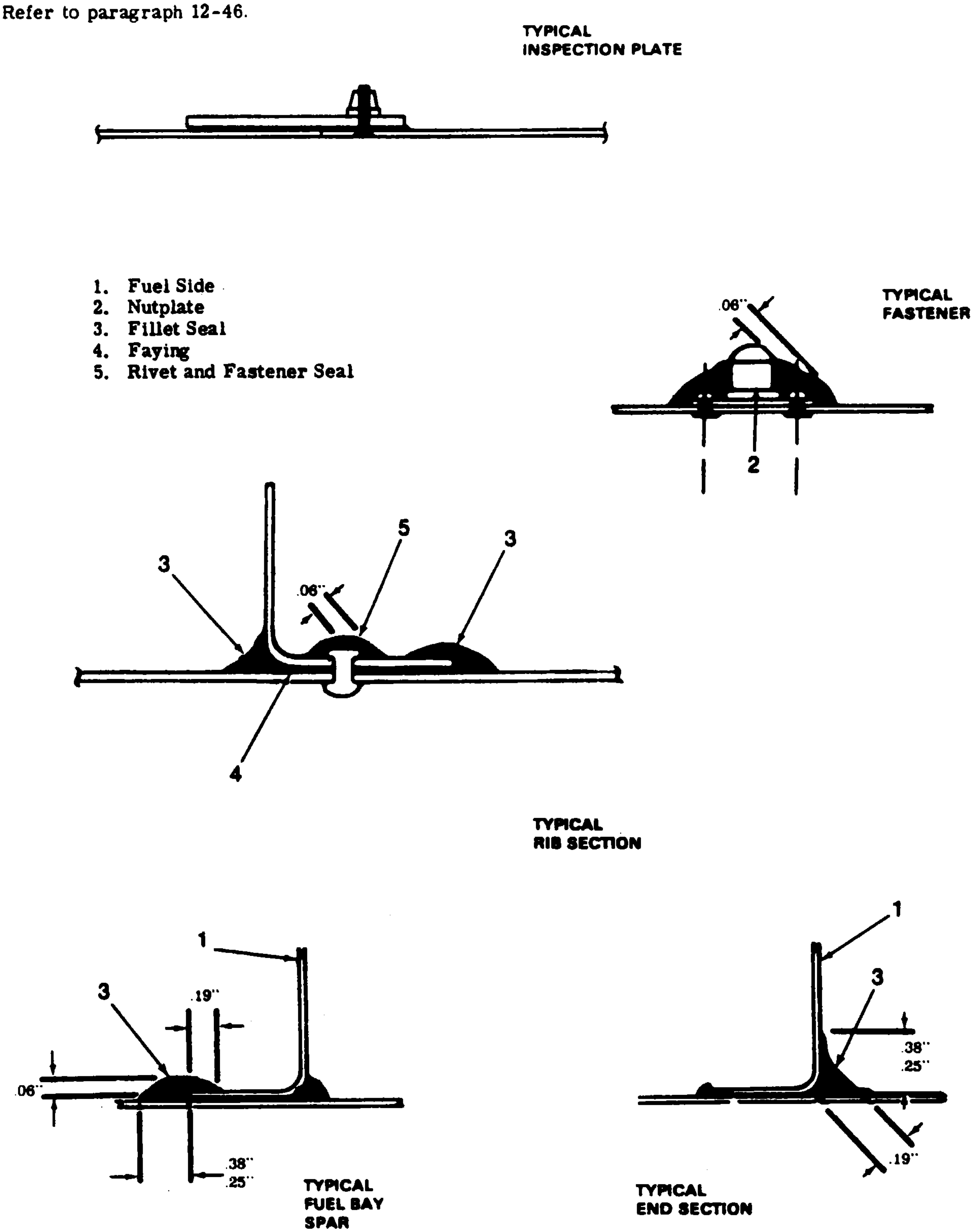


Figure 12-11. Typical Fuel Bay Sealing

sealed, leaving a taper on the remaining sealant. The taper will allow a scarf bond and a continuous seal when the new sealant is applied.

NOTE

The best method for removing sealant is with a chisel-type tool made of hard fiber. Remaining sealant is then removed with aluminum wool. Steel wool or sandpaper must not be used.

b. Vacuum thoroughly to remove all chips, filings, dirt, etc., from the bay area.

c. All surfaces and areas to be sealed shall be thoroughly cleaned by wiping with a clean cloth dampened with Methyl Ethyl Ketone (MEK), acetone or similar solvent and dried with a clean cloth before the solvent evaporates. Always pour the solvent on the cloth. Never use contaminated solvent. The cloth shall not be so saturated that dripping occurs.

NOTE

Work life of sealants included in kit SK210-56 is two hours. Work life of sealants included in kit SK210-101 is 1/2 (one-half) hour. These times are based on standard conditions of 77°F (25°C) and 50 percent relative humidity. A temperature increase or a lower humidity level will shorten the work life of the sealants.

d. Apply fay surface sealant to one mating part and install rivets or fasteners while sealant is still within its allowable work life.

NOTE

During the sealing operation, sealant must be checked at various times to determine that it has not exceeded its allowable work life. Use a small wood paddle, such as a tongue depressor, to gather some sealant. Touch the sealant to a piece of clean sheet metal. If the sealant adheres to the sheet metal, it is still within its allowable work life. If the sealant does not adhere to the sheet metal, it is beyond its allowable work life and must not be used.

e. Apply a fillet seal to the repaired area on the inside of the bay.

f. Apply fay surface door sealant to access doors and fuel quantity transmitter adapter, if removed, and install the doors and adapter.

g. Allow the sealant to cure. Refer to paragraph 12-48 for curing time.

h. Clean stains from outside of bay area.

i. Test fuel bay for leaks as described in paragraph 12-49.

12-47. SEALING FUEL LEAKS. First determine the source of the fuel leak. Fuel can flow along a seam or structure of the wing for several inches, making the leak source difficult to find. A stained area is an indication of the leak source. Fuel leaks can be found by testing the complete bay as described in paragraph 12-49. Another method of detecting the source of a fuel leak is to remove access doors and blow with an air nozzle from the inside of the bay in the area of the leak while soap bubble solution is applied to the outside of the bay. After the leak source has been found, proceed as follows:

a. Remove existing sealant in the area of the leak as described in paragraph 12-46.

b. Clean the area and apply a fillet seal. Press sealant into leaking area with a small paddle, working out all air bubbles.

c. If leakage occurs around a rivet or bolt, restrike the rivet or loosen bolt, retorque, and reseal around nut plate.

d. Apply fay surface door sealant to access doors, fuel quantity transmitters, etc., if removed, and install.

e. Test fuel bay for leakage as outlined in paragraph 12-49.

12-48. NORMAL CURE TIME. Service Kit SK210-56 contains: (A) SP654706B2 access door sealant and (B) SP654890B2 fuel bay sealant. Cure times for (A) and (B) are 24 hours. Service Kit SK210-101 contains: (C) PR1321B 1/2 access door sealant and (D) PR1422B 1/2 fuel bay sealant. Cure time for (C) is 18 hours; cure time for (D) is 45 hours. Cure times for both kits are based on 77°F (25°C) and 50 percent relative humidity.

12-48A. NORMAL WORK TIME. Normal work time for Service Kit SK210-56 is two hours, and 0.5 hour for Service Kit SK210-101. Shelf life of these kits is approximately six months. If more rapid cure times are desired, refer to the following note and accelerated curing time chart.

NOTE

Temperature shall not exceed 160°F (71°C). Bay must be vented to relieve pressure during accelerated curing.

ACCELERATED CURING TIME

°F of Sealant	Time in Hours
160	3
140	4
●130	5 1/2
120	7

●Applicable to SK210-101 only.

12-48B. INTEGRAL FUEL BAY QUICK-REPAIR SEALANT. GC-435 is a quick-repair synthetic rubber sealant for use in fuel bays when it is necessary to refill bays as soon as the repair has been made. The sealant is a two-part, medium-viscosity, polysulfide liquid polymer and is formulated for application by brush or extrusion. GC-435 may be purchased from: Goal Chemical Sealants Corp., 3137 East 26th Street, Los Angeles, CA 90023.

12-48C. SURFACE PREPARATION. To ensure maximum adhesion of GC-435, integral bay surfaces should be free of oil, grease, wax, dirt, etc. Pour cleaning solvent onto the cloth and wipe the surface. Then use a clean, dry cloth to wipe the solvent from the surface prior to its evaporation. Be sure the surface to be sealed is clean and dry. Observe all warnings and cautions covering preparation and application of sealants as noted in this section and the instructions included with GC-435 sealant.

12-48D. MIXING SEALANT. GC-435 comes in premeasured and proportioned kits ready for use. The base compound is cream-colored, and the catalyst is black. If the entire kit is not needed, the GC-435 may be proportioned by combining (10) parts of the base compound (cream-colored), with (1) part of the catalyst (black) by weight. Use an accurate scale and slowly mix the base and catalyst until a homogeneous blend of color and appearance is accomplished.

NOTE

Work life of GC-435 is approximately (15) minutes. Shelf life is at least (6) months when stored in an area where the ambient temperatures are 80° (26°C) or lower.

12-49. TESTING INTEGRAL FUEL BAY.

a. Remove vent line from vent fitting and cap fitting.
b. Disconnect fuel lines from bay.
c. To one of the bay fittings, attach a water manometer capable of measuring twenty inches of water.
d. To the other bay fitting, connect a well regulated supply of air (1/2 PSI MAXIMUM, or 13.8 INCHES of water). Nitrogen may be used where the bay might be exposed to temperature changes while testing.
e. Make sure filler cap is installed and sealed.

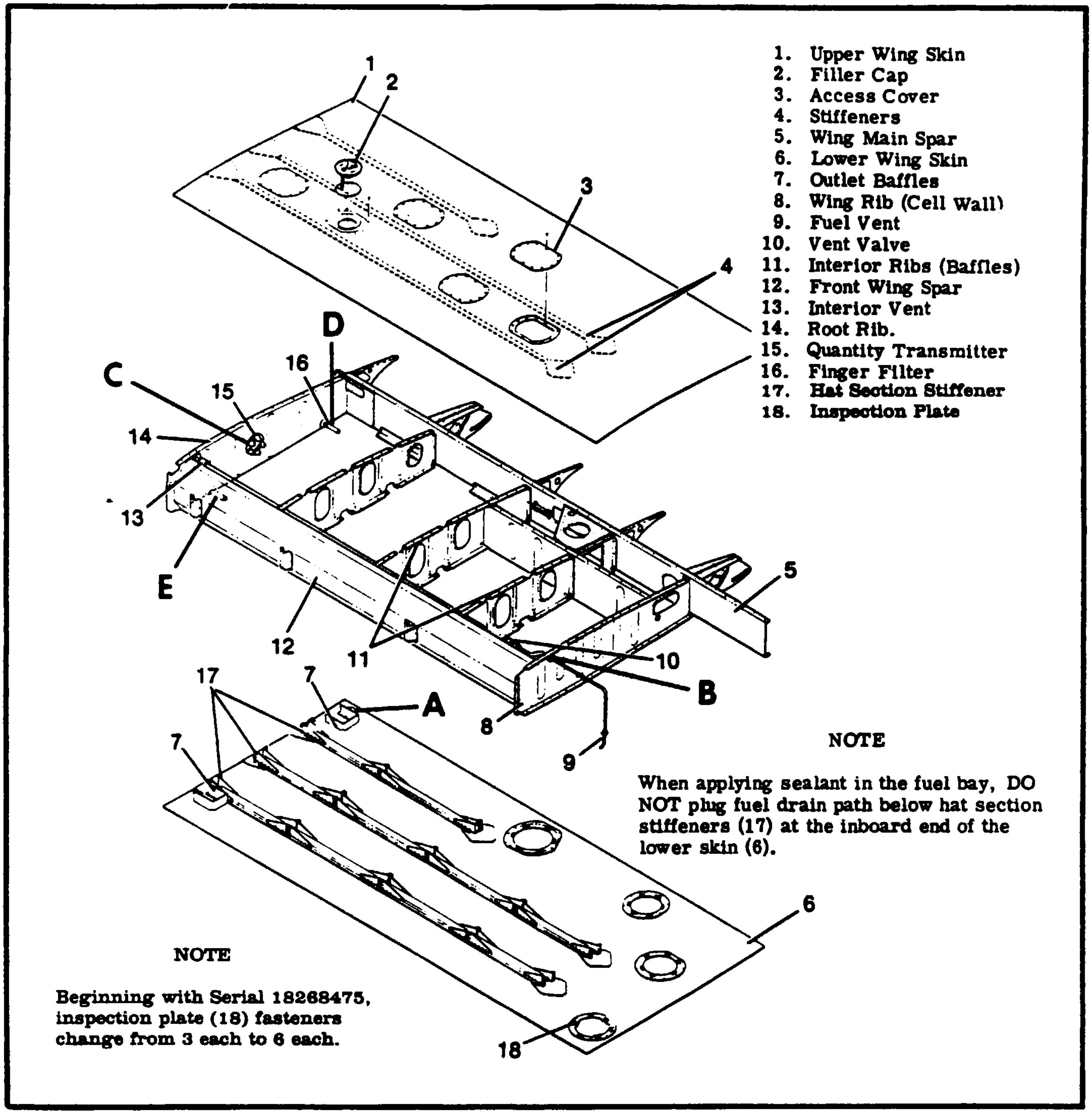


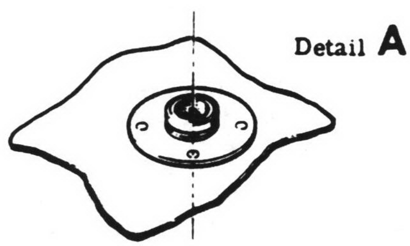
Figure 12-12. Integral Fuel Bay Components (1 of 4)

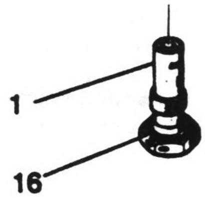
CAUTION

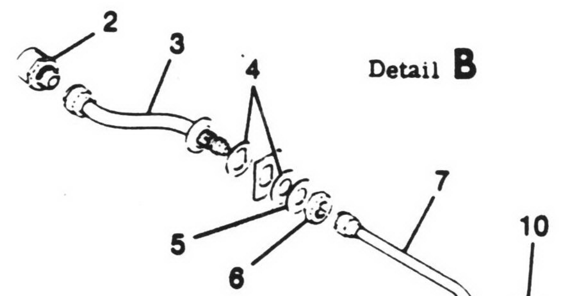
Do not attempt to apply pressure to the bay without a good regulator and a positive shut-off in the supply line. Do not inflate the fuel bay to more than 1/2 psi or damage may occur.

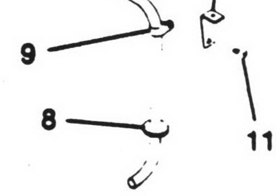
f. Apply pressure slowly until 1/2 PSI is obtained.
g. Apply soap solution as required.
h. Allow 15 to 30 minutes for pressure to stabilize.
i. If bay holds for 15 minutes, without pressure loss, bay is acceptable.
j. Reseal and retest if any leaks are found.

12-50. FUEL QUANTITY TRANSMITTERS. One float-actuated, variable-resistive transmitter is located in each fuel bay. They are connected electrically to separate galvanometric gages, one for each bay, thereby indicating fuel level in each bay. A complete description and procedures for operation and maintenance are contained in Section 15.



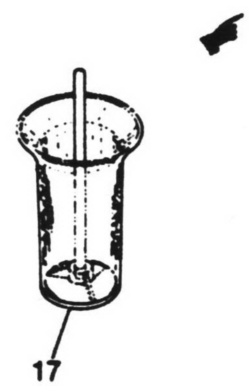






NOTE

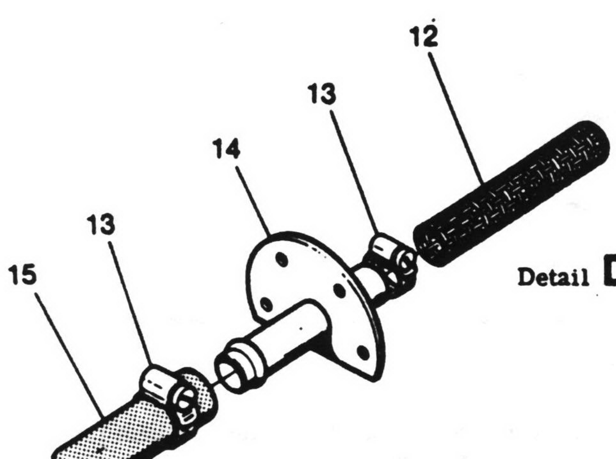
Torque drain valve (1), 15 to 35 inch-pounds. Drain valve gasket (16) should be lightly oiled and installed with asbestos side against head of valve. Safety-wire drain valve (1).



1. Drain Valve
2. Valve Assembly
3. Vent Line
4. Gasket
5. Washer
6. Nut
7. Vent Line
8. Grommet
9. Clamp
10. Angle
11. Screw
12. Finger Strainer
13. Clamp
14. Fitting
15. Hose
16. Gasket
17. Fuel Sampler Cup

NOTE

Beginning with 1979 models, items 2 thru 11 are installed in LEFT and RIGHT wings.



NOTE

When tightening screw clamp (13), do not exceed 8-10 in-lbs.

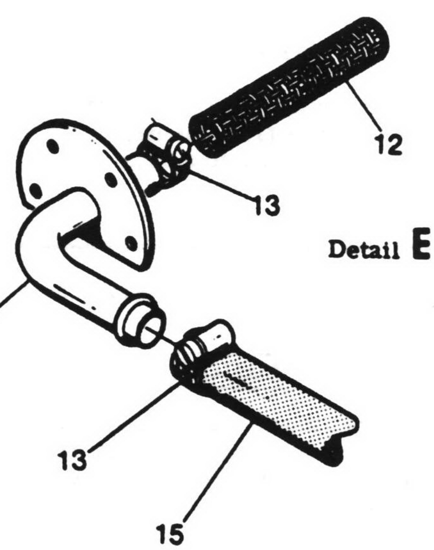


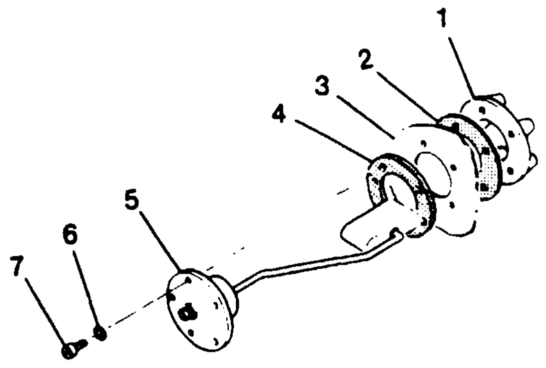
Figure 12-12. Integral Fuel Bay Components (2 of 4)

NOTES

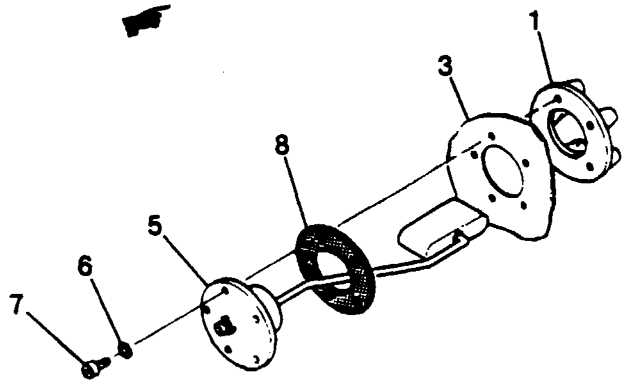
Beginning with serial 18268457, nutring (1) is bonded to root rib (3). Order kit number SK210-56 or SK210-101, fuel tank sealant from Cessna Supply Division.

18265176 thru 18268455, whenever removing and replacing fuel quantity transmitter (5), discard gasket (4) and replace it with new S2670-1 gasket (8).

Torque screws (7) to 20 in.-lbs (once only), using a cross-pattern sequence.



18265176 THRU 18268456
F18200026 THRU 18200169



1. Nutring
2. Gasket - Root Rib
3. Root Rib
4. Gasket - Transmitter
5. Fuel Quantity Transmitter
6. Washer
7. Screw
8. Gasket

18268457 AND ON

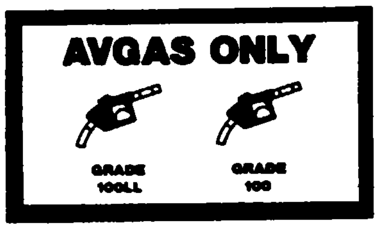
Detail C

Figure 12-12. Integral Fuel Bay Components (3 of 4)

FUEL

100LL/100 MIN GRADE AVIATION GASOLINE
CAP. 46.0 U.S. GAL.
CAP. 34.5 U.S. GAL. TO BOTTOM OF FILLER NECK

Fuel Quantity Placard



Fuel Grade Placard

1. Fuel Cap (See figure 12-5)
2. Fuel Filler Neck

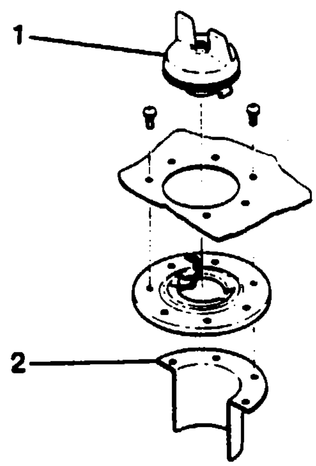


Figure 12-12. Integral Fuel Bay Components (4 of 4)

SECTION 13

PROPELLER AND GOVERNOR

WARNING

When performing any inspection or maintenance that requires turning on the master switch, installing a battery, or pulling the propeller through by hand, treat the propeller as if the ignition switch were ON. Do not stand, nor allow anyone else to stand, within the arc of the propeller, since a loose or broken wire, or a component malfunction, could cause the propeller to rotate.

TABLE OF CONTENTS — Page No. Aerofiche/Manual

13-1. PROPELLER.

13-2. DESCRIPTION. The aircraft is equipped with an all-metal, constant-speed, governor-regulated propeller. The constant-speed propeller is single-acting, in which engine oil pressure, boosted and regulated by the governor is used to obtain the correct blade pitch for the engine load. Engine lubricating oil is supplied to the power piston in the propeller hub through the crankshaft. The amount and pressure of the oil supplied is controlled by the engine-driven governor. An increase or decrease in throttle setting or a change in aircraft attitude will affect the balance which maintains a given RPM. If the throttle is opened further or if aircraft speed is increased, engine RPM will try to increase. The governor senses this and directs oil pressure to the forward side of the piston. The blades will be moved to a higher pitch and engine speed will remain constant. Conversely, if the throttle opening or the aircraft speed is decreased, the engine RPM will try to decrease. The governor senses this and allows the oil to drain from the forward side of the piston. Spring tension and centrifugal twisting moment will move the blades to a lower pitch to maintain the selected engine speed. Figure 13-1, illustrates the different propellers used on the aircraft. Refer to applicable vendor publications for further information.

13-3. REPAIR. Metal propeller repair first involves evaluating the damage and determining whether the repair will be a major or minor one. Federal Aviation Regulations, Part 43 (FAR 43), and Federal Aviation Agency, Advisory Circular No. 43.13 (FAA AC No. 43.13), define major and minor repairs, alterations and who may accomplish them. When making repairs or alterations to a propeller FAR 43, FAA AC No. 43.13 and the propeller manufacturer's instructions must be observed.

13-4. TROUBLE SHOOTING.

TROUBLE	PROBABLE CAUSE	REMEDY
FAILURE TO CHANGE PITCH.	Governor control disconnected or broken.	Check visually. Connect or replace control.
	Governor not correct for propeller. (Sensing wrong.)	Check that correct governor is installed. Replace governor.
	Defective governor.	Refer to paragraph 13-10.
	Defective pitch changing mechanism inside propeller or excessive propeller blade friction.	Propeller repair or replacement is required.
FAILURE TO CHANGE PITCH FULLY.	Improper rigging of governor control.	Check that governor control arm and control have full travel. Rig control and arm as required.
	Defective governor.	Refer to pararaph 13-10.
SLUGGISH RESPONSE TO PROPELLER CONTROL.	Excessive friction in pitch changing mechanism inside propeller or excessive blade friction.	Propeller repair or replacement is required.
STATIC RPM TOO HIGH OR TOO LOW.	Improper propeller governor adjustments.	Preform static RPM check. Refer to Section 11 & 11A for procedures.
ENGINE SPEED WILL NOT STABILIZE.	Sludge in governor.	Refer to paragraph 13-10.
	Air trapped in propeller actuating cylinder.	Trapped air should be purged by exercising the propeller several times prior to take-off after propeller has been reinstalled or has been idle for an extended period.
	Excessive friction in pitch changing mechanism inside propeller or excessive blade friction.	Propeller repair or replacement is required.
	Defective governor.	Refer to paragraph 13-10.
OIL LEAKAGE AT PROPELLER MOUNTING FLANGE.	Damaged O-ring and seal between engine crankshaft flange and propeller.	Check visually. Remove propeller and install O-ring seal.
	Foreign material between engine crankshaft flange and propeller mating surfaces or mounting nuts not tight.	Remove propeller and clean mating surfaces; install new O-ring and tighten mounting nuts evenly to torque value in figure 13-1.
OIL LEAKAGE AT ANY OTHER PLACE.	Defective seals, gaskets, threads, etc., or incorrect assembly.	Propeller repair or replacement is required.

13-5. REMOVAL-182 & F182. (See Figure 13-1.)

WARNING

Be sure magneto is grounded before turning propeller.

a. Remove spinner (1), spinner support (2) and spacers (3). Retain spacers.
b. Remove cowling as required for access to mounting nuts (14).
c. Loosen all mounting nuts (14) approximately 1/4 inch and pull propeller (6) forward until stopped by nuts.

NOTE

As the propeller (6) is separated from the engine crankshaft flange, oil will drain from the propeller and engine cavities.

d. Remove all propeller mounting nuts (14) and pull propeller forward to remove from engine crankshaft (11).
e. If desired, the spinner bulkhead (12) can be removed by removing screws and nuts attaching lugs (13) to bulkhead. Note direction of lugs (13) and lug attaching screws.

13-6. INSTALLATION-182 & F182.

WARNING

Be sure magneto is grounded before turning propeller.

a. If the spinner bulkhead (12) was removed, position bulkhead so the propeller blades will emerge from the spinner (1) with ample clearance and install spinner bulkhead attaching lugs and screws.

CAUTION

Avoid scraping metal from bore of spinner bulkhead and wedging scrapings between engine flange and propeller. Trim the inside diameter of the bulkhead as necessary when installing a new spinner bulkhead.

b. Clean propeller hub cavity and mating surfaces of propeller and crankshaft.
c. Lightly lubricate a new O-ring (9) and the crankshaft pilot with clean engine oil and install the O-ring in the propeller hub.
d. Align propeller mounting studs and dowel pins with proper holes in engine crankshaft flange and slide propeller carefully over crankshaft pilot until mating surfaces of propeller and crankshaft flange are approximately 1/4 inch apart.
e. Install propeller attaching nuts (14) and work propeller aft as far as possible, then tighten nuts evenly and torque to 660-780 lb-in.
f. Install spacers (3) and spinner support (2) on propeller cylinder (4). If spacers (3) are not centered mechanically (piloted) visually center and hold them until spinner support (2) is forced firmly in place.
g. Hold spinner (1) snug against spinner support (2) and check alignment of holes in spinner (1) with holes in spinner bulkhead (12). Add or remove spacers (3) from the propeller cylinder (4) until holes are within .050 of alignment.
h. Push hard on spinner (1) to align holes and install screws and washers (if required) in 3 or more equal spaces around the spinner bulkhead (12). Relax pressure on the spinner and install the remaining screws and washers (if required) in the spinner.
i. Tighten all screws uniformly around the spinner.

13-7. REMOVAL-T182. (See Figure 13-1.)

WARNING

Be sure magneto is grounded before turning propeller.

a. Remove spinner (1).
b. Remove safety wire, back off bolts attaching propeller to engine crankshaft about 1/4 inch, pull propeller forward.

NOTE

Bolts will have to be backed out evenly so propeller (2) can be pulled forward (approximately 1/4 inch each time) until all bolts are disengaged from engine crankshaft flange. As the propeller is seperated from the engine crankshaft, oil will drain from the propeller and engine crankshaft cavities.

c. If necessary, the aft spinner bulkhead (3) can be removed by removing screws (4), washers (5), and nuts (6) attaching bulkhead to the propeller. Then remove screws (7) to seperate bulkhead halves.
d. Pull propeller from engine crankshaft.

13-8. INSTALLATION-T182. (See Figure 13-1.)

WARNING

Be sure magneto is grounded before turning the propeller.

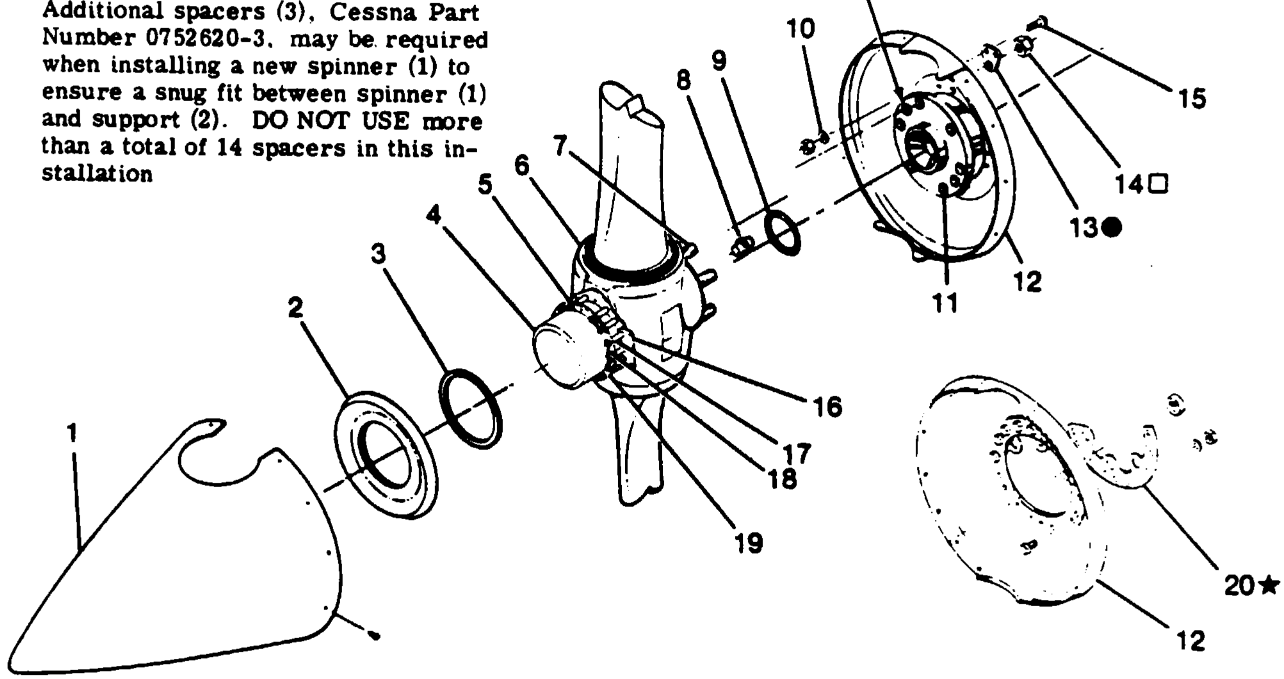
a. If aft spinner bulkhead was removed. Reinstall.
b. If starter ring gear support was removed, clean mating surfaces of support assembly and engine crankshaft flange.
c. Place alternator drive belt in pully groove of starter ring gear support. Fit starter ring gear over propeller flange bushings on crankshaft.

□Torque propeller mounting nuts (14) to 660-780 lb-in.

Propeller indexing is provided by aligning the dowel pins (8) with the locating holes in the engine crankshaft flange.

NOTE

Additional spacers (3), Cessna Part Number 0752620-3, may be required when installing a new spinner (1) to ensure a snug fit between spinner (1) and support (2). DO NOT USE more than a total of 14 spacers in this installation



182 & F182 ONLY

● THRU 18268029

★ BEGINNING WITH 18268030

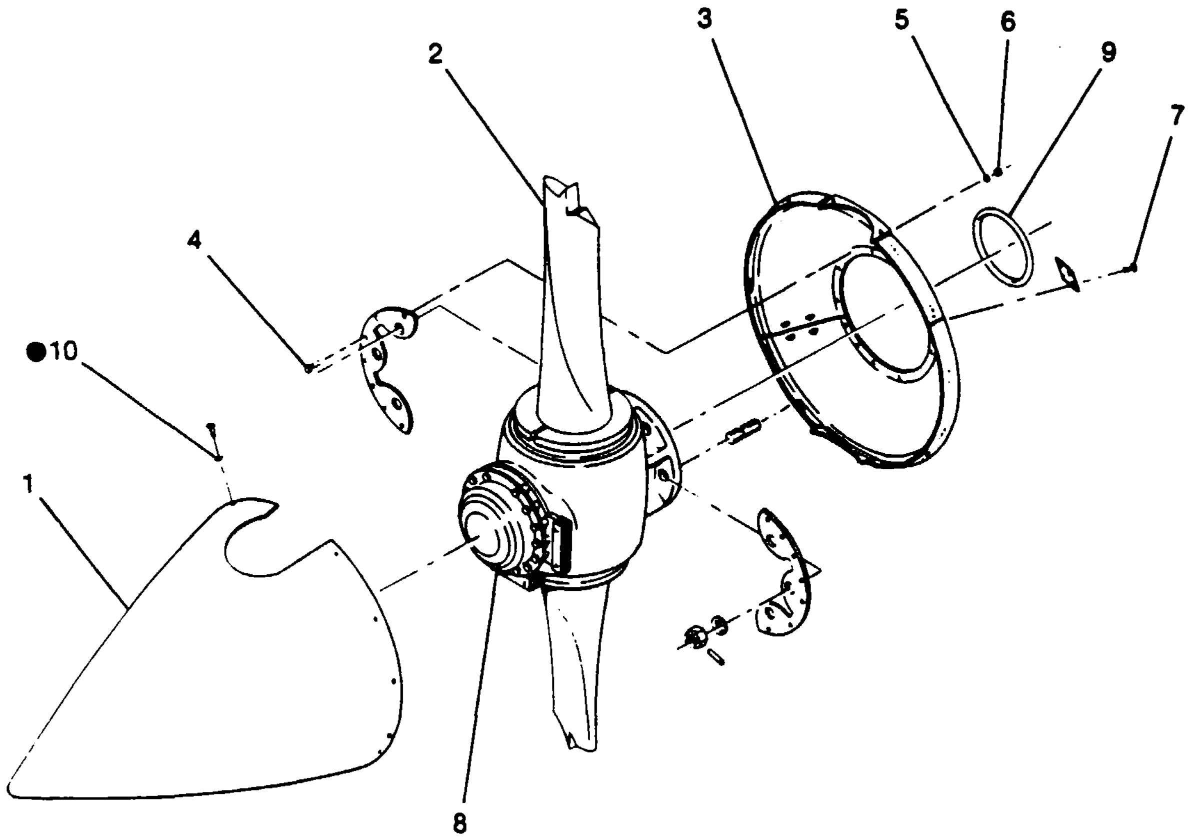
1. Spinner
2. Spinner Support
3. Spacer
4. Cylinder
5. Screw
6. Propeller
7. Stud
8. Dowel Pin
9. O-Ring
10. Washer
11. Engine Crankshaft
12. Spinner Bulkhead
13. Lug
14. Mounting Nut
15. Screw
16. Balance Weight Bracket
17. Tube
18. Safety Wire
19. Ring
20. Ring Half

Figure 13-1. Propeller Installation (Sheet 1 of 3)

NOTE

Torque propeller mounting bolts to 660-780 lb-in.

● BEGINNING WITH 18267931



1. Spinner
2. Propeller
3. Aft Spinner Bulkhead
4. Screw
5. Washer
6. Nut
7. Screw
8. Propeller Hub
9. O-Ring
10. Mylar Washer

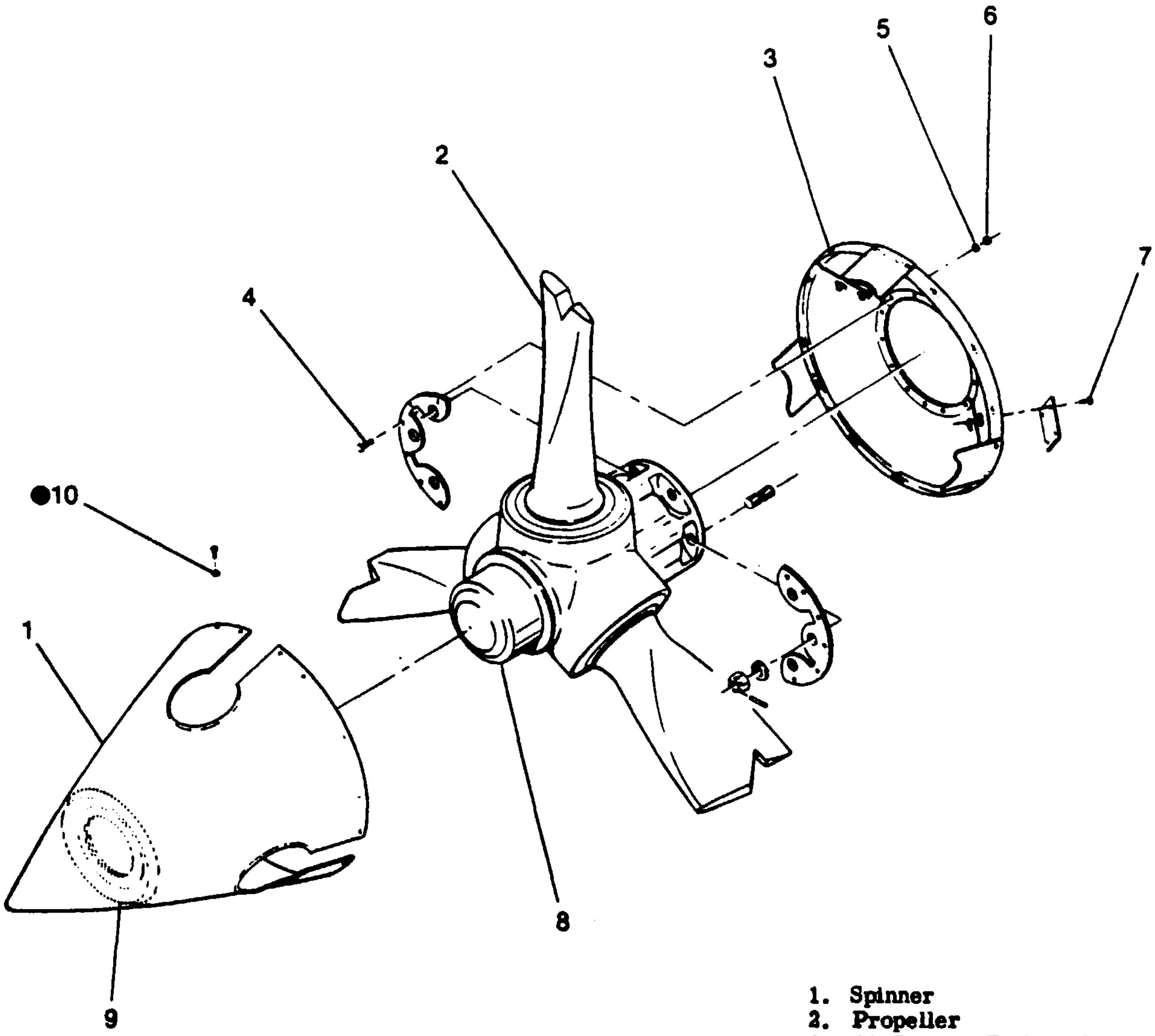
T182 ONLY

Figure 13-1. Propeller Installation (Sheet 2 of 3)

NOTE

Torque propeller mounting bolts to 660-780 lb-in.

● BEGINNING WITH 18267931



OPTIONAL 3-BLADED
T182 ONLY

1. Spinner
2. Propeller
3. Aft Spinner Bulkhead
4. Screw
5. Washer
6. Nut
7. Screw
8. Propeller Hub
9. Forward Support
10. Mylar Washer

Figure 13-1. Propeller Installation (Sheet 3 of 3)

NOTE

Make sure bushing hole in ring gear support, marked "O", is assembled adjacent to "O" mark on crankshaft flange bushing. The starter ring gear must be located correctly to assure proper alignment of the timing mark on the ring gear.

d. Clean propeller hub cavity and mating surfaces of propeller hub and ring gear support.
e. On the standard 2 bladed propeller, lightly lubricate new O-ring (9) and crankshaft pilot with clean engine oil, and install O-ring in the propeller hub.
f. Align propeller mounting bolts with proper holes in engine crankshaft flange, and slide propeller carefully over crankshaft pilot until bolts can be started in crankshaft flange bushing. Position propeller blades to extend thru aft spinner bulkhead with ample clearance.
g. Tighten bolts evenly, and work propeller aft on crankshaft flange. Torque bolts per figure 13-1.
h. Install .040 inch diameter corrosion resistant safety wire through bolts in pairs.
i. Adjust alternator drive belt tension as outlined in Section 16.
j. Install spinner (1), using spacers as required.

NOTE

When replacing optional three bladed propeller assembly (2), apply Y8560 Polyurethane Film (3M Company), a minimum of one wrap on propeller hub (8), then as required to obtain a snug fit of forward support (9) to propeller hub (8).

13-9. TIME BETWEEN OVERHAUL (TBO). Propeller overhaul shall coincide with engine overhaul, but shall not exceed limits specified in McCauley Service Bulletin 137 and all other revisions and supplements thereto. Refer to Sections 11 & 11A for engine overhaul periods.

13-10. GOVERNOR.

13-11. DESCRIPTION. The propeller governor is a single-acting, centrifugal type, which boosts oil pressure from the engine and directs it to the propeller where the oil is used to increase blade pitch. A single-acting governor uses oil pressure to effect a pitch change in one direction only; a pitch change in the opposite direction results from a combination of centrifugal twisting moment of rotating blades and compressed springs. Oil pressure is boosted in the governor by a gear type oil pump. A pilot valve, fly weight and speeder spring act together to open and close governor oil passages as required to maintain a constant engine speed.

NOTE

Outward physical appearance of specific governors is the same, but internal parts determine whether it uses oil pressure to increase or decrease blade pitch. The propellers used on these aircraft require governors which "sense" in a certain manner. "Sensing" is determined by the type pilot valve installed inside the governor. Since the basic governor may be set to "sense" oppositely, it is important to ascertain that the governor is correct for the propeller being used.

13-12. TROUBLE SHOOTING. When trouble shooting the propeller-governor combination, it is recommended that a governor known to be in good condition be installed to check whether the propeller or the governor is at fault. Removal and replacement, rigging, high-speed stop adjustment, desludging and replacement of the governor mounting gasket are not major repairs and may be accomplished in the field. Repairs to propeller governors are classed as propeller major repairs in Federal Aviation Regulations, which also define who may accomplish such repairs.

13-13. REMOVAL.

WARNING

Be sure magneto is grounded before turning propeller

a. Remove cowling and engine baffles as required for access to governor.
b. Disconnect governor control from governor.

NOTE

Note EXACT position of all washers so that washers may be installed in the same position on reinstallation.

c. Remove nuts and washers securing governor to engine and pull governor from mounting studs.
d. Remove gasket from between governor and engine mounting pad.

13-14. INSTALLATION.

WARNING

Be sure magneto is grounded before turning propeller

a. Wipe governor and engine mounting pad clean.
b. Install a new gasket on the mounting studs. Install gasket with raised surface of the gasket screen toward the governor.
c. Position governor on mounting studs, aligning governor drive splines with splines in the engine and install mounting nuts and washers. Do not force spline engagement. Rotate engine crankshaft slightly and splines will engage smoothly when properly aligned.

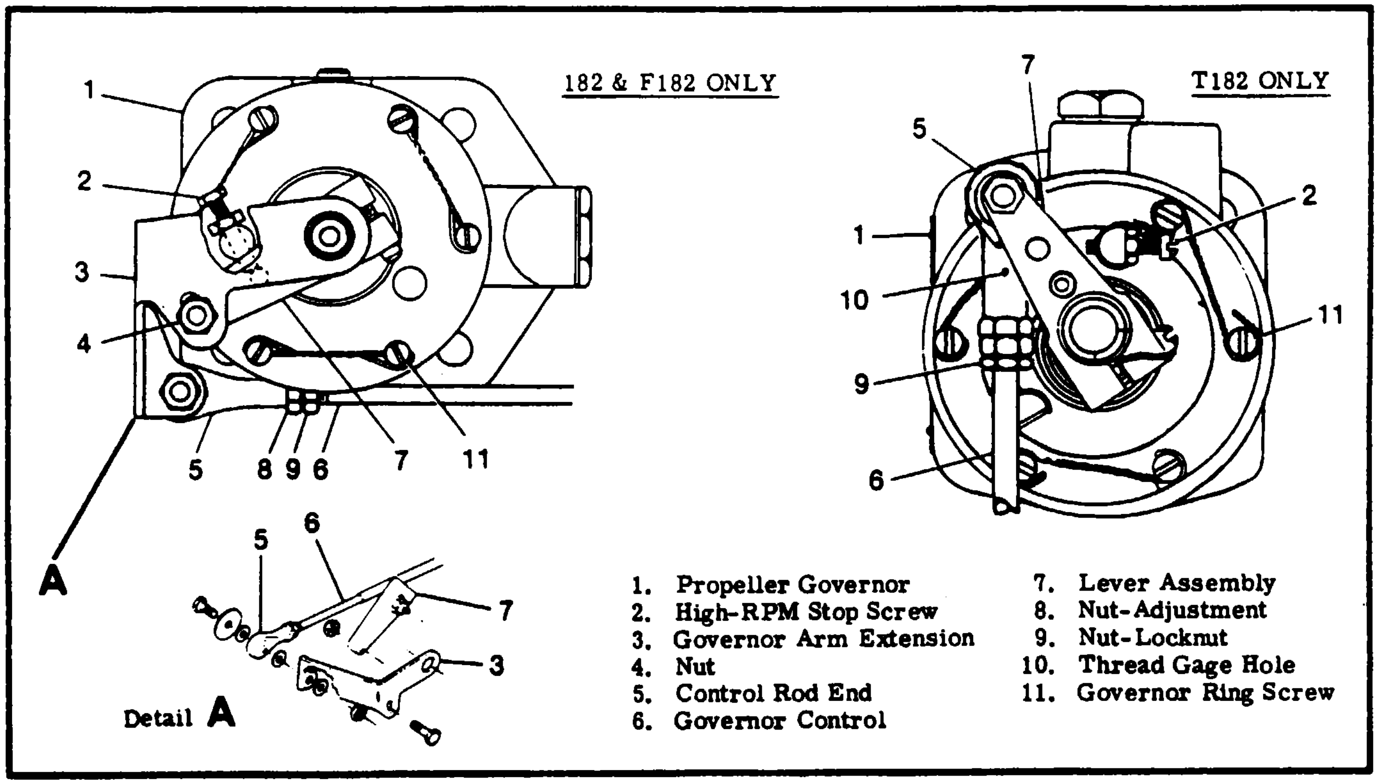


Figure 13-2. Governor and Control Adjustments

d. Connect governor control to governor arm extension and rig control as outlined in paragraph 13-16.
e. Reinstall all items removed for access.

13-15. HIGH-RPM STOP ADJUSTMENT.
a. Remove engine cowling and baffles as required for access.
b. Remove safety wire and loosen the high-speed stop screw locknut.
c. Turn the stop screw IN to decrease maximum rpm and OUT to increase maximum rpm. One full turn of the stop screw causes a change of approximately 25 rpm.
d. Tighten stop screw locknut, safety wire stop screw and make propeller control linkage adjustment as necessary to maintain full travel.
e. Install baffles and cowling.
f. Test operate propeller and governor.

NOTE

It is possible for either the propeller low pitch (high-rpm) stop or the governor high-rpm stop to be the high-rpm limiting factor. It is desirable for the governor stop to limit the high-rpm at the maximum rated rpm for a particular aircraft. Due to climatic conditions, field elevation, low-pitch blade angle and other considerations, an engine may not reach rated rpm on the ground. It may be necessary to readjust the governor stop after test flying to obtain maximum rated rpm when airborne.

13-16. RIGGING PROPELLER GOVERNOR CONTROL.
a. Disconnect governor control from governor extension arm.
b. Place propeller governor control, in cabin, full forward, then pull back approximately 1/8 inch and lock in this position. This will allow "cushion" to assure full contact of the governor arm with the governor high-rpm stop screw.
c. Place governor arm against high-rpm stop screw.
d. Loosen jam nuts and adjust control rod end until attaching holes align while governor arm is against high-rpm stop screw. Be sure to maintain sufficient thread engagement of the control and rod end. If necessary, shift control in the clamps to achieve this.
e. Attach rod end to the governor arm extension. Be sure all washers are installed correctly.
f. Operate the control to see that the governor arm bottoms out against the low pitch stop and bottoms out against or a maximum of .12 " from the high pitch stop on the governor before reaching the end of control cable travel.

NOTE

The governors are equipped with an offset extension to the governor arm. The offset extension has an elongated slot to permit further adjustment. The preceding steps may still be used as an outline in the rigging procedure.

13-17. TIME BETWEEN OVERHAUL (TBO). Propeller governor overhaul shall coincide with engine overhaul. Refer to sections 11 and 11A for engine time between overhaul (TBO) periods. The governor overhaul manual is available from the Cessna Supply Division.

SECTION 14

UTILITY SYSTEMS

TABLE OF CONTENTS — Page No. Aerofiche/Manual

14-1. UTILITY SYSTEMS.

14-2. HEATING SYSTEM. (See figure 14-1.)

14-3. DESCRIPTION. The heating system is comprised of the heat exchange section of the exhaust muffler, a shut-off valve, mounted on the right forward side of the firewall, a push-pull control on the instrument panel, outlets and flexible ducting connecting the system,

14-4. OPERATION. Ram air is ducted through engine baffle inlets and heat exchange section of the exhaust muffler, to the shut-off valve at the firewall. The heated air flows from the shut-off valve into a duct across the aft side of the firewall, where it is distributed into the cabin. The shut-off valve, operated by a push-pull control labeled "CABIN HEAT." located on the instrument panel, regulates the volume of heated air entering the system. Pulling the control full out supplies maximum flow and pushing control in gradually decreases flow, shutting off flow completely when the control is pushed full in.

14-5. TROUBLE SHOOTING. Most of the operational troubles in the heating and defrosting systems are caused by sticking or binding valves and their controls, damaged air ducting or defects in the exhaust muffler. In most cases, valves or controls can be freed by proper lubrication. Damaged or broken parts must be repaired or replaced. When checking controls, ensure valves respond freely to control movement, that they move in the correct direction, that they move through their full range of travel and seal properly. Check that hose are properly secured and replace hose that are burned, frayed or crushed. If fumes are detected in the cabin, a thorough inspection of the exhaust system should be accomplished. Refer to applicable paragraph in Section 11 for this inspection. Since any holes or cracks may permit exhaust fumes to enter the cabin, replacement of defective parts is imperative because fumes constitute an extreme danger. Seal any gaps in heater ducts across the firewall with Pro-Seal #700 (Coast Pro-Seal Co., Los Angeles, California) compound or equivalent compound.

14-6. REMOVAL, INSTALLATION AND REPAIR. Figure 14-1 may be used as a guide during removal, installation and repair of heating system components. Burned, frayed or crushed hose must be replaced with new hose, cut to length and installed in the original routing. Trim hose winding shorter than the hose to allow clamps to be fitted. Defective air valves must be repaired or replaced. Check for proper operation of valves and their controls after repair or replacement.

14-7. DEFROSTING SYSTEM. (See figure 14-1.)

14-8. DESCRIPTION. The defrosting system is comprised of a duct across the aft side of the firewall, a defroster outlet and shut-off valve assembly mounted on the left side of the cowl deck immediately aft of the windshield, a shut-off valve control on the instrument panel and flexible ducting connecting the system.

14-9. OPERATION. Air from the duct across the aft side of the firewall flows through a flexible duct to the defroster outlet. The temperature and volume of this air is controlled by the settings of the heater system control.

14-10. TROUBLE SHOOTING. Since the defrosting system depends on proper operation of the heating system, refer to paragraph 14-5 for trouble shooting the defrosting system.

14-11. REMOVAL, INSTALLATION AND REPAIR. Figure 14-1 may be used as a guide during removal, installation and repair of defrosting system components. Cut hose to length and install in the original routing. Trim hose winding shorter than the hose to allow clamps to be fitted. A defective defroster outlet must be repaired or replaced.

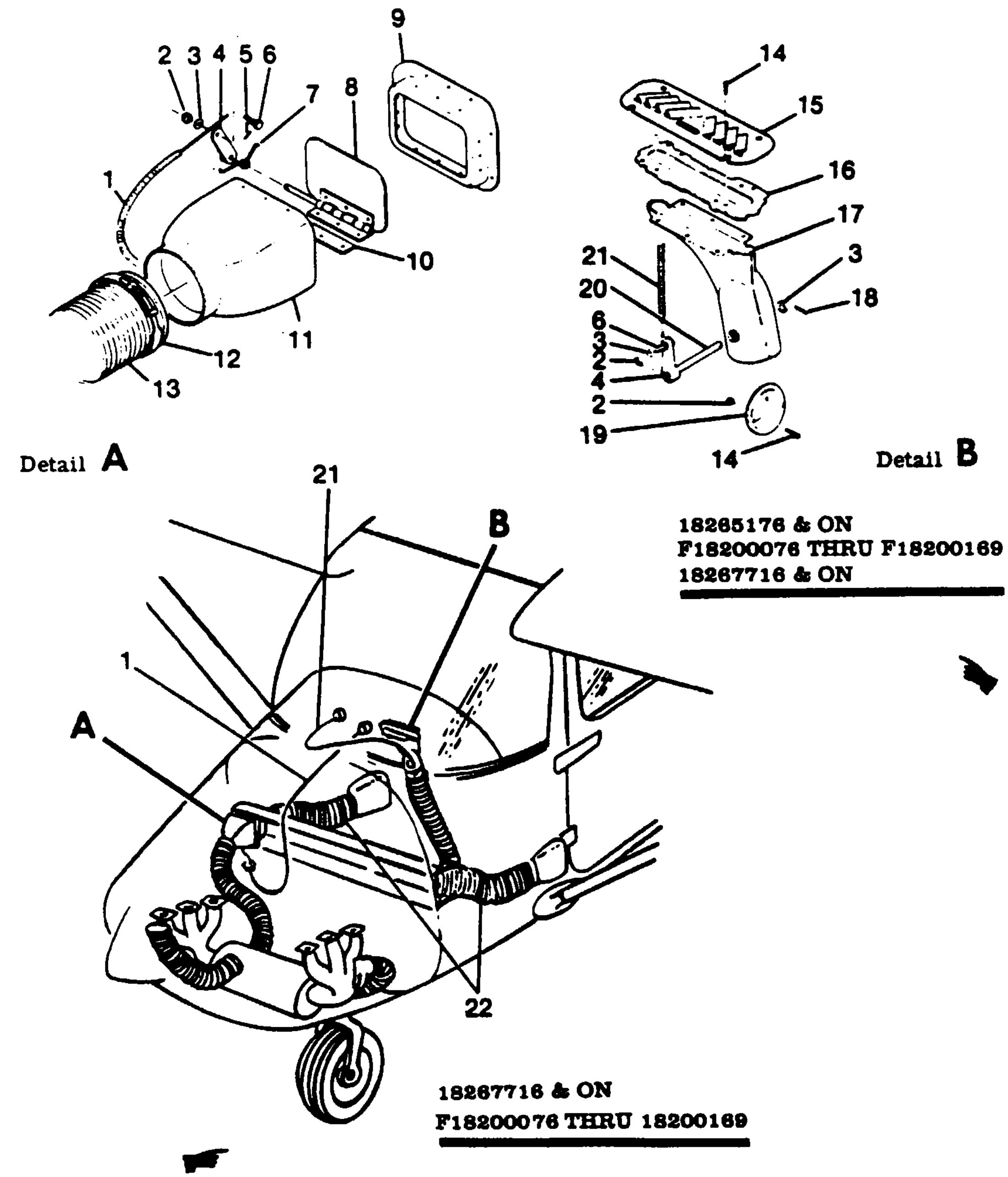
14-12. VENTILATING SYSTEM. (See figure 14-2.)

14-13. DESCRIPTION. The ventilating system is comprised of two airscoops mounted in the inboard leading edge of each wing, a manually-adjustable ventilator installed on each side of the cabin near the upper corners of the windshield, two plenum chambers mounted in the rear cabin wing root areas, a fresh airscoop door on the right side of the fuselage just forward of the copilot's seat, a control knob on the instrument panel and flexible ducting connecting the system.

14-14. OPERATION. Air received from scoops mounted in the inboard leading edges of the wing is ducted to adjustable ventilators mounted on each side of the cabin near the upper corners of the windshield. Rear seat ventilation is provided by plenum chambers mounted in the left and right rear cabin wing root areas. These plenum chambers receive ram air from the airscoops in the inboard leading edges of the wings. Each plenum chamber is equipped with a valve which meters the incoming cabin ventilation air. This provides a chamber for expansion of cabin air which greatly reduces inlet air noise. Filters at the air inlets are primarily noise reduction filters. Forward cabin ventilation is provided by a fresh air-scoop door mounted on the right side of the fuselage, just forward of the copilot seat. The scoop door is operated by a control in the instrument panel marked "CABIN AIR." Fresh air from the scoop door is routed to the duct across the aft side of the firewall, where it is distributed into the cabin. As long as the "CABIN HEAT" control is pushed in, no heated air can enter the firewall duct; therefore, when the "CABIN AIR" control is pulled out, only fresh air from the scoop will flow through the duct into the cabin. As the "CABIN HEAT" control is gradually pulled out, more and more heated air will blend with the fresh air from the scoop and be distributed into the cabin. Either one, or both of the controls may be set at any position from full open to full closed.

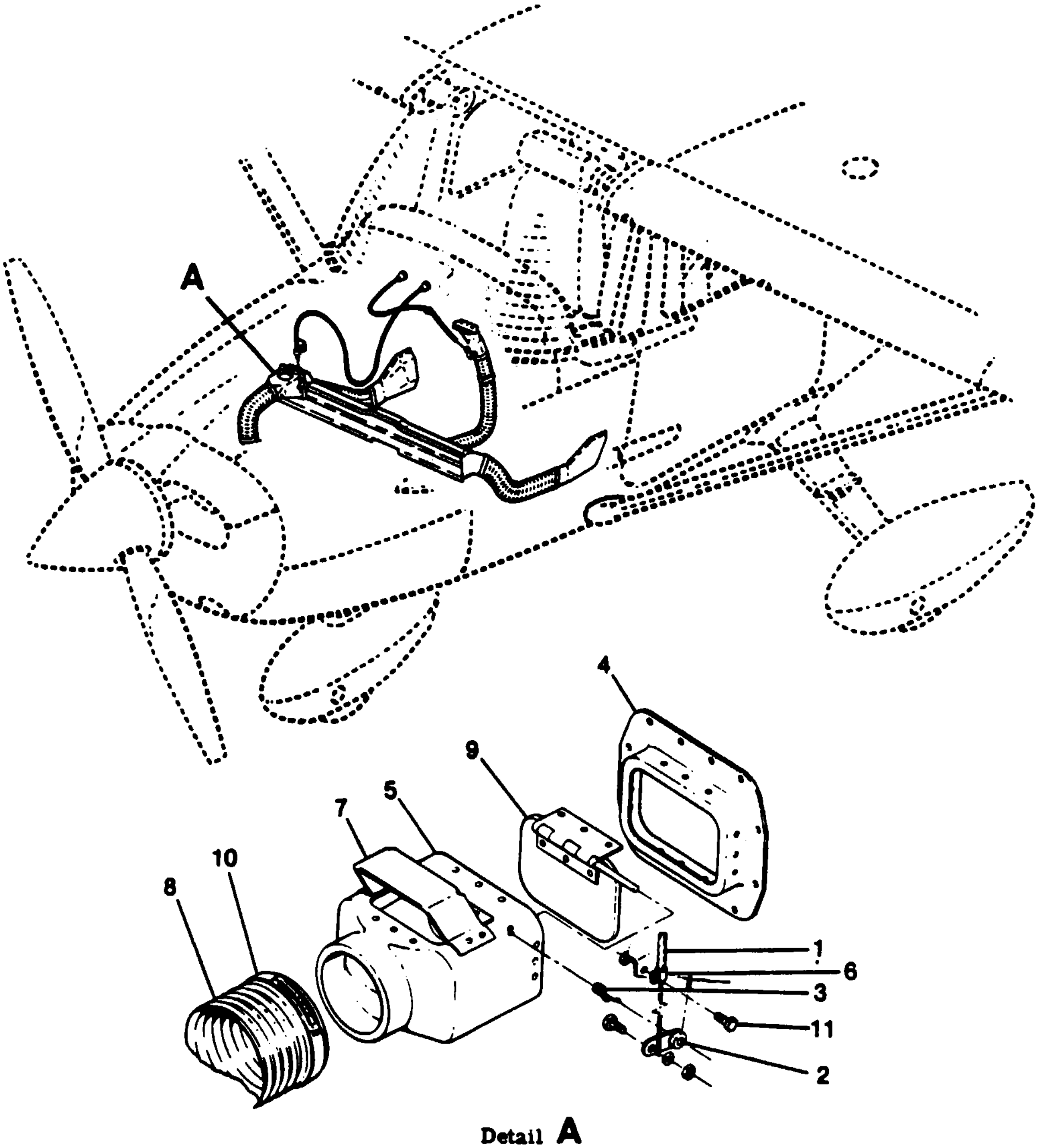
14-15. TROUBLE SHOOTING. Most of the operational troubles in the ventilating system are caused by sticking or binding of the inlet scoop door or its control. Check the airscoop filter elements in the wing leading edges for obstructions. The elements may be removed and cleaned or replaced. Since air passing through the filters is emitted into the cabin, do not use a cleaning solution which would contaminate the air. The filters may be removed to increase air flow. However, their removal will cause a slight increase in noise level.

14-16. REMOVAL, INSTALLATION AND REPAIR. Figure 14-2 may be used as a guide during removal, installation and repair of the ventilating system components. A defective ventilator or scoop must be repaired or replaced. Check for proper operation of ventilating controls after installation or repair.



1. Cabin Heat Control
2. Nut
3. Washer
4. Control Arm
5. Roll Pin
6. Clamp Bolt
7. Spring
8. Valve Plate Assembly
9. Valve Seat
10. Shim
11. Valve Body
12. Clamp
13. Hose
14. Screw
15. Deflector
16. Cowl Deck
17. Nozzle
18. Cotter Pin
19. Valve
20. Shaft
21. Defroster Control
22. Duct

Figure 14-1. Heating and Defrosting Systems (Sheet 1 of 2)



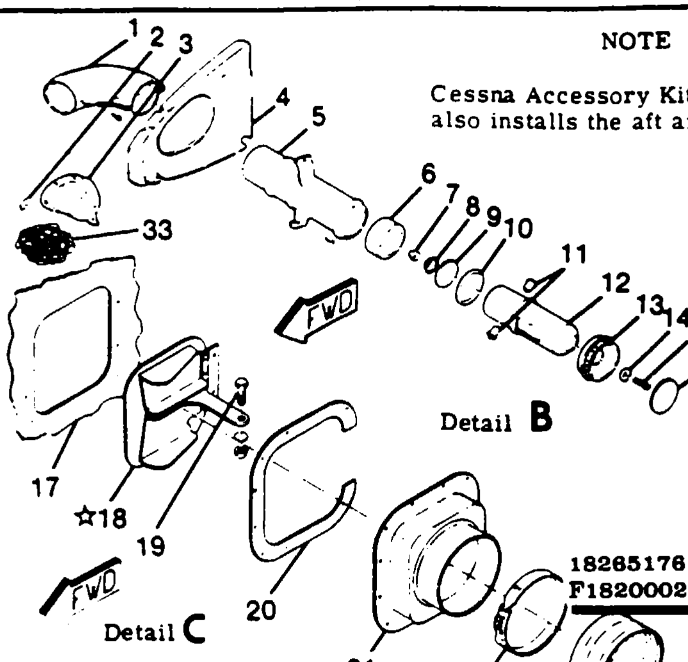
1. Cabin Heat Control
2. Control Arm
3. Spring
4. Valve Seat
5. Valve Body
6. Clamp
7. Deflector
8. Hose
9. Valve Door
10. Clamp
11. Bolt

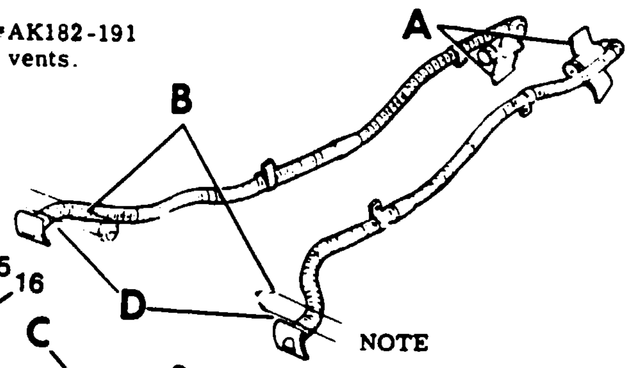
T182 18267716 & ON

Figure 14-1. Heating and Defrosting Systems (Sheet 2 of 2)

NOTE

Cessna Accessory Kit *AK182-191 also installs the aft air vents.





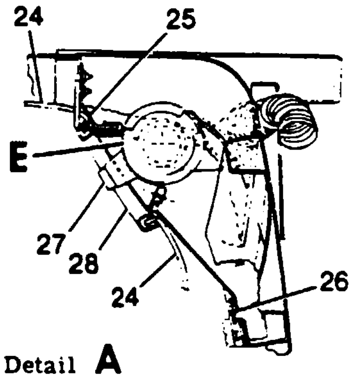
NOTE

Thoroughly saturate all seals with Miller Stephenson Co. Inc. *MS-122 (MIL-L-60326, Type I) release agent/dry lubricant spray.

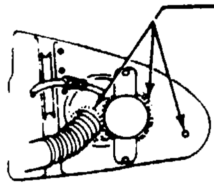
18265176 THRU 18267715
F18200026 THRU 18200169

☆ Adjust end of cabin air control to allow fresh air door (18) to open 0.80-inch.

1. Elbow Assembly
2. Nutplate
3. Air Scoop
4. Rib
5. Tube Assembly
6. Seal
7. Nut
8. Washer
9. Washer
10. Seal
11. Bullet Catch
12. Outlet Assembly
13. Knob
14. Washer
15. Screw
16. Insert
17. Fuselage Skin
18. Fresh Air Door
19. Clamp Bolt
20. Seal
21. Inlet
22. Clamp
23. Hose
24. Headliner
25. Bracket
26. Bracket
27. Valve Assembly
28. Escutcheon
29. Wheel
30. Housing
31. Tube Assembly (Inner)
32. Connector
33. Element



Seal with RTV102 (white) or RTV103 (black), typical LH & RH sides.

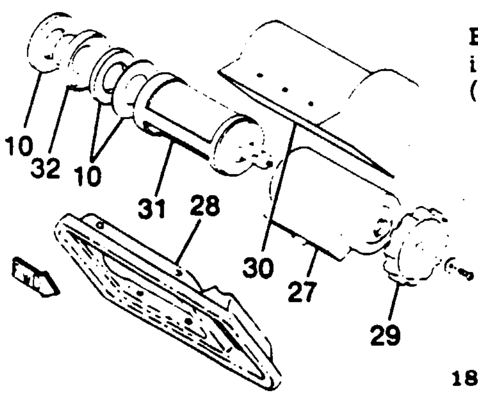


Detail D

NOTES

Trap headliner (24) between housing (30) and escutcheon (28). (Typical entire perimeter of escutcheon.

Beginning with Serial 18268335, install screw (15) through insert (16) to provide attachment.

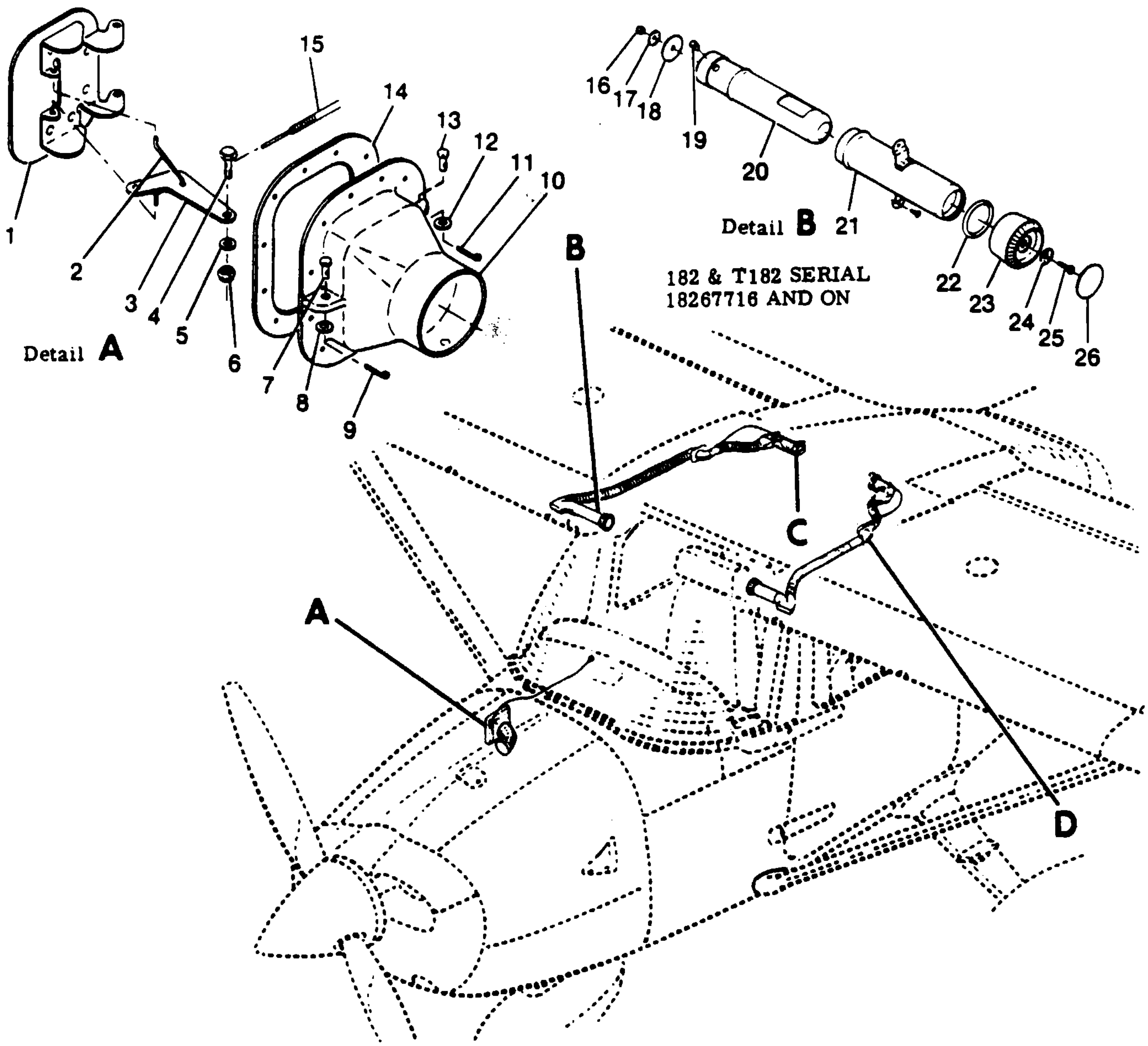


Detail E

18265176 THRU 18268293
F18200026 THRU 18200169

T182 18267716 THRU 18268293

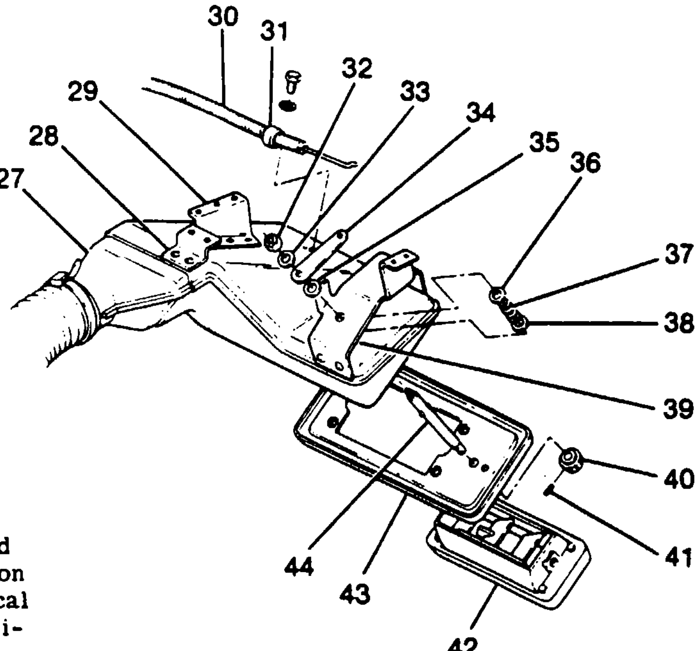
Figure 14-2. Ventilating System (Sheet 1 of 3)



1. Door Assembly
2. Link
3. Lever
4. Clamp Bolt
5. Washer
6. Nut
7. Pin
8. Washer
9. Cotter Pin
10. Housing
11. Cotter Pin
12. Washer
13. Pin
14. Seal
15. Control
16. Nut
17. Washer
18. Washer
19. Bullet Catch
20. Outlet Assembly
21. Tube Assembly
22. Packing
23. Knob
24. Washer
25. Screw
26. Insert

BEGINNING WITH 18268294

Figure 14-2. Ventilating System (Sheet 2 of 3)



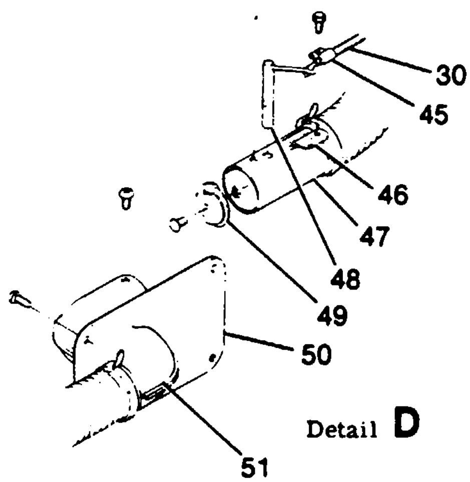
Detail C

NOTE

Tighten nut (32) securely and cement to shaft (44) with Epon 815, Epon 828 (Shell Chemical Co., Plastics and Resin Division, Houston, Texas) or equivalent.

Elbow (51) is bonded to plate (50) with RTV-102 (white) or RTV-103 (black) (General Electric, Waterford, N.Y.)

Adjust casing of control (30) in clamps (31) and (45) such that when knob (40) is in OFF position, valve assembly (49) seals tightly in tube (47), shutting off outside (fresh) air. Rigging of valve assembly (49) is not required when knob (40) is in ON position.

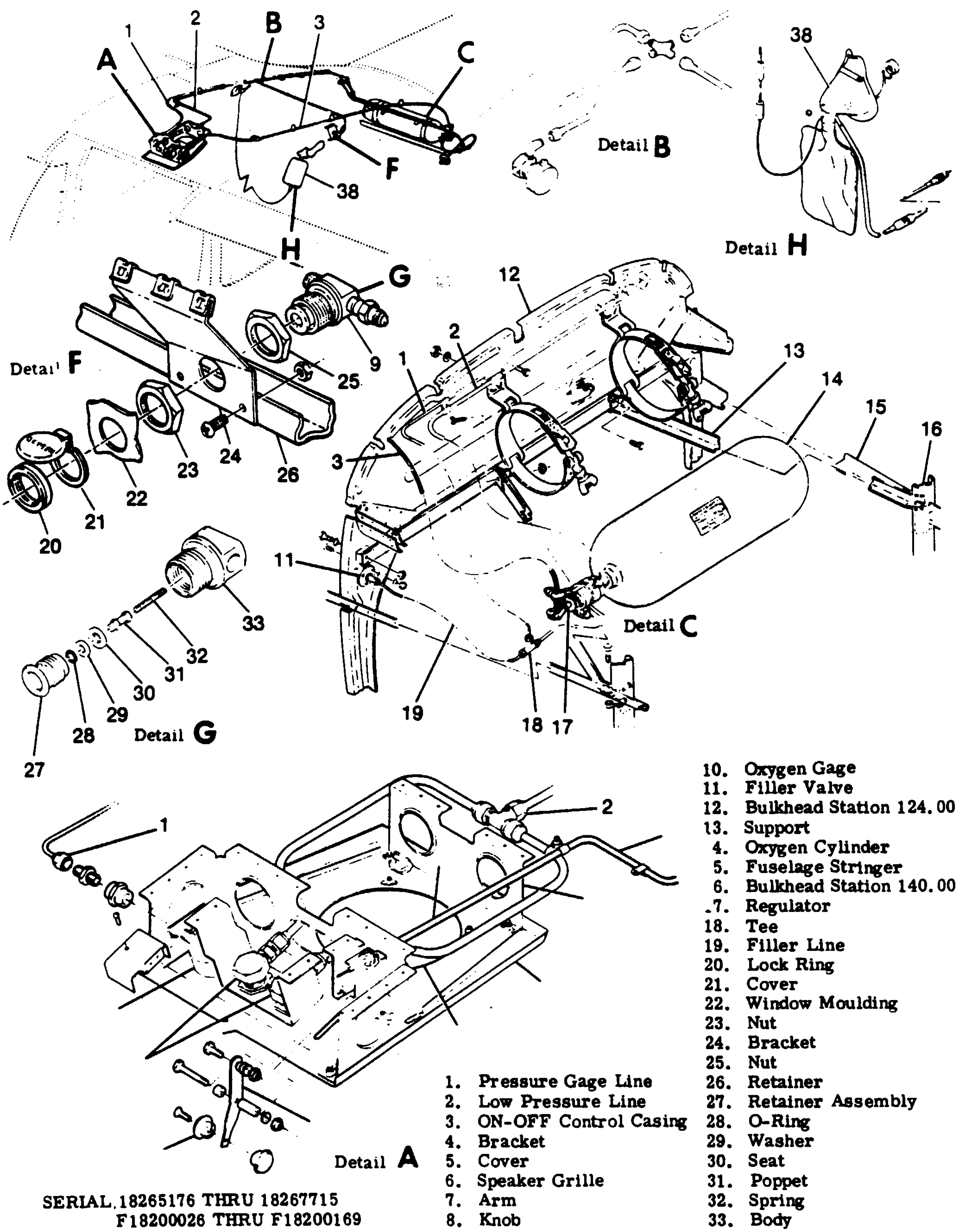


Detail D

27. Adapter
28. Bracket
29. Bracket
30. Control
31. Clamp
32. Nut
33. Washer
34. Control Arm
35. Washer
36. Washer
37. Spring
38. Washer
39. Bracket
40. Knob
41. Setscrew
42. Louver
43. Cover
44. Shaft
45. Clamp
46. Bracket
47. Tube
48. Shaft Assembly
49. Valve Assembly
50. Plate
51. Elbow

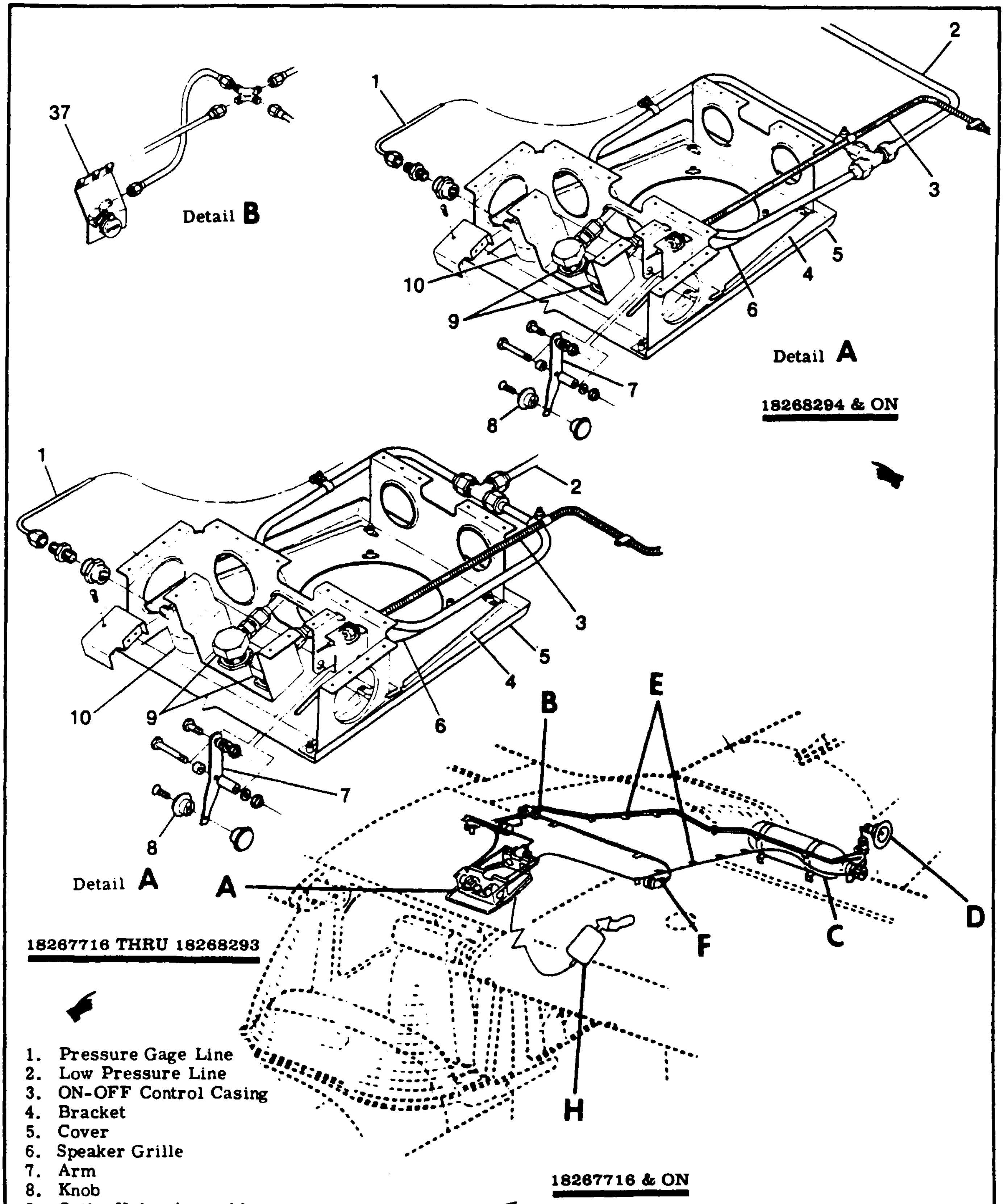
BEGINNING WITH 18268294

Figure 14-2. Ventilating System (Sheet 3 of 3)



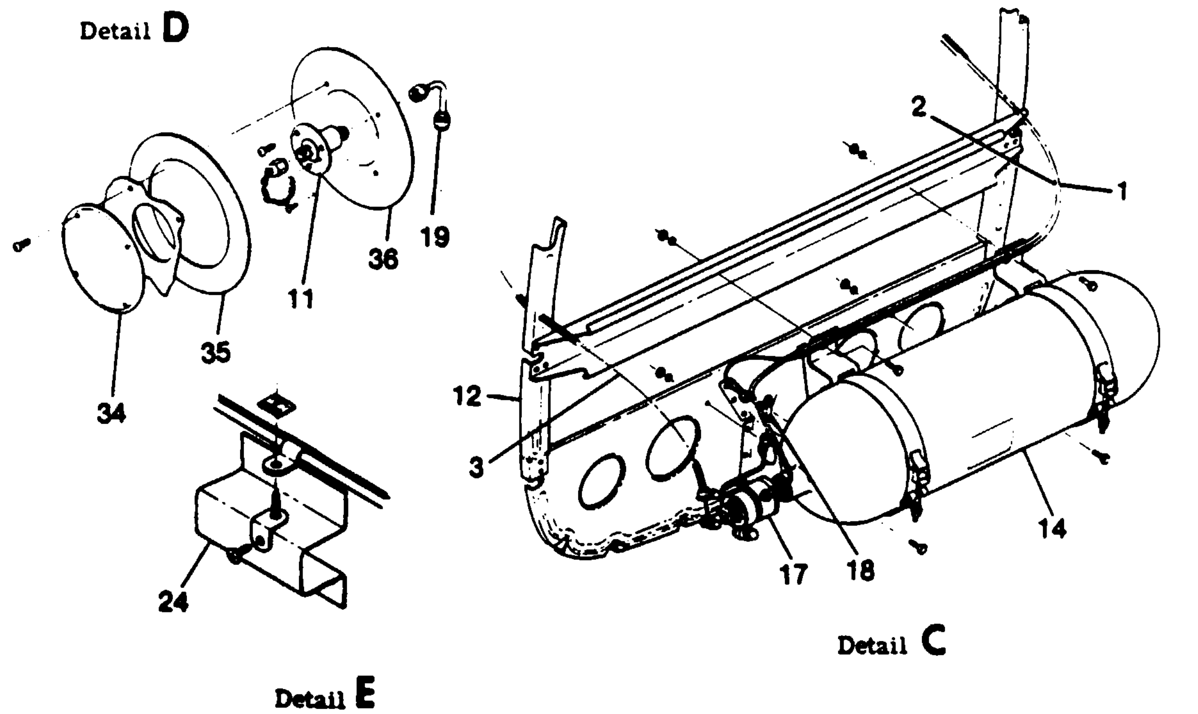
1. Pressure Gage Line
2. Low Pressure Line
3. ON-OFF Control Casing
4. Bracket
5. Cover
6. Speaker Grille
7. Arm
8. Knob
9. Outlet Valve Assembly
10. Oxygen Gage
11. Filler Valve
12. Bulkhead Station 124.00
13. Support
4. Oxygen Cylinder
5. Fuselage Stringer
6. Bulkhead Station 140.00
.7. Regulator
18. Tee
19. Filler Line
20. Lock Ring
21. Cover
22. Window Moulding
23. Nut
24. Bracket
25. Nut
26. Retainer
27. Retainer Assembly
28. O-Ring
29. Washer
30. Seat
31. Poppet
32. Spring
33. Body
38. Oxygen Mask

Figure 14-3. Oxygen Systems (Sheet 1 of 3)

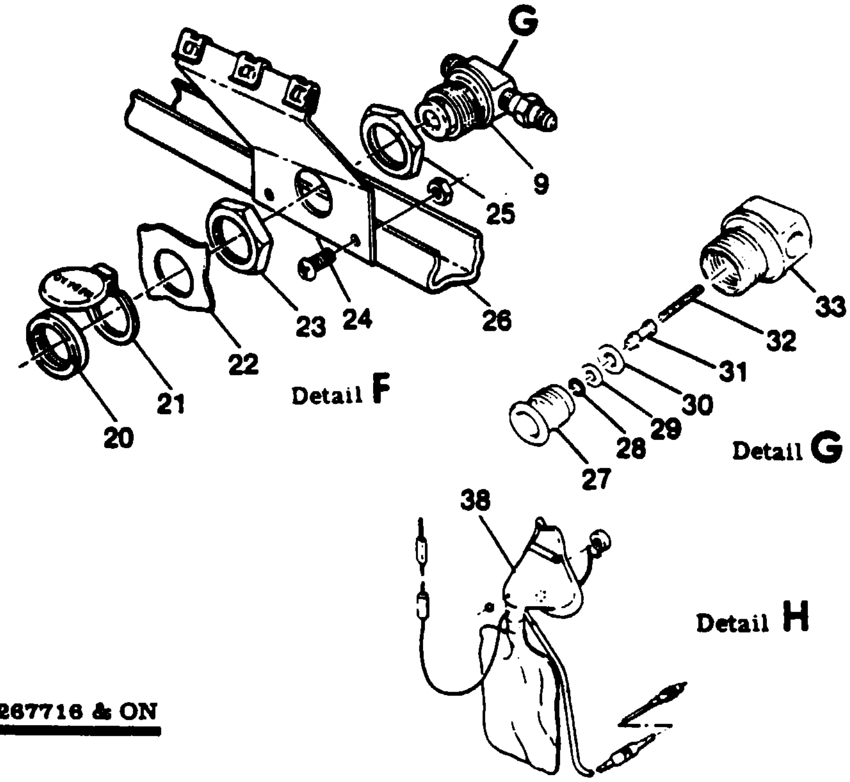


1. Pressure Gage Line
2. Low Pressure Line
3. ON-OFF Control Casing
4. Bracket
5. Cover
6. Speaker Grille
7. Arm
8. Knob
9. Outlet Valve Assembly
10. Oxygen Gage
37. Bracket

Figure 14-3. Oxygen Systems (Sheet 2 of 3)



1. Pressure Gage Line
2. Low Pressure Line
3. ON-OFF Control Casing
9. Outlet Valve Assembly
11. Filler Valve
12. Bulkhead Station 124.00
17. Regulator
18. Tee
19. Filler Line
20. Lock Ring
21. Cover
22. Window Moulding
23. Nut
24. Bracket
25. Nut
26. Retainer
27. Retainer Assembly
28. O-Ring
29. Washer
30. Seat
31. Poppet
32. Spring
33. Body
34. Access Plate
35. Spacer
36. Adapter Assembly
38. Oxygen Mask



18267716 & ON

Figure 14-3. Oxygen Systems (Sheet 3 of 3)

14-17. OXYGEN SYSTEM. (See figure 14-3.)

14-18. DESCRIPTION. The oxygen system consists of an oxygen cylinder. pressure gage, regulator assembly. control assembly, filler valve, pressure lines. outlets and oxygen masks with line assemblies. The pilot's mask is designed to provide a greater flow of oxygen than the passengers' oxygen masks. The masks are color-coded with a sleeve adjacent to the quick-connect adapter to indicate altitude ratings. The pilot's color code is red, and the passengers' color code is orange. The volume of oxygen is controlled by an orifice in the connector. A built-in flow meter provides a visual indication of correct oxygen flow. The pilot's mask is equipped with a microphone that is keyed by a switch button on the pilot's control wheel. Oxygen valve outlets are located overhead of each station. Low-pressure oxygen is provided to each mask when mask line is connected to an oxygen valve outlet. A gage to measure pressure of oxygen in cylinder is located immediately adjacent to the oxygen valve outlet in the overhear console. The control assembly consists of a knob-cable apparatus which turns the oxygen supply off and on. The control is located in the overhead console. The control is connected to the cylinder-regulator assembly by a control cable. The oxygen cylinder is mounted on the aft side of bulkhead station 124.0. A circular access plate, located on the left-hand side of the fuselage provides access to the oxygen filler valve assembly.

14-19. TROUBLE SHOOTING - Oxygen System.

TROUBLE	PROBABLE CAUSE	REMEDY
NO PRESSURE INDICATION ON PRESSURE GAGE (OXYGEN NOT DEPLETED).	Leak in capillary line connection.	Correct leakage.
	Crimped or damaged capillary line.	Replace line.
OXYGEN DURATION IS TOO SHORT.	Defective pressure gage.	Replace gage.
	Leak in system.	Locate and tighten loose fittings.
	Defective part.	Functionally test system. Replace defective part.
PRESSURE INDICATION NORMAL. BUT NO FLOW OF OXYGEN WITH CYLINDER REGULATOR ON.	Defective cylinder regulator	Replace cylinder regulator.
	Crimped or damaged lines.	Replace damaged lines.
	Damaged control cable.	Replace control cable.

14-20. MAINTENANCE PRECAUTIONS.

NOTE

Before any maintenance is performed on the oxygen system, personnel should read and thoroughly understand the following. Careful adherence to these instructions will aid in maintaining a trouble-free oxygen system.

WARNING

Do not permit smoking or open flame near aircraft while maintenance is being performed on the oxygen system. Assure that all electrical power is disconnected and that the aircraft is properly grounded. In addition, oils, grease and solvents may burn or explode spontaneously when contacted by oxygen under pressure.

a. Use extreme caution to assure every port on the system is kept thoroughly clean and free of water, oil, grease and solvent contamination.

b. Cap all openings immediately upon removal of any component. Do not use tape or caps which will induce moisture.

c. Lines and fittings shall be clean and dry. One of the following methods may be used to clean lines.

CAUTION

Most air compressors are oil-lubricated. and a small amount of oil may be carried by the airstream into the system. A water-lubricated compressor can be used to blow tubing clean only when nitrogen or argon are not available. However, air from such a compressor must be clean, dry and filtered..

(1) Wash with a vapor-degreasing solution of stabilized trichloroethylene conforming to MIL-T-7003, followed by blowing tubing clean and drying with a jet of nitrogen gas (BB-N-411) Type 1. Class 1. Grade A or Technical Argon (MIL-A-18455).

(2) Flush with naptha conforming to Specification TT-N-95; then blow clean and dry with clean, dry filtered air. Flush with anti-icing fluid conforming to MIL-F-5566 or anhydrous ethyl alcohol. Rinse

thoroughly with fresh water and dry with a jet of nitrogen gas (BB-N-411) Type 1. Class 1. Grade A or Technical Argon (MIL-A-18455).

(3) Flush with hot inhibited alkaline cleaner until free from oil and grease. Rinse with fresh water and dry with a jet of nitrogen gas (BB-N-411) Type 1. Class 1. Grade A or Technical Argon (MIL-A-18455).

NOTE

Cap all lines immediately after drying.

d. Fabrication of pressure lines is not recommended. Lines should be replaced from the factory by part number.
e. Use only S1465 Teflon lubricating tape on threads of male fittings. No lubricating tape is to be used on coupling sleeves or outside of flares.
f. Maintenance personnel must assure that their hands are free of dirt and grease prior to installing oxygen tubing or fittings.

WARNING

Use only nonsparking tools.

CAUTION

With oxygen cylinder charged, do not pull control to "ON" position with outlet ports (low pressure) open to atmosphere. Damage to regulator metering poppet may occur.

CAUTION

Whenever a component of the oxygen system has been removed, reinstalled, replaced or the system has been disassembled for any reason, the oxygen system must be leak checked and purged.

g. All tools used for installing oxygen tubes or fittings must be free of dirt, grease and oils.

14-21. OXYGEN CYLINDER GENERAL INFORMATION. The following information is permanently stamped on the shoulder, neck or top head of the oxygen cylinder to aid in proper identification.
a. Cylinder specification followed by service pressure, such as "ICC or DOT-3AA1800".

NOTE

Effective 1 January 1970, all newly-manufactured cylinders are stamped "DOT" (Department of Transportation), rather than "ICC" (Interstate Commerce Commission). An example of the new designation would be "DOT-3AA1800".

b. Cylinder serial number is stamped below or directly following the cylinder specification. The symbol of the purchaser, user or maker, if registered with the Bureau of Explosives, may be located directly below or following the serial number. The cylinder serial number may be stamped in an alternate location on the cylinder top head.
c. Inspector's official mark near serial number.
d. Date of manufacture: This is the date of the first hydrostatic test (such as 8-82 for August 1982). The dash between the month and the year figures may be replaced with the mark of the testing or inspection agency (e.g. 8L81).
e. Hydrostatic test date: The dates of subsequent hydrostatic tests shall be steel stamped (month and year) directly below the original manufacturer date. The dash between the month and year figures can be replaced with the mark of the testing agency.
f. A Cessna identification placard is located near the center of the cylinder body.
g. Halogen test stamp: "Halogen Tested", date of test (month, day and year) inspector's mark appears directly underneath the Cessna identification placard.

14-22. CYLINDER-REGULATOR. The cylinder-regulator assembly consists of a 48.0 cubic foot capacity cylinder with a factory-assembled, non field-serviceable regulator. The cylinder is classified as standard weight DOT 3AA1800 and is subject to periodic inspections. Standard weight DOT 3AA-1800 cylinders must be hydrostatically tested to 5/3 their working pressure every five years, commencing with the date of the last hydrostatic test. Standard weight DOT 3AA1800 cylinders have no age life limitations and may continue to be used until they fail hydrostatic test.

NOTE

These test periods and life limitations are established by the Interstate Commerce Commission Code of Federal Regulations, Title 49, Chapter 1, Para. 73.34

14-23. SERVICING OXYGEN CYLINDER - REGULATOR. A circular access place is provided on the left side of the fuselage, just aft of bulkhead station 140.00. This provides access to the oxygen system filler valve assembly.

WARNING

Oil, grease or other lubricants, in contact with high pressure oxygen, create a serious fire hazard, and such contact should be avoided. Do NOT permit smoking or open flame in or near aircraft while work is being performed on oxygen systems.

a. Breathing oxygen conforming to MIL-O-27210D, must be used.
b. Check oxygen system pressure gage.

WARNING

Be sure to ground aircraft and ground servicing equipment before charging oxygen system.

c. Do not attempt to charge oxygen cylinder if servicing equipment fittings or filler valve are corroded or contaminated. If in doubt, clean with stabilized trichloroethylene and let air dry. Do not allow solvent to enter any internal parts.

d. If cylinder is completely empty, do not charge, as the cylinder must be removed, inspected and cleaned.

CAUTION

A cylinder which is completely empty may be contaminated. The regulator-cylinder assembly must then be disassembled, inspected and cleaned by an FAA-approved facility, before filling. Contamination, as used here, means dirt, dust or any other foreign material, as well as ordinary air in large quantities. If a gage line or filler line is disconnected and the fittings capped immediately, the cylinder will not become contaminated unless temperature variation has created a suction within the cylinder. Ordinary air contains water vapor which could condense and freeze. Since there are very small orifices in the system, it is very important that this condition not be allowed to occur.

e. Connect cylinder valve outlet or outside filler valve to a manifold or a portable oxygen cascade.

f. Slowly open valve on cascade cylinder or manifold with lowest pressure, as noted on pressure gage, allow pressure to equalize, then close cascade cylinder valve.

g. Repeat this procedure, using a progressively higher pressure cascade cylinder, until system has been charged to the pressure indicated in the chart immediately following step "h".

h. Ambient temperature listed in the chart is the air temperature in the area where the system is to be charged. Filling pressure refers to the pressure to which aircraft cylinders should be filled. This table gives approximations only, and assumes a rise in temperature of approximately 25°F. due to heat of compression. This table also assumes the aircraft cylinder will be filled as quickly as possible and that they will only be cooled by ambient air; no water bath or other means of cooling be used.

AMBIENT TEMP °F	FILLING PRESSURE PSIG
0	1600
10	1650
20	1675
30	1725
40	1775
50	1825
60	1875
70	1925
80	1950
90	2000
100	2050
110	2100
120	2150
130	2200

14-24. REMOVAL OF OXYGEN CYLINDER - REGULATOR (See figure 14-3.)

a. Remove aft baggage partition to gain access to oxygen cylinder - regulator assembly.

b. Straighten cable end of ON-OFF control casing (3) at regulator (17).

c. Loosen cable clamp and cable housing clamp. Remove cable casing (3) from regulator (17).

d. Remove and cap high pressure gage line (1) at tee (18).

e. Remove and cap high pressure gage line (2) at regulator (17).

f. Loosen clamps securing oxygen cylinder (14).

g. Remove oxygen cylinder (14).

14-25. INSTALLATION OF OXYGEN CYLINDER - REGULATOR. (See figure 14-3.)

a. Slip clamps over oxygen cylinder (14), ensuring that orientation is correct for installation of lines (1) and (2) and control casing (3); secure oxygen cylinder.

b. Uncap and install low pressure line (2) at regulator (17).

c. Uncap and install high pressure gage line (1) at tee (18).

d. Insert ON-OFF control casing (3) in cable clamp and cable housing clamp at regulator (17).

e. Test operate oxygen system to ensure that arm (7) will function properly.

f. Bend cable end of ON-OFF control casing (3) 90°.

g. Reinstall aft baggage partition.

14-26. INSPECTION OF OXYGEN CYLINDER - REGULATOR.

a. A careful visual inspection of the oxygen cylinder should be performed during routine maintenance and periodic inspections. If any bad dents, scratches or areas of corrosion are found, the cylinder must be checked in accordance with the following chart: Inspection Criteria for Acceptance of Oxygen Cylinders.

NOTE

If the acceptability of the cylinder is questionable after using inspection criteria, return cylinder to manufacturer.

Discrepancies	Tolerance (Inches)	See Note
Isolated pitting or corrosion (Depth)	0.010	1 2
Local pitting or corrosion or line corrosion (Depth)	0.005	2 3
General corrosion	Not allowed	4
Cuts, digs, gouges (Depth)	0.005	5
Dents (Depth)	0.031	6
Fire damage	Not allowed	7
Bulges	Not allowed	8

NOTES

1. Isolated pits of small cross section involving loss of wall thickness by corrosive media. Small isolated pits with a maximum depth as shown are acceptable.

2. If depth exceeds figure shown, cylinder must be returned to the manufacturer for disposition.

3. Local pitting or corrosion or line corrosion involving loss of wall thickness by corrosive media with a pattern of pits which are connected to others in a band or line. A small area with a minimum depth as shown is acceptable. Areas extending beyond 3-inches in diameter or 4-inches long shall be considered general corrosion.

4. General corrosion (sometimes accompanied by pitting) involving loss of wall thickness by corrosive media covering a considerable area. Cylinder must be returned to the manufacturer for hydrostatic testing.

5. Deformations caused by contact with a sharp object cutting or upsetting the material of the cylinder must be returned to the manufacturer for removal of defects and verification of cylinder strength by hydrostatic testing.

6. Deformations caused by contact with blunt objects in such a manner that the thickness of the metal is not impaired. The major diameter of the dent must be equal to or greater than 32 times the depth of the dent. Sharper dents (or deeper dents) than this are considered too abrupt and must be returned to the cylinder manufacturer for disposition.

7. Fire damage is indicated by charring or burning or sintering of the metal, charring or burning of the paint, distortion of the cylinder, functioned safety relief devices, melting of valve parts, etc. Cylinders must be returned to the cylinder manufacturer for disposition.

8. Bulged cylinders are not acceptable. Cylinders must be returned to the cylinder manufacturer for disposition.

NOTE

The preceding data must be used to determine that oxygen cylinders are acceptable for service. This criteria should be used prior to charging cylinders.

b. Regulator shall be removed and overhauled by the manufacturer or an FAA-approved facility during hydrostatic testing.
c. Actuate regulator controls and valve to check for ease of operation.

CAUTION

Damage to regulator will occur if the control of a charged oxygen cylinder is turned ON with the low pressure side of the regulator open to the atmosphere.

d. Pressurize the system and check for leaks.

14-27. OXYGEN FILLER VALVE. (See figure 14-3.)

14-28. DESCRIPTION. Thru 18267715 and F182-00169, the oxygen filler valve is mounted on the aft, left-hand side of bulkhead Station 124.0. Beginning with 18267716, the oxygen filler valve is mounted on the left fuselage skin, aft of bulkhead Station 140.0.

14-29. REMOVAL. (Thru 18266715 and F18200169.) (See figure 14-3.)
a. Remove aft baggage partition for access.
b. Remove filler line (19) from filler valve (11); cap filler line.
c. Remove nuts, washers and screws securing filler valve (11) to bulkhead; remove filler valve.

14-30. INSTALLATION. (Thru 18267715 and F182-00169.) (See figure 14-3.)
a. Install filler valve (11) in mounting hole in bulkhead, install screws, washers and nuts; tighten nuts.
b. Uncap filler line (19) and attach to filler valve (11).

14-31. REMOVAL. (Beginning with 18267716.) (See figure 14-3.)
a. Remove access plate (34) from fuselage skin.
b. Remove filler line (19) from filler valve (11); cap filler line.
c. Remove screws attaching filler valve (11) to adapter assembly (36).
d. Remove filler valve (11) from adapter assembly (36).
e. Remove spacer (35).

14-32. INSTALLATION. (Beginning with 18267716.) (See figure 14-3.)
a. Install filler valve (11) in adapter assembly (36) and secure with screws.
b. Install adapter assembly (36) and spacer (35).
c. Install access plate (34) to fuselage skin and adapter assembly (36) with screws.
d. Uncap filler line (19) and attach to filler valve (11).

14-33. OXYGEN LINES. (See figure 14-3.)

14-34. DESCRIPTION. A pressure line is routed from the oxygen cylinder regulator to the pressure gage, located in the overhead console, above the pilot and copilot stations. A line is routed from the oxygen cylinder regulator to a tee, adjacent to the regulator. A line is routed from the tee to the oxygen filler valve. A line is routed from the tee to the union, located along the right fuselage sidewall. A line is routed from the union to a cross, installed above the cabin headliner at fuselage station 77.50. Two lines are routed from the cross, one to the left passenger oxygen supply outlet, and one to the right passenger oxygen outlet valve assembly. A line is routed from the cross to a tee, located at the aft end of the overhead console. Two lines are routed from the tee, one to the pilot's oxygen outlet valve assembly, and one to the copilot's oxygen outlet valve assembly, both installed in the overhead console.

14-35. REMOVAL AND INSTALLATION. (See figure 14-3.) Assure that the oxygen control is off. Access to the various lines is gained by removing the cabin headliner and/or appropriate upholstery side panels, depending on line location. Removal and installation procedures for cabin headliner and upholstery side panels are outlined in Section 3 of this manual. Lines are secured by clamps and/or nylon ties. Whenever ties are removed, replace with new ties.

NOTE

Observe all cautions, warnings, precautions and procedures outlined in paragraph 14-20 when removing or installing oxygen lines.

14-36. OUTLET VALVE ASSEMBLIES. (See figure 14-3.)

14-37. DESCRIPTION. The pilot and copilot outlet valve assemblies are mounted in the overhead console. Passenger outlet valve assemblies are mounted overhead and outboard of each passenger station.

4-38. REMOVAL OF PASSENGER OUTLET VALVE ASSEMBLY. (See figure 14-3.)

NOTE

Ensure oxygen control is OFF.

a. Remove lock ring (20) and cover (21).
b. Remove window moulding (22).
c. Remove cabin headliner as outlined in Section 3 of this manual.
d. Remove nut (23).
e. Remove bracket (24).
f. Disconnect oxygen line from outlet valve assembly, and cap line.
g. Remove nut (25).
h. Remove outlet valve assembly.

14-39. INSTALLATION OF PASSENGER OUTLET VALVE ASSEMBLY. (See figure 14-3.)
a. Install nut (25) on threads of outlet valve assembly, and install outlet valve assembly in mounting hole of retainer (26); tighten nut (25).
b. Uncap and connect oxygen line to outlet valve assembly.
c. Install bracket (24).
d. Install and tighten nut (23).
e. Turn oxygen control ON and test connection for leaks.
f. Install cabin headliner as outlined in Section 3 of this manual.
g. Install window moulding.
h. Install cover (21) and lock ring (20).

14-40. REMOVAL OF PILOT AND/OR COPILOT OUTLET VALVE ASSEMBLY. (See figure 14-3.)

NOTE

Ensure oxygen control is OFF.

a. Remove overhead console.
b. Disconnect oxygen line at rear of outlet valve assembly; cap oxygen line.
c. Remove nut (25).
d. Remove outlet valve assembly.

14-41. INSTALLATION OF PILOT AND/OR COPILOT OUTLET VALVE ASSEMBLY. (See figure 14-3.)
a. Install outlet valve assembly in mounting hole of bracket (37).
b. Install and tighten nut (25).
c. Uncap and install oxygen line at rear of outlet valve assembly.
d. Turn oxygen control ON and test connection for leaks.
e. Install overhead console.

14-42. INSPECTION/TEST OF OXYGEN OUTLET VALVE ASSEMBLIES.
a. Assure that oxygen system is fully charged.
b. Insert an oxygen outlet adapter, connected to a pressure gage, into the oxygen outlet valve.
c. Test retainer assembly (27)/adapter junction for leaks with fluid leak detector. No bubbles are permitted.
d. After completion of leak tests, fully charge oxygen system as outlined in paragraph 14-23.

14-43. OXYGEN SYSTEM FUNCTIONAL TEST.

NOTE

Whenever the oxygen system regulator (cylinder-regulator assembly) has been replaced or overhauled, perform a flow test to determine that system functions properly.

a. Fully charge the oxygen system as outlined in paragraph 14.23.
b. Install an oxygen outlet adapter into a pressure gage (calibrated in one pound increments from 0 to 100 PSIG) and insert adapter into pilot's oxygen outlet valve assembly.
c. Turn oxygen system ON. Pressure should be 70±10 PSIG. If pressure does not fall within these tolerances, replace cylinder-regulator and repeat test.
d. Recharge oxygen system as required as outlined in paragraph 14-23.

14-44. OXYGEN GAGE. (See figure 14-3.)

14-45. DESCRIPTION. The oxygen gage is located on the right-hand side of the overhead console. The oxygen gage is calibrated from 0 to 2000 PSI.

14-46. REMOVAL. (See figure 14-3.)

NOTE

The system does not have to be discharged before removing high pressure lines as there is a check valve in the regulator to shut off the flow of oxygen when a connection is broken. Ensure the system is OFF.

a. Remove aft baggage partition for access to oxygen cylinder-regulator assembly.
b. Disconnect pressure gage line (1) at tee (18).
c. Remove overhead console for access to pressure gage (10).
d. Disconnect pressure gage line (1) from pressure gage (10); remove pressure gage by unscrewing bezel and removing clear lens.

14-47. INSTALLATION. (See figure 14-3.)
a. Install pressure gage (10) in overhead console, install clear lens and screw bezel on pressure gage threads, attaching pressure gage to overhead console.
b. Connect pressure gage line (1) to pressure gage (10).
c. Connect pressure gage line (1) to tee (18).
d. Turn oxygen control ON and test for leaks.
e. Install aft baggage partition.
f. Install overhead console.

NOTE

Pressure gage is not repairable and must be tested by the manufacturer every 3000 flight hours or three years, whichever comes first.

14-48. INSPECTION. The only inspection possible is to observe indicated pressure rise as the system is charged and decrease as oxygen is bled off.

14-49. OXYGEN MASKS.

14-50. DESCRIPTION. One pilot's mask and three passengers' masks are provided with the aircraft. The pilot's mask has a built-in microphone and also provides a greater flow of oxygen. The masks are of the constant-flow type, with a metering orifice in the quick-connect adapter. A flowmeter built into the line, approximately six-inches from the connector, provides a visual indication of proper oxygen flow, showing red when no flow is taking place, red and green with a partial flow, and green with full flow. The masks are color-coded by a sleeve adjacent to the quick-connect adapter; red for pilot, 22,000 to 30,000 foot altitude rating, and orange for passenger, 14,000 to 22,000 foot rating.

14-51. INSPECTION.
a. Check oxygen masks for cracks and rough face seals.
b. Flex mask hose gently over its entirety and check for evidence of deterioration or dirt.
c. Examine mask and hose storage compartment for cleanliness and general condition.
d. Observe that each mask breathing tube end is free of nicks, and that the tube end will slip into the cabin oxygen receptacle with ease and will not leak.
e. If a mask assembly is defective (leaks, does not allow breathing or contains a defective microphone), it is advisable to return the mask assembly to the manufacturer or an FAA-approved repair station.
f. Replace hose if it shows evidence of deterioration.

14-52. CLEANING.
a. Clean and disinfect mask assemblies after use with rubbing alcohol, as appropriate.
b. If installed, remove microphone from mask.

CAUTION

Do not allow rubbing alcohol to enter microphone or electrical connections.

c. Apply rubbing alcohol to mask with a cotton swab or the equivalent, as required, to remove contamination.
d. If used, install microphone.

14-53. FUNCTIONAL TEST.

NOTE

Each mask should be periodically tested to ensure its correct functioning.

a. Turn oxygen control ON.
b. Insert oxygen mask adapter into its outlet valve assembly.
c. Observe that the flowmeter shows a proper flow of oxygen (indicator shows green only.)
d. Return mask to storage.
e. Recharge oxygen system as outlined in paragraph 14-23.

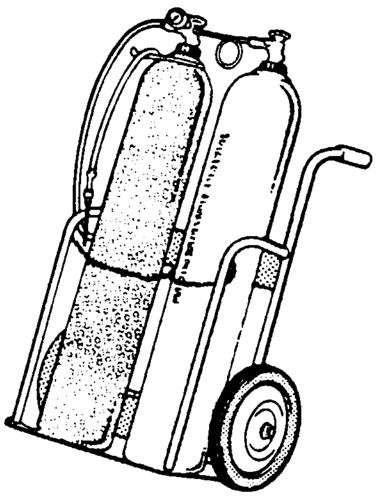
14-54. HEATED WINDSHIELD PANEL. (See figure 14-5.)

14-55. DESCRIPTION. The panel is constructed of two sheets of plate glass covering a layer of vinyl. Imbedded in the vinyl is a fine resistance wire which provides the heat for windshield anti-icing. The panel is installed in two brackets. The outboard bracket (10) is mounted on the cowl deck skin immediately forward of the lower left windshield retainer, and the inboard bracket (5) is mounted in the lower windshield retainer. The upper end of the panel is supported by a rubber bumper (12) which holds panel off the windshield. The lower end of the panel pivots in mounting brackets, providing easy cleaning between panel and windshield. Power to the heated panel is provided through an electrical plug located in cover assembly (13) mounted to the left of outboard mounting bracket (10). An ON-OFF switch and a circuit breaker labeled W/S A-ICE are installed in the switch panel.

14-56. REMOVAL AND INSTALLATION. (See figure 14-5.) Panel removal is accomplished by disconnecting connector (11) inside cover (13) and moving spring-loaded handles (8) in tube (9) toward center of panel,

NOTE

Each interconnected series of oxygen cylinders is equipped with a single gage. The trailer type cascade may also be equipped with a nitrogen cylinder (shown reversed) for filling landing gear struts, accumulators, etc. Cylinders are not available for direct purchase, but are usually leased and refilled by a local compressed gas supplier.



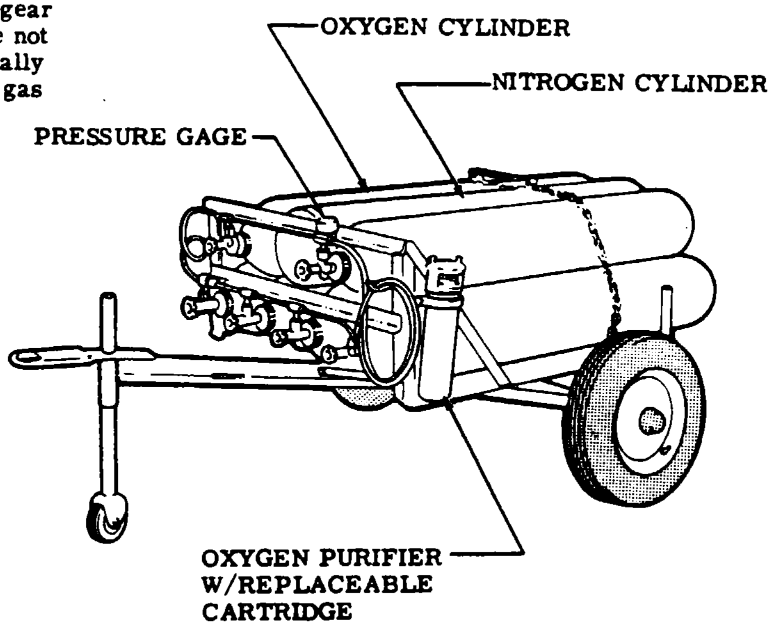
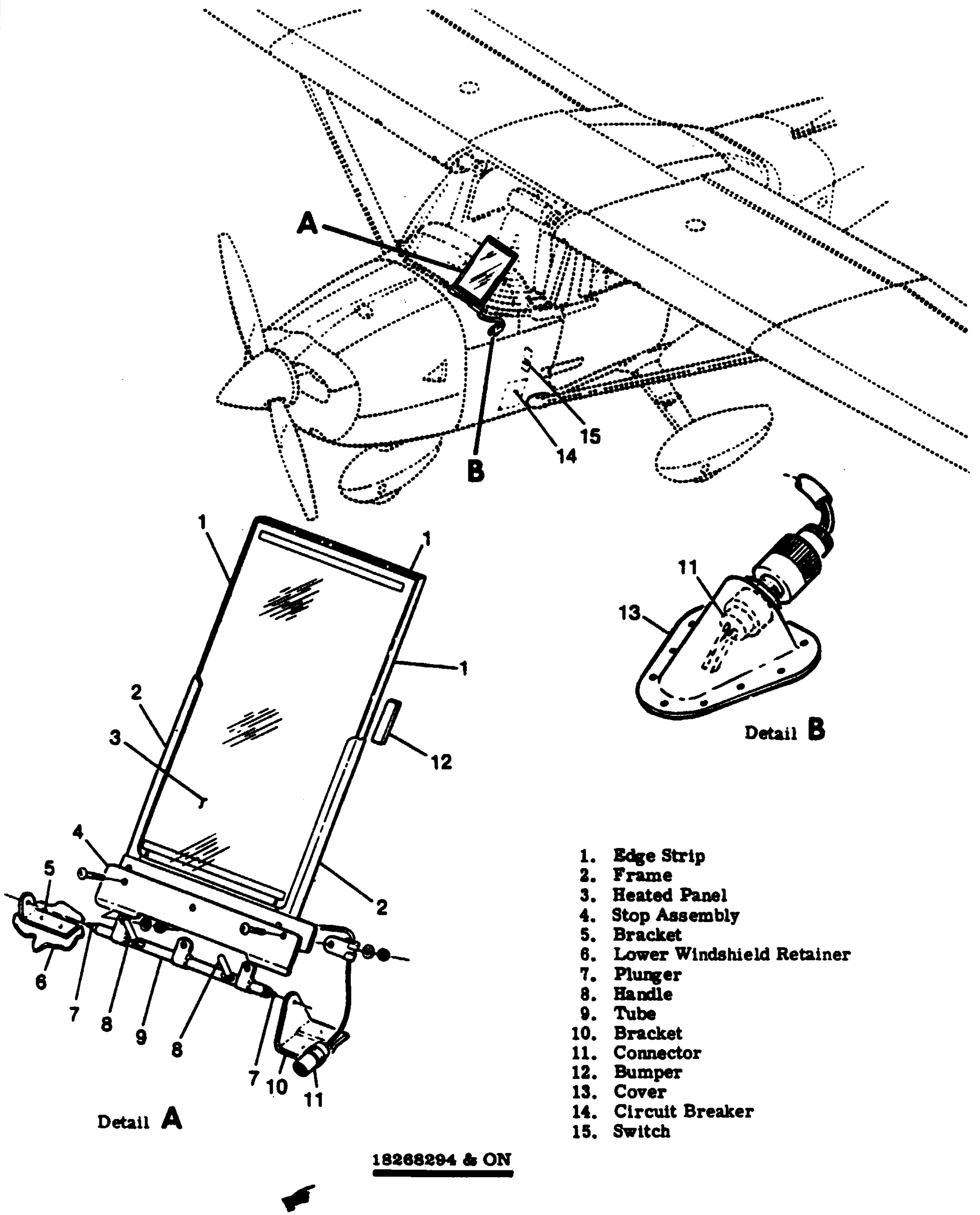


Figure 14-4. Portable Oxygen Cascades

releasing plungers (7) from holes in brackets (10) and (5). Panel installation is accomplished by reversing the preceding procedures.

14-57. PROPELLER DE-ICE SYSTEM. (B. F. Goodrich, 2-Bladed Propeller Installation.) (See figure 14-6.)

14-58. DESCRIPTION. The system is of an electrothermal type, consisting of electrically heated de-icer boots bonded to each propeller blade, a slip ring assembly for power distribution to the de-icers, a brush block assembly to transfer electrical power to the rotating slip ring, a timer to cycle electrical power to the de-icers in proper sequence, an ammeter, mounted in the instrument panel, a shunt, mounted on the forward side of the right hand stationary instrument panel, switch and a circuit breaker. The de-ice system applies heat to the surfaces of the propeller blades where ice would normally adhere. This heat, plus centrifugal force and the blast from the airstream, removes accumulated ice. When the de-ice switch is turned on, the timer provides power through the brush block and slip ring to a heating element on each blade for 90 seconds and off for 90 seconds. System components may be removed and replaced, using the figure as a guide. Propeller removal is necessary before de-ice system components, except the brush block assembly, can be installed or removed.



1. Edge Strip
2. Frame
3. Heated Panel
4. Stop Assembly
5. Bracket
6. Lower Windshield Retainer
7. Plunger
8. Handle
9. Tube
10. Bracket
11. Connector
12. Bumper
13. Cover
14. Circuit Breaker
15. Switch

Figure 14-5. Windshield Anti-Ice Installation

14-59. TROUBLE SHOOTING.

NOTE

The propeller de-ice ammeter may be used while trouble shooting the system. The ammeter needle should rest within the shaded band for 90 seconds while the system is heating, and then to zero for 90 seconds while the system is off.

TROUBLE	PROBABLE CAUSE	REMEDY
ELEMENTS DO NOT HEAT.	Circuit breaker out or defective.	Reset circuit breaker. If it pops out again, determine cause and correct.
	Defective wiring.	Repair or replace wiring.
	Defective switch.	Replace switch.
	Defective timer.	Replace timer.
	Defective brush-to-slip ring connection.	Check alignment. Replace defective parts.
CYCLING SEQUENCE NOT CORRECT OR NO CYCLING.	Crossed Connections	Correct wiring.
	Defective timer.	Replace timer.
RAPID BRUSH WEAR. FREQUENT BREAKAGE. SCREECHING OR CHATTERING.	Brush block or slip ring out of alignment.	Align properly.

14-60. TIMER TEST.

a. Remove connector plug of wire harness from timer and jump power input socket of wire harness to timer input pin. (Refer to chart following this paragraph for pin identification.)

b. Jump timer ground pin to ground.

c. Turn on de-ice system.

d. Check timer operation per the chart. (Use a voltmeter.)

e. Check volts to ground in each case. If engine is not running. and auxiliary power is not used. voltage will be battery voltage and cycle time may be slightly longer than indicated.

f. Hold voltmeter probe on the pin until the voltage drops to 0. Move the probe to the next pin in the sequence shown in the chart. Check voltage at each pin in sequence.

TIMER P/N	3E1899-1
POWER INPUT PIN	B (28VDC)
GROUND PIN	G (28VDC)
OUTPUT PIN	C (28VDC)
TIME REPEAT CYCLE TIME (SECONDS)	.90

14-61. SLIP RING ALIGNMENT. After installation, the slip ring assembly must be checked for run-out, and adjustments made. if necessary.

NOTE

Excessive slip ring run-out will result in severe arcing between the slip ring and brushes and cause rapid brush wear. If allowed to persist, this condition will result in rapid deterioration of the slip ring and brush contact surfaces, leading to eventual failure of the de-ice system.

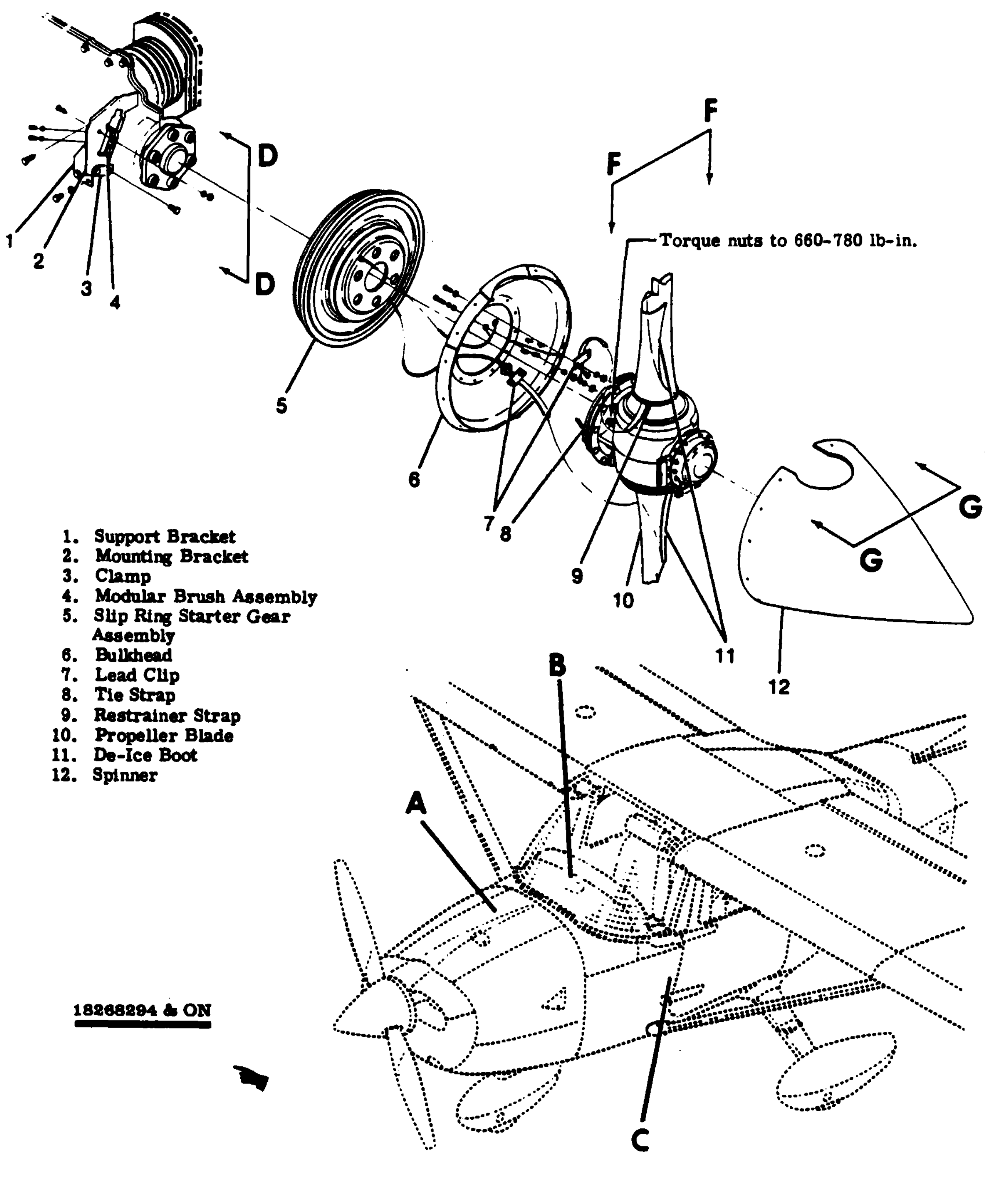
a. Securely attach dial indicator gage to engine. and place pointer on slip ring.

b. Rotate propeller slowly by hand. noting the deviation of the slip ring from a true plane as indicated on the gage.

c. Check that total run-out does not exceed 0.008-inch (±0.004-inch). Also check that run-out does not exceed 0.002-inch within any 4-inches of slip ring travel.

CAUTION

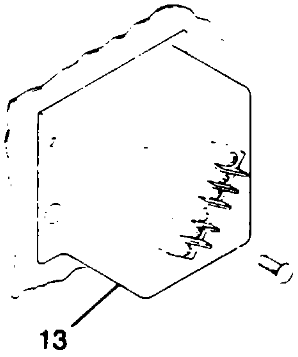
Due to the loose fit of some propeller thrust bearings, a considerable error may be indicated in the readings by pushing in or pulling out on the propeller while rotating it. Care must be taken to exert a uniform push or pull on the propeller to hold this error to a minimum.



1. Support Bracket
2. Mounting Bracket
3. Clamp
4. Modular Brush Assembly
5. Slip Ring Starter Gear Assembly
6. Bulkhead
7. Lead Clip
8. Tie Strap
9. Restrainer Strap
10. Propeller Blade
11. De-Ice Boot
12. Spinner

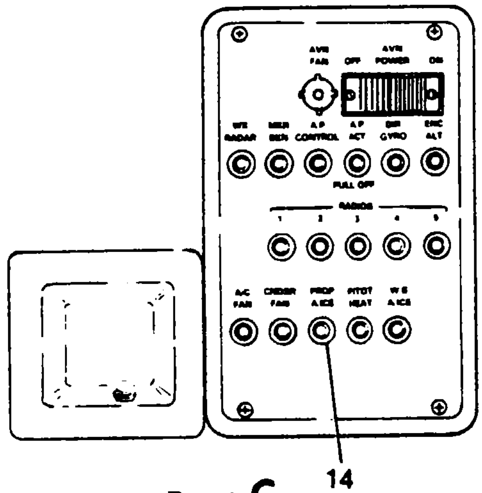
18268294 & ON

Figure 14-6. B. F. Goodrich 2-Bladed Propeller De-Ice System (Sheet 1 of 4)

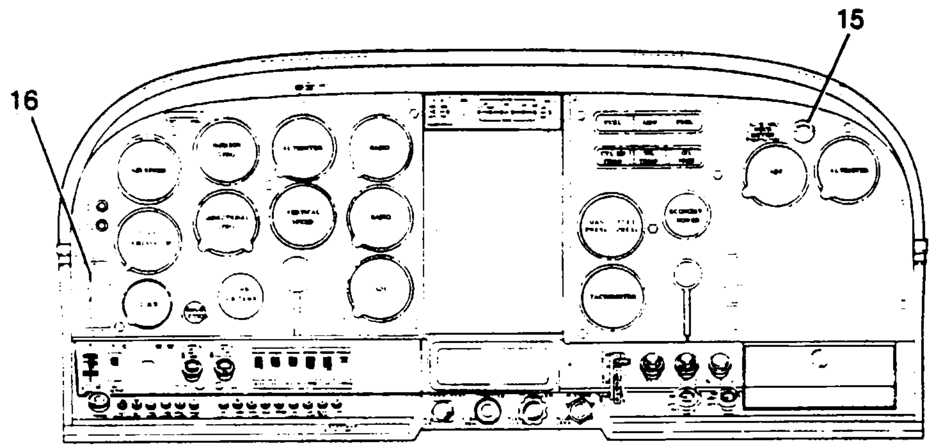


Detail A

13. Timer
14. Circuit Breaker
15. Propeller De-Ice Gage
16. Propeller De-Ice Switch



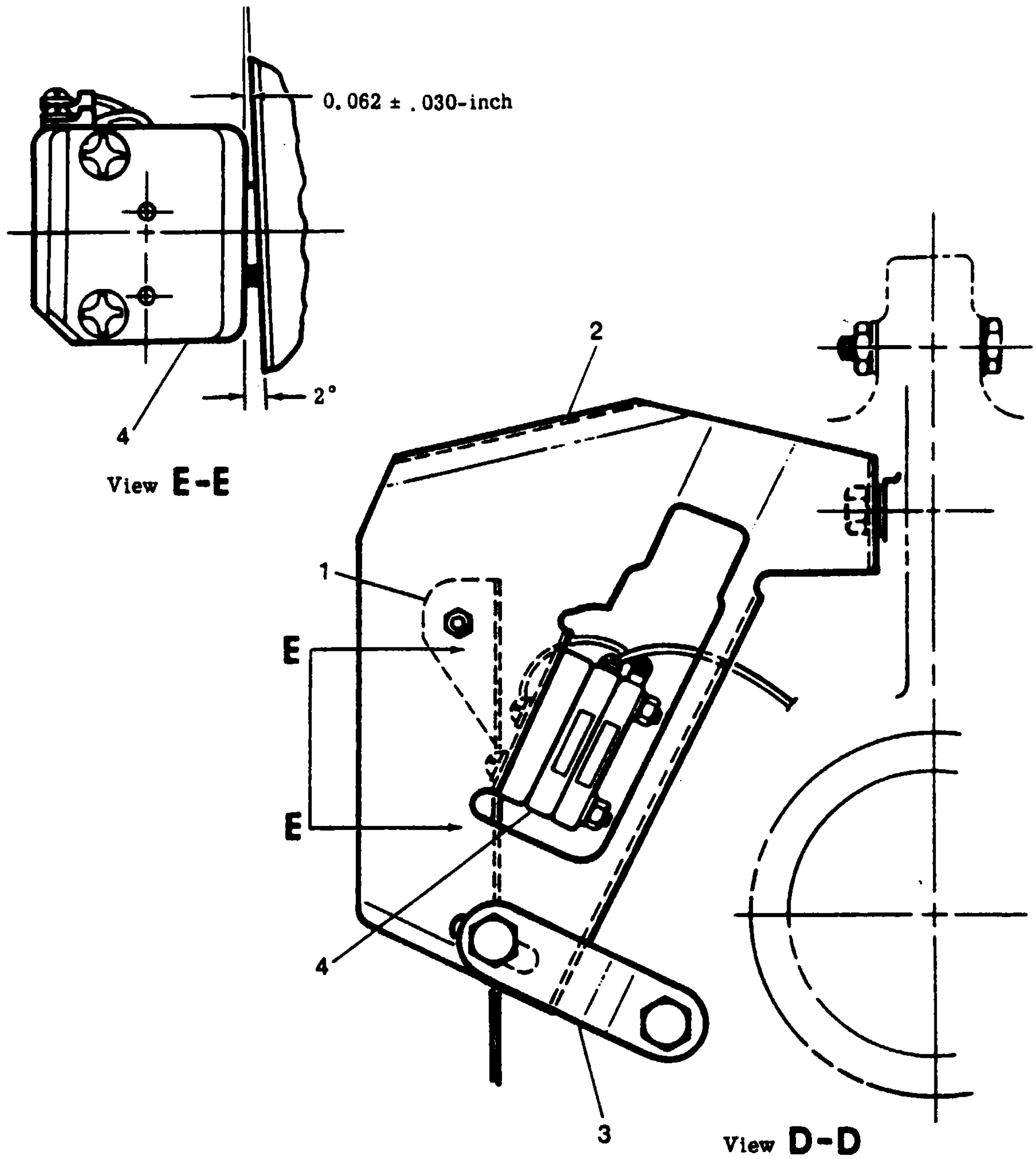
Detail C



Detail B

18268294 & ON

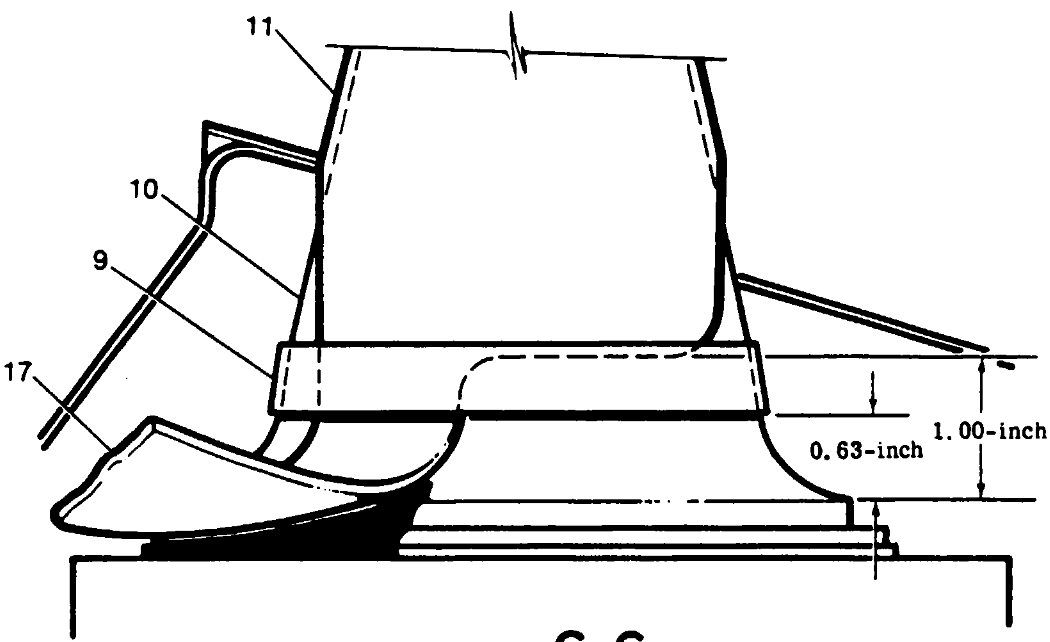
Figure 14-6. B. F. Goodrich 2-Bladed Propeller De-Ice System (Sheet 2 of 4)

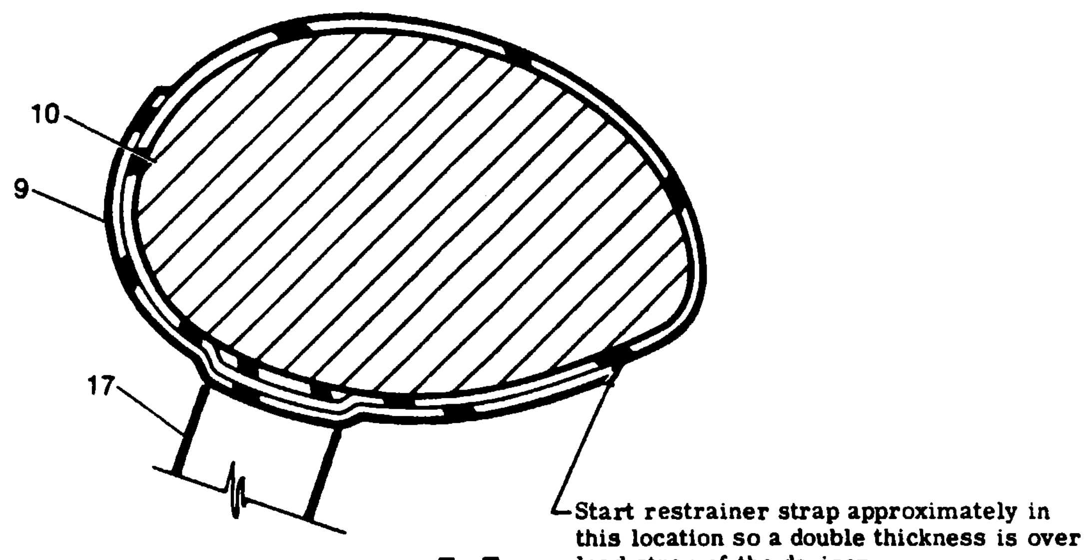


1. Support Bracket
2. Mounting Bracket
3. Clamp
4. Modular Brush Assembly

BEGINNING WITH 18268294

Figure 14-6. B.F. Goodrich 2-Bladed Propeller De-Ice System (Sheet 3 of 4)





9. Restrainer Strap
10. Propeller Blade
11. De-Ice Boot
17. Lead Strap

18268294 & ON

Figure 14-6. B. F. Goodrich 2-Bladed Propeller De-Ice System (Sheet 4 of 4)

d. If slip ring run-out is within limits specified in step "c". no corrective action is required. A small amount of run-out may be corrected by varying the torque of the attachment bolts within the limits specified by the propeller manufacturer.

14-62. INSTALLATION AND ALIGNMENT OF BRUSH BLOCK ASSEMBLY. (See figures 14-8 and 14-9.)

NOTE

Installation of the brush block should be deferred, when possible, until after the slip ring, propeller, and related components are installed. However, the brush block assembly may be replaced without removing the propeller. To avoid breakage when installing the brush block assembly, keep brushes retracted in brush block until slip ring and propeller assemblies have been installed.

CAUTION

Make sure that slip ring run-out has been corrected before attempting to align brushes on slip ring.

a. In order to get smooth, efficient and quiet transfer of electric power from the brushes to the slip ring, brush alignment must be checked and adjusted, if necessary to meet the following requirements.

1. Projection must be such that the distance between the brush block and the slip ring is 0.062 (±0.030-inch).
2. The brushes must be lined up with the slip ring so that the entire face of each brush is in contact with the slip ring throughout the full 360° of slip ring rotation.
3. The brushes must contact the slip ring at an angle of approximately 2° from perpendicular to the slip ring surface, measured toward the direction of rotation of the slip ring.

b. Brush projection can normally be adjusted by loosening hardware attaching the brush block and holding the brushes in the desired location while retightening the hardware. Slotted holes are provided.

c. One method for face alignment is described in step "b". Another is to use shims between brush block and bracket. Laminated metal shims are generally provided. Layers of metal .003" are used to make up shims which are approximately 0.20" thick overall. Shims may be fabricated locally.

d. Loosen mounting bolts and twist block while tightening to attain proper angular adjustment.

CAUTION

Use care not to disturb other adjustments when adjusting angular alignment.

14-63. REPLACEMENT OF DE-ICE BOOTS. To remove or loosen installed de-ice boots, use toluol to soften the "cement line". Apply a minimum amount of this solvent to the cement line as tension is applied to peel back the boot. Removal should be slow enough to allow the solvent to undercut the cement so that parts will not be damaged. To install a propeller anti-ice boot. proceed as follows:

a. Clean the metal to be bonded with Methyl Ethyl Ketone, (MEK). For final cleaning, wipe the solvent film off quickly with a clean, dry cloth before it has time to dry.

b. Prepare a pattern the size of the boot, including three inches of the boot strap. Draw a centerline (lengthwise) through the pattern.

c. Draw a line on the centerline of the leading edge of the blade. Position the pattern centerline over the leading edge centerline. Position pattern so bottom of boot is 1/2" below spinner cutout. Draw a line on the propeller hub on each side of the pattern boot strap where it crosses the hub. Check boot strap position by fitting restraining strap on the hub and comparing its position with the marked position of the strap.

d. Mask off an area 1/2" from each side and outer end of the pattern, and remove the pattern.

NOTE

Apply cement at room temperature (65°-75°F). For best results, allow to air dry for a minimum of one hour at 50°F or above when relative humidity is less than 75%. If the humidity is 75% and 90%, allow additional drying time. Do not apply cement if relative humidity is higher than 90% or if the temperature is below 50°F. Allow 12 hours cement curing time before starting engine. Allow 24 hours cement curing time before operating the de-icers.

e. Mix EC-1300L cement (Minnesota Mining & Mfg. Co.) thoroughly. Surfaces shall be 65°F prior to applying cement. During periods of high humidity, care shall be taken to prevent moisture condensation due to the cooling effect of the evaporating solvent. This can be done by warming the area with a heat gun or heat lamp. Apply one even brush coat of EC-1300L cement to the cleaned metal surface. Allow to air dry for a minimum of one hour and then apply a second even brush coat of EC-1300L cement.

f. Moisten a cloth with Methyl Ethyl Ketone and clean the unglazed back surface of the boot, changing cloths frequently to avoid contamination of the cleaned area.

g. Apply one even coat of EC-1300L cement to back surface of boot. It is not necessary to cement more than 1/2" of the boot strap.

h. Using a silver-colored pencil, mark a centerline along the leading edge of the propeller blade and a corresponding centerline on the cemented side of the boot.

i. Reactivate the surface of the cement using a clean lint-free cloth, heavily moistened with toluol. Avoid excessive rubbing of cement, which would remove the cement.

j. Position the boot centerline on the propeller leading edge, starting at the hub end of the position marked. Make sure that boot strap will fall in the position marked. Tack the boot centerline to the leading edge of the propeller blade. If the boot is allowed to get off-center, pull up with a quick motion and replace properly. Roll firmly along centerline with a rubber roller.

k. Gradually tilting the roller, work the boot carefully over either side of the blade contour to avoid trapping air in pockets.

l. Rolling outward from the centerline to the edges tends to form wrinkles, work them out smoothly and carefully with fingers.

m. Apply one even coat of EC-539 (Minnesota Mining & Mfg. Co.), mixed per manufacturer's instructions, around the edges of the installed boot.

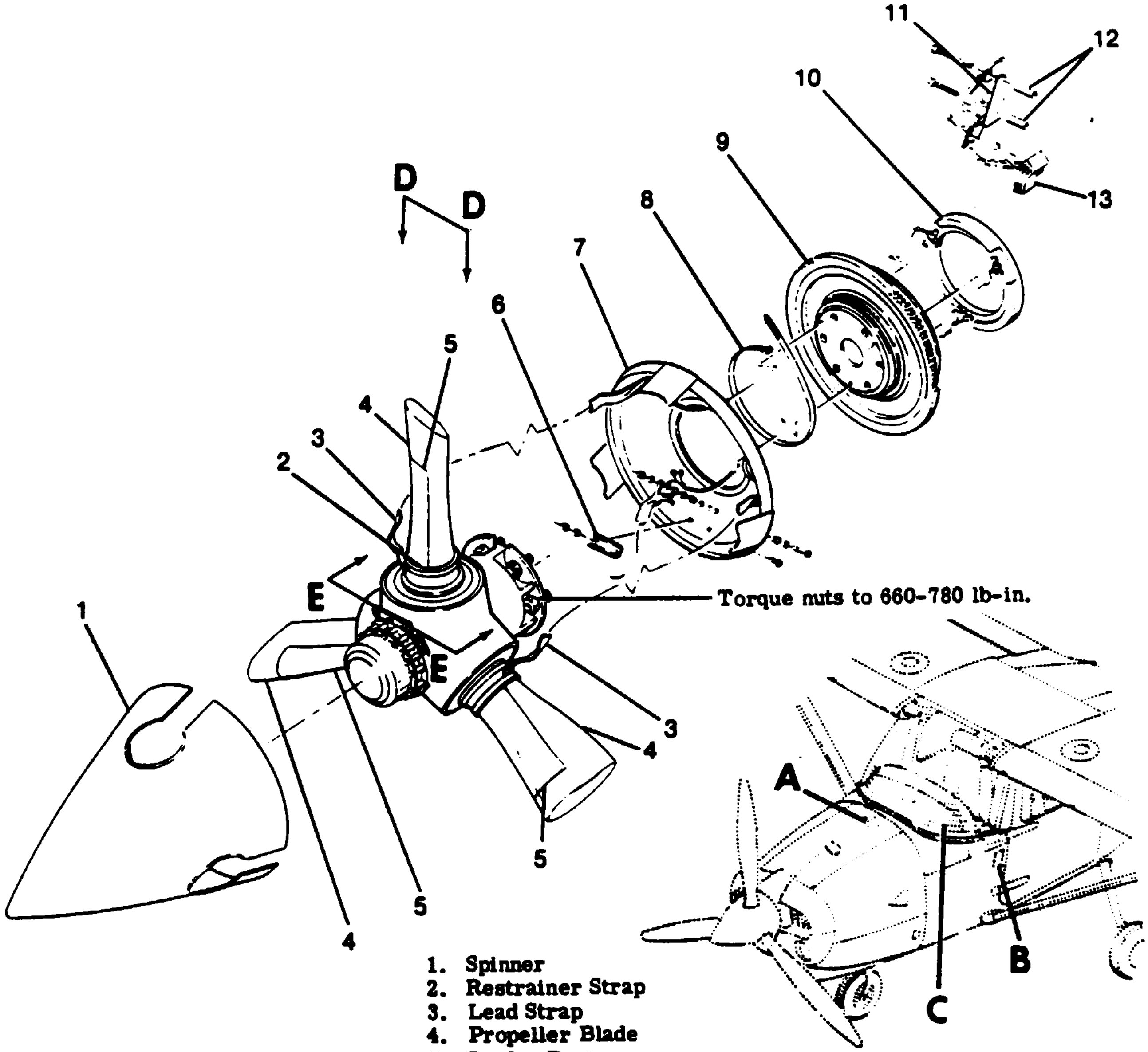
n. Remove masking tape from the propeller and clean the surface of the propeller by wiping with a clean cloth dampened with toluol.

o. Install restrainer strap as shown in detail in figure 14-6, sheet 4. Start strap approximately in location shown in detail so a double thickness is over lead strap of the de-icer. The lead strap must not be twisted more than one turn (180°) in lining up the respective leads. Trim restrainer strap so it will end approximately as shown in the detail.

p. Secure electrical leads of restrainer strap with screws, washers and sleeves.

14-64. PROPELLER DE-ICE SYSTEM. (McCauley, 3-Bladed Propeller Installation.) (See figure 14-7.)

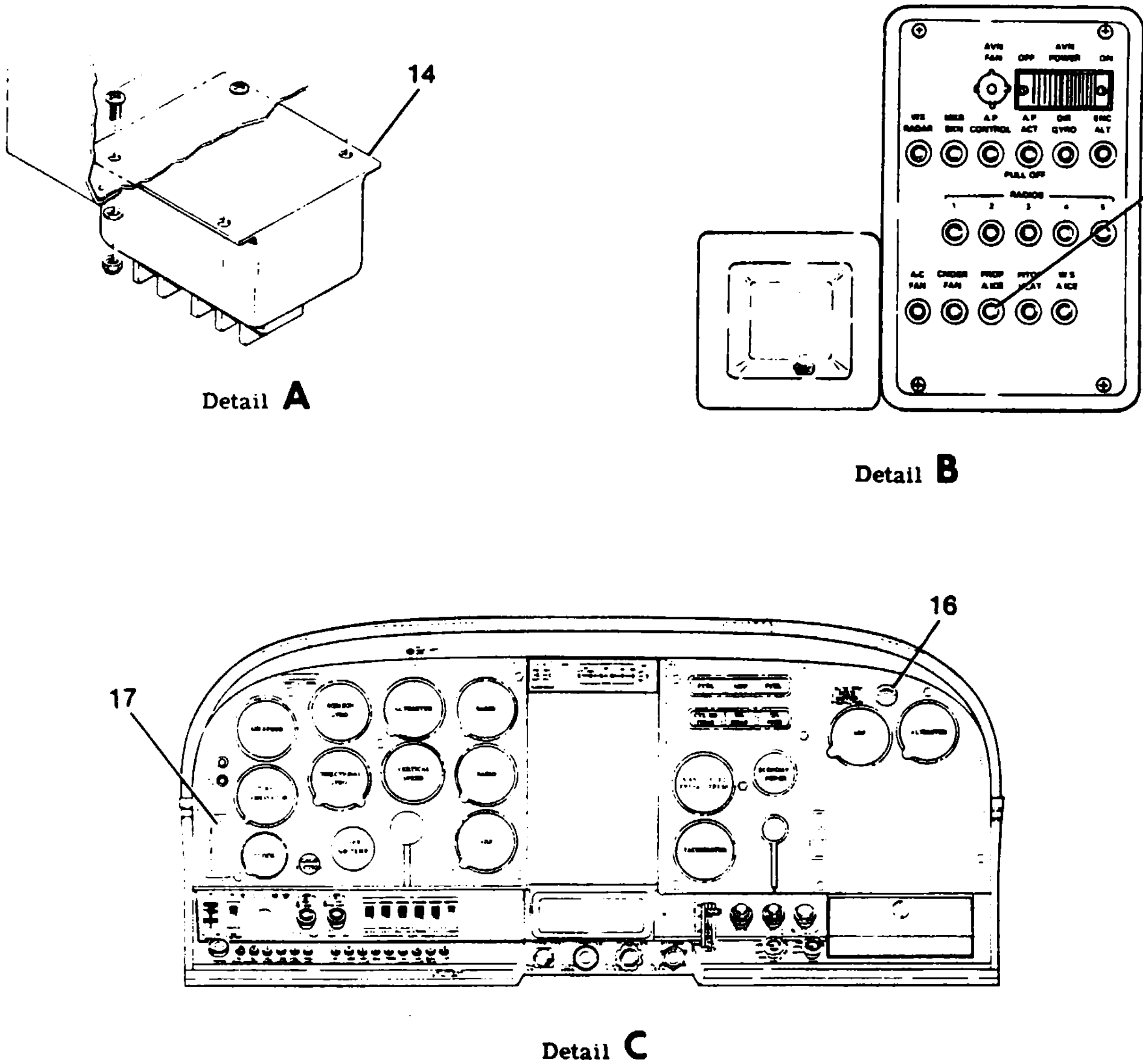
14-65. DESCRIPTION. The system is of an electrothermal type, consisting of electrically heated de-icers bonded to each propeller blade, a slip ring assembly for power distribution to the propeller de-icers, a brush block assembly to transfer electrical power to the rotating slip ring, a timer to cycle electric power to the de-icers in proper sequence, an ammeter, mounted in the instrument panel, a shunt, a switch and a circuit breaker. The de-ice system applies heat to the surfaces of the propeller blades where ice would normally adhere. This heat, plus centrifugal force and the blast from the airstream, removes accumulated ice. Each de-icer has two separate electrothermal heating elements, an inboard section and an outboard section. When the switch is turned on, the timer provides power through the brush block and slip ring to outboard elements for approximately 30 seconds, reducing ice and adhesion in these areas. Then the timer switches power to inboard heating elements for approximately 30 seconds. It then returns to the outer elements and continues cycling action. This outboard-inboard sequence is very important since the loosened ice, through centrifugal force moves outboard. Heating may begin at any phase in the cycle, depending on timer position when the switch was turned off from previous use. Ground checkout of the systems is permitted when the engine is not running. System components may be removed and replaced, using the figure as a guide. Propeller removal is necessary before de-ice components, except brush block assembly, can be installed or removed.



1. Spinner
2. Restrainer Strap
3. Lead Strap
4. Propeller Blade
5. De-Ice Boot
6. Lead Clip
7. Bulkhead
8. Tie Strap
9. Starter Support
10. Slip Ring
11. Bracket Assembly
12. Spacer
13. Brush Block Assembly

T182 18268294 & ON

Figure 14-7. McCauley 3-Bladed Propeller De-Ice System (Sheet 1 of 3)



14. Timer
15. Circuit Breaker
16. De-Ice Gage
17. De-Ice Switch

T182 18268294 & ON

Figure 14-7. McCauley 3-Bladed Propeller De-Ice System (Sheet 2 of 3)

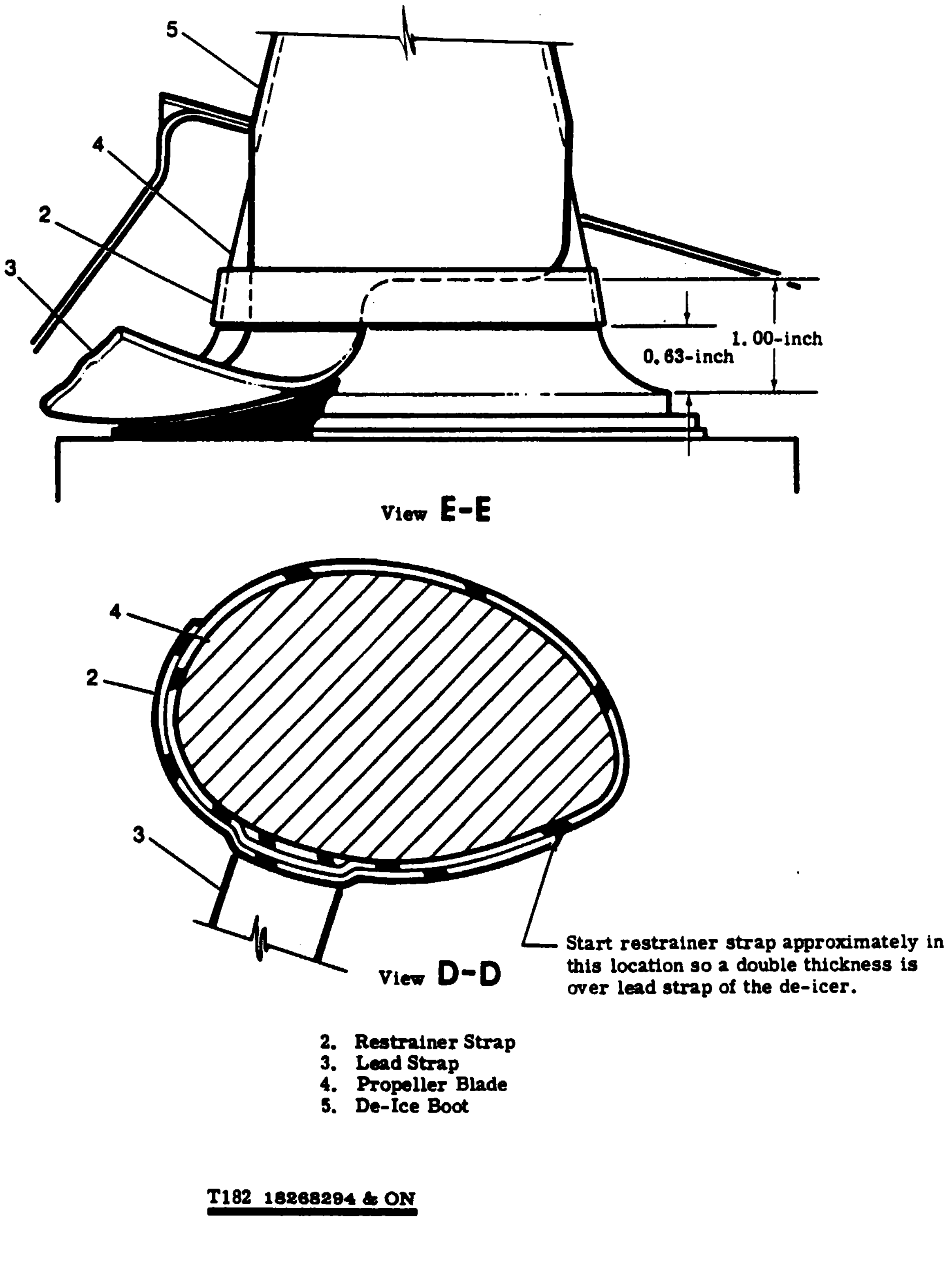


Figure 14-7. McCauley 3-Bladed Propeller De-Ice System (Sheet 3 of 3)

14-66. TROUBLE SHOOTING.

NOTE

The propeller anti-ice ammeter may be used while trouble shooting the system. The ammeter needle should rest within the shaded band except for "flickers" approximately 20 seconds apart, as the step switch of the timer operates. The ammeter will also reflect a bad connection or open circuit by reading below normal or zero. A high reading indicates a short circuit.

TROUBLE	PROBABLE CAUSE	REMEDY
ELEMENTS DO NOT HEAT.	Circuit breaker out or defective.	Reset circuit breaker. If it pops out again, determine cause and correct. Replace defective parts.
	Defective wiring.	Repair or replace wiring.
	Defective switch.	Replace switch.
	Defective timer.	Replace timer.
	Defective brush-to-slip ring connection.	Check alignment. Replace defective parts.
SOME ELEMENTS DO NOT HEAT.	Incorrect wiring.	Correct wiring.
	Defective wiring.	Repair or replace wiring.
	Defective wiring.	Replace timer.
	Defective brush-to-slip ring connection.	Check alignment. Replace defective parts.
	Defective element.	Replace element.
CYCLING SEQUENCE NOT CORRECT OR NOT CYCLING.	Crossed connections	Correct wiring.
	Defective timer.	Replace timer.
RAPID BRUSH WEAR. FREQUENT BREAKAGE. SCREECHING OR CHATTERING.	Brush block or slip ring out of alignment.	Align properly.

14-67. TIMER TEST.

a. Remove connector plug of wire harness from timer and jump power input socket of wire harness to timer input pins. (Refer to chart following this paragraph for pin identification.)

b. Jump timer ground pin to ground.

c. Turn on de-icing system.

d. Check timer operation per the chart. (Use a voltmeter.)

e. Check volts to ground in each case. If engine is not running. and auxiliary power is not used, voltage will be battery voltage and cycle time may be slightly longer than indicated.

f. Hold voltmeter probe on pin until voltage drops to 0. Move probe to next pin in the sequence shown in the chart. Check voltage at each pin in sequence. When correctness of the cycling sequence is established, turn propeller de-ice switch off at the beginning of one of the on-time periods, and record the number of the pin at which the voltage supply is present.

TIMER P/N C40171
POWER INPUT PIN 1 (24VDC)
GROUND PIN 5 (24VDC)
OUTPUT SEQUENCE 2 sequences, 30 seconds each (TIME)
TIME REPEAT CYCLE TIME (SECONDS) 60

14-68. SLIP RING ALIGNMENT.

After installation. the slip ring assembly must be checked for run-out, and adjustments made. if necessary.

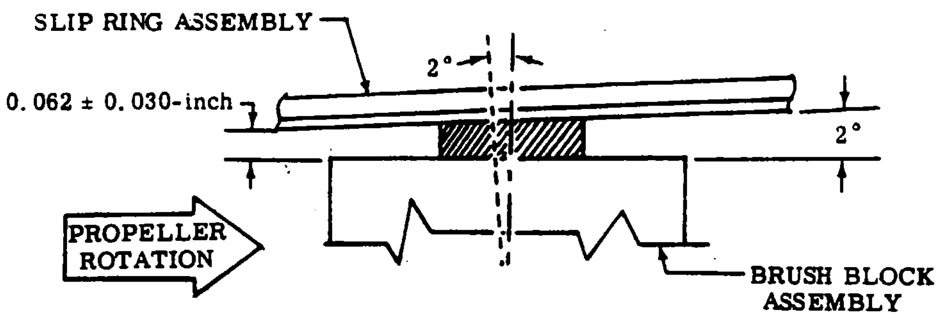


Figure 14-8. Angular Brush Alignment

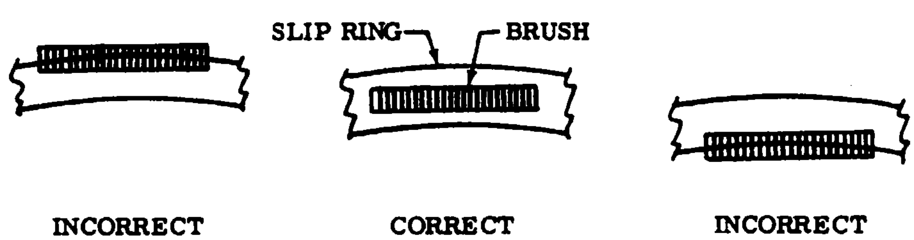


Figure 14-9. Brush Face Alignment

NOTE

Excessive slip ring run-out will result in severe arcing between the slip ring and brushes, and cause rapid brush wear. If allowed to persist, this condition will result in rapid deterioration of the slip ring and brush contact surfaces, and lead to the eventual failure of the de-icing system.

a. Securely attach dial indicator gage to the engine, and place the pointer on the slip ring.
b. Rotate propeller slowly by hand, noting the deviation of the slip ring from a true plane as indicated on the gage.
c. Check that total run-out does not exceed 0.008-inch (±0.004-inch). Also check that runout does not exceed 0.002-inch within any 4 inches of slip ring travel.

CAUTION

Due to the loose fit of some propeller bearings, a considerable error may be indicated in the readings by pushing in or pulling out on the propeller while rotating it. Care must be taken to exert a uniform push or pull on the propeller to hold this error to a minimum.

d. If slip ring run-out is within the limits specified, no corrective action is required. A small amount of run-out may be corrected by varying the torque of the attachment bolts within the limits specified by the propeller manufacturer.

14-69. INSTALLATION AND ALIGNMENT OF BRUSH BLOCK ASSEMBLY. (See figures 14-8 and 14-9.)

NOTE

Installation of the brush block should be deferred, when possible, until after the slip ring, propeller, and related components are installed. However, the brush block assembly may be replaced without removing the propeller. To avoid breakage when installing the brush block assembly, keep brushes retracted in brush block until slip ring and propeller assemblies have been installed.

CAUTION

Make sure that slip ring run-out has been corrected before attempting to align brushes on slip ring.

a. In order to get smooth, efficient and quiet transfer of electric power from the brushes to the slip ring, brush alignment must be checked and adjusted, if necessary to meet the following requirements.
   1. Projection must be such that the distance between the brush block and the slip ring is 0.062 (±0.030-inch).
   2. The brushes must be lined up with the slip ring so that the entire face of each brush is in contact with the slip ring throughout the full 360° of slip ring rotation.
   3. The brushes must contact the slip ring at an angle of approximately 2° from perpendicular to the slip ring surface, measured toward the direction of rotation of the slip ring.
b. Brush projection can normally be adjusted by loosening hardware attaching the brush block and holding the brushes in the desired location while retightening the hardware. Slotted holes are provided.

14-70. REPLACEMENT OF DE-ICE BOOTS. (Refer to paragraph 14-63.

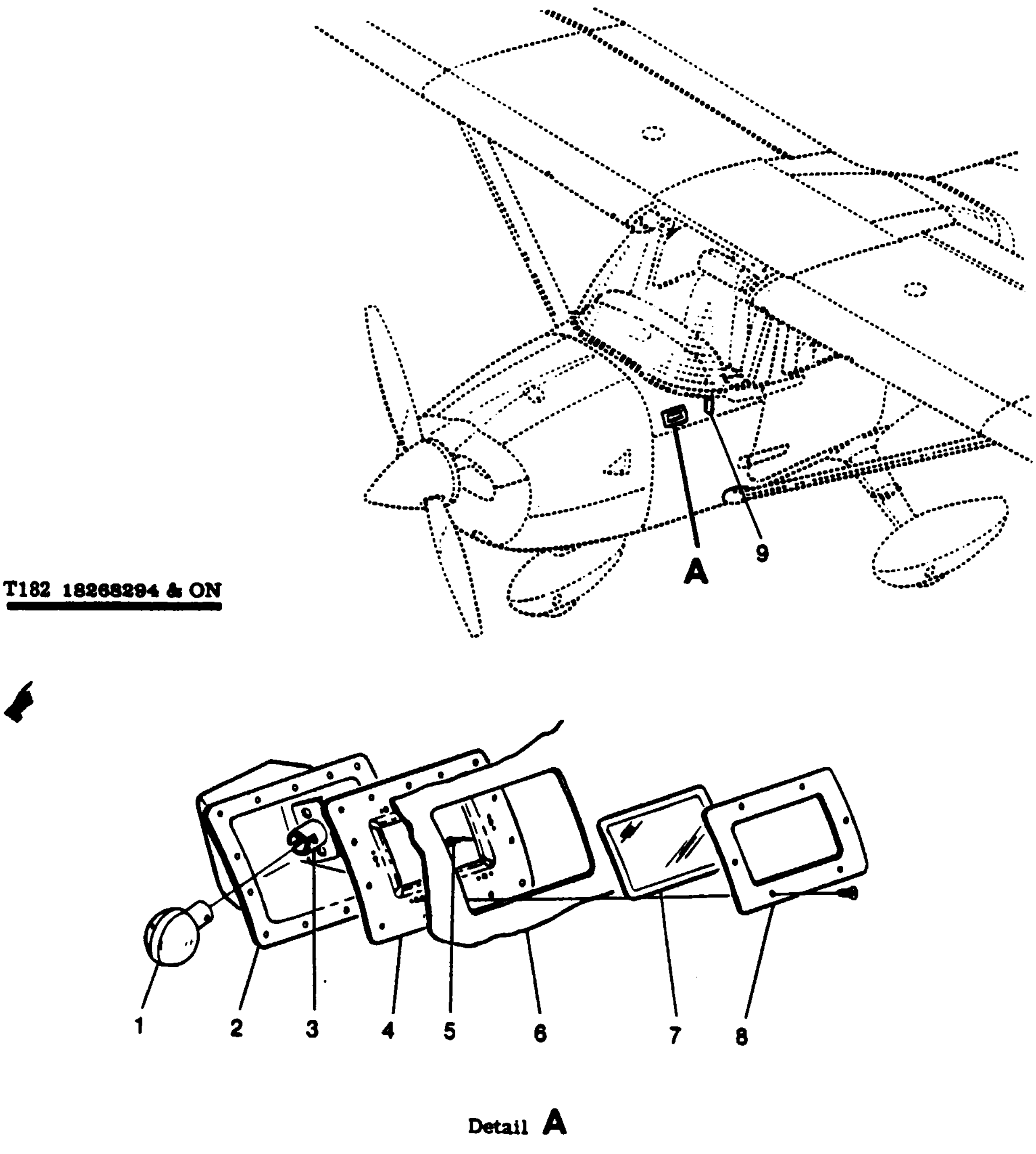
14-71. ICE DETECTOR LIGHT. (T182) (See figure 14-10.)

14-72. DESCRIPTION. Beginning with T18268291, an optional ice detector light may be installed on the left side of the fuselage, forward of the cabin door. The ice detector light will illuminate the leading edge of the left wing so the pilot can visually detect ice formation on the wing. A snap-in rocker switch, located in the lower left switch panel, controls the ice detector light.

14-73. REMOVAL OF ICE-DETECTOR LIGHT. (See figure 14-10.)
a. Remove six mounting screws, light cover assembly (8) and lens (7).
b. Remove lamp (1) from lamp socket (3).

14-74. INSTALLATION OF ICE-DETECTOR LIGHT. (See figure 14-10.)
a. Install lamp (1) in lamp socket (3).
b. Clean and install lens (7).
c. Install light cover assembly (8) with six screws.

T182 18268294 & ON



1. Lamp
2. Bracket Assembly
3. Lamp Socket
4. Lens Doubler Assembly
5. Terminal
6. Fuselage Skin
7. Lens
8. Light Cover Assembly
9. Light Switch

Figure 14-10. Ice Detector Light Installation

14-75. CONTROL SURFACE DISCHARGERS.

14-76. DESCRIPTION. Wick type static dischargers may be installed on the trailing edge surfaces of the ailerons, elevators and rudder of the aircraft. One type discharger is fabricated with the wick and the base combined into an integral unit; in the other type, the wick is attached to the base by a threaded fitting, and may be replaced without removing the base from the aircraft. The installation of static dischargers reduces the build-up of static electricity on the airframe as a consequence of flying through haze, dust, rain, snow or ice crystals. In some cases, if dischargers are not installed, or not functioning as a result of age or repeated exposure to static electricity, static build-up can result in the loss of usable radio signals on all communication and navigation equipment. Whenever static dischargers are installed, replaced, and at regular intervals during their service life, resistance checks should be performed to determine their effectiveness in reducing static build-up.

14-77. RESISTANCE CHECK. Since static dischargers lose their effectiveness with age and exposure to static electricity, they should be checked with a 500 to 1000 volt capacity megohmmeter every 500 hours or annually, whichever occurs first. Megohmmeters may be purchased from the following source:

James G. Biddle Co
Plymouth Meeting, Pa., 19462

Perform the following resistance checks:

1. If the wick and base of the static discharger are combined, the resistance from the base of the discharger to a good aircraft ground should check 2.5 milliohms maximum.
2. If the wick can be separated from the base, the resistance from the base to the airframe should check 1.0 ohm maximum. In the preceding steps, establish a good ground before proceeding to step 3.
3. Connect the EARTH terminal of the megohmmeter to the base of the discharger and check the resistance at the tip of the wick. The resistance should check 1.0 to 100.0 megohms. This check applies to either type of static discharger. If the resistance of the wick checks less than 1.0 or more than 100.0 megohms, the wick should be replaced.

WARNING

DO NOT BEND the wick during this check since wicks have a higher resistance if bent.

SECTION 15

INSTRUMENTS AND INSTRUMENT SYSTEMS

TABLE OF CONTENTS

15-1. INSTRUMENTS AND INSTRUMENT SYSTEMS.

15-2. GENERAL. This section describes typical instrument installations and their respective operating systems. Emphasis is placed on trouble shooting and corrective measures only. It does NOT deal with specific instrument repairs since this usually requires special equipment and data and should be handled by instrument specialists. Federal Aviation Regulations require malfunctioning instruments be sent to an approved instrument overhaul and repair station or returned to manufacturer for servicing. Our concern here is with preventive maintenance on various instrument systems and correction of system faults which result in instrument malfunctions. The descriptive material, maintenance and trouble shooting

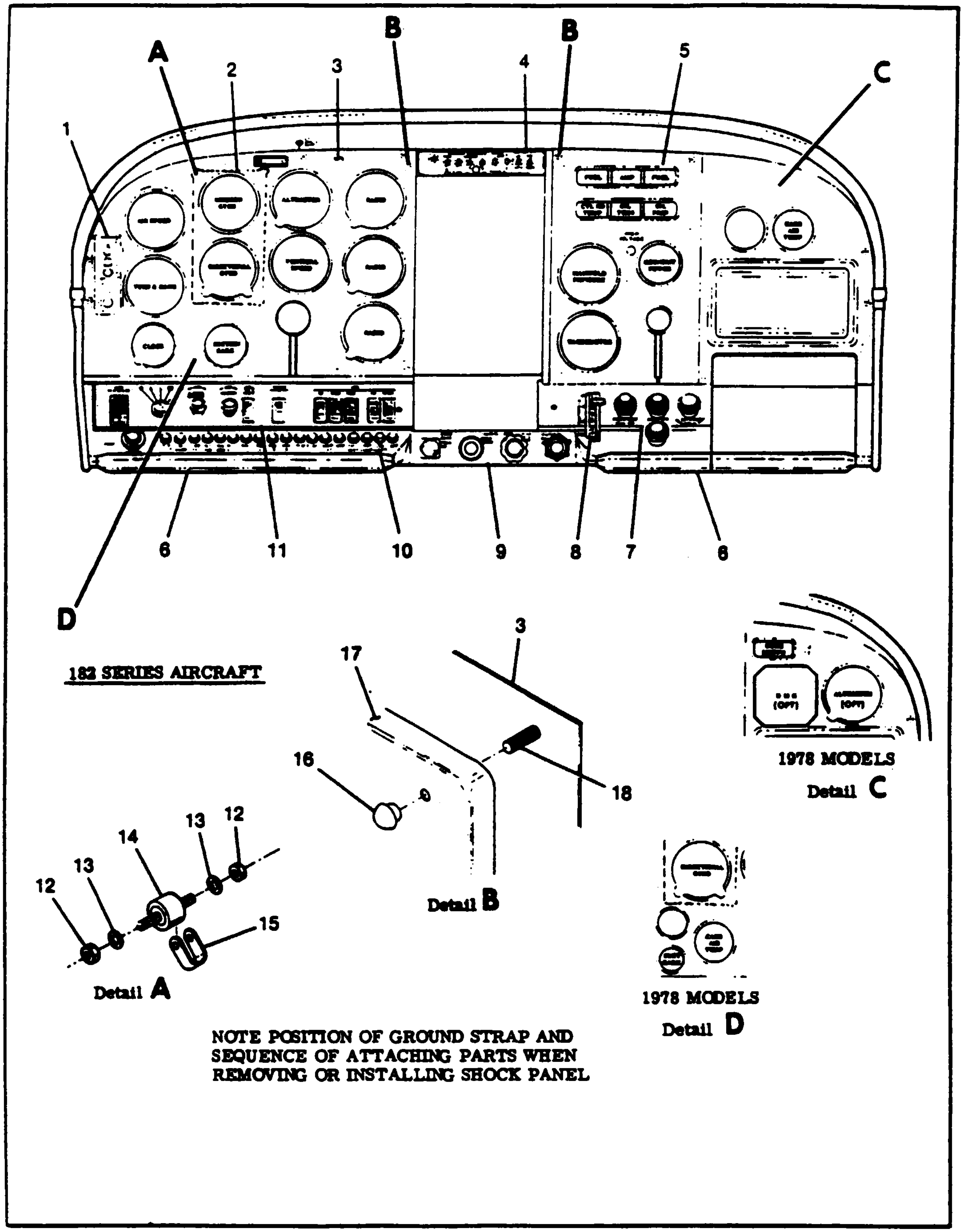
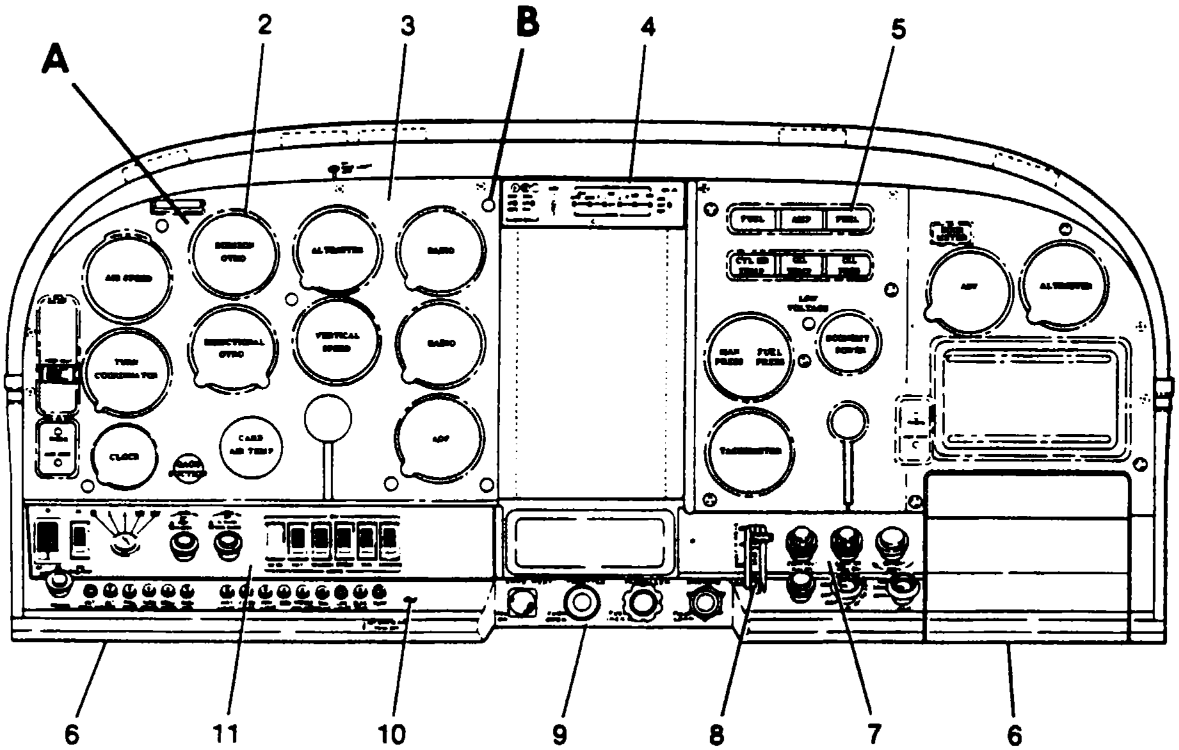


Figure 15-1. Instrument Panel (Sheet 1 of 2)



T182 SERIES AIRCRAFT

1. Marker Beacon Controls.
2. Shock Mounted Panel
3. Removable Panel
4. Radio and Switch Panel
5. Fuel and Engine Instruments
6. Knee Pad
7. Heating and Ventilating Controls.
8. Wing Flap Control
9. Engine Controls
10. Circuit Breaker Panel
11. Switch Panel
12. Nut
13. Washer
14. Shock Mount
15. Ground Strap
16. Threaded Button
17. Decorative Cover
18. Stud

Figure 15-1. Instrument Panel (Sheet 2 of 2) information in this section is intended to help the mechanic determine malfunctions and correct them, up to the defective instrument itself, at which point an instrument technician should be called in. Some instruments, such as fuel quantity and oil pressure gages, are so simple and inexpensive, repairs usually will be more costly than a new instrument. On the other hand, aneroid and gyro instruments usually are well worth repairing. The words "replace instrument" in the text, therefore, should be taken only in the sense of physical replacement in aircraft. Whether replacement is to be with a new instrument, an exchange one, or original instrument is to be repaired must be decided on basis of individual circumstances.

15-3. INSTRUMENT PANEL. (See Figure 15-1.)

15-4. DESCRIPTION. The instrument panel assembly consists of a stationary panel, a removable flight instrument panel and a shock-mounted panel. The stationary panel, containing fuel and engine instrumants is secured to the engine mount stringers and a forward fuselage bulkhead. The removable panel, containing flight instruments such as airspeed, vertical speed and altimiter is secured to the stationary panel with screws. The shock-mounted panel, containing major flight instruments such as the horizontal and directional gyros is secured to the removable panel with rubber shock-mounted assemblies. Most of the instruments are screw mounted on the panel.

15-5. REMOVAL AND INSTALLATION.

a. FLIGHT INSTRUMENT PANEL

1. Unscrew threaded buttons and remove decorative cover. Disconnect post light wiring if installed.
2. Tag and disconnect plumbing and wiring. Cap plumbing.
3. Remove screws securing flight instrument panel to stationary panel and pull straight back to remove.
4. To install, place panel in position and install screws.
5. Install flight instruments in panel.
6. Uncap plumbing and connect plumbing also wiring. Do not over-tighten connections. Refer to note in paragraph 15-9.

b. SHOCK-MOUNTED PANEL

NOTE

Due to the difficulty encountered when removing the shock-mounted panel with the gyros installed, it is recommended that the directional gyro be disconnected and removed prior to removal of the shock-mounted panel.

1. Unscrew threaded buttons and remove decorative cover. Disconnect post light wiring if installed.
2. Tag, disconnect and cap gyro plumbing.
3. Remove directional gyro mounting screws and remove gyro from panel.
4. Remove shock-mount nuts and washers then work panel out from behind flight instrument panel. The horizon gyro may also be removed from panel if desired.
5. To install shock-mounted panel, place panel over shock mount studs. Be sure the ground strap is installed in the proper position. if removed. then install nuts and washers.
6. Install gyros, uncap and install plumbing. Refer to note in paragraph 15-9.
7. Install decorative cover.

15-6. SHOCK-MOUNTS. Service life of shock-mounted instruments is directly related to adequate shock-mounting of the panel. If removel of shock-mounted panel is necessary, check mounts for deterioration and replace as necessary.

15-7. INSTRUMENTS. (See Figure 15-1.)

15-8. REMOVAL. Most instruments are secured to the panel with screws inserted through the panel face, under the decorative cover. To remove an instrument, remove decorative cover, disconnect wiring or plumbing to instrument, remove mounting screws and take instrument out from behind, or in some cases, from front of panel. Instrument clusters are installed as units and are secured by a screw at each end. A cluster must be removed from panel to replace an individual gage. In all cases when an instrument is removed, disconnected lines or wires should be protected. Cap open lines and cover pressure connections on instrument to prevent thread damage and entrance of foreign matter. Wire terminals should be insulated or tied up to prevent accidental grounding or short-circuiting.

15-9. INSTALLATION. Generally, installation procedure is the reverse of removal procedure. Ensure mounting screw nuts are tightened firmly, but do not over-tighten, particularly on instruments having plastic cases. The same rule applies to connecting plumbing and wiring.

NOTE

All instruments (gages and indicators), requiring a thread seal or lubricant, shall be installed using teflon tape on male fittings only. This tape is available through the Cessna Supply Division.

When replacing an electrical gage in an instrument cluster assembly, avoid bending pointer or dial plate. Distortion of dial or back plate could change the calibration of gages.

15-10. PITOT AND STATIC SYSTEMS.

15-11. DESCRIPTION. The pitot system conveys ram air pressure to the airspeed indicator. The static system vents vertical speed indicator, altimeter and airspeed indicator to atmospheric pressure through plastic tubing connected to static ports. A static line sump is installed at each source button to collect condensation in static system. A pitot tube heater may be installed. The heating element is controlled by a switch at the instrument panel and powered by the electrical system. A static pressure alternate source valve may be installed in the static system for use when the external static source is malfunctioning. This valve also permits draining condensate from the static lines. Refer to Pilots Operating Handbook for flight operation using alternate static source pressure. The encoding altimeter supplies an altimeter reading to the optional 300 or 400 transponder for signal transmission. The standby altimeter is connected to the static system by a tube to the vertical speed indicator. The static tube installation will vary when an alternate static source is installed.

15-12. MAINTENANCE. Proper maintenance of pitot and static system is essential for proper operation of altimeter, vertical speed and airspeed indicators. Leaks, moisture and obstructions in pitot system will result in false airspeed indications, while static system malfunctions will affect readings of all three instruments. Under instrument flight conditions, these instrument errors could be hazardous. Cleanliness and security are the principal rules for system maintenance. The pitot tube and static ports MUST be kept clean and unobstructed.

15-13. STATIC PRESSURE SYSTEM INSPECTION AND LEAKAGE TEST. The following procedure outlines inspection and testing of static pressure system, assuming altimeter has been tested and inspected in accordance with current Federal Aviation Regulations.

a. Ensure static system is free from entrapped moisture and restrictions.

b. Ensure no alterations or deformations of airframe surface have been made which would affect the relationship between air pressure in static pressure system and true ambient static air pressure for any flight configuration.

c. Seal one static source port with pressure sensitive tape. This seal must be air tight.

d. Close static pressure alternate source valve, if installed.

e. Attach a source of suction to the remaining static pressure source opening. Figure 15-5 shows one method of obtaining suction.

f. Slowly apply suction until altimeter indicates a 1000-foot increase in altitude.

CAUTION

When applying or releasing suction, do not exceed range of vertical speed indicator or airspeed indicator.

g. Cut off suction source to maintain a "closed" system for one minute. Leakage shall not exceed 100 feet of altitude loss as indicated on altimeter.

h. If leakage rate is within tolerance, slowly release suction source and remove tape from static port.

NOTE

If leakage rate exceeds the maximum allowable, first tighten all connections, then repeat leakage test. If leakage rate still exceeds the maximum allowable, use following procedure.

i. Disconnect static pressure lines from airspeed indicator and vertical speed indicator. Use suitable fittings to connect lines together so altimeter is the only instrument still connected into static pressure system.

j. Repeat leakage test to check whether static pressure system or the bypassed instruments are cause of leakage. If instruments are at fault, they must be repaired by an "appropriately rated repair station" or replaced. If static pressure system is at fault, use following procedure to locate leakage.

k. Attach a source of positive pressure to static source opening. Figure 15-4 shows one method of obtaining positive pressure.

CAUTION

Do not apply positive pressure with airspeed indicator or vertical speed indicator connected to static pressure system.

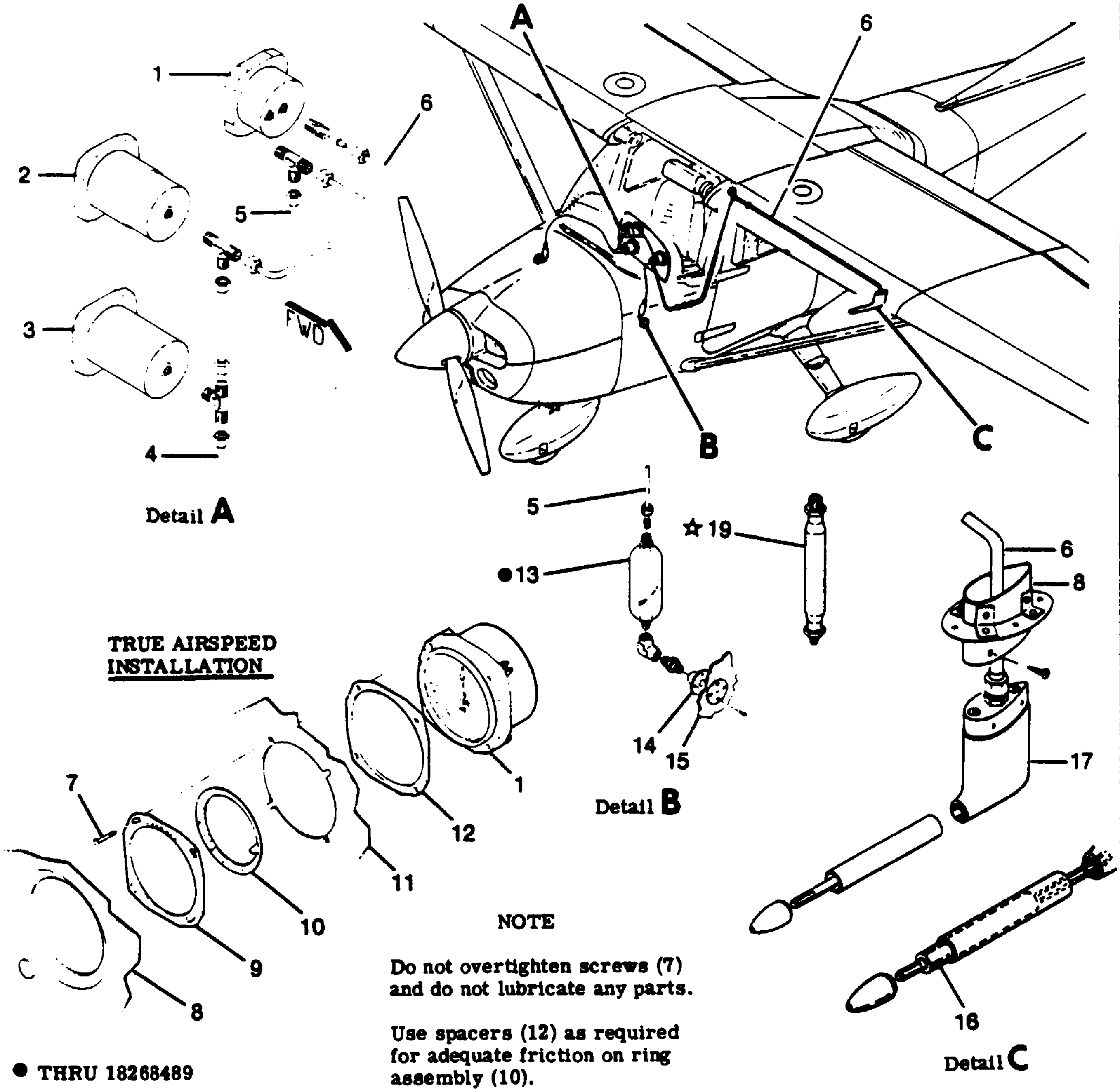
l. Slowly apply positive pressure until altimeter indicates a 500-foot decrease in altitude and maintain this altimeter indication while checking for leaks. Coat line connections and static source flange with LEAK-TEC or a solution of mild soap and water, watching for bubbles to locate leaks.

m. Tighten leaking connections. Repair or replace parts found defective.

n. Reconnect airspeed and vertical speed indicators into static pressure system and repeat leakage test per steps "c" thru "h".

15-14. PITOT SYSTEM INSPECTION AND LEAKAGE TEST. To check pitot system for leaks, place a piece of tape over small hole in lower aft end of pitot tube, fasten a piece of rubber or plastic tubing over pitot tube, close opposite end of tubing and slowly roll up tube until airspeed indicator registers in cruise range. Secure tube and after a few minutes recheck airspeed indicator. Any leakage will have reduced the pressure in system, resulting in a lower airspeed indication. Slowly unroll tubing before removing it, so pressure is reduced gradually. Otherwise instrument may be damaged. If test reveals a leak in system, check all connections for tightness.

15-15. BLOWING OUT LINES. Although the pitot system is designed to drain down to pitot tube opening, condensation may collect at other points in system and produce a partial obstruction. To clear the line, disconnect it at airspeed indicator. Using low pressure air, blow from indicator end of line toward the pitot tube.



NOTE

Do not overtighten screws (7) and do not lubricate any parts.

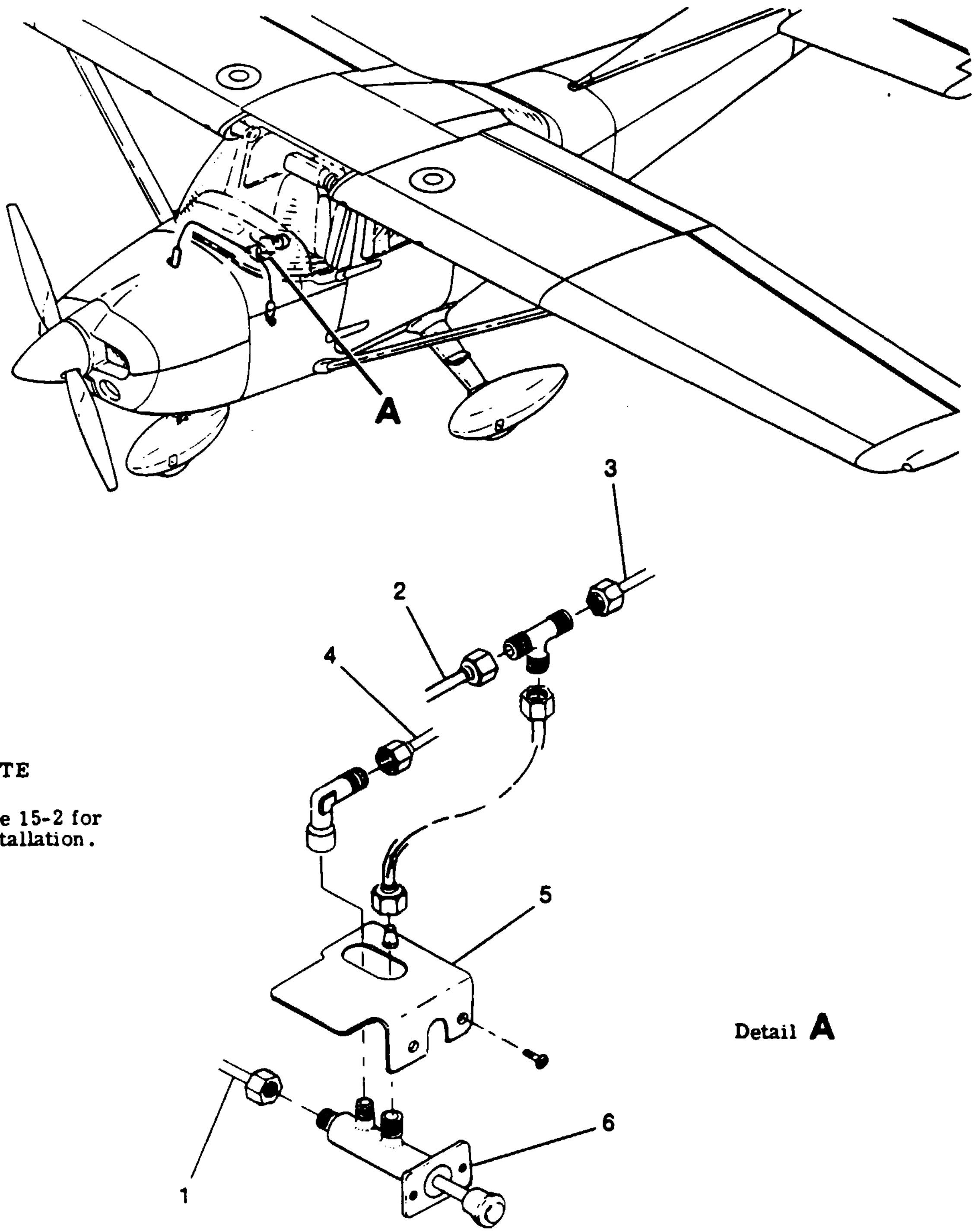
Use spacers (12) as required for adequate friction on ring assembly (10).

● THRU 18268489

☆ BEGINNING WITH 18268490

1. Airspeed Indicator
2. Altimeter
3. Vertical Speed Indicator
4. Static Line (To Right Sump)
5. Static Line (To Left Sump)
6. Pitot Line (To Pitot Tube)
7. Mounting Screw
8. Decorative Cover
9. Retainer
10. True Airspeed Ring
11. Instrument Panel
12. Spacer
13. Sump - Plastic
14. Static Port
15. Fuselage Skin
16. Heater,Element (Heated Pitot Only)
17. Mast Body
18. Connector
19. Sump - Metal

Figure 15-2. Pitot-Static Systems



NOTE

See figure 15-2 for sump installation.

1. Line (To Instruments)
2. Line (To Left Sump)
3. Line (To Right Sump)
4. Line (Alternate Air)
5. Bracket
6. Valve

Figure 15-3. Alternate Static Air System

CAUTION

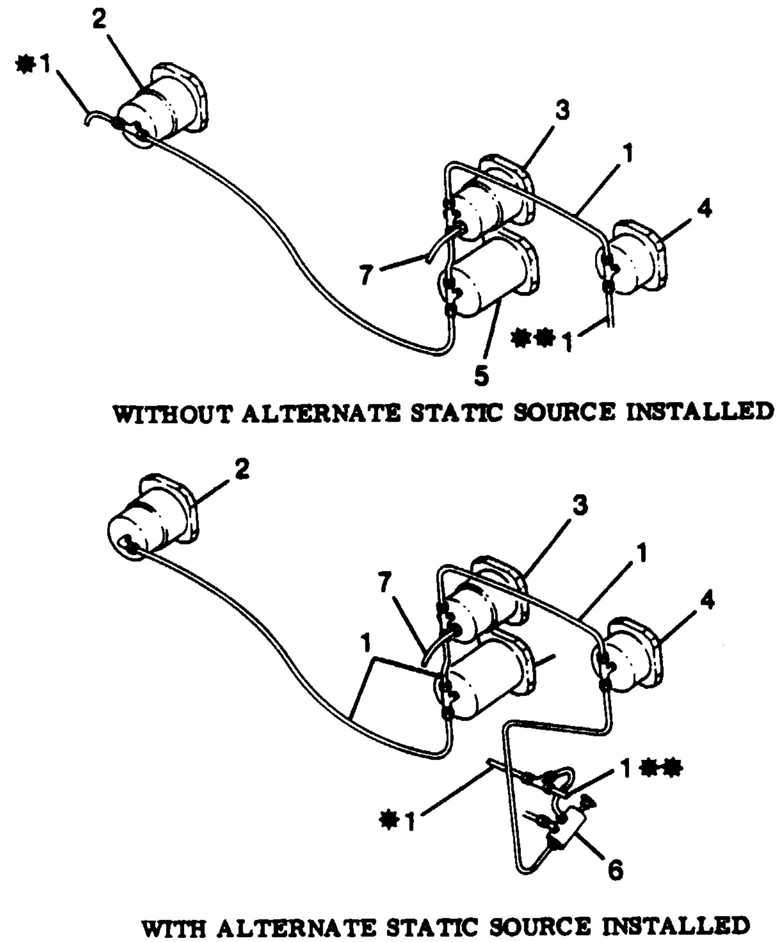
Never blow through pitot or static lines toward the instruments.

Like the pitot lines, static pressure lines must be kept clear and connections tight. Static source sumps collect moisture and keeps system clear. However, when necessary, disconnect static line at first instrument to which it is connected, then blow line to clear with low pressure air.

NOTE

On aircraft equipped with alternate static source, use the same procedure, opening alternate static source valve momentarily to clear line, then close valve and clear remainder of system.

Check all static pressure line connections for tightness. If hose or hose connections are used, check for general condition and clamps for security. Replace hose which have cracked, hardened or show other signs of deterioration.



1. Static Line
2. Standby Altimeter
3. Encoding Altimeter
4. Airspeed Indicator
5. Vertical Speed Indicator
6. Alternate Static Source
7. Line (To Transponder)

NOTE

* TO R/H STATIC SOURCE
** TO L/H STATIC SOURCE

Figure 15-4. Encoding Altimeter Installation

15-16. REMOVAL AND INSTALLATION OF COMPONENTS. (See figure 15-2.) To remove pitot mast, remove four mounting screws on side of connector (18) and pull mast out of connector far enough to disconnect pitot line (6). Electrical connections to heater assembly (if installed) may be disconnected through wing access opening just inboard of mast. Pitot and static lines are removed in the usual manner, after removing wing access plates, lower wing fairing strip and upholstery as required. Installation of tubing will be simpler if a guide wire is drawn in as tubing is removed from wing. The tubing may be removed intact by drawing it out through cabin and right door. When replacing components of pitot and static pressure systems, use anti-seize compound sparingly on male threads on both metal and plastic connections. Avoid excess compound which might enter lines. Tighten connections firmly, but avoid overtightening and distorting fittings. If twisting of plastic tubing is encountered when tightening fittings, VV-P-236 (USP Petrolatum), may be applied sparingly between tubing and fittings.

15-17. TROUBLE SHOOTING--PITOT-STATIC SYSTEM.

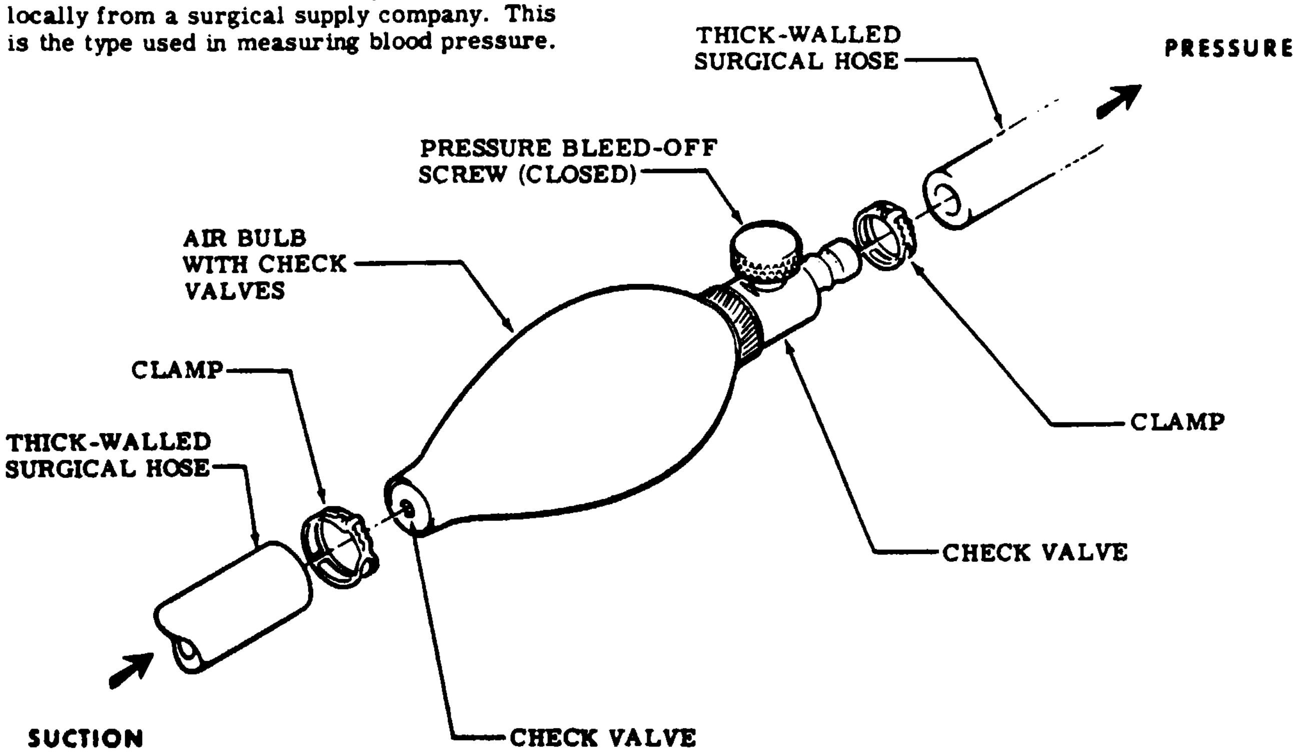
TROUBLE	PROBABLE CAUSE	REMEDY
LOW OR SLUGGISH AIRSPEED INDICATION.	Normal altimeter and vertical speed - pitot tube deformed, leak or obstruction in pitot line.	Straighten tube, repair or replace damaged line.
INCORRECT OR SLUGGISH RESPONSE.	All three instruments - leaks or obstruction in static line.	Repair or replace line.
	Alternate static source valve open.	Close for normal operation.

15-18. TRUE AIRSPEED INDICATOR. A true airspeed indicator may be installed. This indicator, equipped with a conversion ring, may be rotated until pressure altitude is aligned with outside air temperature, then airspeed indicated on the instrument is read as true airspeed on the adjustable ring. See figure 15-2 for removal and installation. Upon installation, before tightening mounting screws (7), calibrate the instrument as follows: Rotate ring (10) until 105 knots on adjustable ring aligns with 105 knots on indicator. Holding this setting, move retainer (9) until 60°F aligns with zero pressure altitude, then tighten mounting screws (7) and replace decorative cover.

SHOP NOTES:

NOTE

Air bulb with check valves may be obtained locally from a surgical supply company. This is the type used in measuring blood pressure.



TO APPLY SUCTION:

1. Squeeze air bulb to expel as much air as possible.
2. Hold suction hose firmly against static pressure source opening.
3. Slowly release air bulb to obtain desired suction, then pinch hose shut tightly to trap suction in system.
4. After leak test, release suction slowly by intermittently allowing a small amount of air to enter static system. To do this, tilt end of suction hose away from opening, then immediately tilt it back against opening. Wait until vertical speed indicator approaches zero, then repeat. Continue to admit this small amount of air intermittently until all suction is released, then remove test equipment.

TO APPLY PRESSURE:

CAUTION

Do not apply positive pressure with airspeed indicator or vertical speed indicator connected into static system.

1. Hold pressure hose firmly against static pressure source opening.
2. Slowly squeeze air bulb to apply desired pressure to static system. Desired pressure may be maintained by repeatedly squeezing bulb to replace any air escaping through leaks.
3. Release pressure by slowly opening pressure bleed-off screw, then remove test equipment.

Figure 15-5. Static System Test Equipment

15-19. TROUBLE SHOOTING.

NOTE

Refer to paragraph 15-15 before blowing out pitot or static lines.

TROUBLE	PROBABLE CAUSE	REMEDY
HAND FAILS TO RESPOND.	Pitot pressure connection not properly connected to pressure line from pitot tube.	Repair or replace damaged line, tighten connections.
	Pitot or static lines clogged.	Blow out lines.
INCORRECT INDICATION OR HAND OSCILLATES.	Leak in pitot or static lines.	Repair or replace damaged lines, tighten connections.
	Defective mechanism.	Replace instrument.
	Leaking diaphragm.	Replace instrument.
	Alternate static source valve open.	Close for normal operation.
HAND VIBRATES.	Excessive vibration caused by loose mounting screws.	Tighten mounting screws.
	Excessive tubing vibration.	Tighten clamps and connections, replace tubing with flexible hose.

15-20. TROUBLE SHOOTING -- ALTIMETER.

NOTE

Refer to paragraph 15-15 before blowing out pitot or static lines.

TROUBLE	PROBABLE CAUSE	REMEDY
INSTRUMENT FAILS TO OPERATE.	Static line plugged.	Blow out lines.
	Defective mechanism.	Replace instrument.
INCORRECT INDICATION.	Hands not carefully set.	Reset hands with knob.
	Leaking diaphragm.	Replace instrument.
	Pointers out of calibration.	Replace instrument.
HAND OSCILLATES.	Static pressure irregular.	Blow out lines, tighten connections.
	Leak in airspeed or vertical speed indicator installations.	Blow out lines, tighten connections.

15-21. TROUBLE SHOOTING -- VERTICAL SPEED INDICATOR.

NOTE

Refer to paragraph 15-15 before blowing out pitot or static lines.

TROUBLE	PROBABLE CAUSE	REMEDY
INSTRUMENT FAILS TO OPERATE.	Static line plugged.	Blow out lines.
	Static line broken.	Repair or replace damaged line, tighten connections.
INCORRECT INDICATION.	Partially plugged static line.	Blow out lines.
	Ruptured diaphragm.	Replace instrument.
	Pointer off zero.	Reset pointer to zero.
POINTER OSCILLATES.	Partially plugged static line.	Blow out lines.
	Leak in static line.	Repair or replace damaged lines, tighten connections.
	Leak in instrument case.	Replace instrument.

15-22. TROUBLE SHOOTING -- PITOT TUBE HEATER.

NOTE

Refer to paragraph 15-15 before blowing out pitot or static lines.

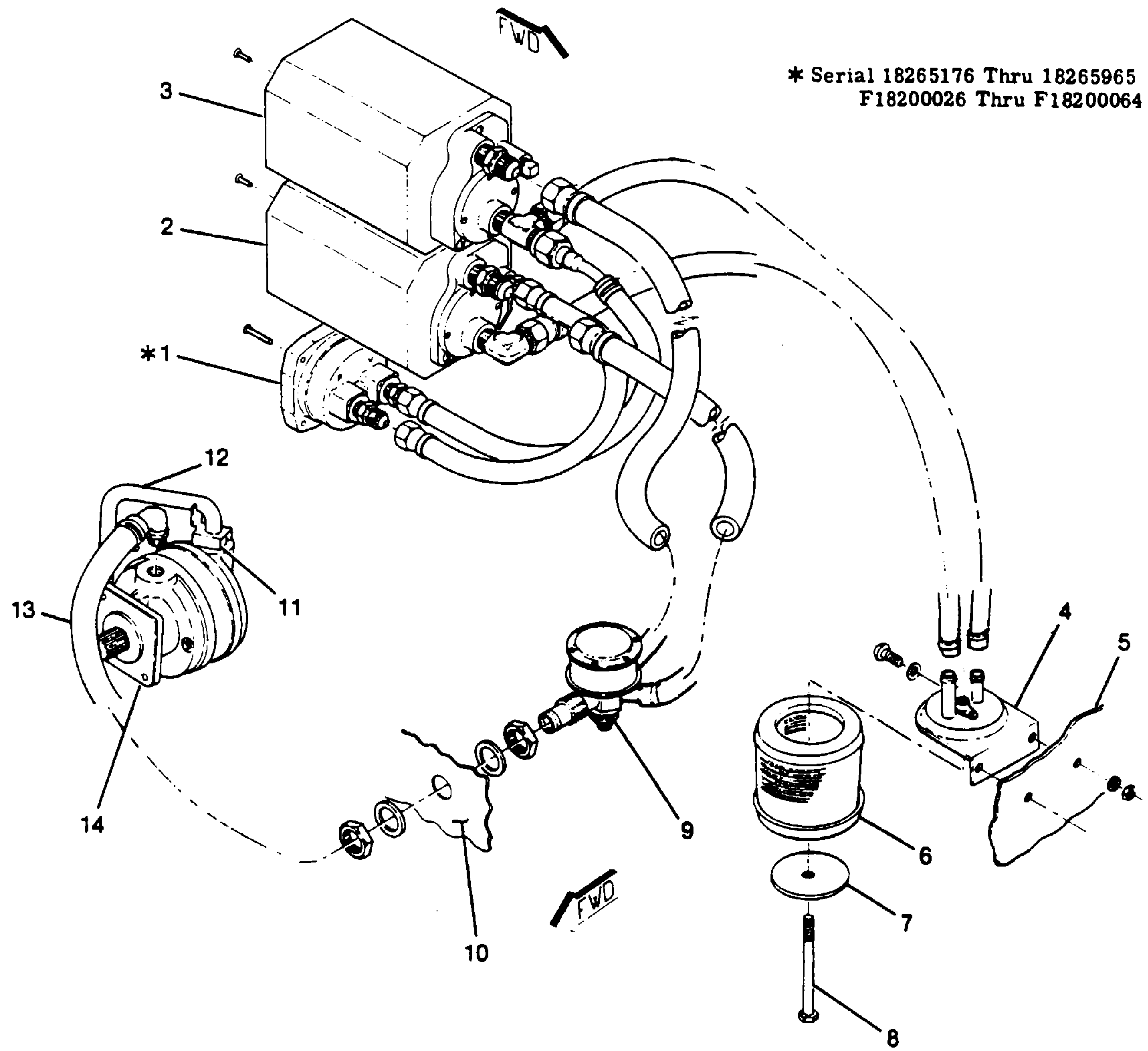
TROUBLE	PROBABLE CAUSE	REMEDY
TUBE DOES NOT HEAT OR CLEAR ICE.	Switch turned "OFF."	Turn switch "ON."
	Popped circuit breaker.	Reset breaker.
	Break in wiring.	Repair wiring.
	Heating element burned out.	Replace element.

15-23. VACUUM SYSTEM.

15-24. DESCRIPTION. A dry vacuum system is installed on the aircraft. The system utilizes a sealed bearing, engine-driven vacuum pump. A discharge tube is connected to the pump to expell the air from the pump overboard. A suction relief valve is used to control system pressure and is connected between the pump inlet and the instruments. In the cabin, the vacuum line is routed from the gyro instruments to the relief valve at the firewall. A central air filtering system is utilized. The reading of the suction gage indicates net difference in suction before and after air passes through a gyro. This differential pressure will gradually decrease as the central air filter becomes dirty, causing a lower reading on the suction gage.

NOTE

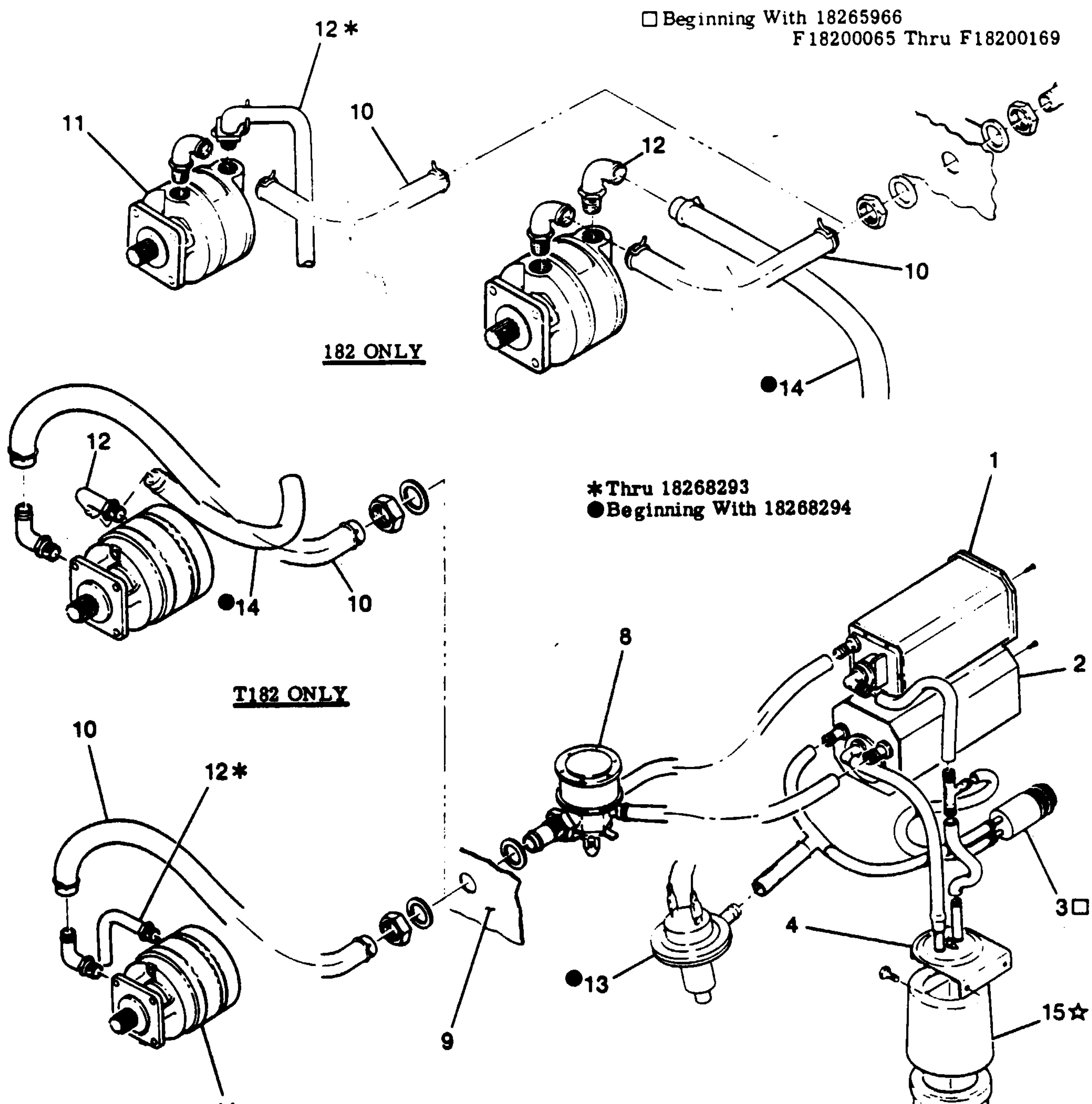
Excessive smoking will cause premature filter clogging.



SERIAL 18265176 THRU 18267715
F18200026 THRU F18200169

1. Suction Gage
2. Directional Gyro
3. Gyro Horizon
4. Bracket
5. Cabin Skin
6. Filter
7. Washer
8. Bolt
9. Suction Relief Valve
10. Firewall
11. Tube Locator
12. Overboard Line
13. Hose
14. Vacuum Pump

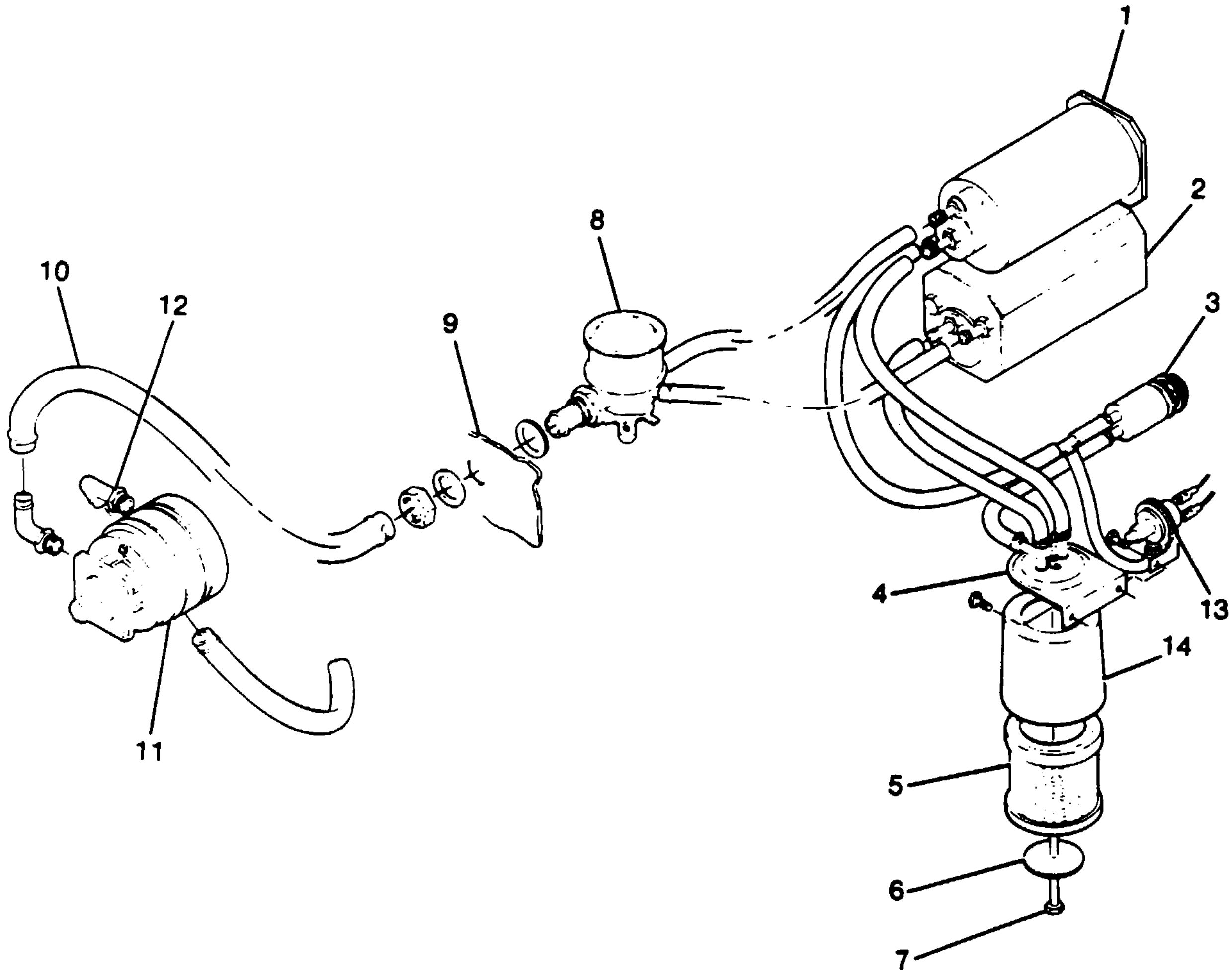
Figure 15-6. Vacuum System Installation (Sheet 1 of 3)



1. Gyro Horizon
2. Directional Gyro
3. Suction Gage
4. Bracket
5. Filter
6. Washer
7. Bolt
8. Suction Relief Valve
9. Firewall
10. Hose
11. Vacuum Pump
12. Overboard Tube
13. Vacuum Switch
14. Overboard Hose
15. Cover

18267716 THRU 18268434

Figure 15-6. Vacuum System Installation (Sheet 2 of 3)



1. Gyro Horizon
2. Directional Gyro
3. Suction Gage
4. Bracket
5. Filter
6. Washer
7. Bolt
8. Suction Relief Valve
9. Firewall
10. Hose
11. Vacuum Pump
12. Overboard Line
13. Vacuum Switch
14. Cover

BEGINNING WITH 18268435

Figure 15-6. Vacuum System Installation (Sheet 3 of 3)

15-25. TROUBLE SHOOTING -- VACUUM SYSTEM.

TROUBLE	PROBABLE CAUSE	REMEDY
HIGH SUCTION GAGE READINGS. (Gyros function normally.)	Relief valve filter clogged, relief valve malfunction.	Replace filter, reset valve. Replace Gage.
LOW SUCTION GAGE READINGS.	Leaks or restriction between instruments and relief valve, relief valve out of adjustment, defective pump.	Repair or replace lines, adjust or replace relief valve, repair or replace pump.
	Central air filter dirty.	Replace filter.
SUCTION GAGE FLUCTUATES.	Defective gage or sticking relief valve.	Replace gage. Clean sticking valve with Stoddard solvent. Blow dry and test. If valve sticks after cleaning, replace it.

15-26. TROUBLE SHOOTING -- GYROS.

TROUBLE	PROBABLE CAUSE	REMEDY
HORIZON BAR FAILS TO RESPOND.	Central air filter dirty.	Replace filter.
	Suction relief valve improperly adjusted.	Adjust or replace relief valve.
	Faulty suction gage.	Replace suction gage.
	Vacuum pump failure.	Replace pump.
	Vacuum line kinked or leaking.	Repair or replace damaged lines, tighten connections.
HORIZON BAR DOES NOT SETTLE.	Defective mechanism.	Replace instrument.
	Insufficient vacuum.	Adjust or replace relief valve.
	Excessive vibration.	Replace defective shock panel mounts.
HORIZON BAR OSCILLATES OR VIBRATES EXCESSIVELY.	Central air filter dirty.	Replace filter.
	Suction relief valve improperly adjusted.	Adjust or replace relief valve.
	Faulty suction gage.	Replace suction gage.
	Defective mechanism.	Replace instrument.
	Excessive vibration.	Replace defective shock panel mounts.

15-26. TROUBLE SHOOTING - - GYROS (Cont.)

TROUBLE	PROBABLE CAUSE	REMEDY
EXCESSIVE DRIFT IN EITHER DIRECTION.	Central air filter dirty.	Replace filter.
	Low vacuum, relief valve improperly adjusted.	Adjust or replace relief valve.
	Faulty suction gage.	Replace suction gage.
	Vacuum pump failure.	Replace pump.
	Vacuum line kinked or leaking.	Repair or replace damaged lines, tighten connections.
DIAL SPINS IN ONE DIRECTION CONTINUOUSLY.	Operating limits have been exceeded.	Replace instrument.
	Defective mechanism.	Replace instrument.

15-27. TROUBLE SHOOTING -- VACUUM PUMP.

TROUBLE	PROBABLE CAUSE	REMEDY
EXCESSIVE OIL IN DISCHARGE.	Damaged engine drive seal.	Replace gasket.
HIGH SUCTION.	Suction relief valve filter clogged.	Replace filter.
LOW SUCTION.	Relief valve leaking.	Replace relief valve.
	Vacuum pump failure.	Replace vacuum pump.

15-28. MAINTENANCE PRACTICES.

NOTE

When replacing a vacuum system component, ensure all connections are made correctly to avoid damage to gyro system. When a component is removed, cap off and identify all open lines, hoses, and fittings to prevent dirt from entering system, and to ensure proper reinstallation. Upon component replacement, check all hoses carefully to be sure they are clean and free of debris, oil, solvent, collapsed inner liners, and external damage. Replace old, hard, cracked, or brittle hoses, particularly on pump inlet, to avoid possible pump damage. On vacuum pump, where hose clearance is tight, making it difficult to reinstall hoses, apply a light film of petrolatum to the fitting. Install hoses by pushing them straight on, and do not wiggle hoses from side to side as this could cause particles to be cut from inside of hose, allowing particles to enter system.

CAUTION

Do not use teflon tape, pipe dope, or thread lubricants of any type on fitting threads, and avoid over-tightening of connections. All filters in vacuum system must be changed when installing a new pump. Failure to do so will void pump warranty. DO NOT CONNECT A PUMP BACKWARDS. Since the manifold check valves provide no pressure relief, the pump will be destroyed in a matter of seconds after starting the engine.

15-28A. REMOVAL OF VACUUM PUMP.

a. Remove upper engine cowling in accordance with procedures in Section 11.

b. Disconnect, cap off and identify hose on inlet side of vacuum pump.

c. Identify and disconnect hose on outlet side of vacuum pump.

d. Remove nuts, lockwashers, and flat washers securing vacuum pump to engine.

e. Remove vacuum pump from mounting studs on engine.
f. Remove elbow from pump and retain if it is reusable.

NOTE

Discard any twisted fittings or nuts with rounded corners.

15-28B. MOUNTING PAD INSPECTION.
a. Check condition of the AND 20000 pad seal. If the seal shows any signs of oil leakage, replace the seal. Replace seal if there is any doubt as to its serviceability.

15-28C. INSTALLATION OF VACUUM PUMP.

a. Before installing a new vacuum pump, purge all lines in the system to remove carbon particles or other pump components that may have been deposited in the lines by previous pump.

b.* Consult the applicable Parts Catalog, the pump vendor's application list, or the PMA label on the pump box to verify that the pump is the correct model for the engine and/or system.

c. Position vacuum pump in a jaw-protected vise, with drive coupling downward.

CAUTION

Pump housing should never be placed directly in a vise, since clamping across center housing will cause an internal failure of carbon rotor. Protect pump mounting flange with soft metal or wood. NEVER install a pump that has been dropped.

NOTE

Do not use teflon tape, pipe dope, or thread lubricants of any type, and avoid overtightening of connections.

d. Install elbow in pump; hand-tighten only.

NOTE

Use only a box wrench to tighten fittings to desired position. Do not make more than one and one half (1-1/2) turns beyond hand-tighten position.

NOTE

Before installing vacuum pump on engine, ensure that mating surfaces are clean and free of any old gasket material.

e. Position new mounting pad gasket on mounting studs on engine.
f. Position vacuum pump on mounting studs.
g. Secure pump to engine with flat washers, new lockwashers, and nuts.

CAUTION

Always replace all lockwashers with new ones when installing a new vacuum pump. Tighten all four mounting nuts (4) to 50 to 70 pound-inches.

h. Connect hose to inlet side of vacuum pump.
i. Install upper engine cowling in accordance with procedures in Section 11.

15-29. CLEANING. In general, low pressure, dry compressed air should be used in cleaning vacuum system components. Suction relief valve should be washed with Staddard solvent, then dried with low-pressure air blast.

CAUTION

Never apply compressed air to lines or components installed in aircraft. The excessive pressures will damage gyros. If an obstructed line is to be blown out, disconnect at both ends and blow from instrument panel out.

15-29A. LOW-VACUUM WARNING LIGHT. A red low-vacuum warning light is installed on the instrument panel. The light is controlled by a vacuum switch which is teed into the line between the suction gage and the directional gyro. The switch contacts are normally closed. The light may be checked by turning ON the master switch. With the engine running the light should illuminate when the vacuum drops below 3 ± .5 inches Hg.

15-30. VACUUM RELIEF VALVE ADJUSTMENT. A suction gage reading of 5.3 inches of mercury is desirable for gyro instruments. However, a range of 4.6 to 5.4 inches of mercury is acceptable. To adjust relief valve, remove central air filter, run engine to 1900 rpm on ground and adjust relief valve to 5.3 ± .1 inches of mercury.

CAUTION

Do not exceed maximum engine temperature.

Be sure filter element is clean before installing. If reading drops noticeably, install new filter element.

15-30A. STANDBY VACUUM SYSTEM.

15-30B. DESCRIPTION. A standby vacuum system may be installed in the airplane. The system consists of a electric motor driven vacuum pump, a vacuum relief valve, a manifold valve and associated hoses. The vacuum pump and motor assembly are mounted on the aft side of the firewall. A circuit breaker switch on the instrument panel controls and protects the system.

15-30C. TROUBLE SHOOTING - STANDBY VACUUM SYSTEM.

TROUBLE	PROBABLE CAUSE	REMEDY
NO SUCTION GAGE READING.	Circuit breaker switch has opened.	Reset circuit breaker switch. If switch reopens, check wire from switch to bus bar for short. Repair or replace wire.
	Defective motor.	Check voltage input wire and ground wire. Repair or replace wires.
	Defective pump.	Check pump operation. Replace pump.
LOW SUCTION GAGE READING.	Leak or restriction between pump and suction gage.	Check hoses and connections for leaks and obstructions. Install new clamps at connections, clear or replace hoses.
	Relief valve not properly adjusted.	Adjust relief valve.
	Defective pump.	Check pump. Replace pump.
	Central air filter dirty.	Replace central air filter.

15-30D. REMOVAL (See figure 15-6A.)

a. Make sure circuit breaker switch (1) and battery switch are off.

b. Remove clamps securing hoses (15) and (16) to vacuum pump (20).

c. Cap hoses and pump fittings so dirt cannot enter system.

d. Disconnect ground wire (18) and voltage input wire (17).

e. Remove safety wire from bolts (23).

f. Remove bolts (23) and washers (24) and remove motor and pump assembly.

g. If motor (26) is to be removed from assembly, remove nuts (21) and washers (22).

15-30E. INSTALLATION. (See figure 15-6A.)

a. If motor was removed from assembly, position motor (26) and install washers (22) and nuts (21).

b. Position pump and motor assembly on duct assembly and install washers (24) and bolts (23).

c. Safety wire bolts (23).

d. Place hoses (15) and (16) over pump fittings and install clamps.

e. Connect voltage input wire (17) and ground wire (18).

f. Turn on battery switch and circuit breaker switch (1), then check suction gage to see that system is operating properly. Turn off switches.

CAUTION

Check that voltage input wire (17) is not pushed down into motor as it could become entangled with the armature, locking it.

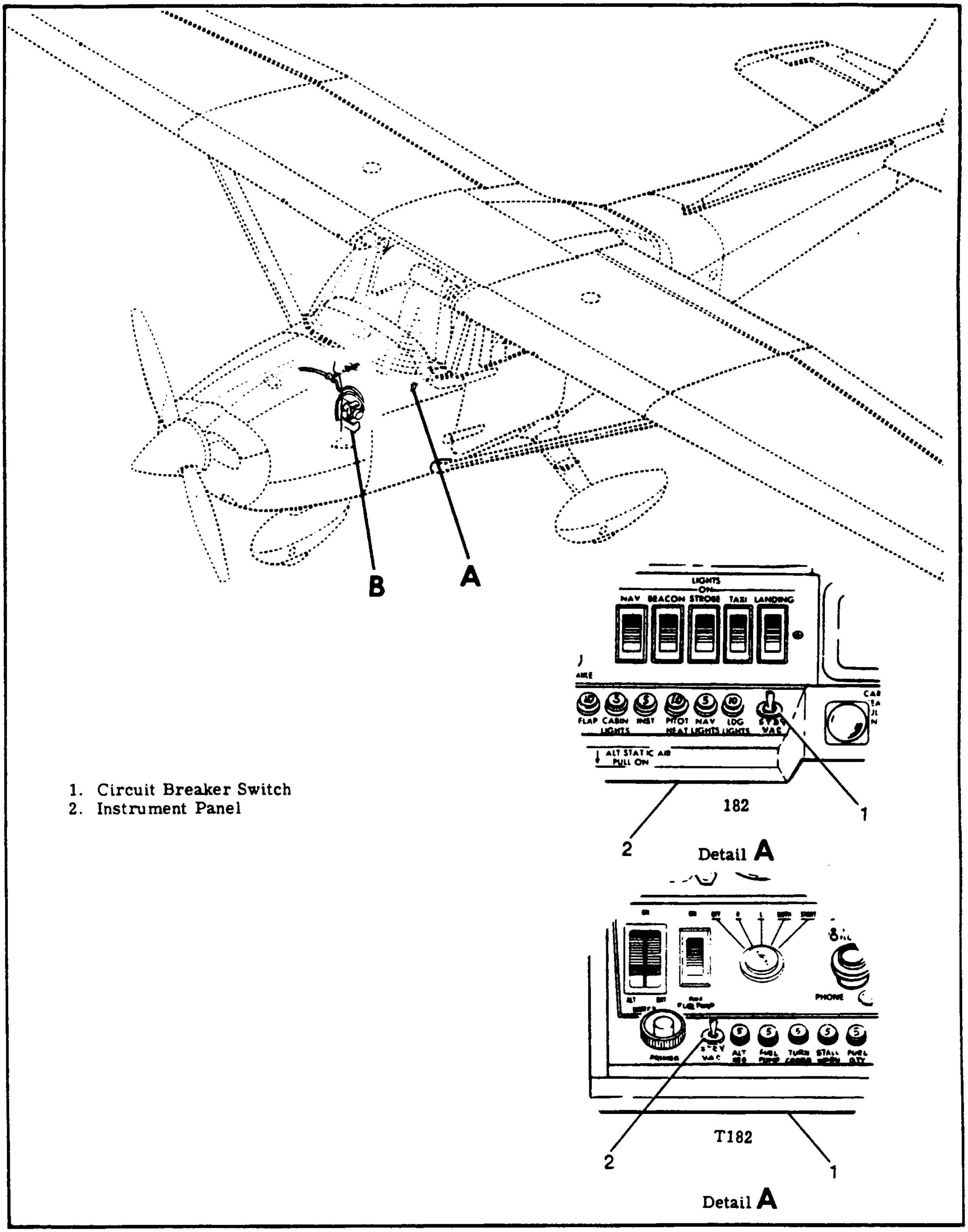
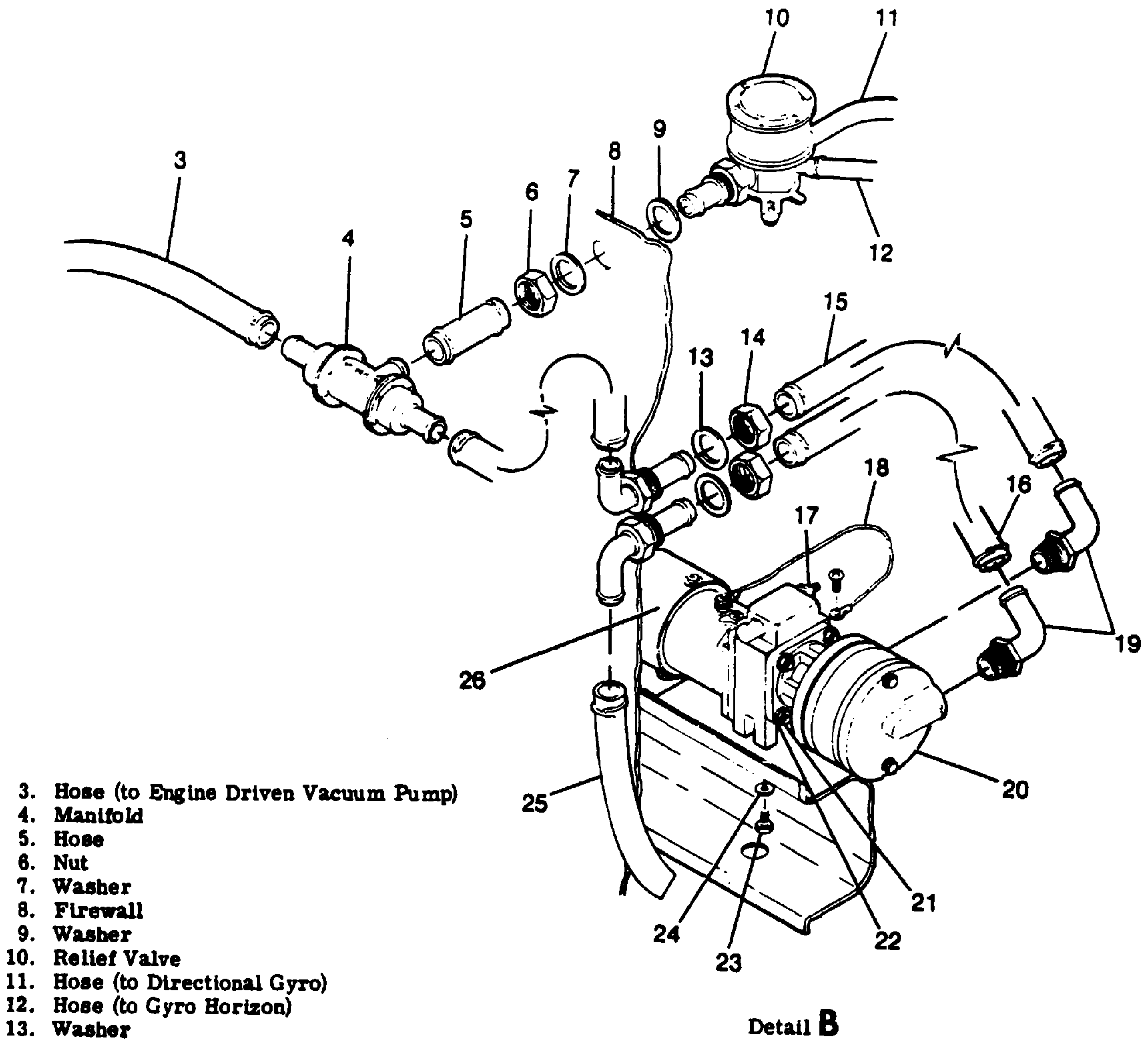


Figure 15-6A. Standby Vacuum System (Sheet 1 of 2)



3. Hose (to Engine Driven Vacuum Pump)
4. Manifold
5. Hose
6. Nut
7. Washer
8. Firewall
9. Washer
10. Relief Valve
11. Hose (to Directional Gyro)
12. Hose (to Gyro Horizon)
13. Washer
14. Nut
15. Hose (to Manifold)
16. Motor
17. Power Input Wire
18. Ground Wire
19. Fittings
20. Vacuum Pump
21. Nut
22. Washer
23. Bolt
24. Washer
25. Vent Hose

Figure 15-6A. Standby Vacuum System (Sheet 2 of 2)

15-31. ENGINE INDICATORS.

15-32. TACHOMETER.

15-33. DESCRIPTION. The tachometer is a mechanical indicator driven at half crankshaft speed by a flexible shaft. Most tachometer difficulties will be found in the drive-shaft. To function properly, the shaft housing must be free of kinks, dents and sharp bends. There should be no bend on a radius shorter than six inches and no bend within three inches of either terminal. If a tachometer is noisy or the pointer oscillates, check cable housing for kinks, sharp bends and damage. Disconnect cable at tachometer and pull it out of housing. Check cable for worn spots, breaks and kinks.

NOTE

Before replacing a tachometer cable in housing, coat lower two thirds with AC Type ST-640 speedometer cable grease or Lubriplate No. 110. Insert cable in housing as far as possible, then slowly rotate to make sure it is seated in the engine fitting. Insert cable in tachometer, making sure it is seated in drive shaft, then reconnect housing and hand tighten, then torque 1/4 turn.

15-34. MANIFOLD PRESSURE GAGE - 182.

15-35. DESCRIPTION. The manifold pressure gage is a barometric instrument which indicates absolute pressure in the intake manifold in inches of mercury.

15-35A. DAMPENING SCREW ADJUSTMENT. If sluggish or excessive vibration of the needle is noted, check the adjustment of the screw as follows: Evacuate the instrument to 10 in. Hg., release the vacuum abruptly, and check the time required fr r the needle to pass from 10 in. Hg. to 25 in. Hg. The required time should check 2 seconds ± 1.0 second. Refer to paragraph 15-38 for additional trouble shooting information.

15-36. MANIFOLD PRESSURE/FUEL PRESSURE GAGE - T182.

15-37. DESCRIPTION. The manifold pressure and fuel pressure gage are in one instrument case. However, each instrument operates independently. The manifold pressure gage is a barometric instrument which indicates absolute pressure in the intake manifold in inches of mercury. The fuel pressure gage is a pressure instrument calibrated in PSI indicating approximate fuel pressure to the engine. Pressure for operating the indicator is obtained through a hose from the fuel manifold valve.

15-38. TROUBLE SHOOTING - MANIFOLD PRESSURE GAGE.

TROUBLE	PROBABLE CAUSE	REMEDY
EXCESSIVE ERROR AT EXISTING BAROMETRIC PRESSURE.	Pointer shifted.	Replace instrument.
	Leak in vacuum bellows.	Replace instrument.
	Loose pointer.	Replace instrument.
	Leak in pressure line.	Test line and connections for leaks. Repair or replace damaged line, tighten connections.
	Condensate or fuel in line.	Check line for obstructions. Blow out line.
JERKY MOVEMENT OF POINTER.	Excessive internal friction.	Replace instrument.
	Rocker shaft screws tight.	Replace instrument.
	Link springs too tight.	Replace instrument.
	Dirty pivot bearings.	Replace instrument.
	Defective mechanism.	Replace instrument.
	Leak in pressure line.	Test line and connections for leaks. Repair or replace damaged line, tighten connections.

15-38. TROUBLE SHOOTING - - MANIFOLD PRESSURE GAGE (Cont.)

TROUBLE	PROBABLE CAUSE	REMEDY
SLUGGISH OPERATION OF POINTER.	Foreign matter in line.	Check line for obstructions. Blow out line.
	Damping needle dirty.	Replace instrument.
	Leak in pressure line.	Test line and connections for leaks. Repair or replace damaged line, tighten connections.
EXCESSIVE POINTER VIBRATION.	Tight rocker pivot bearings.	Replace instrument.
	Excessive vibration.	Check panel shock-mounts. Replace defective shock-mounts.
IMPROPER CALIBRATION.	Faulty mechanism.	Replace instrument.
NO POINTER MOVEMENT.	Faulty mechanism.	Replace instrument.
	Broken pressure line.	Check line and connections for breaks. Repair or replace damaged line.

15-39. TROUBLE SHOOTING - - FUEL PRESSURE GAGE.

TROUBLE	PROBABLE CAUSE	REMEDY
DOES NOT REGISTER.	Pressure line clogged.	Check line for obstructions. Blow out line.
	Pressure line broken.	Check line for damage or leaks. Repair or replace damaged line.
	Fractured bellows or damaged mechanism.	Replace instrument.
	Clogged snubber orifice.	Replace instrument.
	Pointer loose on shaft.	Replace instrument.
POINTER FAILS TO RETURN TO ZERO.	Foreign matter in line.	Check line for obstructions. Blow out line.
	Clogged snubber orifice.	Replace instrument.
	Damaged bellows or mechanism.	Replace instrument.
INCORRECT OR ERRATIC READING.	Damaged or dirty mechanism.	Replace instrument.
	Pointer bent, rubbing on dial or glass.	Replace instrument.
	Leak or partial obstruction in pressure or vent line.	Check line for obstructions or leaks. Blow out dirty line, repair or tighten loose connections.

15-40. CYLINDER HEAD TEMPERATURE GAGE.

15-41. DESCRIPTION. The temperature sending unit regulates electrical power through the cylinder head temperature gage. The gage and sending unit require little or no maintenance other than cleaning, making sure lead is properly supported and all connections are clean, tight and properly insulated. Torque on lead nut at sending unit not to exceed 4 inch pounds. The Rochester and Stewart Warner gages are connected the same, but the Rochester gage does not have a calibration pot and cannot be adjusted. Refer to Table 2, on page 15-24B when trouble shooting the cylinder head temperature gage.

NOTE

A Cylinder Head Temperature Gage Calibration Unit, (SK182-43) is available and may be ordered through the Cessna Supply Division.

15-42. TROUBLE SHOOTING.

TROUBLE	PROBABLE CAUSE	REMEDY
GAGE INOPERATIVE.	No current to circuit.	Repair electrical circuit.
	Defective gage, bulb or circuit.	Repair or replace defective items.
GAGE FLUCTUATES RAPIDLY.	Loose or broken wire permitting alternate make and break of gage circuit.	Repair or replace defective wire.
GAGE READS TOO HIGH ON SCALE.	High voltage.	Check "A" terminal.
	Gage off calibration.	Replace gage.
GAGE READS TOO LOW ON SCALE.	Low voltage.	Check voltage supply and "D" terminal.
	Gage off calibration.	Replace gage.
GAGE READS OFF SCALE AT HIGH END.	Break in bulb.	Replace bulb.
	Break in bulb lead.	Replace bulb.
	Internal break in gage.	Replace gage.
OBVIOUSLY INCORRECT READING.	Defective gage mechanism.	Replace gage.
	Incorrect calibration.	Calibrate system.

15-43. OIL PRESSURE GAGE.

15-44. DESCRIPTION. The Bourdon tube-type oil pressure gage is a direct-reading instrument, operated by a pressure pickup line connected to the engine main oil gallery. The oil pressure line from the instrument to the engine should be filled with kerosene, especially during cold weather operation, to attain an immediate oil indication.

15-45. TROUBLE SHOOTING.

TROUBLE	PROBABLE CAUSE	REMEDY
GAGE DOES NOT REGISTER.	Pressure line clogged.	Clean line.
	Pressure line broken.	Repair or replace damaged line.
	Fractured Bourdon tube.	Replace instrument.
	Gage pointer loose on staff.	Replace instrument.
	Damaged gage movement.	Replace instrument.
GAGE POINTER FAILS TO RETURN TO ZERO.	Foreign matter in line.	Clean line.
	Foreign matter in Bourdon tube.	Replace instrument.
	Bourdon tube stretched.	Replace instrument.
GAGE DOES NOT REGISTER PROPERLY.	Faulty mechanism.	Replace instrument.
GAGE HAS ERRATIC OPERATION.	Worn or bent movement.	Replace instrument.
	Foreign matter in Bourdon tube.	Replace instrument.
	Dirty or corroded movement.	Replace instrument.
	Pointer bent and rubbing on dial, dial screw or glass.	Replace instrument.
	Leak in pressure line.	Repair or replace damaged line.

15-46. OIL TEMPERATURE GAGE.

15-47. DESCRIPTION. On some airplanes, the oil temperature gage is a Bourdon tube type pressure instrument connected by armored capillary tubing to a temperature bulb in the engine. The temperature bulb, capillary tube and gage are filled with fluid and sealed. Expansion and contraction of fluid in the bulb with temperature changes operates the gage. Checking capillary tube for damage and fittings for security is the only maintenance required. Since the tubes inside diameter is small, small dents and kinks, which would be acceptable in larger tubing, may partially or completely close off the capillary, making the gage inoperative. Some airplanes are equipped with gages that are electrically actuated and are not adjustable. Refer to Table 1, page 15-24A when trouble shooting the oil temperature gage.

15-48. CARBURETOR AIR TEMPERATURE GAGE.

15-49. DESCRIPTION. The carburetor air temperature gage is of the resistance-bridge type. Changes in electrical resistance of the element are indicated by the gage, calibrated for temperature. The system requires power from the aircraft electrical system and operates only when the master switch is on. Although both instrument and sensing bulb are grounded. two leads are used to avoid possibility of instrument error induced by poor electrical bonds in the airframe

15-50. TROUBLE SHOOTING.

TROUBLE	PROBABLE CAUSE	REMEDY
GAGE POINTER STAYS OFF LOW END OF SCALE.	Popped circuit breaker.	Reset breaker.
	Master switch "OFF" or switch defective.	Replace defective switch.
	Broken or grounded leads between gage and sensing unit.	Repair or replace defective wiring.
	Defective gage or sensing unit.	Replace gage or sensing unit.
GAGE POINTER GOES OFF HIGH END OF SCALE.	Broken or grounded lead.	Repair or replace defective wiring.
	Defective gage or sensing unit.	Replace gage or sensing unit.
GAGE OPERATES INTER-MITTENTLY.	Defective master switch, broken or grounded lead.	Replace switch, repair or replace defective wiring.
	Defective gage or sensing unit.	Replace gage or sensing unit.
EXCESSIVE POINTER OSCILLATION.	Loose or broken lead.	Repair or replace defective wiring.
	Defective gage or sensing unit.	Replace gage or sensing unit.
	Excessive panel vibration.	Tighten panel mounting screws.
OBVIOUSLY INCORRECT TEMPERATURE READING.	Defective gage or sensing unit.	Replace gage or sensing unit.
POINTER FAILS TO GO OFF SCALE WITH CURRENT OFF.	Defective master switch.	Replace switch.
	Defective gage.	Replace gage.

15-51. FUEL QUANTITY INDICATING SYSTEM.

15-52. DESCRIPTION. The magnetic type fuel quantity indicators are used in conjunction with a float-operated variable-resistance transmitter in each fuel cell. The full position of float produced a minimum resistance through the transmitter, permitting maximum current flow through the fuel quantity indicator and maximum pointer deflection. As fuel level is lowered, resistance in the transmitter is increased, producing a decreased current flow through the fuel quantity indicator and a smaller pointer deflection.

15-53. REMOVAL AND INSTALLATION OF TRANSMITTER. (Refer to section 12).

a. Drain fuel from cell. (Observe the precautions in Section 12.)

b. Remove wing root fairing.

c. Disconnect electrical lead and ground strap from transmitter.

d. Remove screws attaching transmitter and carefully work transmitter from cell. DO NOT BEND FLOAT ARM.

e. Install transmitter by reversing preceding steps, using new gaskets around opening in fuel cell and under screw heads. Be sure to tighten screws evenly to ensure bottom of float is approximately .20 in. from bottom of fuel cell.

f. Service fuel tanks. Check for leaks and correct quanity indication.

15-54. TROUBLE SHOOTING.

TROUBLE	PROBABLE CAUSE	REMEDY
FAILURE TO INDICATE.	No power to indicator or transmitter. (Pointer stays below E.)	Check and reset breaker, repair or replace defective wiring.
	Grounded wire. (Pointer stays above F.)	Repair or replace defective wire.
	Low voltage.	Correct voltage.
	Defective indicator.	Replace indicator.
SYSTEM OFF CALIBRATION.	Defective indicator.	Replace indicator.
	Defective transmitter.	Recalibrate or replace.
	Low or high voltage.	Correct voltage.
STICKY OR SLUGGISH INDICATOR OPERATION.	Defective indicator.	Replace indicator.
	Low voltage.	Correct voltage.
ERRATIC READINGS.	Loose or broken wiring on indicator or transmitter.	Repair or replace defective wire.
	Defective indicator or transmitter.	Replace indicator or transmitter.
	Defective master switch.	Replace switch.

15-55. TRANSMITTER ADJUSTMENT.
(Refer to page 15-24A).

15-56. HOURMETER. (See Figure 15-7.)

15-57. DESCRIPTION. The hourmeter is an electically operated instrument, actuated by a pressure switch in the oil pressure gage line. Electrical power is supplied through a one-amp fuse from the electrical clock circuit, and therefore will operate independent of the master switch. A diode incorporated into the meter prevents interruption of avionics operation. This type hourmeter is identified by a white + above the positive terminal.

NOTE

When installing the hourmeter, the positive (Red) wire must be connected to the white + terminal. Connecting wires will damage the meter.

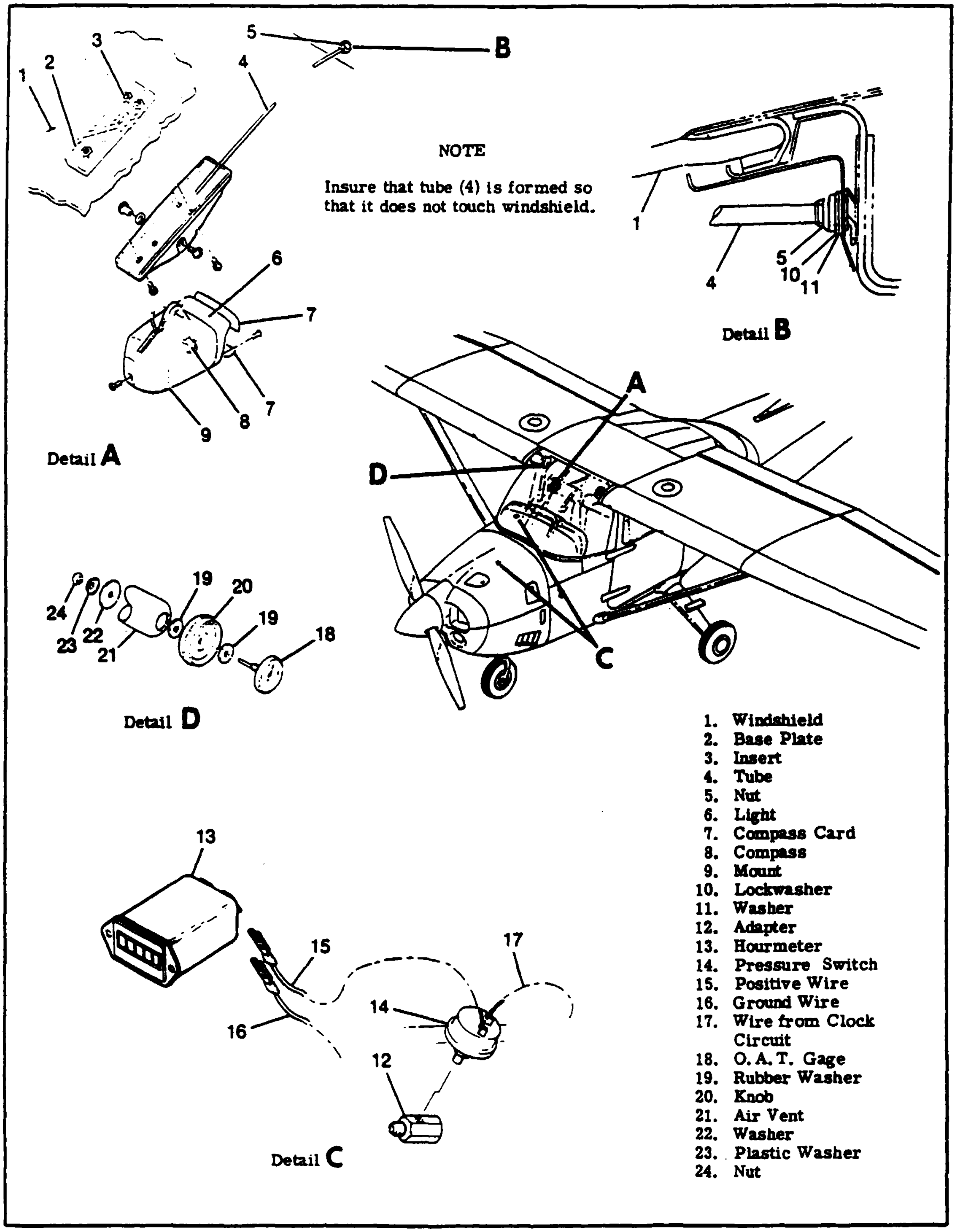


Figure 15-7. Compass, O.A.T. Gage and Hourmeter Installation.

15-55. TRANSMITTER ADJUSTMENT.

WARNING

Using the following fuel transmitter calibration procedure on components other than the originally installed (Stewart Warner) components will result in a faulty fuel quantity reading.

15-55A. STEWART WARNER GAGE TRANSMITTER CALIBRATION. Chances of transmitter calibration changing in normal service is remote; however, it is possible that float arm or float arm stops may become bent if transmitter is removed from cell. Transmitter calibration is obtained by adjusting float travel. Float travel is limited by float arm stops.

WARNING

Use extreme caution while working with electrical components of the fuel system. The possibility of electrical sparks around an "empty" fuel cell creates a hazardous situation.

Before installing transmitter, attach electrical wires and place master switch in "ON" position. Allow float arm to rest against lower float arm stop and read indicator. The pointer should be on E (empty) position. Adjust the float arm against lower stop so pointer indicator is on E. Raise float until arm is against upper stop and adjust upper stop to permit indicator pointer to be on F (full). Install transmitter in accordance with paragraph 16-50.

15-55B. ROCHESTER GAGE TRANSMITTER. Do not attempt to adjust float arm or stop. No adjustment is allowed.

Table 1

NOTE

Select the oil temperature sending unit part number that is used in your aircraft from the left column and the temperature from the column headings. Read the ohms value under the appropriate temperature column.

Part Number	Type	72°F	120°F	165°F	220°F	250°F
S1630-1	Oil Temp				46.4	
S1630-3	Oil Temp		620.0			52.4
S1630-4	Oil Temp		620.0			52.4
S1630-5	Oil Temp			192.0		
S2335-1	Oil Temp	990.0				34.0

Table 2

NOTE

Select the cylinder head temperature sending unit part number that is used in your aircraft from the left column and the temperature from the column headings. Read the ohms value under the appropriate temperature column.

Part Number	Type	200°F	220°F	450°F	475°F
S1372-1	CHT		310.0	34.8	
S1372-2	CHT		310.0	34.8	
S1372-3	CHT			113.0	
S1372-4	CHT			113.0	
S2334-3	CHT	745.0			38.0
S2334-4	CHT	745.0			38.0

15-55C. FUEL QUANTITY INDICATING SYSTEM OPERATIONAL TEST.

WARNING: REMOVE ALL IGNITION SOURCES FROM THE AIRPLANE AND VAPOR HAZARD AREA. SOME TYPICAL EXAMPLES OF IGNITION SOURCES ARE STATIC ELECTRICITY, ELECTRICALLY POWERED EQUIPMENT (TOOLS OR ELECTRONIC TEST EQUIPMENT - BOTH INSTALLED ON THE AIRPLANE AND GROUND SUPPORT EQUIPMENT), SMOKING AND SPARKS FROM METAL TOOLS.

WARNING: OBSERVE ALL STANDARD FUEL SYSTEM FIRE AND SAFETY PRACTICES.

1. Disconnect all electrical power from the airplane. Attach maintenance warning tags to the battery connector and external power receptacle stating:

   DO NOT CONNECT ELECTRICAL POWER, MAINTENANCE IN PROGRESS.

2. Electrically ground the airplane.
3. Level the airplane and drain all fuel from wing fuel tanks.
4. Gain access to each fuel transmitter float arm and actuate the arm through the transmitter's full range of travel.

   A. Ensure the transmitter float arm moves freely and consistently through this range of travel. Replace any transmitter that does not move freely or consistently.

   WARNING: USE EXTREME CAUTION WHILE WORKING WITH ELECTRICAL COMPONENTS OF THE FUEL SYSTEM. THE POSSIBILITY OF ELECTRICAL SPARKS AROUND AN "EMPTY" FUEL CELL CREATES A HAZARDOUS SITUATION.

   B. While the transmitter float arm is being actuated, apply airplane battery electrical power as required to ensure that the fuel quantity indicator follows the movement of the transmitter float arm. If this does not occur, troubleshoot, repair and/or replace components as required until the results are achieved as stated.

      NOTE: Stewart Warner fuel quantity indicating systems can be adjusted. Refer to instructions for adjusting Stewart Warner fuel indicating systems in this section.
      Rochester fuel quantity indicating system components are not adjustable, only component replacement or standard electrical wiring system maintenance practices are permitted.

5. With the fuel selector valve in the "OFF" position, add unusable fuel to each fuel tank.
6. Apply electrical power as required to verify the fuel quantity indicator indicates "EMPTY".

   A. If "EMPTY" is not indicated, adjust, troubleshoot, repair and/or replace fuel indicating components as required until the "EMPTY" indication is achieved.

      NOTE: Stewart Warner fuel quantity indicating systems can be adjusted. Refer to instructions for adjusting Stewart Warner fuel indicating systems in this section.
      Rochester fuel quantity indicating system components are not adjustable, only component replacement or standard electrical wiring system maintenance practices are permitted.

7. Fill tanks to capacity, apply electrical power as required and verify that the fuel quantity indicators indicate "FULL".

   A. If "FULL" is not indicated, adjust, troubleshoot, repair and/or replace fuel indicating components as required until the "FULL" indication is achieved.

NOTE: Stewart Warner fuel quantity indicating systems can be adjusted. Refer to instructions for adjusting Stewart Warner fuel indicating systems in this section.
Rochester fuel quantity indicating system components are not adjustable, only component replacement or standard electrical wiring system maintenance practices are permitted.

8. Install any items and/or equipment removed to accomplish this procedure, remove maintenance warning tags and connect the airplane battery.

15-58. ECONOMY MIXTURE INDICATOR.

15-59. DESCRIPTION. The economy mixture indicator is an exhaust gas temperature (EGT) sensing device which is used to aid the pilot in selecting the most desirable fuel-air mixture for cruising flight at less than 75% power. Exhaust gas temperature (EGT) varies with ratio of fuel-to-air mixture entering the engine cylinders. Refer to the Owner's Manual for operating procedure of the system.

15-60. TROUBLE SHOOTING.

TROUBLE	PROBABLE CAUSE	REMEDY
GAGE INOPERATIVE.	Defective gage, probe or circuit.	Repair or replace defective part.
INCORRECT READING.	Indicator needs calibrating.	Calibrate indicator in accordance with paragraph 15-61.
FLUCTUATING READING.	Loose, frayed or broken lead. permitting alternate make and break of current.	Tighten connections and repair or replace defective leads.

15-61. CALIBRATION. When a new EGT gage or probe is installed accomplish the following steps:

a. Before flight remove the decorative cover on right hand instrument panel and temporarily install the EGT indicator with one screw.

b. Test fly the airplane and establish 75% power in level flight. Carefully lean the fuel mixture to achieve peak EGT. Remove the EGT indicator from the panel and adjust the screw on the back of the instrument beneath the plastic cap with a small blade screwdriver to place the EGT indicator hand over the 4/5 scale increment of the indicator scale. Turning the screw clockwise increases the reading and counterclockwise decreases the reading. The adjusting screw has an adjustment range of approximately 600°F or 2 increments in either direction. Stops are provided on the adjust screw which control the above and should not be forced past stops as it will affect calibration of the Unit Scale.

NOTE

The 4/5 scale increment setting provides the reference indicator point for relative temperature indications for normal cruise power settings within range of instrument scale.

c. After flight reinstall indicator and decorative cover.

The yellow adjustable hand on indicator is for use to mark a reference temperature setting.

15-62. REMOVAL AND INSTALLATION. Removal of the indicator is accomplished by removing the mounting screws and disconnecting the leads. Tag leads to facilitate installation. The thermocouple probe is secured to the exhaust stack with a clamp. When installing probe, tighten clamp to 45 pound-inches and safety as required. Refer to Section 11 for exaust system installation.

15-63. MAGNETIC COMPASS. (See figure 15-7.)

15-64. DESCRIPTION. The magnetic compass is liquid-filled, with expansion provisions to compensate for temperature changes. It is equipped with compensating magnets adjustable from the front of the case. The compass is internally lighted, controlled by the instrument lights rheostat switch. No maintenance is required on the compass except an occasional check on a compass rose and replacement of lamp. The compass mount is attached by three screws to a base plate which is bonded to windshield with methylene chloride. A tube containing the compass light wires is attached to the metal strip at the top of the windshield. Removal of the compass is accomplished by removing the screw at forward end of compass mount, unfastening the metal strip at the top of windshield and cutting the two wire splices. Removal of the compass mount is accomplished by removing three screws attaching mount to the base plate. Access to the inner screw is gained through a hole in the bottom of mount, through which a thin screwdriver may be inserted. When installing the compass, it will be necessary to splice the compass light wires.

15-65. STALL WARNING HORN AND TRANSMITTER.

15-66. DESCRIPTION. The stall warning horn is mounted on the glove box. It is electrically operated and controlled by a stall warning transmitter mounted on the leading edge of the left wing. For further information on the warning horn and transmitter, refer to Section 16.

15-67. TURN COORDINATOR.

15-68. DESCRIPTION. The turn coordinator is an electrically operated, gyroscopic, roll-turn rate indicator. Its gyro simultaneously senses rate of motion roll and yaw axis which is projected on a single indicator. The gyro is a non-tumbling type requiring no caging machanism and incorporates an ac brushless spin motor with a solid state inverter.

15-69. TROUBLE SHOOTING.

TROUBLE	PROBABLE CAUSE	REMEDY
INDICATOR DOES NOT RETURN TO CENTER.	Friction caused by contamination in the indicator dampening.	Replace instrument.
	Friction in gimbal assembly.	Replace instrument.
DOES NOT INDICATE A STANDARD RATE TURN (TOO SLOW).	Low voltage.	Correct voltage.
	Inverter frequency changed	Replace instrument.
NOISY MOTOR.	Faulty bearings.	Replace instrument.
ROTOR DOES NOT START.	Faulty electrical connection.	Correct voltage or replace faulty wire.
	Inverter malfunctioning.	Replace instrument.
	Motor shorted.	Replace instrument.
	Bearings frozen.	Replace instrument.
IN COLD TEMPERATURES, HAND FAILS TO RESPOND OR IS SLUGGISH.	Oil in indicator becomes too thick.	Replace instrument.
	Insufficient bearing end play.	Replace instrument.
	Low voltage.	Correct voltage.
NOISY GYRO.	High voltage.	Correct voltage.
	Loose or defective rotor bearings.	Replace instrument.

15-70. TURN-AND-SLIP INDICATOR.

15-71. DESCRIPTION. The turn-and-slip indicator is operated by the aircraft electrical system and operates ONLY when the master switch is on. Its circuit is protected by an automatically-resetting circuit breaker.

15-72. TROUBLE SHOOTING.

TROUBLE	PROBABLE CAUSE	REMEDY
INDICATOR POINTER FAILS TO RESPOND.	Automatic resetting circuit breaker defective.	Replace circuit breaker.
	Master switch "OFF" or switch defective.	Replace defective switch.
	Broken or grounded lead to indicator.	Repair or replace defective wiring.
	Indicator not grounded.	Repair or replace defective wire.
	Defective mechanism.	Replace instrument.
HAND SLUGGISH IN RE-TURNING TO ZERO.	Defective mechanism.	Replace instrument.
	Low voltage.	Correct voltage.
POINTER DOES NOT INDICATE PROPER TURN.	Defective mechanism.	Replace instrument.
HAND DOES NOT SIT ON ZERO.	Gimbal and rotor out of balance.	Replace instrument.
	Hand incorrectly sits on rod.	Replace instrument.
	Sensitivity spring adjustment pulls hand off zero.	Replace instrument.
IN COLD TEMPERATURES, HAND FAILS TO RESPOND OR IS SLUGGISH.	Oil in indicator becomes too thick.	Replace instrument.
	Insufficient bearing end play.	Replace instrument.
	Low voltage.	Correct voltage.
NOISY GYRO.	High voltage.	Correct voltage.
	Loose or defective rotor bearings.	Replace instrument.

15-73. ELECTRIC CLOCK.

15-74. DESCRIPTION. The electric clock is connected to the battery through a one-ampere fuse mounted adjacent to the battery box. The electrical circuit is separate from the aircraft electrical system and will operate when the master switch is OFF. Beginning with 1979 Models a digital clock may be installed. Refer to Pilots Operating Handbook for operating procedures.

15-75. OUTSIDE AIR TEMPERATURE GAGE. (See figure 15-7.)

SECTION 16
ELECTRICAL SYSTEMS

WARNING

When performing any inspection or maintenance that requires turning on the master switch, installing a battery, or pulling the propeller through by hand, treat the propeller as if the ignition switch were ON. Do not stand, nor allow anyone else to stand, within the arc of the propeller, since a loose or broken wire, or a component malfunction, could cause the propeller to rotate.

TABLE OF CONTENTS

16-1. ELECTRICAL SYSTEMS.

16-2. GENERAL. This section contains service information necessary to maintain the Aircraft Electrical Power Supply System, Battery and External Power Supply System, Aircraft Lighting System, Pitot Heater, Cigar Lighter and Electrical Load Analysis.

16-3. ELECTRICAL POWER SUPPLY SYSTEM.

16-4. DESCRIPTION. Electrical energy for the aircraft is supplied by a 14-volt, direct current, single-wire, negative ground electrical system. A single 12-volt battery supplies power for starting and furnishes a reserve source of power in the event of alternator failure thru 1977 models. Beginning with 1978 models the electrical system is 28-volt and a 24-volt battery is utilized. An engine-driven alternator is the normal source of power during flight and maintains a battery charge controlled by a voltage regulator. An external power receptacle is offered as optional equipment to supplement the battery system for starting and ground operation.

16-5. SPLIT BUS BAR.

16-6. DESCRIPTION. Electrical power is supplied through a split bus bar. One side of the bus bar supplies power to the electrical equipment while the other side supplies the electronic installations. When the master switch is closed, the battery contactor engages and the battery power is supplied to the electrical side of the split bus bar. The electrical bus feeds battery power thru a relay, thru 1977 models and an avionics master switch beginning with 1978 models, to the electronics bus. On the T182 the electronic bus is mounted on the left hand cabin sidewall forward of the doorpost.

16-7. SPLIT BUS POWER RELAY. (THRU 1977 MODELS).

16-8. DESCRIPTION. A power relay is installed behind the instrument panel on all aircraft utilizing a split bus bar. The relay is a normally closed type, opening when external power is connected or when the starter is engaged, thus removing battery power from the electronic side of the split bus bar and preventing transient voltages from damaging the electronic installation. (See figure 16-2.)

16-9. MASTER SWITCH.

16-10. DESCRIPTION. The operation of the battery and alternator system is controlled by a master switch. The switch, when operated, connects the battery contactor coil to ground and the alternator field circuit to the battery, activating the power systems. The switch is a inter-locking, split rocker with battery mode on the right hand side and the alternator mode on the left hand side. This arrangement allows the battery to be on the line without the alternator, however, operation of the alternator without the battery on the line is not possible. The switch is labeled BAT and ALT above the switch and is located on the left hand side of the switch panel.

16-11. AMMETER.

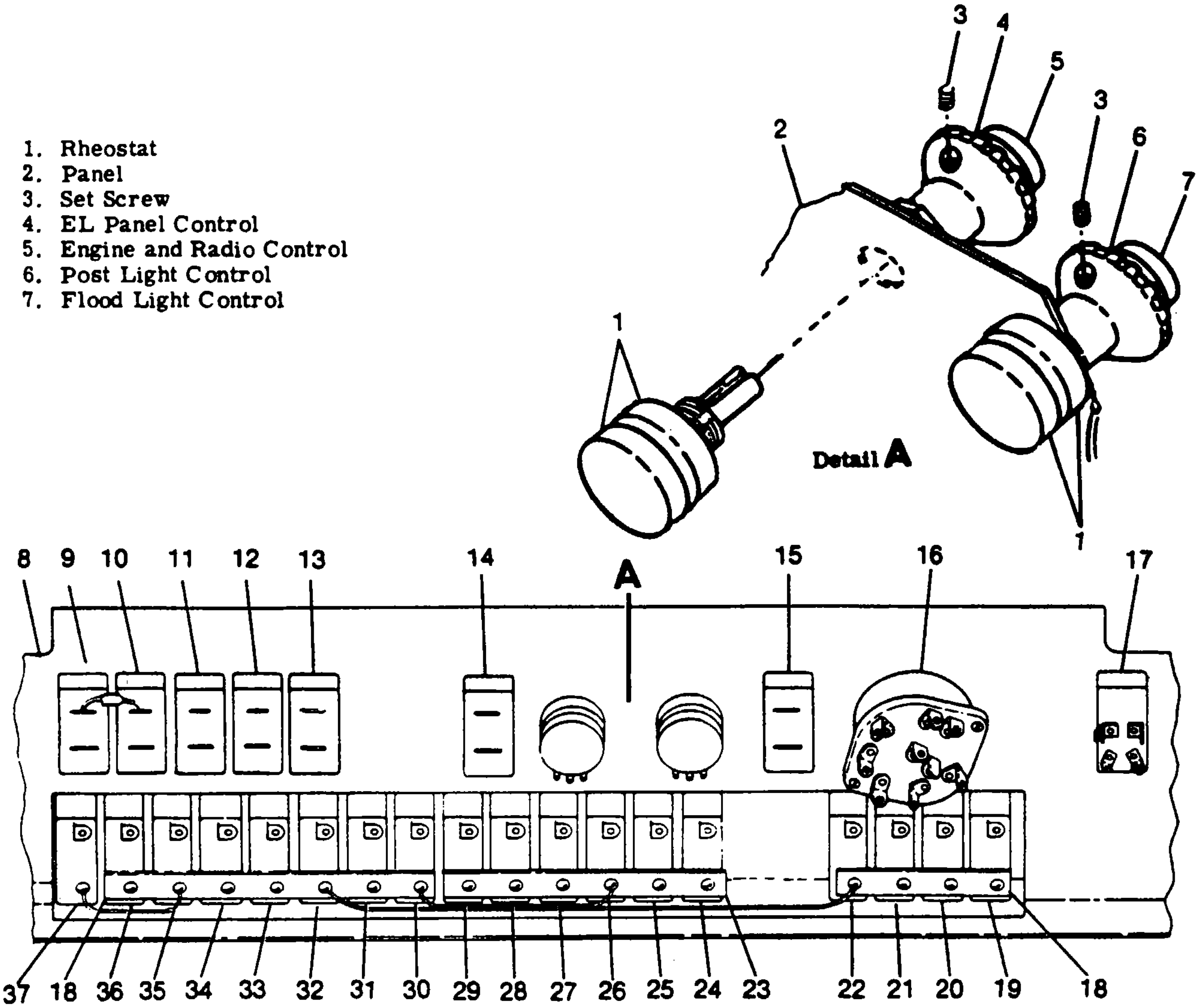
16-12. DESCRIPTION. The ammeter is connected between the battery and the aircraft bus. The meter indicates the amount of current flowing either to or from the battery. With a low battery and the engine operating at cruise speed, the ammeter will show the full alternator output. When the battery is fully charged and cruise is maintained with all electrical equipment off, the ammeter will show a minimum charging rate.

16-13. BATTERY POWER SYSTEM.

16-14. BATTERY.

16-15. DESCRIPTION. Thru 1977 models the battery furnished as standard equipment, is 12-volt and is approximately 25 ampere-hour capacity. A larger heavy duty battery is offered as optional equipment. The heavy duty battery is also 12-volt but is approximately 33 ampere hour capacity. The battery is mounted in the tailcone and is equipped with non-spill filler caps. Since the same battery box is used for both batteries, a spacer is utilized to fill the unused portion of the battery box when the smaller standard battery is installed. Beginning with 1978 models a 24-volt battery is installed. This battery has an approximate 12.75 ampere hour capactiy on the standard battery and 15.5 ampere hour capacity on the optional battery.

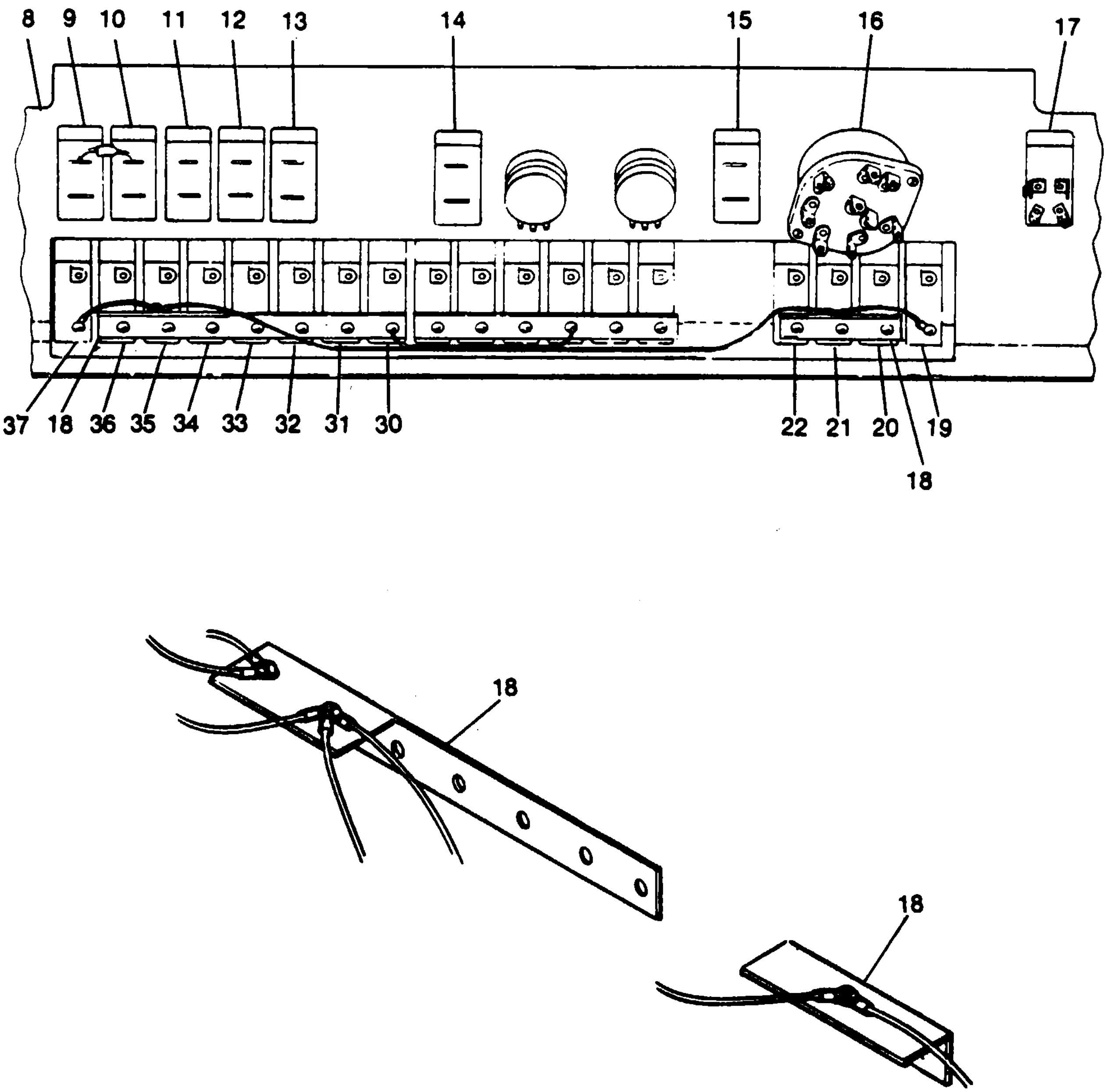
1. Rheostat
2. Panel
3. Set Screw
4. EL Panel Control
5. Engine and Radio Control
6. Post Light Control
7. Flood Light Control



THRU 1980 MODELS

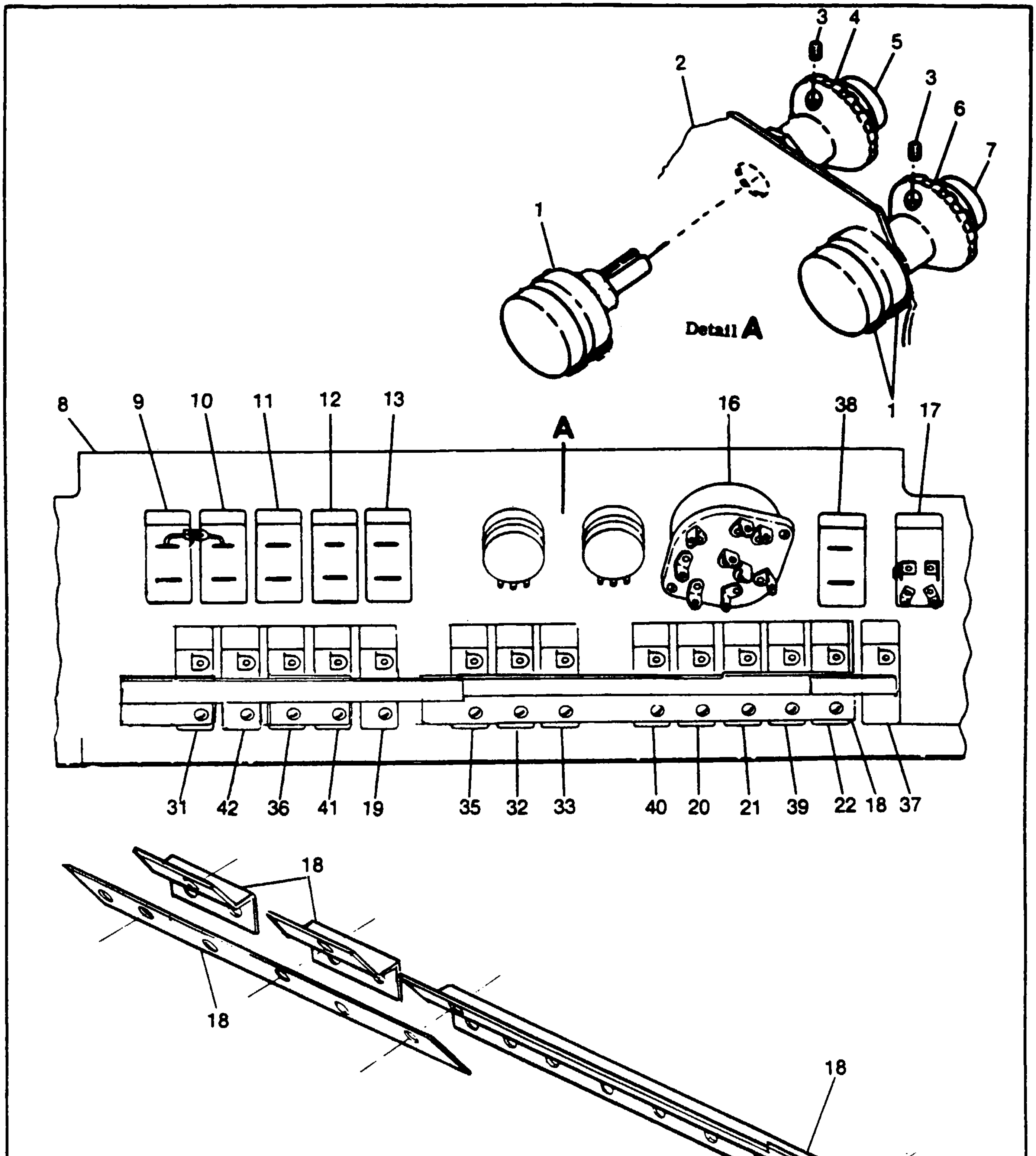
8. Panel
9. Landing Light Switch
10. Taxi Light Switch
11. Strobe Light Switch
12. Flashing Beacon Switch
13. Navigation Light Switch
14. Pitot Heat Switch
15. Avionics Master Switch
16. Ignition Switch
17. Master Switch
18. Bus Bar
19. Strobe Light Circuit Breaker
20. Stall Warning Circuit Breaker
21. Turn Coordinator Circuit Breaker
22. Alternator Regulator Circuit Breaker
23. Avionics Bus Bar
24. Auto Pilot Circuit Breaker
25. Radio No. 1 Circuit Breaker
26. Radio No. 2 Circuit Breaker
27. Radio No. 3 Circuit Breaker
28. Radio No. 4 Circuit Breaker
29. Radio No. 5 Circuit Breaker
30. Flashing Beacon Circuit Breaker
31. Flap Circuit Breaker
32. Cabin Light Circuit Breaker
33. Instrument Circuit Breaker
34. Pitot Heat Circuit Breaker
35. Navigation Light Circuit Breaker
36. Landing Light Circuit Breaker
37. Alternator Circuit Breaker

16-1. Switch and Circuit Breaker Installation (Sheet 1 of 4)



BEGINNING WITH 1981 MODELS

16-1. Switch and Circuit Breaker Installation (Sheet 2 of 4)



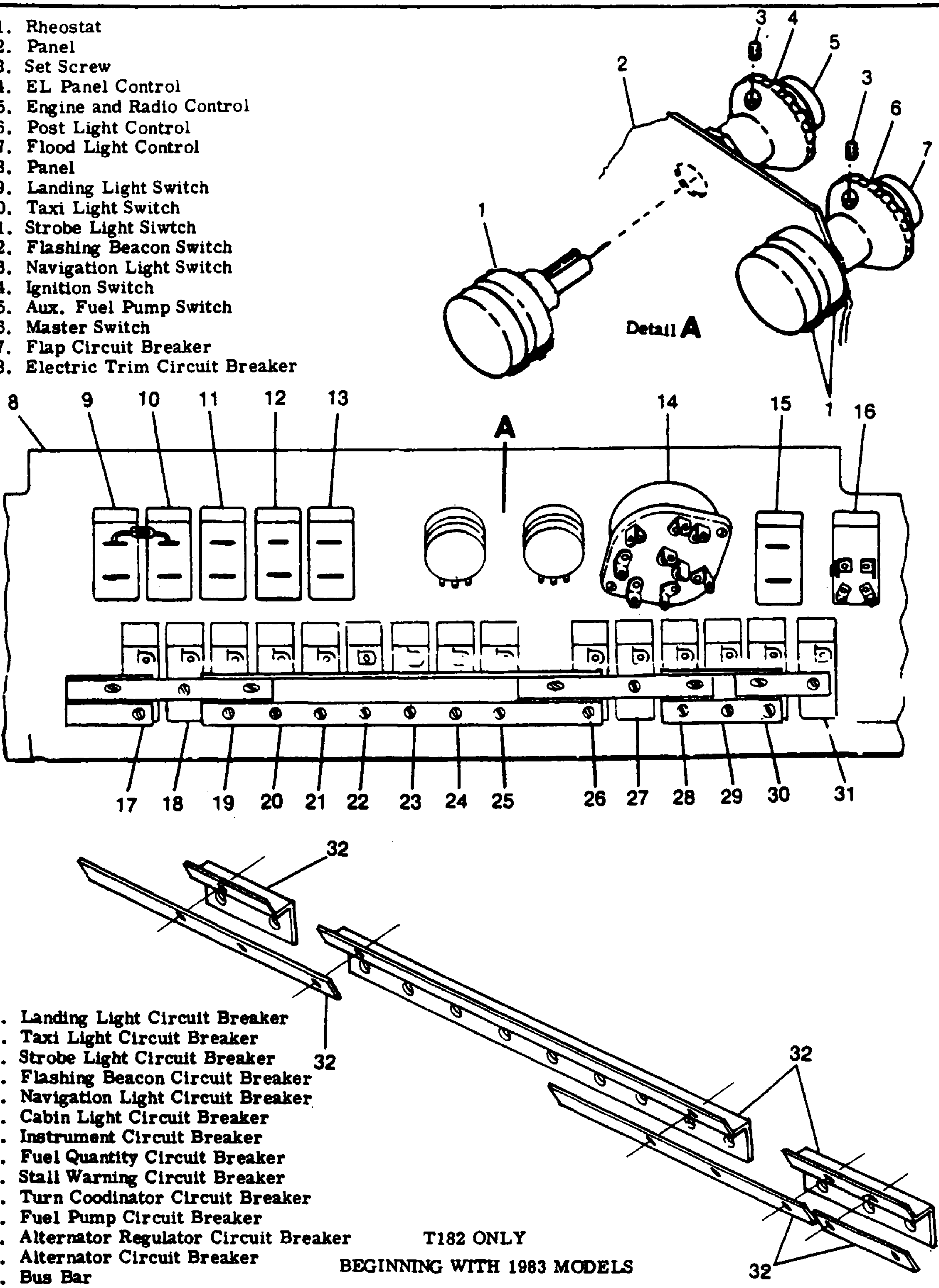
38. Aux. Fuel Pump Switch
39. Fuel Pump Circuit Breaker
40. Fuel Quantity Circuit Breaker
41. Taxi Light Circuit Breaker
42. Electric Trim Circuit Breaker

THRU 1982 MODELS

T182 ONLY

16-1. Switch and Circuit Breaker Installation (Sheet 3 of 4)

1. Rheostat
2. Panel
3. Set Screw
4. EL Panel Control
5. Engine and Radio Control
6. Post Light Control
7. Flood Light Control
8. Panel
9. Landing Light Switch
10. Taxi Light Switch
11. Strobe Light Siwtch
12. Flashing Beacon Switch
13. Navigation Light Switch
14. Ignition Switch
15. Aux. Fuel Pump Switch
16. Master Switch
17. Flap Circuit Breaker
18. Electric Trim Circuit Breaker

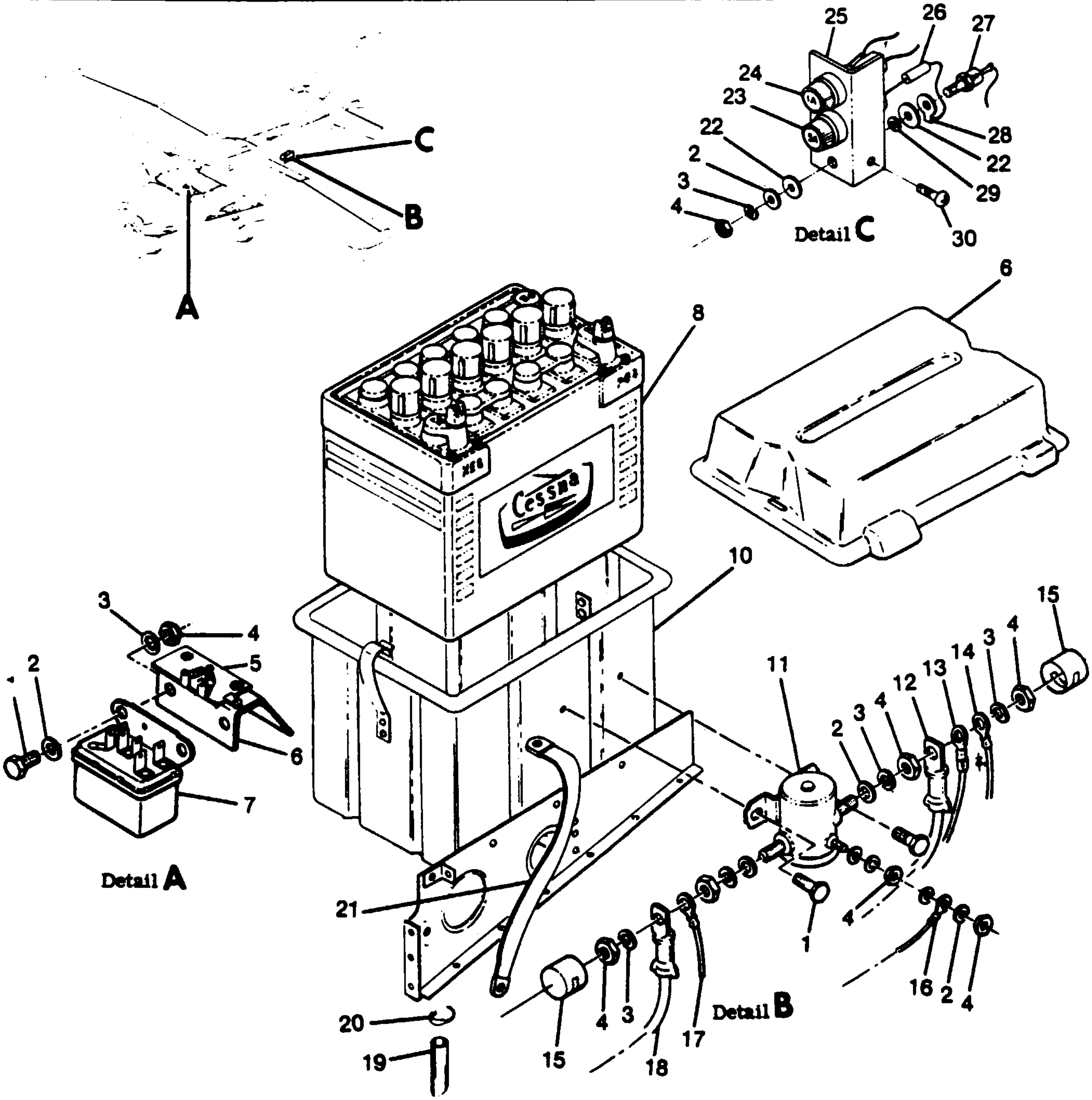


19. Landing Light Circuit Breaker
20. Taxi Light Circuit Breaker
21. Strobe Light Circuit Breaker
22. Flashing Beacon Circuit Breaker
23. Navigation Light Circuit Breaker
24. Cabin Light Circuit Breaker
25. Instrument Circuit Breaker
26. Fuel Quantity Circuit Breaker
27. Stall Warning Circuit Breaker
28. Turn Coodinator Circuit Breaker
29. Fuel Pump Circuit Breaker
30. Alternator Regulator Circuit Breaker
31. Alternator Circuit Breaker
32. Bus Bar

16-1. Switch and Circuit Breaker Installation (Sheet 4 of 4)

16-16. TROUBLE SHOOTING THE BATTERY POWER SYSTEM.

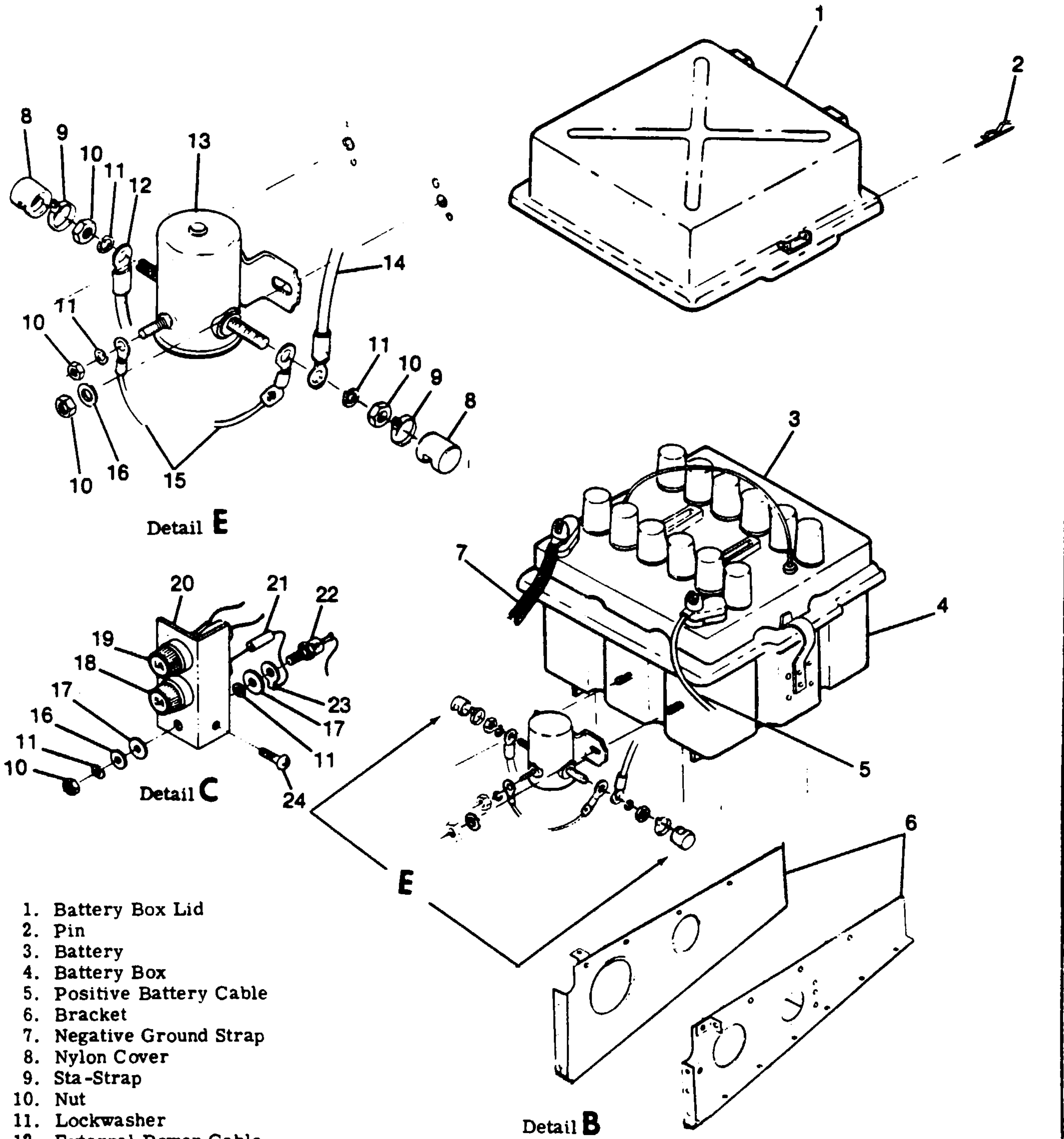
TROUBLE	PROBABLE CAUSE	REMEDY
BATTERY WILL NOT SUPPLY POWER TO BUS OR IS INCAPABLE OF CRANKING ENGINE.	Battery discharged.	1. Measure voltage at "BAT" terminal of battery contactor with master switch and a suitable load such as a taxi light turned on. Normal battery will indicatc 11.5 volts or more on a 14 volt system or 23 volts or more on a 28 volt system. If voltage is low proceed to step 2. If voltage is normal, proceed to step 3.
	Battery faulty.	2. Check fluid level in cells and charge 12-volt battery at 14 volts or 24-volt battery at 28 volts for approximately 30 minutes or until battery voltage rises to 14 volts on 12-volt battery or 28 volts on 24-volt battery. If tester indicates a good battery, the malfunction may be assumed to be a discharged battery. If the tester indicates a faulty battery, replace the battery.
	Faulty contactor or wiring between contactor or master switch.	3. Measure voltage at master switch terminal (smallest) on contactor with master switch closed. Normal indication is zero volts. If voltage reads zero, proceed to step 4. If a voltage reading is obtained check wiring between contactor and master switch. Also check master switch.
	Open coil on contactor.	4. Check continuity between "BAT" terminal and master switch terminal of contactor. Normal indication on 14 volt aircraft is 16-24 ohms. Normal indication on 28 volt aircraft is 50-70 ohms. If ohmmeter indicates an open coil, replace contactor. If ohmmeter indicates a good coil, proceed to step 5.
BATTERY WILL NOT SUPPLY POWER TO BUS OR IS INCAPABLE OF CRANKING ENGINE.	Faulty contactor contacts.	5. Check voltage on "BUS" side of contactor with master switch closed. Meter normally indicates battery voltage is zero or intermittant, replace contactor. If voltage is normal, proceed to step 6.
	Faulty wiring between contactor and bus.	6. Inspect wiring between contactor and bus. Repair or replace wiring.



1. Bolt
2. Washer
3. Lockwasher
4. Nut
5. Diode Board
6. Bracket - Relay Mounting
7. Split Bus Power Relay
8. Battery
9. Battery Box Lid
10. Battery Box
11. Battery Contactor
12. Positive Battery Cable
13. Diode Wire
14. Wire to Fuses
15. Nylon Cover
16. Master Switch Wire
17. Wire to Battery Contactor Closing Circuit
18. External Power Cable
19. Battery Drain Tube
20. Clamp
21. Negative Ground Strap
22. Insulating Washer
23. Fuse - Battery Contactor Closing Circuit
24. Fuse - Clock
25. Bracket - Fuse Mounting
26. Resistor
27. Diode
28. Solder Terminal
29. Spacer
30. Screw

THRU 18266075 AND F18200085

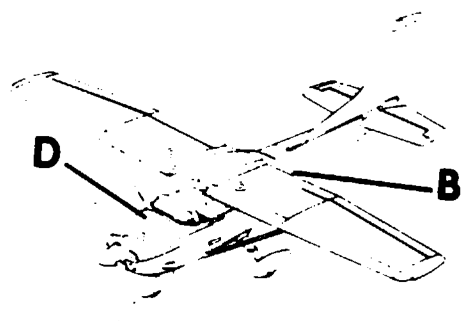
Figure 16-2. Battery and Electrical Equipment Installation (Sheet 1 of 6)



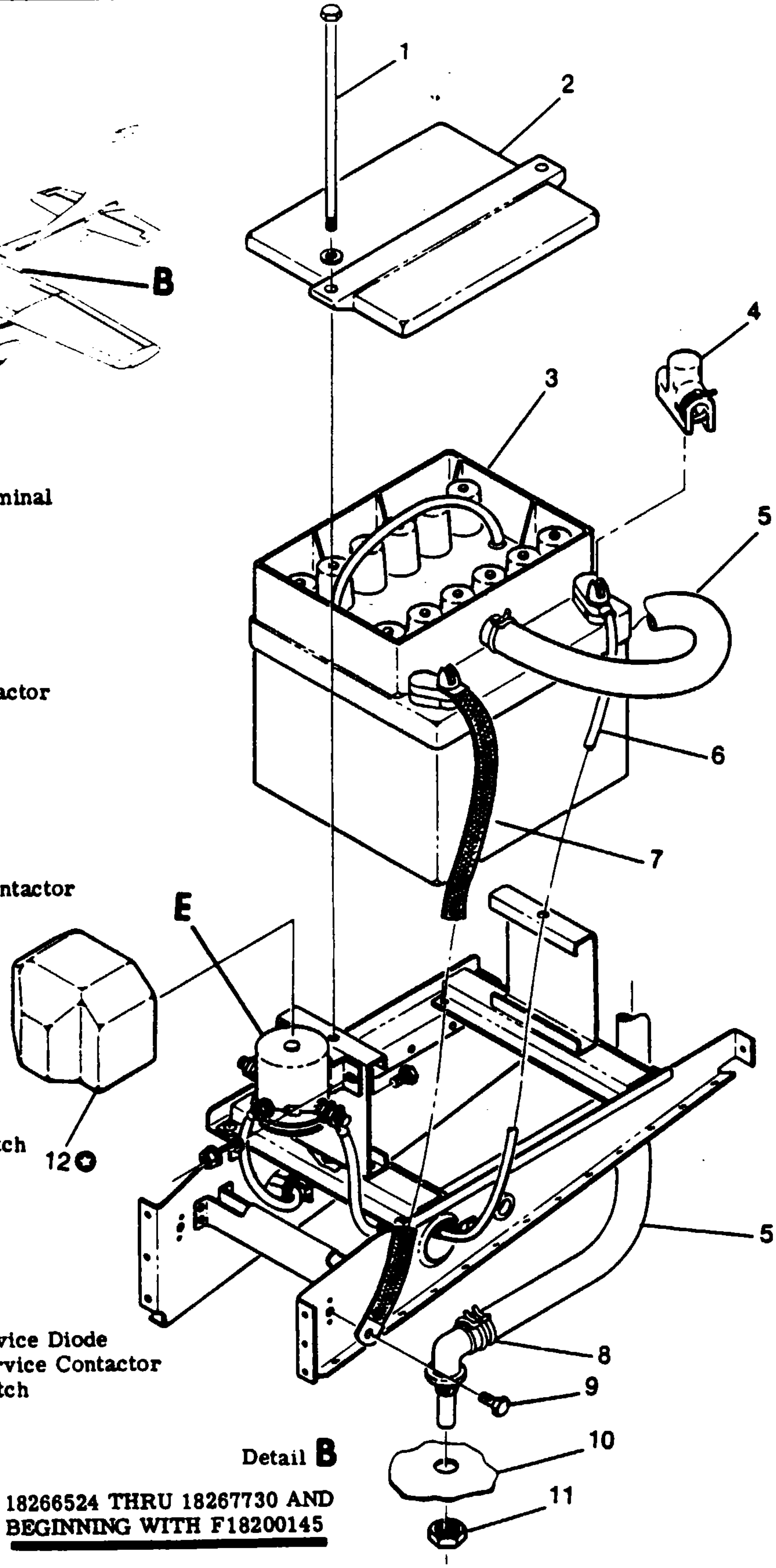
1. Battery Box Lid
2. Pin
3. Battery
4. Battery Box
5. Positive Battery Cable
6. Bracket
7. Negative Ground Strap
8. Nylon Cover
9. Sta-Strap
10. Nut
11. Lockwasher
12. External Power Cable
13. Battery Contactor
14. Positive Battery Cable
15. Diode Assembly
16. Washer
17. Insulating Washer
18. Fuse - Battery Contactor Closing Circuit
19. Fuse - Clock
20. Bracket - Fuse Mounting
21. Resistor
22. Diode
23. Solder Terminal
24. Screw

18266076 THRU 18266523 AND
F18200086 THRU F18200144

Figure 16-2. Battery and Electrical Equipment Installation (Sheet 2 of 6)



1. Bolt
2. Cover-Battery Box
3. Battery
4. Cover-Positive Terminal
5. Drain Tube
6. Positive Cable
7. Ground Strap
8. Clamp
9. Bolt
10. Tailcone Skin
11. Nut
12. Cover-Battery Contactor
13. Nylon Cover
14. Sta-strap
15. Nut
16. Lockwasher
17. Cable-to Starter
18. Starter Contactor
19. Firewall
20. Cable-to Battery Contactor



21. Wire-to Ammeter
22. Bolt
23. Wire-to Starter Switch
24. Nipple
25. Ground Wire
26. Washer
27. Cover
28. Wire-to Clock Fuse
29. Diode Assembly
30. Battery Contactor
31. Wire-to Ground Service Diode
32. Cable-to Ground Service Contactor
33. Wire-to Master Switch

Detail **B**

18266524 THRU 18267730 AND
BEGINNING WITH F18200145

Figure 16-2. Battery and Electrical Equipment Installation (Sheet 3 of 6)

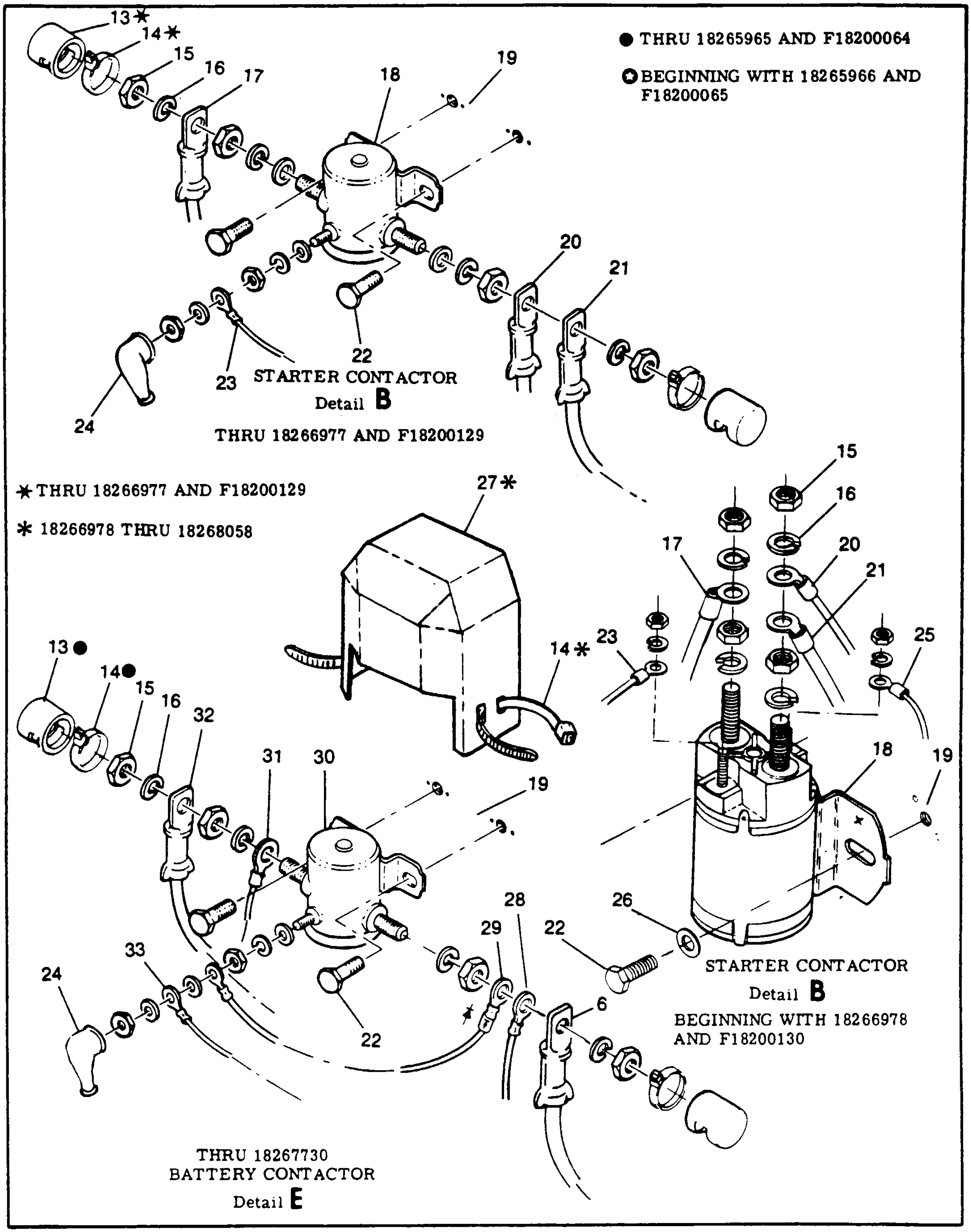
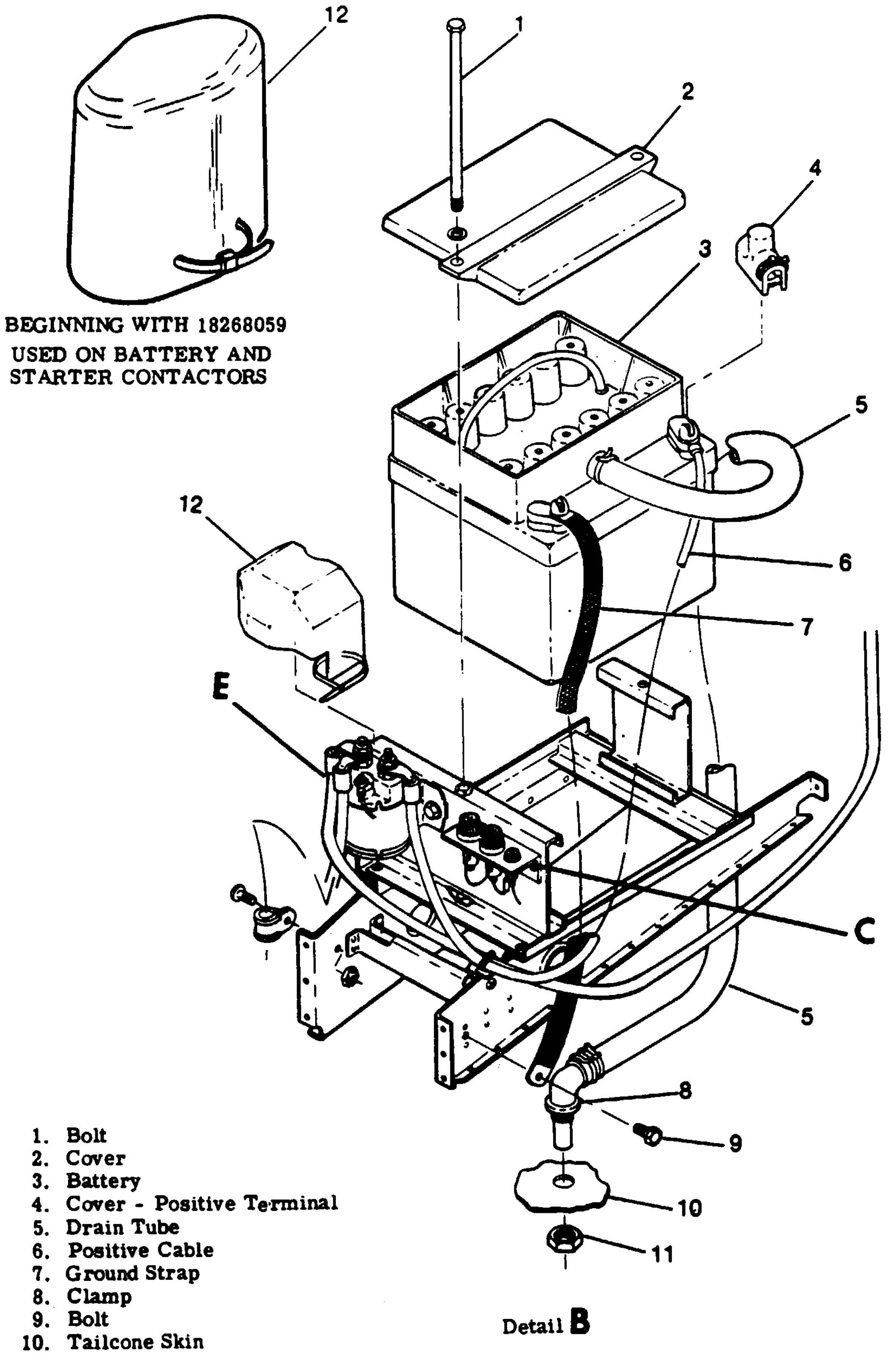


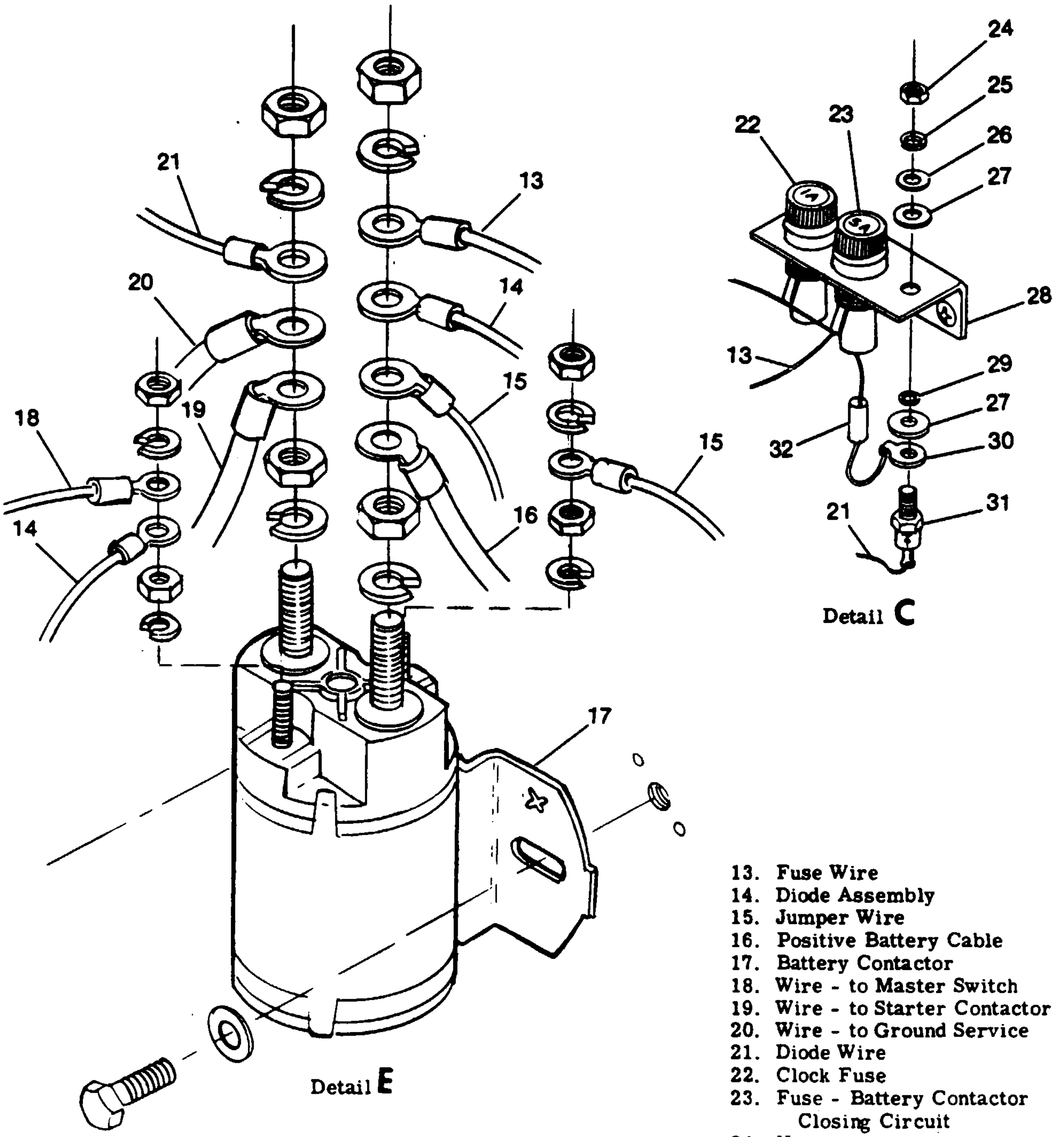
Figure 16-2. Battery and Electrical Equipment Installation (Sheet 4 of 6)



1. Bolt
2. Cover
3. Battery
4. Cover - Positive Terminal
5. Drain Tube
6. Positive Cable
7. Ground Strap
8. Clamp
9. Bolt
10. Tailcone Skin
11. Nut
12. Cover - Battery Contactor

BEGINNING WITH 18267731

Figure 16-2. Battery and Electrical Equipment Installation (Sheet 5 of 6)



13. Fuse Wire
14. Diode Assembly
15. Jumper Wire
16. Positive Battery Cable
17. Battery Contactor
18. Wire - to Master Switch
19. Wire - to Starter Contactor
20. Wire - to Ground Service
21. Diode Wire
22. Clock Fuse
23. Fuse - Battery Contactor Closing Circuit
24. Nut
25. Lockwasher
26. Washer
27. Insulating Washer
28. Bracket
29. Spacer
30. Solder Terminal
31. Diode
32. Resistor

BEGINNING WITH 18267731

Figure 16-2. Battery and Electrical Equipment Installation (Sheet 6 of 6)

16-17. REMOVAL AND INSTALLATION. (See figure 16-2.)

a. THRU 18266523 AND F18200144.

CAUTION

When installing or removing battery always observe the proper polarity with the aircraft electrical system (negative to ground). Reversing the polarity, even momentarily, may result in failure of semiconductor devices (alternator diodes, radio protection diodes and radio transistors).

Always remove the battery ground cable first and replace it last to prevent accidental short circuits.

1. Remove aft baggage wall.
2. Remove the battery box cover.
3. Disconnect the ground cable from the negative battery terminal.
4. Disconnect the cable from the positive terminal of the battery.
5. Lift the battery out of the battery box.
6. To replace the battery, reverse this procedure.

b. BEGINNING WITH 18266524 AND F18200145.

1. Remove aft baggage wall.
2. Disconnect battery ground strap.
3. Cut sta-strap and remove cover from positive battery terminal.
4. Disconnect positive cable from battery.
5. Disconnect drain tube from battery.
6. Remove the two battery mounting bolts and remove battery cover.
7. Remove battery.
8. To install battery, reverse this procedure.

16-18. CLEANING THE BATTERY. For maximum efficiency the battery and connections should be kept clean at all times.

a. Remove the battery and connections in accordance with the preceding paragraph.

b. Tighten battery cell filler caps to prevent the cleaning solution from entering the cells.

c. Wipe the battery cable ends, battery terminals and the entire surface of the battery with a clean cloth moistened with a solution of bicarbonate of soda (baking soda) and water.

d. Rinse with clear water, wipe off excess water and allow battery to dry.

e. Brighten up cable ends and battery terminals with emery cloth or a wire brush.

f. Install the battery according to the preceding paragraph.

g. Coat the battery terminals with petroleum jelly or an ignition spray product to reduce corrosion.

16-19. ADDING ELECTROLYTE OR WATER TO THE BATTERY. A battery being charged and discharged with use will decompose the water from the electrolyte by electrolysis. When the water is decomposed hydrogen and oxygen gases are formed which escape into the atmosphere through the battery vent system. The acid in the solution chemically combines with the plates of the battery during discharge or is suspended in the electrolyte solution during charge. Unless the electrolyte has been spilled from a battery, acid should not be added to the solution. The water, however will decompose into gases and should be replaced regularly. Add distilled water as necessary to maintain the electrolyte level with the horizontal baffle plate or the split ring on the filler neck inside the battery. When "dry charged" batteries are put into service fill as directed with electrolyte. When the electrolyte level falls below normal with use, add only distilled water to maintain the proper level. The battery electrolyte contains approximately 25% sulphuric acid by volume. Any change in this volume will hamper the proper operation of the battery.

WARNING

Do not add any type of "battery rejuvenator" to the electrolyte. When acid has been spilled from a battery, the acid balance may be adjusted by following instructions published by the Association of American Battery Manufacturers.

16-20. TESTING THE BATTERY. The specific gravity of the battery may be measured with a hydrometer to determine the state of battery charge. If the hydrometer reading is low, slow-charge the battery and retest. Hydrometer readings of the electrolyte must be compensated for the temperature of the electrolyte. Some hydrometers have a built-in thermometer and conversion chart. The following chart shows the battery condition for various hydrometer readings with an electrolyte temperature of 80° Fahrenheit.

BATTERY HYDROMETER READINGS

READINGS	BATTERY CONDITION
1.280 Specific Gravity.	100% Charged
1.250 Specific Gravity.	75% Charged
1.220 Specific Gravity.	50% Charged
1.190 Specific Gravity.	25% Charged
1.160 Specific Gravity. . . .	Practically Dead

NOTE

All readings shown are for an electrolyte temperature of 80° Fahrenheit. For higher temperatures the readings will be slightly lower. For cooler temperatures the readings will be slightly higher. Some hydrometers will have a built-in temperature compensation chart and a thermometer. If this type tester is used, disregard this chart.

16-21. CHARGING THE BATTERY. When the battery is to be charged, the level of the electrolyte should be checked and adjusted by adding distilled water to cover the tops of the internal battery plates. Remove the battery from the aircraft and place in a well ventilated area for charging.

WARNING

- When a battery is being charged, hydrogen and oxygen gases are generated. Accumulation of these gases can create a hazardous explosive condition. Always keep sparks and open flame away from the battery.
- Allow unrestricted ventilation of the battery area during charging.

The main points of consideration during a battery charge are excessive battery temperature and violent gassing. Test the battery with a hydrometer to determine the amount of charge. Decrease the charging rate or stop charging temporarily if the battery temperature exceeds 125°F.

16-22. BATTERY BOX. (THRU 18266523 AND F18200144).

16-23. DESCRIPTION. The battery is completely enclosed in an acid resistant plastic box which is riveted to mounting brackets in the tailcone. The box has a vent tube which protrudes through the bottom of the aircraft allowing battery gases and spilled electrolyte to escape.

16-24. REMOVAL AND INSTALLATION. (See figure 16-2.) The battery box is riveted to the mounting brackets in the tailcone. The rivets must be drilled out to remove the box.

16-25. MAINTENANCE OF BATTERY BOX. The battery box should be inspected and cleaned periodically. The box and cover should be cleaned with a strong solution of bicarbonate of soda (baking soda) and water. Hard deposits may be removed with a wire brush. When all corrosive deposits have been removed from the box, flush it thoroughly with clean water.

WARNING

Do not allow acid deposits to come in contact with skin or clothing. Serious acid burns may result unless the affected area is washed immediately with soap and water. Clothing will be ruined upon contact with battery acid.

Inspect the cleaned box and cover for physical damage and for areas lacking proper acid proofing. A badly damaged or corroded box should be replaced. If the box or lid require acid proofing, paint the area with acid proof paint Part No. CES1054-529, available from the Cessna Service Parts Center.

16-26. BATTERY CONTACTOR.

16-27. DESCRIPTION. Thru 18266523 and F18200144 the battery contactor is bolted to the side of the battery box. Beginning with 18266524 and F18200145 the contactor is bolted to a bracket adjacent to the battery. The contactor is a plunger type contactor which is actuated by turning the master switch on. When the master switch is off, the battery is disconnected from the electrical system. A silicon diode is used to eliminate spiking of transistorized radio equipment. The large terminal of the diode connects to the battery terminal of the battery contactor. The small terminal of the diode and the master switch wire connect to the coil terminal of the battery contactor. (See figure 16-2.)

16-28. REMOVAL AND INSTALLATION. (See figure 16-2.)

a. THRU 18266523 AND F18200144.

1. Remove the battery box cover and disconnect the ground cable from the negative battery terminal and pull cable clear of battery box.
2. Remove the nut, lockwasher and the two plain washers securing the battery cables to the battery contactor.
3. Remove the nut, lockwasher and the two plain washers securing the wire which is routed to the master switch.
4. Remove the silicon diode which is connected to the battery terminal and the coil terminal.
5. Remove the bolt, washer and nut securing each

side of the battery contactor to the battery box. The contactor will now be free for removal.

6. To replace the contactor, reverse this procedure.

b. BEGINNING WITH 18266524 AND F18200145.

1. Remove baggage wall.
2. Disconnect ground strap from negative terminal of the battery.
3. Cut sta-straps and remove cover from contactor.
4. Remove nut and washers securing, positive cable, diode assembly and wire to fuse. Tag wires for reinstallation.
5. Remove nut and washers securing, wire to starter contactor, wire to ground service and wire to diode. Tag wires for reinstallation.
6. Remove bolts and washers securing contactor to bracket and remove contactor.
7. To install contactor reverse this procedure, using new sta-straps on cover.

16-29. BATTERY CONTACTOR CLOSING CIRCUIT.

16-30. DESCRIPTION. This circuit consists of a 5-amp fuse, a resistor and a diode mounted on a bracket on the side of the battery box. This serves to shunt a small charge around the battery contactor so that ground power may be used to close the contactor.

16-31. GROUND SERVICE RECEPTACLE.

16-32. DESCRIPTION. A ground service receptacle is offered as optional equipment to permit use of external power for cold weather starting or when performing lengthy electrical maintenance. A reverse polarity protection system is utilized whereby ground power must pass through an external power contactor to be connected to the bus. A silicon junction diode is connected in series with the coil on the external power contactor so that if the ground power source is inadvertently connected with a reverse polarity, the external power contactor will not close. This feature protects the diodes in the alternator, and other semiconductor devices, used in the aircraft from possible reverse polarity damage.

NOTE

Maintenance of the electronic installation cannot be performed when using external power. Application of external power opens the relay supplying voltage to the electronic bus. For lengthy ground testing of electronic systems, connect a well regulated and filtered power supply directly to the battery side of the battery contactor. Adjust the supply for 14-volts and close the master switch.

NOTE

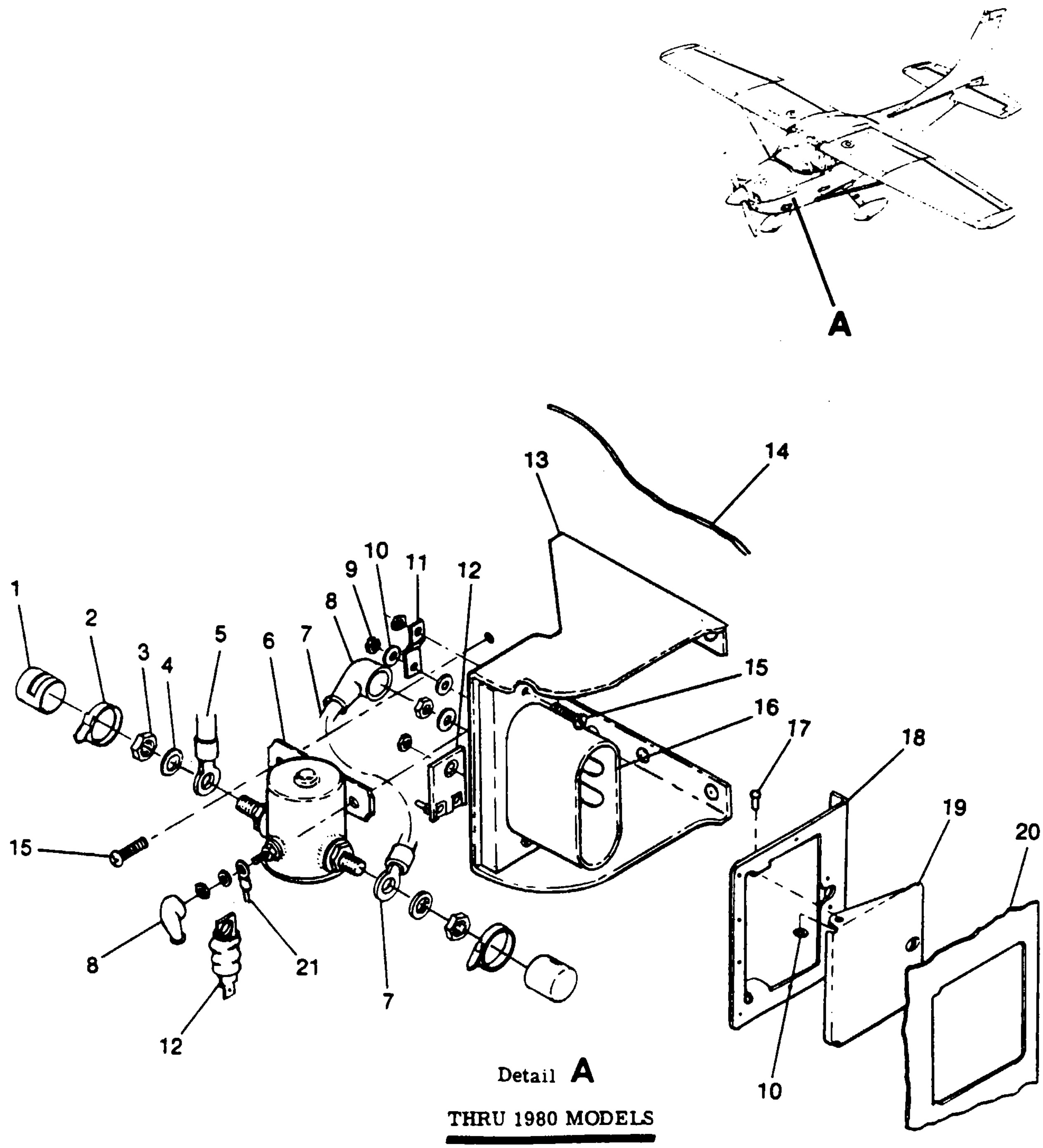
When using ground power to start the aircraft, close the master switch before removing the ground power plug. This will ensure closure of the battery contactor and excitation of the alternator field.

CAUTION

Failure to observe polarity when connecting an external power source directly to the battery or directly to the battery side of the battery contactor, will damage the diodes in the alternator and other semiconductor devices in the aircraft.

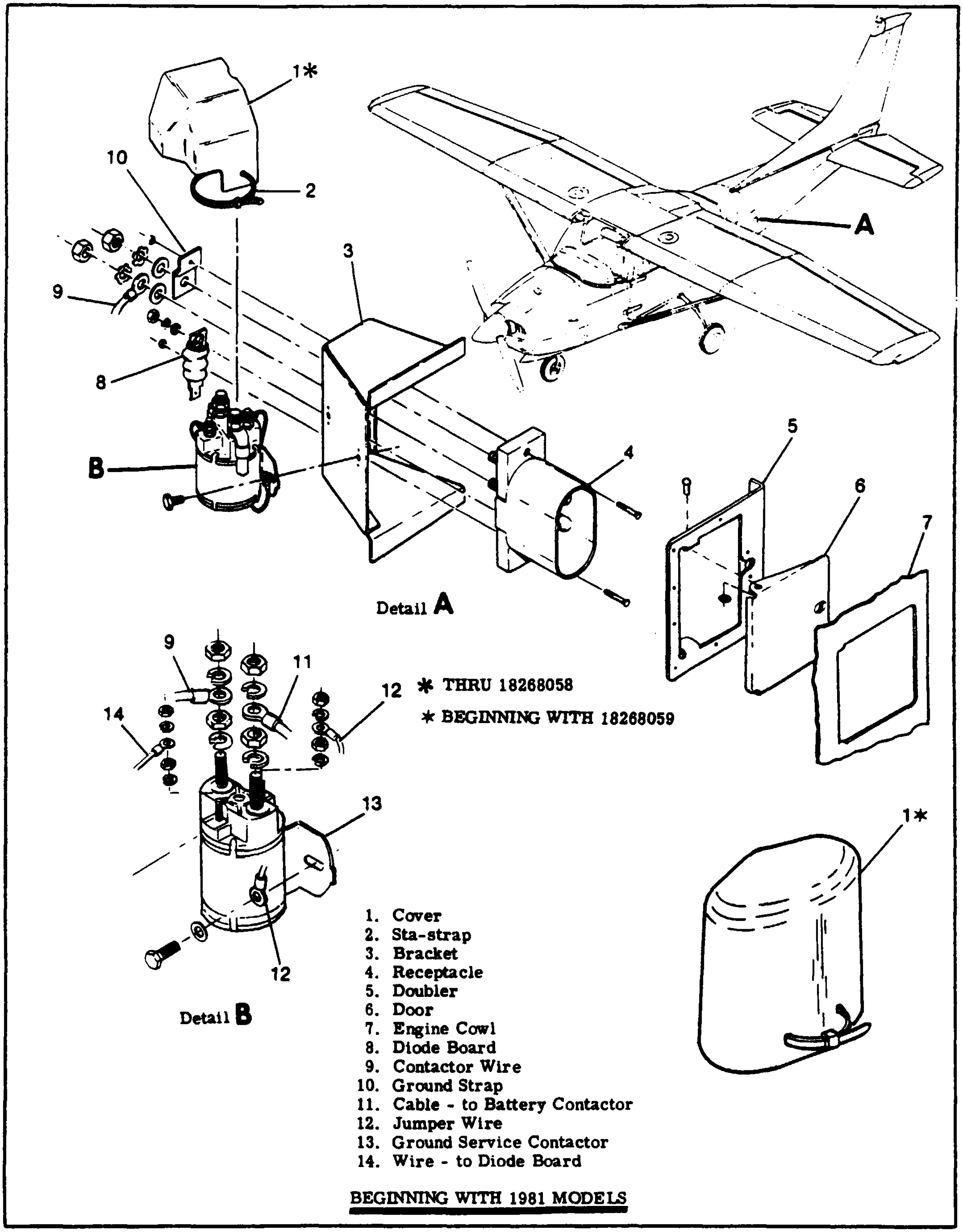
WARNING

External power receptacle must be functionally checked after wiring, or after replacement of components of the external power or split bus systems. Incorrect wiring or malfunctioned components can cause immediate engagement of starter when ground service plug is inserted. Also refer to Cessna Single-Engine Service Letter, SE77-1 (Supplement #1) Dated May 2, 1977.



1. Nylon Cover
2. Sta-strap
3. Nut
4. Washer
5. Cable (to Battery Contactor)
6. Ground Service Contactor
7. Power Cable
8. Nipple
9. Nut
10. Washer
11. Ground Strap
12. Diode Board
13. Bracket
14. Firewall
15. Screw
16. Receptacle
17. Rivet
18. Doubler
19. Door
20. Engine Cowl
21. Wire (to Diode Board)

Figure 16-3. Ground Service Receptacle Installation (Sheet 1 of 2)



* THRU 18268058

* BEGINNING WITH 18268059

1. Cover
2. Sta-strap
3. Bracket
4. Receptacle
5. Doubler
6. Door
7. Engine Cowl
8. Diode Board
9. Contactor Wire
10. Ground Strap
11. Cable - to Battery Contactor
12. Jumper Wire
13. Ground Service Contactor
14. Wire - to Diode Board

BEGINNING WITH 1981 MODELS

Figure 16-3. Ground Service Receptacle Installation (Sheet 2 of 2)

16-33. TROUBLE SHOOTING.

TROUBLE	PROBABLE CAUSE	REMEDY
STARTER ENGAGES WHEN GROUND POWER IS CONNECTED.	Shorted or reversed diode in split bus-bar system.	Check wiring to, and condition of diode mounted on the split bus relay bracket adjacent to the magneto switch. Correct wiring. Replace diode board assembly.
GROUND POWER WILL NOT CRANK ENGINE.	Ground service connector wired incorrectly.	1. Check for voltage at all three terminals of external power contactor with ground power connected and master switch off. If voltage is pre sent on input and coil terminals but not on the output terminal, proceed to step 4. If voltage is present on the input terminal but not on the coil terminal, proceed to step 2. If voltage is present on all three terminals, check wiring between contactor and bus.
		2. Check for voltage at small terminal of ground service receptacle. If voltage is not present, check ground service plug wiring. If voltage is present, proceed to step 3.
	Open or mis-wired diode on ground service diode board assembly.	3. Check polarity and continuity of diode on diode board at rear of ground service receptacle. If diode is open or improperly wired. replace diode board assembly.
	Faulty external power contactor.	4. Check resistance from small (coil) terminal of external power contactor to ground (master switch off) and ground power unplugged. Normal indication is 16-24 ohms on the 12 volt and 50-70 on the 24 volt. If resistance indicates an open coil, replace contactor. If resistance is normal. proceed to step 5.
	Faulty contacts in external power contactor.	5. With master switch off and ground power applied, check for voltage drop between two large terminals of external power (turn on taxi light for a load). Normal indication is zero volts. If voltage is intermittently present or present all the time, replace contactor.

16-34. REMOVAL AND INSTALLATION. (See figure 16-3.)

a. Disconnect the ground cable from the negative terminal of the battery.

b. Remove the nuts, washers, ground strap and diode board from the studs of the receptacle and remove the battery cables.

c. Remove the screws and nuts holding the receptacle. The receptacle will then be free from the bracket.

d. To install a ground service receptacle, reverse this procedure. Be sure to place the ground strap on the negative stud of the receptacle.

16-35. ALTERNATOR POWER SYSTEM.

16-36. DESCRIPTION. The alternator system consists of an engine driven alternator, a voltage regulator mounted on the left hand side of the firewall and a circuit breaker located on the instrument panel. The system is controlled by the left hand portion of the split rocker, master switch labeled ALT.

16-37. ALTERNATOR.

16-38. DESCRIPTION. Thru 1977 Models the alternator used on the aircraft is rated at 14-volts at 60-amperes continuous output. Beginning with 1978 Models the alternator used is rated at 28-volts at 60-amperes. A 28-volt 95 amper alternator is offered as optional equipment on the T182. The alternator is three-phase, delta connected with integral silicon diode rectifiers. The moving center part of the alternator (rotor) consists of an axial winding with radial interlocking poles which surround the winding. With excitation applied to the winding through slip rings, the pole pieces assume magnetic polarity. The rotor is mounted in bearings and rotates inside the stator which contains the windings in which the ac is generated. The stator windings are three-phase, delta connected, and are attached to two diode plates, each of which contains three silicon diodes.

NOTE

A 2201074-1 balance weight is installed on tailcone bulkhead station 230.187 when the 95 amperes alternator is installed.

The diode plates are connected to accomplish full-wave, rectification of the ac. The resulting dc output is applied to the aircraft bus and sensed by the voltage regulator/alternator control unit. The regulator controls the excitation applied to the alternator field, thus controlling the output voltage of the alternator.

16-39. TROUBLE SHOOTING THE ALTERNATOR SYSTEM. (THRU 1977 MODELS).

TROUBLE	PROBABLE CAUSE	REMEDY
AMMETER INDICATES HEAVY DISCHARGE WITH ENGINE NOT RUNNING OR ALTERNATOR CIRCUIT BREAKER OPENS WHEN MASTER SWITCH IS TURNED ON.	Shorted radio noise filter or shorted wire.	1. Remove cable from output terminal of alternator. Check resistance from end of cable to ground (MASTER SWITCH MUST BE OFF). If resistance does not indicate a direct short, proceed to step 4. If resistance indicates a direct short, proceed to step 2.
		2. Remove cable connections from radio noise filter. Check resistance from the filter input terminal to ground. Normal indication is infinite resistance. If reading indicates a direct short, replace filter. If no short is evident, proceed to step 3.
		3. Check resistance from ground to the free ends of the wires which were connected to the radio noise filter (or alternator if no noise filter is installed). Normal indication does not show a direct short. If a short exists in wires, repair or replace wiring.

16-39. TROUBLE SHOOTING THE ALTERNATOR SYSTEM (Cont). (THRU 1977 MODELS).

TROUBLE	PROBABLE CAUSE	REMEDY
AMMETER INDICATES HEAVY DISCHARGE WITH ENGINE NOT RUNNING OR ALTERNATOR CIRCUIT BREAKER OPENS WHEN MASTER SWITCH IS TURNED ON. (Cont.)	Shorted diodes in alternator.	4. Check resistance from output terminal of alternator to alternator case. Reverse leads and check again. Resistance reading may show continuity in one direction but should show an infinite reading in the other direction. If an infinite reading is not obtained in at least one direction, repair or replace alternator.
ALTERNATOR SYSTEM WILL NOT KEEP BATTERY CHARGED.	Regulator faulty or improperly adjusted.	1. Start engine and adjust for 1500 RPM. Ammeter should indicate a heavy change rate with all electrical equipment turned off. Rate should taper off in 1-3 minutes. A voltage check at the bus should indicate a reading consistant with the voltage ex temperature chart in the Cessna Alternator Charging System Service/Parts Manual. If charge rate tapers off very quickly and voltage is normal, check battery for malfunction. If ammeter shows a low charge rate or any discharge rate, and voltage is low, proceed to step 2.
		2. Stop engine, remove cowl, and remove cover from voltage regulator. Turn master switch ON/OFF several times and observe field relay in regulator. Relay should open and close with master switch and small arc should be seen as contacts open. If relay is inoperative, proceed to step 3. If relay operates, proceed to step 4.
		3. Check voltage at "S" terminal of regulator with master switch closed. Meter should indicate bus voltage. If voltage is present, replace regulator. If voltage is not present, check wiring between regulator and bus.

CAUTION

Before performing step 4, remove radios from panel.

TROUBLE	PROBABLE CAUSE	REMEDY
		4. Remove plug from regulator and start engine. Momentarily jumper the "A+" and "F" terminals together on the plug. Ship's ammeter should show heavy rate of charge. If heavy charge rate is observed, replace regulator. If heavy charge rate is not observed, proceed to step 5.

16-39. TROUBLE SHOOTING THE ALTERNATOR SYSTEM (Cont.) (THRU 1977 MODELS).

TROUBLE	PROBABLE CAUSE	REMEDY
ALTERNATOR SYSTEM WILL NOT KEEP BATTERY CHARGED (Cont).	Faulty wiring between alternator and regulator, or faulty alternator.	5. Check resistance from "F" terminal of regulator to "F" terminal of alternator. Normal indication is a very low resistance. If reading indicates no, or poor continuity, repair or replace wiring from regulator to alternator.
		6. Check resistance from "F" terminal of alternator to alternator case. Normal indication is 6-7 ohms. If resistance is high or low, repair or replace alternator.
		7. Check resistance from case of alternator to airframe ground. Normal indication is very low resistance. If reading indicates no, or poor continuity, repair or replace alternator ground wiring.
ALTERNATOR OVERCHARGES BATTERY - BATTERY USES EXCESSIVE WATER.	Regulator faulty or improperly adjusted.	Check bus voltage with engine running. Normal indication agrees with voltage vs temperature chart on page 16-13. Observe ship's ammeter, ammeter should indicate near zero after a few minutes of engine operation. Replace regulator.
OVER-VOLTAGE WARNING LIGHT ON.	Regulator faulty or improperly adjusted. Faulty sensor switch.	1. With engine running turn off and on battery portion of the master switch. If the light stays on shut down engine then turn on the "BAT and "ALT" portions of the master switch. Check for voltage at the "S" terminal of the voltage regulator. If voltage is present adjust or replace regulator. If voltage is not present check master switch and wiring for short or open condition. If wiring and switch are normal replace sensor.

16-40. TROUBLE SHOOTING THE ALTERNATOR SYSTEM. (THRU 1978 MODELS.)

a. ENGINE NOT RUNNING.

TROUBLE	PROBABLE CAUSE	REMEDY
AMMETER INDICATES HEAVY DISCHARGE OR ALTERNATOR CIRCUIT BREAKER OPENS. (Battery Switch ON, Alternator Switch OFF, all other electrical switches OFF.)	Shorted diode in alternator.	Turn off Battery Switch and remove "B" Lead from alternator. Check resistance from "B" Terminal of alternator to alternator case. Reverse leads and check again. Resistance reading may show continuity in one direction but should show an infinite reading in the other direction. If an infinite reading is not obtained in at least one direction, repair or replace alternator.
ALTERNATOR REGULATOR CIRCUIT BREAKER OPENS WHEN BATTERY AND ALTERNATOR SWITCHES ARE TURNED ON.	Short in Over-Voltage sensor.	Disconnect Over-Voltage Sensor plug and recheck. If circuit breaker stays in replace Over-Voltage Sensor.
	Short in alternator voltage regulator.	Disconnect regulator plug and recheck. If circuit breaker stays in, replace regulator.
	Short in alternator field.	Disconnect "F" terminal wire and recheck. If circuit breaker stays in, replace alternator.
ALTERNATOR CIRCUIT BREAKER OPENS WHEN BATTERY AND ALTERNATOR SWITCHES ARE TURNED ON, OVER-VOLTAGE LIGHT DOES NOT COME ON.	Defective circuit breaker.	Replace circuit breaker.

16-40. TROUBLE SHOOTING THE ALTERNATOR SYSTEM. (THRU 1978 MODELS.) (Cont.)
b. ENGINE RUNNING (Cont.)

TROUBLE	PROBABLE CAUSE	REMEDY
ALTERNATOR REGULATOR CIRCUIT BREAKER OPENS WHEN BATTERY AND ALTERNATOR SWITCHES ARE TURNED ON, OVER-VOLTAGE LIGHT DOES NOT COME ON.	Shorted field in alternator.	Check resistance from "F" terminal of alternator to alternator case, if resistance is less than 5 ohms repair/ replace.
CAUTION This malfunction frequently causes a shorted regulator which will result in an over-voltage condition when system is again operated.		
ALTERNATOR MAKES ABNORMAL WHINING NOISE	Shorted diode in alternator.	Turn off Battery Switch and remove "B" Lead from alternator. Check reisitance from "B" terminal of alter-nator to alternator case. Re-verse leads and check again. Resistance reading may show continuity in one direction but should show an infinite reading in the other direction. If an infinite reading is not obtained in at least one direction, repair or replace alternator.
OVER-VOLTAGE LIGHT DOES NOT GO OUT WHEN ALTER-NATOR AND BATTERY SWITCHES ARE TURNED ON.	Shorted regulator	Replace regulator
	Defective over-voltage sensor.	Replace sensor.
AFTER ENGINE START WITH ALL ELECTRICAL EQUIPMENT TURNED OFF CHARGE RATE DOES NOT TAPER OFF IN 1-3 MINUTES	Regulator faulty or high resistance in field circuit.	With engine not running turn off all electrical loads and turn on battery and alternator switches. Measure bue voltage to ground, then measure voltage from terminal of alternator to ground. If there is more than 2 volts difference check field circuit wiring shown on alter-nator system wiring diagram in Section 20. Clean all contacts. Replace components until there is less than 2 volts difference between bus voltage and field voltage.
NOTE Also refer to battery power system trouble shooting chart.		

16-40. TROUBLE SHOOTING THE ALTERNATOR SYSYEM. (THRU 1978 MODELS.) (Cont.)
b. ENGINE RUNNING (Cont.)

TROUBLE	PROBABLE CAUSE	REMEDY
ALTERNATOR SYSTEM WILL NOT KEEP BATTERY CHARGED.	Alternator output voltage insufficient.	1. Connect coltmeter between D.C. Bus and ground. Turn off all electrical loads. Turn on Battery Switch. Start engine and adjust for 1500 RPM, voltage should read approximately 24 volts. Turn on alternator switch, voltage should read between 27.4 and 28.0 volts. Ammeter should indicate a heavy charge rate which should taper off in 1-3 minutes. If charge rate tapers off very quickly and voltage is normal, check battery for malfunction. If ammeter shows a low charge rate or any discharge rate, and voltage does not rise when alternator switch is turned on proceed to step 2.
		2. Stop engine, turn off all switches. Connect voltmeter between "F" terminal of alternator and ground. Do NOT start engine. Turn on battery switch and alternator switch. Battery voltage should be present at "F" terminal, less 1 volt drop thru regulator, if not refer to step 3.
		3. Starting at "F" terminal of alternator trace circuit to voltage regulator, at "B" terminal of regulator trace circuit to over-voltage sensor, to master switch, to bus bar. Replace component which does not have voltage present at output. Refer to alternator system wiring diagram in Section 20.
	Alternator field winding open.	1. If voltage is present turn off alternator and battery switches. Check resistance from "F" terminal of alternator to alternator case, turning alternator shaft during measurement. Normal indication is 12-20 ohms. If resistance is high or low, repair or replace alternator, If OK refer to Step 2.

16-40. TROUBLE SHOOTING THE ALTERNATOR SYSTEM. (THRU 1978 MODELS.) (Cont.)
b. ENGINE RUNNING (Cont.)

TROUBLE	PROBABLE CAUSE	REMEDY
ALTERNATOR SYSTEM WILL NOT KEEP BATTERY CHARGED. (Cont.)	Alternator output voltage insufficient (cont.)	2. Check resistance from case of alternator to airframe ground. Normal indication is very lcw resistance. If reading indicates no, or poor continuity, repair or replace alternator ground wiring.

16-41. TROUBLE SHOOTING THE ALTERNATOR SYSTEM. BEGINNING WITH 1979 MODELS.)

a. ENGINE NOT RUNNING.

TROUBLE	PROBABLE CAUSE	REMEDY
AMMETER INDICATES HEAVY DISCHARGE OR ALTERNATOR CIRCUIT BREAKER OPENS. (Battery Switch ON. Alternator Switch OFF, all other electrical switches OFF.)	Shorted diode in alternator.	Turn off Battery Switch and remove "B" Lead from alternator. Check resistance from "B" Terminal of alternator to alternator case. Reverse leads and check again. Resistance reading may show continuity in one direction but should show an infinite reading in the other direction. If an infinite reading is not obtained in at least one direction, repair or replace alternator.
ALTERNATOR REGULATOR CIRCUIT BREAKER OPENS WHEN BATTERY AND ALTERNATOR SWITCHES ARE TURNED ON.	Short in alternator control unit.	Disconnect Over-Voltage Sensor plug and recheck. If circuit breaker stays in replace Over-Voltage Sensor.
		Disconnect alternator control unit plug and recheck. If circuit breaker stays in, replace alternator control unit.
	Short in alternator field.	Disconnect "F" terminal wire and recheck. If circuit breaker stays in, replace alternator
b. ENGINE RUNNING.		
ALTERNATOR CIRCUIT BREAKER OPENS WHEN BATTERY AND ALTERNATOR SWITCHES ARE TURNED ON. LOW-VOLTAGE LIGHT DOES NOT COME ON.	Defective circuit breaker	Replace circuit breaker.

16-41. TROUBLE SHOOTING THE ALTERNATOR SYSTEM (BEGINNING WITH 1979 MODELS.) (Cont.)

b. ENGINE RUNNING (Cont.)

TROUBLE	PROBABLE CAUSE	REMEDY
ALTERNATOR REGULATOR CIRCUIT BREAKER OPENS WHEN BATTERY AND ALTERNATOR SWITCHES ARE TURNED ON, LOW-VOLTAGE LIGHT MAY OR MAY NOT COME ON.	Shorted field in alternator.	Check resistance from "F" terminal of alternator to alternator case, if resistance is less than 5 ohms repair/replace.
CAUTION This malfunction may cause a shorted alternator control unit, which will result in an over-voltage condition when system is again operated.		
ALTERNATOR MAKES ABNORMAL WHINING NOISE.	Shorted diode in alternator.	Turn off Battery Switch and remove "B" Lead from alternator. Check resistance from "B" Terminal of alternator to alternator case. Reverse leads and check again. Resistance reading may show continuity in one direction but should show an infinite reading in the other direction. If an infinite reading is not obtained in one direction, repair or replace alternator.
LOW-VOLTAGE LIGHT DOES NOT GO OUT WHEN ALTERNATOR AND BATTERY SWITCHES ARE TURNED ON.	Shorted alternator control unit.	Replace alternator control unit.
	Defective low-voltage sensor.	Replace alternator control unit.
AFTER ENGINE START WITH ALL ELECTRICAL EQUIPMENT TURNED OFF CHARGE RATE DOES NOT TAPER OFF IN 1-3 MINUTES	Alternator control unit faulty or high resistance in field circuit	With engine not running turn off all electrical loads and turn on battery and alternator switches. Measure bus voltage to ground, then measure voltage from terminal of alternator to ground. If there is more than 2 volts difference check field circuit wiring shown in alternator system wiring diagram in Section 19. Clean all contacts. Replace components until there is less than 2 volts difference between bus voltage and field voltage.
NOTE Also refer to battery power system trouble shooting chart.		

16-41. TROUBLE SHOOTING THE ALTERNATOR SYSTEM (BEGINNING WITH 1979 MODELS) (Cont.)

b. ENGINE RUNNING (Cont.)

TROUBLE	PROBABLE CAUSE	REMEDY
ALTERNATOR SYSTEM WILL NOT KEEP BATTERY CHARGED.	Alternator output voltage insufficient.	1. Connect voltmeter between D.C. Bus and ground. Turn off all electrical loads. Turn on Battery Switch, start engine and adjust for 1500 RPM. voltage should read approximately 24 volts. Turn on alternator switch. voltage should read between 28.4 and 28.9 volts. Ammeter should indicate a heavy charge rate which should taper off in 1-3 minutes. If charge rate tapers off very quickly and voltage is normal, check battery for malfunction. If ammeter shows a low charge rate or any discharge rate, and voltage does not rise when alternator switch is turned on proceed to Step 2.
	Alternator output voltage insufficient (cont.)	2. Stop engine, turn off all switches. Connect voltmeter between "F" terminal of alternator and ground. Do NOT start engine. Turn on battery switch and alternator switch. Battery voltage should be present at "F" terminal, less 1 volt drop thru regulator, if not refer to Step 3.
		3. Starting at "F" terminal of alternator, trace circuit to alternator control unit at Pin 1 (Blue Wire). Trace circuit from Pin 3 (Red Wire) to master switch, to Bus Bar. Trace circuit from alternator control unit Pin 2 (Orange Wire) to alternator "BAT" terminal. Check connections and replace component which does not have voltage present at output. Refer to alternator system wiring diagram in Section 19.
	Alternator field winding open.	1. If voltage is present turn off alternator and battery switches. Check resistance from "F" terminal of alternator to alternator case, turning alternator shaft during measurement. Normal indication is 12-20 ohms. If resistance is high or low, repair or replace alternator. If OK refer to Step 2.

16-41. TROUBLE SHOOTING THE ALTERNATOR SYSTEM (BEGINNING WITH 1979 MODELS) (Cont.)

b. ENGINE RUNNING (Cont.)

TROUBLE	PROBABLE CAUSE	REMEDY
ALTERNATOR SYSTEM WILL NOT KEEP BATTERY CHARGED. (Cont.)	Alternator output voltage insufficient.	2. Check resistance from case of alternator to airframe ground. Normal indication is very low resistance. If reading indicates no, or poor continuity, repair or replace alternator ground wiring.

16-42. REMOVAL AND INSTALLATION. (See figure 16-4.)

a. Make sure the master switch remains in the off position or disconnect the negative lead from the battery.

b. Disconnect and label the wiring from the alternator.

c. Remove the safety wire from the upper adjusting bolt and remove the bolt from the alternator.

d. Remove the nut and washer from the lower mounting bolt.

e. Remove the alternator drive belt and the lower mounting bolt to remove alternator.

f. To replace alternator, reverse this procedure.

g. On 60-amp alternator adjust belt tension to obtain 3/8" deflection at center of belt when applying 12 pounds of pressure. After belt is adjusted and the bolt is safety wired. tighten the bottom bolt to 100-140 lb-in. torque to remove any play between alternator mounting foot and U-shaped support assembly. On New aircraft or whenever a new belt is installed, belt tension should be checked within 10 to 25 hours of operation.

h. On 95 amp alternator or on initial installation of new belt adjust belt tension to 75 Lb., thereafter belt tension should be 58 to 72 Lb.

NOTE

When tightening the alternator belt, apply pry bar pressure only to the end of the alternator nearest the pulley.

16-43. ALTERNATOR FIELD CIRCUIT PROTECTION. A manually resettable circuit breaker located on the switch panel is provided to protect the alternator field circuit.

16-44. ALTERNATOR VOLTAGE REGULATOR.

16-45. DESCRIPTION. Thru 1977 Models the voltage regulator is semi-solid state. The mechanical relay in the regulator is actuated by the aircraft master switch and connects the regulator to the battery. The solid state portion is voltage sensitive and controls the current applied to the field windings of the alternator. The regulator is a remove and replace item. adjustment on the aircraft is not recommended. Beginning with 1978 Models the regulator is transistorized. This regulator is also adjustable. but adjustment on the aircraft is not recommended. A bench adjustment procedure is outlined in the Cessna Alternator Charging Systems Service/Parts Manual. A Cessna Alternator Charging System Test Box Assembly (P/N 9870000-1) is available through the Cessna Supply Division for use in isolating failures in the 28-volt transistorized voltage regulator (C611002-0105) and 28-volt Alternator.

16-46. REMOVAL AND INSTALLATION. (See figure 16-5.)

a. Make sure that the master switch is off, or disconnect the negative lead from the battery.

b. Remove the connector plug from the regulator.

c. Remove two screws holding the regulator on the firewall.

d. To replace the regulator, reverse the procedure. Be sure that the connections for grounding the alternator, wiring shields and the base of the regulator are clean and bright before assembly. Otherwise, poor voltage regulation and/or excessive radio noise may result.

16-47. ALTERNATOR CONTROL UNIT.

16-48. DESCRIPTION. The alternator control unit is a solid state voltage regulator with an over-voltage sensor and low-voltage sensor incorporated in the unit. The control unit is not adjustable and is a remove and replace item. A Cessna Alternator Charging System Test Box Assembly (P/N 9870005) is available through the Cessna Supply Division for use in isolating failures in the 28-volt alternator control units (C611005-0101 and C611005-0102) and the 28-volt alternator.

16-49. REMOVAL AND INSTALLATION. (See figure 16-5.)

a. Remove upper half of engine cowl.

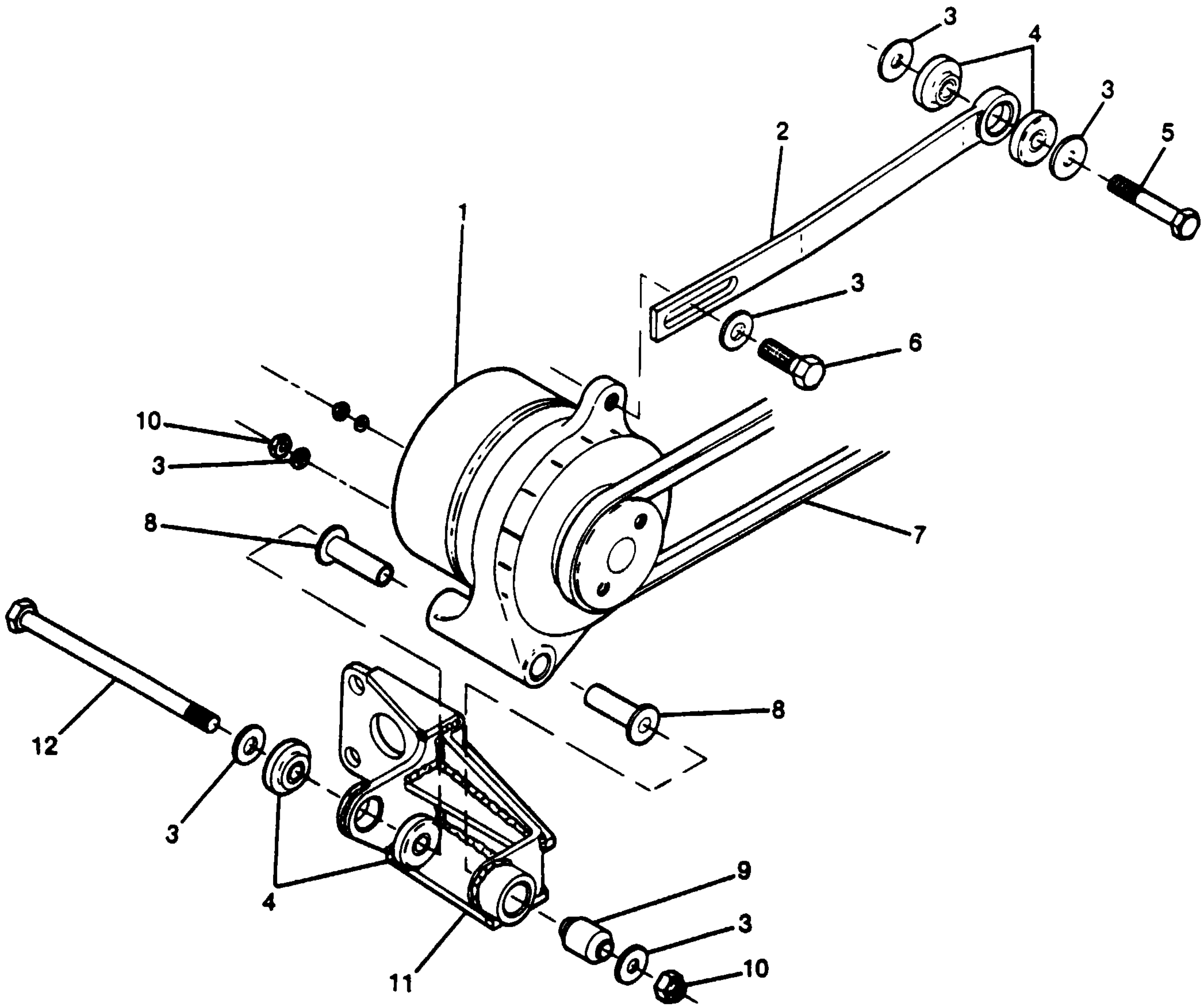
b. Place master switch in the "OFF" position.

c. Disconnect negative lead from the battery and pull lead free of the battery box.

d. Disconnect housing plug from the alternator control unit.

e. Remove screws securing the alternator control unit to the firewall.

f. To install alternator control unit. reverse the preceding steps. Be sure the connections for grounding are clean and bright before assembly. otherwise faulty voltage regulation and/or excessive radio noise may result.

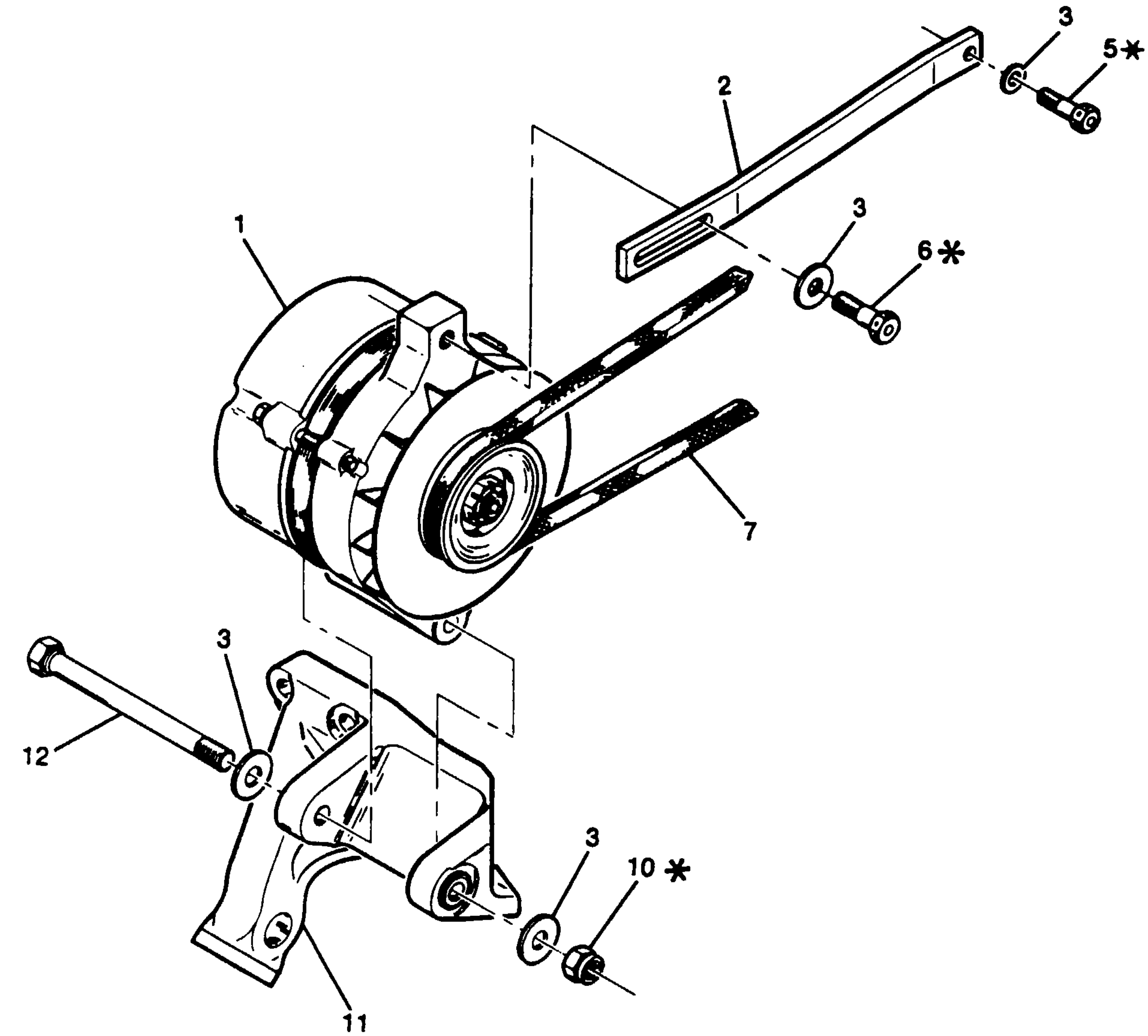


1. Alternator
2. Adjusting Arm
3. Washer
4. Rubber Bushing
5. Bolt
6. Upper Adjusting Bolt
7. Drive Belt
8. Bushing
9. Bonded Mount
10. Nut
11. Support Assembly
12. Lower Mounting Bolt

For replacement of alternator support bracket refer to Cessna Single-Engine Customer Care Service Information Letter SE79-58, Dated May 12, 1980.

THRU 18266408, 18266413, 18266415 THRU 18266418 AND 18266420 THRU 18266541

Figure 16-4. Alternator Installation (Sheet 1 of 3)



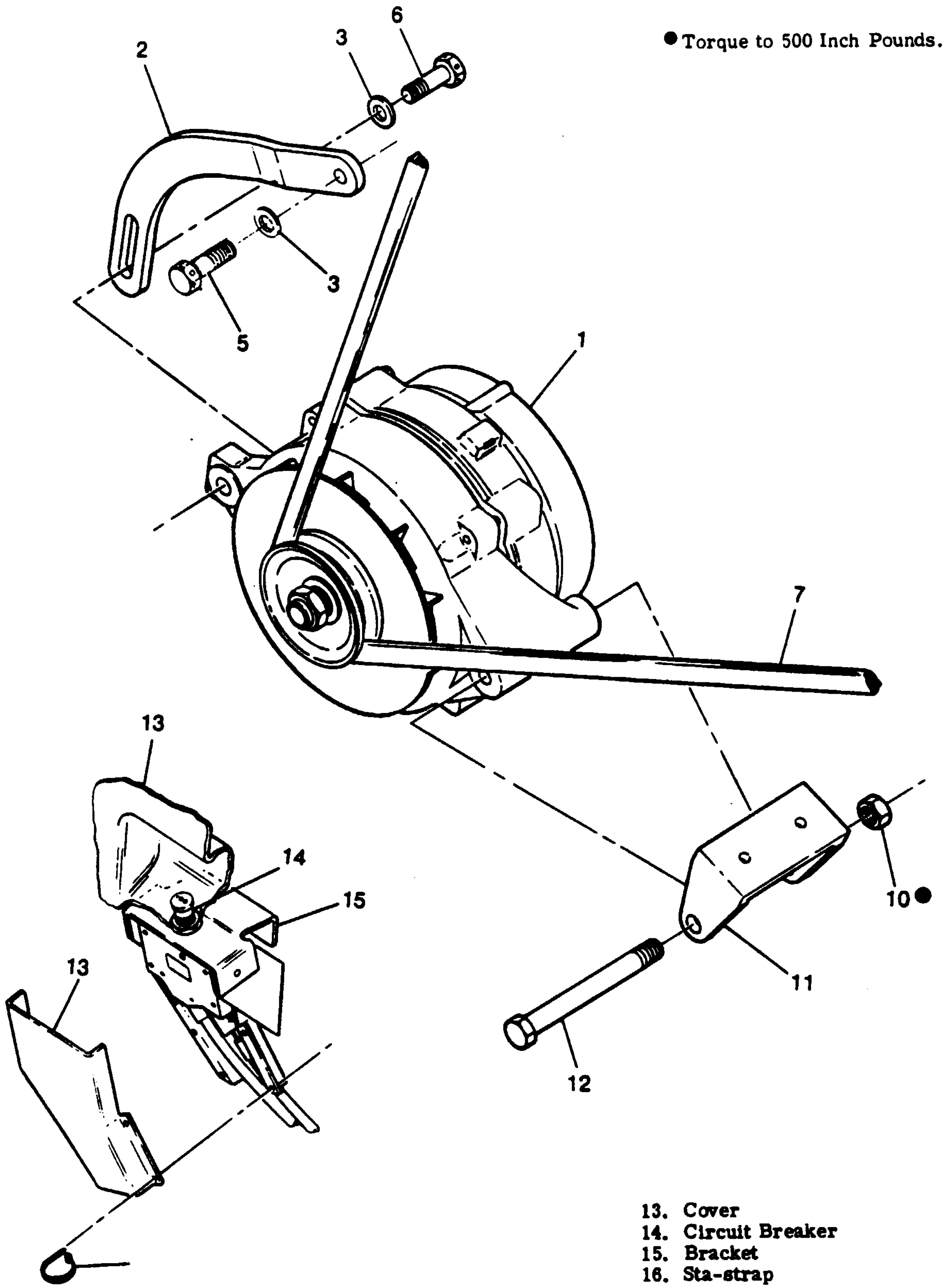
* TORQUE TO 165 ± 10 IN LBS.

* TORQUE TO 450 - 500 IN LBS.

* TORQUE TO 200 - 270 IN LBS.

BEGINNING WITH 18266409 THRU 18266412 , 18266414, 18266419, AND 18266542 & ON

Figure 16-4. Alternator Installation (Sheet 2 of 3)



13. Cover
14. Circuit Breaker
15. Bracket
16. Sta-strap

MODEL T182

95 AMP ALTERNATOR

Figure 16-4. Alternator Installation (Sheet 3 of 3)

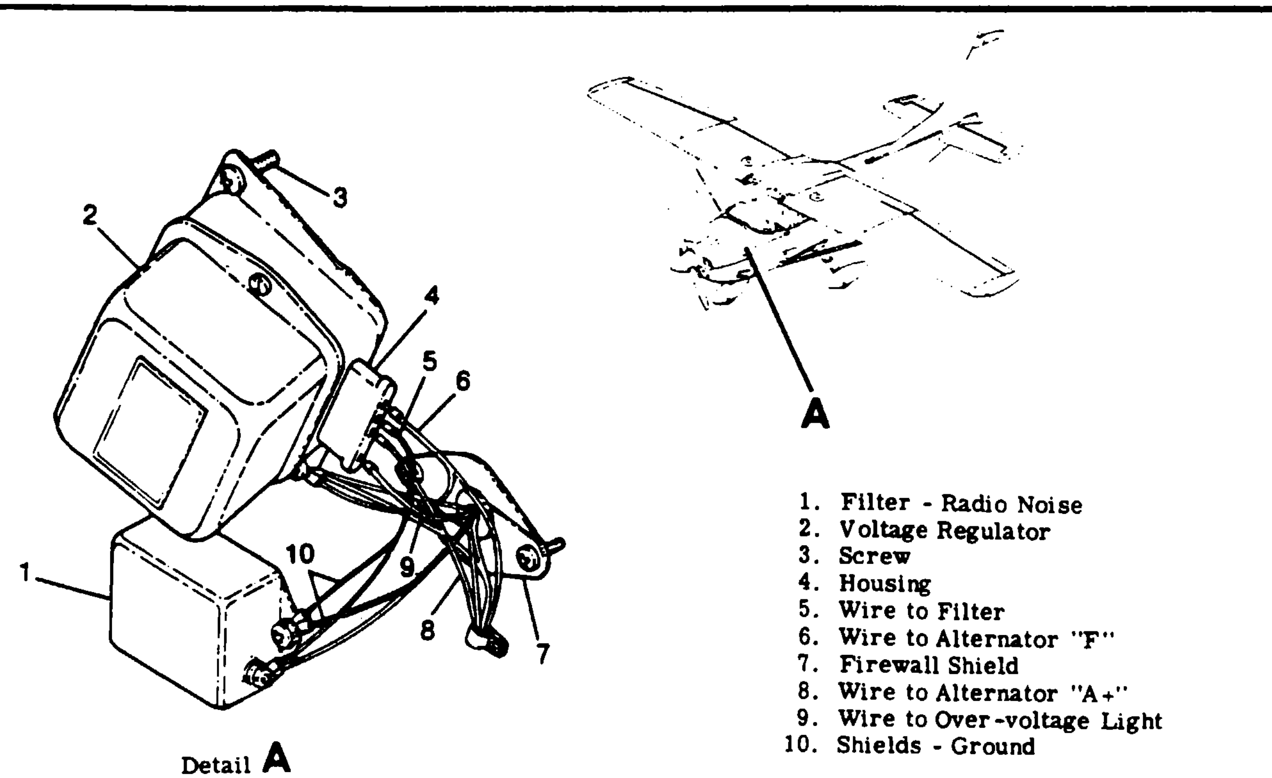
16-50. OVER-VOLTAGE WARNING SYSTEM.

16-51. DESCRIPTION. The over-voltage warning system consists of a sensor switch and a red warning light labeled, "HIGH-VOLTAGE", on the instrument panel. When an over-voltage tripoff occurs the over-voltage sensor turns off the alternator system and the red warning light comes on. The ammeter will show a discharge. Turn off both sections of the Master Switch to recycle the over-voltage sensor. If the over-voltage condition was transient, the normal alternator charging will resume and no further action is necessary. If the over-voltage tripout recurs, then a generating system malfunction has occurred such that the electrical accessories must be operated from the aircraft battery only. Conservation of electrical energy must be practiced until the flight can be terminated. The over-voltage red warning light filament can be tested by turning off the Alternator portion of the Master Switch and leaving the Battery portion turned on. This test does not induce an over-voltage condition on the electrical system.
Beginning with 1979 Models the over-voltage sensor is contained within the alternator control unit. The unit also contains a low-voltage sensor. A red warning light labeled "LOW VOLTAGE" is installed on the instrument panel. When an over-voltage condition occurs the over-voltage sensor turns off the alternator and the voltage in the system drops. When system voltage drops below 24.8 volts the low-voltage sensor turns on the low-voltage light indicating a drain on the battery and the ammeter will show a discharge. Turn off both sections of the master switch to recycle the over-voltage sensor. If the over-voltage condition was transient, the normal alternator charging will resume and no further action is necessary. If the over-voltage tripoff recurs, then a generating system malfunction has occurred such that the electrical accessories must be operated from the aircraft battery only. Conservation of electrical energy must be practiced until the flight can be terminated. The over-voltage light filament may be tested at any time by turning off the "Alternator" portion of the master switch and leaving the battery portion on. This test does not induce an over-voltage condition on the electrical system.

If the alternator low voltage light comes on when a COM radio transmitter is keyed the following corrective action should be followed.

a. Inspect COM coax connections at the radios and antennas for security and proper installation. Replace as required.
b. Ensure the COM coax shielding is properly grounded.
c. Inspect routing of COM coax and reroute as required to provide separation from the alternator wiring.
d. Inspect alternator control unit connector for loose or improperly installed contacts and replace or repair as required.
e. Inspect COM coax cables for damage where secured with ty-wraps. Cables that have been crushed or deformed should be replaced.

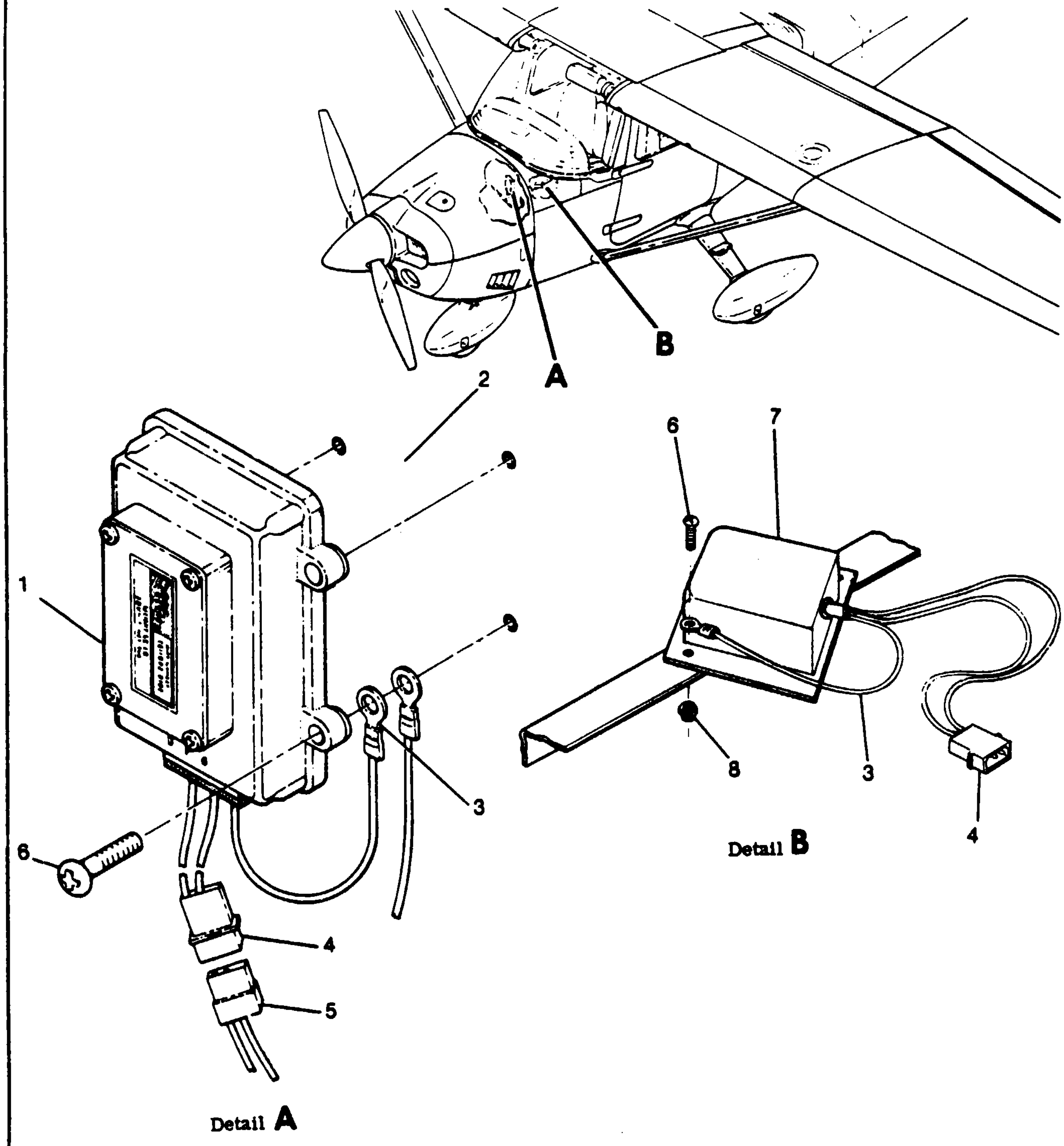
If the above inspection does not correct the problem a new alternator control unit may be installed.



1. Filter - Radio Noise
2. Voltage Regulator
3. Screw
4. Housing
5. Wire to Filter
6. Wire to Alternator "F"
7. Firewall Shield
8. Wire to Alternator "A+"
9. Wire to Over-voltage Light
10. Shields - Ground

THRU 1977 MODELS

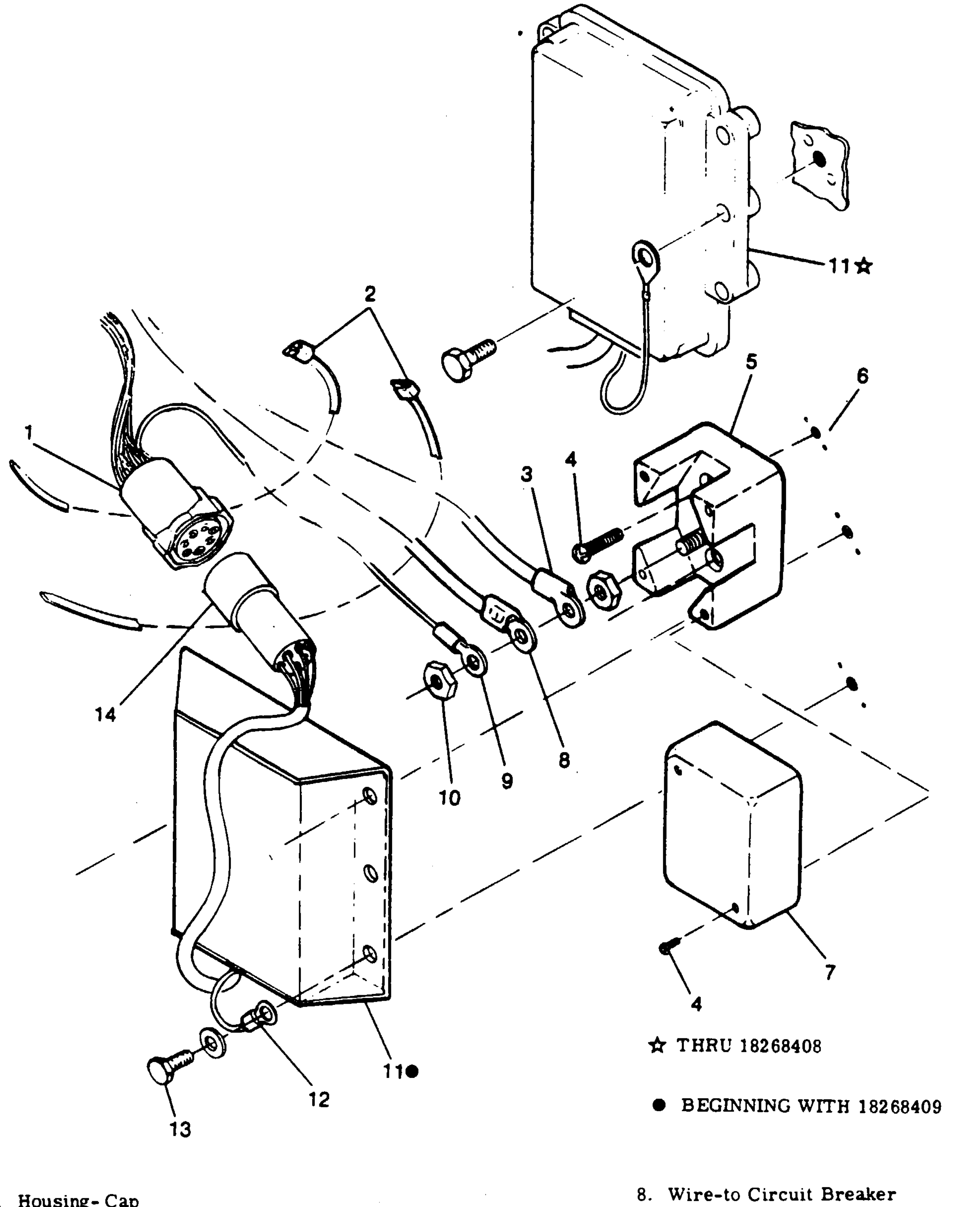
Figure 16-5. Voltage Regulator/Alternator Control Unit (Sheet 1 of 4)



1. Voltage Regulator
2. Firewall
3. Ground Wire
4. Housing-Cap
5. Housing-Plug
6. Screw
7. Over-Voltage Sensor
8. Nut

1978 MODELS

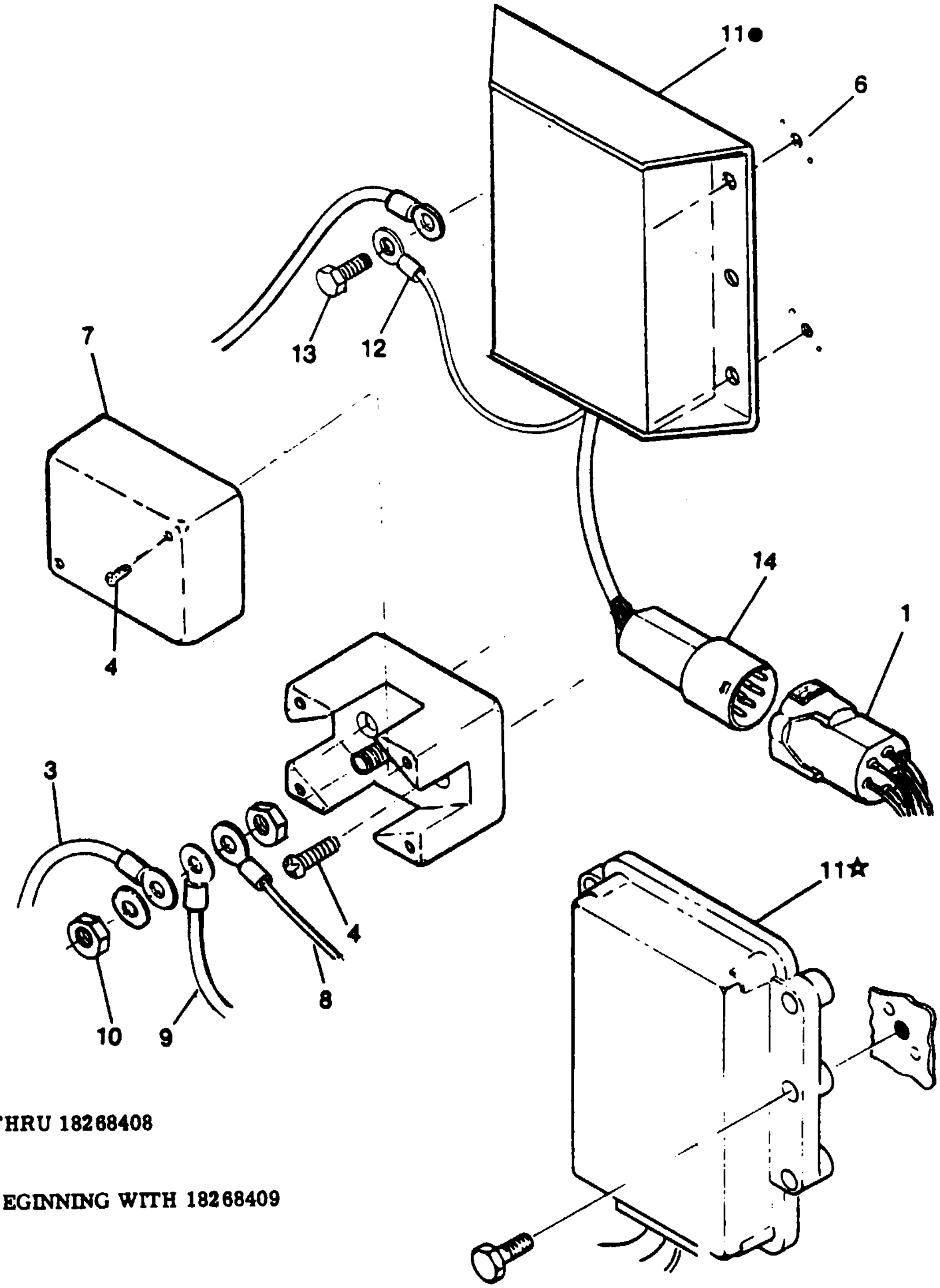
Figure 16-5. Voltage Regulator/Alternator Control Unit (Sheet 2 of 4)



1. Housing-Cap
2. Sta-strap
3. Wire-to Alternator
4. Screw
5. Terminal Block
6. Firewall
7. Cover-Terminal Block
8. Wire-to Circuit Breaker
9. Wire-to Alternator Control Unit
10. Nut
11. Alternator Control Unit
12. Ground Wire
13. Bolt
14. Housing-Plug

BEGINNING WITH 1979 MODELS

Figure 16-5. Voltage Regulator/Alternator Control Unit (Sheet 3 of 4)



☆ THRU 18268408

● BEGINNING WITH 18268409

MODEL T182 ONLY

Figure 16-5. Voltage Regulator/Alternator Control Unit (Sheet 4 of 4)

16-52. AIRCRAFT LIGHTING SYSTEM.

16-53. DESCRIPTION. The aircraft lighting system consists of landing and taxi lights, navigation lights, flashing beacon light, anti-collision strobe lights, dome and instrument flood lights, courtesy lights, control wheel map light, compass and radio dial lights.

16-54. TROUBLE SHOOTING.

TROUBLE	PROBABLE CAUSE	REMEDY
LANDING AND TAXI LIGHTS OUT.	Short circuit in wiring.	1. Inspect circuit breaker. If circuit breaker is open, proceed to step 2. If circuit breaker is OK, proceed to step 3.
	Defective wiring.	2. Test each circuit separately until short is located. Repair or replace wiring.
	Defective switch.	3. Check voltage at lights with master and landing and taxi light switches ON. Should read battery voltage. Replace switch.
LANDING OR TAXI LIGHT OUT.	Lamp burned out.	1. Test lamp with ohmmeter or new lamp. Replace lamp.
	Open circuit in wiring.	2. Test wiring for continuity. Repair or replace wiring.
FLASHING BEACON DOES NOT LIGHT.	Short circuit in wiring.	1. Inspect circuit breaker. If circuit breaker is open, proceed to step 2. If circuit breaker is OK, proceed to step 3.
	Defective wiring.	2. Test circuit until short is located. Repair or replace wiring.
	Lamp burned out.	3. Test lamp with ohmmeter or a new lamp. Replace lamp. If lamp is good, proceed to step 4.
	Open circuit in wiring.	4. Test circuit from lamp to flasher for continuity. If no continuity is present, repair or replace wiring. If continuity is present, proceed to step 5.
	Defective switch.	5. Check voltage at flasher with master and beacon switch on. Should read battery voltage. Replace switch. If voltage is present, proceed to step 6.
	Defective flasher.	6. Install new flasher.
FLASHING BEACON CONSTANTLY LIT.	Defective flasher.	1. Install new flasher.

16-54. TROUBLE SHOOTING (Cont).

TROUBLE	PROBABLE CAUSE	REMEDY
ALL NAV LIGHTS OUT.	Short circuit in wiring.	1. Inspect circuit breaker. If circuit breaker is open, proceed to step 2. If circuit breaker is OK, proceed to step 3.
	Defective wiring.	2. Isolate and test each nav light circuit until short is located. Repair or replace wiring.
	Defective switch.	3. Check voltage at nav light with master and nav light switches on. Should read battery voltage. Replace switch.
ONE NAV LIGHT OUT.	Lamp burned out.	1. Inspect lamp. Replace lamp.
	Open circuit in wiring.	2. Test wiring for continuity. Repair or replace wiring.
WARNING The anti-collision system is a high voltage device. Do not remove or touch tube assembly while in operation. Wait at least 5 minutes after turning off power before starting work.		
BOTH ANTI-COLLISION STROBE LIGHTS WILL NOT LIGHT.	Open circuit breaker.	1. Check, if open reset. If circuit breaker continues to open proceed to step 2.
		2. Disconnect red wire between aircraft power supply (battery/external power) and strobe power supplies, one at a time. If circuit breaker opens on one strobe power supply, replace strobe power supply. If circuit breaker opens on both strobe power supplies proceed to step 3. If circuit breaker does not open proceed to step 4.
		3. Check aircraft wiring. Repair or replace as necessary.
		4. Inspect strobe power supply ground wire for contact with wing structure.

16-54. TROUBLE SHOOTING (Cont).

TROUBLE	PROBABLE CAUSE	REMEDY
CAUTION Extreme care should be taken when exchanging flash tube. The tube is fragile and can easily be cracked in a place where it will not be obvious visually. Make sure the tube is seated properly on the base of the nav light assembly and is centered in the dome. NOTE When checking defective power supply and flash tube, units from opposite wing may be used. Be sure power leads are protected properly when unit is removed to prevent short circuit.		
ONE ANTI-COLLISION STROBE LIGHT WILL NOT LIGHT.	Defective Strobe Power Supply, or flash tube.	1. Connect voltmeter to red lead between aircraft power supply (battery/ external power) and strobe power supply, connecting negative lead to wing structure. Check for 12 volts thru 1977 models, and 24 volts beginning with 1978 models. If OK proceed to step 2. If not. check aircraft power supply (battery/external power).
		2. Replace flash tube with known good flash tube. If system still does not work, replace strobe power supply.
DOME LIGHT TROUBLE.	Short circuit in wiring.	1. Inspect circuit breaker. If circuit breaker is open, proceed to step 2. If circuit breaker is OK, proceed to step 3.
	Defective wiring.	2. Test circuit until short is located. Repair or replace wiring.
		3. Test for open circuit. Repair or replace wiring. If no short or open circuit is found, proceed to step 4.
	Lamp burned out.	4. Test lamp with ohmmeter or new lamp. Replace lamp.
	Defective switch.	5. Check for voltage at dome light with master and dome light switch on. Should read battery voltage. Replace switch.

16-54. TROUBLE SHOOTING (Cont).

TROUBLE	PROBABLE CAUSE	REMEDY
INSTRUMENT LIGHTS WILL NOT LIGHT	Short circuit wiring.	1. Inspect circuit breaker. If circuit breaker is open, proceed to step 2. If circuit breaker is OK, proceed to step 3.
	Defective wiring.	2. Test circuit until short is located. Repair or replace wiring.
		3. Test for open circuit. Repair or replace wiring. If no short or open circuit is found, proceed to step 4.
	Faulty section in dimming potentiometer.	4. Lights will work when control is placed in brighter position. Replace potentiometer.
	Faulty light dimming transistor.	5. Test both transistors with new transistor. Replace faulty transistor.
	Faulty selector switch.	6. Inspect. Replace switch.
INSTRUMENT LIGHTS WILL NOT DIM	Open resistor wiring in minimum intensity end of potentiometer.	1. Test for continuity. Replace resistor or repair wiring.
	Shorted transistor.	2. Test transistor by substitution. Replces defective transistor.
CONTROL WHEEL MAP LIGHT WILL NOT LIGHT	Nav light switch turned off.	1. Nav light switch has to be ON before map light will light.
	Short circuit in wiring.	2. Check lamp fuse on terminal board located on back of stationary panel with ohmmeter. If fuse is open, proceed to step 3. If fuse is OK, proceed to step 4.
	Defective wiring.	3. Test circuit until short is located. Repair or replace wiring. 4. Test for open circuit. Repair or replace wiring. If a short or open circuit is not found, proceed to step 5.
	Defective map light assembly.	5. Check voltage at map light assembly with master and nav switches on. If battery voltage is present, replace map light assembly.

16-55. LANDING AND TAXI LIGHTS.

16-56. DESCRIPTION. The landing and taxi lights are mounted in the lower half of the engine cowl. Both lights are used for landing but only the left hand for taxi. Power for the lights is supplied through a circuit breaker located on the primary bus bar. Two rocker switches control the lights. The switches are interconnected by two diods, when the taxi light switch is actuated only the left hand light is illuminated. When the landing light switch is actuated power is supplied to the landing light, and through the diods around the taxi light switch to the taxi light so both lights are illuminated.

16-57. REMOVAL AND INSTALLATION. (See figure 16-6.)

a. Remove the lower cowl and disconnect wires from the landing and taxi lights.

b. Remove screws (8) securing lamp assembly to support (2) and remove lamp assembly. Note number and position of washers between plate (3) and support (2) for reinstallation.

c. Remove screws (7) securing bracket (6) to plate (3) and remove lamp (5) and gasket (4).

d. To install , place lamp (5) in bracket (6) and install gasket (4) and plate (3) using screws (7).

NOTE

Aminimum of one gasket (4) and a maximum of two gaskets may be used to secure lamp (5) between bracket (6) and plate (3).

e. Using screws (8) secure lamp assembly to support (2) installing washers, in the proper position, removed in step (b.).

NOTE

A maximum of two washers may be used between support (2) and plate (3) for adjustment.

f. Connect wires to lamps and install cowl.

g. Check lights for operation.

16-58. ADJUSTMENT OF LANDING AND TAXI LIGHT. (See figure 16-6.) Adjustment of the landing and taxi lights is pre-set at the factory. If further asjustment is desired proceed as follows:

a. Remove the lower engine cowland disconnect wires from the landing and taxi lights.

b. Remove screws (8) securing lamp assembly to support (2).

c. Add or remove washers between lamp assembly and support (2).

NOTE

A maximum of two washers may be used between support (2) and plate (3) for adjustment.

d. Using screws (8) secure lamp assembly to support (2).

e. Connect wires to lamps and install cowl.

f. Check lights for operation and direction.

16-59. NAVIGATION LIGHTS.

16-60. DESCRIPTION. The navigation lights are installed on each wing tip and the stinger. The lights are controled by a switch located on the instrument panel.

16-61. REMOVAL AND INSTALLATION. For removal and installation of the navigation lights see figure 16-7.

16-62. FLASHING BEACON.

16-63. DESCRIPTION. The flashing beacon light is attached to the vertical fin tip. The flashing beacon is an iodine-vapor lamp electrically switched by a solid-state flasher assembly. The flasher assembly is located in the vertical fin under the fin tip. Switching frequency of the flasher assembly operates the lamp at approximately 45 flashes per minute. A 1.5 ohm resistor is installed to provide a dummy load to eliminate a "pulsing" effect on the cabin lighting and ammeter.

16-64. REMOVAL AND INSTALLATION. For removal and installation of the flashing beacon light see figure 16-8.

16-65. ANTI-COLLISION STROBE LIGHTS.

16-66. DESCRIPTION. A white strobe light is installed on each wing tip. These lights are vibration resistant and operate on the principle of a capacitor discharge into a xenon tube, producing an extremely high intensity flash. Energy is supplied to the strobe lights from power supplies mounted on each wing tip rib.

16-67. OPERATIONAL REQUIREMENTS. (THRU 1977 MODELS).

CAUTION

The capacitors in the strobe light power supplies must be reformed if not used for a period of six (6) months. The following procedure must be used.

Connect the power supply, red wire to plus, black to ground to 6 volt DC source. Do Not connect strobe tube. Turn on 6 volt supply. Note current draw after one minute. If less than 1 ampere, continue operation for 24 hours. Turn off DC power source. Then connect to the proper voltage, 12 volt. Connect tube to output of strobe power supply and allow to operate, flashing, for 15 minutes. Remove strobe tube. Operating power supply at 12 volts, note the current drain after one minute. If less than 0.5 amperes, operate for 6 hours. If current draw is greater than 0.5 amperes, reject the unit.

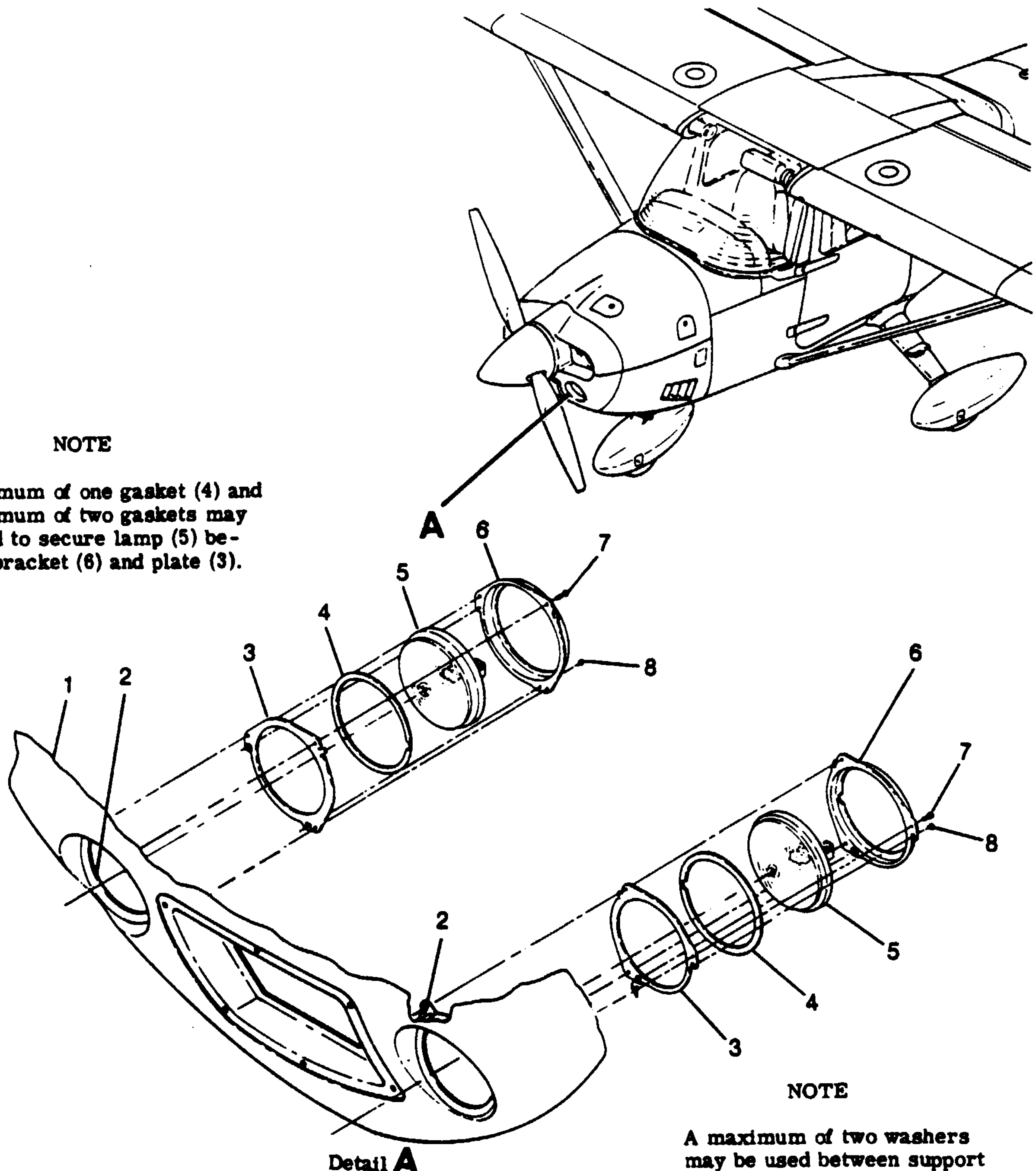
16-68. REMOVAL AND INSTALLATION. (See figure 16-7 as a guide for removal and installation of the anti-collision strobe light components.

WARNING

This anti-collision system is a high voltage device. Do not remove or touch tube assembly while in operation. Wait at least 5 minutes after turning off power before starting work.

NOTE

A minimum of one gasket (4) and a maximum of two gaskets may be used to secure lamp (5) between bracket (6) and plate (3).

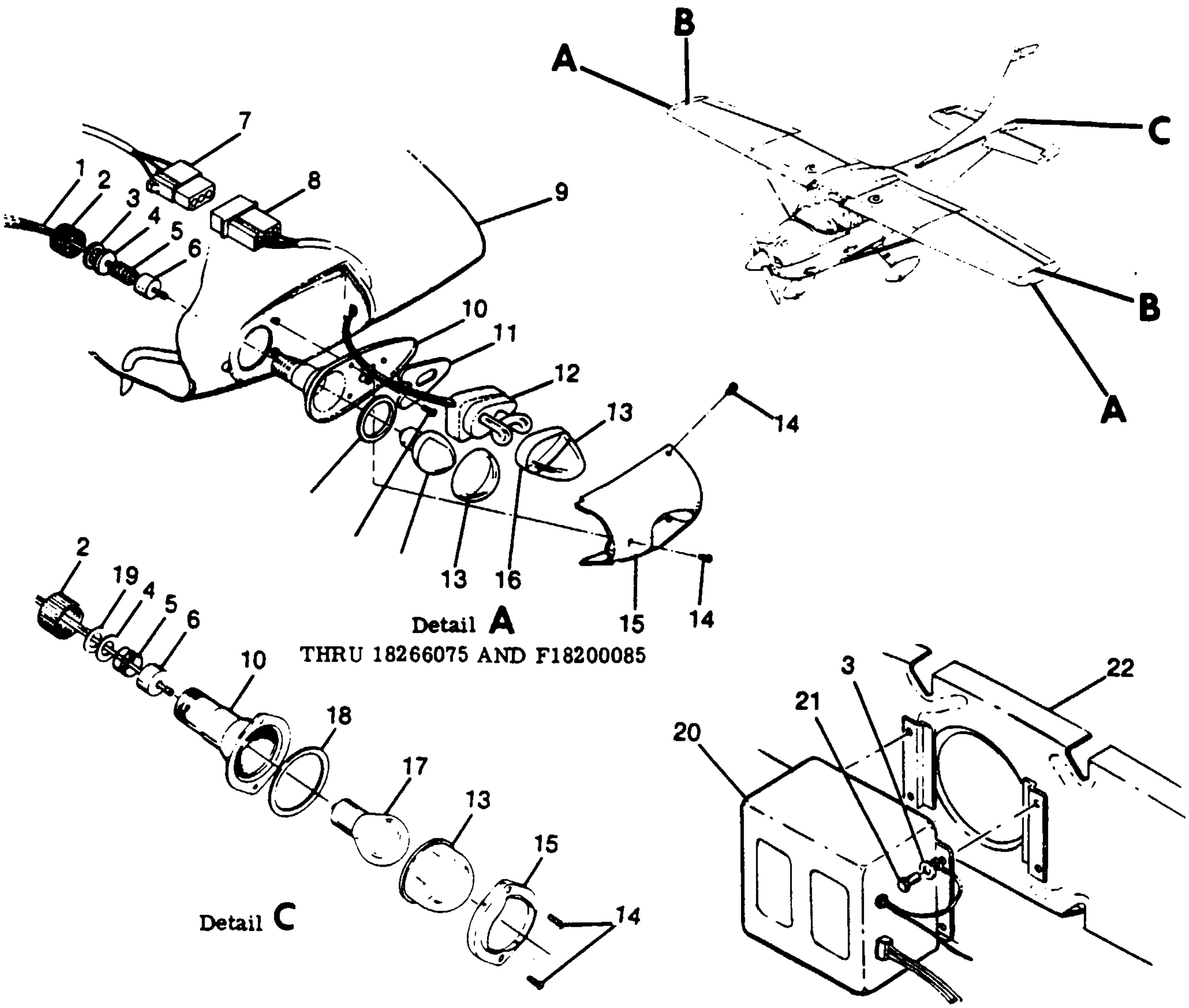


NOTE

A maximum of two washers may be used between support (2) and plate (3) for adjustment.

1. Nose Cap
2. Landing Light Support
3. Plate
4. Gasket
5. Lamp
6. Bracket
7. Screw
8. Tinnerman Screw

Figure 16-6. Landing and Taxi Light Installation

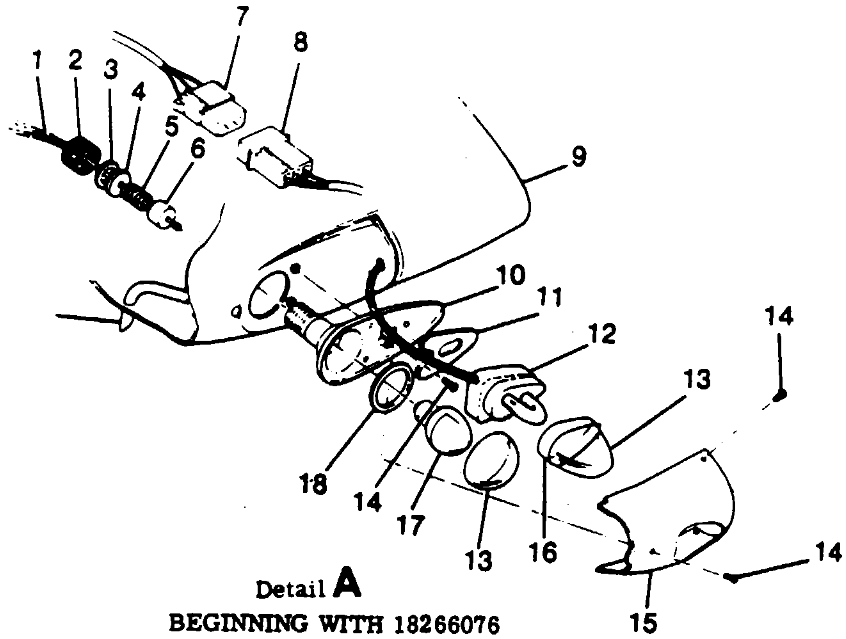


NOTE

When replacing strobe light power supplies or when radio frequency interference is experienced during strobe light operation, refer to Cessna Single-engine Service Letter SE76-13, dated June 14, 1976.

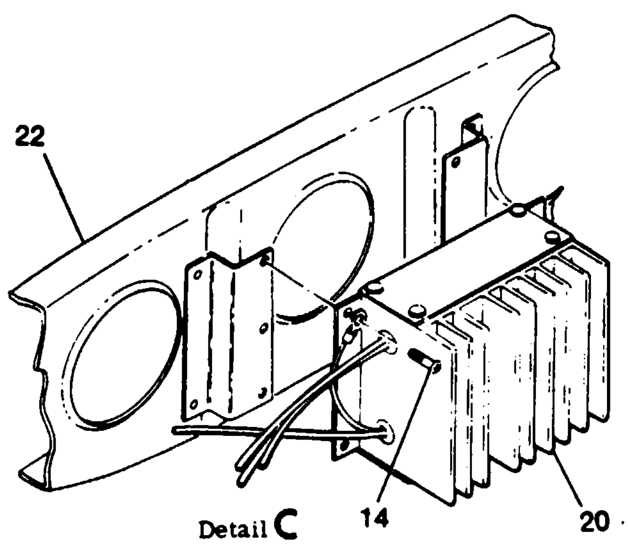
1. Electrical Leads
2. Cap
3. Washer
4. Insulated Washer
5. Spring
6. Insulator
7. Housing - Plug
8. Housing - Cap
9. Wing Tip
10. Lamp Socket
11. Spacer
12. Flash Tube Assembly
13. Lens
14. Screw
15. Lens Retainer
16. Gasket
17. Lamp
18. Seal
19. Grounding Washer
20. Power Supply
21. Bolt
22. Wing Tip Rib

Figure 16-7. Navigation and Anti-Collision Strobe Light Installation (Sheet 1 of 2)



Detail **A**

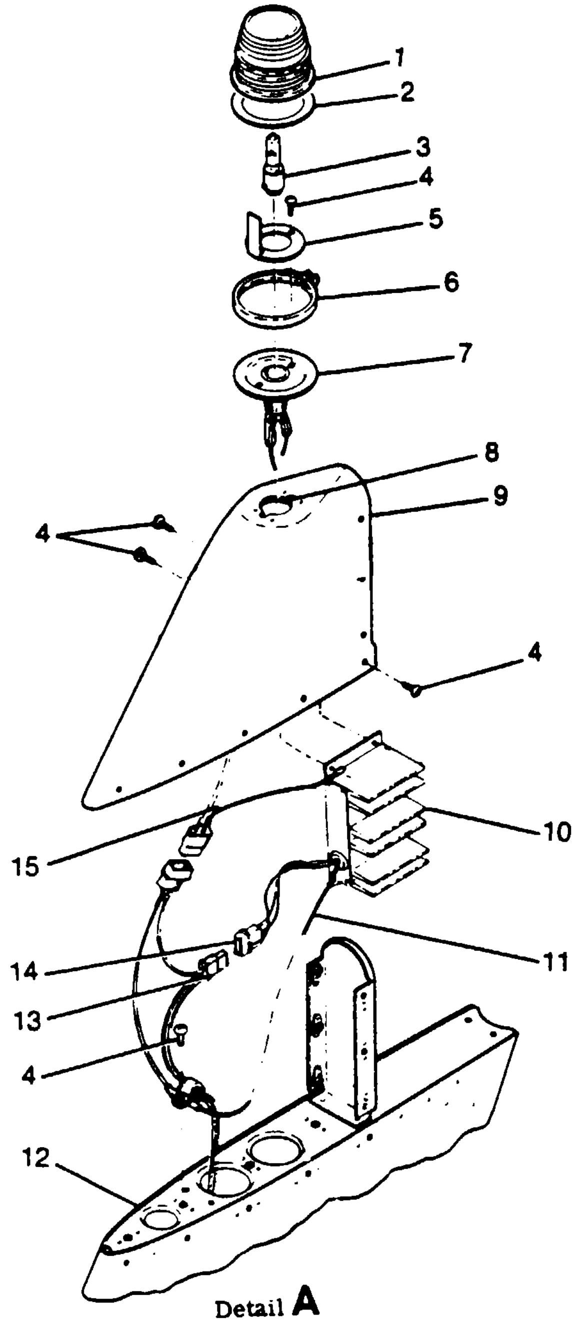
BEGINNING WITH 18266076
AND F18200086

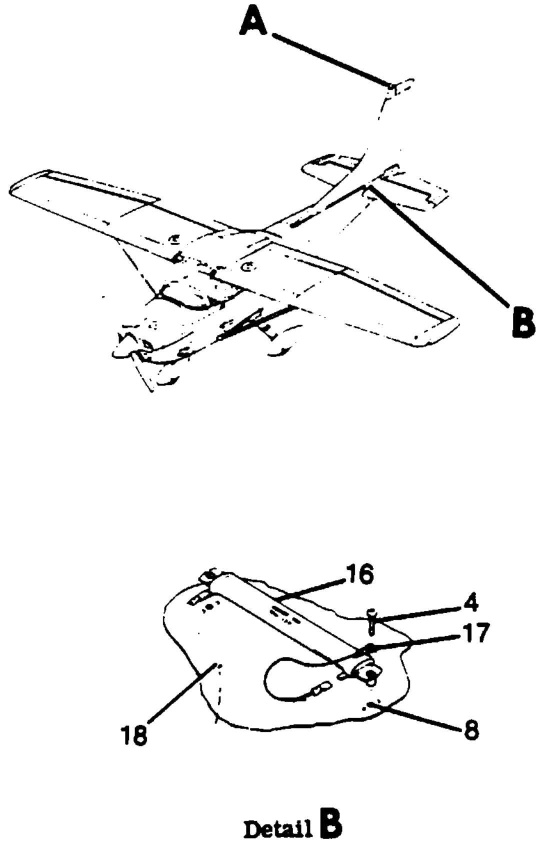


Detail **C**

BEGINNING WITH 18265300

Figure 16-7. Navigation and Anti-Collision Strobe Light Installation (Sheet 2 of 2)





CAUTION

When inserting lamp into socket always use a handkerchief or a tissue to prevent getting fingerprints on the lamp.

NOTE

Fingerprints on lamp may shorten the life of the lamp.

1. Lens
2. Gasket
3. Lamp
4. Screw
5. Baffle
6. Clamp
7. Socket
8. Nutplate
9. Tip Assembly
10. Flasher
11. Ground Wire
12. Fin Assembly
13. Housing-Plug
14. Housing-Cap
15. Ground Wire
16. Resistor
17. Ground Wire
18. Wire to Flasher

Figure 16-8. Flashing Beacon Light Installation (Sheet 1 of 3)

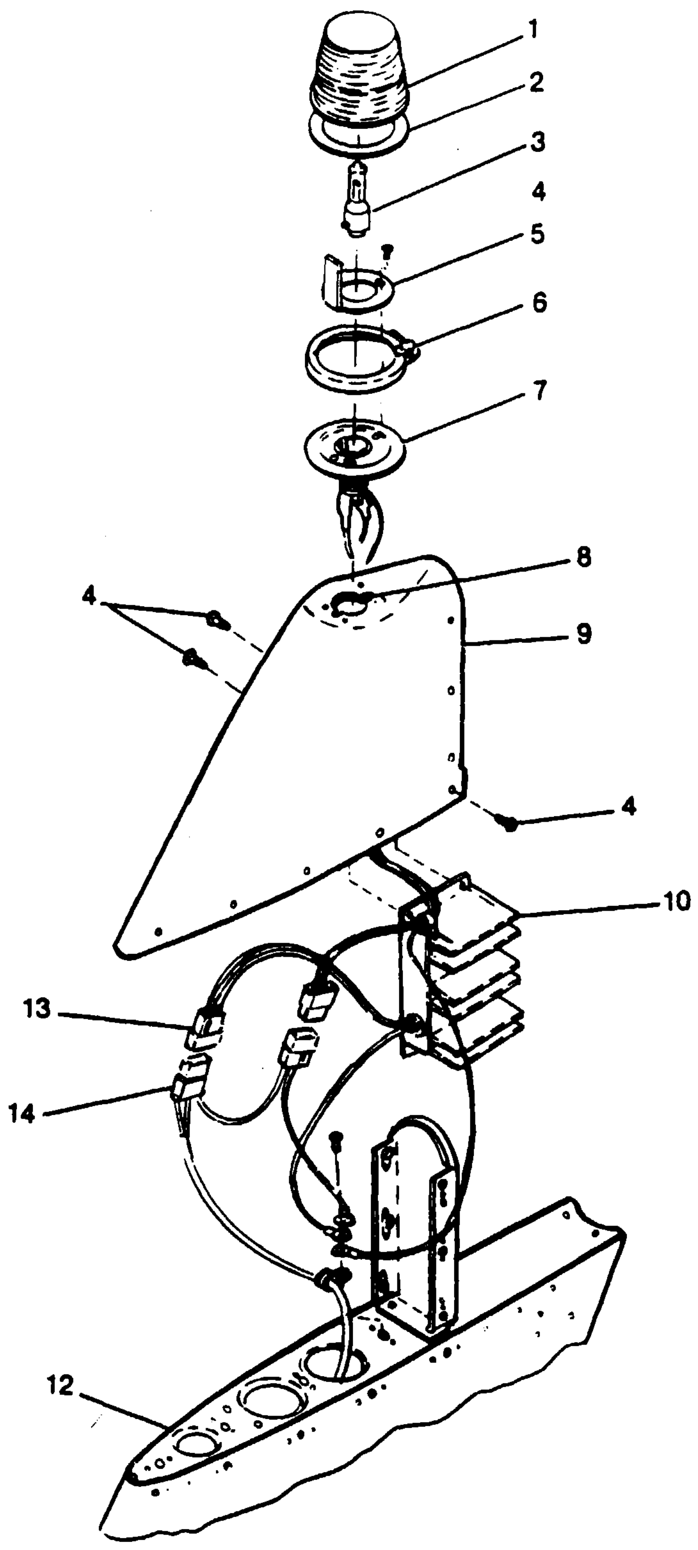
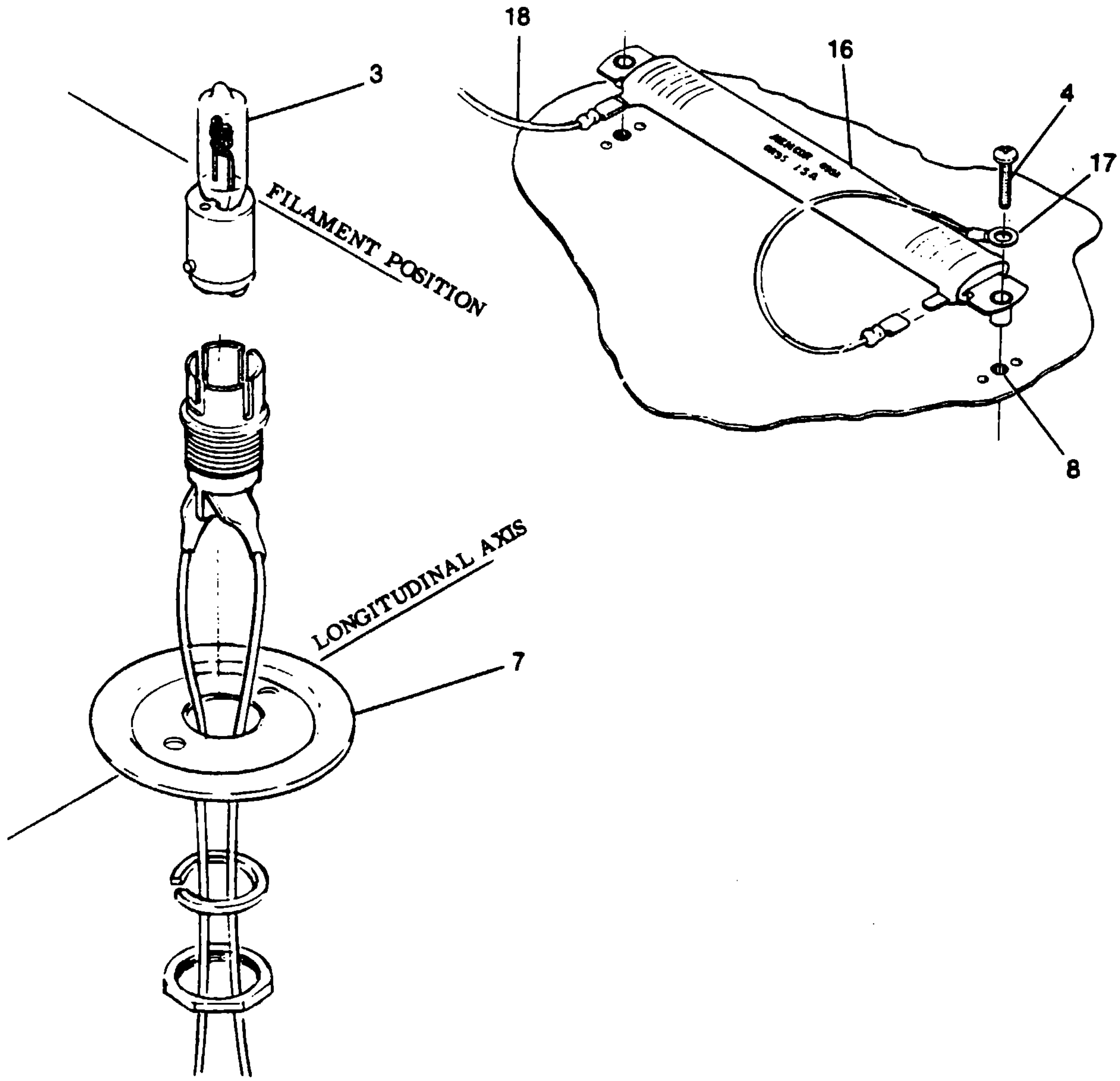


Figure 16-8. Flashing Beacon Light Installation (Sheet 2 of 3)



NOTE

When installing lamp be sure socket assembly is installed in mounting plate so lamp may be installed with filament perpendicular to the longitudinal axis of the aircraft.

Figure 16-8. Flashing Beacon Light Installation (Sheet 3 of 3)

16-69. OVERHEAD CONSOLE.

16-70. DESCRIPTION. The overhead console contains the instrument flood lights which also may be used as map lights by moving the slide covers below the lamps. The intensity of the lights is controlled by a rheostat mounted on the instrument panel.

16-71. REMOVAL AND INSTALLATION. (See figure 16-9 for removal and installation.

16-72. INSTRUMENT LIGHTING.

16-73. DESCRIPTION. The instrument panel lighting consists of two seperate sections. The lower two-thirds of the panel is illuminated by two lights mounted in the overhead console. The lighting for the upper one-third of the panel is provided by four lights mounted in the instrument panel glare shield. The intensity of the lighting is controled by the instrument light dimming rheostat located on the swithc panel.

16-74. REMOVAL AND INSTALLATION. See figure 16-9 and 16-10.

16-75. ELECTROLUMINESCENT PANEL LIGHTING.

16-76. DESCRIPTION. The electroluminscent lighting consists of two "EL" panels. The switch panel and the comfort control panel. The ac voltage required to drive the "EL" panels is supplied by a small invertapak (power supply) located behind the instrument panel on the glove box. The intensity of the "EL" panel lighting is controlled by a rheostat located on the instrument switch panel.

16-77. REMOVAL AND INSTALLATION. (See figure 16-11.)

a. Disconnect positive cable from battery.
b. Disconnect and tag all electrical leads from panel.
c. Remove knobs, decorative nuts, and switches.
d. Remove screws securing panel to stationary panel and remove panel.
e. For installation reverse the preceding steps. After installation, check all switches for operation.

16-78. INSTRUMENT POST LIGHTING.

16-79. DESCRIPTION. Individual post lighting may be installed to provide nonglare instrument lighting. The post light consists of a cap and a clear lamp assembly with a tinted lens. The intensity of the post lights is controlled by the instrument light dimming rheostat located on the switch panel.

NOTE

When installing postlight assemblies, assemblies shall be coated with RTV-102, General Electric, Waterford, New York, on forward side of panel where postlight could come in contact with sheet metal subpanel. This coating shall insulate postlight assembly from contact with airplane structure. Maximum coating thickness to be .03.

16-79A. TROUBLE SHOOTING - POSTLIGHTING.

TROUBLE	PROBABLE CAUSE	REMEDY
LAMP WILL NOT LIGHT.	Defective lamp.	1. Test lamp with ohmmeter or replace with a new lamp. If lamp is OK, proceed to step 2.
	Defective socket or open circuit.	2. With switch on, test socket. If defective, replace socket or wiring.
ONE SECTION OF LAMPS WILL NOT LIGHT.	Defective connector.	1. Test for voltage on lamp side of connector. If voltage is not present, check opposite side of connector. If voltage is present, replace pins and sockets as necessary. If voltage is not present, check connections at terminal block.
	Defective circuit in dimming assembly.	2. Refer to paragraph 17-90B.

16-79A. TROUBLE SHOOTING - POSTLIGHTING. CONT.

TROUBLE	PROBABLE CAUSE	REMEDY
ONE SECTION OF LAMPS WILL NOT LIGHT. Cont.	Defective rheostat.	3. Check voltage at output side of rheostat with battery switch on. Should read battery voltage with rheostat turned full clockwise. voltage should decrease as rheostat is turned counterclockwise. If no voltage is present or voltage has a sudden drop before rheostat has been turned full counterclockwise replace rheostat.
ALL LAMPS OUT.	Open circuit breaker.	1. With battery switch on, check circuit breaker. Reset if open. If circuit breaker is set, check voltage at output side of breaker. If no voltage is present, replace circuit breaker.
LAMPS WILL NOT DIM.	Defective resistor or rheostat.	1. Check resistor and rheostat for continuity and resistance value. Also, check transistors for partial short. Refer to paragraph 17-90B. Replace rheostat and transistor.

16-80. TRANSISTORIZED LIGHT DIMMING.

16-81. DESCRIPTION. The light dimmimg circuit consists of a two-circuit transistorized dimming assembly, mounted on the right hand side of the cabin forward of the instrument panel, and two controls on the lower left hand side of the panel. The left control is a dual rheostat with a concentric knob arrangement The center portion controls lower panel lighting, the outer portion controls engine instrument and radio lighting. The right hand is a single rheostat and controls instrument lighting, this includes, glare shield lights, instrument flood lights, compass light and post lighting if installed.

16-82. REMOVAL AND INSTALLATION. See figure 16-11 for removal and installation.

16-82A. TROUBLE SHOOTING - TRANSISTORIZED HEAT SINK. Remove heat sink from airplane. Check transistors for opens and shorts, check transistor sockets for evidence of shorting out against heat sink, especially on the bottom side. Check that legs of transistor socket have not been bent up against heat sink. If this has happened, you may see burned spot on the socket leg. If the transistor sockets and wiring appear to be in good condition, install transistor back in heat sink and make a continuity check. Attach one lead of an ohmmeter to the heat sink then check every pin of the pigtail plug with the other lead for continuity. (These should not be continuity). If continuity is found, this will burn out transistors immediately.

16-83. DOME LIGHT.

16-84. DESCRIPTION. The dome light is mounted aft of the overhead console. The assembly consists of a housing a socket and lamp and a cover. The light is controlled by a slide switch mounted on the cover aft of the light.

16-85. REMOVAL AND INSTALLATION. See figure 16-9. for removal and installation.

16-86. MAP LIGHT.

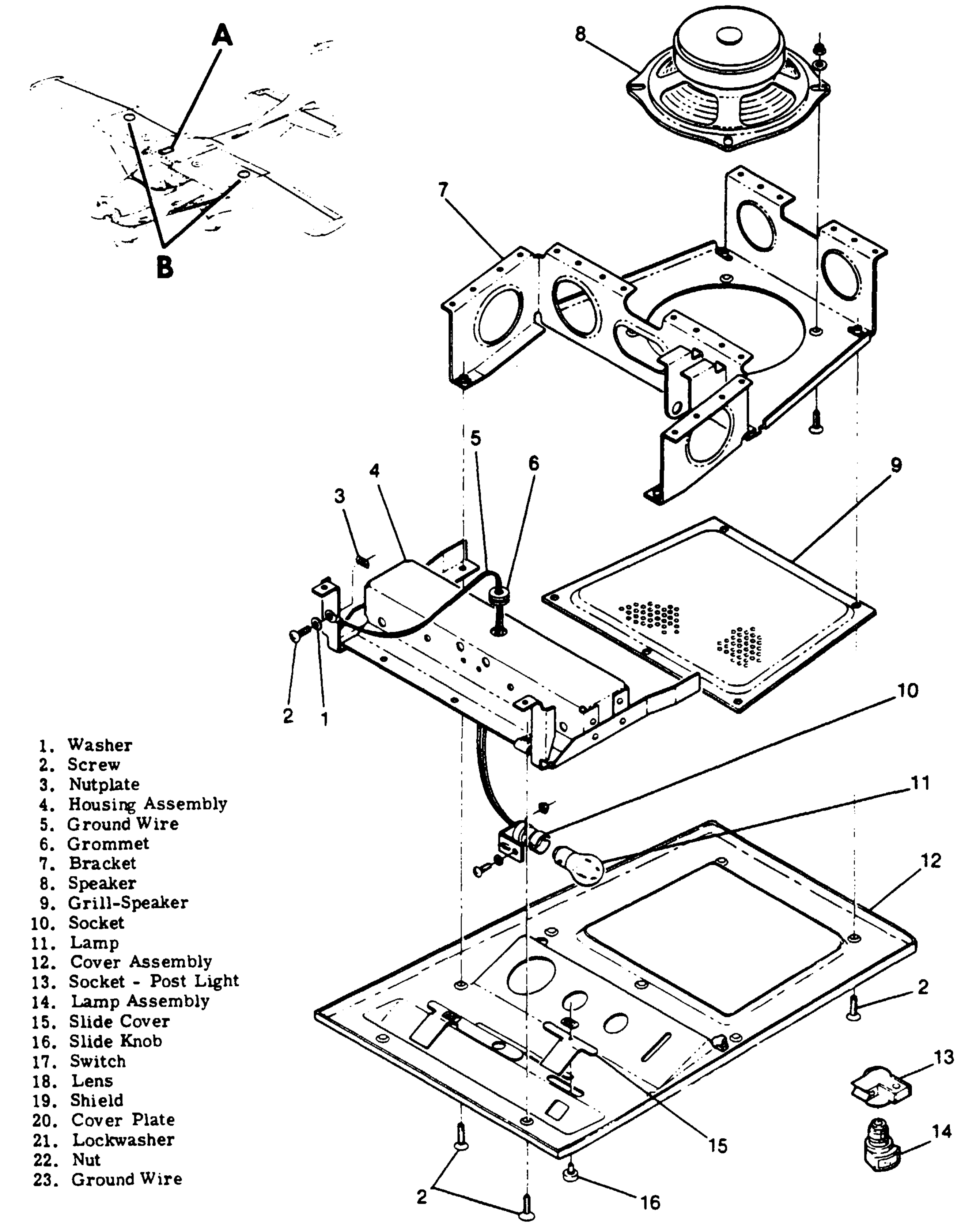
16-87. DESCRIPTION. A light assembly is installed in the instrument panel galre shield above the pilots control wheel. The light has a blue lens. A switch located forward of the light control the light.

16-88. REMOVAL AND INSTALLATION. See figure 16-10 for removal and installation.

16-89. CONTROL WHEEL MAP LIGHT.

16-90. DESCRIPTION. The control wheel map light is internally mounted in the control wheel. A rheostat located on the lower right hand side of the wheel controls the light.

16-91. REMOVAL AND INSTALLATION. (See figure 16-13.) To remove, push upward on the lamp and turn. The lamp and reflector is replaced as a unit.



1. Washer
2. Screw
3. Nutplate
4. Housing Assembly
5. Ground Wire
6. Grommet
7. Bracket
8. Speaker
9. Grill-Speaker
10. Socket
11. Lamp
12. Cover Assembly
13. Socket - Post Light
14. Lamp Assembly
15. Slide Cover
16. Slide Knob
17. Switch
18. Lens
19. Shield
20. Cover Plate
21. Lockwasher
22. Nut
23. Ground Wire

Figure 16-9. Overhead Console, Dome Light and Courtesy Light Installation (Sheet 1 of 2)

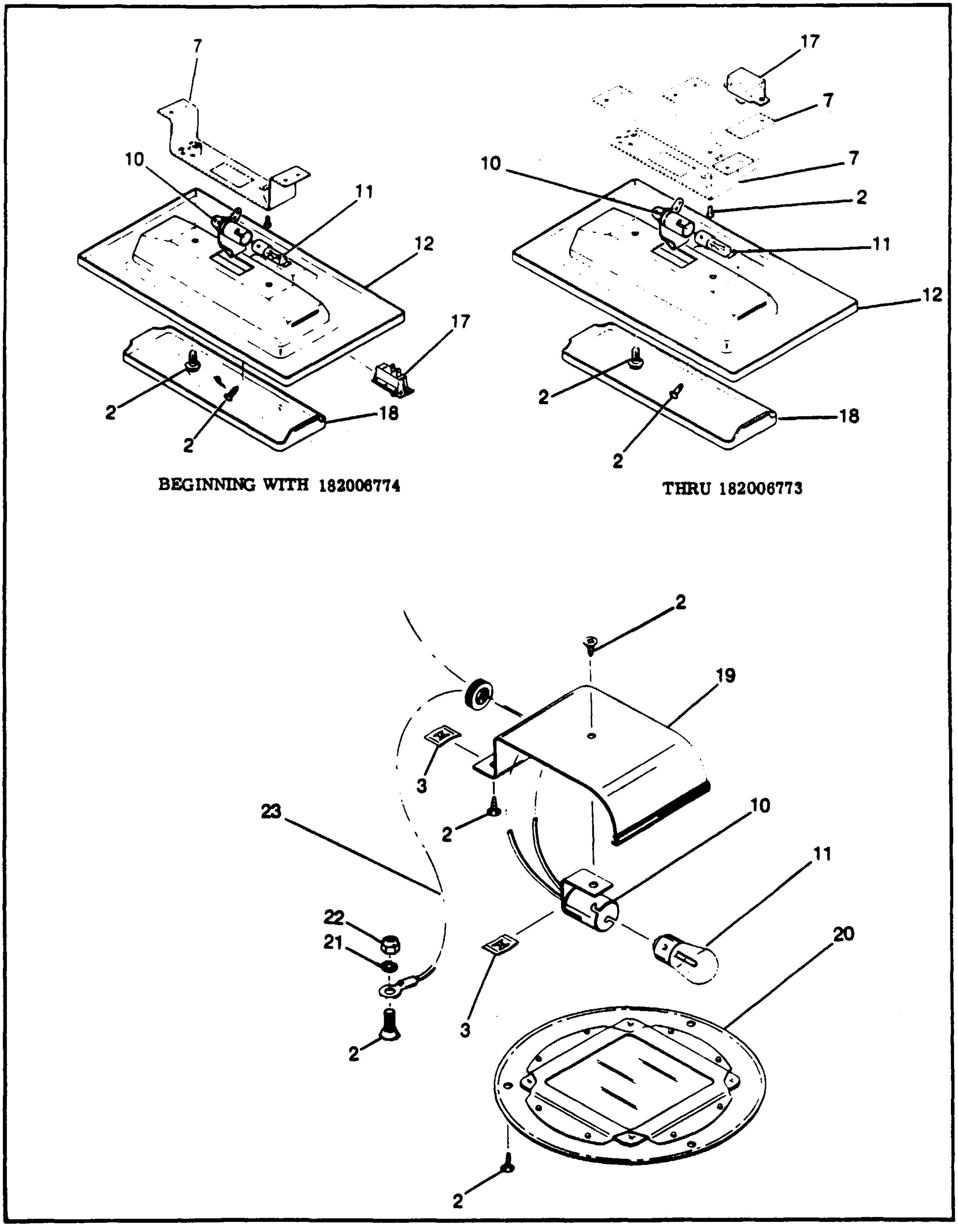
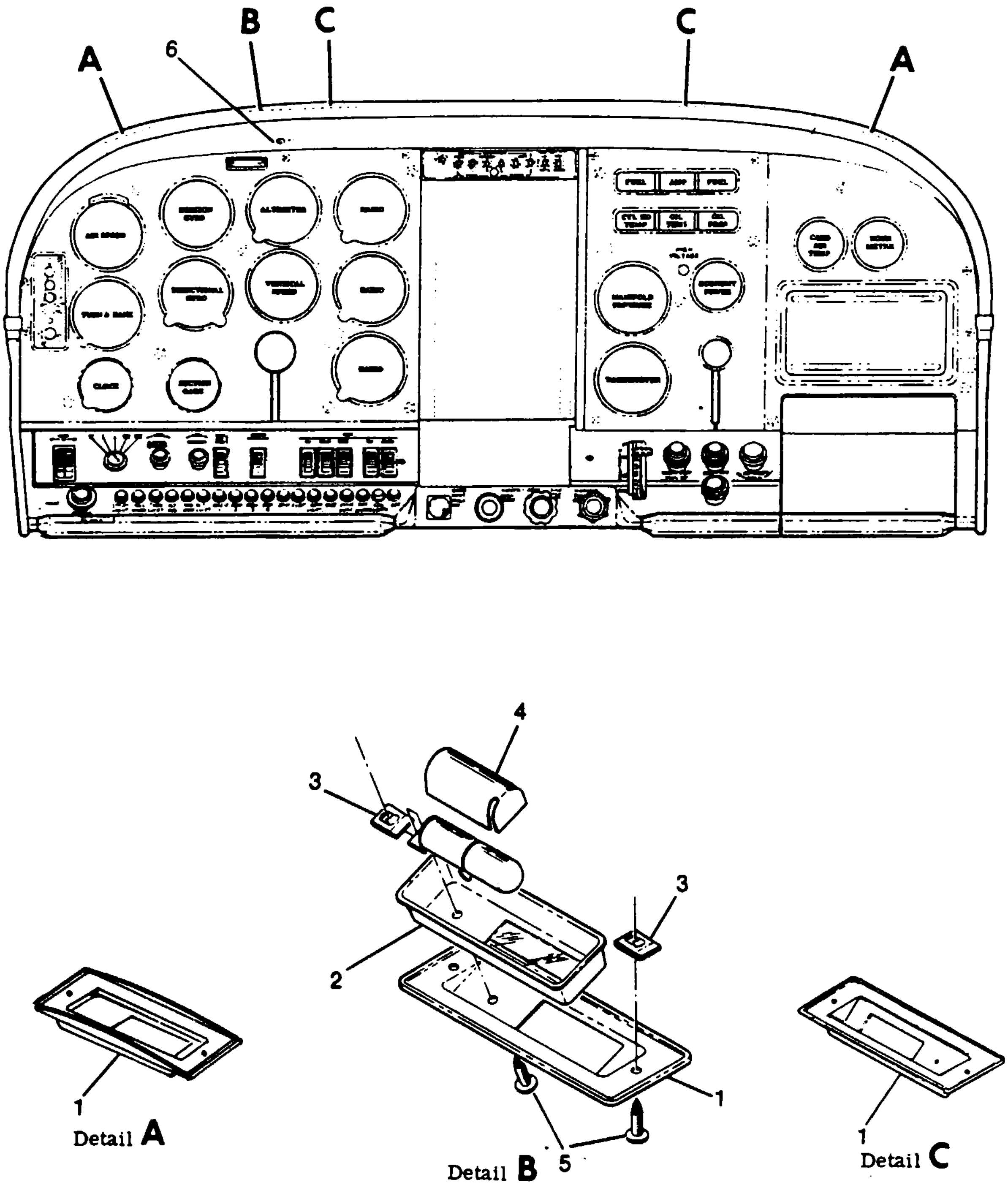
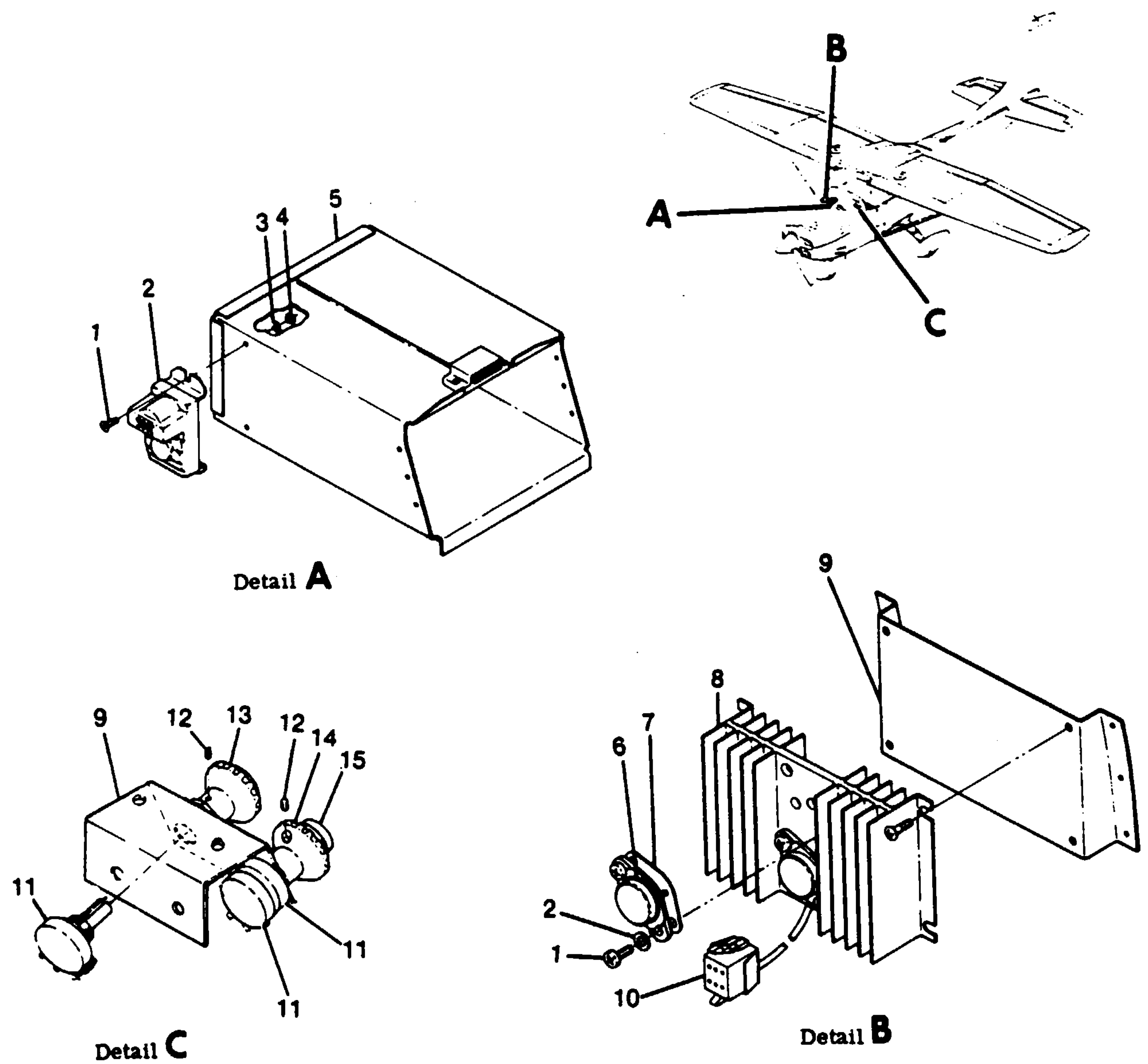


Figure 16-9. Overhead Console, Dome Light and Courtest Light Installation (Sheet 2 of 2)



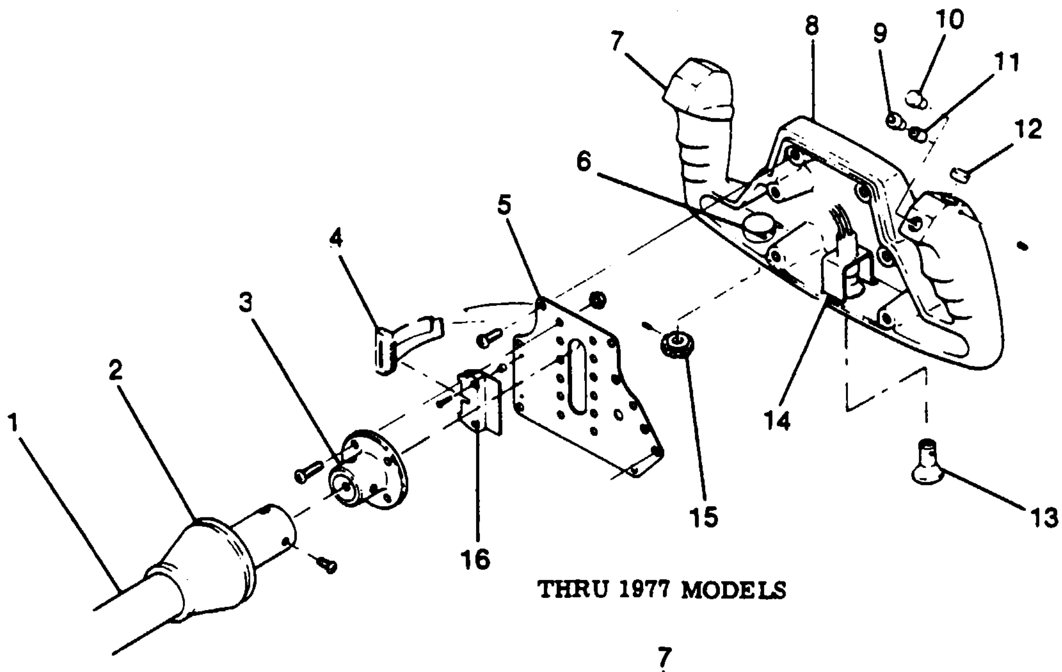
1. Cover
2. Light Housing
3. Nutplate
4. Shield
5. Screw
6. Switch - Map Light

Figure 16-10. Instrument Panel Glareshield Lighting Installation

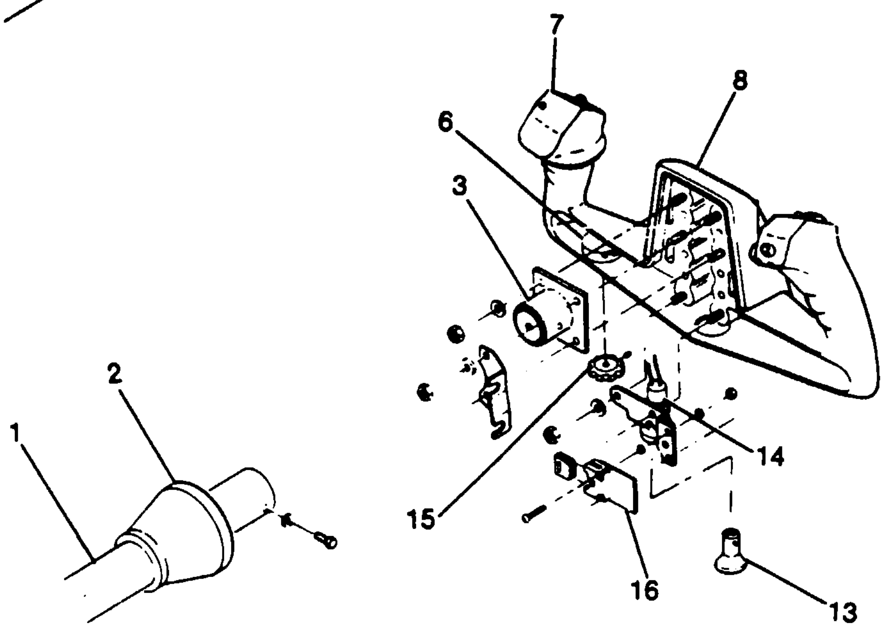


1. Screw
2. Inverter
3. Washer
4. Nut
5. Glove Box
6. Transistor
7. Mica Washer
8. Heat Sink
9. Mounting Bracket
10. Housing-Socket
11. Rheostat
12. Set Screw
13. Control - Instrument Lighting
14. Control - Engine Inst. and Radio lighting
15. Control - Lower Panel Lighting

Figuer 16-11. Transistorized Light Dimming and Electroluminescent Light Inverter Installation



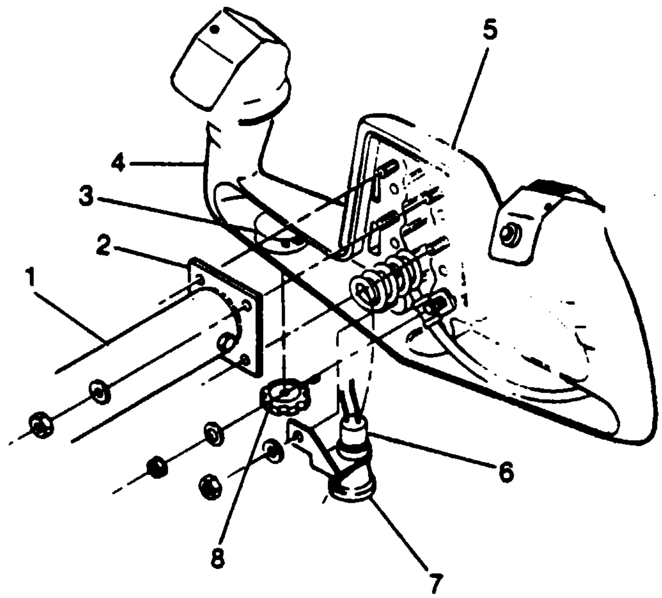
THRU 1977 MODELS



1978 THRU 1981 MODELS

1. Control Tube Assembly
2. Cover
3. Adapter
4. Connector
5. Plate
6. Map Light Rheostat
7. Control Wheel
8. Pad
9. Mike Switch
10. Plug
11. Insulator
12. Plug
13. Lamp Assembly
14. Map Light Socket
15. Knob (Map Light)
16. Connector-Circuit Board

Figure 16-12. Control Wheel Map Light Installation (Sheet 1 of 2)



1. Control Tube Assembly
2. Adapter
3. Map Light Rheostat
4. Control Wheel
5. Pad
6. Map Light Socket
7. Lamp
8. Knob (Map Light)

BEGINNING WITH 1982 MODELS

Figure 16-12. Control Wheel Map Light Installation (Sheet 2 of 2)

16-92. PEDESTAL LIGHTING.

16-93. DESCRIPTION. The pedestal lighting consists of two lights. One on the upper poriotn of the pedestal for lighting of the trim wheels and the cowl flap control. One on the lower portion for lighting of the fuel selector. Light dimming is controled by the transistorized light dimming circuit.

16-94. REMOVAL AND INSTALLATION. For removal and installation of the lamps see figure 16-13.

16-95. STALL WARNING SYSTEM.

16-96. DESCRIPTION. The stall warning circuit is comprised of a warning horn and an actuating switch The switch is installed in the leading edge of the left wing and is actuated by airflow over the surface of the wing. The switch will close as a stall condition is approached, actuating the warning horn which is mounted on the glove box. The stall warning unit should actuate the stall warning horn approximately five to ten miles per hour above the airplane stall speed. Install the lip of the warning unit approximately one-sixteenth of an inch below the centerline of the wing skin cutout. Test fly the aircraft to determine if the unit actuates the warning horn at the desired speed. If the unit actuates the warning horn at a speed in excess of ten miles per hour above stall speed, loosen the mounting screws and move the unit down. If the unit actuates the horn five miles per hour below stall speed, loosen the mounting screws and move the unit up.

16-97. PITOT AND STALL WARNING HEATERS.

16-98. DESCRIPTION. Electrical heater units are incorporated in some pitot tubes and stall warning switch units. The heaters offset the possibility of ice formations on the pitot tube and stall warning actuator switch. The heaters are integrally mounted in the pitot tube and the stall warning actuator switch. Both heaters are operated by the pitot heat switch.

16-99. CIGAR LIGHTER.

16-100. DESCRIPTION. The cigar lighter (located on the instrument panel) is equipped with a thermal-actuated circuit breaker which is attached to the rear of the cigar lighter. The circuit breaker will open if the lighter becomes jammed in the socket or held in position too long. The circuit breaker may be reset by inserting a small probe into the .078 diameter hole in the back of the circuit breaker and pushing lightly until a click is heard.

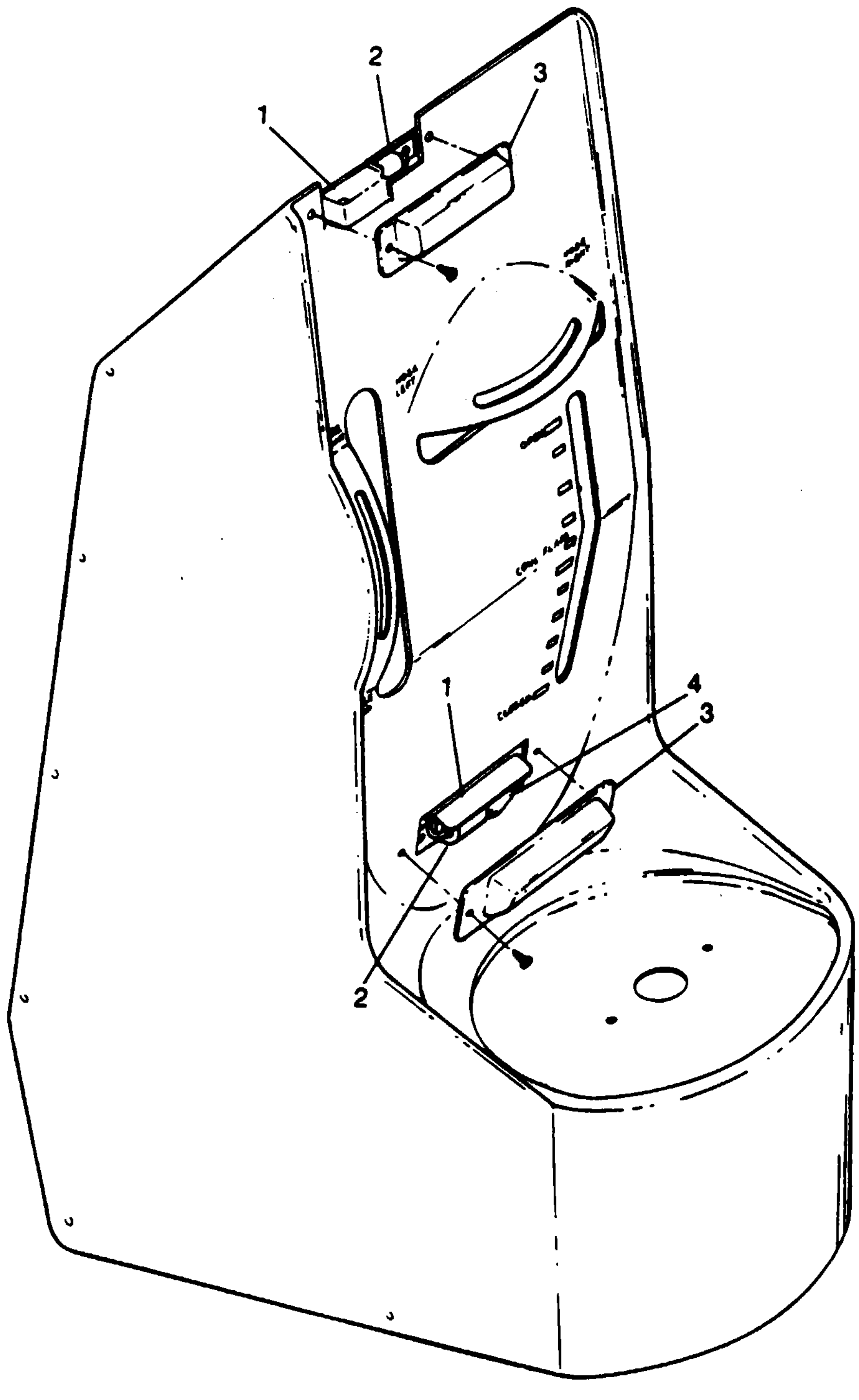
CAUTION

Make sure the master switch is "OFF" before inserting probe into the circuit breaker on cigar lighter to reset.

16-101. REMOVAL AND INSTALLATION. (See figure 16-15.)

a. Ensure that the master switch is "OFF."
b. Remove cigar lighter element.
c. Disconnect wire on back of lighter.
d. Remove shell that screws on socket back of panel.
e. The socket will then be free for removal.
f. To install a cigar lighter, reverse this procedure.

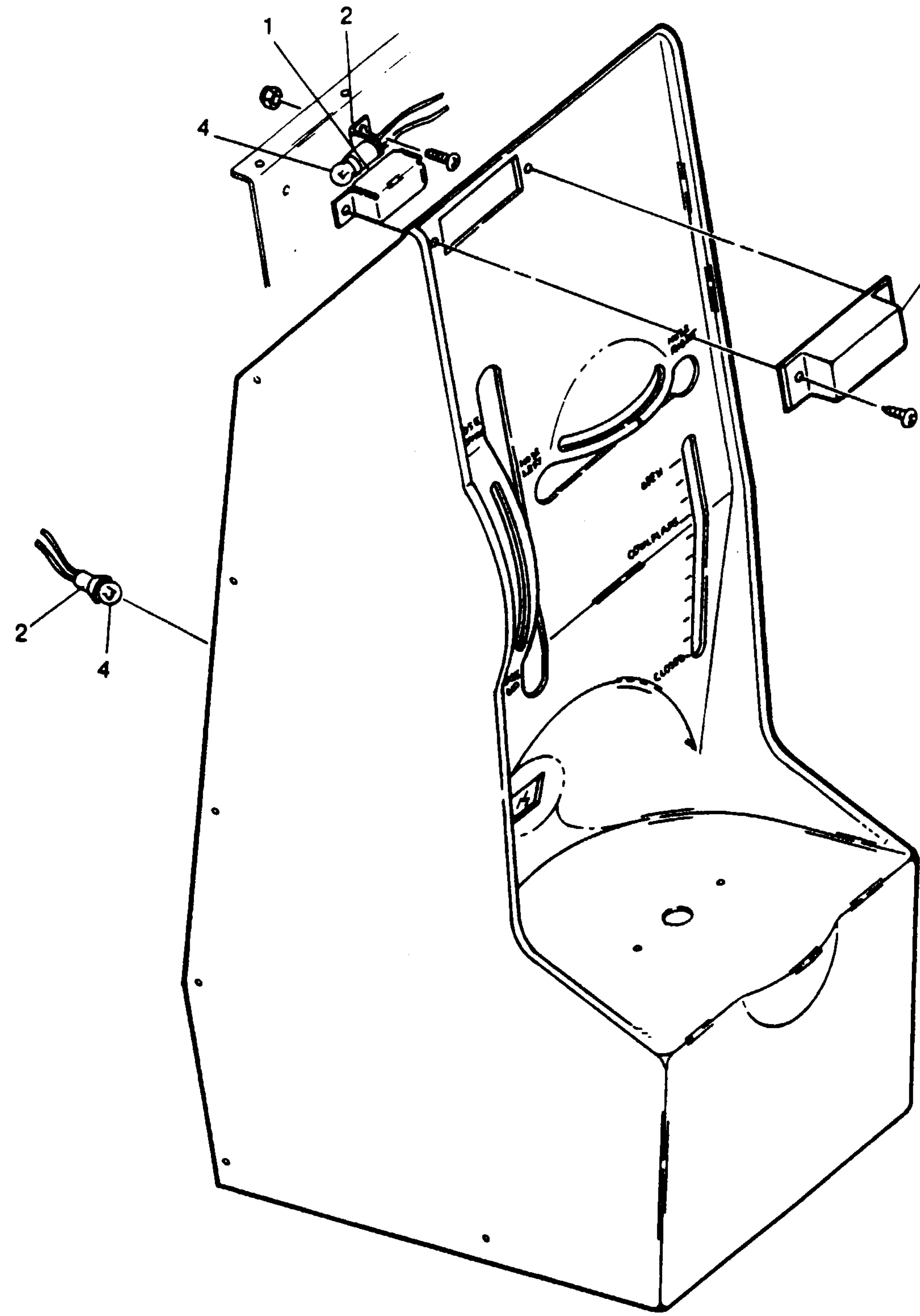
SHOP NOTES:



1. Shield
2. Socket
3. Cover
4. Lamp

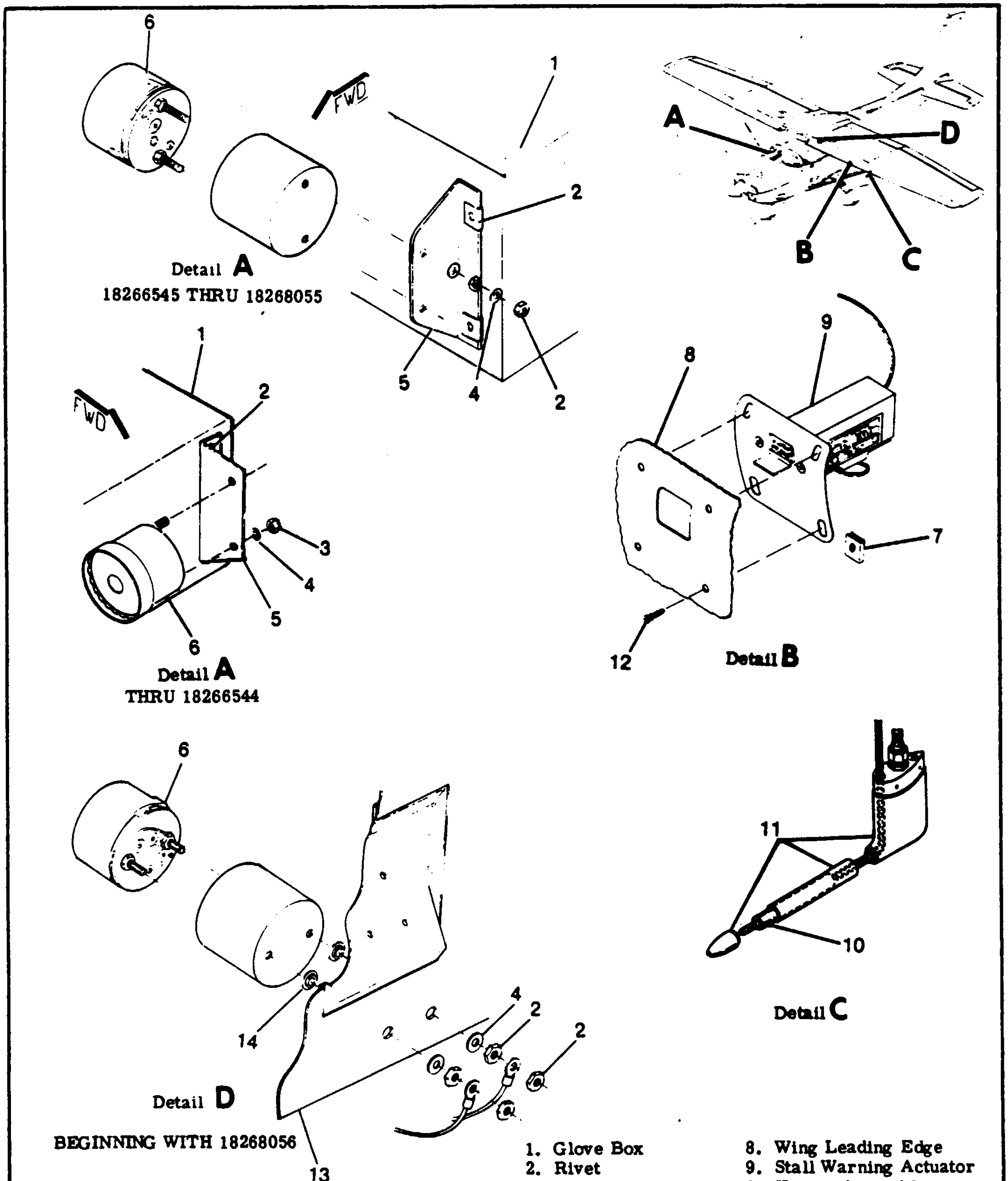
T182 BEGINNING WITH 1982 MODELS

Figure 16-13. Pedestal Lighting (Sheet 1 of 2)



MODEL 182 AND ON T182 THRU 1981 MODELS

Figure 16-13. Pedestal Lighting (Sheet 2 of 2)



1. Glove Box
2. Rivet
3. Nut
4. Washer
5. Bracket
6. Stall Warning Horn
7. Tinnerman Nut
8. Wing Leading Edge
9. Stall Warning Actuator
10. Heater Assembly
11. Pitot Tube
12. Screw
13. Bulkhead
14. Insulation Washer

Figure 16-14. Pitot Heat and Stall Warning Installation

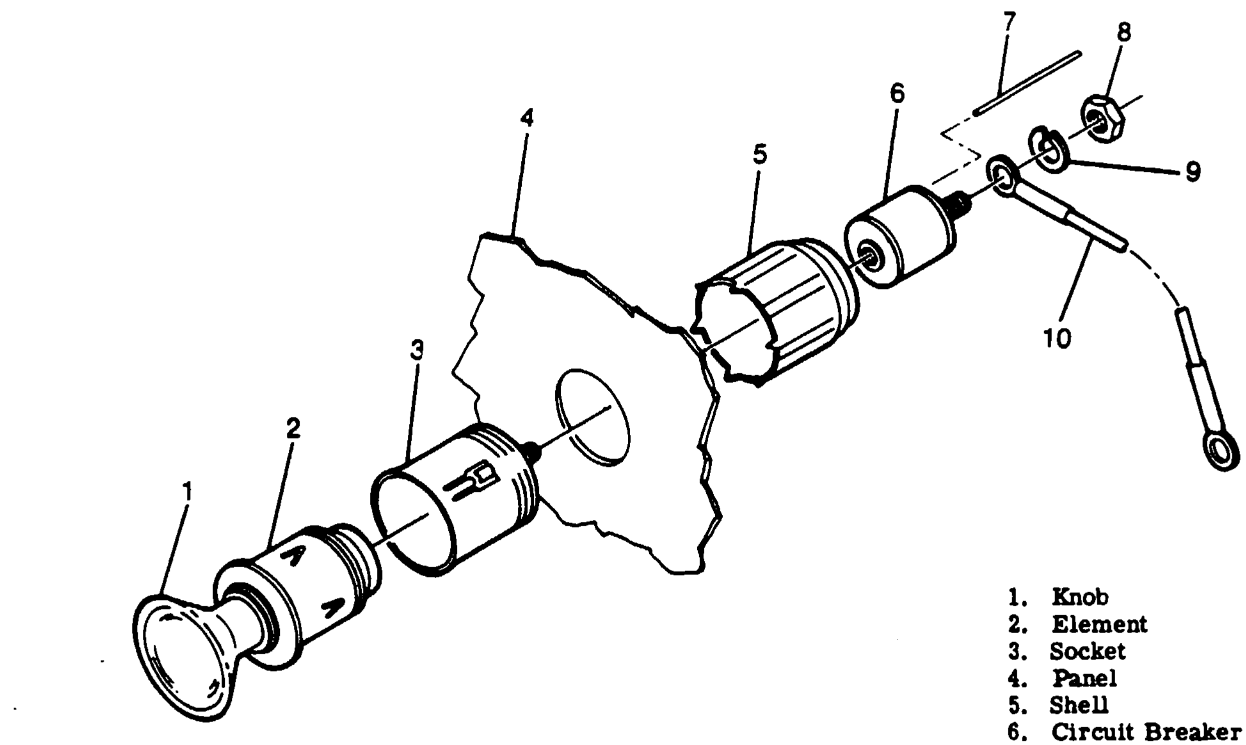


Figure 16-15. Cigar Lighter Installation

SHOP NOTES:

16-102. EMERGENCY LOCATOR TRANSMITTER. THRU 18265360.

16-103. DESCRIPTION. The ELT is a Self-contained, solid state unit, having its own power supply, with an externally mounted antenna. The C589510-0209 transmitter is designed to transmit simultaneously on dual emergency frequencies of 121.5 and 243.0 Megahertz. The 589510-0211 transmitter thru 18265175 and the C589510-0212 beginning with 18265176 used for Canadian registry, operates on 121.5 only. The unit is mounted in the tailcone, aft of the baggage curtain on the right hand side. The transmitters are designed to provide a broadcast tone that is audio modulated in a swept manner over the range of 1600 to 300 Hz in a distinct, easily recognizable distress signal for reception by search and rescue personnel and others monitoring the emergency frequencies. Power is supplied to the transmitter by a battery-pack which has the service life of the batteries placarded on the batteries and also on the outside end of the transmitter. ELT's are equipped with a battery-pack containing four lithium "D" size batteries which are stacked in two's (See figure 16-15). The ELT exhibits line of sight transmission characteristics which correspond approximately to 100 miles at a search altitude of 10,000 feet. When battery inspection and replacement schedules are adhered to, the transmitter will broadcast an emergency signal at rated power (75 MW-minimum), for a continuous period of time as listed in the following table.

TRANSMITTER LIFE
TO 75 MILLIWATTS OUTPUT

Temperature	4 Cell Lithium Battery Pack
+130°F	115 hrs
+ 70°F	115 hrs
- 4°F	95 hrs
- 40°F	23 hrs

Battery-packs have a normal shelf life of five to ten (5-10) years and must be replaced at 1/2 of normal shelf life in accordance with TSO-C91. Cessna specifies 5 years replacement of lithium (4-cell) battery packs.

16-104. OPERATION. A three position switch on the forward end of the unit controls operation. Placing the switch in the ON position will energize the unit to start transmitting emergency signals. In the OFF position, the unit is inoperative. Placing the switch in the ARM position will set the unit to start transmitting emergency signals only after the unit has received a 5g (tolerances are +2g and -0g) impact force, for a duration of 11-16 milliseconds.

CAUTION

Do not leave the emergency locator transmitter in the ON position longer than 1 second (3 sweeps of the warble tone) or you may activate downed aircraft procedures by C.A.P., D.O.T. or F.A.A. personnel.

16-105. CHECKOUT INTERVAL.

100 HOURS OR THREE MONTHS, WHICHEVER COMES FIRST.

a. Turn aircraft master switch ON.
b. Turn aircraft transceiver ON and set frequency on receiver to 121.5 MHZ.
c. Remove the ELT's antenna cable from the ELT unit.
d. Place the ELT's function selector switch in the ON position for 1 second (3 sweeps of the warble tone). Immediatly replace the ELT function selector switch in the ARM position after testing ELT.
e. Test should be conducted only within the time period made up of the first five minutes after any hour.

CAUTION

Tests with the antenna connected should be approved and confirmed by the nearest control tower. The F.A.A./D.O.T. allows free space transmission tests from the aircraft anytime within five minutes after each hour. The test time allowed is generally three sweeps of the warble tone, or approximately one second. The control tower should be notified that a test is about to be performed.

NOTE

Without its antenna connected, the ELT will produce sufficient signal to reach your receiver, yet it will not disturb other communications or damage output circuitry.

NOTE

After accumulated test or operation time equals 1 hour, battery-pack replacement is required.

f. Check calendar date for replacement of battery-pack. This date is supplied on a sticker attached to the outside of the ELT case and to each battery.

16-106. REMOVAL AND INSTALLATION OF TRANSMITTER. (See figure 16-16.)

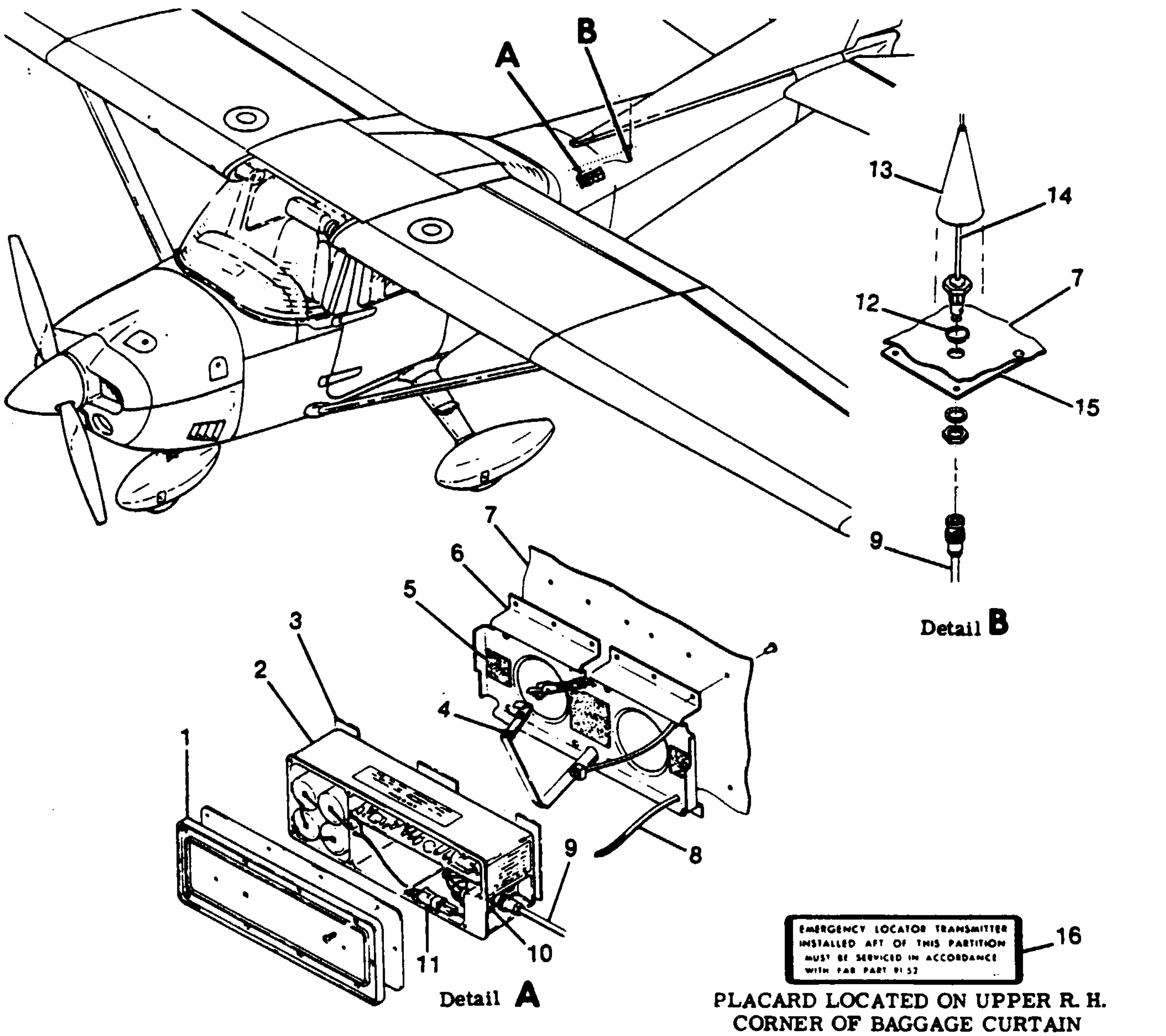
a. Remove baggage curtain to gain access to the transmitter and antenna.
b. Disconnect co-axial cable from end of transmitter.
c. Cut sta-strap securing antenna cable and unlatch metal strap to remove transmitter.

NOTE

Transmitter is also attached to the mounting bracket by velcro strips; pull transmitter to free from mounting bracket and velcro.

NOTE

To replace velcro strips, clean surface thoroughly with clean cloth saturated in one of the following solvents: Trichloric thylene, Aliphatic Napthas, Methyl Ethyl Ketone or Enmar 6094 Lacquer Thinner. Cloth should



NOTE

Metal Strap (4) must be positioned so that latch is on top of transmitter as installed in the aircraft and not across transmitter cover.

1. Cover
2. Transmitter
3. Fabric Fastener - Pile
4. Metal Strap
5. Fabric Fastener - Hook
6. Bracket
7. Tailcone Skin
8. Sta-strap
9. Co-axial Cable
10. Arm Switch
11. Connector
12. Rubber Washer
13. Rubber Boot
14. Antenna
15. Doubler
16. Placard

Figure 16-16. Emergency Locator Transmitter Installation be folded each time the surface is wiped to present a clean area and avoid redepositing of grease. Wipe surface immediately with clean dry cloth, do not allow solvent to dry on surface. Apply Velcro #40 adhesive to each surface in a thin even coat and allow to dry until quite tacky, but no longer transfers to the finger when touched (usually between 5 and 30 minutes). Porous surfaces may require two coats. Place the two surfaces in contact and press firmly together to ensure intimate contact. Allow 24 hours for complete cure.

d. To reinstall transmitter, reverse preceding steps.

NOTE

An installation tool is required to properly secure sta-strap. This tool may be purchased locally or ordered from the Panduit Corporation, Tinley Park, Ill., part number GS-2B (Conforms to MS90387-1).

CAUTION

Ensure that the direction of flight arrows (placarded on the transmitter) are pointing towards the nose of the aircraft.

16-107. REMOVAL AND INSTALLATION OF ANTENNA. (See figure 16-16.)

a. Disconnect co-axial cable from base of antenna.
b. Remove the nut and lockwasher attaching the antenna base to the fuselage and the antenna will be free for removal.
c. To reinstall the antenna, reverse the preceding steps.

NOTE

Upon reinstallation of antenna, cement rubber boot (14) using RTV102, General Electric Co. or equivalent, to antenna whip only; do not apply adhesive to fuselage skin or damage to paint may result.

16-108. REMOVAL AND INSTALLATION OF LITHIUM FOUR (4) CELL BATTERY-PACK. (See figure 16-16)

NOTE

- When existing battery fails or exceeds normal expiration date, convert ELT System to new D/M alkaline powered ELT per Avionics Service Letter AF78-31 dated November 20, 1978.

- Transmitters equipped with the 4 cell battery-pack can only be replaced with another 4 cell battery-pack.

a. After the transmitter has been removed from aircraft in accordance with para, 16-106, place the transmitter switch in the OFF position.
b. Remove the nine screws attaching the cover to the case and then remove the cover to gain access to the battery pack.

NOTE

Retain the rubber gasket and screws for reinstallation.

c. Disconnect the battery-pack electrical connector and remove battery-pack.
d. Place new battery-pack in the transmitter with four batteries as shown in the case in figure 16-17.
e. Connect the electrical connector as shown in figure 16-16.

NOTE

Before installing the new 4 cell battery-pack, check to ensure that its voltage is 11.2 volts or greater.

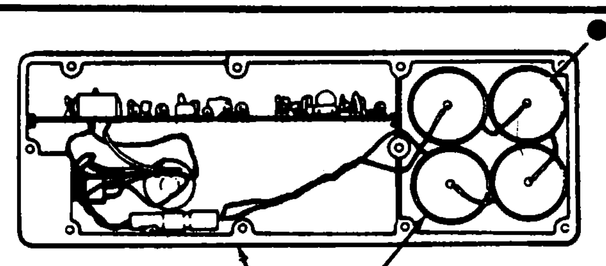
CAUTION

It is desirable to replace adhesive material on the 4 cell battery-pack, use only 3M Jet Melt Adhesive #3738. Do not use other adhesive materials since other materials may corrode the printed circuit board assembly.

f. Replace the transmitter cover and gasket.
g. Remove the old battery-pack placard from the end of transmitter and replace with new battery-pack placard supplied with the new battery-pack.

CAUTION

Be sure to enter the new battery-pack expiration date in the aircraft records. It is also recommended this date be placed in your ELT Owner's Manual for quick reference.



● NOTE

A PVC spacer is installed in this position on the C589510-0213 battery pack used in the C589510-0212 transmitter used on Canadian aircraft.

Figure 16-17. Lithium 4 Cell

16-109. TROUBLE SHOOTING. Should your Emergency Locating Transmitter fail the 100 Hours performance checks, it is possible to a limited degree to isolate the fault to a particular area of the equipment. In performing the following trouble shooting procedures to test peak effective radiated power, you will be able to determine if battery replacement is necessary or if your unit should be returned to your dealer for repair.

16-109. TROUBLE SHOOTING (Cont.)

TROUBLE	PROBABLE CAUSE	REMEDY
*POWER LOW.	Low battery voltage.	1. Set toggle switch to off. 2. Remove plastic plug from the remote jack and by means of a Switchcraft #750 jackplug, connect a Simpson Model 260 voltmeter and measure voltage. If the battery pack voltage is 11.2 volts or less, the battery pack is below specification.
	Faulty transmitter.	3. If the battery pack voltage meets the specifications in step 2, the battery pack is O.K. If the battery is O.K., check the transmitter as follows: a. Remove the voltmeter. b. By means of a Switchcraft #750 jackplug and 3 inch maximum long leads, connect a Simpson Model 1223 ammeter to the jack. c. Set the toggle switch to ON and observe the ammeter current drain. If the current drain is in the 85-100 ma range, the transmitter or the coaxial cable is faulty.
	Faulty coaxial antenna cable.	4. Check coaxial antenna cable for high resistance joints. If this is found to be the case, the cable should be replaced.

*This test should be carried out with the coaxial cable provided with your unit.

16-109A. G SWITCH OPERATIONAL CHECK.

a. Remove emergency locator beacon transmitter from airplane in accordance with paragraph 16-106.

b. While holding transmitter in one hand, sharply strike the end of the case in the direction of activation, indicated on the case of the transmitter.

1. Verify that the G switch has been actuated.

c. Reset the G switch.

d. Reinstall transmitter in airplane in accordance with paragraph 16-106.

16-110. EMERGENCY LOCATOR TRANSMITTER.

16-111. DESCRIPTION. The ELT is a self-contained, solid state unit, having its own power supply with an externally mounted antenna. The unit is mounted in the tailcone, aft of the baggage curtain on the right hand side. The transmitters are designed to provide a broadcast tone that is audio modulated in a swept manner over the range of 1600 to 300 Hz in a distinct, easily recognizable distress signal for reception by search and rescue personnel and others monitoring the emergency frequencies. The ELT exhibits line of sight transmission characteristics which correspond approximately to 100 miles at a search altitude of 10,000 feet. The C589511-0117 transmitter, and the C589511-0113 transmitter on aircraft with Canadian registry, are used thru 18268309. Beginning with 18268294 the C589512-0103 transmitter is used on all aircraft.

The C589511-0113 transmits on 121.5 MHz at 25 mw rated output for 100 continuous hours in the temperature range of -4° to +131°F (-20°C to +55°C). The C589511-0117 and C589512-0103 transmits on 121.5 and 343.0 MHz at 75 mw rated power output for 48 continuous hours in the temperature range of -4°F to +131°F (-20°C to +55°C).

Power is supplied to the transmitter by a battery-pack. The C589511-0114 alkaline battery-packs have the service life of the battery-pack stamped on the battery-pack, on the end of the transmitter below the switch and on top of the transmitter. The C589512-0107 alkaline battery-packs have the replacement date and date of installation on the battery-pack and the replacement date on the top of the transmitter.

16-112. OPERATION. A three position switch on the forward end of the unit controls operation. Placing the switch in the ON position will energize the unit to start transmitting emergency signals. In the OFF position, the unit is inoperative. Placing the switch in the ARM position will set the unit to start transmitting emergency signals only after the unit has received a 5g (tolerances are +2g and -0g) impact force, for a duration of 11-16 milliseconds.

CAUTION

Do not leave the emergency locator transmitter in the ON position longer than 1 second (3 sweeps of the warble tone) or you may activate downed aircraft procedures by C.A.P., D.O.T. or F.A.A. personnel.

CAUTION

Tests with the antenna connected should be approved and confirmed by the nearest control tower. The FAA/DOT allows free space transmission tests from the aircraft any time within five minutes after each hour. The test time allowed is generally three sweeps of the warble tone, or approximately one second. The control tower should be notified that a test is about to be performed.

NOTE

Without its antenna connected, the ELT will produce sufficient signal to reach your receiver, yet it will not disturb other communications or damage output circuitry.

NOTE

After accumulated test or operation time equals 1 hour, battery-pack replacement is required.

f. Check calendar date for replacement of battery-pack. This date is supplied on a sticker attached to the outside of the ELT case and to each battery.

16-114. REMOVAL AND INSTALLATION OF TRANSMITTER. (See figure 16-18.)

a. Remove baggage curtain to gain access to the transmitter and antenna.
b. Disconnect co-axial cable from end of transmitter.
c. Remove the two #10 screws from the baseplate of the ELT and remove ELT.
d. To reinstall transmitter, reverse preceding steps.

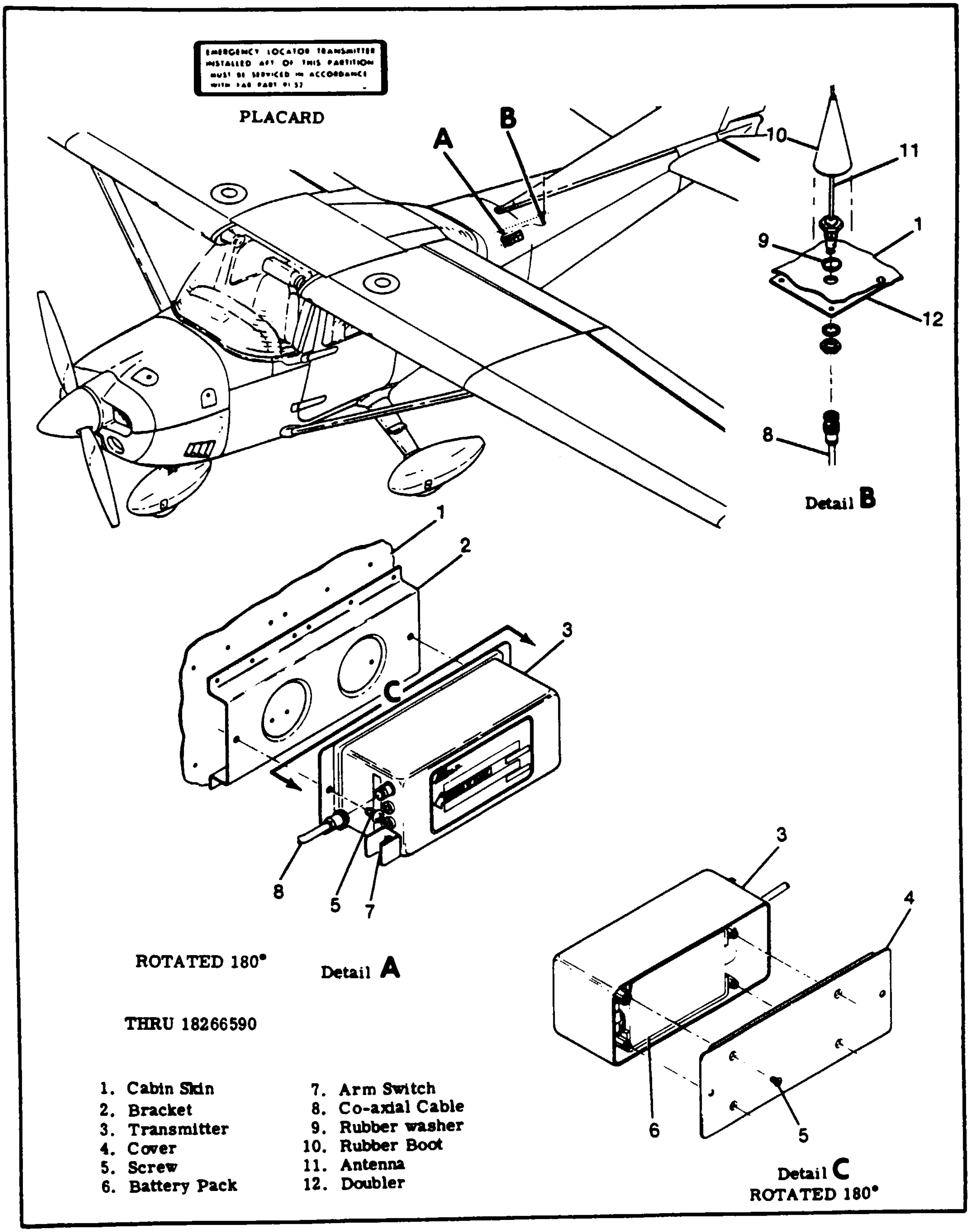
CAUTION

Ensure that the direction of flight arrows (placarded on the transmitter) are pointing towards the nose of the aircraft.

16-113. CHECKOUT INTERVAL:

100 HOURS OR THREE MONTHS, WHICHEVER COMES FIRST.

a. Turn aircraft master switch ON.
b. Turn aircraft transceiver ON and set frequency on receiver to 121.5 MHz.
c. Remove the ELT's antenna cable from the ELT unit.
d. Place the ELT's function selector switch in the ON position for 1 second (3 sweeps of the warble tone). Immediatly replace the ELT function selector switch in the ARM position after testing ELT.
e. Test should be conducted only within the time period made up of the first five minutes after any hour.



1. Cabin Skin
2. Bracket
3. Transmitter
4. Cover
5. Screw
6. Battery Pack
7. Arm Switch
8. Co-axial Cable
9. Rubber washer
10. Rubber Boot
11. Antenna
12. Doubler

Figure 16-18. Emergency Locator Transmitter Installation (Sheet 1 of 3)

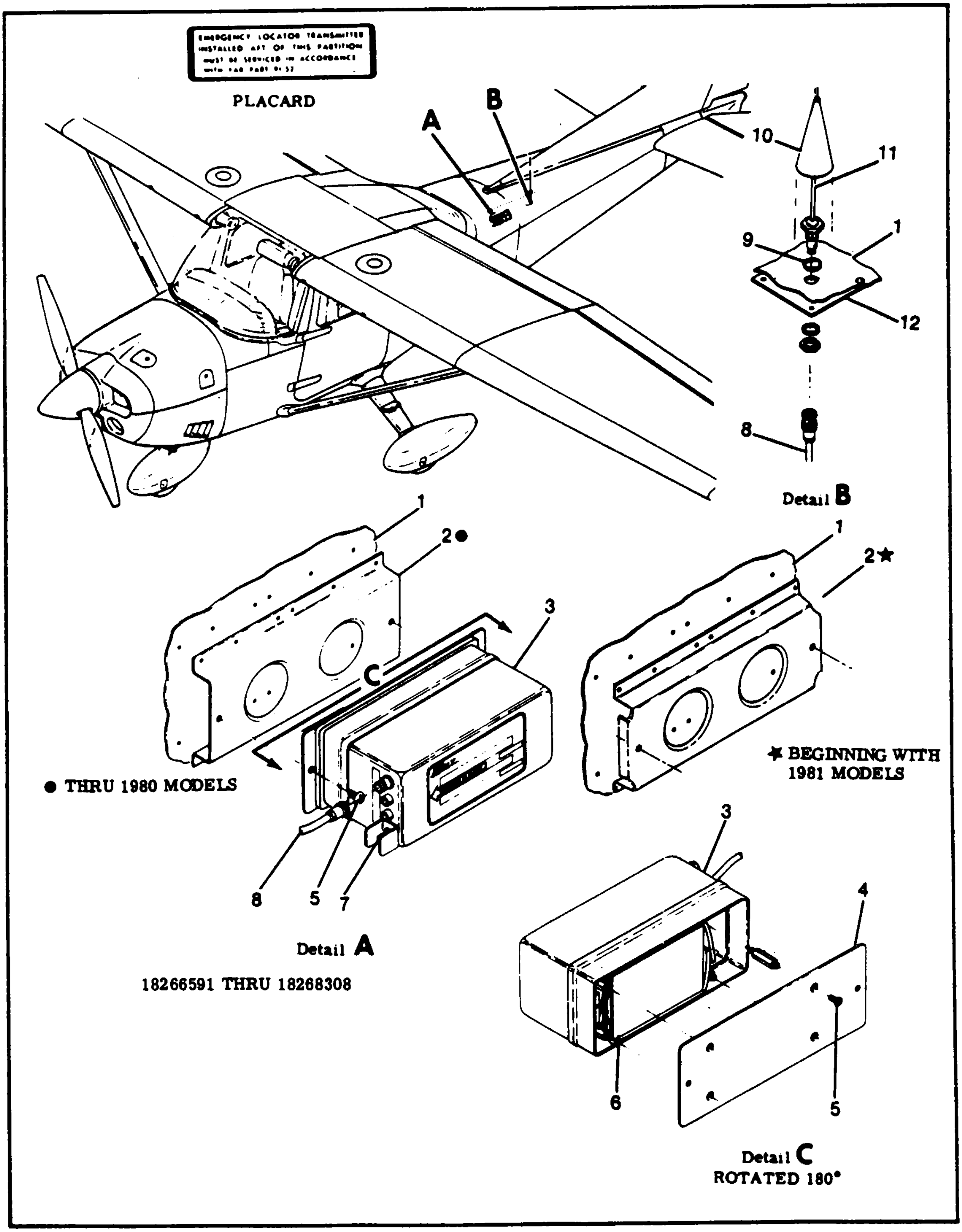


Figure 16-18. Emergency Locator Transmitter Installation (Sheet 2 of 3)

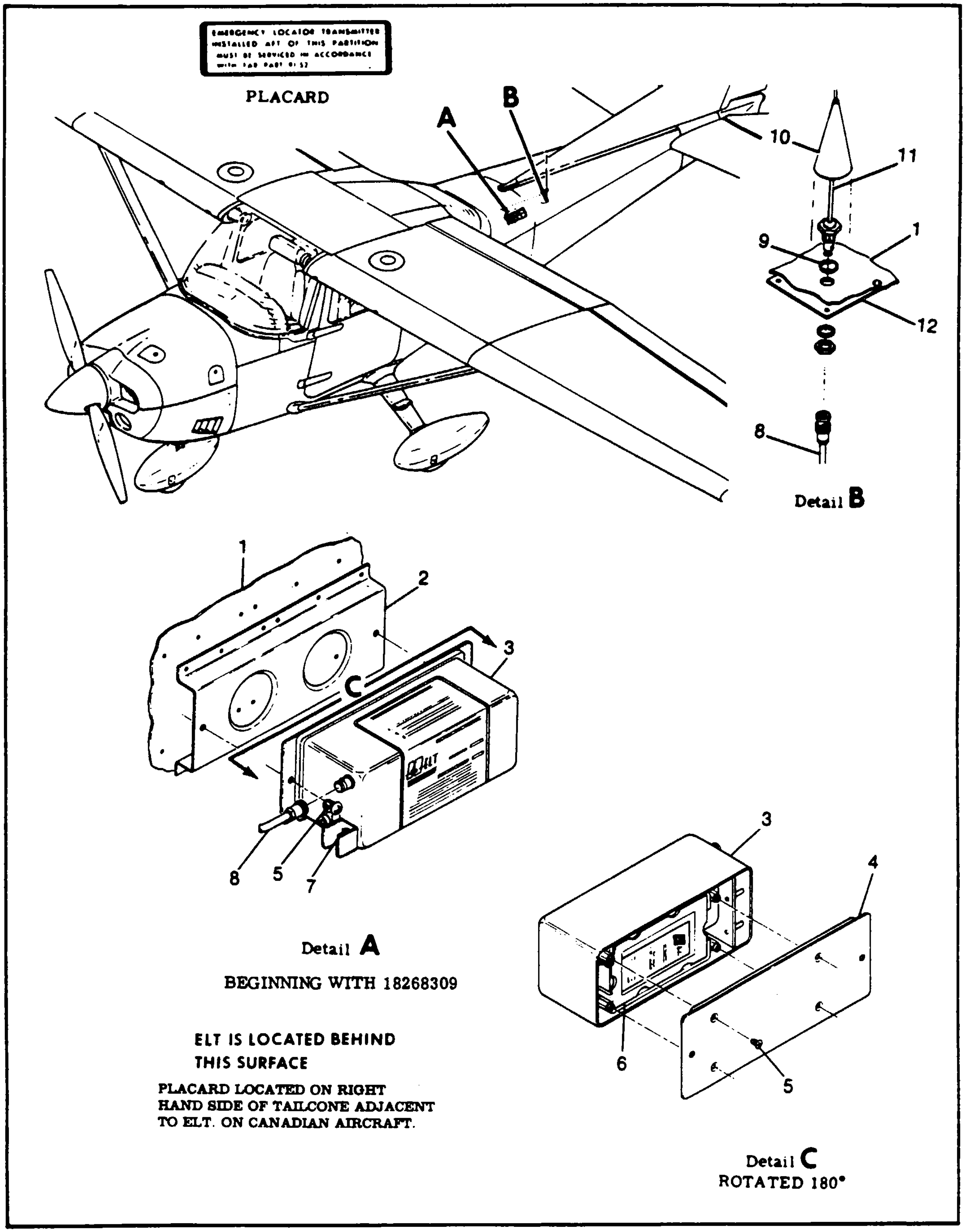


Figure 16-18. Emergency Locator Transmitter Installation (Sheet 3 of 3)

16-115. REMOVAL AND INSTALLATION OF ANTENNA. (See figure 16-18.)

a. Disconnect co-axial cable from base of antenna.

b. Remove the nut and lockwasher attaching the antenna base to the fuselage and the antenna will be free for removal.

c. To reinstall the antenna, reverse the preceding steps.

CAUTION

The C589511-0111 and C589511-0119 co-axial cable must be installed as indicated on the cable sleeve. Cable end marked "TO ANT" must be connected to the ELT antenna, and the end marked "TO ELT" must be connected to the C589511-0113/-0117 and C589511-0103/-0104 transmitters.

NOTE

Upon reinstallation of antenna, cement rubber boot (14) using RTV102, General Electric Co. or equivalent, to antenna whip only; do not apply adhesive to fuselage skin or damage to paint may result.

16-116. REMOVAL AND INSTALLATION OF BATTERY PACK. (See figure 16-19.)

NOTE

Transmitters equipped with the C589511-0105 or C589511-0106 battery-packs can only be replaced with a C589511-0114 after modification by SK185-20 has been completed.

CAUTION

Lithium battery-pack must be replaced with alkaline battery-packs per SK185-20.

a. After the transmitter has been removed from aircraft in accordance with para, 16-114, place the transmitter switch in the OFF position.

b. Remove the four screws attaching the cover to the case and then remove the cover to gain access to the battery-pack.

c. Disconnect the battery-pack electrical connector and remove battery-pack.

d. Place new battery-pack in the transmitter with four batteries as shown in the case in figure 16-19.

e. Connect the electrical connector as shown in figure 16-19.

NOTE

Before installing the C589511-0105 pack, check to ensure that its voltage is 7.5 volts or greater.

f. Replace the transmitter baseplate on the unit and pressing the baseplate and unit together attach baseplate with four nylok patch screws.

g. Stamp the new replacement date on the outside of the ELT. The date should be noted on the switching nameplate on the side of the unit as well as on the instruction nameplate on top of the unit.

WARNING

The battery-pack has pressurized contents. Do not recharge, short circuit or dispose of in fire.

CAUTION

Be sure to enter the new battery-pack expiration date in the aircraft records. It is also recommended this date be placed in your ELT Owner's Manual for quick reference.

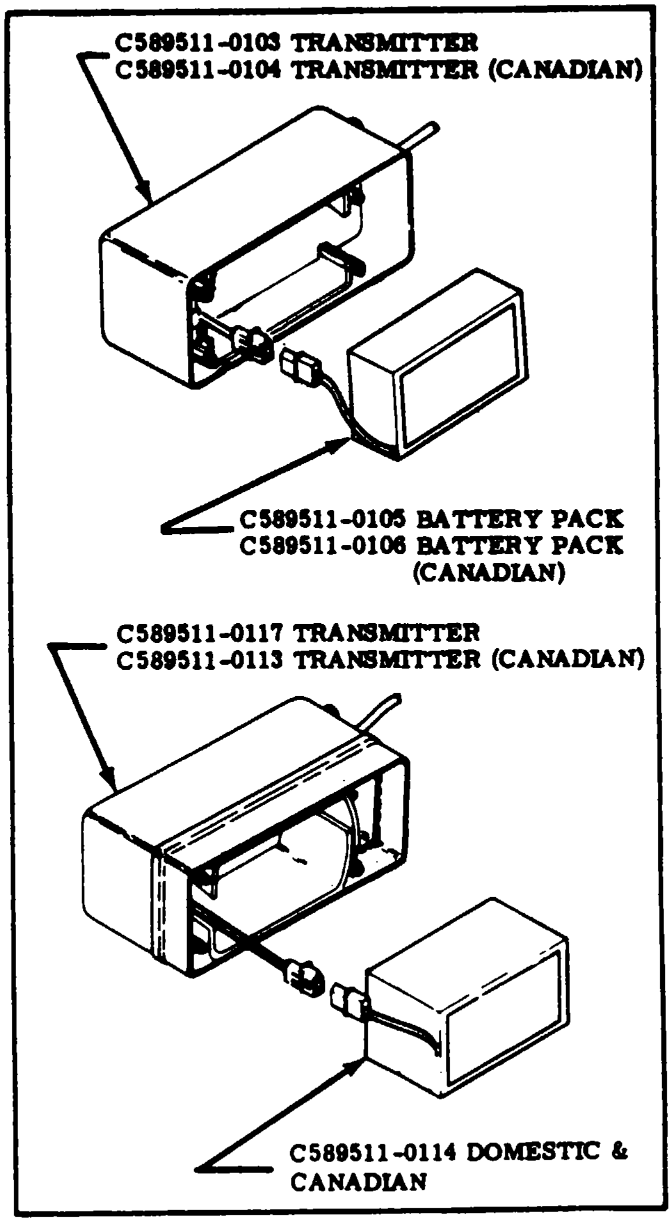


Figure 16-19. BATTERY PACK INSTALLATION.

16-117. TROUBLE SHOOTING. Should your Emergency Locator Transmitter fail the 100 Hours performance checks, it is possible to a limited degree to isolate the fault to a particular area of the equipment. In performing the following trouble shooting procedures to test peak effective radiated power, you will be able to determine if battery replacement is necessary, or if your unit should be returned to your dealer for repair.

16-117A. G SWITCH OPERATIONAL CHECK.

a. Remove emergency locator beacon transmitter from airplane in accordance with paragraph 16-114.

b. While holding transmitter in one hand, sharply strike the end of the case in the direction of activation, indicated on the case of the transmitter.

1. Verify that the G switch has been actuated.

c. Reset the G switch.

d. Reinstall transmitter in airplane in accordance with paragraph 16-114.

TROUBLE	PROBABLE CAUSE	REMEDY
*POWER LOW.	Low battery voltage.	1. Set toggle switch to off. 2. Disconnect the battery pack from the transmitter and connect a Simpson Model 260 voltmeter and measure voltage. If the battery pack voltage is 7.5 volts or less, the battery pack is below specification.
	Faulty transmitter.	3. If the battery pack voltage meets the specifications in step 2, the battery pack is O.K. If the battery is O.K., check the transmitter as follows: a. Reconnect battery pack to the transmitter. b. By means of E.F. Johnson 105-0303-001 jackplugs and 3 inch maximum long leads, connect a Simpson Model 1223 ammeter to the jack. c. Set the toggle switch to AUTO and observe the ammeter current drain. If the current drain is in the 15-25 ma range, the transmitter or the coaxial cable is faulty.
	Faulty coaxial antenna cable.	4. Check coaxial antenna cable for high resistance joints. If this is found to be the case, the cable should be replaced.

*This test should be carried out with the coaxial cable provided with your unit.

ELECTRICAL LOAD ANALYSIS CHART

STANDARD EQUIPMENT (RUNNING LOAD)	AMPS REQD 1977	1978	1979	1980	1981	1982	1983
Instrument (Engine)		0.2	0.2	0.2	0.2	0.2	0.2
Instrument Lights		0.7	0.7	0.7	0.7	0.7	1.0
a. EL Panel	0.04	0.7	0.7	0.7	0.7	0.7	0.7
b. Cluster	0.32						
c. Console*	2.08						
d. Compass	.08						
e. Pedestal	0.16						
Position Lights	5.6	2.5	2.5	2.5	2.5	2.5	2.5
Battery Contactor	0.6	0.5	0.5	0.5	0.5	0.5	0.5
Fuel Quantity Indicators	0.10	0.10	0.10	0.10	0.10		
Cylinder Head Temperature Indicators	0.05	0.05	0.05	0.05	0.05		
Turn Coordinator	0.8	0.3	0.3	0.3	0.3	0.3	0.3
Clock	†	†	†	†	†	†	†
OPTIONAL EQUIPMENT (Running Load)							
Turn and Bank Indicator		0.2	0.2	0.2	0.2		
Heated Pitot and Stall Warning	10.0	5.8	5.8	5.8	5.8	5.8	5.8
Strobe Lights	4.0	3.0	3.0	3.0	3.0	3.0	3.0
Carburetor Air Temp	0.03	0.03	0.03	0.03	0.03		
Cessna 200A Navomatic (Type AF-295B)	2.5	2.5	2.5	2.5	2.5	2.5	2.5
Cessna 300 ADF (Type R-546E)	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Cessna 300 Nav Com (360 Channel-Type RT-308C)	1.5						
Cessna 300 Nav Com (720 Channel-Type RT-328T)	1.5						
Cessna 300 Transponder (Type RT-359A)	1.0	2.0	2.0	2.0	2.0	2.0	2.0
Cessna 300A Navomatic (Type AF-395A)	2.5	2.5	2.5	2.5	2.5	2.5	2.5
With Unslaved HSI (IG-832C)			2.8	2.8	2.8	2.8	2.8
Cessna 300 Nav Com (Type RT-385A)		1.0	1.0	1.0	1.0	1.0	1.0
		2.3*	2.3*	2.3*	2.3*	2.3*	2.3*
Cessna 400 Nav Com (Type RT-485A)		1.6	1.6	1.6	1.6	1.6	1.6
		4.0*	4.0*	4.0*	4.0*	4.0*	4.0*
Cessna 400 ADF (Type RT-485A)		1.6*	1.6*	1.6*	1.6*	1.6*	1.6*
		4.0*	4.0*	4.0*	4.0*	4.0*	4.0*
Cessna 400 ADF (Type R-446A)	1.3	1.6	1.6	1.6	1.6	1.6	1.6
Cessna Glideslope (Type R-443B)	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Cessna 400 Transponder (Type RT-459A)	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Cessna 400 Marker Beacon (Type R-402A)	.10	0.1	0.1	0.1	0.1	0.1	0.1
Cessna 400 DME (Type 478A)		2.5	2.5	2.5	2.5	2.5	2.5
Cessna 400 RNAV (Type RN-476A)		0.5	0.5	0.5	0.5	0.5	0.5
Sunair SSB Transceiver (Type ASB-125	5.0	2.5*	2.5*	2.5*	2.5*	2.5*	2.5*
		7.5*	7.5*	7.5*	7.5*	7.5*	7.5*
Flashing Beacon	7.0	6.0	6.0	6.0	6.0	6.0	6.0
Narco 190 DME	2.9	2.9	2.9	2.9	2.9		
Pantronics PT10-A HF Transceiver	1.5	1.0*	1.0*	1.0*			
		9.0*	9.0*	9.0*			
Post Lights*	1.52	0.6	0.6	0.6	0.6	0.6	0.8
Mkr Bcn EL Panel	0.02						
Bendix Marker Beacon (Type GM-247A)	.10	0.1	0.1				
Blind Encoder	.10	0.1	0.1	0.1	0.1	0.1	0.1
Cessna Encoding Altimeter (Type EA-401A)	.07	0.1	0.1	0.1		0.1	0.1
Foster RNAV 511			1.0	1.0	1.0		
Stereo - AM/FM Cassette				1.0	1.0	1.0	1.0
Interphone System					†	†	†
RNAV ANS 351					0.65	0.65	0.65
Avionics Cooling Fan						1.0	0.6
DME - 451						1.2	1.2

ITEMS NOT CONSIDERED AS PART OF RUNNING LOAD	AMPS REQD 1977	1978	1979	1980	1981	1982	1983
Cigarette Lighter	10.0	7.0	7.0	7.0	7.0		
Stall Warning Horn	0.25	0.25	0.25	0.25	0.25	0.25	0.25
Wing Courtesy Lights and Cabin Lights	2.5	1.2	1.2	1.2	1.2	1.2	1.2
Landing Lights	15.6						
Flap Motor	15.0	10.0	10.0	8.5	8.5	8.5	8.5
Landing Lights (Dual)		3.6 ea	3.6 ea	3.6 ea	3.6 ea	3.6 ea	3.6 ea
Electric Elevator Trim		0.7	0.7	0.7	0.7	0.7	0.7
Map Light (Control Wheel)		0.1	0.1	0.1	0.1	0.1	0.1
Air Conditioning						19.7	19.7

* Only one or the other may be used at one time. † Negligible *Receive * Transmit

ELECTRICAL LOAD ANALYSIS CHART

STANDARD EQUIPMENT (RUNNING LOAD)	AMPS REQD 1984	1985	1986
Instrument (Engine)	0.2	0.2	0.2
Instrument Lights	1.0	1.0	1.0
a. EL Panel	0.7	0.7	0.7
Position Lights	2.5	2.5	2.5
Battery Contactor	0.5	0.5	0.5
Turn Coordinator	0.3	0.3	0.3
Clock	†	†	†
OPTIONAL EQUIPMENT (RUNNING LOAD)			
Turn and Bank Indicator	.24	.24	.24
Heated Pitot and Stall Warning	5.8	5.8	5.8
Strobe Lights	3.0	3.0	3.0
Cessna 200A Navomatic (Type AF-295B)	2.5	2.5	2.5
Cessna 300 ADF (Type R-546E)	1.0	1.0	1.0
Cessna 300 Transponder (Type RT-359A)	2.0	2.0	2.0
Cessna 300A Navomatic (Type AF-395A) With Unslaved HSI (IF-832C)	2.5	2.5	2.5
Cessna 300 Nav Com (Type RT-385A)	1.0●	1.0●	1.0●
	2.3*	2.3*	2.3*
Cessna 400 Nav Com (Type RT-485A)	1.6●	1.6●	1.6●
	4.0*	4.0*	4.0*
Cessna 400 ADF (Type R-446A)	1.6	1.6	1.6
Cessna Glideslope (Type R-443B)	0.5	0.5	0.5
Cessna 400 Transponder (Type RT-459A)	2.0	2.0	2.0
Cessna 400 Marker Beacon (Type R-4.	0.1	0.1	0.1
Cessna 400 DME (RT-477A)	1.5	1.5	1.5
Cessna 400 RNAV (RN-479A)	1.0	1.0	1.0
Sunair SSB Transceiver (Type ASB-125)	2.5●	2.5●	2.5●
	7.5*	7.5*	7.5*
Flashing Beacon	6.0	7.0	7.0
Post Lights*	0.8	0.8	0.8
Blind Encoder	0.1	0.1	0.1
Cessna Encoding Altimeter (Type EA-401A)	0.1	0.1	0.1
Stereo - AM/FM Cassette	1.0	1.0	1.0
Interphone System	†	†	†
Avionics Cooling Fan	0.6	1.0	1.0
Sperry RT-377A DME		0.3	0.3
ITEMS NOT CONSIDERED AS PART OF RUNNING LOAD			
Stall Warning Horn	0.25	0.25	0.25
Wing Courtesy Lights and Cabin Lights	1.2	1.2	1.2
Flap Motor	8.5	1.8	1.8
Landing Lights (Dual)	3.6 ea	3.6 ea	3.6 ea
Electric Elevator Trim	0.7	0.7	0.7
Map Light (Control Wheel)	0.1	0.1	0.1
Air Conditioning	19.7	19.7	19.7
Standby Vacuum System		13.0	13.0

† Negligible ● Receive * Transmit

SECTION 18

STRUCTURAL REPAIR

TABLE OF CONTENTS	Page No. Aerofiche/Manual

NOTE

If bulkhead station 230.187 is repaired or replaced, also replace balance weight which is installed if 95-amp alternator and/or 3-bladed propeller is installed. Refer to Section 13 and/or 16 of this manual.

18-1. STRUCTURAL REPAIR.

18-2. REPAIR CRITERIA. Although this section outlines repair permissible on structure of the aircraft, the decision of whether to repair or replace a major unit of structure will be influenced by such factors as time and labor available, and by a comparison of labor costs with the price of replacement assemblies. Past experience indicates that replacement, in many cases, is less costly than major repair. Certainly, when the aircraft must be restored to its airworthy condition in a limited length of time, replacement is preferable. Restoration of a damaged aircraft to its original design strength, shape, and alignment involves careful evaluation of the damage, followed by exacting workmanship in performing the repairs. This section suggests the extent of structural repair practicable on the aircraft, and supplements Federal Aviation Regulation, Part 43. Consult the factory when in doubt about a repair not specifically mentioned here.

18-3. EQUIPMENT AND TOOLS.

18-4. SUPPORT STANDS. Padded, reinforced sawhorse or tripod type support stands, sturdy enough to support any assembly placed upon them, must be used to store a removed wing or tailcone. Plans for local fabrication of support stands are contained in figure 18-1. The fuselage assembly, from the tailcone to the firewall, must NOT be supported from the underside, since the skin bulkheads are not designed for this purpose. Adapt support stands to fasten to the wing attach points or landing gear attach points when supporting a fuselage.

18-5. FUSELAGE REPAIR JIGS. Whenever a repair is to be made which could affect structural alignment, suitable jigs must be used to assure correct alignment of major attach points, such as fuselage, firewall, wing and landing gear. These fuselage repair jigs are obtainable from the factory.

18-6. WING JIGS. These jigs serve as a holding fixture during extensive repair of a damaged wing, and locates the root rib, leading edge and tip rib of the wing. These jigs are also obtainable from the factory.

18-7. WING TWIST AND STABILIZER ANGLE-OF-INCIDENCE.

18-8. Wing twist (washout) and horizontal stabilizer angle-of-incidence are shown below. Stabilizers do not have twist. Wings have no twist from the root to the lift strut station. All twist in the wing panel occurs between this station and the tip rib. See figure 18-2 for wing twist measurement.

WING
    Twist (Washout) 3°

STABILIZER
    Angle of Incidence -3° 30'

18-9. REPAIR MATERIALS. Thickness of a material on which a repair is to be made can easily be determined by measuring with a micrometer. In general, material used in Cessna aircraft covered in this manual is made from 2024 aluminum alloy, heat treated to a -T3, -T4, or -T42 condition. If the type of material cannot readily be determined, 2024-T3 may be used in making repairs, since the strength of -T3 is greater than -T4 or -T42 (-T4 and -T42 may be used interchangeably, but they may not be substituted for -T3). When necessary to form a part with a smaller bend radius than the standard cold bending radius for 2024-T4, use 2024-0 and heat treat to 2024-T42 after forming. The repair material used in making a repair must equal the gauge of the material being replaced unless otherwise noted. It is often practical to cut repair pieces from service parts listed in the Parts Catalog. A few components (empennage tips, for example) are fabricated from thermo-formed plastic or glass-fiber constructed material.

18-10. WING.

18-11. DESCRIPTION. The wing assemblies are a semicantilever type employing semimoncoque type of structure. Basically, the internal structure consists of built-up front and rear spar assemblies, a formed auxiliary spar assembly and formed sheet metal nose, intermediate, and trailing edge ribs. Stressed skin, riveted to the rib and spar structures, completes the rigid structure. Access openings (hand holes with removable cover plates) are located in the underside of the wing between the wing root and tip section. These openings afford access to aileron bellcranks, flap bellcranks, electrical wiring, strut attach fittings, control cables and pulleys, and control disconnect points.

18-12. WING SKIN.

18-13. NEGLIGIBLE DAMAGE. Any smooth dents in the wing skin that are free from cracks, abrasions and sharp corners, which are not stress wrinkles and do not interfere with any internal structure or mechanism, may be considered as negligible damage. In areas of low stress intensity, cracks, deep scratches, or deep, sharp dents, which after trimming or stop-drilling can be enclosed by a two-inch circle, can be considered negligible if the damaged area is at least one diameter of the enclosing circle away from all existing rivet lines and material edges. Stop drilling is considered a temporary repair and a permanent repair must be made as soon as practicable.

18-14. REPAIRABLE DAMAGE. Figure 18-4 outlines typical repair to be employed in patching skin. Before installing a patch, trim the damaged area to form a retangular pattern, leaving at least a one-half inch radius at each corner, and de-burr. The sides of the hole should lie span-wise or chord-wise. A circular patch may also be used. If the patch is in an area where flush rivets are used, make a flush patch type of repair; if in an area where flush rivets are not used, make an overlapping type of repair. Where optimum appearance and airflow are desired, the flush patch may be used. Careful workmanship will eliminate gaps at butt-joints; however, an epoxy type filler may be used at such joints.

18-15. DAMAGE NECESSITATING REPLACEMENT OF PARTS. If a skin is badly damaged, repair must be made by replacing an entire skin panel, from one structural member to the next. Repair seams must be made to lie along structural members and each seam must be made exactly the same in regard to rivet size, spacing and pattern as the manufactured seams at the edges of the original sheet. If the manufactured seams are different, the stronger must be copied. If the repair ends at a structural member where no seam is used, enough repair panel must be used to allow an extra row of staggered rivets, with sufficient edge margin, to be installed.

18-16. WING STRINGERS.

18-17. NEGLIGIBLE DAMAGE. Refer to paragraph 18-13.

18-18. REPAIRABLE DAMAGE. Figure 18-5 outlines a typical wing stringer repair. Two such repairs may be used to splice a new section of stringer material in position, without the filler material.

18-19. DAMAGE NECESSITATING REPLACEMENT OF PARTS. If a stringer is so badly damaged that more than one section must be spliced, replacement is recommended.

18-20. WING AUXILIARY SPARS.

18-21. NEGLIGIBLE DAMAGE. Refer to paragraph 18-13.

18-22. REPAIRABLE DAMAGE. Figure 18-8 illustrates a typical auxiliary spar repair.

18-23. DAMAGE NECESSITATING REPLACEMENT OF PARTS. If damage to an auxiliary spar would require a repair which could not be made between adjacent ribs, the auxiliary spar must be replaced.

18-24. WING RIBS.

18-25. NEGLIGIBLE DAMAGE. Refer to paragraph 18-13.

18-26. REPAIRABLE DAMAGE. Figure 18-6 illustrates a typical wing rib repair.

18-27. DAMAGE NECESSITATING REPLACEMENT OF PARTS. Leading and trailing edge ribs that are extensively damaged can be replaced. However, due to the necessity of unfastening an excessive amount of skin in order to replace the rib, they should be repaired if practicable. Center ribs, between the front and rear spar should always be repaired if practicable.

18-28. WING SPARS.

18-29. NEGLIGIBLE DAMAGE. Due to the stress which wing spars encounter, very little damage can be considered negligible. All cracks, stress wrinkles, deep scratches, and sharp dents must be repaired. Smooth dents, light scratches and abrasions may be considered negligible.

18-30. REPAIRABLE DAMAGE. Figure 18-7, illustrates typical spar repairs. It is often practical to cut repair pieces from service parts listed in the Parts Catalog. Service Kits are available for certain types of spar repairs.

18-31. DAMAGE NECESSITATING REPLACEMENT OF PARTS. Damage so extensive that repair is not practicable requires replacement of a complete wing spar. Also refer to paragraph 18-2.

18-32. WING LEADING EDGES.

18-33. NEGLIGIBLE DAMAGE. Refer to paragraph 18-13.

18-34. REPAIRABLE DAMAGE. Wing skin repairs, outlined in paragraph 18-14, may be used to repair leading edge skins, although the flush-type patches should be used. To facilitate repair, extra access holes may be installed in locations noted in figure 18-13. If the damage would require a repair which could not be made between adjacent ribs, refer to the following paragraph.

18-35. DAMAGE NECESSITATING REPLACEMENT OF PARTS. Where extreme damage has occurred, complete leading edge skin panels should be replaced. Extra access holes may be installed. See figure 18-13 for procedures.

18-36. BONDED LEADING EDGES REPAIR.

18-37. NEGLIGIBLE DAMAGE. Refer to paragraph 18-13.

18-38. REPAIRABLE DAMAGE. (See figure 18-11.) Cut out damaged area as shown, to the edge of undamaged ribs. Using a corresponding section from a new leading edge skin, overlap ribs and secure to wing, using rivet pattern shown in the figure.

18-39. AILERONS.

18-40. NEGLIGIBLE DAMAGE. Refer to paragraph 18-13.

18-41. REPAIRABLE DAMAGE. The repair shown in figure 18-9 may be used to repair damage to aileron leading edge skins. Figure 18-4 may be used as a guide to repair damage to flat surface between corrugations. when damaged area includes corrugations, see figure 18-12. It is recommended that material used for repair be cut from spare parts of the same gauge and corresponding spacing. Following repair, the aileron must be balanced. Refer to paragraph 18-43 for balancing. If damage would require a repair which could not be made between adjacent ribs, refer to paragraph 18-42.

18-42. DAMAGE NECESSITATING REPLACEMENT OF PARTS. If the damage would require a repair which could not be made between adjacent ribs, complete skin panels must be replaced. Ribs and spars may be repaired, but replacement is generally preferable. Where extensive damage has occurred, replacement of the aileron assembly is recommended. After repair and/or replacement, balance aileron in accordance with paragraph 18-43 and figure 18-3.

18-43 AILERON BALANCING. Following repair, replacement or painting, the aileron must be balanced. A flight control surface balancing fixture kit is available (P/N5180002-1). See figure 18-3 for procedures pertaining to the use of this kit.

18-44. WING FLAPS

18-45. NEGLIGIBLE DAMAGE. Refer to paragraph 18-13.

18-46. REPAIRABLE DAMAGE. Flap repairs should be similar to aileron repairs discussed in paragraph 18-41. A flap leading edge repair is shown in figure 18-10.

18-47. DAMAGE NECESSITATING REPLACEMENT OF PARTS. Flap repairs which require replacement of parts should be similar to aileron repairs discussed in paragraph 18-42. Since the flap is not considered a movable control surface, no balancing is required.

18-48. ELEVATORS AND RUDDER.

18-49. NEGLIGIBLE DAMAGE. Refer to paragraph 18-13. The exception to negligible damage on the elevator surfaces is the front spar, where a crack appearing in the web at the hinge fittings or in the structure which supports the overhanding balance weight is not considered negligible. Cracks in the overhanging tip rib, in the area at the front spar intersection with the web of the rib, also cannot be considered negligible.

18-50. REPAIRABLE DAMAGE. Skin patches illustrated in figure 18-4 may be used to repair skin damage between corrugations. For skin damage which includes corrugations, see figure 18-12. Following repair, the elevator/rudder must be balanced. See figure 18-3 for balancing procedures. If damage requires a repair which could not be made between adjacent ribs, see paragraph 18-51.

18-51. DAMAGE NECESSITATING REPLACEMENT OF PARTS. If the damaged area would require a repair which could not be made between adjacent ribs, complete skin panels must be replaced. Ribs and spars may be repaired, but replacement is generally preferable. Where extensive damage has occurred, replacement of the entire assembly is recommended. After repair and/or replacement, balance elevators and rudder in accordance with paragraph 18-52 and figure 18-3.

18-52. ELEVATOR AND RUDDER BALANCING. Following repair, replacement or painting, the elevators and rudder must be balanced. A flight control surface balancing fixture kit is available (P/N 5180002-1). See figure 18-3 for procedures pertaining to the use of this kit.

18-53. FIN AND STABILIZER.

18-54. NEGLIGIBLE DAMAGE. Refer to paragraph 18-13.

18-55. REPAIRABLE DAMAGE. Skin patches illustrated in figure 18-4 may be used to repair skin damage. Access to the dorsal area of the fin may be gained by removing the horizontal closing rib at the bottom of the fin. Access to the internal fin structure is best gained by removing skin attaching rivets on one side of the rear spar and ribs, and springing back the skin. Access to the stabilizer structure may be gained by removing skin attaching rivets on one side of the rear spar and ribs, and springing back the skin. If the damaged area would require a repair which could not be made between adjacent ribs, or a repair would be located in an area with compound curves, see the following paragraph.

18-56. DAMAGE NECESSITATING REPLACEMENT OF PARTS. If the damaged area would require a repair which could not be made between adjacent ribs, or the repair would be located in an area with compound curves, complete skin panels must be replaced. Ribs and spars may be repaired, but replacement is generally preferable. Where damage is extensive, replacement of the entire assembly is recommended.

18-57. FUSELAGE.

18-58. DESCRIPTION. The fuselage is of semimonocoque construction, consisting of formed bulkheads, longitudinal stringer, reinforcing channels, and skin panels.

18-59. NEGLIGIBLE DAMAGE. Refer to paragraph 18-13. Mild corrosion appearing upon alclad surfaces does not necessarily indicate incipient failure of the base metal. However, corrosion of all types must be carefully considered, and approved remedial action taken. Small cans appear in the skin structure of all metal aircraft. It is strongly recommended however, that wrinkles which appear to have originated from other sources, or which do not follow the general appearance of the remainder of the skin panels, be thoroughly investigated. Except in the landing gear bulkhead areas, wrinkles occurring over stringers which disappear when the rivet pattern is removed, may be considered negligible. However, the stringer rivet holes may not align perfectly with the skin holes because of a permanent "set" in the stringer. If this is apparent, replacement of the stringer will usually restore the original strength characteristics of the area.

NOTE

Wrinkles occurring in the skin of the main landing gear bulkhead areas must not be considered negligible. The skin panel must be opened sufficiently to permit a thorough examination of the lower portion of the landing gear bulkhead and its tie-in structure.

18-40A. CRACKS IN CORRUGATED AILERON SKINS (Continued from page 18-3)

1. It is permissible to stop drill crack(s) that originate at the trailing edge of the control surface provided the crack is not more than 2 inches in length.
2. Stop drill crack using a #30 (.128 inch) drill.
3. A crack may only be stop drilled once.

   NOTE: A crack that passes through a trailing edge rivet and does not extend to the trailing edge of the skin may be stop drilled at both ends of the crack.

4. Any control surface that has a crack that progresses past a stop drilled hole shall be repaired. Refer to paragraphs 18-40, -41, and -42 as applicable for repair information.
5. A control surface that has any of the following conditions shall have a repair made as soon as practicable:

   A. A crack that is longer than 2 inches.

   B. A crack that does not originate from the trailing edge or a trailing edge rivet.

   C. Cracks in more than six trailing edge rivet locations per skin.

   Refer to paragraphs 18-40, -41, and -42 as applicable for repair information.

6. Affected control surfaces with corrugated skins and having a stop drilled crack that does not extend past the stop drilled hole, may remain in service without additional repair.

18-45A. CRACKS IN CORRUGATED FLAP SKINS (Continued from page 18-4)

1. It is permissible to stop drill crack(s) that originate at the trailing edge of the control surface provided the crack is not more than 2 inches in length.
2. Stop drill crack using a #30 (.128 inch) drill.
3. A crack may only be stop drilled once.

   NOTE: A crack that passes through a trailing edge rivet and does not extend to the trailing edge of the skin may be stop drilled at both ends of the crack.

4. Any control surface that has a crack that progresses past a stop drilled hole shall be repaired. Refer to paragraphs 18-45, -46, and -47 as applicable for repair information.
5. A control surface that has any of the following conditions shall have a repair made as soon as practicable:

   A. A crack that is longer than 2 inches.

   B. A crack that does not originate from the trailing edge or a trailing edge rivet.

   C. Cracks in more than six trailing edge rivet locations per skin.

   Refer to paragraphs 18-45, -46, and -47 as applicable for repair information.

6. Affected control surfaces with corrugated skins and having a stop drilled crack that does not extend past the stop drilled hole, may remain in service without additional repair.

18-49A. CRACKS IN CORRUGATED ELEVATOR SKINS (Continued from page 18-4)

1. It is permissible to stop drill crack(s) that originate at the trailing edge of the control surface provided the crack is not more than 2 inches in length.
2. Stop drill crack using a #30 (.128 inch) drill.
3. A crack may only be stop drilled once.

   NOTE: A crack that passes through a trailing edge rivet and does not extend to the trailing edge of the skin may be stop drilled at both ends of the crack.

4. Any control surface that has a crack that progresses past a stop drilled hole shall be repaired. Refer to paragraphs 18-49, -50, and -51 as applicable for repair information.
5. A control surface that has any of the following conditions shall have a repair made as soon as practicable:

   A. A crack that is longer than 2 inches.

   B. A crack that does not originate from the trailing edge or a trailing edge rivet.

   C. Cracks in more than six trailing edge rivet locations per skin.

   Refer to paragraphs 18-49, -50, and -51 as applicable for repair information.

6. Affected control surfaces with corrugated skins and having a stop drilled crack that does not extend past the stop drilled hole, may remain in service without additional repair.

Wrinkles occurring in open areas which disappear when the rivets at the edge of the sheet are removed, or a wrinkle which is hand removable, may often be repaired by the addition of a 1/2 x 1/2 x .060 inch 2024-T4 extruded angle, riveted over the wrinkle and extended to within 1/16 to 1/18 inch of the nearest structural members. Rivet pattern should be identical to existing manufactured seam at edge of sheet. Negligible damage to stringers, formed skin flanges, bulkhead channels, and like parts is similar to that for the wing skin, given in paragraph 18-13.

18-60. REPAIRABLE DAMAGE. Fuselage skin repairs may be accomplished in the same manner as wing skin repairs outlined in paragraph 18-14. Stringers, formed skin flanges, bulkhead channels and similar parts may be repaired as shown in figure 18-5.

18-61. DAMAGE NECESSITATING REPLACEMENT OF PARTS. Fuselage skin major repairs may be accomplished in the same manner as the wing repairs outlined in paragraph 18-15. Damaged fittings must be replaced. Seat rails serve as structural parts of the fuselage and must be replaced if damaged.

18-62. BULKHEADS.

18-63. LANDING GEAR BULKHEADS. Since these bulkheads are highly stressed members, irregularly formed to provide clearance for control cables, fuel lines, etc., the patch-type repairs will be, for the most part, impractical. Minor damage, consisting of small nicks or scratches, may be repaired by dressing out the damaged area, or by replacement of rivets. Any other damage must be repaired by replacing the landing gear support assembly as an aligned unit.

18-64. REPAIR AFTER HARD LANDING. Buckled skin or floorboards, and loose or sheared rivets in the area of the main gear support will give evidence of damage to the structure from an extremely hard landing. When such evidence is present, the entire support structure must be examined, and all support forgings must be checked for cracks, using a dye penetrant and proper magnification. Bulkheads in the damaged area must be checked for alignment, and deformation of the bulkhead webs must be determined with the aid of a straightedge. Damaged support structure, buckled floorboards and skins, and damaged or questionable forgings must be replaced.

18-65. FIREWALL DAMAGE. Firewall sheets may be repaired by removing the damaged material (MIL-S-5059) corrosion-resistant (18-8) steel. and splicing in a new section. The new portion must be lapped over the old material, sealed with Pro-Seal #700 (Coast Pro-Seal Co., Chemical Division, 2235 Beverly Blvd.. Los Angeles, California) compound, or equivalent, and secure with steel (MS16535) rivets. The heater valve, located in the right-hand side of the firewall is secured with steel rivets. The remainder of the firewall attaching structure and bracketry is attached with aluminum (MS20470D) rivets.

18-66. ENGINE MOUNT.

18-67. DESCRIPTION. The mount for the aircraft engine is constructed of 4130 chrome-molybdenum steel tubing. A truss structure, fastened to the firewall at four points, supports a cradle arrangement. This cradle arrangement with its supporting lugs, forms the base for rubber shock mounted engine supports.

18-68. GENFRAL CONSIDERATIONS. All welding on the engine mount must be of the highest quality since the tendency of vibration is to accentuate any minor defect present and cause fatigue cracks. Engine mount members are preferably repaired by using a larger diameter replacement tube, telescoped over the stub of the original member using fishmouth and rosette type welds. However, reinforced 30-degree scarf welds in place of the fishmouth welds are considered sstisfactory for engine mount repair work. Refer to Section 19 for engine mount painting.

18-69. ENGINE MOUNT SUPPORT CRADLE DAMAGE. Minor damage such as a crack adjacent to an engine attaching lug may be repaired by rewelding the cradle tube and extending a gusset past the damaged area. Extensively damaged parts must be replaced.

18-70. DAMAGE INVOLVING ENGINE MOUNTING LUGS AND ENGINE MOUNT TO FUSELAGE ATTACHING FITTINGS. Engine mounting lugs and engine mount-to-fuselage attaching fittings should not be repaired but must be replaced.

18-71. BAFFLES. Baffles ordinarily require replacement if damaged or cracked. However, small plate reinforcements riveted to the baffle will often prove satisfactory both to the strength and cooling requirements of the unit.

18-72. ENGINE COWLING.

18-73. REPAIR OF COWLING SKINS. If extensively damaged, complete sections of cowling must be replaced. Standard insert-type skin patches, however, may be used if repair parts are formed to fit. Small cracks may be stop-drilled and dents straightened if they are reinforced on the inner side with a doubler of the same material.

18-74. REPAIR OF REINFORCEMENT ANGLES. Cowl reinforcement angles, if damaged, must be replaced. Due to their small size they are easier to replace than to repair.

18-74A. FASTENERS. Fasteners used in the aircraft are generally solid aluminum rivets, blind rivets, and steel-threaded fasteners. Usage of each is primarily a function of the loads to be carried, accessibility, and frequency of removal. Rivets used in aircraft construction are usually fabricated from aluminum alloys. In special cases, monel, corrosion-resistant steel and mild steel, copper, and iron rivets are used.

18-74B. RIVETS. Standard solid-shank MS rivets are those generally used in aircraft construction. They are fabricated in the following head types: roundhead, flathead, countersunk head, and brazier head. Flathead rivets are generally used in the aircraft interior where head clearance is required. MS20426 countersunk head rivets are used on the exterior surfaces of the aircraft to minimize turbulent airflow. MS20470 brazier head rivets are used on the exterior surfaces of the aircraft where strength requirements necessitate a stronger rivet head than that of the countersunk head rivet. Both the brazier head and the countersunk head rivets are used on the exterior of the aircraft where head clearance is required. Hi-shear rivets are special, patented rivets having a hi-shear strength equivalent to that of standard AN bolts. They are used in special cases in locations where hi-shear loads are present, such as in spars, wings, and in heavy bulkhead ribs. This rivet consists of a cadmium-plated pin of alloy steel. Some have a collar of aluminum alloy. Some of these rivets can be readily identified by the presence of the attached collar in place of the formed head on standard rivets. Blind rivets are used, where strength requirements permit, where one side of the structure is inaccessible, making it impossible or impractical to drive standard solid-shank rivets.

18-74C. REPLACEMENT OF HI-SHEAR RIVETS. Replacement of hi-shear rivets with close-tolerance bolts or other commercial fasteners of equivalent strength properties is permissible. Holes must not be elongated, and the hi-shear substitute must be a smooth, push-fit. Field replacement of main landing gear forgings on bulkheads may be accomplished by using the following fasteners.

a. NAS464P-* bolt, MS21042-* nut and AN960-* washer in place of Hi-shear rivets for forgings with machined flat surfaces around attachment holes.

b. NAS464P-* bolt, ESNA2925-* mating base washer and ESNA RM52LH2935-* self-aligning nut for forgings (with draft angle of up to a maximum of 8°) without machined flat surfaces around attachment holes.

*Dash numbers to be determined according to the size of the holes and the grip lengths required. Bolt grip length should be chosen so that no threads remain in the bearing area.

18-74D. SUBSTITUTION OF RIVETS.

a. Solid-shank rivets (MS20426AD and MS20470AD). When placing rivets in installations which require raised head rivets, it is desirable to use rivets identical to the type of rivet removed. Countersunk-head rivets (MS20426) are to be replaced by rivets of the same type and degree of countersink. When rivet holes become enlarged, deformed, or otherwise damaged, use the next larger size rivet as a replacement. Replacement shall not be made with rivets of lower strength material.

b. Hi-shear Rivets. When hi-shear rivets are not available, replacement of sizes 3/16-inch or greater rivets shall be made with bolts of equal or greater strength than the rivet being replaced, and with self-locking nuts of the same diameter.

c. The following pages contain approved solid-shank and hi-shear rivet substitutions.

18-75. REPAIR OF GLASSFIBER-CONSTRUCTED COMPONENTS.

18-76. Glass fiber-constructed components on the aircraft may be repaired as stipulated in instructions furnished in Service Kit SK182-12. Observe the resin manufacturer's recommendations concerning mixing and application of the resin. Epoxy resins are preferable for making repairs, since epoxy compounds are usually more stable and predictable than polyester and give better adhesion. In addition, repair kits are also available for the repair of cracks in ABS, PBC, PVPC, graphite and fiberglass material. These kits P/N's 51543 thru 51548 are available from the Cessna Supply Division.

18-76. CORROSION AND CORROSION CONTROL.

NOTE

For information on corrosion and corrosion control for aircraft, refer to FAA Advisory Circular AC43-4.

Replace	In thickness (or thicker)	With
MS20470AD3	.025	NAS1398B4, NAS1398D4
	.020	NAS1738B4, NAS1738D4, NAS1768D4, CR3213-4, CR3243-4
MS20470AD4	.050	NAS1398B4, NAS1398D4
	.040	NAS1399B5, NAS1398D5, NAS1738B4, NAS1738E4, NAS1768D4, CR3213-4
	.032	NAS1738B5, NAS1738E5, NAS1768D5, CR3213-5, CR3243-4
	.025	CR3243-5
MS20470AD5	.063	NAS1398B5, NAS1398D5
	.050	NAS1398B6, NAS1398D6, NAS1398B5, NAS1738E5, CR3213-5
	.040	NAS1738B6, NAS1738E6, NAS1768D5, CR3213-6, CR3243-5
	.032	CR3243-6
MS20470AD6	.080	NAS1398B6
	.071	NAS1398D6
	.063	NAS1738B6, NAS1738D6, NAS1768D6, CR3213-6
	.050	CR3243-6
MS20426AD3	.063	NAS1399B4, NAS1399D4
(Countersunk)	.040	NAS1769D4, CR3212-4
(See Note 1)	.025	NAS1769B4, NAS1739E4, CR3242-4
MS20426AD4	.080	NAS1399B4, NAS1399D4
(Countersunk)	.063	NAS1739B4, NAS1739D4, CR3212-4
	.050	NAS1769D4
	.040	CR3242-4
(See Note 1)	.050	CR3212-5
	.040	NAS1739B5, NAS1739D5, NAS1769D4
	.032	CR3242-5
MS20426AD4 (Dimpled)	.063	NAS1739B4, NAS1739D4

Replace	In thickness (or thicker)	With
MS20426AD5 (Countersunk)	.090	NAS1399B5, NAS1399D5
	.080	CR3212-5
	.071	NAS1739B5, NAS1739E5
	.063	NAS1769D5
	.050	CR3242-5
(See Note 1)	.063	NAS1739B6, NAS1739D6, NAS1769D6, CR3212-6
	.040	CR3242-6
	.032	AN509-10 Screw with MS20365 Nut
MS20426AD5 (Dimpled)	.071	NAS1739B5, NAS1739D5
	.090	NAS1739B6, NAS1739D6, CR3212-6
MS20426AD6 (Countersunk)	.071	NAS1769D6
	.063	CR3242-6
	.032	AN509-10 Screw with MS20365 Nut
MS20426AD6 (Dimpled)	.090	NAS1739B6, NAS1739D6
	.032	AN509-10 Screw with MS20365 Nut

NOTE 1: Rework required. Countersink oversize to accommodate oversize rivet.

NOTE 2: Do not use blind rivets in high-vibration areas or to pull heavy sheets or extrusions together. High-vibration areas include the nacelle or engine compartment including the firewall. Heavy sheets or extrusions include spar caps.

REPLACE		DIAMETER	WITH	
Fastener	Collar		Fastener	Collar
● NAS178	NAS179	(See Note 1)	● NAS1054	NAS179, NAS528
		(See Note 1)	● NAS14XX	NAS1080C, NAS1080E, NAS1080G
		(See Note 1)	● NAS529	NAS524A
		(See Notes 1 and 2)	★ NAS1446	NAS1080C, NAS1080A6
		(See Note 1)	★ NAS7034	NAS1080K
		(See Note 1)	▫ NAS464	AN364, MS20364, MS21042
			▫ NAS1103	
			▫ NAS1303	
			▫ NAS6203	
			▫ AN173	AN305, MS20305, MS21044, MS21045
● NAS1054	NAS179, NAS528		● NAS14XX	NAS1080C, NAS1080E
			● NAS529	NAS524A
		(See Note 2)	★ NAS1446	NAS1080C, NAS1080A6
			★ NAS7034	NAS1080K
			▫ NAS464	AN364, MS20304, MS21042
			▫ NAS1103	
			▫ NAS1305	
			▫ NAS6203	
● NAS14XX	NAS1080C NAS1080E NAS1080G		● NAS529	NAS524A
			★ NAS1446	NAS1080C, NAS1080A6
			★ NAS7034	NAS1080K
			▫ NAS464	AN364, MS20364, MS21042
			▫ NAS1103	
			▫ NAS1303	
			▫ NAS6203	
● NAS529	NAS524A	(See Note 3)	▫ NAS1446	NAS1080C, NAS1080A6

NOTE 1: See appropriate tables for nominal diameters available.

NOTE 2: Available in oversize for repair of elongated holes. Ream holes to provide a .001 inch interference fit.

NOTE 3: NAS1446 oversize only permitted as a replacement for NAS529.

● Steel shank fastener designed for drive-on collars.

★ Steel shank fastener designed for squeeze-on collars. Installation requires sufficient space for the tool and extended shank of the fastener.

▫ Threaded fastener.

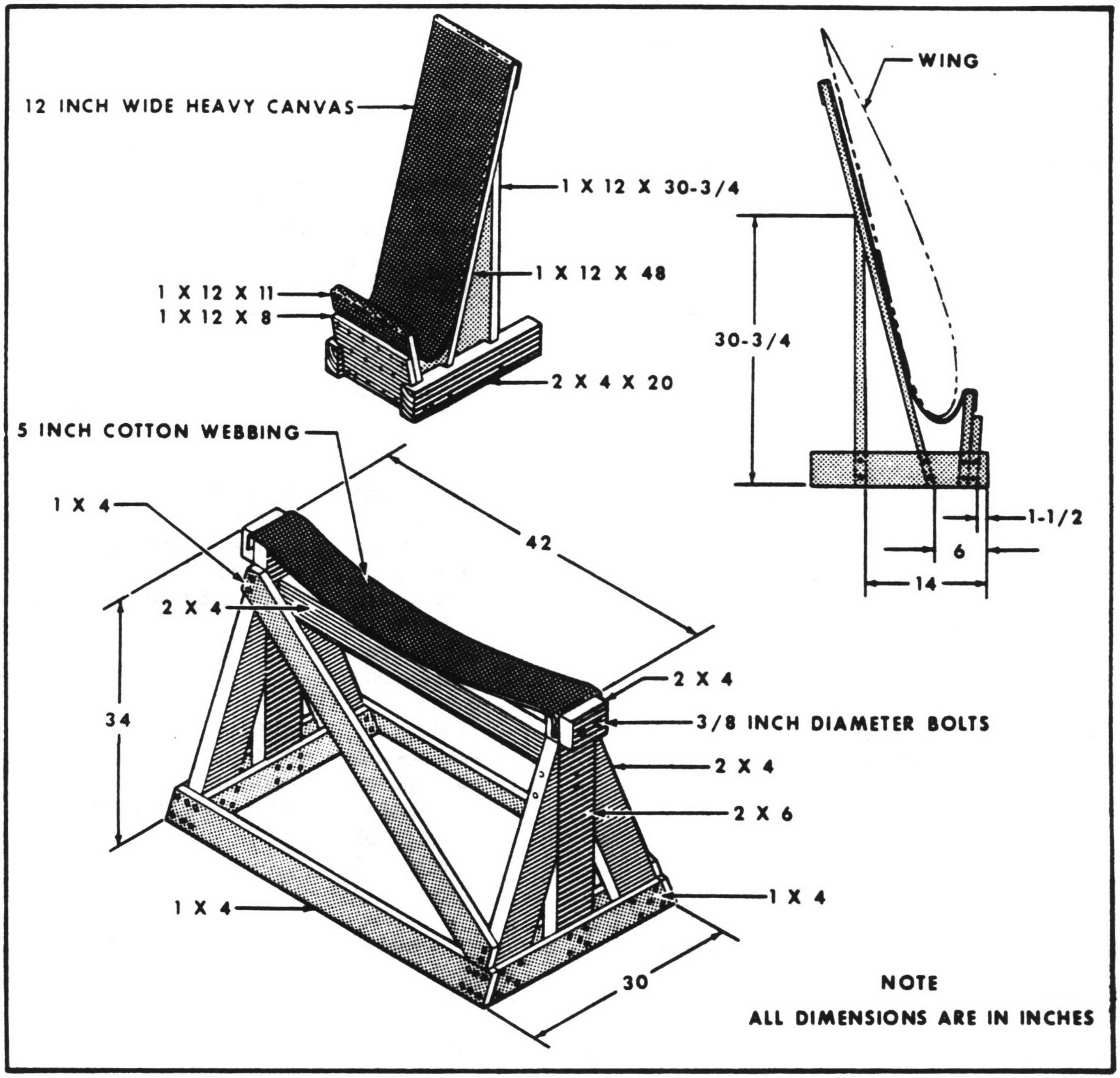
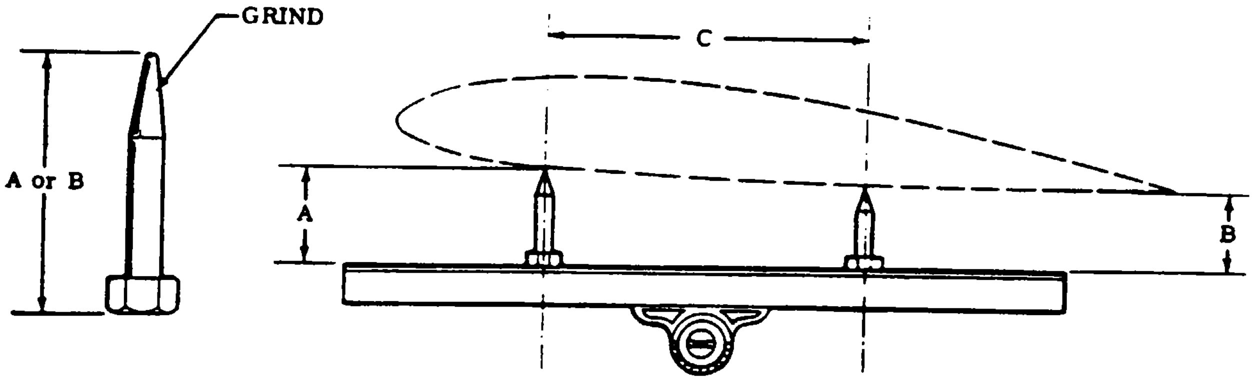


Figure 18-1. Wing and Fuselage Support Stands

18-76. REPAIR OF GLASS-FIBER CONSTRUCTED COMPONENTS. Glass-fiber constructed components on the aircraft may be repaired as stipulated in instructions furnished in Service Kit SK182-12. Observe the resin manufacturer's recommendations concerning mixing and application of the resing. Epoxy resins are preferable for making repairs, since epoxy compounds are usually more stable and predictable than polyester and, in addition, give better adhesion.



A	B	C	WING STATION
2.00	1.00	29.50	39.00
2.00	1.00	29.50	100.00
.45	1.00	24.00	207.00

ALL WING TWIST OCCURS BETWEEN STA. 100.00 AND STA. 207.00. (Refer to paragraph 18-7).

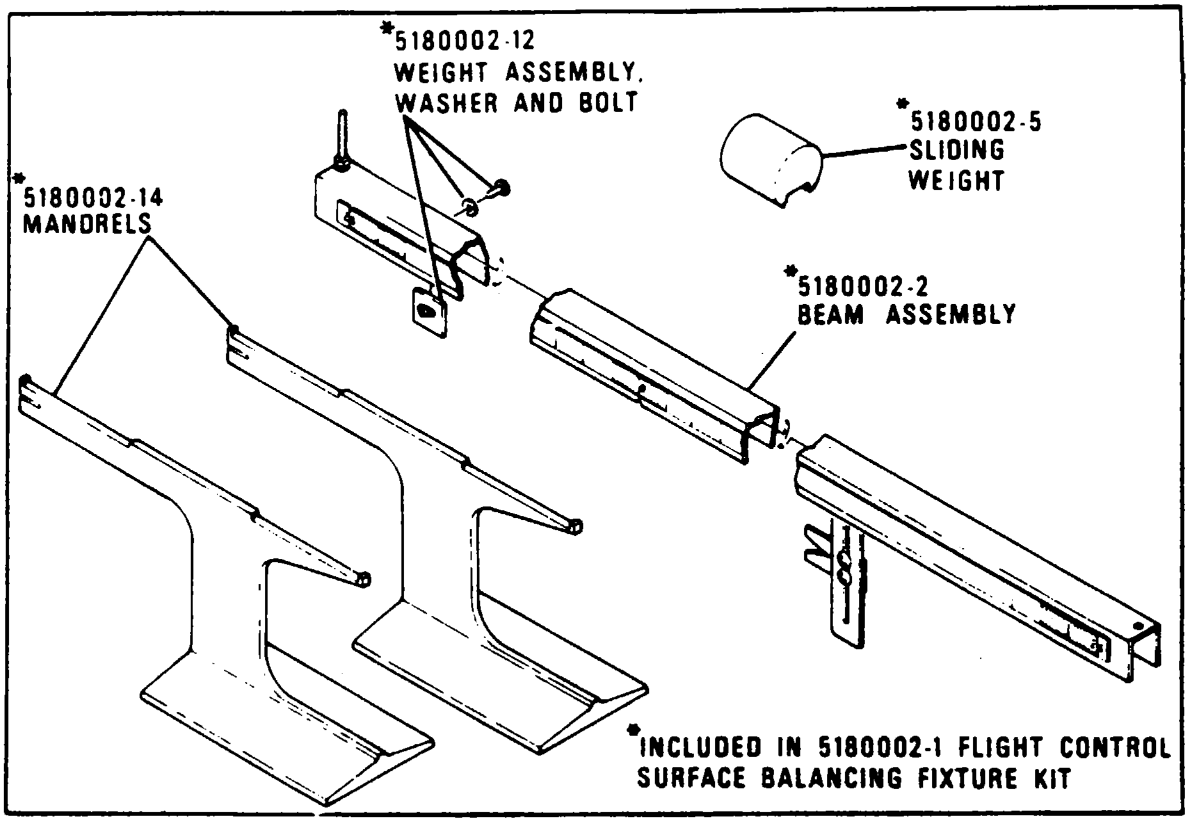
MEASURING WING TWIST

If damage has occurred to a wing, it is advisable to check the twist. The following method can be used with a minimum of equipment, which includes a straightedge (32" minimum length of angle, or equivalent), three modified bolts for a specific wing, and a protractor head with level.

1. Check chart for applicable dimension for bolt length (A or B).
2. Grind bolt to a rounded point as illustrated, checking length periodically.
3. Tape two bolts to straightedge according to dimension C.
4. Locate inboard wing station to be checked and make a pencil mark approximately one-half inch aft of the lateral row of rivets in the wing leading edge spar flange.
5. Holding straightedge parallel to wing station (staying as clear as possible from "cans"). place longer bolt on pencil mark and set protractor head against lower edge of straightedge.
6. Set bubble in level to center and lock protractor to hold this reading.
7. Omitting step 6, repeat procedure for each wing station, using dimensions specified in chart. Check to see that protractor bubble is still centered.
8. Proper twist is present in wing if protractor readings are the same (parallel). Forward or aft bolt may be lowered from wing .10 inch maximum to attain parallelism.

Figure 18-2. Checking Wing Twist

FLIGHT CONTROL SURFACE BALANCING FIXTURE KIT
(PART NUMBER 5180002-1)



GENERAL NOTES

1. Balance control surfaces in a draft-free area.

2. Place hinge bolts through control surface hinges and position on knife edge balancing mandrels. Be sure hinge bolt shank rests on knife edge.

3. Make sure all control surfaces are in their approved flight configurations: painted (if applicable), trim tabs installed, all foreign matter removed from inside of control surface, elevator trim tab push-pull rod installed and all tips installed.

4. Place balancing mandrels on a table or other suitable flat surface.

5. Adjust trailing edge support to fit control surface being balanced while center of balancing beam is directly over hinge line. Remove balancing beam and balance the beam itself by moving the adjustable weight (fastened by bolt and washer). Fine balance may be accomplished by use of washers at long screw on end of beam.

6. When positioning balancing beam on control surface, avoid rivets to provide a smooth surface for the beam and keep the beam 90° to the hinge line of the control surface.

Figure 18-3. Control Surface Balancing (Sheet 1 of 6)

7. Paint is a considerable weight factor. In order to keep balance weight to a minimum, it is recommended that existing paint be removed before adding paint to a control surface. Increase in balance weight will also be limited by the amount of space available and clearance with adjacent parts. Good workmanship and standard repair practices should not result in unreasonable balance weight.
8. The approximate amount of weight needed may be determined by taping loose weight at the balance weight area.
9. Lighten balance weight by drilling off part of weight.
10. Make balance weight heavier by fusing bar stock solder to weight after removal from control surface. The ailerons should have balance weight increased by ordering additional weight and attaching bracket, listed in applicable Parts Catalog, and installing next to existing inboard weight the minimum length necessary for correct balance. However, install weights and attaching brackets in lengths which contain at least two attaching rivets. If necessary, lighten the new weights or existing weights for correct balance.

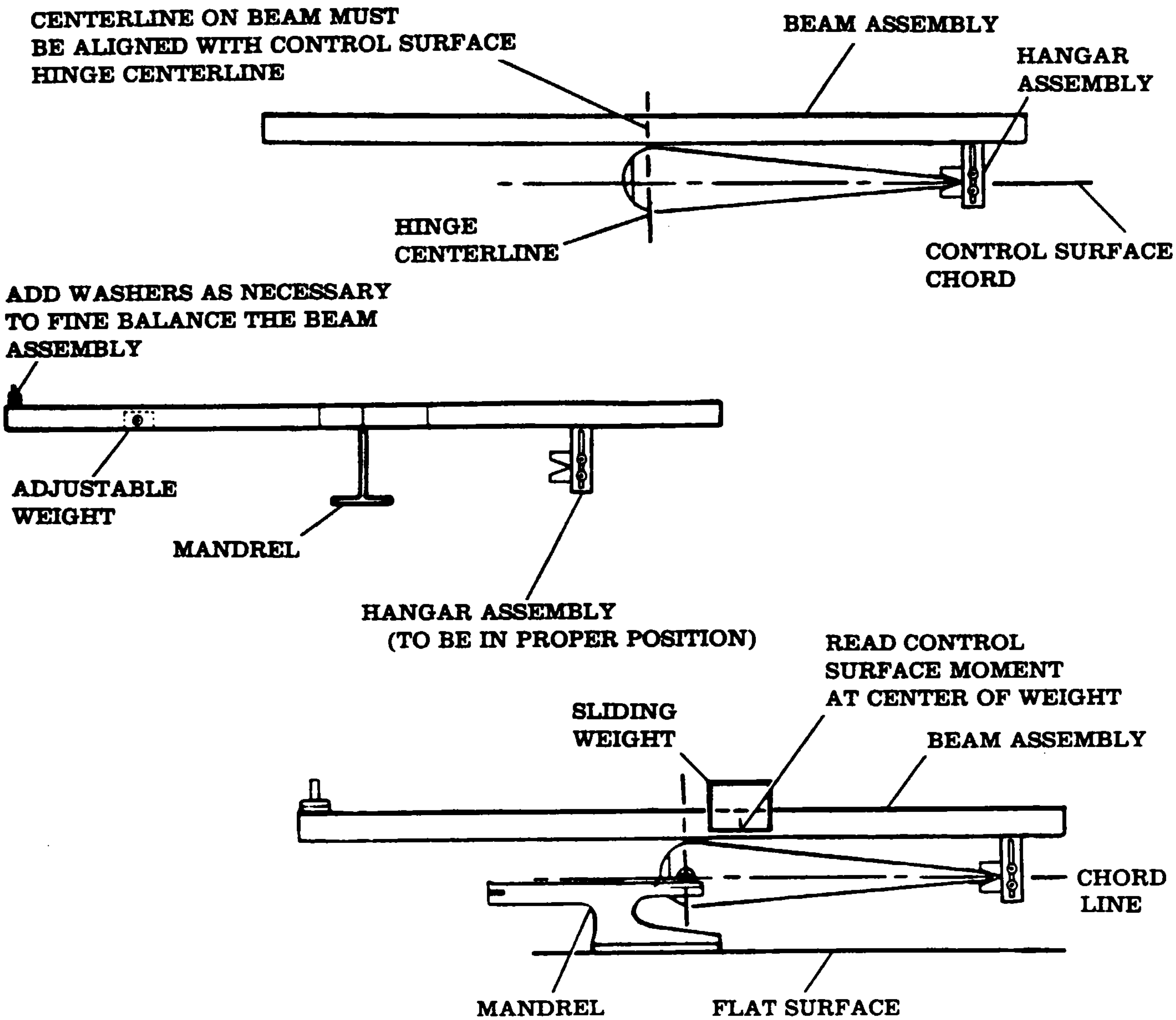


Figure 18-3. Control Surface Balancing (Sheet 2 of 6)

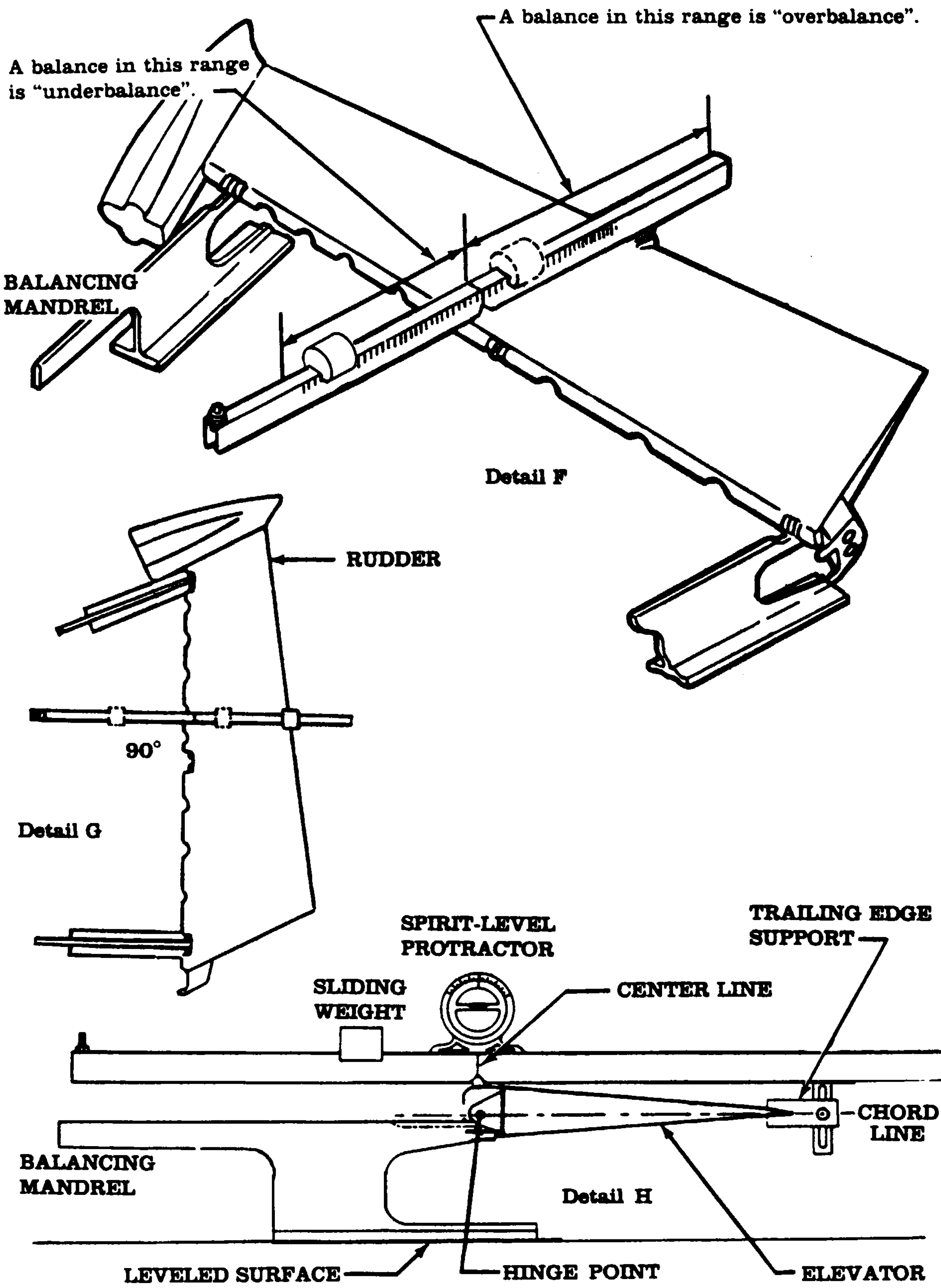
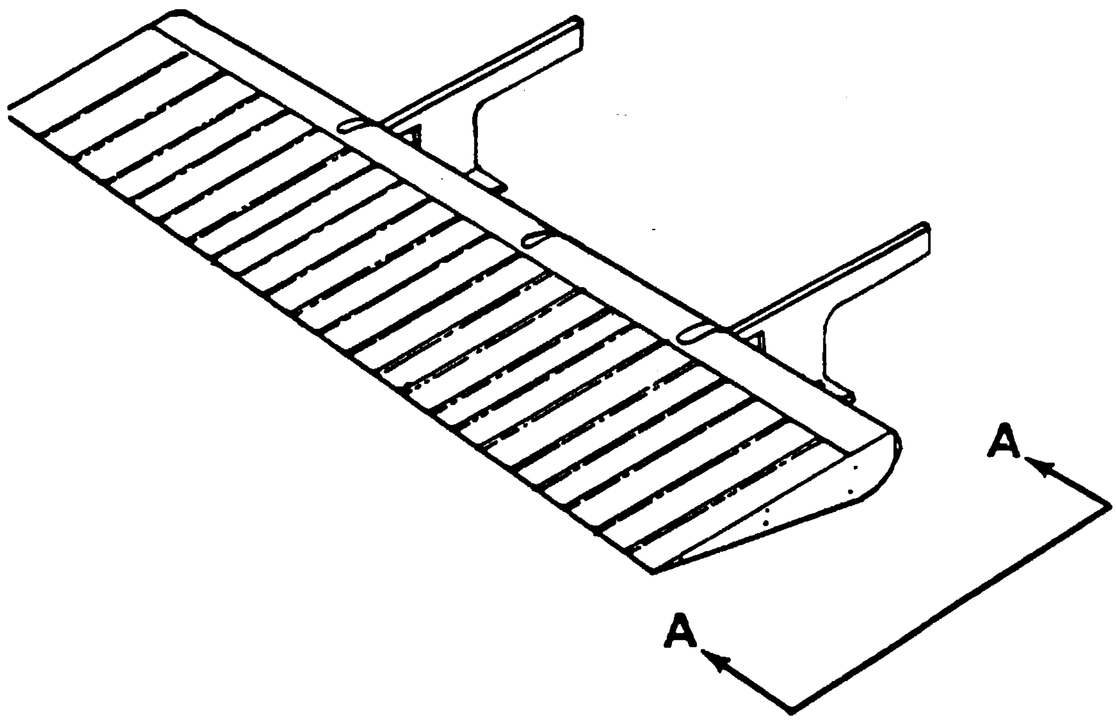
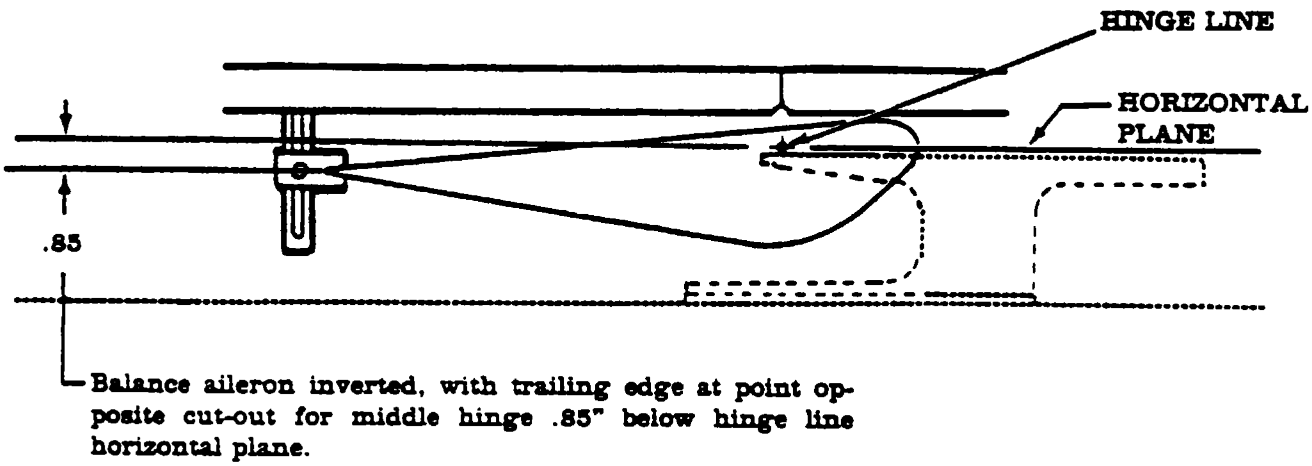


Figure 18-3. Control Surface Balancing (Sheet 3 of 6)

AILERONS





DETAIL A-A

Figure 18-3. Control Surface Balancing (Sheet 4 of 6)

CONTROL SURFACE BALANCE REQUIREMENTS

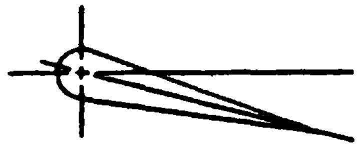
NOTE

Balance limits for control surfaces are expressed for "Approved Flight" configuration. "Approved Flight" configuration is that condition of the control surface as prepared for flight of the airplane whether it be painted or unpainted.

"Approved Flight" limits must never be exceeded when the surface is in its final configuration for flight.

DEFINITIONS:

UNDERBALANCE is defined as the condition that exists when surface is trailing edge heavy and is defined by a symbol (+). If the balance beam sliding weight must be on the leading edge side of the hinge line (to balance the control surface), the control surface is considered to be underbalanced.



OVERBALANCE is defined as the condition that exists when surface is leading edge heavy and is defined by a symbol (–). If the balance beam sliding weight must be on the trailing edge side of the hinge line (to balance the control surface), the control surface is considered to be overbalanced.

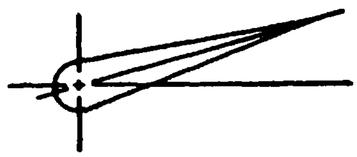


Figure 18-3. Control Surface Balancing (Sheet 5 of 6)

CONTROL SURFACE	APPROVED FLIGHT CONFIGURATION BALANCE LIMITS (Inch-Pounds)
AILERON	0.0 to + 9.64
RUDDER	0.0 to + 6.7
RIGHT ELEVATOR	0.0 to + 20.47
LEFT ELEVATOR	0.0 to + 20.47

Figure 18-3. Control Surface Balancing (Sheet 6 of 6)

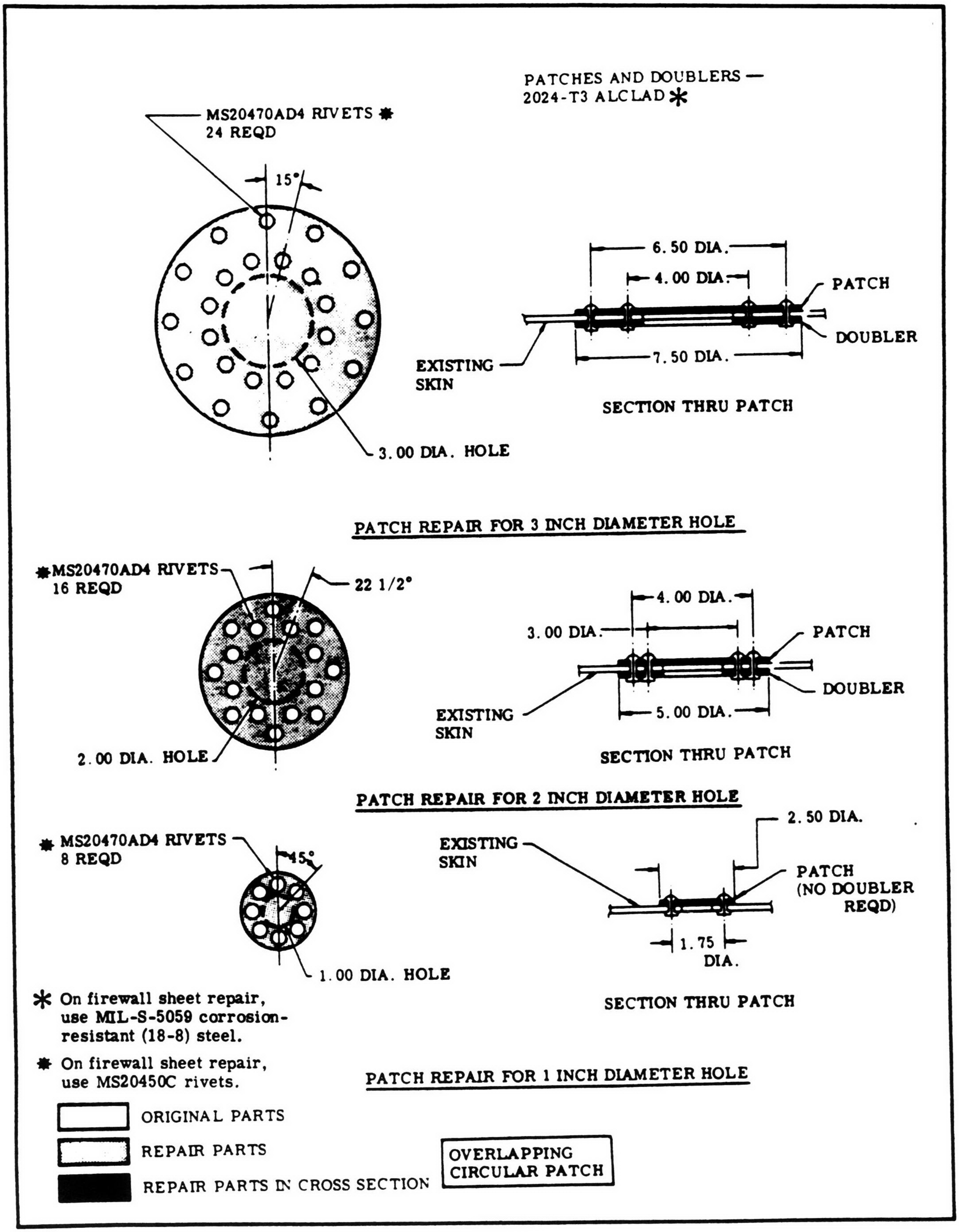
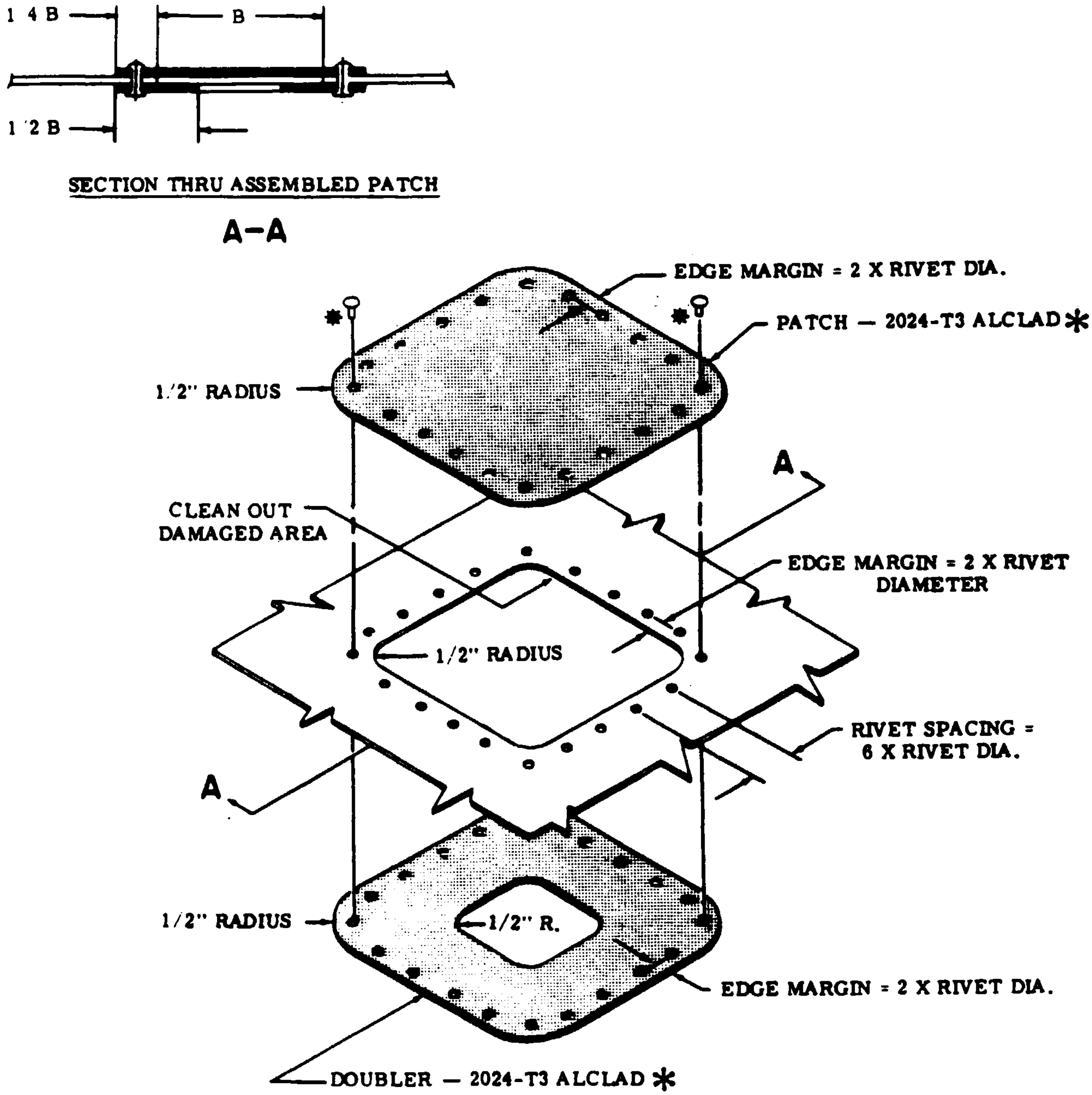


Figure 18-4. Skin Repair (Sheet 1 of 6)



✱ On firewall sheet repair, use MIL-S-5059 corrosion-resistant (18-8) steel.

✹ On firewall sheet repair, use MS20450C rivets.

ORIGINAL PARTS

REPAIR PARTS

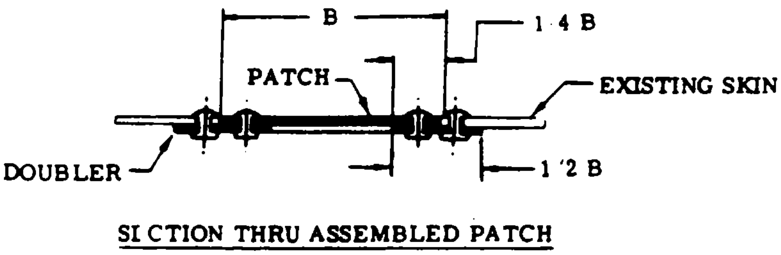
REPAIR PARTS IN CROSS SECTION

OVERLAPPING RECTANGULAR PATCH

RIVET TABLE

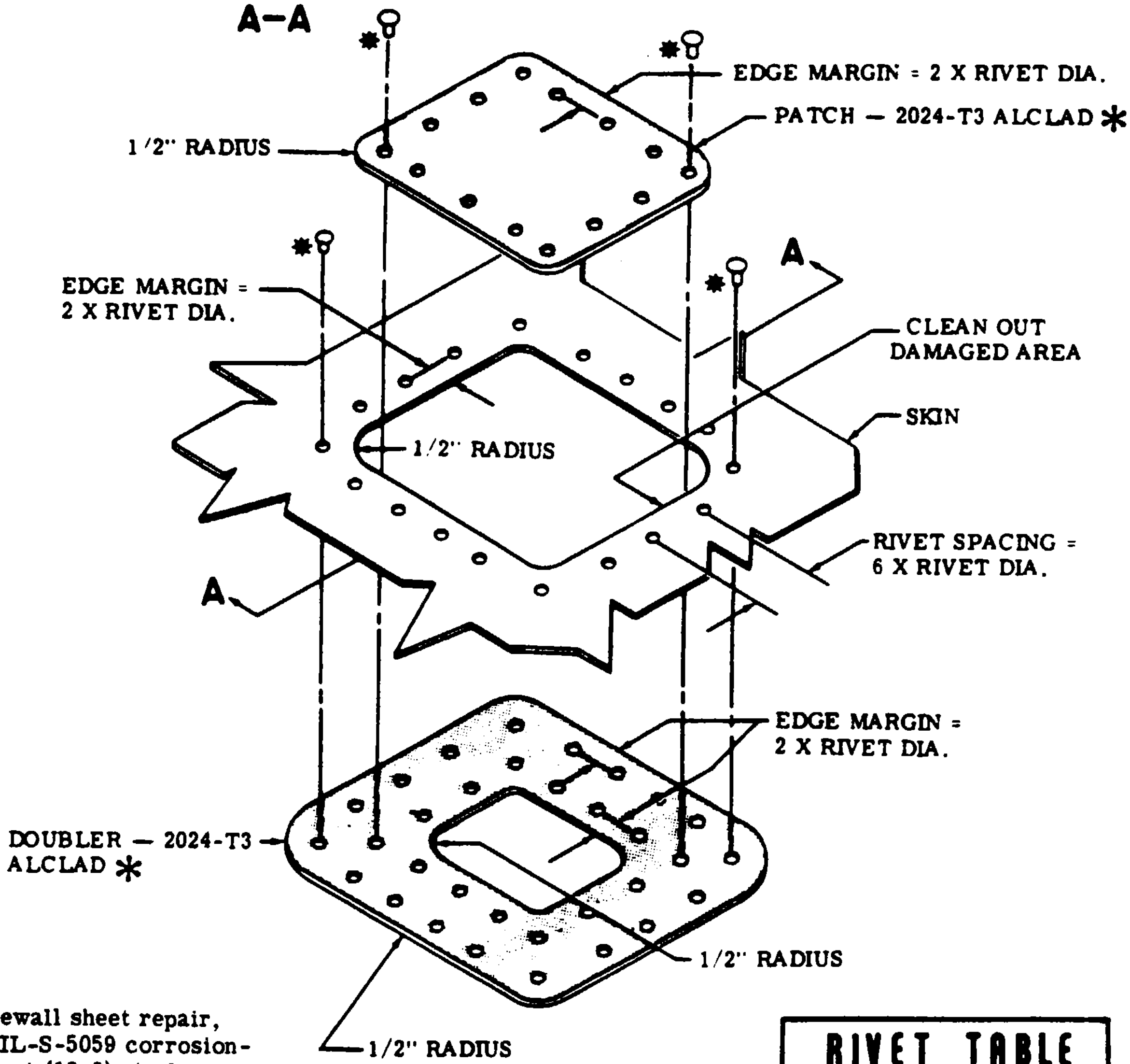
SKIN GAGE	RIVET DIA.
.020	1/8
.025	1/8
.032	1/8
.040	1/8
.051	5/32

Figure 18-4. Skin Repair (Sheet 2 of 6)



NOTE

For optimum appearance and airflow, use flush rivets, dimpled skin and patch, and countersunk doubler.



* On firewall sheet repair, use MIL-S-5059 corrosion-resistant (18-8) steel.

✸ On firewall sheet repair, use MS20450C rivets.

ORIGINAL PARTS

REPAIR PARTS

REPAIR PARTS IN CROSS SECTION

FLUSH RECTANGULAR PATCH (CIRCULAR FLUSH PATCH IS SIMILAR)

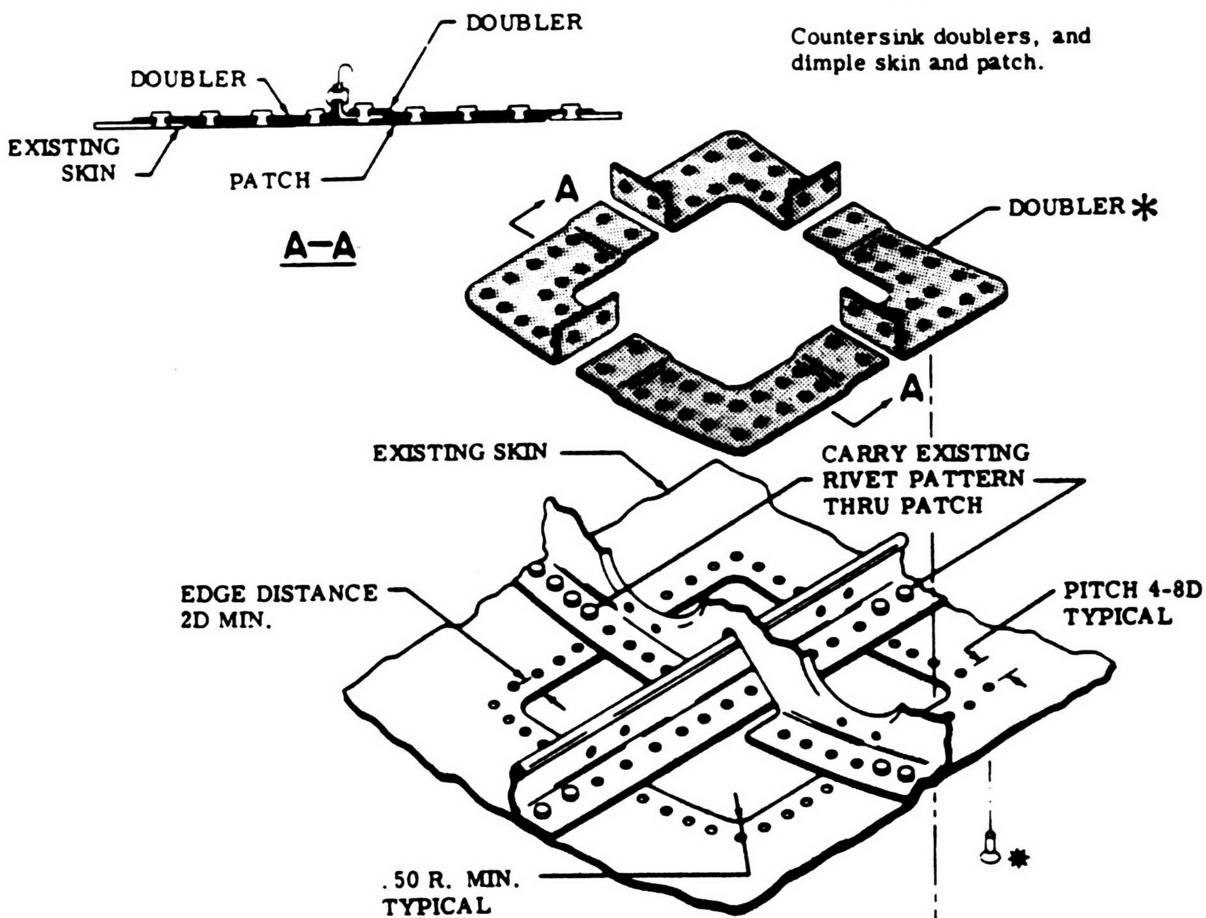
RIVET TABLE

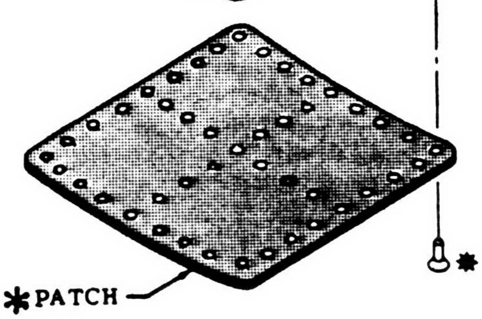
SKIN GAGE	RIVET DIA.
.020	1/8
.025	1/8
.032	1/8
.040	1/8
.051	5/32

Figure 18-4. Skin Repair (Sheet 3 of 6)

NOTE

Countersink doublers, and dimple skin and patch.





RIVET TABLE

SKIN GAGE	RIVET DIA.
.020	1/8
.025	1/8
.032	1/8
.040	1/8
.051	5/32

FLUSH PATCH AT STRINGER/BULKHEAD INTERSECTION

* On firewall sheet repair, use MIL-S-5059 corrosion-resistant (18-8) steel.

✱ On firewall sheet repair, use MS20450 rivets.

ORIGINAL PARTS

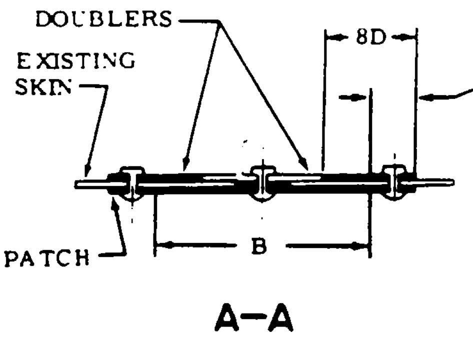
REPAIR PARTS

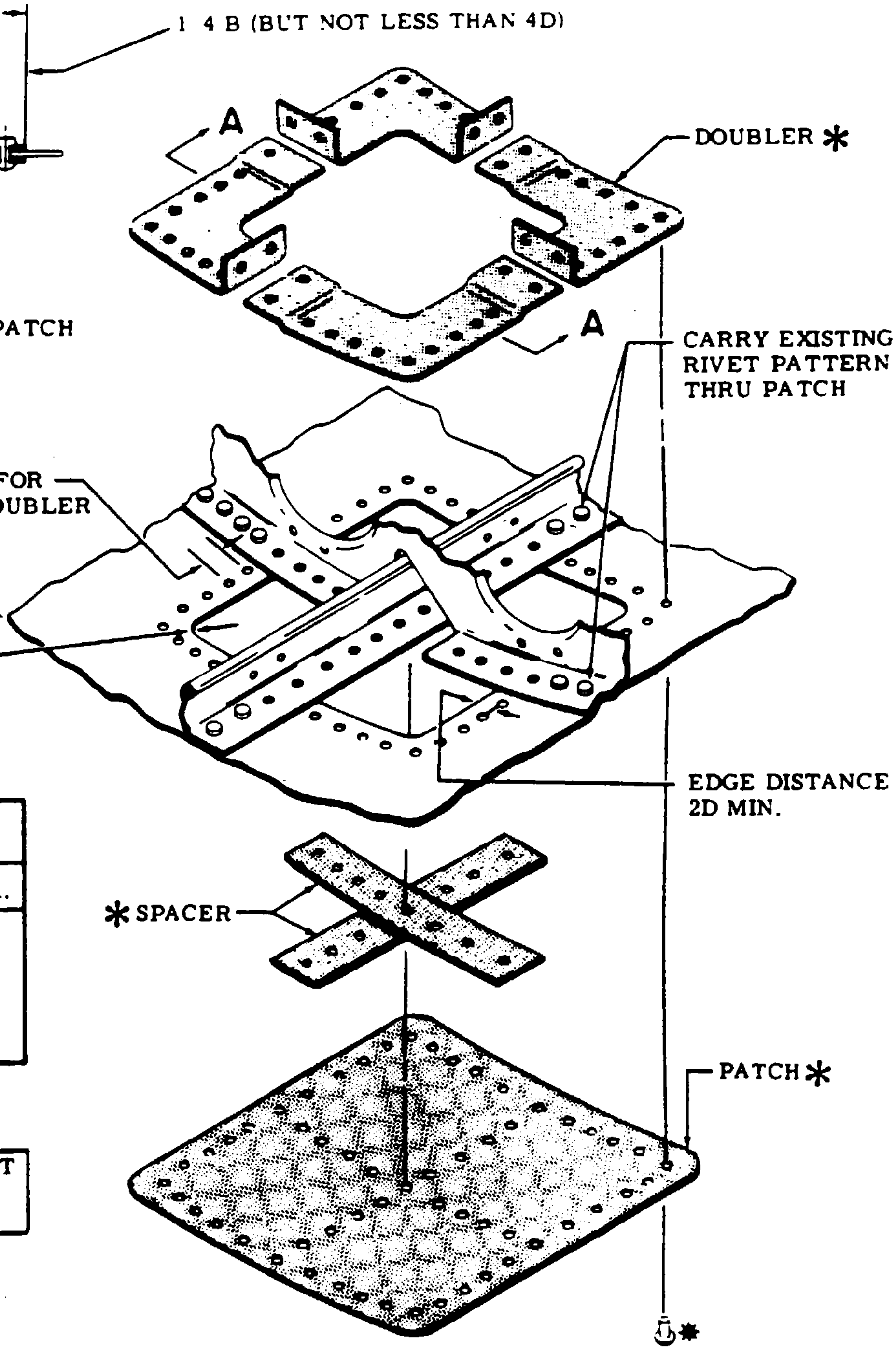
REPAIR PARTS IN CROSS SECTION

NOTE

This procedure is not recommended in areas where stringers are riveted to bulkheads.

Figure 18-4. Skin Repair (Sheet 4 of 6)





RIVET TABLE

SKIN GAGE	RIVET DIA.
.020	1/8
.025	1/8
.032	1/8
.040	1/8
.051	5/32

OVERLAPPING PATCH AT STRINGER/BULKHEAD INTERSECTION

* On firewall sheet repair, use MIL-S-5059 corrosion-resistant (18-8) steel.

✱ On firewall sheet repair, use MS20450C rivets

ORIGINAL PARTS

REPAIR PARTS

REPAIR PARTS IN CROSS SECTION

Figure 18-4. Skin Repair (Sheet 5 of 6)

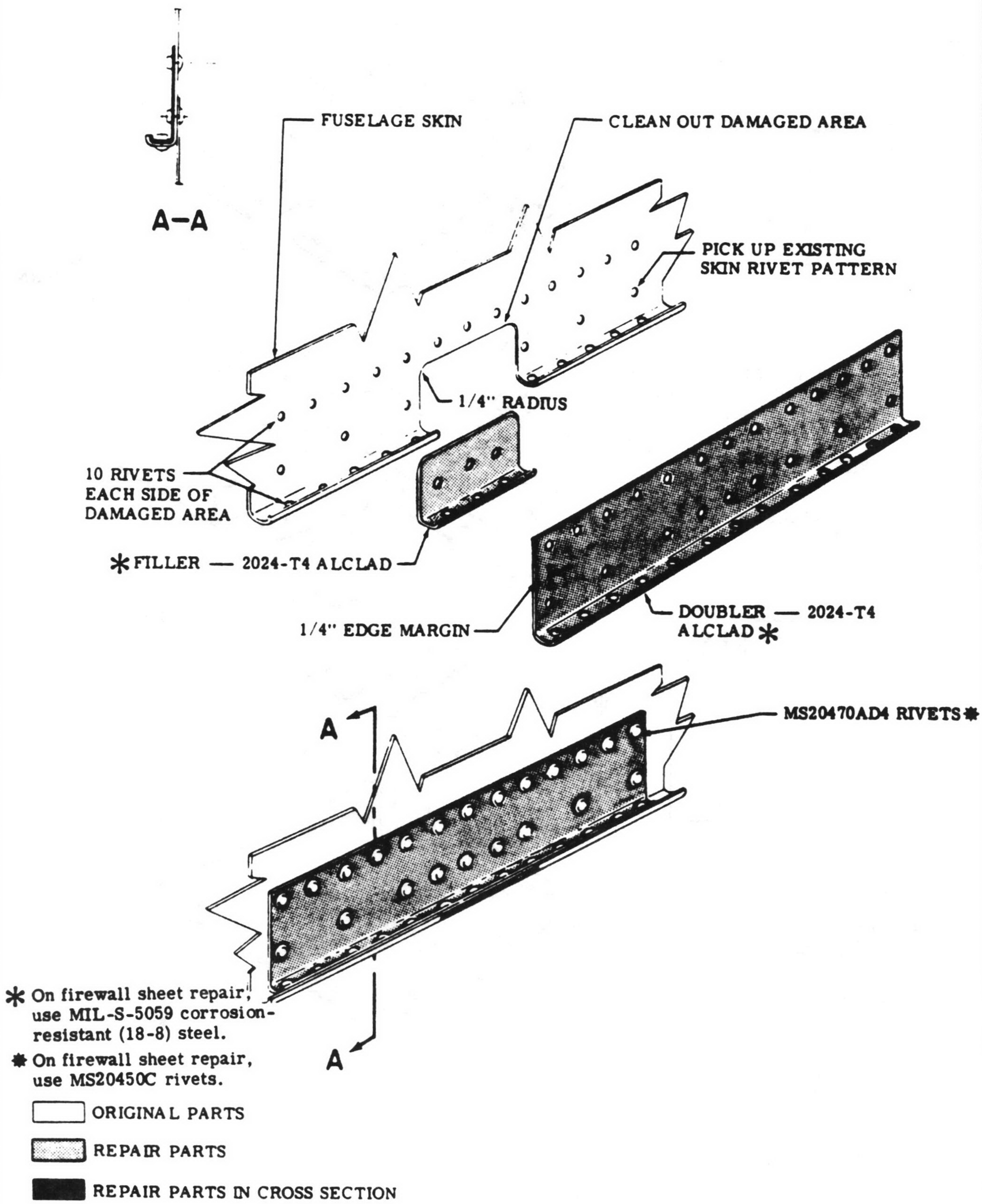


Figure 18-4. Skin Repair (Sheet 6 of 6)

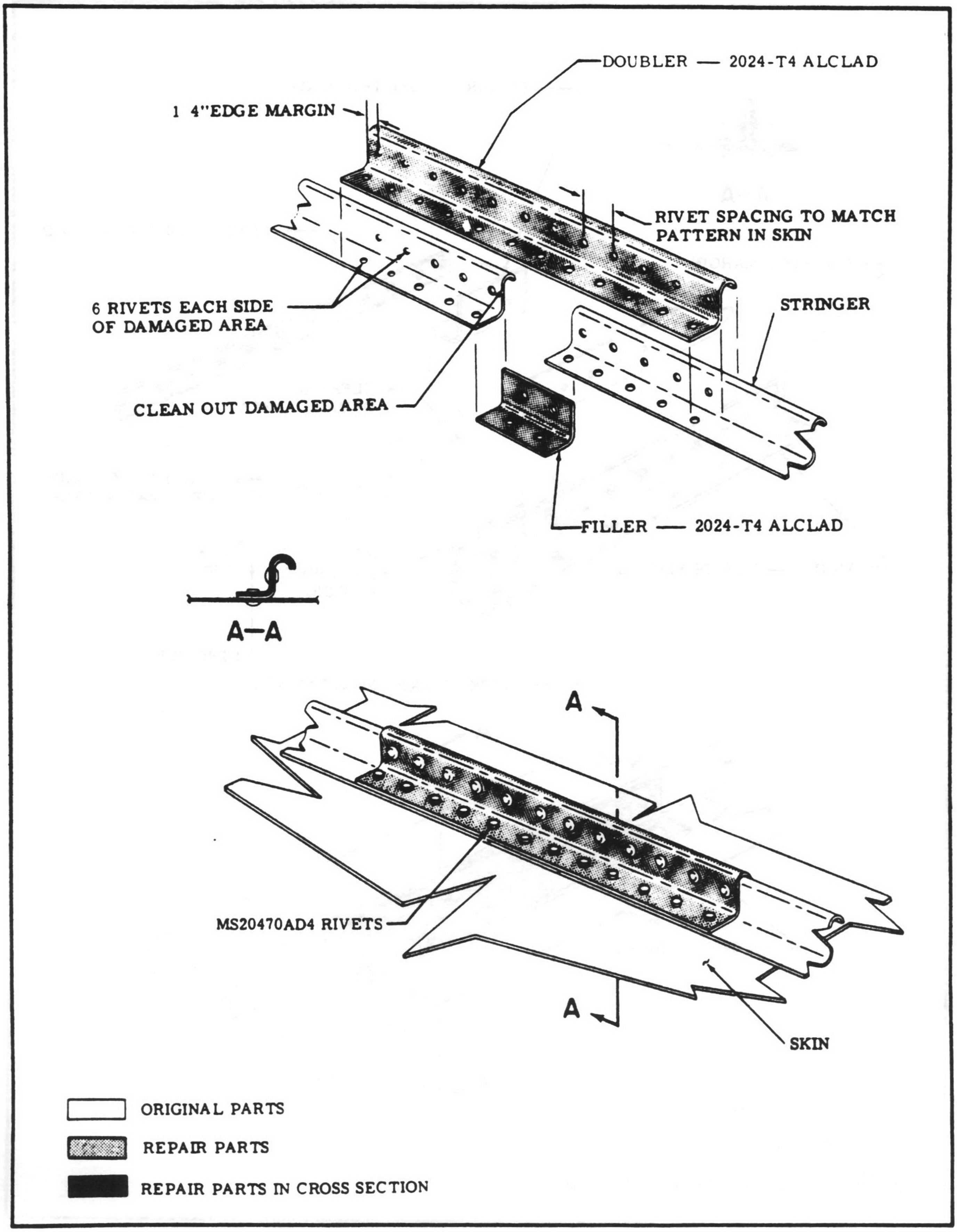


Figure 18-5. Stringer and Channel Repair (Sheet 1 of 4)

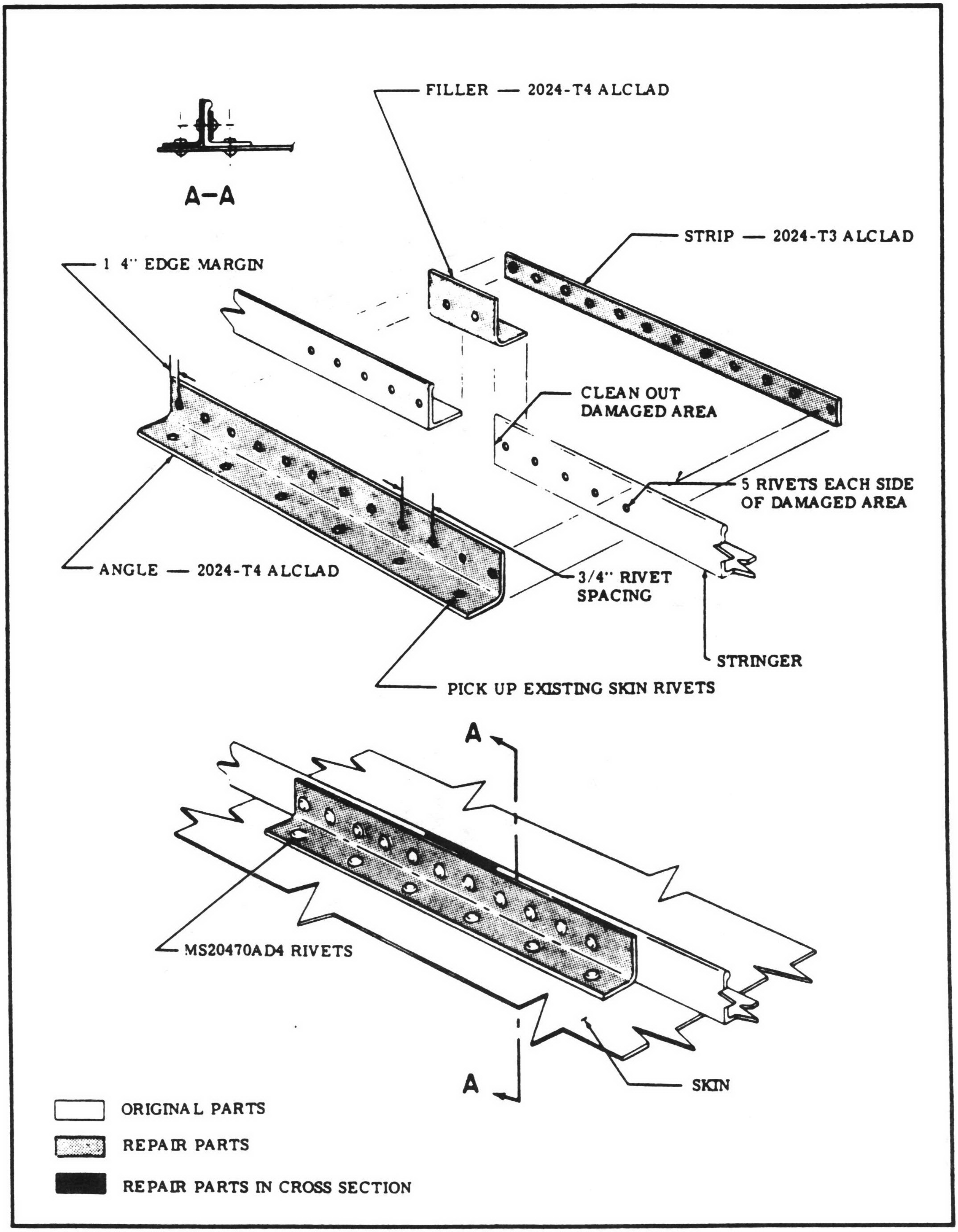


Figure 18-5. Stringer and Channel Repair (Sheet 2 of 4)

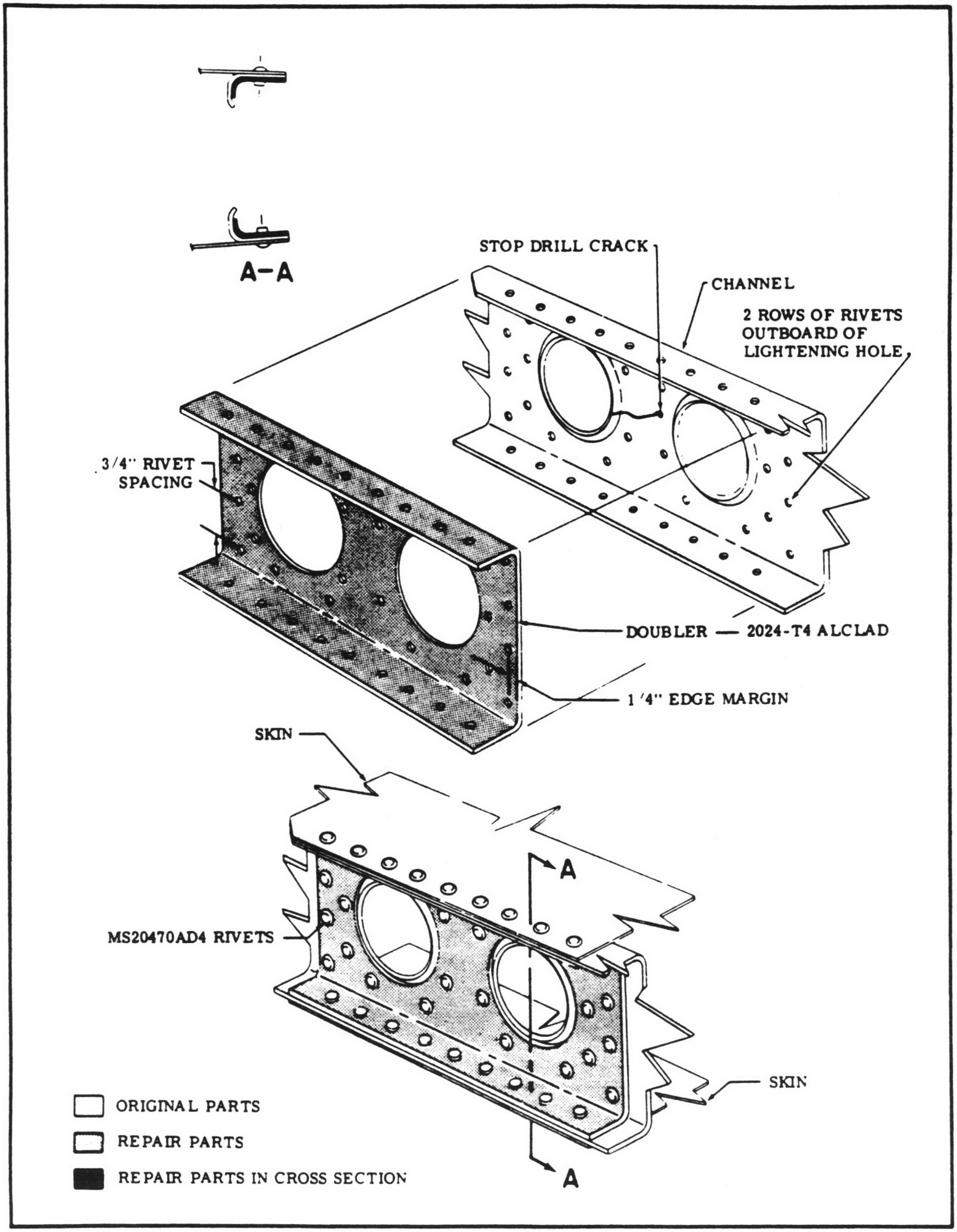


Figure 18-5. Stringer and Channel Repair (Sheet 3 of 4)

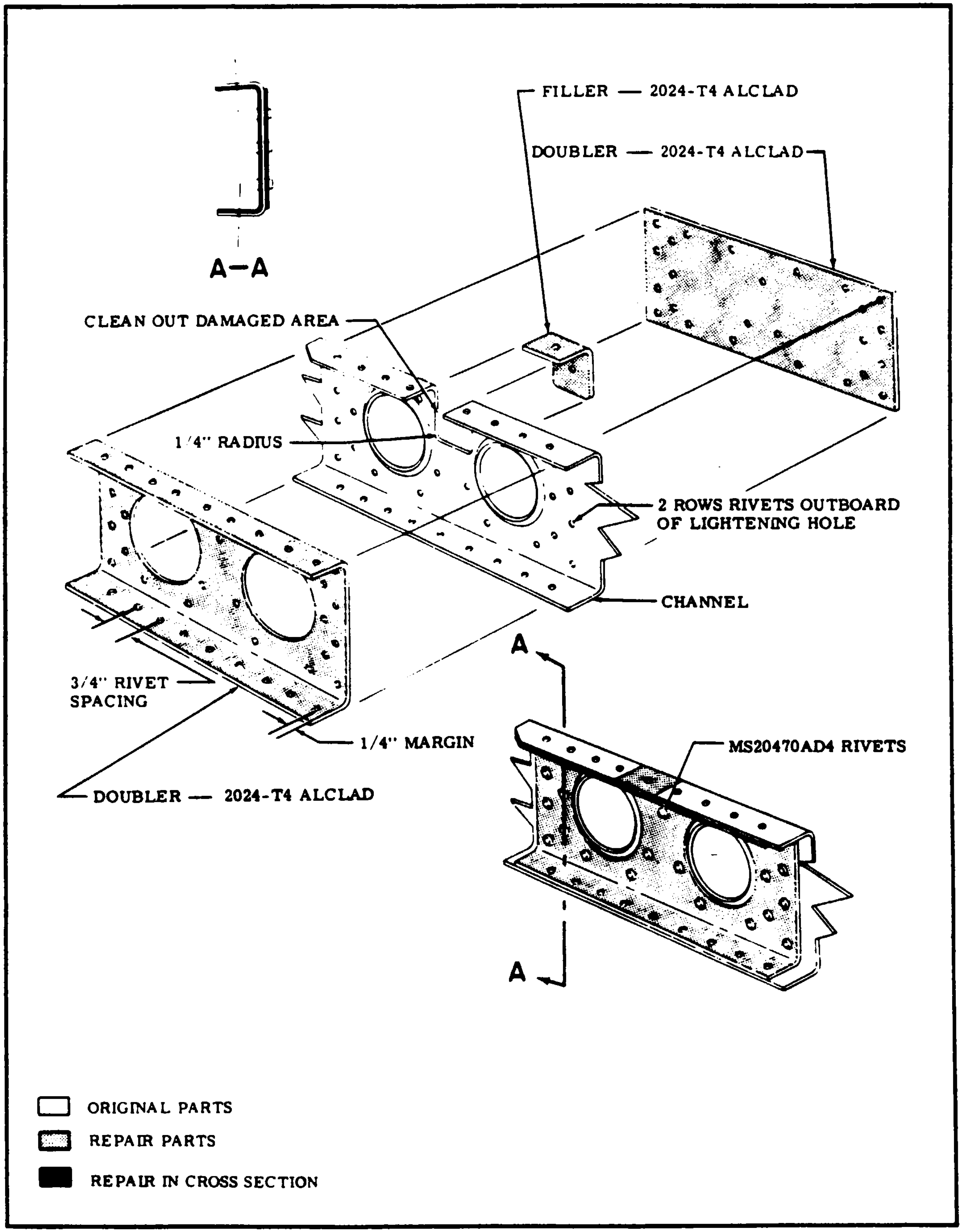


Figure 18-5. Stringer and Channel Repair (Sheet 4 of 4)

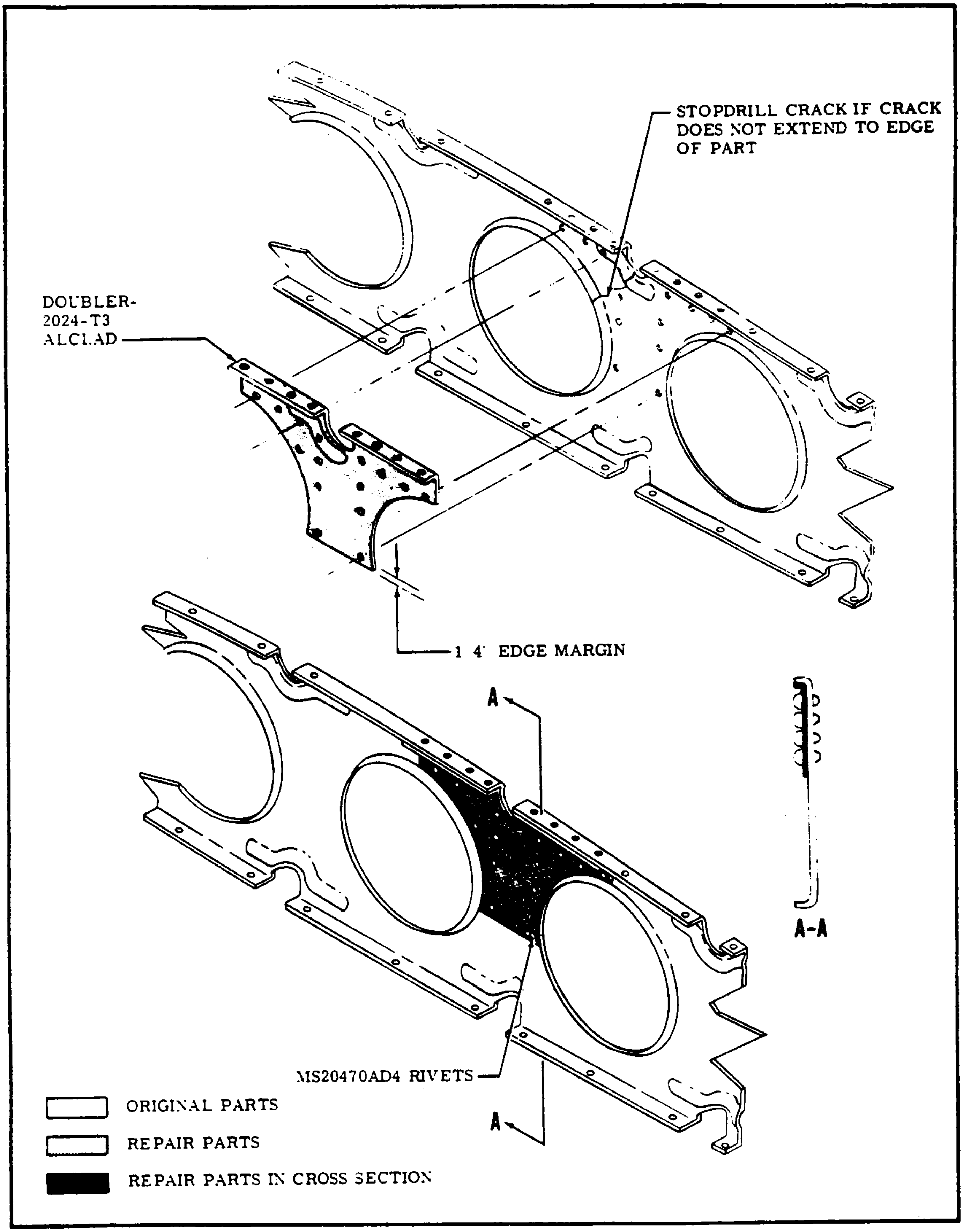


Figure 18-6. Rib Repair (Sheet 1 of 2)

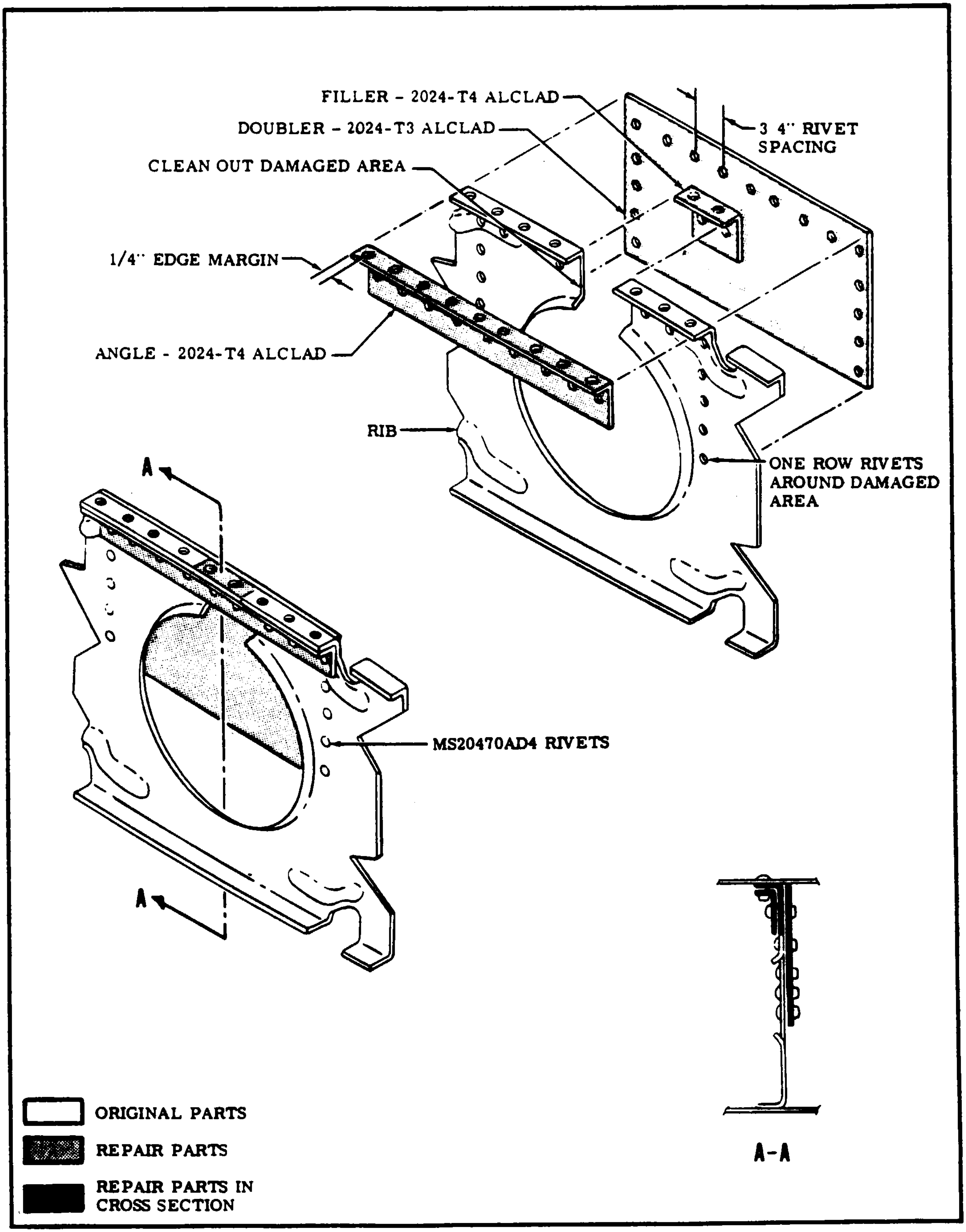


Figure 18-6. Rib Repair (Sheet 2 of 2)

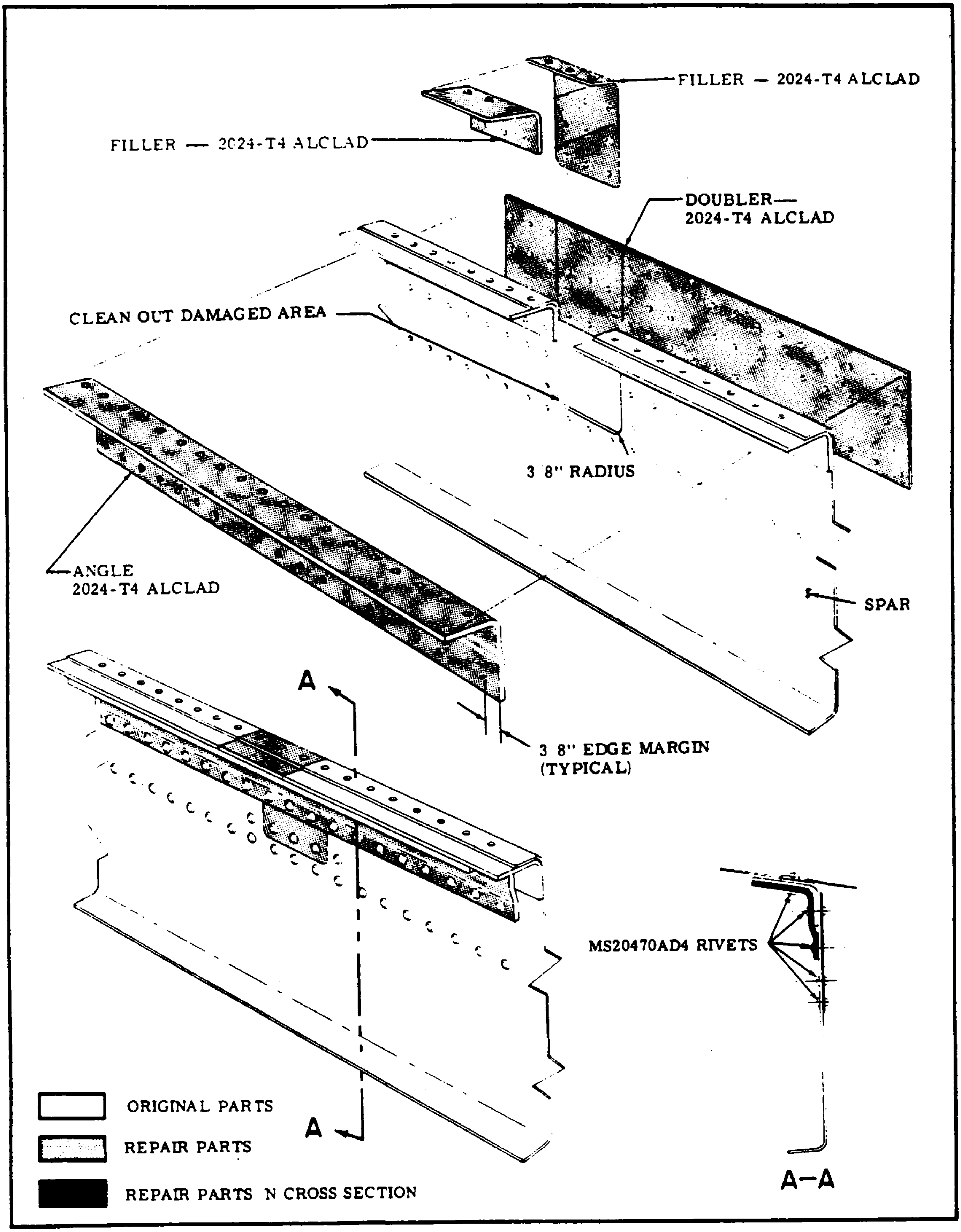


Figure 18-7. Wing Spar Repair (Sheet 1 of 4)

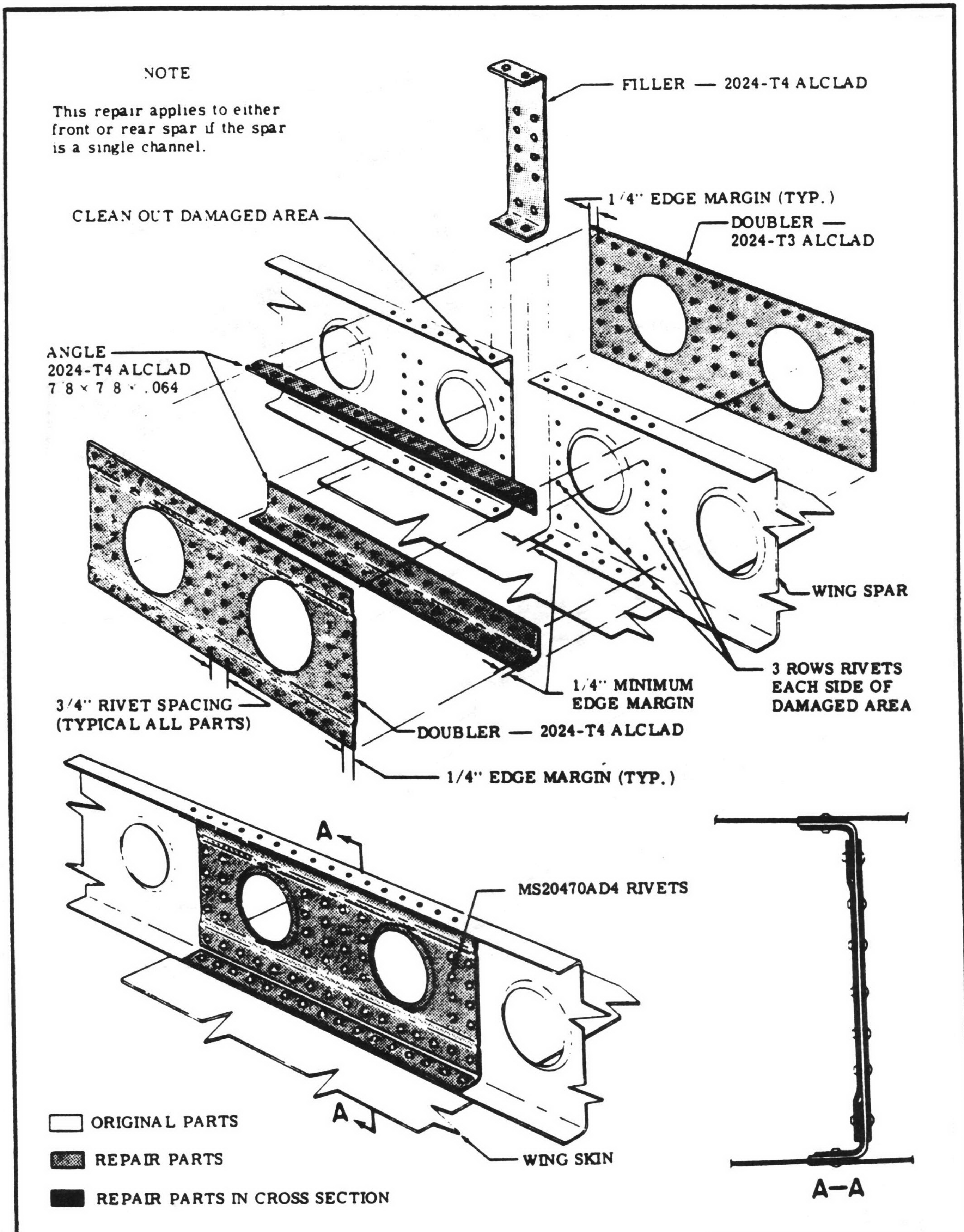


Figure 18-7. Wing Spar Repair (Sheet 2 of 4)

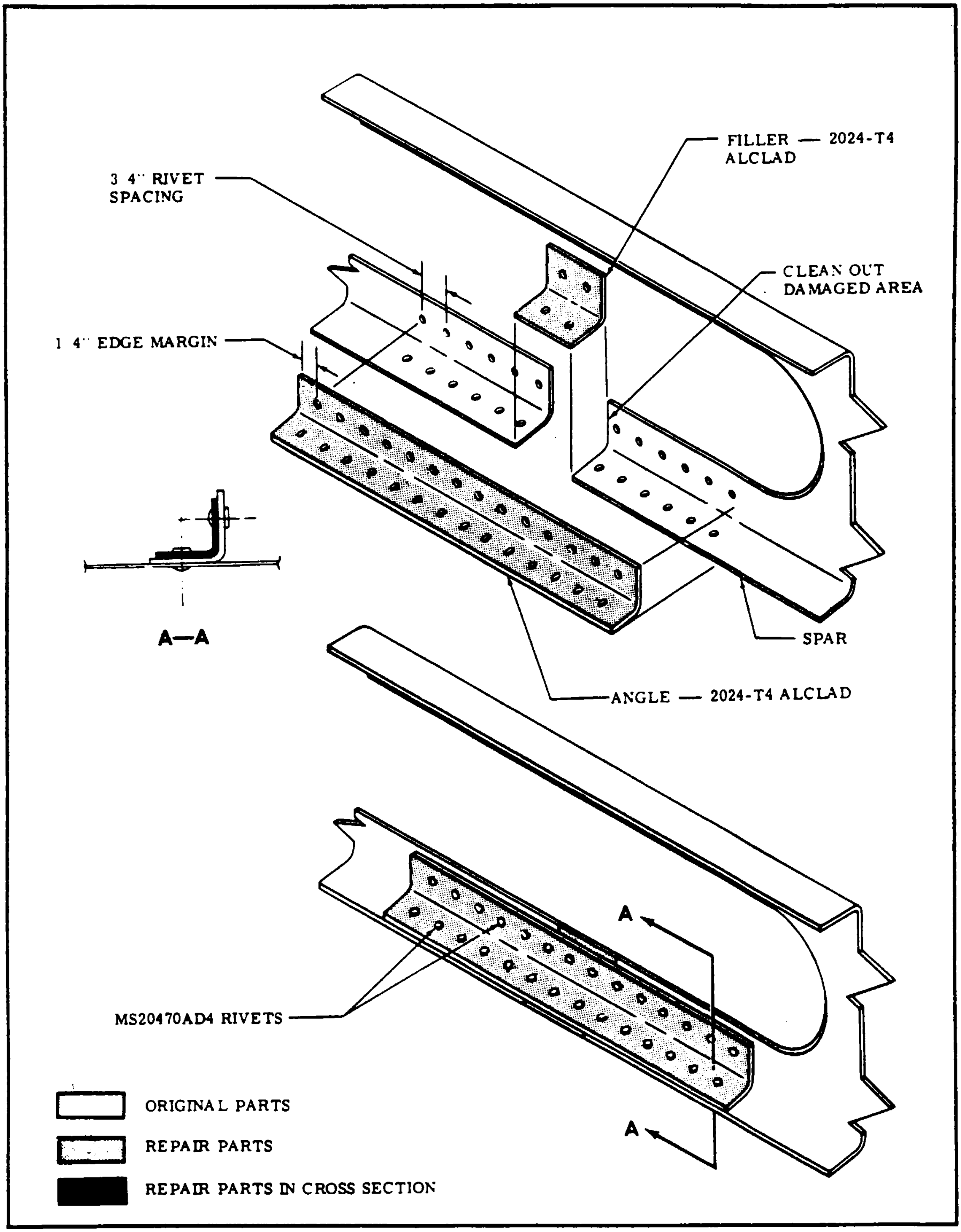


Figure 18-7. Wing Spar Repair (Sheet 3 of 4)

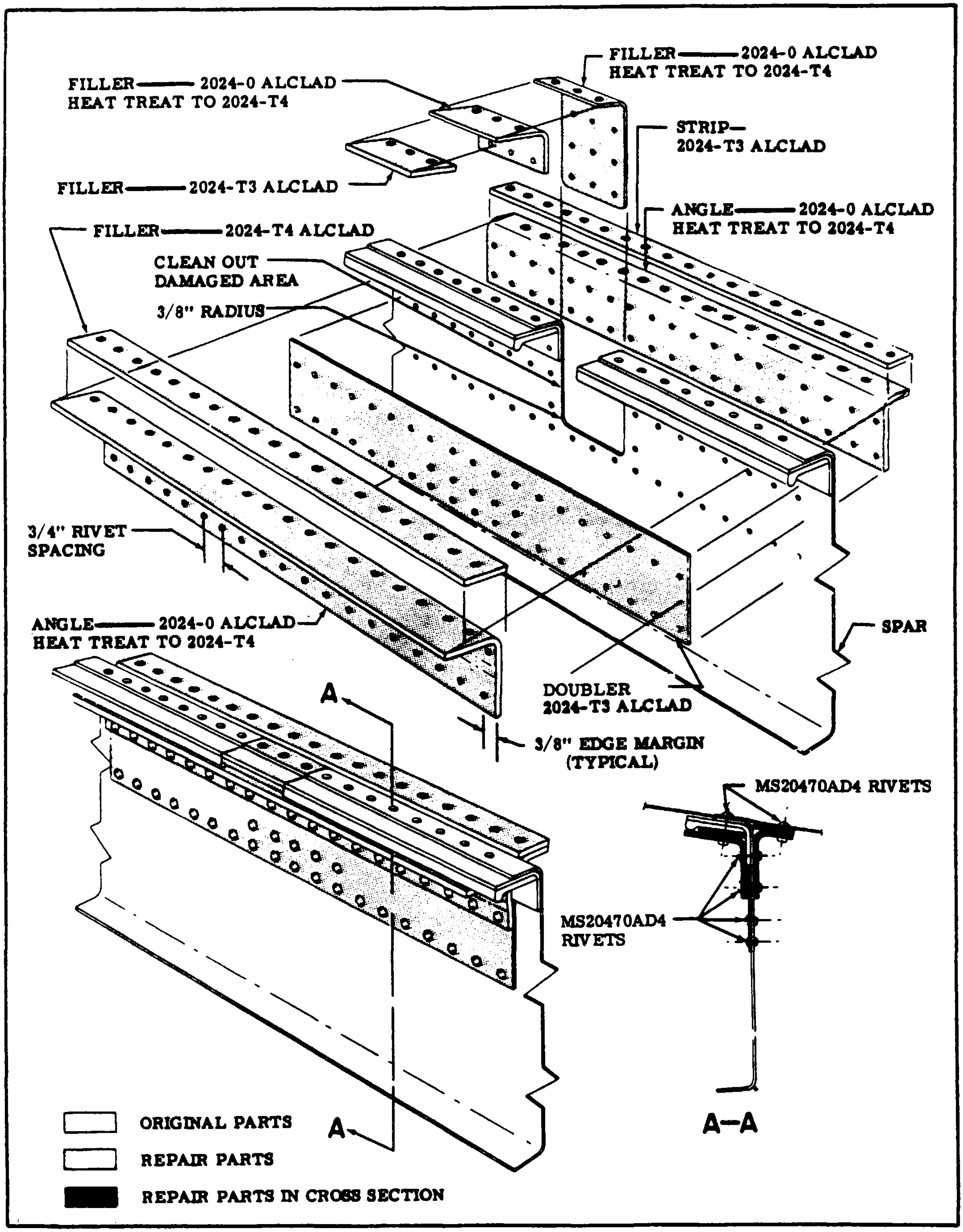


Figure 18-7. Wing Spar Repair (Sheet 4 of 4)

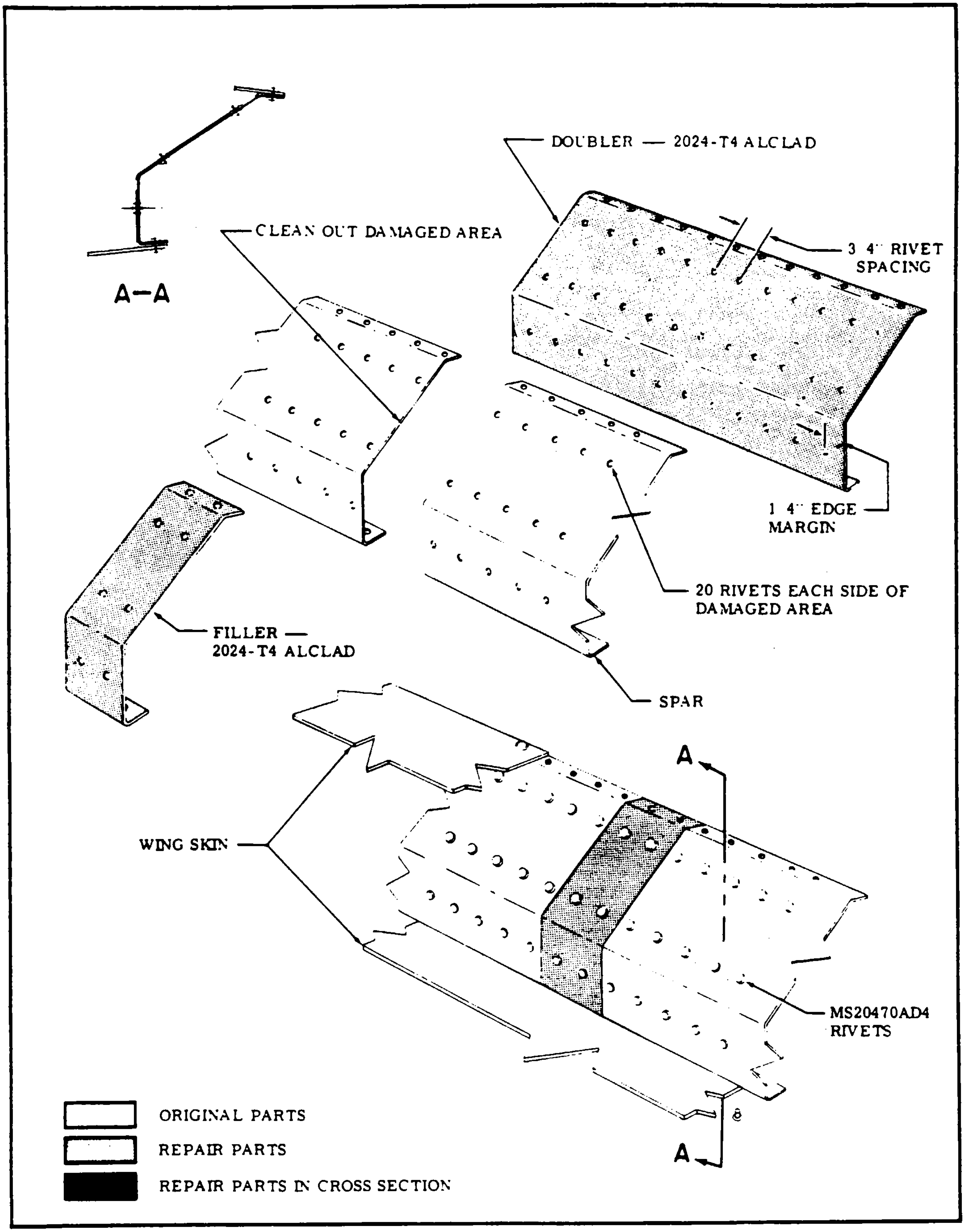


Figure 18-8. Auxiliary Spar Repair

NOTES:

1. Dimple leading edge skin and filler material; countersink the doubler.
2. Use MS20426AD4 rivets to install doubler.
3. Use MS20426AD4 rivets to install filler, except where bucking is impossible. Use CR162-4 Cherry (blind) rivets where regular rivets cannot be bucked.
4. Contour must be maintained; after repair has been completed, use epoxy filler as necessary and sand smooth before painting.
5. Vertical size is limited by ability to install doubler clear of front spar.
6. Lateral size is limited to seven inches across trimmed out area.
7. Number of repairs is limited to one in each bay.

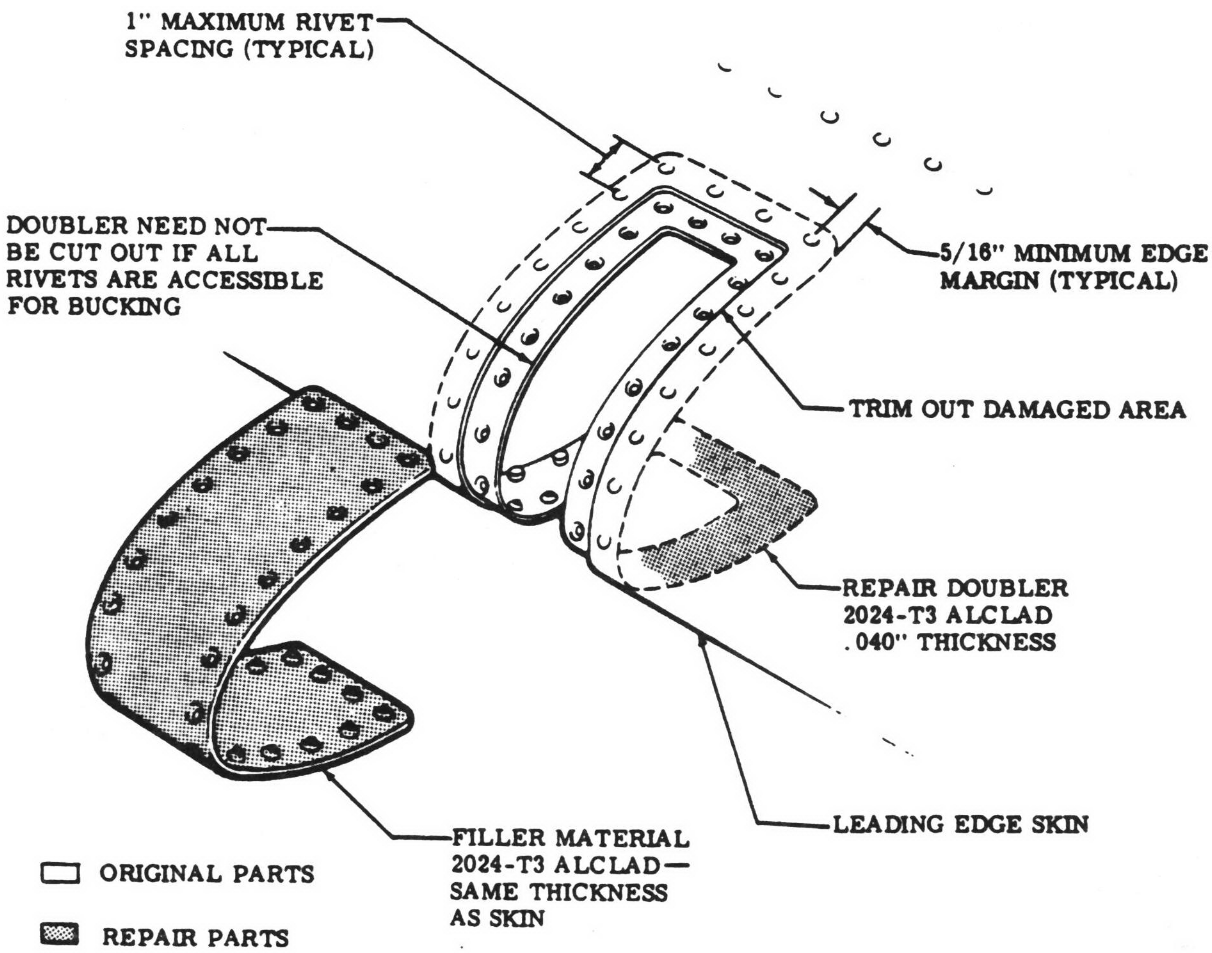


Figure 18-9. Leading Edge Repair

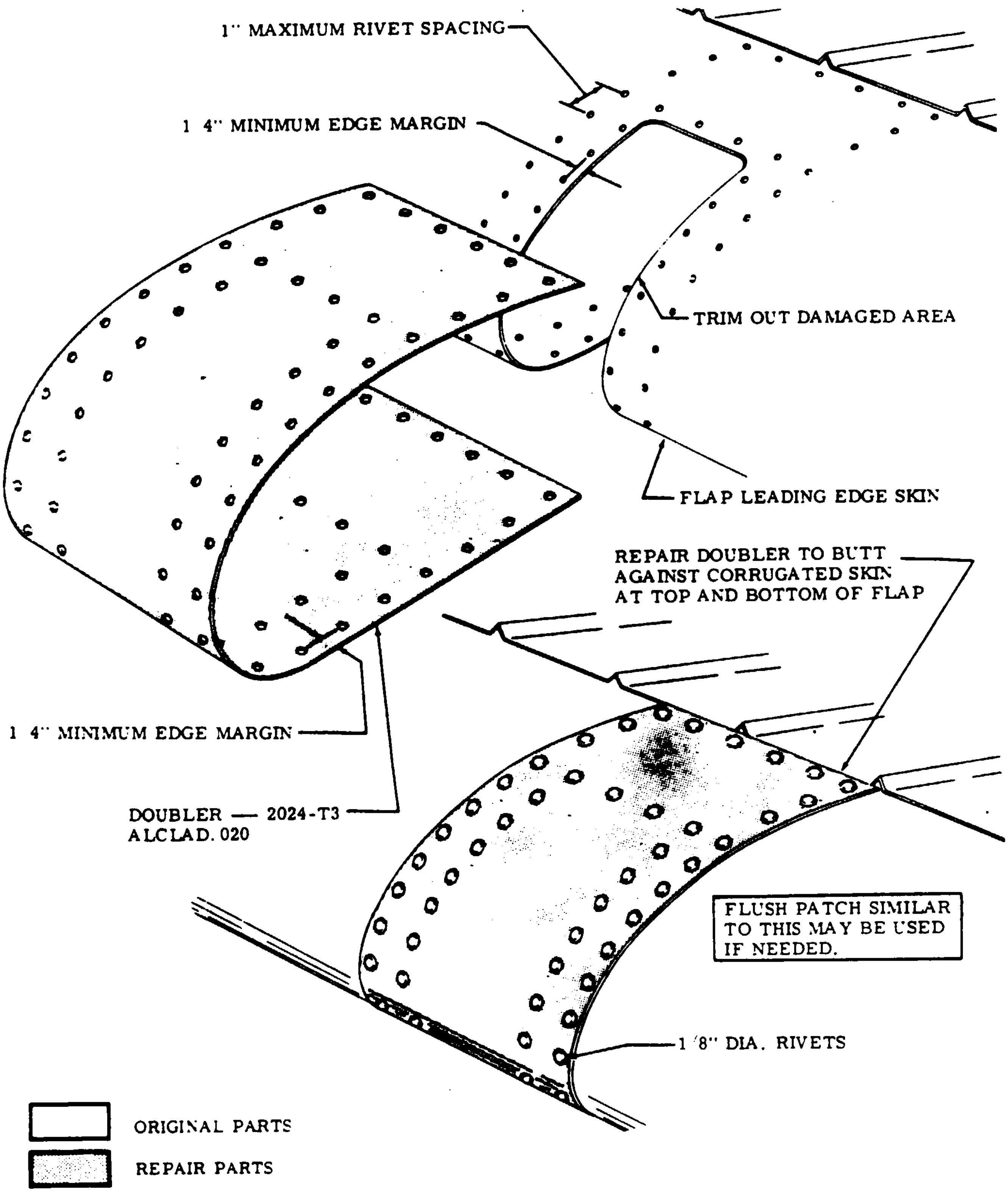


Figure 18-10. Flap Leading Edge Repair

(1) Use rivet pattern at wing station 23.62 for repair from wing station 23.62 to wing station 85.86. Use rivet pattern at wing station 100.50 for lap splice patterns from wing station 100.50 to 190.00. See figure 1-2 for wing stations.

(2) Use rivet spacing similar to the pattern at wing station 100.50 at leading edge ribs between lap splices.

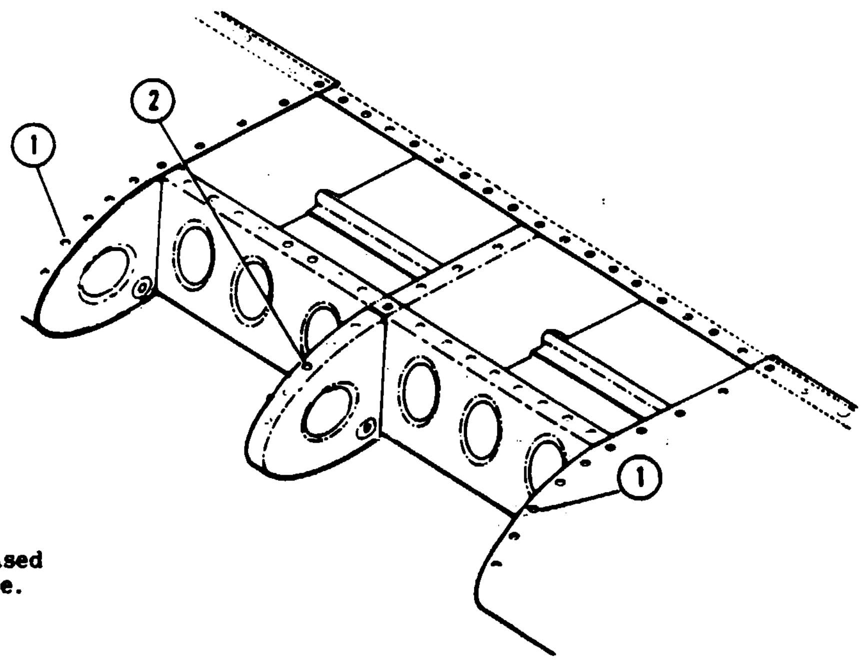
Select number of flush rivets to be used at each wing station leading edge rib from table below.

RIBS:

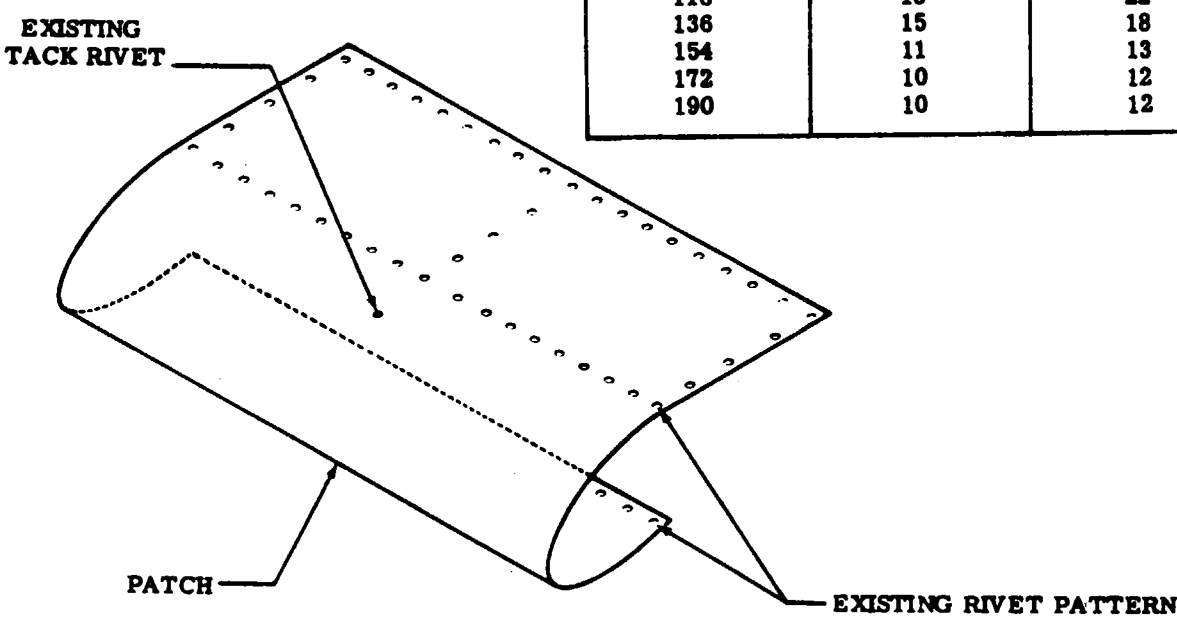
Blind rivets may be substituted for solid rivets in proportionally increased numbers in accordance with the table.

SPARS:

Blind rivets may be installed in wing spars only in those locations where blind rivets were used during original manufacture, ie fuel bay area of front spars on aircraft with integral fuel bays.



NUMBER OF FLUSH RIVETS IN DIMPLED SKIN REQUIRED IN REPLACEMENT LEADING EDGE SKINS		
WING STATION RIB	SOLID MS20426-4	BLIND CR2248-4
118	18	22
136	15	18
154	11	13
172	10	12
190	10	12



TYPICAL LEADING EDGE SECTION

Figure 18-11. Bonded Leading Edge Repair

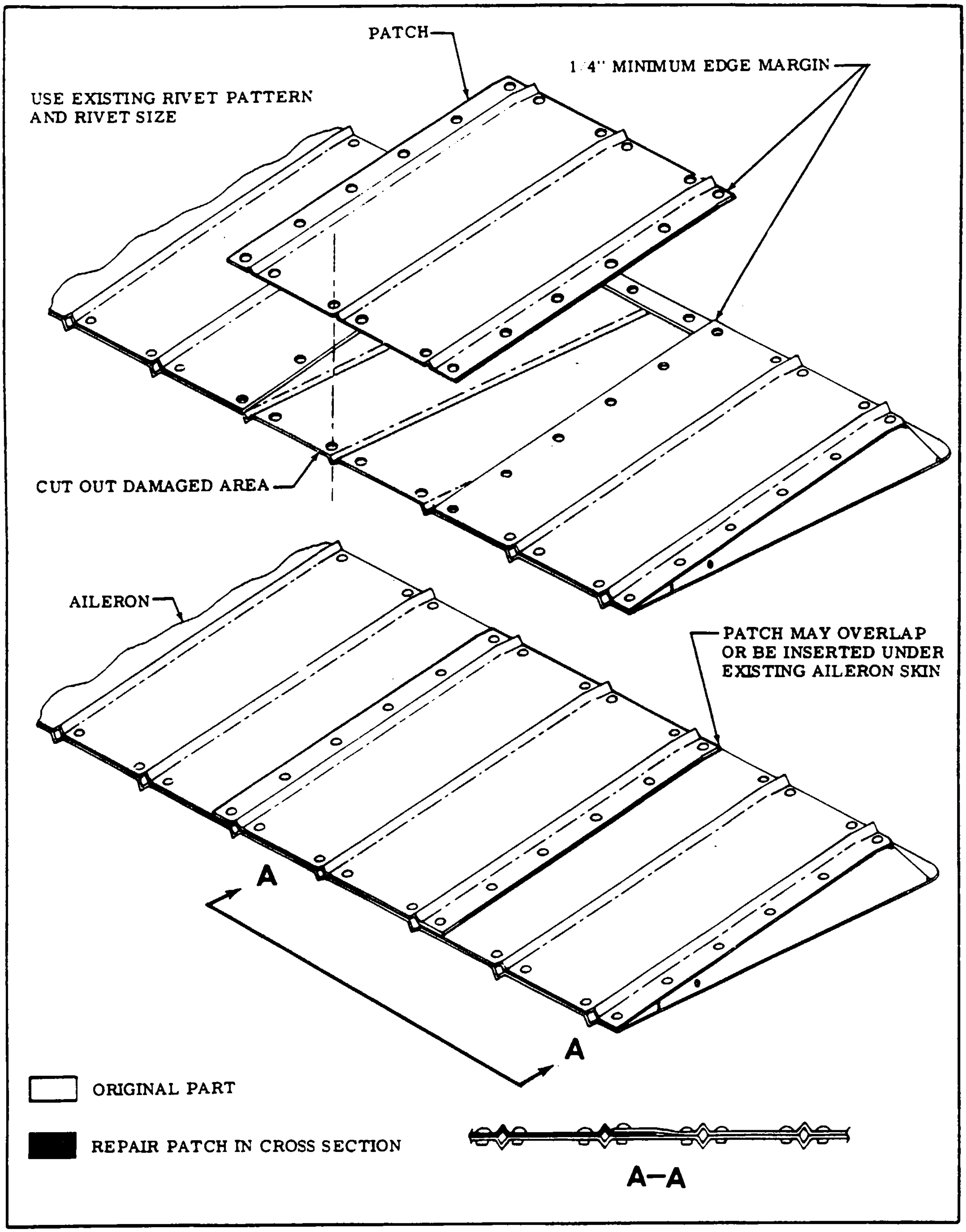
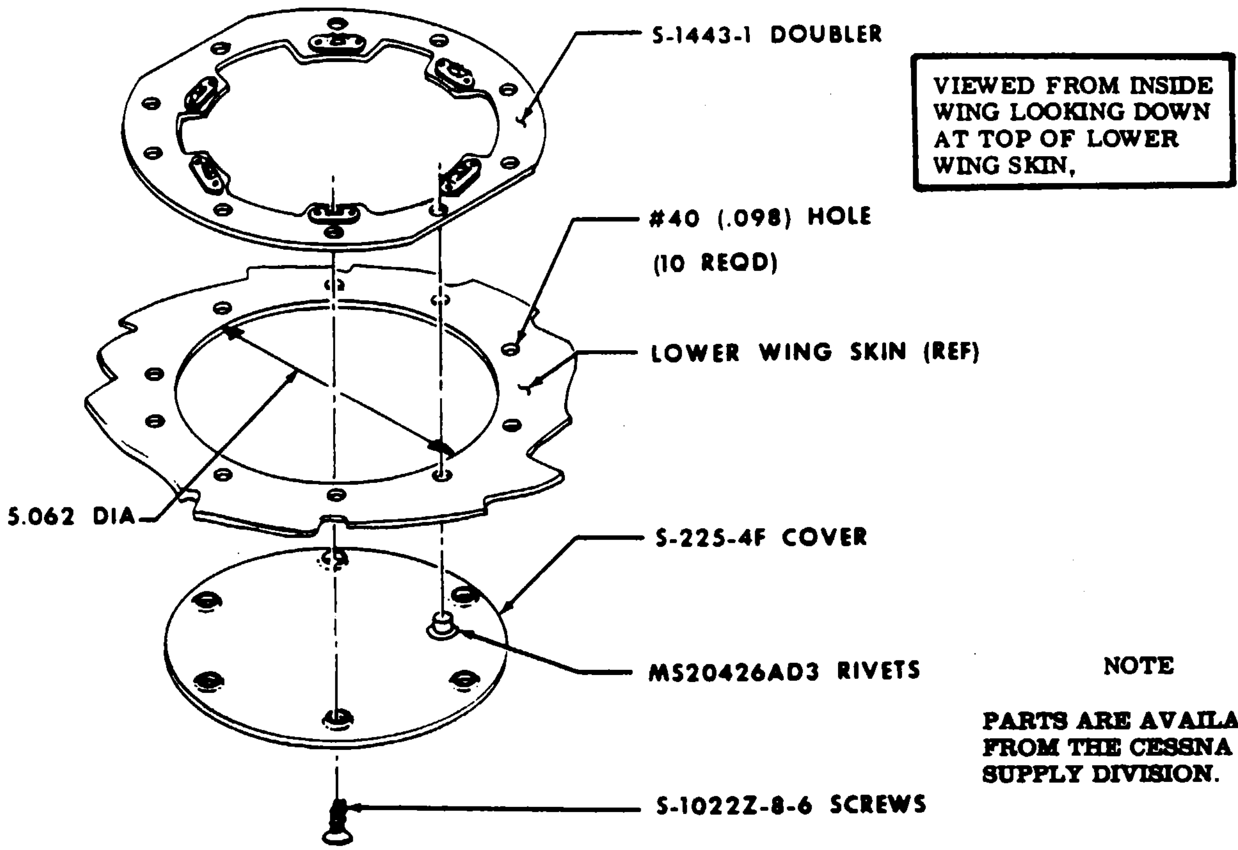


Figure 18-12. Corrugated Skin Repair



NOTE

PARTS ARE AVAILABLE FROM THE CESSNA SUPPLY DIVISION.

PRECAUTIONS

1. Add the minimum number of access holes necessary.
2. Any circular or rectangular access hole which is used with approved optional equipment installations may be added in lieu of the access hole illustrated.
3. Use landing light installations instead of adding access holes where possible. Do not add access holes at outboard end of wing; remove wing tip instead.
4. Do not add an access hole in the same bay where one is already located.
5. Locate new access holes near the center of a bay (spanwise).
6. Locate new access holes forward of the front spars as close to the front spar as practicable.
7. Locate new access holes aft of the front spar between the first and second stringers aft of the spar. When installing the doubler, rotate it so the two straight edges are closest to the stringers.
8. Alternate bays, with new access holes staggered forward and aft of the front spar, are preferable.
9. A maximum of five new access holes in each wing is permissible; if more are required, contact the Cessna Service Department.
10. When a complete leading edge skin is being replaced, the wing should be supported in such a manner so that wing alignment is maintained.

a. Establish exact location for inspection cover and inscribe centerlines.

b. Determine position of doubler on wing skin and center over centerlines. Mark the ten rivet hole locations and drill to size shown.

c. Cutout access hole, using dimension shown.

d. Flex doubler and insert through access hole, and rivet in place.

e. Position cover and secure, using screws as shown.

Figure 18-13. Access Hole Installation

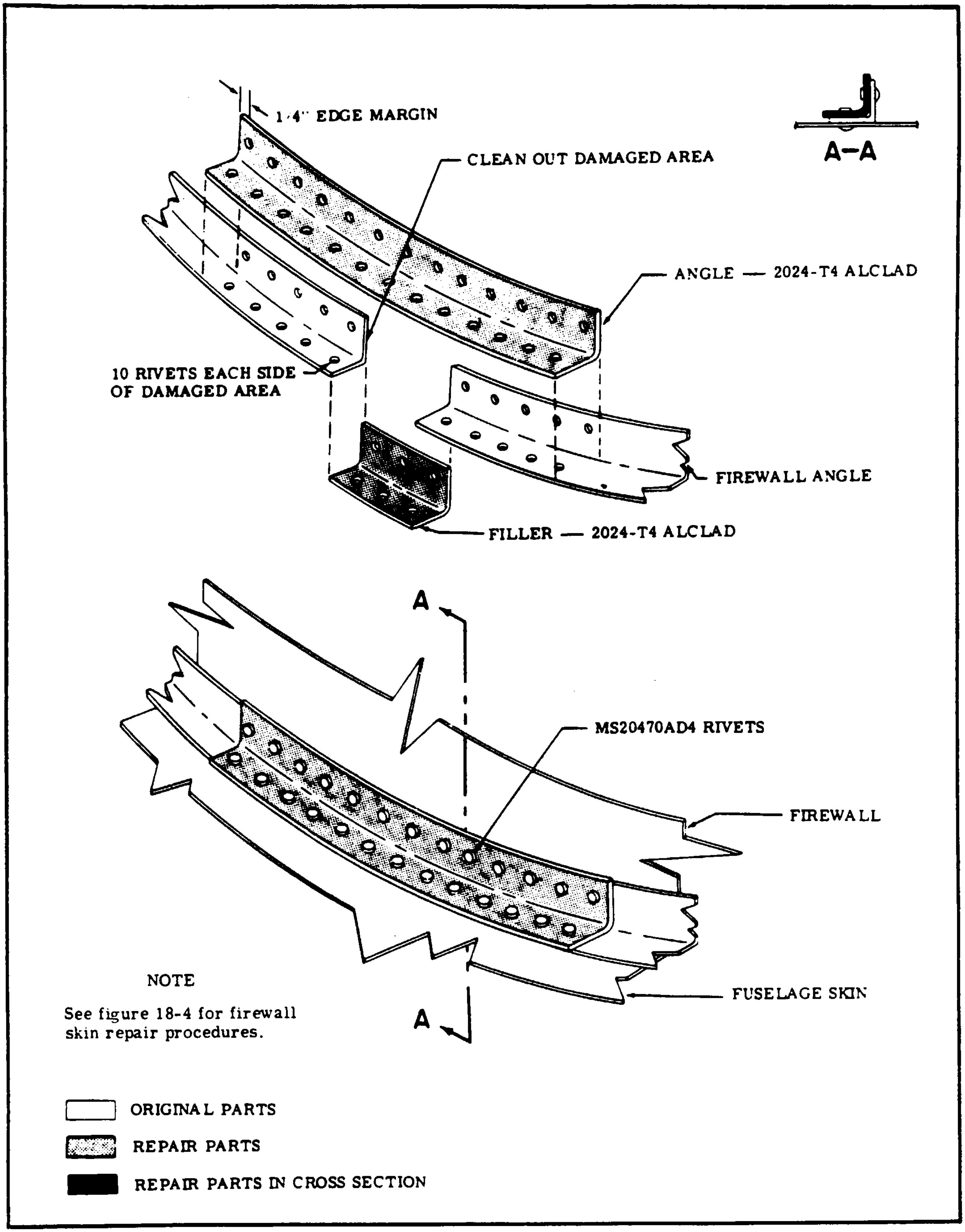


Figure 18-14. Firewall Angle Repair

SECTION 19

PAINTING

TABLE OF CONTENTS	Page No. Aerofiche/Manual

MATERIAL	NO/TYPE	CONFIGURATION	AREA OF APPLICATION
PAINT	ACRYLIC LACQUER	Domestic thru Serial 18265780	NOTE 1
	LACQUER	French	NOTE 1
	CES1099-IS ZINC RICH PRIMER CCM44A (K000486)	Both	NOTE 6
	CES1054-812 VHT ENAMEL	Both	NOTE 7
PRIMER	P60G2 With R7K44	Both	NOTE 2
	484-684 with 120-789 Reducer	Both	NOTE 2
THINNER	T-8402A	Domestic	NOTE 4
	T-6094A	Both	NOTE 3
	TOLUENE	Both	NOTE 8
SOLVENT	Methyl Ethyl Ketone (MEK)	Both	NOTE 5

1. Used on aircraft exterior.
2. Used with lacquer or acrylic lacquer on aircraft exterior.
3. Used to thin lacquer, for burndown, and to thin VHT enamel.
4. Used to thin acrylic lacquer and for burndown.
5. Used to clean aircraft exterior prior to priming.
6. Used on engine mount allover.
7. Used on designated areas of engine mount.
8. Used to thin VHT enamel.

CAUTION

When stripping paint from aircraft, do not allow stripper to contact ABS parts. Strong solvents, Xylol, Toluol, or Lacquer Thinner should not be used. ABS parts are to be cleaned with Naptha or soap and water, dried, and topcoated without priming.

19-1. PAINTING OF FORMED ABS PLASTIC PARTS. The following procedures outline some basic steps which are useful during touchup or painting of formed ABS plastic parts.

19-2. INTERIOR PARTS (finish coat of lacquer).

a. Painting of spare parts.

1. Ensure a clean surface by wiping with Naphtha to remove surface contamination.

CAUTION

Do not use strong solvents such as Xylol, Toluol or lacquer thinner since prolonged exposure can soften or embrittle ABS.

2. After the part is thoroughly dry it is ready for the lacquer topcoat. Paint must be thinned with lacquer thinner and applied as a wet coat to ensure adhesion.

b. Touch up of previously painted parts.

1. Light sanding is acceptable to remove scratches and repair the surface but care must be exercised to maintain the surface texture or grain.

2. Ensure a clean surface by wiping with Naphtha to remove surface contamination.

CAUTION

Do not use strong solvents such as Xylol, Toluol or lacquer thinner since prolonged exposure can soften or embrittle ABS.

3. After the part is thoroughly dry it is ready for the lacquer topcoat. Paint must be thinned with lacquer thinner and applied as a wet coat to ensure adhesion.

NOTE

Lacquer paints can be successfully spotted in.

19-3. EXTERIOR PARTS (acrylic topcoat).

a. Painting of spare parts.

1. Lightly scuff sand to remove scratches and improve adhesion.

2. Ensure a clean surface by wiping with Naptha to remove surface contamination.

CAUTION

Do not use strong solvents such as Xylol, Toluol or lacquer thinner since prolonged exposure can soften or embrittle ABS.

3. After the part is thoroughly dry it is ready for the topcoat. Paint must be thinned with appropriate acrylic thinner and applied as a wet coat to ensure adhesion.

b. Touch up of previously painted parts.

1. Lightly scuff sand to remove scratches and improve adhesion.

2. Ensure a clean surface by wiping with Naphtha to remove surface contamination.

CAUTION

Do not use strong solvents such as Xylol, Toluol or lacquer thinner since prolonged exposure can soften or embrittle ABS.

3. Apply a compatible primer - surfacer and sealer.

4. After the part is thoroughly dry it is ready for the topcoat. Paint must be thinned and applied as a wet coat to ensure adhesion.

NOTE

Acrylic topcoats can be successfully spotted in.

19-4. EXTERIOR PARTS (Epoxy or Polyurethane topcoat).

a. Painting of spare parts and touch up of painted parts.

1. Lightly scuff sand to remove scratches and improve adhesion.

2. Ensure a clean surface by wiping with Naphtha to remove surface contamination.

CAUTION

Do not use strong solvents such as Xylol, Toluol or lacquer thinner since prolonged exposure can soften or embrittle ABS.

3. Apply a primer compatible with Epoxy or Polyurethane topcoat.

4. After the part is thoroughly dry it is ready for the topcoat.

NOTE

Epoxy or Polyurethane topcoats cannot be successfully spotted in - finish should be applied in areas with natural breaks such as skin laps or stripe lines.

When painting interior and exterior polycarbonate parts, or where the part material is questionable, a "barrier primer" should be applied prior to the enamel, lacquer, epoxy or polyurethane topcoat.

NOTE

Enflex III is standard on serials 18265781 thru 18265784, 18265786 thru 18265806, 18265808, 18265809, 18265815, and 18265817.

ENMAR MODIFIED URETHANE

MATERIAL	NO/TYPE	AREA OF APPLICATION
PAINT	ENFLEX III ENAMEL	Standard Exterior, and Stripe Only configuration
	ENFLEX III ADDUCT	Catalyst for Enflex III Enamel
ACCELERATOR	URETHANE ACCELERATOR 120-975	Used to speed curing on stripes
PRIMER	WASH PRIMER 484-684	Used to prime aircraft for Enflex III topcoat
REDUCER	120-789	Used to thin 484-684
THINNER	Jet Glo 86T-10399 (110-655)	Used to thin Enflex III
	110-805	Used to thin Enflex III
RETARDER	110-996	Used to slow curing time

NOTE

Imron is standard on serials 18265785, 18265807, 18265810 thru 18265814, 18265816, and 18265818.

IMRON MODIFIED URETHANE

MATERIAL	NO/TYPE	AREA OF APPLICATION
PAINT	IMRON ENAMEL	Used as corrosion proof topcoat
	IMRON 192S Activator	Catalyst for Imron Enamel
PRIMER	WASH PRIMER P60G2	Used to prime aircraft for Imron Enamel
REDUCER/THINNER	IMRON Y8485S Reducer	Used to thin Imron Enamel
	Catalyst Reducer R7K44	Used to reduce P60G2

NOTE

Do not paint pitot tube, gas caps, or aileron gap seals. Also do not paint antenna covers which were not painted at the factory.

NOTE

This section contains standard factory materials listing and area of application. For paint number and color, refer to Aircraft Trim Plate and Parts Catalog. In all cases determine the type of paint on the aircraft as some types of paint are not compatible. Materials may be obtained from Cessna Service Parts Center.

MATERIAL	NO/TYPE	AREA OF APPLICATION
STRIPPER	Strypeeze Stripper	Used to strip primer overspray
CLEANER	DX 440 Wax and Grease Remover	Used to clean aircraft exterior
	Imperial Cleaner	Used to remove grease, bug stains, etc.
	Klad Polish	Used to clean aluminum finish
	808 Polishing Compound	Used to rub out overspray
SOLVENT	(MEK) Methyl Ethyl Ketone	Used to tack aircraft prior to topcoat
CLOTH	HEX Wiping Cloth	Used with solvent to clean aircraft exterior
FILLER	White Streak	Used to fill small dents
MASKING	Class A Solvent Proof Paper	Used to mask areas not to be painted
	Tape Y218	Used for masking small areas
	Tape Y231	Used for masking small areas

19-5. FACILITY. Painting facilities must include the ability to maintain environmental control; temperature at 65°F., and a positive pressure inside to preclude the possibility of foreign material damage. All paint equipment must be clean, and accurate measuring containers available for mixing protective coatings. Modified Urethane has a pot life of four to eight hours, depending on ambient temperature and relative humidity. Use of approved respirators while painting is a must, for personal safety. All solvent containers should be grounded to prevent static build-up. Catalyst materials are toxic, therefore, breathing fumes or allowing contact with skin can cause serious irritation. Material stock should be rotated to allow use of older materials first, because its useful life is limited. All supplies should be stored in an area where temperature is higher than 50°F., but lower than 90°F. Storage at 90°F is allowable for no more than sixty days providing it is returned to room temperature for mixing and use.

Modified urethane paint requires a minimum of seven days to cure under normal conditions, if humidity and temperature is lower, curing time will be extended a maximum of 14 days. During the curing period, indiscriminate use of masking tape, abrasive polishes, or cleaners can cause damage to finish. Desirable curing temperature for modified urethane is 60°F. for a resulting satisfactory finish.

19-6. CLEAN UP.

a. Inspect airplane for any surface defects, such as dents or unsatisfactory previous repairs, and correct according to paragraph 19-13.

b. Wipe excess sealer from around windows and skin laps with Form Tech AC aircraft window cleaning solvent. Mask windows, ABS parts, and any other areas not to be primed, with 3M tape and Class A Solvent Proof Paper. Care must be exercised to avoid cuts, scratches or gouges by metal objects to all plexiglass surfaces, because cuts and scratches may contribute to crazing and failure of plexiglass windows.

c. Methyl Ethyl Ketone (MEK) solvent should be used for final cleaning of airplanes prior to painting. The wiping cloths shall be contaminat and lint free HEX. Saturate cloth in the solvent and wring out so it does not drip. Wipe the airplane surface with the solvent saturated cloth in one hand, and immediately dry with a clean cloth in the other hand. It is important to wipe dry solvent before it evaporates.

When an airplane has paint or zinc chromate overspray on the exterior, stripper may be used to remove the overspray. The stripper may be applied by brush and will require a few minutes to soften the overspray. Heavy coatings may require more than one application of the stripper. Use extreme care to prevent stripper from running into faying surfaces on corrosion proofed airplanes. After removal of the overspray, clean the airplane with Methyl Ethyl Ketone (MEK) solvent in the prescribed manner.

NOTE

It is imperative that clean solvent be used in cleaning airplanes. Dispose of contaminated solvent immediately. Fresh solvent should be used on each airplane.

WARNING

Use explosion proof containers for storing wash solvents and other flammable materials.

19-7. PREPRIMING.

NOTE

Enflex III is standard on serials 18265781 thru 18265784, 18265786 thru 18265806, 18265808, 18265809, 18265815, and 18265817.

a. Above serialized aircraft have Enmar Wash primer EX-ER-7, Enflex III Enamel for overall color and stripes, which has been replaced with 484-684.

b. Mix one to one, 484-684 primer with 120-789Reducer by volume. Mix in stainless steel or lined containers only. After mixing, allow primer to set for 30 minutes before spraying. Pot life of the mixed primer is six (6) hours. All mixed material should be discarded if not used within this time. Pot pressure during spraying should be approximately 10 ± 1 psi. Air pressure should be 30 to 40 psi at the gun. Blow loose contanimant of the aircraft with clean dry air. Check all tapes to make sure it adheres properly. Cover the flap tracks, nose gear strut tube, wheels, and shimmy dampener rod ends. ABS parts and other preprimed parts do not receive wash primer.

NOTE

Imron is standard on serials 18265785, 18265807, 18265810 thru 18265814, 18265816, and 18265818.

c. Corrosion proofed and standard aircraft will receive Sherwin Williams Primer P60G2, DuPont Imron Enamel for over all color, and for stripes.

d. Mix 1 part P60G2 primer with 1 1/2 parts R7K44 catalyst reducer, by volume. Mix in stainless steel or lined containers only. After mixing allow primer to set for 30 minutes before spraying. Pot life of the mixed primer is six (6) hours, all mixed materials should be discarded if not used within that time limit. Pot pressure during spraying should be approximately 10 ± 1 psi. Air pressure should be 40 to 50 psi at the gun. Blow loose contaminant off the airplane with clean, dry air. Check all tapes to make sure they adhere properly. Cover the flap tracks, nose gear strut tube, wheels, and shimmy dampener rod ends. ABS parts and other preprimed parts do not receive wash primer.

WARNING

AIRCRAFT SHOULD BE GROUNDED PRIOR TO PAINTING TO PREVENT STATIC ELECTRICITY BUILD-UP AND DISCHARGE.

19-8. PRIMING.

a. Apply primer in one wet even coat. Dry film thickness to be .0003 to .0005 inches. Do not topcoat until sufficiently cured. When scratching with firm pressure of the fingernail does not penetrate the coating, the primer is cured. Primer should be topcoated within four hours after application.

19-9. PREPAINTING.

NOTE

Enflex III is standard on serials 18265781 thru 18265784, 18265786 thru 18265806, 18265808, 18265809, 18265815, and 18265817.

a. On above serialized aircraft, mix the required amount of Enflex III with Enflex III Adduct in a 4 to 1 ratio by volume. Mix thoroughly, and allow to stand for approximately 30 minutes before spraying. Enflex III can be thinned with Jet Glo thinner 86T-10399 (110-655) to obtain spraying viscosity, which should be checked after four hours and adjusted if necessary.

NOTE

Imron is standard on serials 18265785, 18265807, 18265810 thru 18265814, 18265816, and 18265818.

b. On standard aircraft, mix the required amount of Imron with Imron 192S Activator in a 3 to 1 ratio by volume. Mix thoroughly, and begin spraying immediately, because there is no induction time requirement. Imron can be thinned to spraying viscosity with Y8485S Imron Reducer. Viscosity should be checked and adjusted after four hours if necessary.

c. When applying modified urethane finishes, the painter should wear an approved respirator, which has a dust filter and organic vapor cartridge, or an air supplied respirator. All modified urethane finishes contain some isocyanate, which may cause irritation to the respiratory tract or an allergic reaction. Individuals may become sensitized to isocyanates.

d. The pot life of the mixture is approximately 6-8 hours at 75°F. Pot pressure should be approximately 12 psi during application. Air pressure at the gun should be 40 to 50 psi.

e. Scuff sand the primer only where runs or dirt particles are evident. Minor roughness or grit may be removed by rubbing the surface with brown Kraft paper which has been thoroughly wrinkled. Unmask ABS and other preprimed parts and check tapes. Clean surface with a jet of low pressure-dry air.

19-10. PAINTING ALL-OVER WHITE OR COLOR.

a. Complete painting of the plane should be done with 2 or 3 wet, even coats. Dry coats will not reflow, and will leave a grainy appearance.

b. Allow 5 minute period for the finish to flash off before moving aircraft to the oven.

c. Move to the force dry oven and dry for approximately 1 1/2 hours at 120°F to 140°F.

d. Dry film thickness of the overall color should be between 1.3 and 2.0 mils. Films in excess of 3.0 mils are not desirable.

19-11. MASKING FOR STRIPES.

a. Remove airplane from the oven. Allow airplane to cool to room temperature before masking.

b. Mask stripe area using 3M Tape Y231 or 3M Tape Y218 and Class A solvent proof paper. Double tape all skin laps to prevent blow by.

c. Airplanes which will have a stripe only configuration shall be masked, cleaned, and primed, in stripe area only.

d. If the base coat is not over 72 hours old, the stripe area does not require sanding. If sanding is necessary because of age or to remove surface defects, use #400 or #600 sand paper. Course paper will leave sand marks which will decrease gloss and depth of gloss of the finish. The use of power sanders should be held to a minimum, if used, exercise care to preclude sanding through the white base coat. Wipe surface to be striped with a tack cloth and check all tapes.

e. Stripe colors on Enflex III base coat will be Enflex III and on Imron base coat will be Imron Enamel. Mix as outlined in paragraph 19-9.

f. Painting of the stripe should be done with 2 or 3 wet-even coats. Dry coats will not reflow, and will leave a grainy appearance. Stripes may be force dried or air dried. Film thickness of a stripe is approximately 1.0 mil.

g. Do not remove masking tape and paper until the paint has dried to a "dry to touch" condition. Care should be exercised in removal of the masking to prevent damage to the finish.

h. Modified urethane finishes are sensitive to moisture, therefore, should be stored out of rain until cured.

19-12. TOUCH-UP.

NOTE

Application of a top coat thickness in excess of 5.0 mils, requires a control surface balance check.

When necessary to touch up or refinish an area, the defect should be sanded with #400 and followed by #600 sandpaper. Avoid, if possible, sanding through the primer. If the primer is penetrated over an area 1/2 inch square or larger, repriming is necessary. Avoid spraying primer on the adjacent paint as much as possible. Since urethane finishes cannot be "spotted in" repairs should be in sections extending to skin laps or stripe lines.

a. Dry overspray and rough areas may be compounded out with DuPont #808 rubbing compound.

b. Grease, bug stains, etc., may be removed from painted surfaces with DX440 Wax and Grease Remover or Imperial Cleaner. Klad Polish may be used on bare aluminum to remove stains, oxides, etc.

c. Rework areas, where paint or primer removal is required, may be stripped with Strypeeze Paint Removal. All traces of stripper must be removed before refinishing.

19-13. REPAIR OF DENTS.

a. To repair dents use White Streak Filler or equivalent. Mix White Streak in the correct proportion as recommended by the manufacturer.

b. Do not apply White Streak Filler over paint. All paint shall be removed in the repair area and the aluminum surface sanded lightly to increase adhesion. Apply the White Streak to a level slightly above the surrounding skin. After drying for 10-15 minutes, sand the filler flush with the skin surface, using care to feather the edges.

19-14. REFINISHING ENGINE MOUNTS. After completing a repair as directed in section 18, finish the entire engine mount with P/N CES1099-IS, (CCM44A), Zinc Rich Primer. Apply as follows:

a. Scuff sand or grit blast the entire mount to bare metal.

b. Wipe with solvent such as lacquer.

c. Thin primer by 25 to 30% with No. 2 thinner, and mix thoroughly.

d. Spray to a film thickness of 0.001" to 0.0015".

e. Material may be force dried at 180° to 200°F for 10 to 15 minutes.

NOTE

Aircraft with serials prior to 18260364 should have the entire mount refininshed after repair actions. Beginning with serial 18260364, only the affected areas need to be repaired and refinished.

SECTION 20
WIRING DIAGRAMS

CIRCUIT FUNCTION AND SPECIFIC CIRCUIT CODE LETTERS

A - Armament
B - Photographic
C - Control Surface
  CA - Automatic Pilot
  CC - Wing Flaps
  CD - Elevator Trim
D - Instrument (Other Than Flight or Engine Instrument)
  DA - Ammeter
  DB - Flap Position Indicator
  DC - Clock
  DD - Voltmeter
  DE - Outside Air Temperature
  DF - Flight Hour Meter
E - Engine Instrument
  EA - Carburetor Air Temperature
  EB - Fuel Quantity Gage and Transmitter
  EC - Cylinder Head Temperature
  ED - Oil Pressure
  EE - Oil Temperature
  EF - Fuel Pressure
  EG - Tachometer
  EH - Torque Indicator
  EJ - Instrument Cluster
F - Flight Instrument
  FA - Bank and Turn
  FB - Pitot Static Tube Heater and Stall Warning Heater
  FC - Stall Warning
  FD - Speed Control System
  FE - Indicator Lights
G - Landing Gear
  GA - Actuator
  GB - Retraction
  GC - Warning Device (Horn)
  GD - Light Switches
  GE - Indicator Lights
H - Heating, Ventilating and De-Icing
  HA - Anti-icing
  HB - Cabin Heater
  HC - Cigar Lighter
  HD - De-ice
  HE - Air Conditioners
J - Ignition
  JA - Magneto
K - Engine Control
  KA - Starter Control
  KB - Propeller Synchronizer
L - Lighting
  LA - Cabin
  LB - Instrument
  LC - Landing
  LD - Navigation
  LE - Taxi
  LF - Rotating Beacon
  LG - Radio
  LH - De-ice
  LJ - Fuel Selector
M - Miscellaneous
  MA - Cowl Flaps
  MB - Electrically Operated Seats
  MC - Smoke Generator
  MD - Spray Equipment
  ME - Cabin Pressurization Equipment
  MF - Chem O_2 - Indicator
P - D. C. Power
  PA - Battery Circuit
  PB - Generator Circuits
  PC - External Power Source
Q - Fuel and Oil
  QA - Auxilliary Fuel Pump
  QB - Oil Dilution
  QC - Engine Primer
  QD - Main Fuel Pumps
  QE - Fuel Valves
R - Radio (Navigation and Communication)
  RA - Instrument Landing
  RB - Command
  RC - Radio Direction Finding
  RD - VHF
  RE - Homing
  RF - Marker Beacon
  RG - Navigation
  RH - High Frequency
  RJ - Interphone
  RK - UHF
  RL - Low Frequency
  RM - Frequency Modulation
  RP - Audio System and Audio Amplifier
  RR - Distance Measuring Equipment (DME)
  RS - Airborne Public Address System
S - Radar
U - Miscellaneous Electronic
  UA - Identification - Friend or Foe
W - Warning and Emergency
  WA - Flare Release
  WB - Chip Detector
  WC - Fire Detection System
X - A. C. Power

FUNCTION CIRCUITS	GAUGE	BASE COLOR (or solid)	STRIPE COLOR
A + Power	16	Red	None
	18	Red	Black
	20	Red	White
		Red	Green
	22	Red	Yellow
Ground	16	Black	None
	18	Black	White
Mike Ground	22	Black	None
Radio Lights Dim	18	Yellow	None
Mike Audio	22	Tan	None
		Tan (Shielded)	None
Mike Key	22	White	Black
Radio Speaker	20	Green	None
Headphones	22	Blue	None
Dev + ●	22	Gray	Red
Dev – ●	22	Gray	Green

● "Dev +" and "Dev -" circuits are for use in Nav-o-matic 300 autopilots and any associated omni indicated circuits to which it connects.

NOTE

All other color coded wires are for general use in multi-conductor radio and autopilot harness assemblies.

CROSS REFERENCE LISTING OF SERIAL REQUEST NUMBERS
LISTED ON DIAGRAMA VS. AIRCRAFT SERIAL NUMBERS.

SR No. AIRCRAFT SERIAL NO.
SR4081 - 18254680
SR4642 - 18256685.
SR4905 - 18257626
SR5852 - 18259306
SR6030 - 18260056
SR6222 - 18259909
SR6292 - 18260315
SR6392 - 18260446
SR6452 - 18260264
SR6754 - 18260826
SR7126 - 18261786
SR7201 - 18261537
SR7320 - 18261798
SR7380 - 18262466
SR7473 - 18261863
SR7624 - 18262794

SR No. AIRCRAFT SERIAL NO.
SR7639 - 18262936
SR7469 - 18263476
SR7677 - 18263095
SR7692 - 18263476
SR7912 - 18264296
SR8085 - 18263666
SR8142 - 18265176
SR8259 - 18264295
SR8260 - 18263941
SR8463 - 18265966
SR8490 - 18265176
SR8499 - 18265176
SR8552 - 18265262
SR8633 - 18265720
SR8656 - 18265303
SR8783 - 18266591

SR No. AIRCRAFT SERIAL NO.
SR8861 - 18265966
SR9087 - 18266522
SR9113 - 18267301
SR9187 - 18266591
SR9193 - 18266612
SR9195 - 18266599
SR9215 - 18266978, F18200130
SR9369 - 18266500, F18200095
SR9437 - 18266738, F18200108
SR9583 - 18267167
SR9633 - 18267716, T18267717
SR9429 - 18266858
SR9785 - 18267756
SR9920 - 18267741
SR9952 - 18268056
SR10068 - 18268056
SR10213 - 18268059
SR10100 - 18268294

REVISION			
LET	DESCRIPTION	DATE	APPD
A	BY REV: SER OUT S-1844-1-1; SER IN S-1994-1-1; ADD DETAIL A, NOTE 1, DETAIL B, S-1991-1 & SR ED&RR 10472 (SR6222) ED&RR 10486 (SR6030) IX	DLB 5-23-68	ELY MOS
B	BY REV: SER OUT S-1575-1 & ADD S-1575-2 (SR7201)	BPH 6-16-72	
C	BY REV: ADD WIRE COLORS YEL D-PC6 GRN D-PC5 ; LG18 WAS 15/ YEL & GRN (NOW SHOP PRACTICE)	JEF 2-15-74	
D	BY REV: 1N2070 WAS 1570043-1, [illegible] DETAIL C : SER. ([illegible])	ES 9-13-74	
E	BY REV: ADD PG 4.1.3, DETAIL C, 1570043 & PACO (REF) (SR8259)	RS 6-11-75	JRS
F	BY REV: ADD DETAIL "D" SER OUT 0770719-2 S-1917-1 WAS S1994-1-1, MS3506-1 WAS AN2552-3A (NOW SHOP PRACTICE)(SR6754)(REF)	GDS 4-27-76	

NOTES:

1. OBSERVE POLARITY SYMBOLS ON DIODE WHEN INSTALLING ON MASTER SWITCH TERMINALS OR DIODE WILL FAIL WHEN SYSTEM IS ENERGIZED

INACTIVE
EFF THRU (SR 8403)
LSS 1-24-77
JAB

63-0916

ITEM NO	PART NO.	DESCRIPTION	
20	1570043	DIODE BOARD ASSY	
19	S-1579-2	CONTACTOR	
18	S-1991-1	CONTACTOR	
17	S-1917-1	RELAY	
16	0770719-2	DIODE ASSY	
15	X26263	.75Ω RESISTOR	
14	S-1091-5	FUSE	
13	20H3P	DIODE (B4970)	
12	1N2070	DIODE	
11	S-1660-1	CONTACTOR	
10	1570043-3	DIODE BOARD ASSY	
9	0770728-1	DIODE ASSY	
8	0412007-1	BAT. GND	
7	S-1673-1	STARTER CONTACTOR	
6	MS3506-1	RECEPTACLE	
5	S-1596-60	CKT BKR	
4	C669502-0202	INST CLUSTER KIT	
3	S-1844-1-1	MASTER SWITCH	
2	S-1579	BATTERY CONTACTOR	
1	0712605-1	BATTERY ASSY	

EQUIPMENT TABLE

WIRE CODE NO.	GA	MATERIAL	LG	TERMINALS			SERIALS
YEL (D-PC6)	18		18	S-1367-1-13	SOLDER		
GRN (D-PC5)	18		18	S-1367-1-13	SOLDER		
D-PC4	18		55	S-1493-1	S-1493-1		
D-PC3	18		5	S-1493-1	S-1367-1-10		
D-PC2	2		9	S-1367-7-14	S-1367-7-13		
D-DA3	8		31	S-1367-4-10	S-1367-4-10		
D-DA1	8		57	S-1367-4-10	S-1367-4-14		
D-PA13	2		35	S-1367-7-14	S-1367-7-13		
D-PA12	18		207	S-1493-1	S-1367-1-10		
D-PA11	2		180	S-1367-7-13	S-1367-7-14		
D-PA10	2		8	S-1367-7-10	S-1367-7-13		
D-PA7	18		4	S-1493-1	S-1367-1-8		

WIRE TABLE

CONTRACT NO:

	NAME	DATE
DESIGN	SIPES YR	6/3/68
GROUP	N Wise	6-27-68
DRAWN	YOUNGERS	6-25-68
CHECK	G Kelly	6-27-68
STRESS		6-25-68
PROJECT		
APPD	SHAVEY	6-27-68

Cessna AIRCRAFT CO.
COMMERCIAL AIRCRAFT DIV.
5800 E. PAWNEE
WICHITA, KANSAS

TITLE
WIRING DIAGRAM — BATTERY & EXTERNAL POWER SYSTEMS

SIZE	CODE IDENT. NO.	DWG NO.
C	71379	0770610

SCALE: NONE | 182 | PAGE: 4.1.2

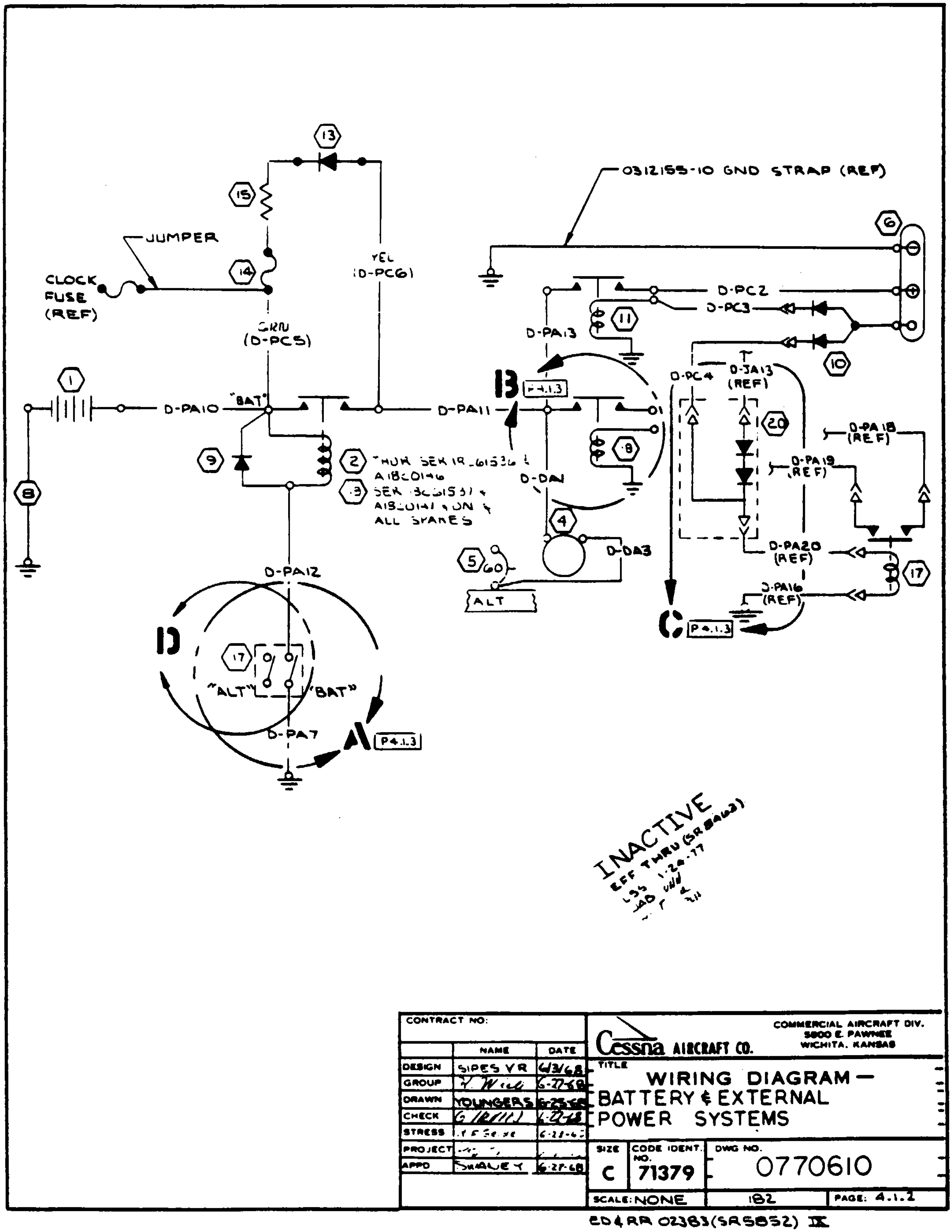
CES-1000 IS APPLICABLE
VENDOR CODES PER S-1400
CES-XXXX=CESSNA SPEC. NO.
S-XXX OR CMXXXX=CESSNA STD. NO.

SUPERSEDES: P 4.1.1

SUPERSEDED BY:

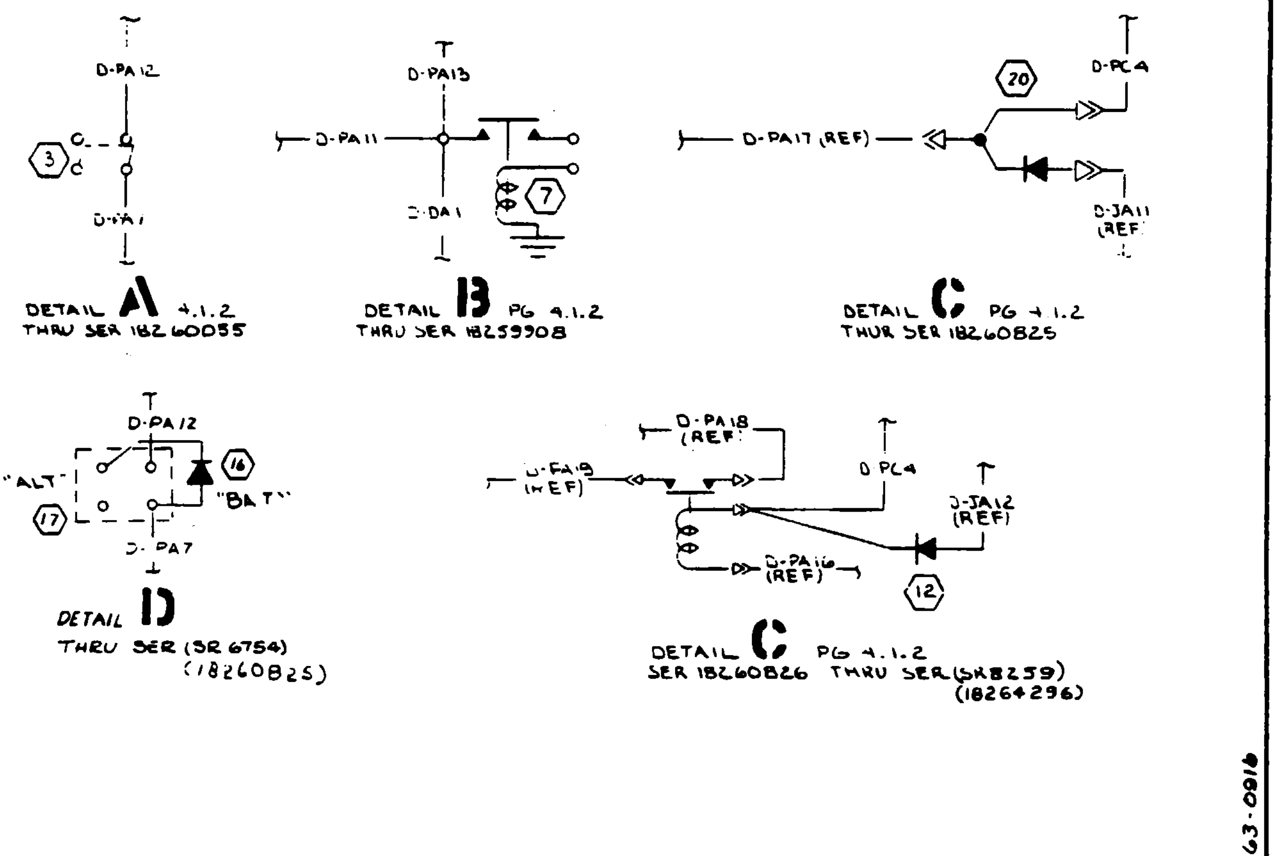
ED&RR 02383(SR5852) IX

Battery & External Power Systems (Sheet 1 of 2)



Battery & External Power Systems (Sheet 2 of 2)

REVISION			
LET	DESCRIPTION	DATE	APPD
F	SEE PG 4.1.2 FOR REVISON		



INACTIVE
EFF THRU (SR 8463)
LSS 1-24-77
JAB

WIRE CODE NO	GA	MATERIAL	LG	TERMINALS		SERIALS

WIRE TABLE

CONTRACT NO:	NAME	DATE
DESIGN		
GROUP		
DRAWN	R SWANSON	6-11-75
CHECK		
STRESS		
PROJ		
APPD		
OTHER		

Cessna AIRCRAFT CO. COMMERCIAL AIRCRAFT DIV. 5800 E. PAWNEE WICHITA, KANSAS

TITLE: WIRING DIAGRAM — BATTERY & EXTERNAL POWER SYSTEMS

SIZE	CODE IDENT NO	DWG NO
C	71379	0770610

SCALE: NONE | 82 | PAGE: 4.1.3

PART NO.	DESCRIPTION	

EQUIPMENT TABLE

CES-1000 IS APPLICABLE
VENDOR CODES PER S-1400
CES-XXXX=CESSNA SPEC. NO.
S-XXX OR CMXXXX=CESSNA STD. NO.

SUPERSEDES:

SUPERSEDED BY:

LET	DESCRIPTION		
E	BY REV: SER 18260826 & ON WAS SER 18260796 & ON; ADD DETAIL "C"; C611001-0102 PB33 & SER; SER OUT C611001-0101 & DFH-PB23 (SR7624) & (SR7639)	RAM 7-31-73	
F	BY REV SER OUT C611001-0102 & SER IN C611001-0201 SER (SR 1912)	RS 9-24-74	
G	BY REV: CHANGE CONTROL NUMBER 2-50-0141 WAS 12-173-0905 (SR7912)	GLW 10-29-74	
H	BY REV: DELETE 0770719-2 FROM DETAIL "B" (SR6754)(REF)	GDS 4-13-76	

REVISION

LET	DESCRIPTION	DATE	APPD
A	BY REV: SER OUT C611501-0101 & SER IN C611501-0102 ED&RR 10610 (SR6292)	RAINES 10/22/69	
B	BY REV ADD: C593001-0101 OVERVOLTAGE SENSOR, S-2135-1 LIGHT ASSY, WIRES D-PB31 & D-PB32 S-1943-1 WAS S-1943-1 (SR 6754) IX	WDA 6-1-71	
C	BY REV REPLACED S-1370-1 TERM WITH S 1635-1 TERM ON PB31 & PB32 WIRES ADDED S-1637-1 & S-1637-2 TO EQUIP TABLE. ADD TVA-1315 CAPACITOR TO E/T & F/O SER 18260928, 18260942 & ON		
D	BY REV: ADDED WIRE LENGTHS (NOW SHOP PRACTICE)	BGM 5-2-73	

NOTES:

1. AMP TERMINAL 42281-2 ON CONDUCTOR AMP TERMINAL 2-323931-2 ON SHIELD & GND WIRE
2. 8 GAUGE SHIELDED WIRE MATERIAL PER S1534-8-9
3. OBSERVE POLARITY SYMBOL ON DIODE WHEN INSTALLING ON SWITCH TERMINALS OR DIODE WILL FAIL WHEN SYSTEM IS ENERGIZED

INACTIVE
EFF THRU (SR8063) 1-20-77

WIRE TABLE

WIRE CODE NO.	GA	MATERIAL	LG	TERMINALS			SERIALS
D-PB33	8	S-1562-8-9	21	S-1943-1	S-1367-4-12		SER 18260927 & on
D-PB32	18		105	S-1635-1	42281-2	[illegible]	SER 18260928 & on
D-PB31	18		71	S-1367-1-6	S-1636-1		SER 18260928 & on
DFN-PB30	18		8	S-1367-1-6	S-1493-1		THRU SER 18260925
D-PB29	18		8	S-1367-1-12	S-1367-1-12		
D-PB28	18S		23	S-1367-1-12			
D-PB28	18S		23	S-1367-2-10			
D-PB27	18S		18	S-1367-1-6			
D-PB27	18S		18	S-1367-1-6			
DFN-PB23	10		21	S-1367-3-10	S-1367-3-10		THRU SER 18262936
D-PB22	18S		24	S-1367-1-6	S-1493-1		
D-PB22	18S		24	S-1367-1-6	S-1367-3-6		
D-PB26	18S		23	S-1367-1-10			
D-PB26	18S		23	S-1367-2-10			
D-PB20	8S		56	S-1943-2	S-1367-4-10		
D-PB20	8S		56	S-1367-3-10	S-1367-4-10		

EQUIPMENT TABLE

ITEM NO.	PART NO.	DESCRIPTION		
17	C611001-0201	REGULATOR		
16	C611001-0102	REGULATOR		
15	TVA-1315	CAPACITOR	56289	
14	S-1637-2	HOUSING-SOCKET		
13	S-1637-1	HOUSING-PIN		
12	C593001-0101	OVERVOLTAGE SENSOR		
11	S-2135-1	LIGHT ASSY		
10	C611501-0102	ALTERNATOR ASSY		
9	S-1360-5	CKT BKR		
8	C6AB-10A730-A	HOUSING (88690)		
7	S-1915-1	FILTER		
6	0770719-2	DIODE ASSY		
5	S-1994-1-1	SWITCH		
4	S-1596-60	CKT BKR		
3	0770038-2	FILTER		
2	C611001-0101	REGULATOR		
1	C611501-0101	ALTERNATOR ASSY		

CES-1000 IS APPLICABLE VENDOR CODES PER S-1400 CES-XXXX=CESSNA SPEC. NO. S-XXX OR CMXXXX=CESSNA STD. NO.

SUPERSEDES: P 4.7.1

SUPERSEDED BY:

CONTRACT NO:

	NAME	DATE
DESIGN	H WISE	7-18-69
GROUP	H Wise	7-18-69
DRAWN	D.L.BURKE	6-12-69
CHECK	R YOUNGERS	7-2A-69
STRESS	W C DAY	7-1-69
PROJECT	[illegible]	[illegible]
APPD	[illegible]	7-16-69

Cessna AIRCRAFT CO.
COMMERCIAL AIRCRAFT DIV. 5800 E. PAWNEE WICHITA, KANSAS

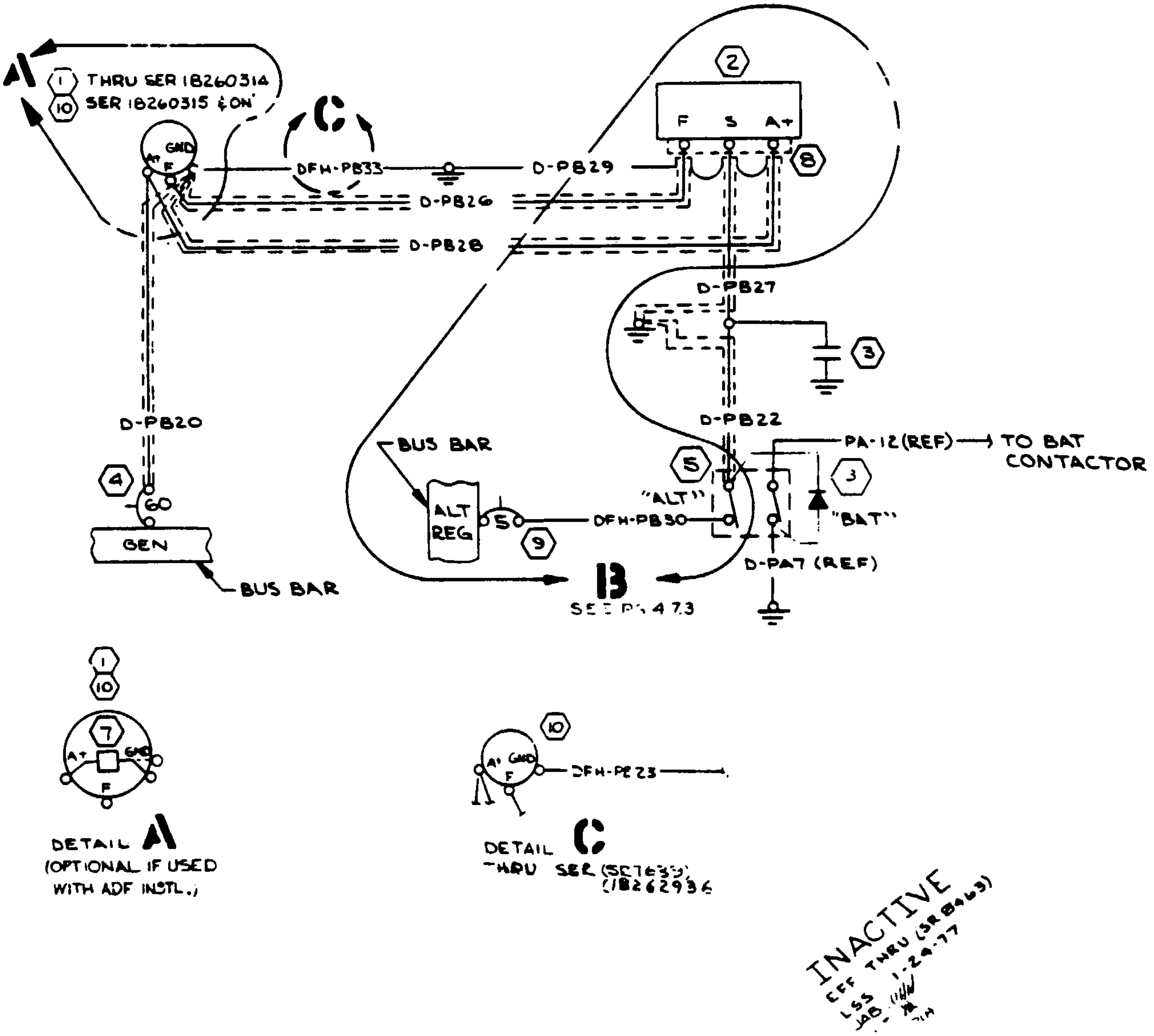
TITLE: WIRING DIAGRAM — ALTERNATOR SYSTEM, 60 AMP

SIZE: C | CODE IDENT. NO. 71379 | DWG NO. 0770610

SCALE: NONE | 182 | PAGE: 4.7.2

ED&RR 10486 (SR6030) IX
ED&RR 10508

Alternator System, 60 AMP (Sheet 1 of 2)



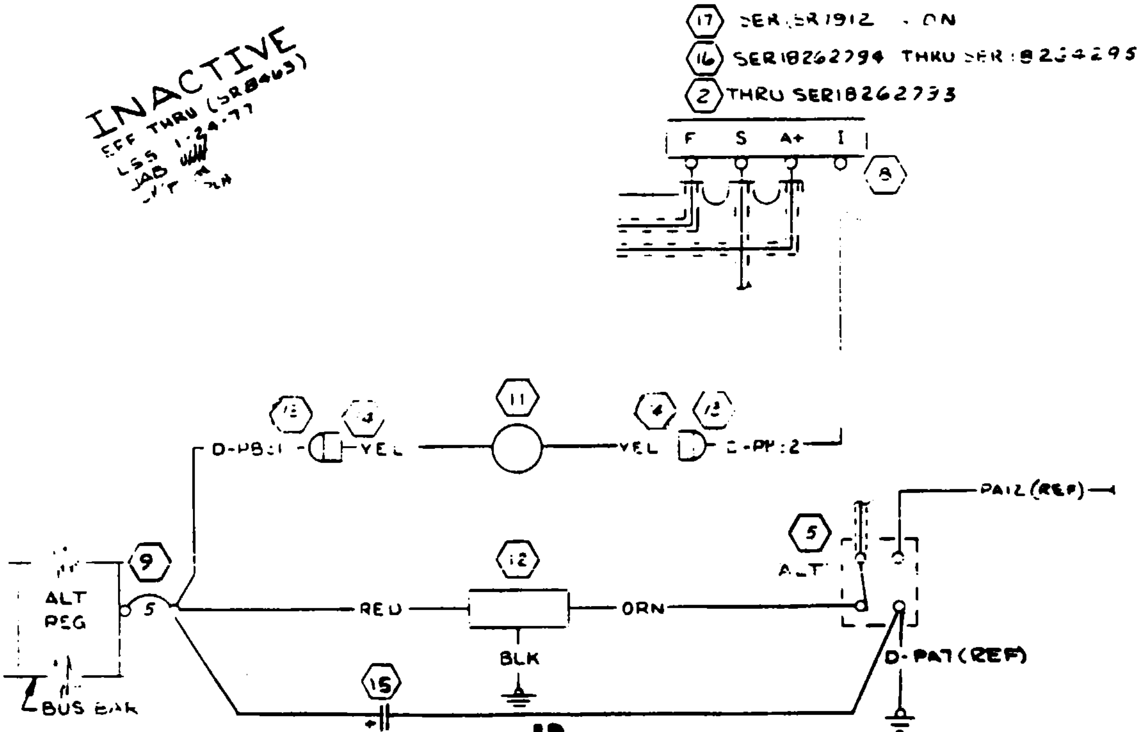
CONTRACT NO.			Cessna AIRCRAFT CO. COMMERCIAL AIRCRAFT DIV. 5800 E. PAWNEE WICHITA, KANSAS
	NAME	DATE	TITLE WIRING DIAGRAM — ALTERNATOR SYSTEM, 60 AMP
DESIGN	H WISE	7-18-69	
GROUP	H Wise	7-18-69	
DRAWN	D.L.BURKE	6-12-69	
CHECK	P. YOUNGERS	6-24-69	
STRESS		7-1-69	
PROJECT			SIZE C · CODE IDENT. NO. 71379 · DWG NO. 0770610
APPD		7-16-69	SCALE: NONE · 182 · PAGE: 4.7.2

ED&RR 10486 (SR6030)IX
ED&RR 10508

Alternator System, 60 AMP (Sheet 2 of 2)

REVISION			
LET	DESCRIPTION	DATE	APPD
H	SEE P. 4.7.1 FOR REV.		

INACTIVE
EFF THRU (SR8465)
LSS 1-24-77
JAB



DETAIL B
SER18260326 & ON

63-0816

WIRE CODE NO.	GA	MATERIAL	LG	TERMINALS			SERIALS

WIRE TABLE

ITEM NO.	PART NO.	DESCRIPTION	
	EQUIPMENT TABLE		

CES-1000 IS APPLICABLE
VENDOR CODES PER S-1400
CES-XXXX=CESSNA SPEC. NO.
S-XXX OR CMXXXX=CESSNA STD. NO.

SUPERSEDES:

SUPERSEDED BY:

CONTRACT NO:

	NAME	DATE
DESIGN		
GROUP	H Wise	1-6-71
DRAWN	ACKERSON	6-1-71
CHECK	L.C. WHITE	5-27-71
STRESS		
PROJ		
APPD		
OTHER		

Cessna AIRCRAFT CO. COMMERCIAL AIRCRAFT DIV. 5800 E. PAWNEE WICHITA, KANSAS

TITLE
WIRING DIAGRAM — ALTERNATOR SYSTEM, 60 AMP

SIZE	CODE IDENT. NO.	DWG NO
C	71379	0770610
SCALE: NONE	182	PAGE: 4.7.3

REVISION			
LET	DESCRIPTION	DATE	APPD
A	BY REV: ADD 0713854-4, S1360-10 & DETAIL A; SER OUT 0713854-3 ED & RR 10175 (SR6392) IX	M H 8-20-70	[illegible]
B	BY REV: ADD S-1917-1, PA18, PA19; SER OUT PA14, PA15 & S-1668-1 ADD DETAIL 'B' EORR 10135 SER 18260446 & ON	VPS 10/22/70	[illegible]
C	BY REV: ADDED WIRE LENGTHS & S-1367-3-8 WAS S-1367-3-6, PER D-PA18 & 19 (NOW SHOP PRACTICE)	BRM 5-2-73	[illegible]
D	BY REV: S-1493-[illegible] WAS S-1493-[illegible] PER D-PA15 (NOW SHOP PRACTICE)	TDW 10-6-73	[illegible]
E	BY REV: IN2070 WAS 1510043-1 [illegible] DETAIL [illegible] TERMINATED D-JA11 WITH DIODE AT PIN 5 OF S-1917-1. [illegible] 7 SER OUT AT SER 18260826 (SER 1826086)	[illegible] 4-15-74	[illegible]
F	BY REV: S-1360-15L WAS S-1360-10L AT BCN LT CKT BKR (SR 8260)	BAH 5-13-75	[illegible]
G	BY REV. ADD DETAIL "B", PA20 & JA13 (REF) & SECOND DIODE (SR8259)	RS 6-11-75	[illegible]
H	BY REV: ON S-1917-1 RELAY NO 4 TERMINAL WAS NO 5, AND NO. 5 TERMINAL WAS NO 4 (NOW SHOP PRACTICE/MEK 182 E0439)	JMS 9-22-75	[illegible]

INACTIVE
EFF THRU (SR 8462)
L.S.S. 1-24-77
JAD [illegible]

63-0916

WIRE CODE NO	GA	MATERIAL	LG	TERMINALS			SERIALS
D-PA20	18			S-1493-1	S-1493-1		SER 18264296 & ON
D-PA19	12		10	S-1493-3	S-1367-3-8		
D-PA18	12		10	S-1493-3	S-1367-3-8		
DFAW-PA80	14		14	S-1367-2-6	S-1367-2-6		
D-PA17	18		5	S-1493-1	S-1493-1		THRU SER 18260826
D-PA16	18		18	S-1493-1	S-1367-1-8		
D-PA15	14		12	S-1493-3	S-1367-2-6		THRU 18260445
D-PA14	14		10	S-1493-2	S-1367-2-6		THRU 18260445

WIRE TABLE

ITEM NO	PART NO.	DESCRIPTION	
13	1510043	DIODE BOARD ASSY	
12	S-1917-1	RELAY-POWER	
11	0713854-4	BUS BAR-PRIMARY 2	
10	S-1668-1	RELAY-POWER	
9	S-1360-60L	CIRCUIT BKR	
8	S-1360-20L	CIRCUIT BKR	
7	S-1360-15L	CIRCUIT BKR	
6	S-1360-10L	CIRCUIT BKR	
5	S-1360-5L	CIRCUIT BKR	
4	IN2070	DIODE	
3	0713854-3	BUS BAR-PRIMARY 2	
2	0713854-2	BUS BAR-PRIMARY 1	
1	0713854-1	BUS BAR-ELECTRONIC	

EQUIPMENT TABLE

CES-1000 IS APPLICABLE
VENDOR CODES PER S-1400
CES-XXXX=CESSNA SPEC. NO.
S-XXX OR CMXXXX=CESSNA STD. NO.

SUPERSEDES: P 4.6

SUPERSEDED BY:

CONTRACT NO:

	NAME	DATE
DESIGN	H WISE	7-18-69
GROUP	H Wise	7-18-69
DRAWN	D.L.BURKE	6-16-69
CHECK	R.YOUNGER	6-2A-69
STRESS	W. C. DALE	[illegible]
PROJ	[illegible]	[illegible]
APPD	[illegible]	7-16-69
OTHER		

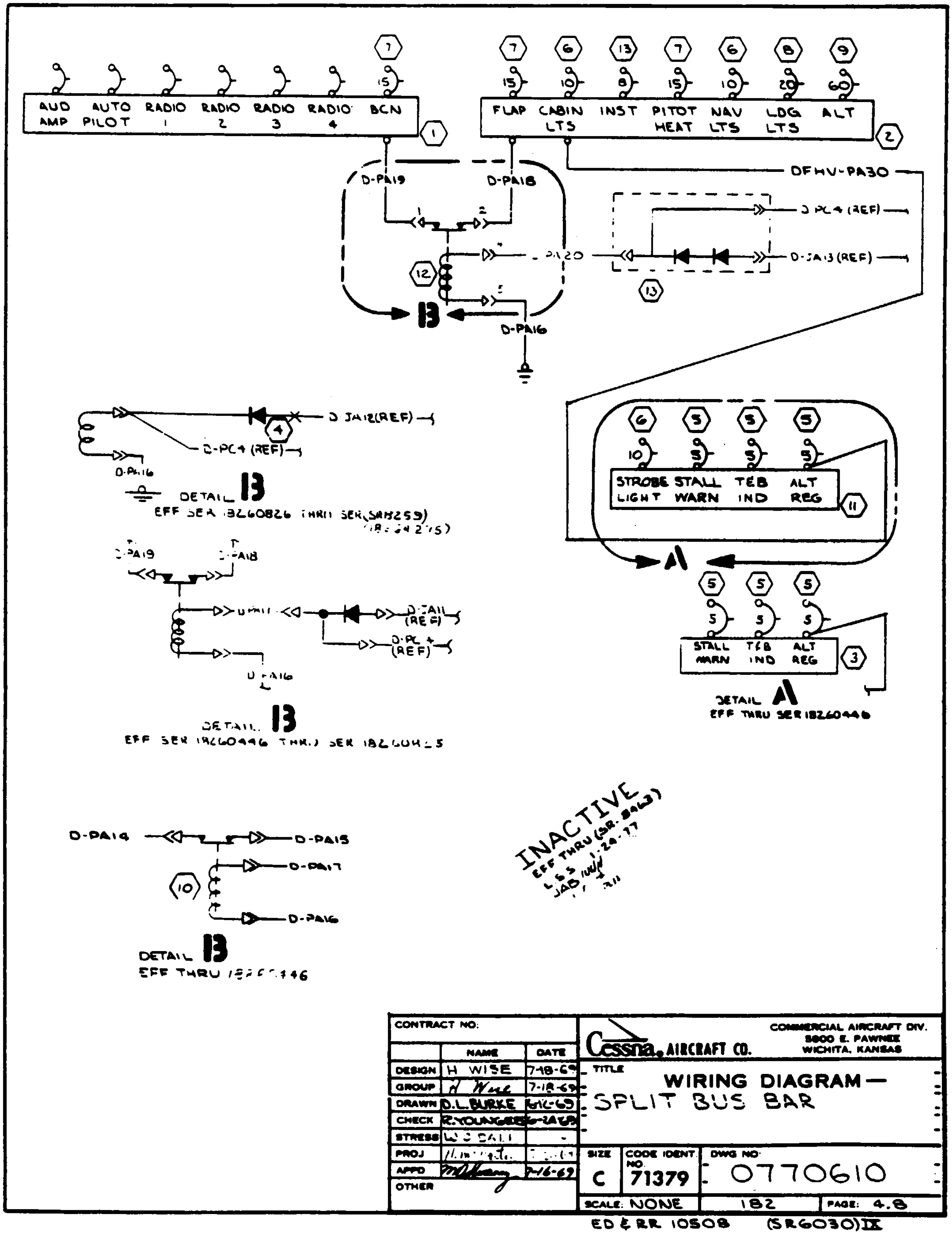
Cessna AIRCRAFT CO.
COMMERCIAL AIRCRAFT DIV.
5800 E. PAWNEE
WICHITA, KANSAS

TITLE WIRING DIAGRAM — SPLIT BUS BAR

SIZE	CODE IDENT. NO.	DWG NO
C	71379	0770610
SCALE NONE	182	PAGE: 4.8

ED & RR 10508 (SR6030) IX

Split Bus Bar (Sheet 1 of 2)



Split Bus Bar (Sheet 2 of 2)

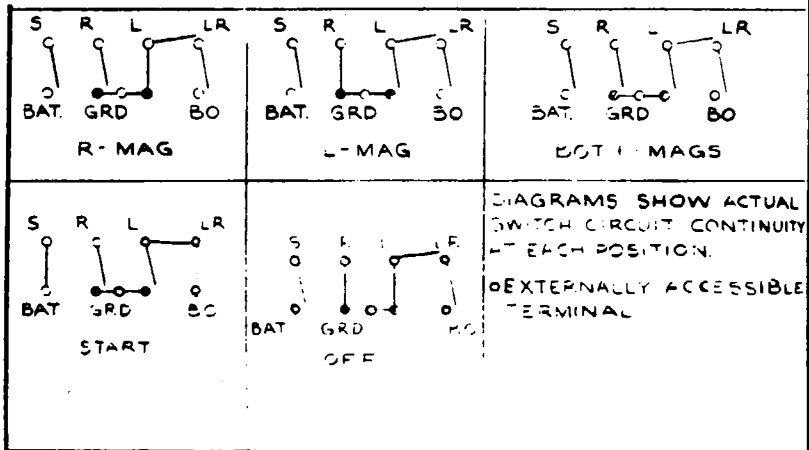
SER 18257080 THRU SER 18257082
SER 18257084 & ON

CHG LET	REVISION	BY DATE	CHK APPD
A	ON D-JA10 & D-JA9 WIRES 18-S WAS 18-S	G W 11-65	
B	BY REV: S-1673-1 WAS 0750027-1; ADD S-1994-1 DETAIL A & SR ED & RR 10472 (SR6222)	DLB 5-23-69	RLY WCD
C	BY REV: C292501-0101 WAS C718129-1; SER CUT C292501-0101 SER IN C292501-0105; SER CUT S-1360-10. SER IN S-1360-10L (547126) (SR6754) (REF)	RLY 3-1-72	
D	BY REV: S-1991-1 WAS S-1994-1 NOW SHOP PRACTICE		

NOTES:

1. SHORTING BAR BETWEEN "R" AND UNMARKED TERMINAL ADJACENT TO IT IS NOT USED FOR THIS CIRCUIT.
2. TERMINATE SHIELDS ON D-JA9 & D-JA10 WIRES AT THE SWITCH WITH S-1367-2-6 TERMINALS & CONNECT TO "GRD" TERMINAL ON SWITCH.
3. S-1367-1-10 TERMINAL ON HOT LEAD, S-1367-3-10 ON SHIELD.

INACTIVE EFF THRU (SR 8463) LSS 1-24-77 JAD



WIRE CODE NO	GA	MATERIAL	LG	TERMINALS			SERIALS
D-JA10	18-S		60	S-1367-1-6	2	3	
D-JA9	18-S		63	S-1367-1-6	2	3	
D-JA8	18		6	S-1367-1-6	S-1367-1-8		

WIRE TABLE

ITEM NO	PART NO	DESCRIPTION	INSTALLED ON
8	S-1360-10L	CIRCUIT BKR	
7	C292501-0105	IGNITION SWITCH	
6	S-1991-1	CONTACTOR	
5	S-1360-10	CIRCUIT BREAKER	
4	S-1673-1	START. SOLENOID	
3	SLICK #662	RIGHT MAGNETO	
2	SLICK #662	LEFT MAGNETO	
1	C292501-0101	SWITCH, MAG	

EQUIPMENT TABLE

CESSNA AIRCRAFT CO. COMMERCIAL AIRCRAFT DIVISION, WICHITA, KANSAS

	NAME	DATE
DRAWN	G WOOD	7-16-65
GROUP		7-16-65
CHECK		7-19-65
PROJ		

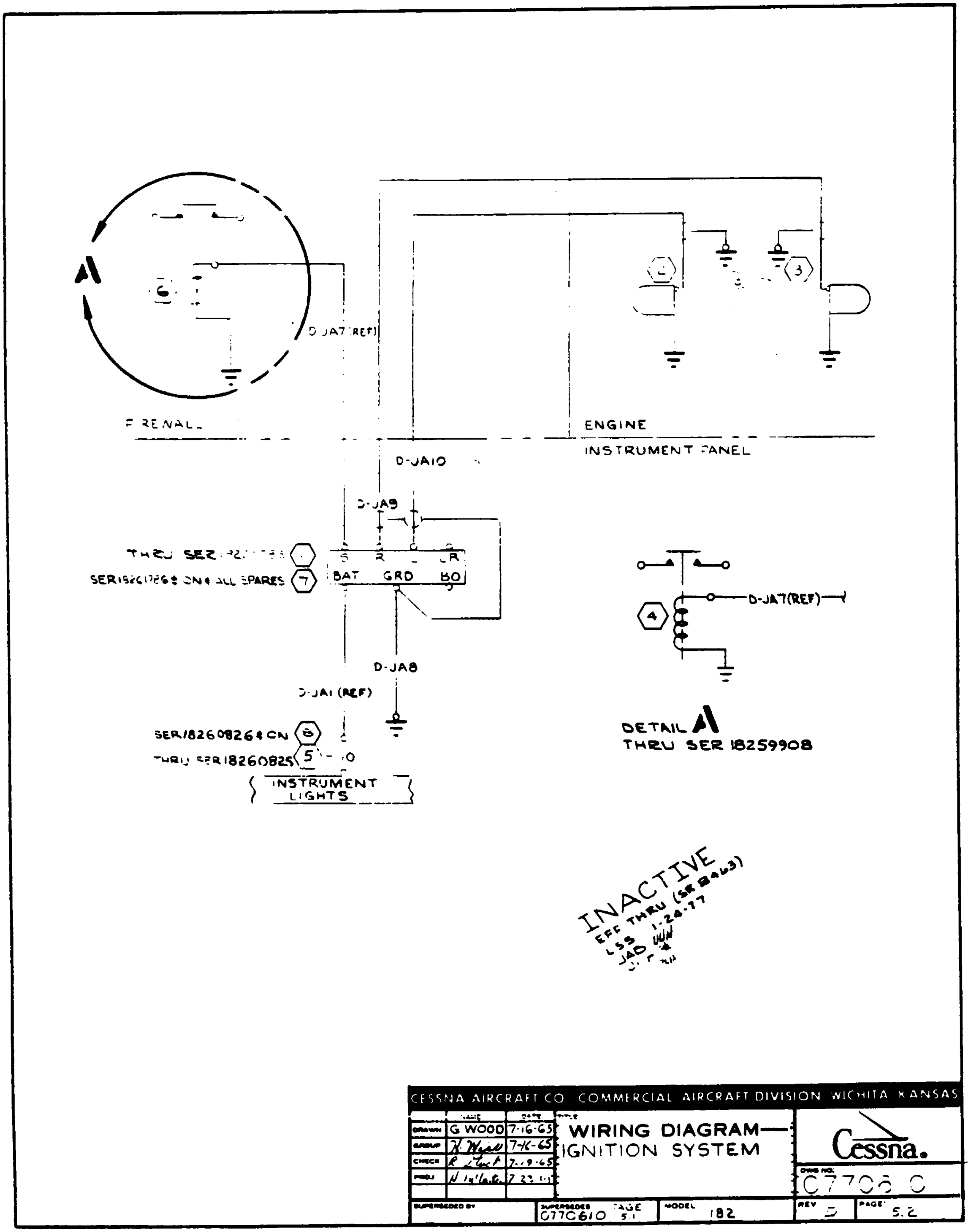
WIRING DIAGRAM— IGNITION SYSTEM

Cessna.

DWG NO C770610

SUPERSEDED BY | SUPERSEDES 0770610 PAGE 5.1 | MODEL 182 | REV D | PAGE 5.2

Ignition System (Sheet 1 of 2)



Ignition System (Sheet 2 of 2)

NOTES:
▷ PART OF 0750027 ENGINE INSTALLATION.

CHG LET	REVISION	BY / DATE	CHK / APPD
A	INST WAS INSTRUMENT LIGHTS; [illegible] 0712706- BUS BAR [illegible] WAS S-1272-10 [illegible] FROM [illegible]	[illegible] -29-64	[illegible]
B	ADD D-JA11, 1570042-1 D-PA11 (REF) WAS D-PA3 (REF) (SR4905)	J [illegible] 12-3-65	[illegible]
C	BY REV: S-1673-1 WAS 0750027-1, 1570043-1 WAS 1570042-1	[illegible] 7-29-67	MDS
D	BY REV: ADD DETAIL A, S-1991-1 & SR EDERR 10472 (SR6222)	DLB 5-23-68	RLY MDS
E	BY REV: C292501-0101 WAS 0713129-1; SER OUT C292501-0101. SER IN C292501-0105; SER OUT S-1860-10. SER IN S-1360-10L (SR7126) (SR6754) (REF)	RLY 3-1-72	[illegible]
F	BY REV: ADDED WIRE LENGTHS (NOW SHOP PRACTICE)	BRM 5-2-73	[illegible]
G	BY REV IN2070 WAS 1570043-1 ADDED DETAIL "B" SER OUT D-JA11; SER IN D-JA12 DELETE D-PC4 (REF) SER 18260826	GS 9-13-74	[illegible]
H	BY REV: ADD 1570043 JA13 & DETAIL B; SER OUT JA12 & DETAIL B (SR8259)	RS 6-11-75	[illegible]

INACTIVE
EFF THRU (SR 8463)
LSS 1-24-77
JAD

63-0916

WIRE CODE NO	GA	MATERIAL	LG	TERMINALS			SERIALS
D-JA13	18			S-1993-1	S-1367-1-6		SER (SR8259) & ON
D-JA12	18			S-1370-1	S-1367-1-6		SER 18260826 THRU SER (SR8259)
D-JA11	18		10	S-1993-1	S-1367-1-6		SER 18257626 THRU SER 18260825
D-PA8	2		10	S-1367-7-14	S-1367-7-14		
D-JA7	18		77	S-1367-1-6	S-1367-1-10		
D-JA1	18		9	S-1367-1-6	S-1367-1-8		

WIRE TABLE

ITEM NO	PART NO	DESCRIPTION	INSTALLED ON
10	1570043	DIODE BOARD ASSY	
9	S-1360-10L	CIRCUIT BKR	
8	C29-501-0105	IGNITION SWITCH	
7	1N2070	DIODE	
6	S-1360-10	CIRCUIT BREAKER	
5	C292501-0105	SWITCH	
4	▷	STARTER	
3	S-1673-1	START. SOLENOID	
2	S-1991-1	CONTACTOR	
1	[illegible]-2	CONTACTOR BAT.	

EQUIPMENT TABLE

CESSNA AIRCRAFT CO. COMMERCIAL AIRCRAFT DIVISION WICHITA KANSAS

	NAME	DATE
DRAWN	[illegible]	[illegible]
GROUP	[illegible]	
CHECK	[illegible]	[illegible]
PROJ	[illegible]	[illegible]

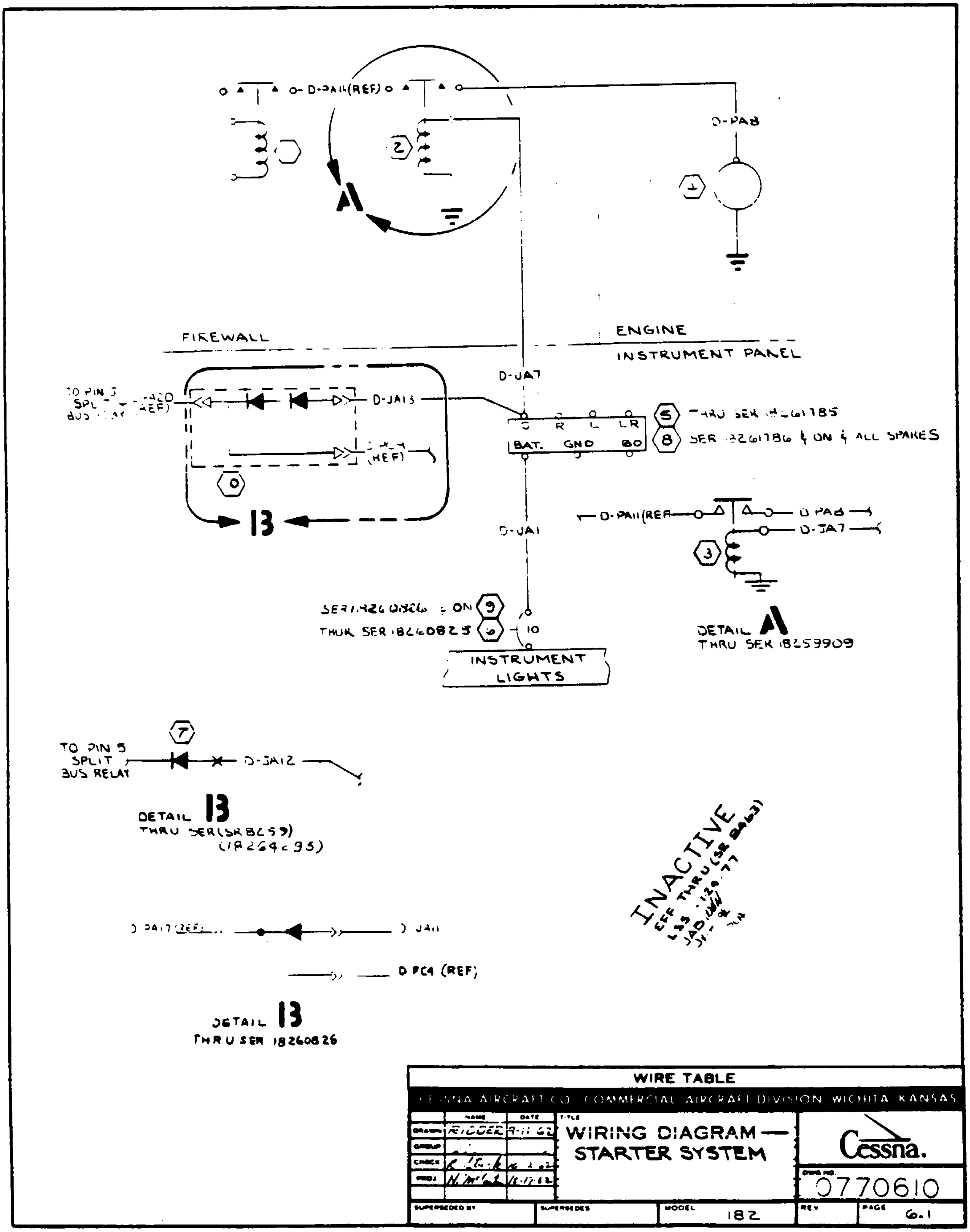
TITLE: WIRING DIAGRAM — STARTER SYSTEM

Cessna.

DWG NO 0770610

SUPERSEDED BY	SUPERSEDES	MODEL	REV	PAGE
		182		6.1

Starter System (Sheet 1 of 2)



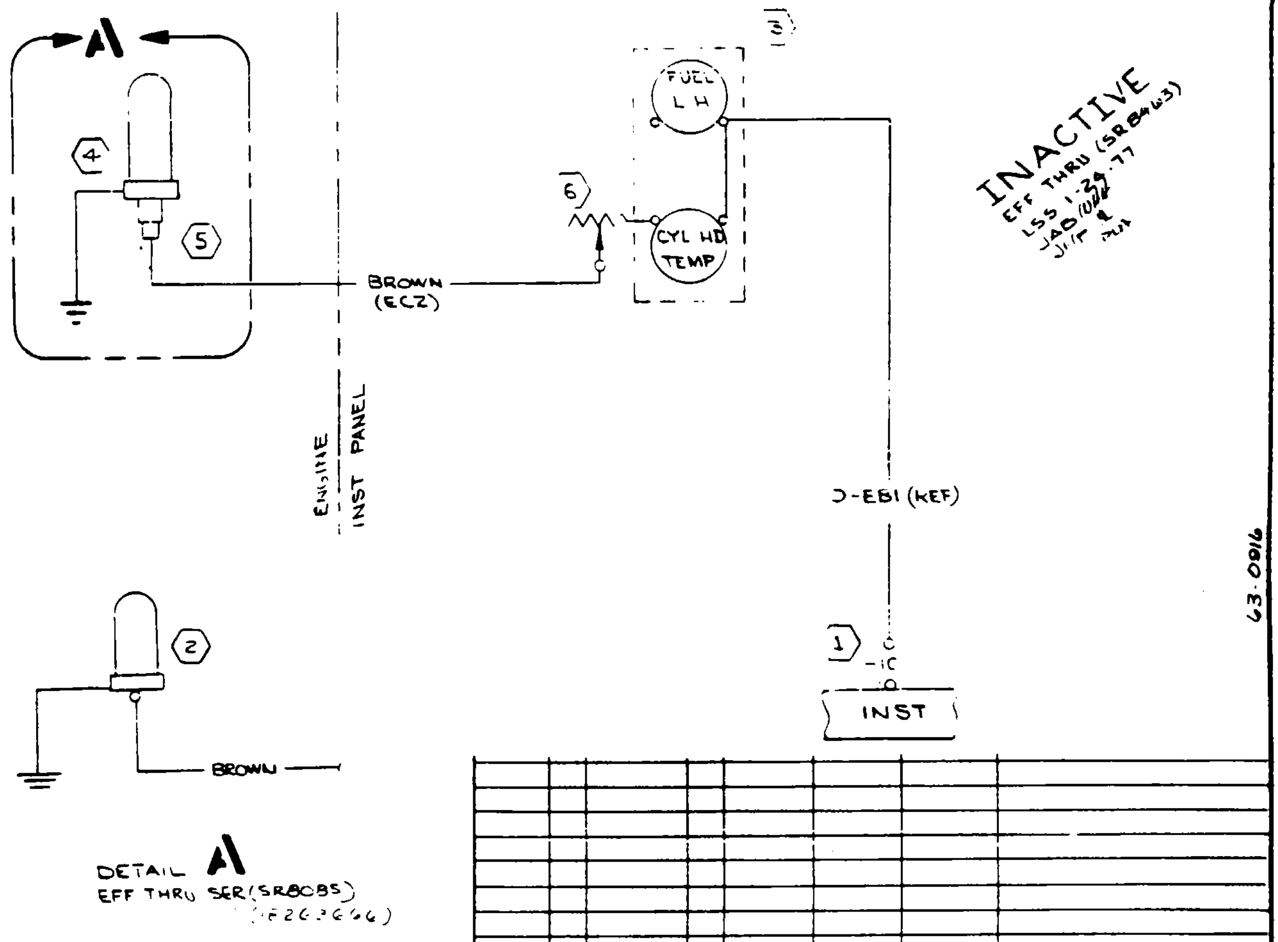
Starter System (Sheet 2 of 2)

SER 825442460N

NOTES:

1. PART NO. 110691 (FIRST) COLOR: BROWN.
2. AT GIVEN SERIALS, MODEL 182 TEMP BULB MOVES FROM NO. 1 CYL TO NO. 6 CYL.
3. CRIMP S-1636-5 TERMINAL AROUND WIRE INSULATION, BEND .25 OF STRIPPED WIRE BACK OVER CRIMP AND SOLDER PER CES 1040. USE MOLEX HT-1719-C CRIMPING TOOL ONLY
4. MATERIAL IS ALPHA 5857-7 (VENDOR CODE 92194) OR BELDEN 83009-1 (VENDOR CODE 70903)

CHG LET	REVISION	BY DATE	CHK APPD
A	[illegible] 0713602-1 [illegible]	7-1-69	
B	ADDED BROWN WIRE & NOTE 2 (SR4646)	WJR 10-20-69	
C	BY REV ADDED WIRE LENGTHS (NOW SHOP PRACTICE)	BRM 5-2-73	
D	BY REV: SER OUT BROWN & S-1372-1, SER IN BRN EC2 & S-1372-2, ADD DETAIL 'A', NOTE 3 (SR8085)	RAM 11-12-76	
E	BY REV: ADD NOTE 4 (NOW SHOP PRACTICE)	1-30-78	



WIRE CODE NO	GA	MATERIAL	LG	TERMINALS				SERIALS
BRN (EC2)	18	4	100	S-1367-1-8	S-1636-5	3		SER 18263667 & ON
BROWN	18	1	100	S-1367-1-8	S-1367-1-4	NO. 6 CYL	2	SER 18255845 THRU 18263666
BROWN	18	1	81	S-1367-1-8	S-1367-1-4	NO. 1 CYL	2	182550718 THRU 18255844
D-EC1	18		81	S-1367-1-8	S-1367-1-4			INACTIVE IF 18255071 8 & ON

WIRE TABLE

ITEM NO	PART NO	DESCRIPTION	INSTALLED ON
6	0713602-4	POTENTIOMETER	
5	S-1637-4	HOUSING PLUG	
4	S-1372-2	BULB, CYL HD TEMP	
3	C669502-0103	INST CLUSTER KIT	
2	S-1372-1	BULB, CYL HD TEMP	
1	S-1360-10	CIRCUIT BREAKER	

EQUIPMENT TABLE

CESSNA AIRCRAFT CO. COMMERCIAL AIRCRAFT DIVISION, WICHITA, KANSAS

	NAME	DATE
DRAWN	H. WISE	[illegible]
GROUP	[illegible]	[illegible]
CHECK	R. [illegible]	9-6-62
PROJ	W. McC[illegible]	10-26-62

TITLE: WIRING DIAGRAM — CYLINDER HEAD TEMPERATURE

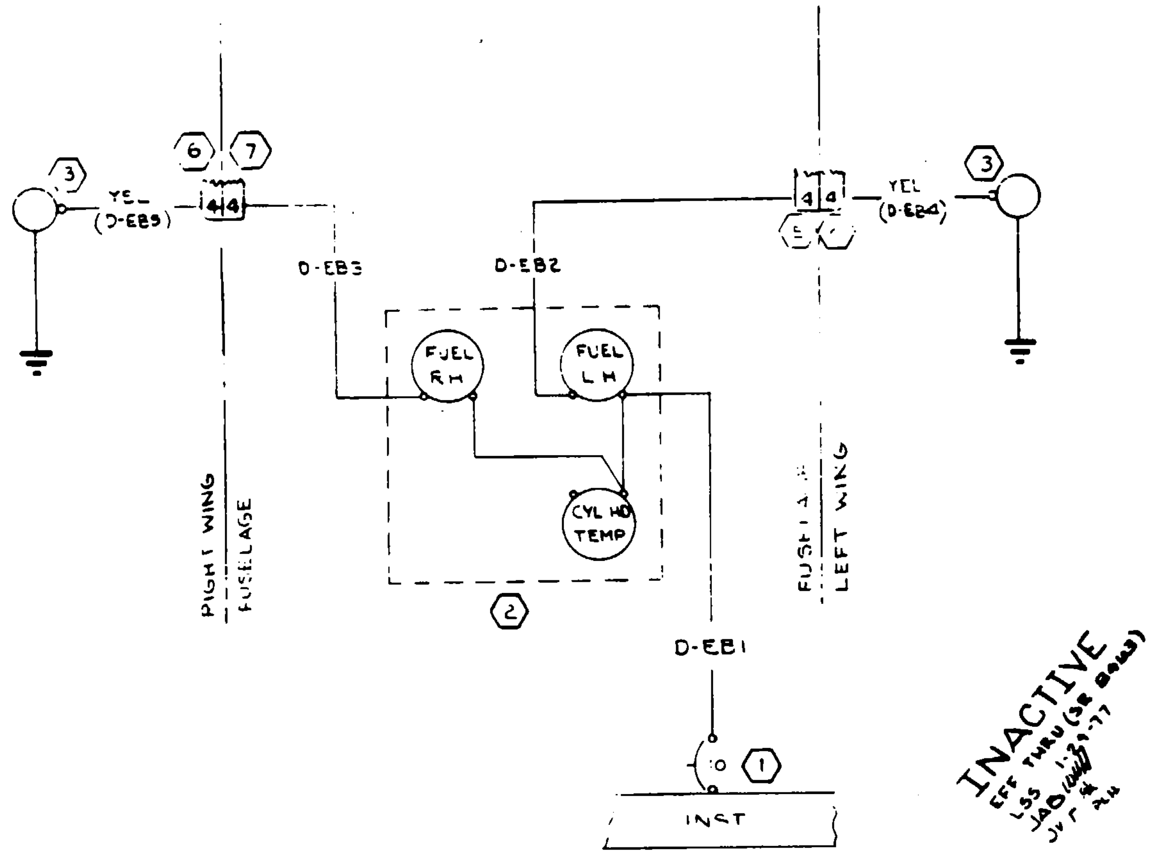
Cessna.

DWG NO 0770610

SUPERSEDED BY: | SUPERSEDES: D 35 | MODEL: 182 | REV: D | PAGE: 8.1

C	BY REV S-1640-6 WAS S-1637-1 LEFT WING; S-1641-6 WAS S-1637-2 LEFT WING; S-1640-9 WAS S-1637-1 RIGHT WING; S-1641-9 WAS S-1637-2 RIGHT WING, ADD LG 35/ YEL (EB5) & 18/ YEL (EB 4) (MER 182E0136) (SR 80372)	BRF 52274	

CHG LET	REVISION	BY / DATE	CHK / APPD
A	ADDED WIRE LENGTHS TO WT - REMOVED 0713726-1 BUS BAR S-1360-10 WAS S-1232-10 C669502-0103 WAS [illegible] INST WAS [illegible] LIGHTS	7-6-68	
B	BY REV S-1636-2 EB2 & EB3 WAS S-341-2/EB2 & EB3; ADD S-1637-1 & S-1637-2 (NOW SHOP PRACT)	1-6-73	DLP



YEL (D-EB5)	18		35	S-1367-1-10	S-1635-2		
YEL (D-EB4)	18		18	S-1367-1-10	S-1635-2		
D-EB1	18		42	S-1367-1-8	S-1367-1-8		
D-EB3	18		87	S-1367-1-10	S-1636-2		
D-EB2	18		117	S-1367-1-10	S-1636-2		
WIRE CODE NO.	GA	MATERIAL	LG	TERMINALS			SERIALS

WIRE TABLE

CESSNA AIRCRAFT CO. COMMERCIAL AIRCRAFT DIVISION WICHITA KANSAS

	NAME	DATE
DRAWN	RIDCER	9-14-62
GROUP		
CHECK		10-12-62
PROJ		10-17-62

TITLE: WIRING DIAGRAM — FUEL QUANTITY INDICATOR

Cessna.

DWG NO 0770610

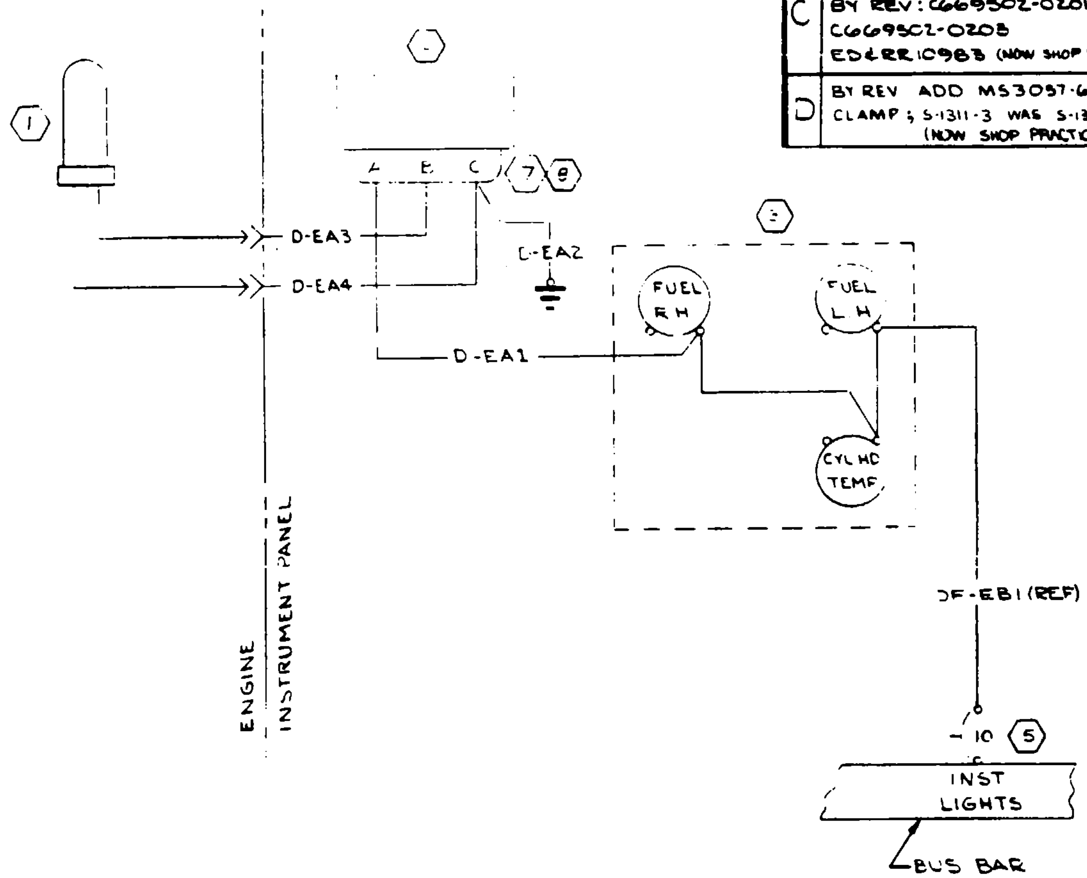
SUPERSEDED BY	SUPERSEDES	MODEL 182	REV B	PAGE 8.2

ITEM NO	PART NO	DESCRIPTION	INSTALLED ON
7	S-1641-9	HOUSING	
6	S-1640-9	HOUSING	
5	S-1641-6	HOUSING	
4	S-1640-6	HOUSING	
3	0726110-1	XMTR, FUEL LEVEL	
2	C669502-0103	INST CLUSTER KIT	
1	S-1360-10	CIRCUIT BREAKER	

EQUIPMENT TABLE

CHG LET	REVISION	BY DATE	CHK APPD
A	THE D-EA1 WAS ERRONEOUSLY CONNECTED TO OTHER TERMINAL ON R.H. FUEL GAUGE	HLW 12 63	RRS
B	BY REV: S-1360-10 WAS S-1232-10; DELETE DF-EB1 & 0713706-1 FROM EQUIP TABLE, C669502-0203 WAS 0713602-1; DF-EB1 (REF) WAS ITEM 4.	JH 7-21-67	JWH MDS
C	BY REV: C669502-0201 WAS C669502-0203 ED&RR 10983 (NOW SHOP PRCT)	RLY 7-7-70	HFW
D	BY REV ADD MS3057-6A CLAMP; S-1311-3 WAS S-1311-1 (NOW SHOP PRACTICE)	LSS 2-21-77	

NOTES:
1. BURNDY YZ 14-H FURNISHED WITH 0550209-1



INACTIVE
EFF THRU SER(SR8463)
3-30-77
GDS

WIRE CODE NO.	GA	MATERIAL	LG	TERMINALS			SERIALS
D-EA4	18		105	YZ 14-H	SOLDER	1	
D-EA3	18		105	YZ 14-H		1	
D-EA2	18		29	S-1367-1-8			
D-EA1	18		13	-1367-1-8	SOLDER		

WIRE TABLE

ITEM NO	PART NO	DESCRIPTION	INSTALLED ON
8	MS3057-6A	CLAMP	
7	MS3106A-14S-7S	PLUG	
6			
5	S-1360-10	CIRCUIT BREAKER	
4			
3	C669502-0201	INST CLUSTER	
2	S-1311-3	INDICATOR	
1	0550209-1	BULB-CARB AIR	

EQUIPMENT TABLE

CESSNA AIRCRAFT CO. COMMERCIAL AIRCRAFT DIVISION WICHITA KANSAS

	NAME	DATE
DRAWN	RIDDER	9-14-62
GROUP		
CHECK		
PROJ		11-12-62

TITLE: WIRING DIAGRAM — CARBURETOR AIR TEMP (CPT)

Cessna.

DWG NO 0770610

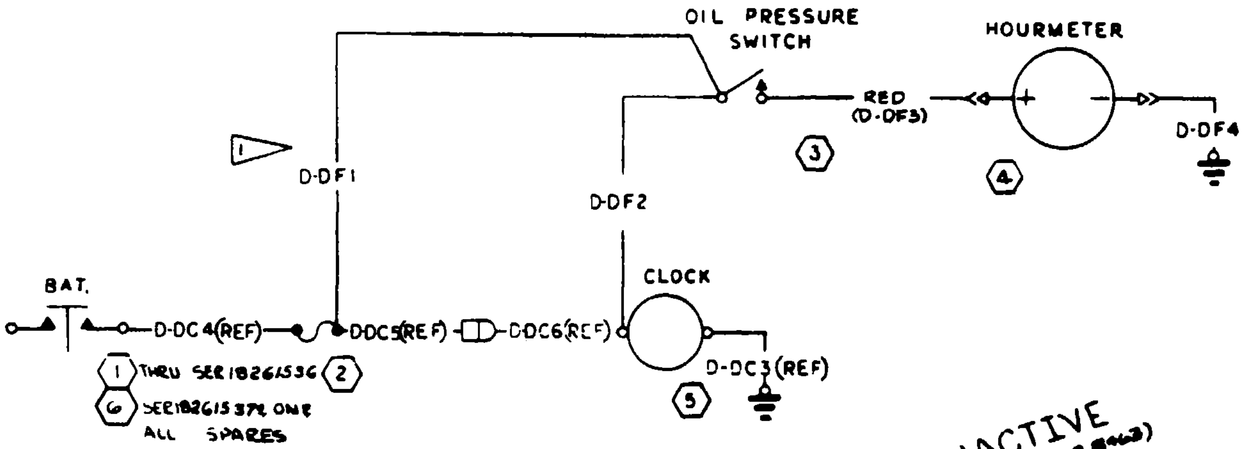
SUPERSEDED BY	SUPERSEDES	MODEL	REV	PAGE
		182	C	8.3

SER182E8354ĘON

NOTE:

1. WIRING DIAGRAM SHOWN IS FOR USE WHEN AN OPTIONAL ELECTRIC CLOCK IS INSTALLED. WHEN ELECTRIC CLOCK IS NOT INSTALLED WIRE D-DF1 CONNECTS PRESSURE SWITCH TO FUSEHOLDER. INSTALL S-1091-1 FUSE AND S-1090-22 FUSEHOLDER.

CHG LET	REVISION	BY / DATE	CHK / APPD
A	BY REV: SEE OUT S-1579-1 & ADD S-1579-2 (SR7201)	BPH 6-16-72	
B	BY REV: ADDED WIRE LENGTHS S-1367-1-8 WAS S-1367-1-6 PER D-DF1 D-DF2 & D-DF3 (NOW SHOP PRACTICE)	BRM 5-2-73	
C	C664502-0101 WAS C664501-0101. S-1090-22 WAS S-1690-22/NOTE 1 (NOW SHOP PRACTICE)(SR8142)	DLP 2-2-76	
D	BY REV: RED (D-DF3) WAS D-DF3 (SR8656)	PH 9-20-76	



63-0816

INACTIVE EFF THRU (SR 8463) LSS 1-28-77 JAB SIT

WIRE CODE NO.	GA	MATERIAL	LG	TERMINALS			SERIALS
D-DF4	18		34	S-1493-1	S-1367-1-8		
RED (D-DF3)	18	-18-2	30	S-1493-1	S-1367-1-8		
D-DF2	18		100	S-1367-1-8	S-1367-1-8		
D-DF1	18		210	S-1367-1-8	SOLDER		

WIRE TABLE

	PART NO.	DESCRIPTION	
5	S-1317N1	CLOCK	
4	C664502-0101	HOURMETER	
3	S-1711-1	OIL PRESSURE SW.	
2	S-1091-1	FUSE	
1	S-1579-1	BAT. CONTACTOR	

EQUIPMENT TABLE

CES-1000 IS APPLICABLE
VENDOR CODES PER S-1400
CES-XXXX=CESSNA SPEC. NO.
S-XXX OR CMXXXX=CESSNA STD. NO.

SUPERSEDES:

SUPERSEDED BY:

	NAME	DATE
DRAWN	W. Wool	9-21-66
CHECK	N. Ware	9-27-66
	R. Utick	9-28-66
	Wm. Cat	9-19-66

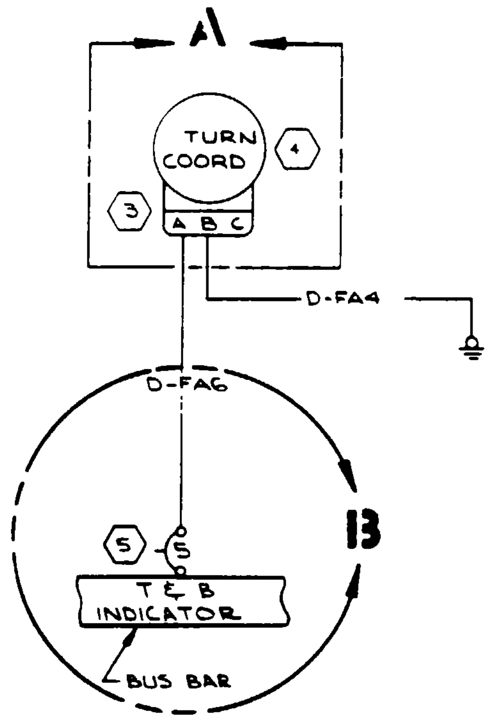
TITLE: WIRING DIAGRAM— HOURMETER (OPT)

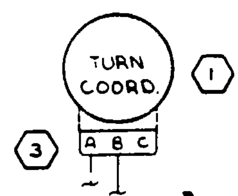
Cessna.

DWG NO. 0770610

MODEL 182 | REV C | PAGE 8.4

REVISION			
LET	DESCRIPTION	DATE	APPD
A	BY REV: ADDED DETAIL A & ITEM 4; DELETE (OPT) FROM TITLE. ED&RR 02376 (SR 5852) IX	LES 6-12-68	
B	BY REV: SER OUT CA-2 & D-FA3; SER IN S-1360-5 & D-FA6; ADD DETAIL B ED & RR 10508 (SR6030) IX	DLB 6-12-69	
C	BY REV. ADDED WIRE LENGTHS & S-1367-1-6 WAS S-1367-1-8 PER D-FA6 (NOW SHOP PRACTICE)	BRM 5-2-73	

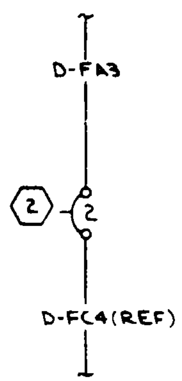




DETAIL A
THRU SER 18259305

INACTIVE
EFF THRU (SR 8463)
LSS 1-24-77

63-0916



DETAIL B
THRU SER 18260055

WIRE CODE NO.	GA	MATERIAL	LG	TERMINALS		SERIALS
D-FA6	18		17	S-1367-1-6	SOLDER	SER 18260056 & ON
D-FA4	18		20	S-1367-1-10	SOLDER	
D-FA3	18			S-1367-1-8	SOLDER	THRU SER 18260055

WIRE TABLE

ITEM NO.	PART NO.	DESCRIPTION	
5	S-1360-5	CIRCUIT BKR	
4	C661003-0501	TURN COORDINATOR	
3	MS3106A10SL3S	CONNECTOR	
2	CA-2	CIRCUIT BREAKER	(80602)
1	C661003-0201	TURN COORDINATOR	

EQUIPMENT TABLE

CES-1000 IS APPLICABLE
VENDOR CODES PER S-1400
CES-XXXX=CESSNA SPEC. NO.
S-XXX OR CMXXXX=CESSNA STD. NO.

SUPERSEDES:

SUPERSEDED BY:

CONTRACT NO:

	NAME	DATE
DESIGN		
GROUP		9-13-67
DRAWN	HARRIS	9-8-67
CHECK	LAURIE	9-9-67
STRESS		
PROJECT		
APPD		

Cessna AIRCRAFT CO. COMMERCIAL AIRCRAFT DIV. 5800 E. PAWNEE WICHITA, KANSAS

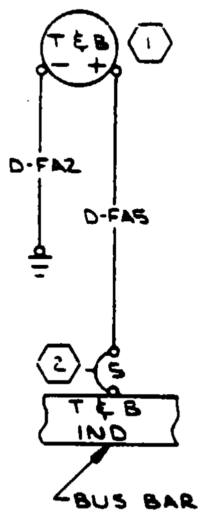
TITLE
WIRING DIAGRAM — TURN COORDINATOR

SIZE	CODE IDENT. NO.	DWG NO.
C	71379	0770610

SCALE: NONE 182 PAGE: 8.4

SER 18258506 & ON

REVISION			
LET	DESCRIPTION	DATE	APPD
A	BY REV. ADDED WIRE LENGTHS & S-1367-1-6 WAS S-1367-1-8 PER D-FA5 (NOW SHOP PRACTICE)	BRM 5-2-73	[illegible]



INACTIVE
EFF THRU (SR [illegible])
LSS 1-24-77

63-0916

WIRE CODE NO	GA	MATERIAL	LG	TERMINALS			SERIALS
D-FA5	18		18	S-1367-1-6	S-1367-1-8		
D-FA2	18		11	S-1367-1-8	S-1367-1-8		

WIRE TABLE

ITEM NO	PART NO.	DESCRIPTION	
2	S-1360-5	CIRCUIT BKR	
1	S-1302-1	INDICATOR T & B	

EQUIPMENT TABLE

CES-1000 IS APPLICABLE
VENDOR CODES PER S-1400
CES-XXXX=CESSNA SPEC. NO.
S-XXX OR CMXXXX=CESSNA STD. NO.

SUPERSEDES: P 9.1

SUPERSEDED BY:

CONTRACT NO:

	NAME	DATE
DESIGN	H WISE	7-18-69
GROUP	H Wise	7-18-69
DRAWN	D.L.BURKE	6-12-69
CHECK	R.YOUNGER	6-24-69
STRESS	W.C DALE	7-17-69
PROJ	[illegible]	[illegible]
APPD	[illegible]	8-16-69
OTHER		

Cessna AIRCRAFT CO.
COMMERCIAL AIRCRAFT DIV.
5800 E. PAWNEE
WICHITA, KANSAS

TITLE
WIRING DIAGRAM — TURN & BANK INDICATOR (OPTIONAL)

SIZE	CODE IDENT NO	DWG NO
C	71379	0770610

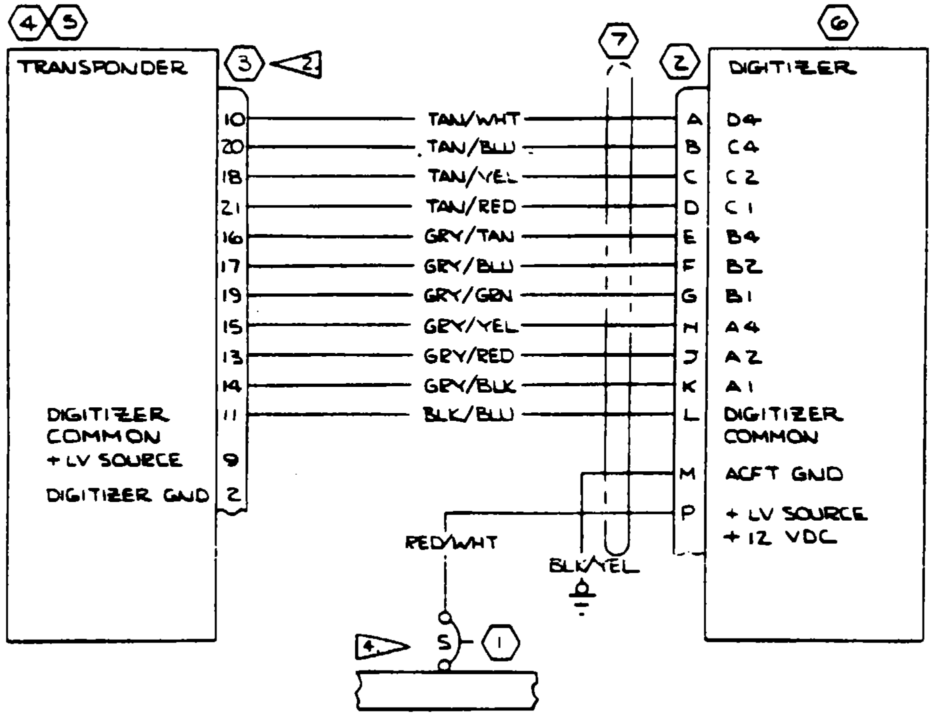
SCALE: NONE | 182 | PAGE: 9.5

ED & RR 10508 (SR6030) IX

NOTES:

1. ~~FOR WIRE & WIRE TERMINALS REFER TO 1270625 PAGE 8.7~~
2. TRANSPONDER CONNECTOR HOUSING IS PART OF TRANSPONDER CABLE ASSY
3. FOR WIRING DIAGRAM OF 300 & 400 TRANSPONDER REFER TO 3920143
4. ATTACH BOTH TRANSPONDER AND ENCODING ALTIMETER TO THE NO 4 CIRCUIT BREAKER
5. PINS ARE CRIMP TYPE AND IS FURNISHED BY VENDOR WITH CONNECTOR

REVISION			
LET	DESCRIPTION	DATE	APPD
A	BY REV: ADD NOTE NO 4; DELETE TURN COORDINATOR FROM BUS BAR (SR 7692)	MEM 3-5-74	
B	BY REV: ADD WIRE TABLE & NOTE 5; 1570312 WAS 1570312-3; DELETE NOTE 1 (SR 7692)(REF)	GDS 6-18-76	



INACTIVE

63-0916

RED/WHT	20	20-2-9	60	S-1367-1-8	5		
BLK/YEL	22	22-0-4	60	S-1367-1-8			
BLK/BLU		22-0-6	43	S-2190-1			
GRY/BLK		22-8-0					
GRY/RED		22-8-2					
GRY/YEL		22-8-4					
GRY/GRN		22-8-5					
GRY/BLU		22-8-6					
GRY/TAN		22-8-10					
TAN/YEL		22-10-4					
TAN/RED		22-10-2					
TAN/BLU		22-10-6					
TAN/WHT	22	22-10-9	43	S-2190-1	5		
WIRE CODE NO	GA	MATERIAL	LG	TERMINALS			SERIALS

WIRE TABLE

7	1570312	CABLE ASSY	
6	EA-401A	ALT DIGITIZER	
5	RT-359A	TRANSPONDER	
4	RT-459A	TRANSPONDER	
3	S-2189-1	CONNECTOR	
2	42816	CONNECTOR	
1	S-1360-5L	CIRCUIT BREAKER	
ITEM NO	PART NO.	DESCRIPTION	

EQUIPMENT TABLE

CES-1000 IS APPLICABLE VENDOR CODES PER S-1400 CES-XXXX=CESSNA SPEC. NO. S-XXX OR CMXXXX=CESSNA STD. NO.

SUPERSEDES:

SUPERSEDED BY:

CONTRACT NO:

	NAME	DATE
DESIGN		
GROUP	D.H. Harden	11-12-73
DRAWN	D. OLLER	11-9-73
CHECK	J. YOUEL	11-9-73
STRESS		
PROJ	H.M.C	11-19-73
APPD	PLH	
OTHER		

Cessna AIRCRAFT CO. COMMERCIAL AIRCRAFT DIV. 5800 E. PAWNEE WICHITA, KANSAS

TITLE WIRING DIAGRAM — ENCODING ALTIMETER

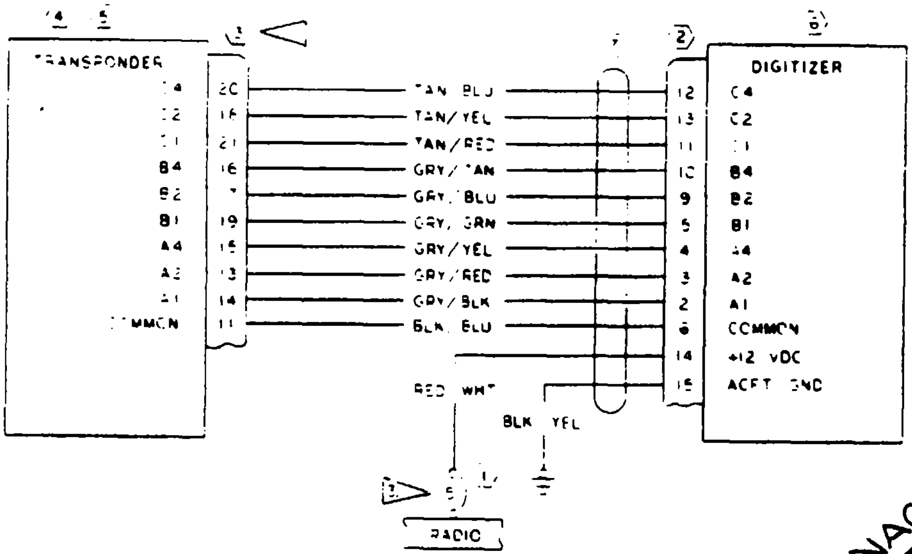
SIZE C | CODE IDENT. NO. 71379 | DWG NO 0770610

SCALE: NONE (SR 7692) PAGE: 9.6

REVISION			
LET	DESCRIPTION	DATE	APPD

NOTES:

1. TRANSPONDER CONNECTOR [illegible] IS PART OF TRANSPONDER CABLE ASSY
2. FOR WIRING DIAGRAM OF 300 & 400 TRANSPONDER REFER TO 3920166
3. ATTACH BOTH TRANSPONDER AND ENCODING ALTIMETER TO THE NO. 4 CIRCUIT BREAKER



INACTIVE
EFF THRU (SR 8462) 1-24-77
LSS
JAB
SNIF

63-0916

WIRE CODE NO.	GA	MATERIAL	LG	TERMINALS			SERIALS
TAN/BLU	22	22-10-6		S-2190-1	SOLDER		
TAN/YEL		22-10-4					
TAN/RED		22-10-2					
GRY/TAN		22-8-10					
GRY/BLU		22-8-6					
GRY/GRN		22-8-5					
GRY/YEL		22-6-4					
GRY/RED		22-6-2					
GRY/BLK		22-8-0					
BLK/BLU		22-0-6		S-2190-1			
BLK/YEL		22-0-4		S-1367-1-8			
RED/WHT	22	22-2-9		S-1367-1-6	SOLDER		

WIRE TABLE

ITEM NO	PART NO.	DESCRIPTION	
7	0470404	CABLE ASSY	
6	C744001-0101	ALT DIGITIZER	
5	RT-459A	TRANSPONDER	
4	RT-359A	TRANSPONDER	
3	S-2189-1	CONNECTOR	
2	CA-155	CONNECTOR	
1	S-1360-5L	CIRCUIT BREAKER	

EQUIPMENT TABLE

CES-1000 IS APPLICABLE
VENDOR CODES PER S-1400
CES-XXXX=CESSNA SPEC. NO.
S-XXX OR CMXXXX=CESSNA STD. NO.

SUPERSEDES:

SUPERSEDED BY:

CONTRACT NO:

	NAME	DATE
DESIGN	G. STAMM	4-23-76
GROUP	W. [illegible]	5-5-76
DRAWN	R. KLEIN	4-22-76
CHECK	Youle	4-22-76
STRESS		
PROJ	PLHedzell	5-6-76
APPD	JRS	5-5-76
OTHER		

Cessna AIRCRAFT CO.
COMMERCIAL AIRCRAFT DIV
5800 E. PAWNEE
WICHITA, KANSAS

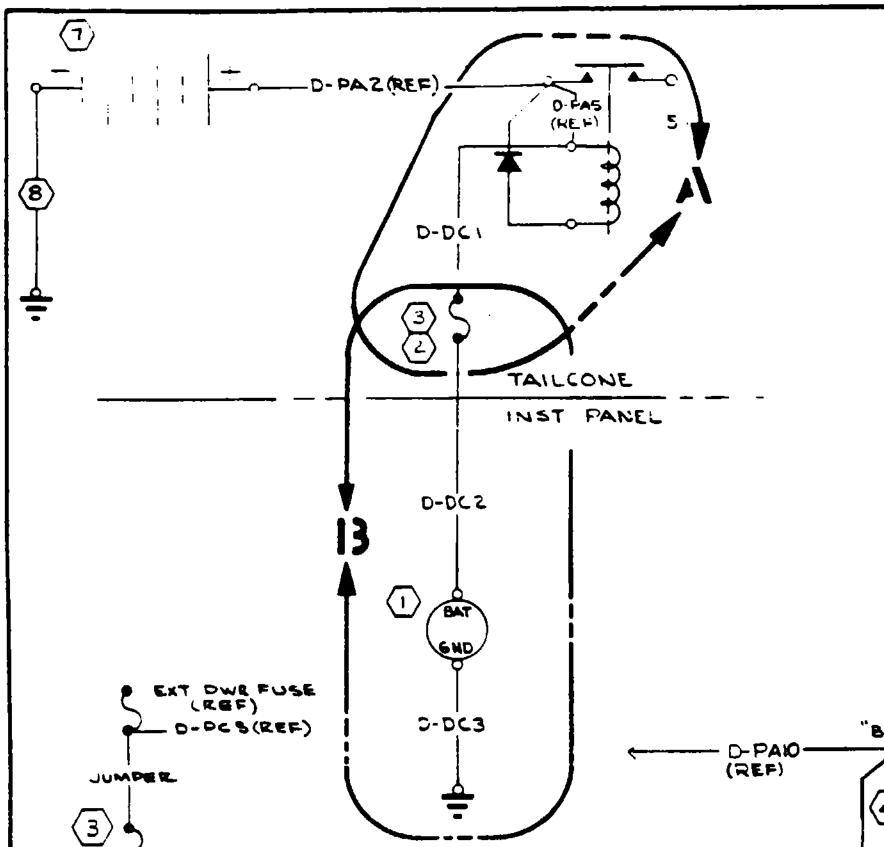
TITLE
WIRING DIAGRAM — BLIND ENCODER 182, F182

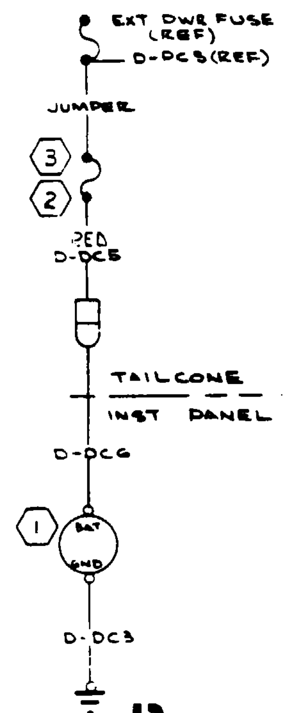
SIZE	CODE IDENT NO	DWG NO
C	71379	C770610

SCALE NONE | SER (SR 8490) | PAGE: 9.7

CHG LET	REVISION	BY / DATE	CHK / APPD
A	ADDED WIRE LENGTHS TO W/T; REMOVED D-PA2 & D-PA5 FROM E/T	WJR 7-15-6[illegible]	[illegible]
B	BY REV: ADD DETAIL A, D-DC4, SERIALS, & ITEM 6 INACTIVATED D-DC1 (SR 4642)	LPB 12-30-6[illegible]	CHS
C	ADD DETAIL B, D-DC5 & D-DC6 INACTIVATE D-DC2 (SR4905)	JH 3-18-6[illegible]	RRS
D	BY REV: S-1317N2 WAS S-1317N1 ED&RR 10493	FER [illegible]69	[illegible]
E	BY REV: SER OUT S-1579-1 ADD S-1579-2 (SE7201)	BPH [illegible]72	[illegible]
F	BY REV: ADDED WIRE LENGTHS/NOW SHOT [illegible]	BRM 5-2-72	[illegible]
G	BY REV: SER OUT DETAIL "A" [illegible] WIRE COLOR [illegible] D-DC5 LG IR WAS 15 REF D-DC5 SER 18257626 (SR7649) MEA [illegible]	ZS JEF 5-18-74	[illegible]

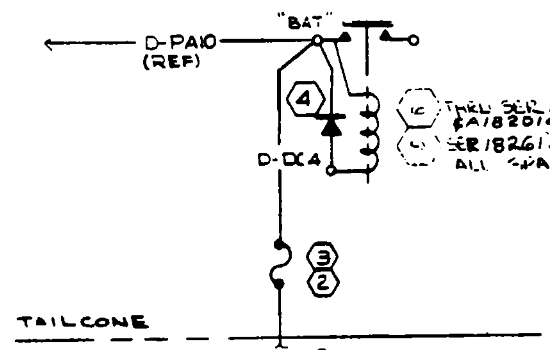
SER 18254550 & ON





DETAIL B
SER 18257626 & ON

INACTIVE
EFF THRU (SR 8463)
LSS 1-24-77



DETAIL A
SER 18256685 THRU
SER 18257626

G3-0916

WIRE CODE NO.	GA	MATERIAL	LG	TERMINALS			SERIALS
D-DC6	18		240	S-1367-1-6	S-1637-1 S-1635-1		SER 18257626 & ON
RED (D-DC5)	18		18	S-1637-2 S-1636-1	SOLDER		SER 18257626 & ON
D-DC4	18		8	S-1367-1-13	SOLDER		SER 18256685 & ON
D-DC3	18		8	S-1367-1-6	S-1367-1-8		
D-DC2	18		200	S-1367-1-6	SOLDER		INACTIVE THRU SER 18257625
D-DC1	18		8	S-1367-1-6	SOLDER		INACTIVE THRU SER 1825668[illegible]

WIRE TABLE

CESSNA AIRCRAFT CO. COMMERCIAL AIRCRAFT DIVISION, WICHITA, KANSAS

	NAME	DATE
DRAWN	RIDDER	10-5-62
GROUP	[illegible]	[illegible]
CHECK	[illegible]	10-11-62
PROJ	N. M'Cate	10-12-62

TITLE: WIRING DIAGRAM — CLOCK

Cessna.

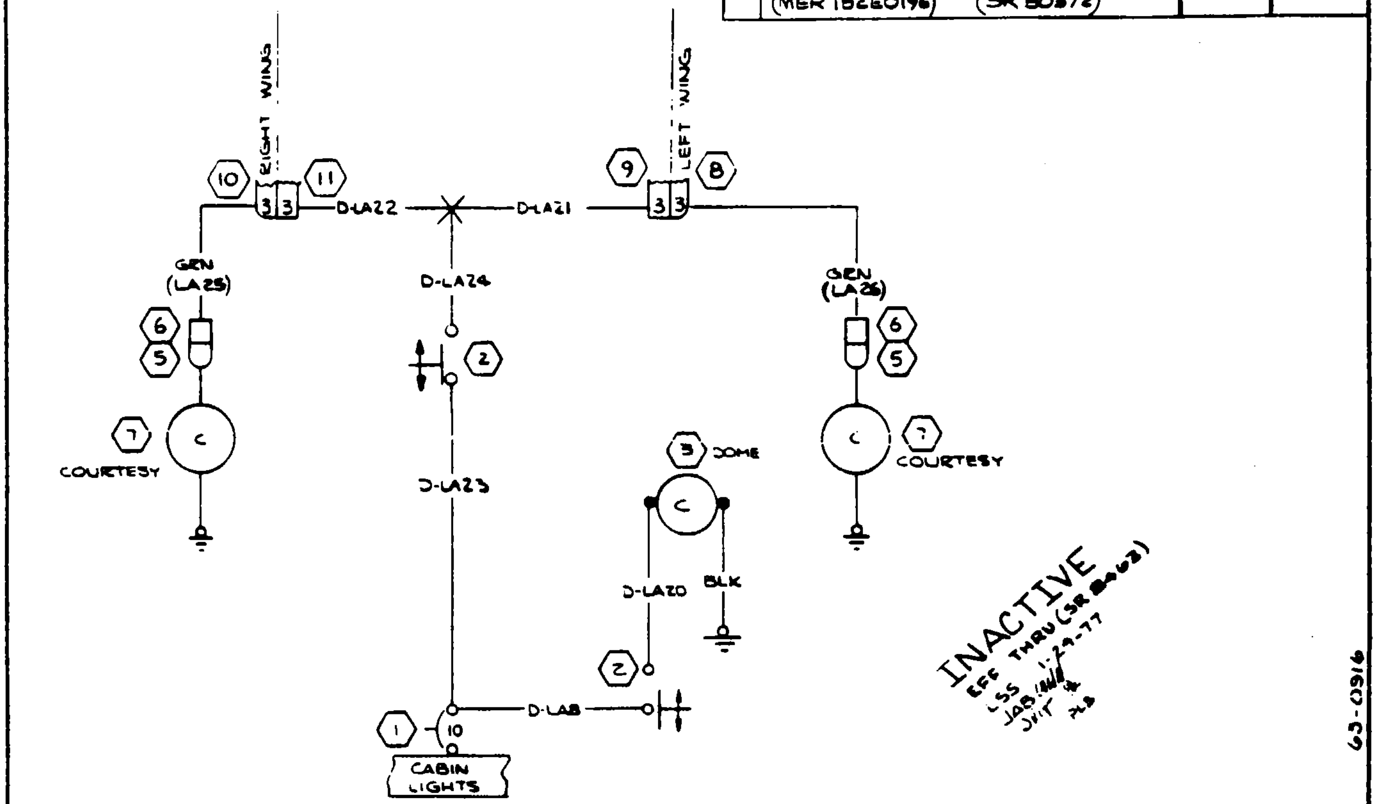
DWG NO 0770610

SUPERSEDED BY	SUPERSEDES	MODEL	REV	PAGE
		182	5	10.1

ITEM NO	PART NO	DESCRIPTION	INSTALLED ON
9	S-1579-2	CONTACTOR	
8	0412007-1	STRAP-BAT. GND	
7	0712605-1	BATTERY	
6	S-1579-1	CONTACTOR-BAT.	
5	0712603-2	CONTACTOR-BAT.	
4	0770728-1	DIODE ASSY	
3	S-1091-1	FUSE	
2	S-1090-22	FUSEHOLDER	
1	S-1317N2	CLOCK	

EQUIPMENT TABLE

REVISION			
LET	DESCRIPTION	DATE	APPD
A	BY REV: DELETE D-LA1 & 0713029-0; ADD D-LA24; D-LA23 WAS D-LA1 (SR 7380) IX	DLO 7-24-73	
B	BY REV: S-1640-6 WAS S-1637-1 LEFT WING; S-1641-6 WAS S-1637-2 LEFT WING; S-1640-9 WAS S-1637-1 RIGHT WING; S-1641-9 WAS S-1637-2 RIGHT WING; GRN(LA26) & GRN(LA25) WAS GRN, ADD LG 135/GRN & 120/GRN (MER 18260196) (SR 80872)	BRF 5-21-74	



GRN (LA25)	18		120	S-1635-2	S-1636-2	
D-LA24	18			S-1830-1	S-1370-2	
D-LA23	18			S-1367-1-6	S-1830-1	
BLK	18	-18-0		SOLDER	S-1367-1-8	
GRN (LA26)	18		135	S-1635-2	S-1636-2	
D-LA22	18			SEE D-LA24	S-1636-2	
D-LA21	18			SEE D-LA24	S-1636-2	
D-LA20	18		8	S-1830-1	SOLDER	
D-LA8	18		109	S-1367-1-6	S-1830-1	
WIRE CODE NO	GA	MATERIAL	LG	TERMINALS		SERIALS

WIRE TABLE

11	S-1641-9	HOUSING - SCKT
10	S-1640-9	HOUSING - PIN
9	S-1641-6	HOUSING - SCKT
8	S-1640-6	HOUSING - PIN
7	MS-5584-2	LAMP
6	S-1637-2	HOUSING
5	S-1637-1	HOUSING
4		
3	S-1876-1	LAMP
2	S-1831-1	SWITCH
1	S-1560-10L	CKT BKR
ITEM NO.	PART NO.	DESCRIPTION

EQUIPMENT TABLE

CES-1000 IS APPLICABLE
VENDOR CODES PER S-1400
CES-XXXX=CESSNA SPEC. NO.
S-XXX OR CMXXXX=CESSNA STD. NO.

SUPERSEDES: P 11.1

SUPERSEDED BY:

CONTRACT NO:

	NAME	DATE
DESIGN		
GROUP	Y. Wise	2-23-73
DRAWN	PAPE	2-21-73
CHECK	R. YOUNGLES	2-22-73
STRESS		
PROJ		2-26-73
APPD		
OTHER		

Cessna AIRCRAFT CO. COMMERCIAL AIRCRAFT DIV. 5800 E. PAWNEE WICHITA, KANSAS

TITLE: WIRING DIAGRAM — DOME & COURTESY LIGHTS (OPT)

SIZE	CODE IDENT. NO.	DWG NO
C	71379	0770610

SCALE: NONE | 182 | PAGE: 11.1.1

(SR7380) IX (18262466)

REVISION			
LET	DESCRIPTION	DATE	APPD
A	BY REV: SER OUT S-1845-1-1; SER IN S-1845-1-2; ADD DETAIL A ED & RR 10486 (SR6030) IX	DLB 6-12-69	
B	BY REV: ADD DETAIL "A", S-1844-1-2 & SER; ADD RED(3)(REF) & LB23(REF) EDRR 10829 (SR6452)	DLP 1-3-70	JWH
C	BY REV: ADD S-2160-1, 34002-55, LD24, LD25, LD26, LD27 & SER, SER OUT S-1844-1-2, LD14, LD15 & LD16 (SR7380) IX	DLP 2-21-73	
D	BY REV: ADD C622001-0401, RED REF & BLK REF; S-1636-1 / D-LD26 WAS S-1635-1 (NOW SHOP PRACTICE)	DLO 10-11-73	
E	BY REV: ADD S-1640-6, S-1641-6, S-1640-9, S-1641-9, DETAIL B, DETAIL C, (LD32) RED, (LD33) RED, D-LD28, D-LD29, RED(REF), RED/GRN(REF) & RED(REF), RED(LD30) WAS RED(1), RED(LD31) WAS RED(2), SER OUT S-1637-1, S-1637-2, LD25, LD27, RED(LD30) & RED(LD31) (MER 182E0196) (SER 18263335)	BRF 5-22-74	
F	BY REV: ADD LD24 CALLOUT AND SER 18263335 WAS (SR 80372); SER OUT LD25 (NOW SHOP PRACTICE) SER 18263335	CJH 10-24-74	

INACTIVE EFF THRU (SR 80463)

WIRE CODE NO.	GA	MATERIAL	LG	TERMINALS			SERIALS
D-LD29	18			S-1829-1	S-1636-1		SER 18263335 & ON
D-LD28	18			S-1829-1	S-1636-1		
RED(LD33)	18		200	S-1635-1	S-1636-1		
RED(LD32)	18		190	S-1636-1	S-1636-1		SER 18263335 & ON
D-LD27	18			S-1636-1	S-1829-1		SER 18262464 THRU SER 18263334
D-LD26	18			S-1636-1	S-1829-1		SER 18262464 THRU SER 18263334
D-LD25	18			S-1636-1	S-1829-1		SER 18262464 THRU SER 18263334
D-LD24	18			S-1829-1	S-1493-1		SER 18262464 ON
RED(LD31)	18		250	S-1636-1	S-1636-1		THRU SER 18263334
RED(LD30)	18		250	S-1636-1	S-1636-1		THRU SER 18263334
D-LD16	18		24	S-1635-1	S-1493-1		THRU SER 18262463
D-LD15	18		305	S-1635-1	S-1493-1		THRU SER 18262463
D-LD14	18		40	S-1635-1	S-1493-1		THRU SER 18262463
D-LD1	18		2	S-1367-1B	S-1493-1		

WIRE TABLE

ITEM NO	PART NO.	DESCRIPTION	
14	S-1641-9	HOUSING - SCKT	
13	S-1640-9	HOUSING - PIN	
12	S-1641-6	HOUSING - SCKT	
11	S-1640-6	HOUSING - PIN	
10	C622001-0401	LT INSTL - TAIL	
9	34002-55	TERM. BOARD	
8	S-2160-1	SWITCH	
7	S-1844-1-2	SWITCH	
6	S-1845-1-2	SWITCH	
5	C622001-0202	LT INSTL - WING	
4	S-1637-2	HOUSING - PLUG	
3	S-1637-1	HOUSING - CAP	
2	S-1845-1-1	SWITCH	
1	S-1360-10L	CIRCUIT BKR	

EQUIPMENT TABLE

CES-1000 IS APPLICABLE
VENDOR CODES PER S-1400
CES-XXXX = CESSNA SPEC. NO.
S-XXX OR CMXXXX = CESSNA STD. NO.

SUPERSEDES: P 11.4 & 11.4.1

SUPERSEDED BY:

CONTRACT NO:

	NAME	DATE
DESIGN	VR SIPES	6/3/68
GROUP	H W	6-27-68
DRAWN	YOUNGERS	6-25-68
CHECK		6-28-68
STRESS		6-21-68
PROJECT		
APPD		6-27-68

Cessna AIRCRAFT CO.
COMMERCIAL AIRCRAFT DIV.
5800 E PAWNEE
WICHITA, KANSAS

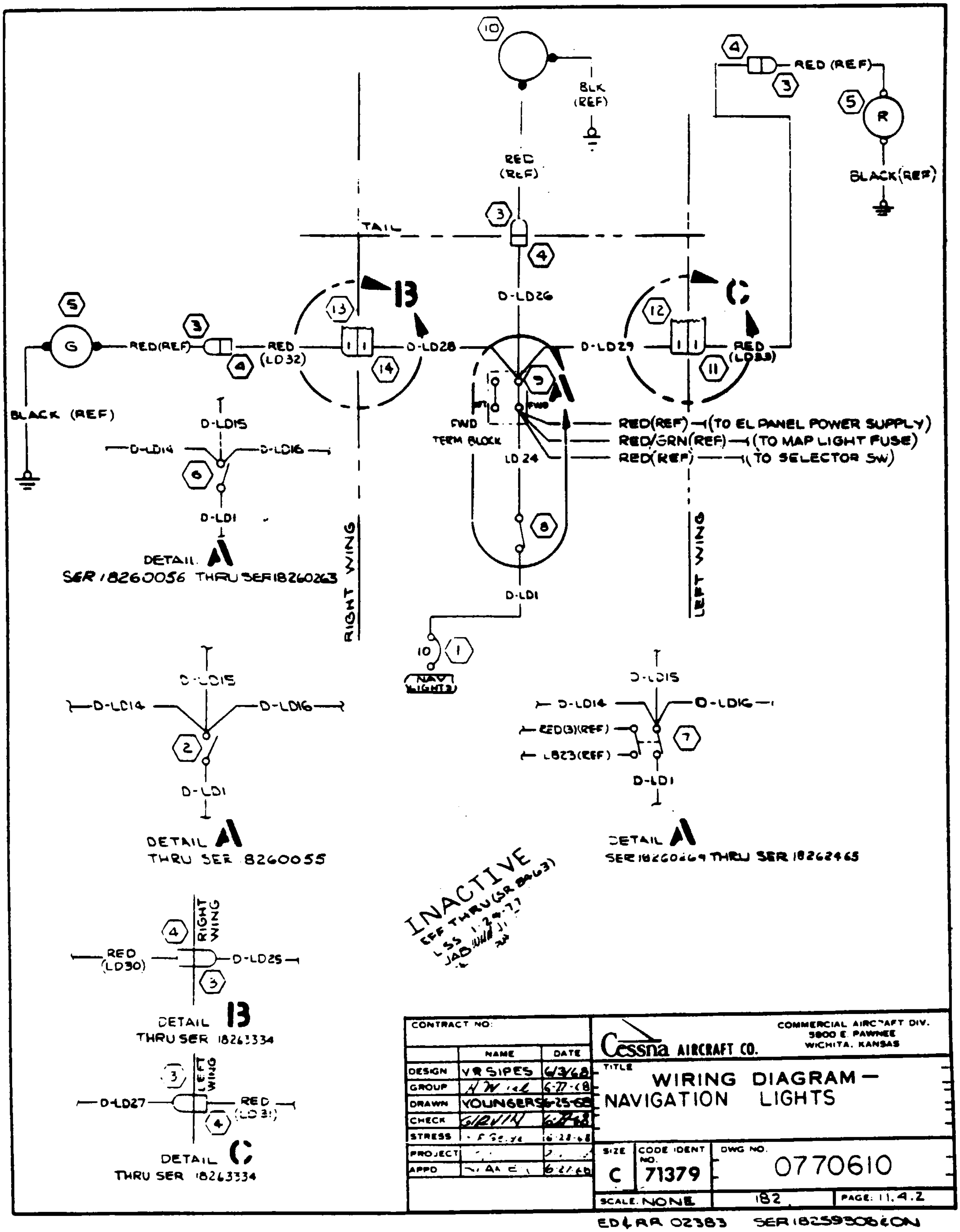
TITLE: WIRING DIAGRAM — NAVIGATION LIGHTS

SIZE: C | CODE IDENT NO: 71379 | DWG NO: 0770610

SCALE: NONE | 182 | PAGE 11.4.2

ED & RR 02383 SER 18259306 & ON

Navigation Lights (Sheet 1 of 2)

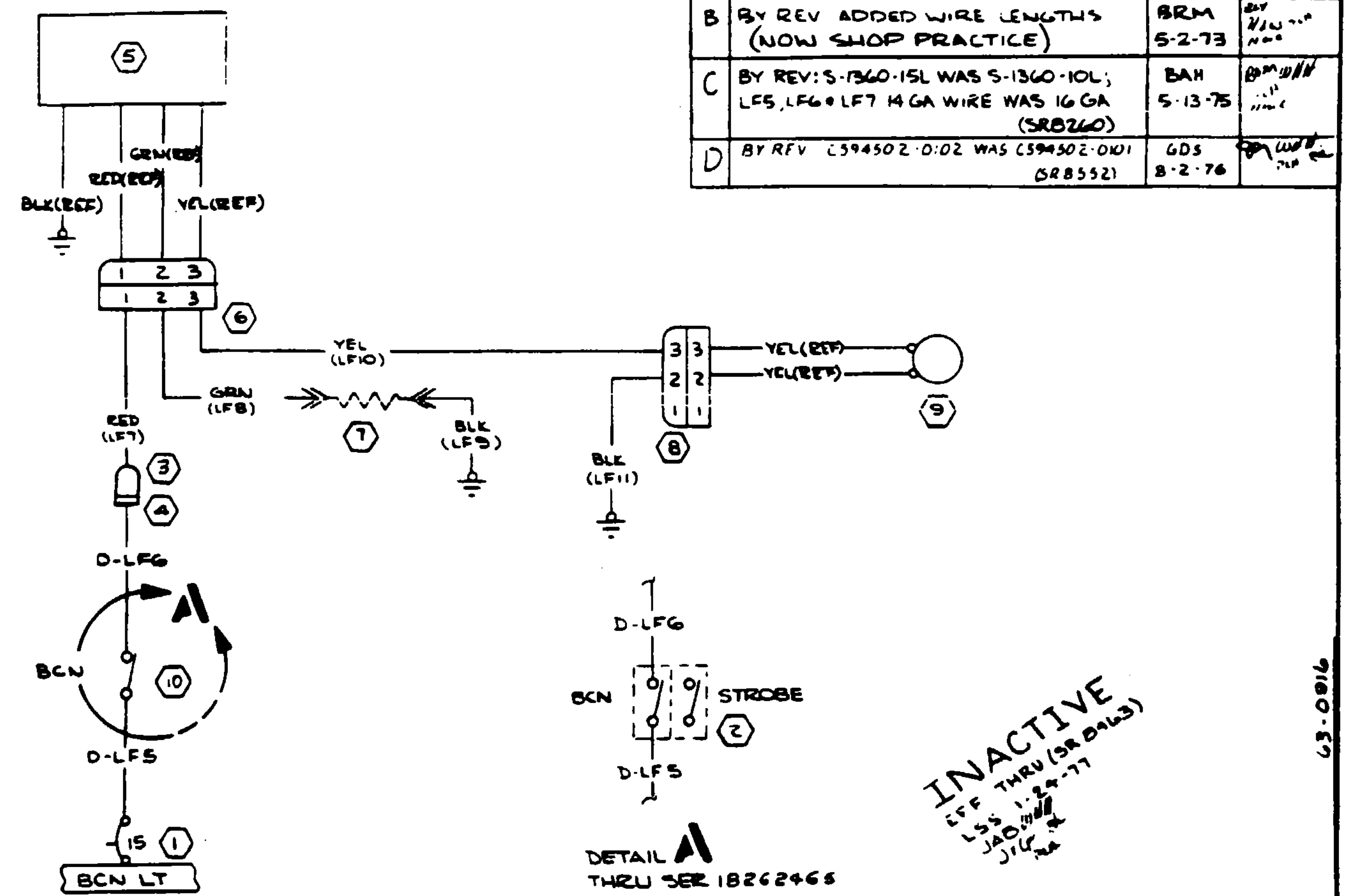


Navigation Lights (Sheet 2 of 2)

NOTES

1. COLORED WIRES BEARING CES1100 CODING IN PARENTHESIS SHALL NOT BE STAMPED. CES1100 CODING ON THESE WIRES IS FOR PARTS LIST USE ONLY

REVISION			
LET	DESCRIPTION	DATE	APPD
A	BY REV. ADD S-2160-1 RED GRN YEL BLK & SER; SER OUT S-1846-2-3 LF7 LF8, LF9, LF10, LF11; ADD NOTE 1 C621001-0106 WAS C621001-0103 (SE7473)(SR7380) IX	DLP 1-10-73	
B	BY REV ADDED WIRE LENGTHS (NOW SHOP PRACTICE)	BRM 5-2-73	
C	BY REV: S-1360-15L WAS S-1360-10L; LF5, LF6 & LF7 14 GA WIRE WAS 16 GA (SR8260)	BAH 5-13-75	
D	BY REV C594502-0102 WAS C594502-0101 (SR8552)	GDS 8-2-76	



WIRE CODE NO	GA	MATERIAL	LG	TERMINALS		SERIALS
BLK (LF11)	16		6	S-1635-2	S-1367-2-8	SER 18261863 & ON
YEL (LF10)	16		6	S-1636-2	S-1635-2	SER 18261863 & ON
BLK (LF9)	16		9	S-1493-2	S-1367-2-8	SER 18261863 & ON
GRN (LF8)	16		75	S-1636-2	S-1493-2	SER 18261863 & ON
RED (LF7)	14		75	S-1635-2	S-1636-2	SER 18261863 & ON
LF11	16		6	S-1635-2	S-1367-2-8	THRU SER 18261862
LF10	16		6	S-1636-2	S-1635-2	THRU SER 18261862
LF9	16		3	S-1493-2	S-1367-2-8	THRU SER 18261862
LF8	16		75	S-1636-2	S-1493-2	THRU SER 18261862
LF7	16		75	S-1635-2	S-1636-2	THRU SER 18261862
LF6	14		300	S-1493-2	S-1636-2	
LF5	14		6	S-1367-2-6	S-1493-2	

WIRE TABLE

ITEM NO	PART NO.	DESCRIPTION	VENDOR
10	S-2160-1	SWITCH	
9	C621001-0106	LIGHT ASSY	
8	S-1638-2	HOUSING-CAP	
7	OR95-1.5	RESISTOR	83777
6	S-1638-1	HOUSING-PLUG	
5	C594502-0102	FLASHER ASSY	
4	S-1637-2	HOUSING-PLUG	
3	S-1637-1	HOUSING-CAP	
2	S-1846-2-3	SWITCH	
1	S-1360-15L	CIRCUIT BREAKER	

EQUIPMENT TABLE

CES-1000 IS APPLICABLE VENDOR CODES PER S-1400 CES-XXXX=CESSNA SPEC. NO. S-XXX OR CMXXXX=CESSNA STD. NO.

SUPERSEDES: PG 11.5.2

SUPERSEDED BY:

CONTRACT NO:

	NAME	DATE
DESIGN	V E SIPES	3/25/72
GROUP	H. Wise	5-22-72
DRAWN	V E SIPES	5-22-72
CHECK	WHITE	5-22-72
STRESS		
PROJ		
APPD		
OTHER		

Cessna AIRCRAFT CO. COMMERCIAL AIRCRAFT DIV. 5800 E. PAWNEE WICHITA, KANSAS

TITLE WIRING DIAGRAM — FLASHING BEACON LIGHT

SIZE C | CODE IDENT NO. 71379 | DWG NO 0770610

SCALE: NONE | 182 | PAGE: 11.5.3

(SE 7037) IX

REVISION

LET	DESCRIPTION	DATE	APP'D
J	BY REV: ADD PG 11.9.2.2 & LB96 DELETE END PER WHT(1) & S-1370-1 WAS S-1370-2 PER LB20 (SR7912)	RS 9-25-75	
K	BY REV: BLU(REF) WAS GRN REF TAN(REF) WAS WHT(REF) (NOW SHOP PRACTICE)	DLP ..-2..-75	
L	BY REV ADD ORN(LB97) WIRE & S-1637-1 (SR8499)	SDS 8-13-76	

REVISION

LET	DESCRIPTION	DATE	APPD
A	BY REV: ADD NOTE 4, RED(3), LB23, S-1844-1-2, VAL-5-6000, DETAIL "A" & SER; SER OUT RED(3) EDRR 10823 (SR6452)	DLP 1-5-70	
B	BY REV: 27 OHM ½ W RESISTOR WAS 47 OHM ½ W EDRR 10001 (NOW SHOP PRACTICE)	J.G. 4-20-70	
C	BY REV: ADD S-2091-1 & SER; SER OUT S-2008-1 SER 18260825	RCA 9-20-72	
D	BY REV ADD S-2160-1, 34002-55, RED(4) & SER; SER OUT S-1844-1-2, RED(3) & LB30, LB30 WAS LB23 (SR7380)	DLP 2-21-73	
E	BY REV. ADDED WIRE LENGTHS, S-1370-1 WAS S-1370-2 PER LB20 (NOW SHOP PRACTICE)	BRM 5-2-73	
F	BY REV: DELETE 5.6K, 2W 10% RESISTOR ADD: 18 GA JUMPERS; S-1370-2 WAS S-1370-1 LB20; DELETE 27OHM ½W RESISTOR ON FRONT RHEOSTAT; SER18262285 MER ED362 SER(SR7912)	CJH 12- -74	
G	BY REV: ADD WIRING FOR 1213757 EL MKR BCN PANEL (SR7912)	BAH 2-28-75	
H	BY REV: 0713351 WAS 1213307, 1213363 WAS 1213192 ADD PG 11.9.2.1 DETAIL "B" & SERS (SR7912)(NOW SHOP PRACTICE)	GW 6-23-75	

NOTES:

1. TO BE RETAINED IN TERMINAL, WIRE MUST BE STRIPPED, DOUBLED & TWISTED
2. THESE WIRES VENDOR FURNISHED
3. WHEN POST LIGHTS ARE INSTALLED S-1493-1 TERMINAL REPLACES S-1829-1 TERMINAL
4. THIS END OF RESISTOR TERMINATED WITH S-1367-1-14 TERMINAL & INSTALLED ON SHAFT OF TANDEM POT ASSY. DUE TO HEAT DISSIPATION, RESISTOR MUST BE KEPT FROM WIRE BUNDLE

INACTIVE EFF THRU (SR8463) LSS 1-24-77

WIRE CODE NO	GA	MATERIAL	LG	TERMINALS				SERIALS
ORN(LB97)	20	-20-3		S-1636-1	SEE LB96			SER (SR8499) & ON
LB96	22			SEE LB20	S-1370-1			SER (SR7912) & ON
LB30	18			S-1493-1	S-1367-1-8			SER18260264 THRU 18262465
RED(4)	18	-18-2		S-1829-1	SEE RED(1)			SER 18262466 & ON
RED(3)	18	-18-2	60	S-1493-1	SEE RED(1)			SER 18260264 THRU 18262465
WHT(4)	20	-20-9	60	SOLDER	SEE WHT(3)			
RED(2)	18	-18-2		SEE RED(1)	S-1367-1-6			THRU SER 18260263
RED(1)	18	-18-2		SOLDER	S-1370-0	1	2	
WHT(3)	22	-22-9		S-1370-1	SOLDER	1	2	
WHT(2)	22	-22-9		SEE LB20	SOLDER	2		
WHT(1)	22	-22-9		SEE LB20	SOLDER	2		
BLK(2)	22	-22-0	6	SOLDER	S-1367-1-8	2		
BLK(1)	22	-22-0	6	SOLDER	S-1367-1-8	2		
LB22	18		56	SEE LB18	S-1367-1-8			
LB21	20		58	S-1635-1	SOLDER			
LB20	18		58	S-1370-2	S-1370-1			
LB19	18		58	S-1635-1	SOLDER			
LB18	18		50	S-1635-1	SOLDER			
LB17	18		55	S-1635-1	S-1829-1			
LB16	18		55	S-1635-1	S-1829-1	3		

WIRE TABLE

ITEM NO	PART NO.	DESCRIPTION	
17	S-1637-2	HOUSING	
16	34002-55	TERM. BOARD	
15	S-2160-1	SWITCH	
14	S-2091-1	POT ASSY	
13	S-1844-1-2	SWITCH	
12	VAL-5-6000	RESISTOR	
11	1213757	EL PANEL	
10	S-20008270	RESISTOR	
9	S-2008-1	POT ASSY	
8	S-1904-3	POT ASSY	
7	S-1641-6	HOUSING-SOCKET	
6	S-1640-6	HOUSING-PIN	
5	S-1360-10L	CIRCUIT BKR	
4	C613001-0201	POWER SUPPLY	
3	1570166	DIMMING ASSY	
2	1213363	EL PANEL	
1	0713351	EL PANEL	

EQUIPMENT TABLE

CES-1000 IS APPLICABLE
VENDOR CODES PER S-1400
CES-XXXX=CESSNA SPEC. NO.
S-XXX OR CMXXXX=CESSNA STD. NO.

SUPERSEDES: P 11.9.1

SUPERSEDED BY:

CONTRACT NO:

	NAME	DATE
DESIGN	H WISE	7-18-69
GROUP	H Wise	7-18-69
DRAWN	D.L.BURKE	6-12-69
CHECK	E.YOUNGERS	6-24-69
STRESS	W.C DALE	7-17-69
PROJ		7-21-69
APPD		2-16-69
OTHER		

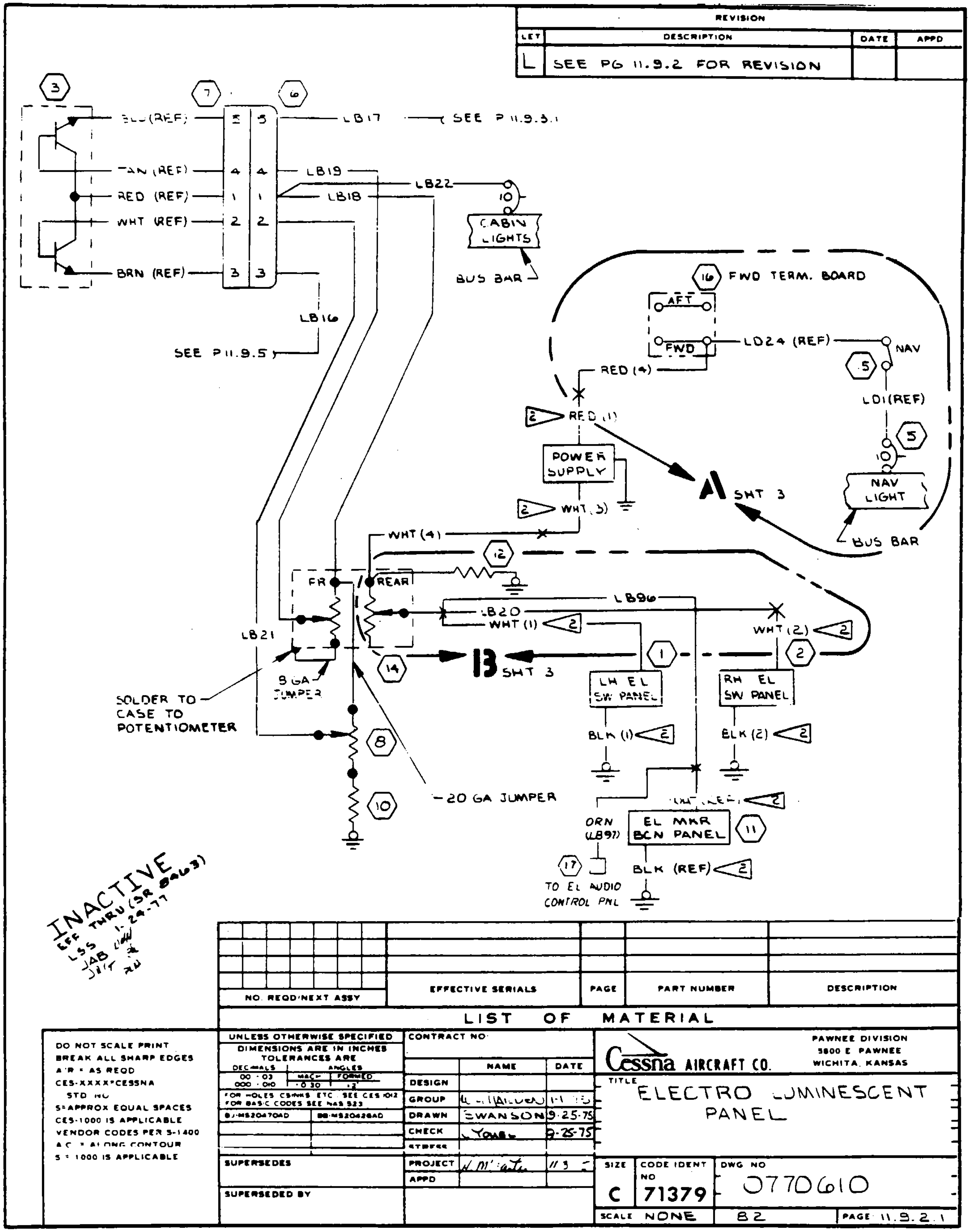
Cessna AIRCRAFT CO. COMMERCIAL AIRCRAFT DIV 5800 E. PAWNEE WICHITA, KANSAS

TITLE WIRING DIAGRAM — ELECTRO LUMINESCENT PANEL

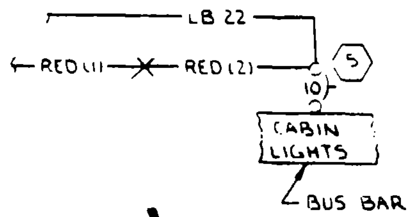
SIZE C | CODE IDENT NO. 71379 | DWG NO 0770610

SCALE NONE | 182 | PAGE: 11.9.2.0

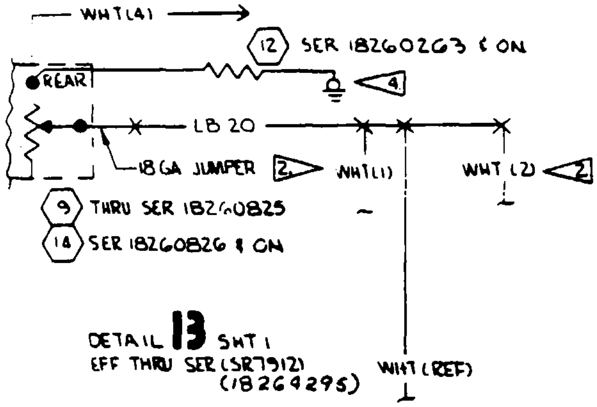
EDRR 10528 SER 62600056 & ON


REVISION
LET
DESCRIPTION
DATE
APPD
L
SEE PG 11.9.2 FOR REVISION
BLU (REF)
TAN (REF)
RED (REF)
WHT (REF)
BRN (REF)
LB17
SEE P 11.9.3.1
LB19
LB22
LB18
CABIN LIGHTS
BUS BAR
LB16
SEE P 11.9.5
FWD TERM. BOARD
AFT
FWD
LD24 (REF)
NAV
RED (4)
LD1 (REF)
RED (1)
POWER SUPPLY
SHT 3
NAV LIGHT
WHT (3)
BUS BAR
WHT (4)
FR
REAR
LB96
LB20
WHT (1)
WHT (2)
LB21
SOLDER TO CASE TO POTENTIOMETER
8 GA JUMPER
SHT 3
LH EL SW PANEL
RH EL SW PANEL
BLK (1)
BLK (2)
20 GA JUMPER
ORN (LB97)
EL MKR BCN PANEL
TO EL AUDIO CONTROL PNL
BLK (REF)
INACTIVE
EFF THRU (SR 8463)
LSS 1-24-77
NO. REQD NEXT ASSY
EFFECTIVE SERIALS
PAGE
PART NUMBER
DESCRIPTION
LIST OF MATERIAL
DO NOT SCALE PRINT
BREAK ALL SHARP EDGES
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ARE
CONTRACT NO
NAME
DATE
DESIGN
GROUP
DRAWN
SWANSON 9-25-75
CHECK
9-25-75
STRESS
PROJECT
APPD
SUPERSEDES
SUPERSEDED BY
Cessna AIRCRAFT CO.
PAWNEE DIVISION
5800 E PAWNEE
WICHITA, KANSAS
TITLE
ELECTRO LUMINESCENT PANEL
SIZE
C
CODE IDENT NO
71379
DWG NO
0770610
SCALE NONE
82
PAGE 11.9.2.1

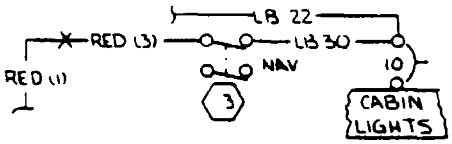
REVISION			
LET	DESCRIPTION	DATE	APPD
J	SEE PG. 11.9.2 FOR REVISION		



DETAIL A SHT 1
EFF THRU SER 18260263



DETAIL B SHT 1
EFF THRU SER (SR7912)
(18264295)



DETAIL A SHT 1
SER 18260264 THRU SER 18262465

INACTIVE
EFF THRU (SR 8403)
1-24-77
L65

CONTRACT NO		
	NAME	DATE
DESIGN		1-30-75
GROUP		1-30-75
DRAWN	WHITSON	6-23-75
CHECK	J. Youel	6-26-75
STRESS		
PROJ		
APPD		
OTHER		

Cessna AIRCRAFT CO.
PAWNEE DIVISION
5800 E. PAWNEE
WICHITA KANSAS

TITLE
WIRING DIAGRAM –
ELECTRO LUMINESCENT
PANEL

SIZE	CODE IDENT NO.	DWG NO
C	71379	0770610
SCALE NONE	182	PAGE 11.9.2.2

LET	DESCRIPTION	DATE	APPD
E	BY REV D-LB94 WAS DHF-LB86; D-LB95 WAS LB10 (REF)(SR 7380)	BAK 11-5-73	
F	BY REV ADD S-2035-1 & S-2035-2. DETAIL "C", NOTE 5. (MER E0034)(SER 18262466) (NOW SHOP PRACTICE)	DEF 2-15-74	
G	BY REV: ADD RED(1), RED(2), LB31, LB32 & DETAIL "D". SER OUT LB28 & LB29 (MER 182 E0120) SER 18262556	RS 5-28-74	
H	BY REV: SER IN 34003-817. SER OUT 34002-55 (SR7912)	GW 8-5-75	

LET	REVISION DESCRIPTION	DATE	APPD
A	BY REV: ADD △ 4TH 23-288 LT ASSY TO EYEBROW LT ASSY. SER 18260446 & ON	VRS 11-13-70	
B	BY REV: ADD LB28, LB29, BLK(6), S-1695-2, 1213319-4 & SER (SR7037X)	DLP 9-20-72	
C	BY REV: ADD DETAIL "A" & SER OUT; SER OUT LB23 & BLK(5), ADD DETAIL "B" & SER OUT; SER OUT LB83 & S-1899-1. ADD RED/YEL(4) BLK(4), LB30, NOTE 4, S-1637-1, S-1637-2 & SER; SER OUT LB11, NOTE 3 & S-341-1/LB10, S-1370-1 / LB6 & LB9 WAS S-341-2/LB6 & S-341-1 / LB9. SER 18260825 SER 18261426 (SR7380) II	DLP 3-6-73	
D	BY REV ADDED WIRE LENGTHS (NOW SHOP PRACTICE)	BRM 5-2-73	

63-0916

INACTIVE EFF THRU (SR 8463) 1-24-77 LSS JAB

NOTES:

1. OXYGEN CONSOLE WIRING APPLICABLE ONLY WHEN OPTIONAL OXYGEN SYSTEM IS INSTALLED
2. FOR OPTIONAL INSTRUMENT CLUSTER LIGHTING, SEE PAGE 11.9.5
3. INSTALL S-341-1 TERMINAL ON VENDOR FURNISHED LEAD AS INDICATED. THRU SER 18262465
4. INSTALL S-1635-1 TERMINAL ON VENDOR FURNISHED LEAD AS INDICATED. SER 18262466 & ON
5. INSTALL S-1637-2-6 TERMINAL ON VENDOR FURNISHED WIRES AS INDICATED

WIRE CODE NO	GA	MATERIAL	LG	TERMINALS	TERMINALS	SERIALS
LB32	18			SOLDER	S-1636-1	SER 18262557 & ON
LB31	18			SOLDER	S-1636-1	SER 18262557 & ON
RED(2)	18			S-1636-1	SOLDER	SER 18262557 & ON
RED(1)	18			SOLDER	S-1636-1	SER 18262557 & ON
D-LB95	20			S-1829-1	S-1370-1	SER 18262466 THRU (SR7380)
D-LB30	20			S-1829-1	S-1636-1	SER 18262466 & ON
BLK(6)	22	-22-0		S-1636-1	S-1367-1-4	SER 18262466 & ON
RED/YEL(4)	22	-22-2-4		S-1370-1	S-1636-1	SER 18262466 & ON
D-LB94	20			S-1829-1	SOLDER	SER 18262466 & ON
BLK(6)	18	-18-0	15	SOLDER	S-1367-1-8	SER 18261426 & ON
LB29	18			SOLDER	SOLDER	SER 18261426 Thru 18262556
LB28	18		60	S-1829-1	SOLDER	SER 18261426 Thru 18262556
RED/BLU	18	-18-2-6		SOLDER	SOLDER	
RED/YEL(3)	22	-22-2-4		SOLDER	SOLDER	
BLK(5)	18	-18-0	20	SOLDER	S-1367-1-8	THRU SER 18260825
BLK(4)	18	-18-0	20	SOLDER	SOLDER	
BLK(3)	22	-22-0	6	SOLDER	S-1367-1-8	
DHF-LB86	20		40	SOLDER	S-1829-1	THRU SER 18262465
DHF-LB85	20		30	SOLDER	S-1367-1-8	THRU SER 18262465
D-LB11	20			S-1829-1	S-341-1	THRU SER 18262465
D-LB10	20			S-1829-1	S-341-1	THRU SER 18262465
D-LB9	20			S-1829-1	S-1370-1	
D-LB6	20			S-1370-1	S-1367-1-8	
LB27	18		65	S-1370-1	S-1829-1	
LB26	18			S-1370-1	S-1367-1-8	
LB25	18			SOLDER	S-1367-1-8	
LB24	18		110	SOLDER	S-1829-1	
LB23	18		65	S-1370-1	S-1829-1	THRU SER 18260825

WIRE TABLE

ITEM NO	PART NO.	DESCRIPTION
16	34002-55	TERMINAL BOARD
15	S-2035-2	HOUSING
14	S-2035-1	HOUSING
13	S-1637-2	HOUSING
12	S-1637-1	HOUSING
11	GE 53	LAMP
10	1213319-4	LIGHT ASSY
9	S-1695-2	SWITCH
8	G.E. 94	MINTR LAMP
7	G.E. 90	MINTR LAMP
6	34003-817	TERMINAL BOARD
5	23-288	LIGHT ASSY
4	S-1899-1	LIGHT ASSY
3	C660501-0101	COMPASS
2	1270479	LIGHT ASSY
1	0513208-1	SOCKET

EQUIPMENT TABLE

CES-1000 IS APPLICABLE
VENDOR CODES PER S-1400
CES-XXXX=CESSNA SPEC. NO
S-XXX OR CMXXXX=CESSNA STD. NO

SUPERSEDES: P 11.2

SUPERSEDED BY:

CONTRACT NO:

	NAME	DATE
DESIGN	H WISE	7-18-69
GROUP	H Wise	7-18-69
DRAWN	D.L. BURKE	7-15-69
CHECK	E. YOUNGER	7-15-69
STRESS	W.C DALE	7-17-69
PROJ		
APPD		2-16-69
OTHER		

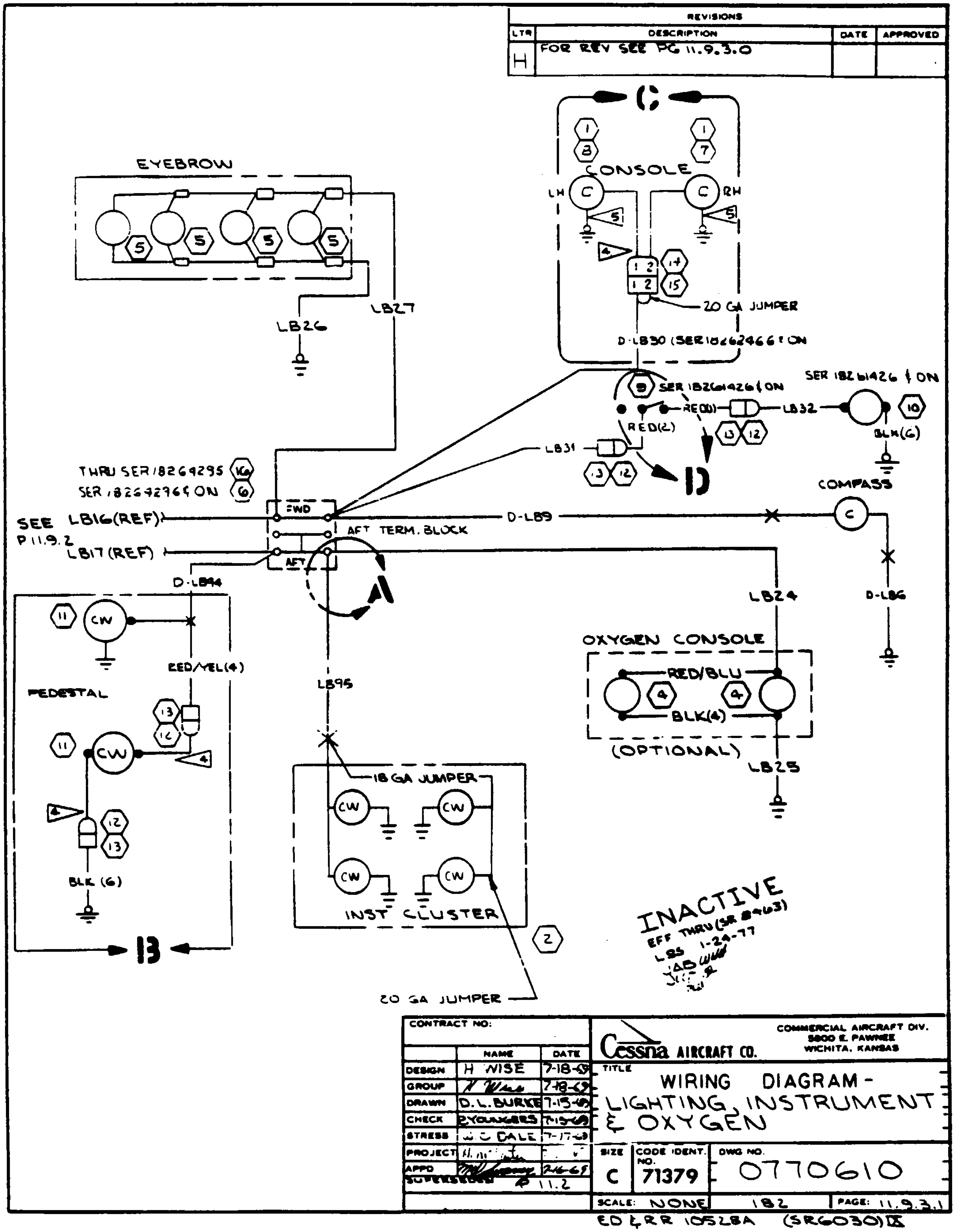
Cessna AIRCRAFT CO. COMMERCIAL AIRCRAFT DIV. 5800 E. PAWNEE WICHITA, KANSAS

TITLE: WIRING DIAGRAM — LIGHTING, INSTRUMENT & OXYGEN

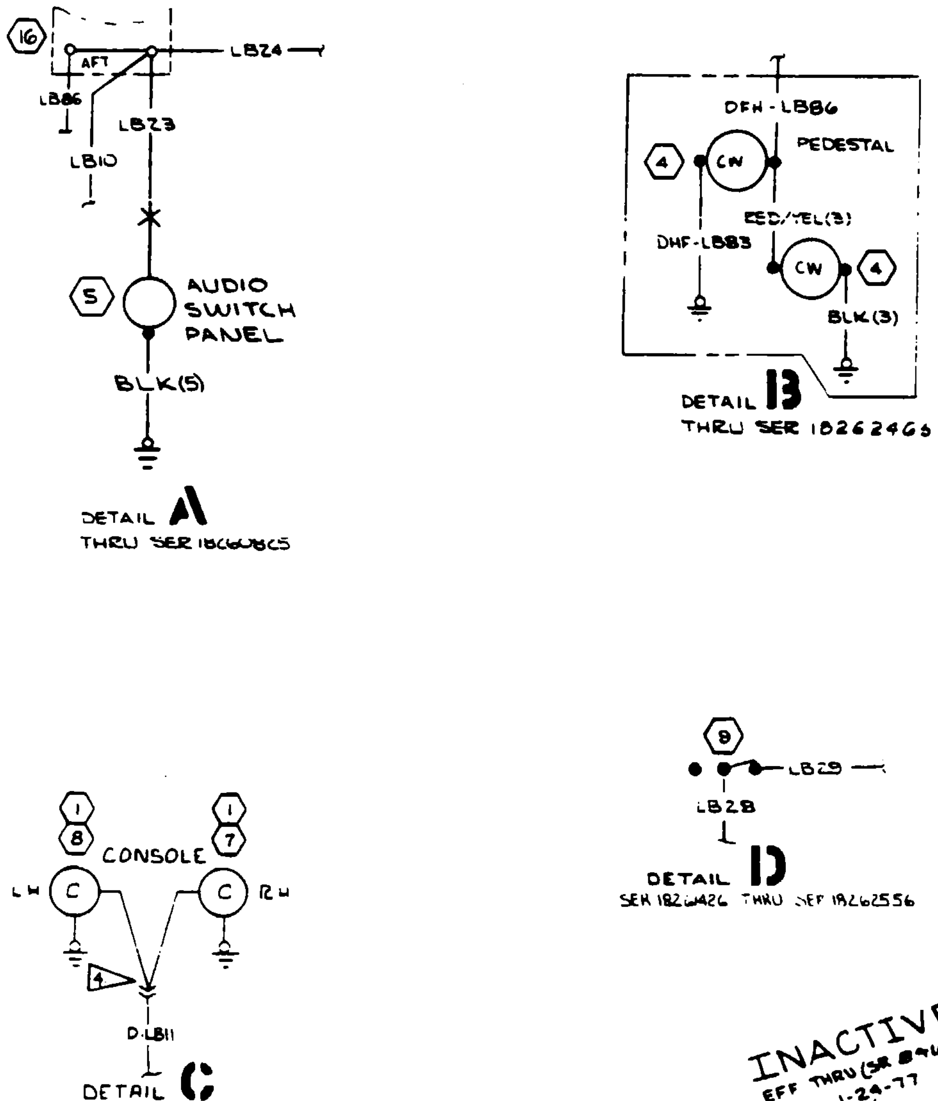
SIZE C | CODE IDENT. NO 71379 | DWG NO 0770610

SCALE NONE | 182 | PAGE 11.9.3.0

ED & RR 10328 (SR6030) IX



Lighting, Instrument & Oxygen (Sheet 1 of 2)



INACTIVE
EFF THRU (SR 8463)
LSS 1-24-77

CONTRACT NO:			Cessna AIRCRAFT CO. COMMERCIAL AIRCRAFT DIV. 5800 E. PAWNEE WICHITA, KANSAS
	NAME	DATE	TITLE
DESIGN	H WISE	7-18-69	WIRING DIAGRAM - LIGHTING, INSTRUMENT & OXYGEN
GROUP	H. Wise	7-18-69	
DRAWN	D.L. BURKE	7-15-69	
CHECK	R.YOUNGERS	7-15-69	
STRESS	W.C DALE	7-17-69	
PROJECT			SIZE C — CODE IDENT. NO. 71379 — DWG NO. 0770610
APPD		7-16-69	
SUPERSEDES:		11.2	
			SCALE: NONE — 182 — PAGE: 11.9.3.1

ED & RR 10528A (SR6030) IX

Lighting, Instrument & Oxygen (Sheet 2 of 2)

REVISION			
LET	DESCRIPTION	DATE	APPD
A	BY REV LB91(REF) WAS LB88, LB30(REF) WAS LB89, 20 GA JUMPER WAS 2-LB16(REF), LB95(REF) WAS LB10(REF), LB94(REF) WAS LB86(REF) (REF)(SR7380)	RAH 11-5-73	WRW
B	BY REV 34003-817 WAS 34002-55 (SR7912)	GW 8-5-75	

INACTIVE
EFF THRU (SR 8463)
LSS 1-20-77
JAO

63-0916

WIRE CODE NO	GA	MATERIAL	LG	TERMINALS			SERIALS
RED/YEL(2)	20	-20-2-4		SOLDER	S-1635-1		
RED/YEL(1)	20	-20-2-4		SOLDER	SOLDER		
BLK(2)	20	-20-0		SOLDER	S-1635-1		
BLK(1)	20	-20-0		SOLDER	SOLDER		
LB93	20			S-1636-1	S-1367-1-8		
LB92	↓			S-1493-1	S-1636-1		
LB91	↓			S-1493-1	S-1636-1		
LB90	20			S-1636-1	S-1367-1-8		

WIRE TABLE

	PART NO.	DESCRIPTION	
12	S-2023-1	ADAPTER	
11	S-1637-2	HOUSING	
10	S-1637-1	HOUSING	
9	S-1695-2	SWITCH	
8	GE94	LAMP	
7	S-1899	LIGHT ASSY	
6	1213319	LIGHT ASSY	
5	0513208-1	SOCKET	
4	C660501-0101	COMPASS ASSY	
3	1213319-4	LIGHT ASSY	
2	34003-817	TERMINAL BLOCK	
1	S-2166-2	SWITCH	

EQUIPMENT TABLE

CES-1000 IS APPLICABLE
VENDOR CODES PER S-1400
CES-XXXX=CESSNA SPEC. NO.
S-XXX OR CMXXXX=CESSNA STD. NO.

SUPERSEDES: Pg. 11.9.4 & 11.9.5
SUPERSEDED BY:

CONTRACT NO:

	NAME	DATE
DESIGN		
GROUP	H. Mue	9-26-73
DRAWN	MERRICK	9-24-73
CHECK	J. YOUEL	9-25-73
STRESS		
PROJ	H. McCarty	9-26-73
APPD	PLH	
OTHER		

Cessna AIRCRAFT CO. COMMERCIAL AIRCRAFT DIV. 5800 E. PAWNEE WICHITA, KANSAS

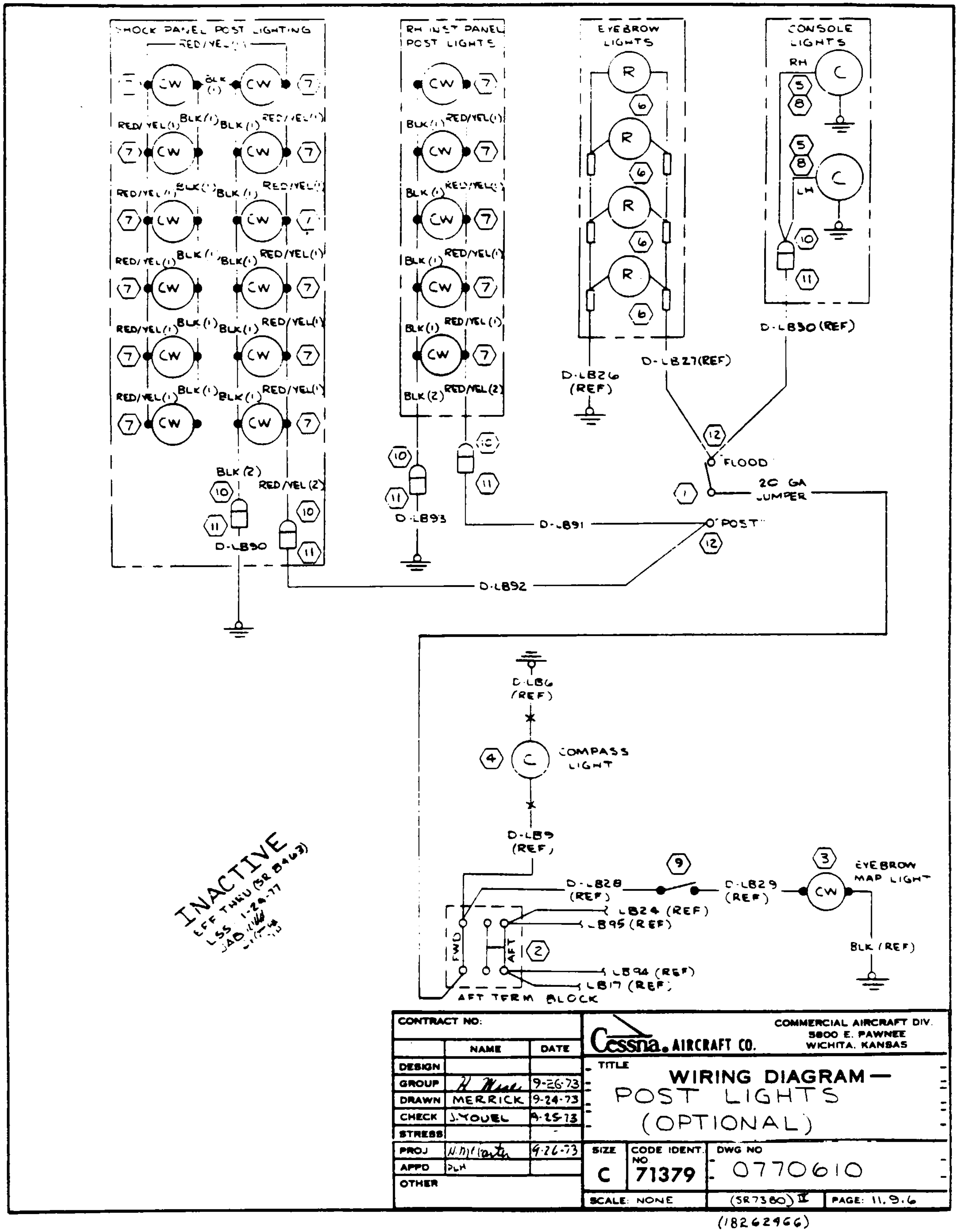
TITLE WIRING DIAGRAM — POST LIGHTS (OPTIONAL)

SIZE C | CODE IDENT. NO. 71379 | DWG NO 0770610

SCALE: NONE | (SR7380) | PAGE: 11.9.6

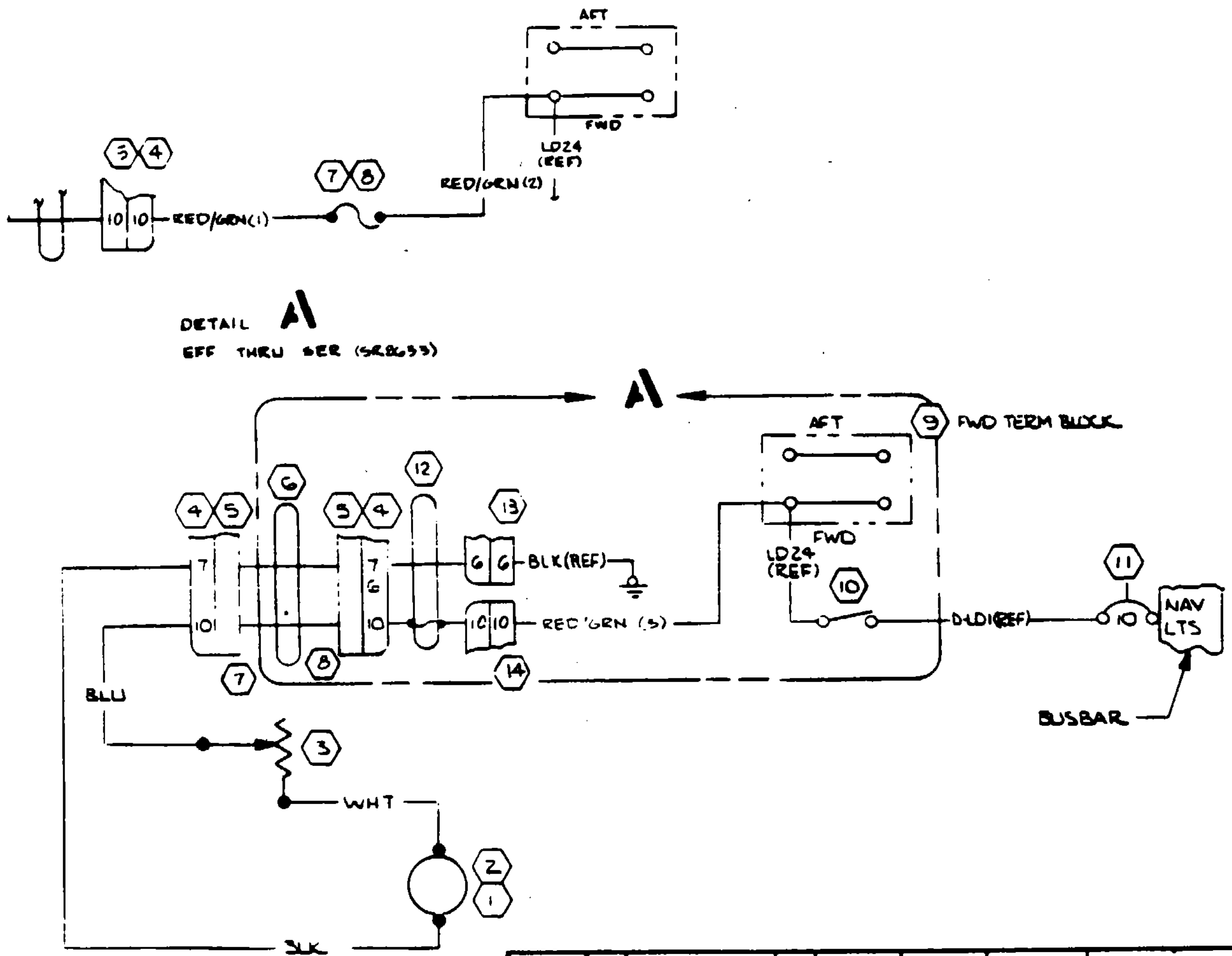
(18262966)

Post Lights (Sheet 1 of 2)



Post Lights (Sheet 2 of 2)

REVISION			
LET	DESCRIPTION	DATE	APPD
A	BY REV: ADD RED/GRN (5), DTL "A"; SER; SER OUT RED/GRN (1) & RED/GRN (2) ADD S-960-2-0, S-1962-2-2 & 1570307 (SR8633)(SR7677)(REF)	PH 8-24-76	



14	S-1962-2-0	HOUSING	
13	S-1960-2-0	HOUSING	
12	1570307	CABLE ASSY	
11	S-1360-10L	CKT BREAKER	
10	S-2160-1	SWITCH	
9	34002-55	TERM BOARD	
8	AGC-1/2	FUSE	
7	HHJ-A	FUSE HOLDER	
6	1570308-1	CABLE ASSY	
5	3421-0000	SOCKET	
4	570307-1	CONNECTOR ASSY	
3	3859AK61-152A	RHEOSTAT	
2	4157-001	SOCKET	
1	12RB	LAMP	
ITEM NO.	PART NO.	DESCRIPTION	

EQUIPMENT TABLE

WIRE CODE NO.	GA	MATERIAL	LG	TERMINALS			SERIALS
GRN/RED(1)	22	-22-2-5		SOLDER	S-1829-1		SER (SR8633) & ON
BLK	22	-22-0		SOLDER	SOLDER		
WHT	22	-22-9		SOLDER	SOLDER		
BLU	22	-22-6		SOLDER	SOLDER		
GRN/RED(2)	22	-22-2-5		SOLDER	S-1829-1		EFF THRU SER (SR8633)
GRN/RED(1)	22	-22-2-5		SOLDER	SOLDER		EFF THRU SER (SR8633)

WIRE TABLE

CES-1000 IS APPLICABLE
VENDOR CODES PER S-1400
CES-XXXX=CESSNA SPEC. NO.
S-XXX OR CMXXXX=CESSNA STD. NO.

SUPERSEDES: 7 11.11.3

SUPERSEDED BY:

CONTRACT NO:

	NAME	DATE
DESIGN		
GROUP	W.H. Harding	11-12-73
DRAWN	D.L. OLLER	11-6-73
CHECK	PAPE	11-7-73
STRESS		
PROJ	H. McCarter	11-19-73
APPD	PW	
OTHER		

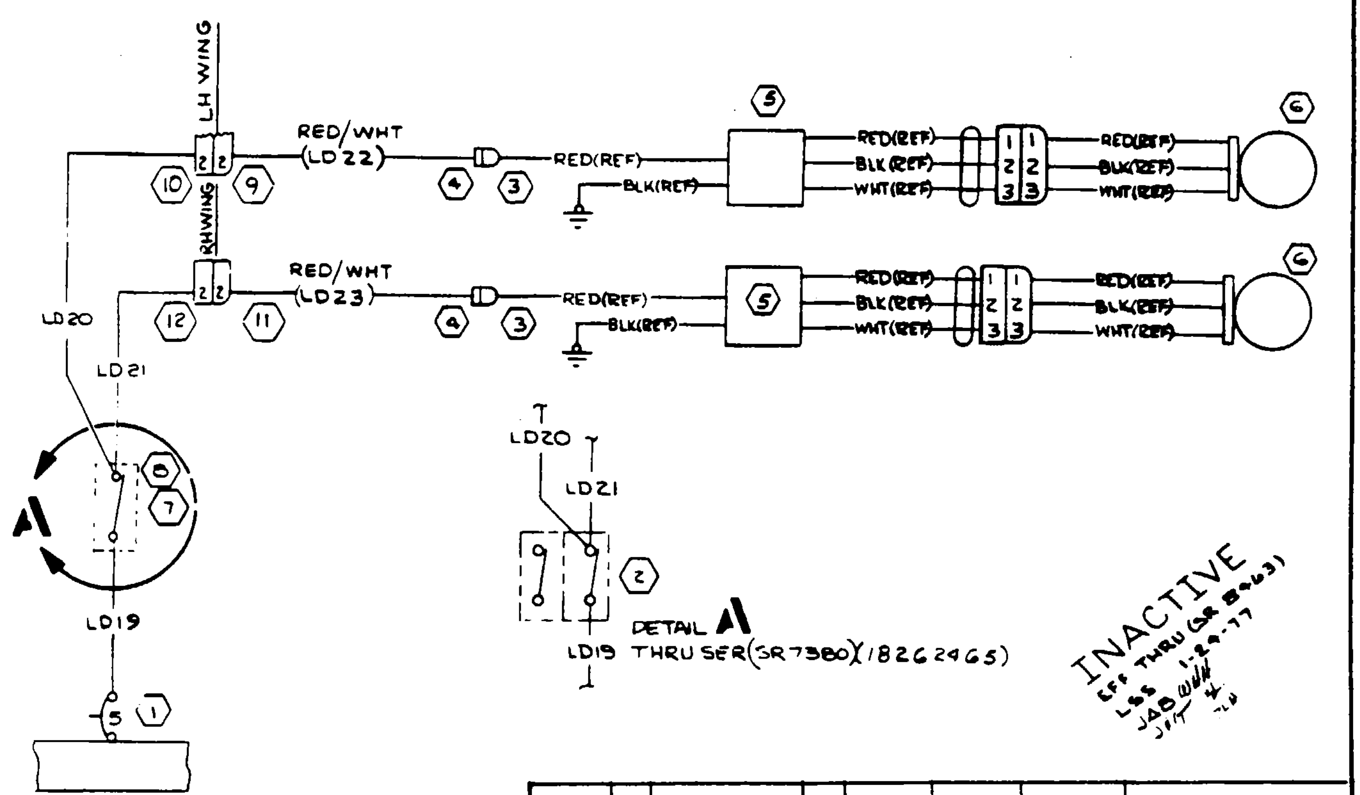
Cessna AIRCRAFT CO.
COMMERCIAL AIRCRAFT DIV.
5800 E. PAWNEE
WICHITA, KANSAS

TITLE
WIRING DIAGRAM — MAP LIGHT, CONTROL WHEEL

SIZE	CODE IDENT. NO.	DWG NO
C	71379	0770610

SCALE: NONE | SR7677 | PAGE: 11.11.4

REVISION			
LET	DESCRIPTION	DATE	APPD
A	BY REV: ADD S-2160 S-2023-1 & SER SER OUT S-1846-2-3 (SR7380)IX	DLP 2-21-73	
B	BY REV: ADDED WIRE LENGTHS S-1635-2 WAS S-1636-2 PER LD22 & LD23 (NOW SHOP PRACTICE)	BRM 5-2-73	
C	BY REV: S-1640-6 WAS S-1637-1; S-1641-6 WAS S-1637-2; S-1640-9 WAS S-1637-1; S-1641-9 WAS S-1637-2; RED/WHT(LD22) WAS LD22; RED/WHT(LD23) WAS LD23 (MER 182E0196) (SR80372)	BRF 5-22-74	



RED/WHT (LD 23)	18	-18-2-9	190	S-1635-2	S-1636-2	STD	
RED/WHT (LD 22)	18	-18-2-9	200	S-1635-2	S-1636-2	STD	
LD21	18		124	S-1493-1	S-1636-2		THRU SER (SR7912)
LD20	18		26	S-1493-1	S-1636-2		THRU SER (SR7912)
LD19	18		20	S-1367-1-4	S-1493-1		
WIRE CODE NO	GA	MATERIAL	LG	TERMINALS			SERIALS

WIRE TABLE

ITEM NO	PART NO.	DESCRIPTION
12	S-1641-9	HOUSING-SCKT
11	S-1640-9	HOUSING-PIN
10	S-1641-6	HOUSING-SCKT
9	S-1640-6	HOUSING-PIN
8	S-2023-1	TERM. ADAPTER
7	S-2160-1	SWITCH
6	C622006-0101	LAMP ASSY
5	C622007-0101	POWER ASSY
4	S-1637-2	HOUSING
3	S-1637-1	HOUSING
2	S-1846-2-3	SWITCH
1	S-1360-5L	CIRCUIT BREAKER

EQUIPMENT TABLE

CES-1000 IS APPLICABLE
VENDOR CODES PER S-1400
CES-XXXX=CESSNA SPEC. NO.
S-XXX OR CMXXXX=CESSNA STD. NO.

SUPERSEDES P11.12

SUPERSEDED BY

CONTRACT NO:

	NAME	DATE
DESIGN	VR SIPES	3/25/72
GROUP	H. Wise	
DRAWN	VR SIPES	5-22-72
CHECK		5-22-72
STRESS		
PROJ		
APPD		
OTHER		

Cessna AIRCRAFT CO.
COMMERCIAL AIRCRAFT DIV.
5800 E. PAWNEE
WICHITA, KANSAS

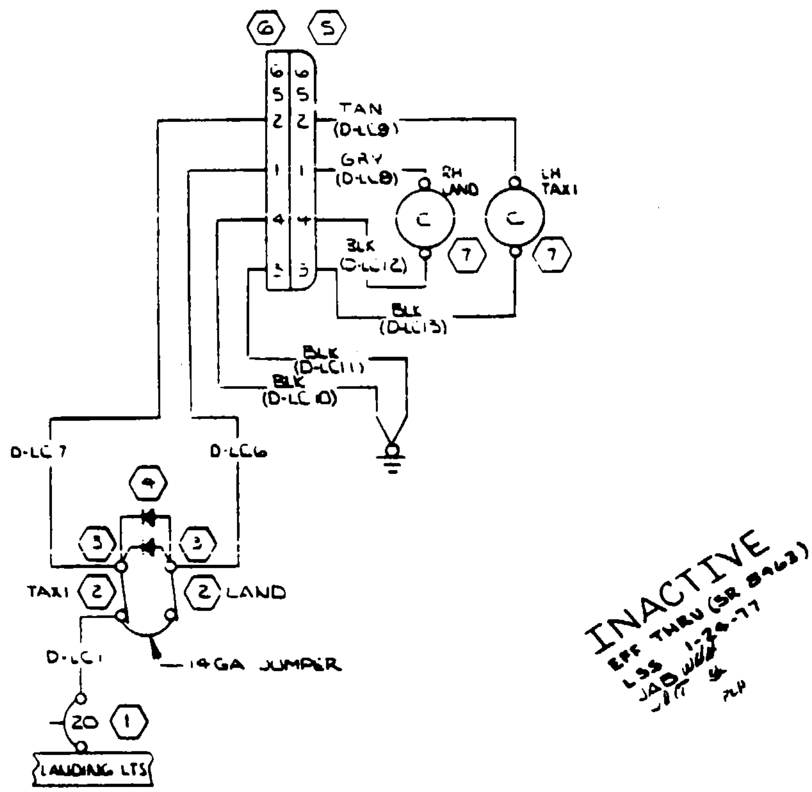
TITLE
WIRING DIAGRAM — WING TIP STROBE LIGHTS (OPT)

SIZE C | CODE IDENT NO. 71379 | DWG NO 0770610

SCALE NONE | 182, A182 | PAGE 11.13

(SR7188) (SR 7037)IX (18261426)

REVISION			
LET	DESCRIPTION	DATE	APPD
A	BY REV: TAN (LC9) WAS GRY(LC8) & GRY (LC8) WAS TAN (LC9) (NOW SHOP PRACTICE)	RS 4-18-79	



BLK (D-LC13)	14	-14-0	50	S-1635-2	S-1367-2-8	
BLK (D-LC12)	14	-14-0	74	S-1635-2	S-1367-2-8	
BLK (D-LC11)	14	-14-0	23	S-1636-2	SEE BLK 1	
BLK (D-LC10)	14	-14-0	23	S-1636-2	S-1367-2-12	
GRY (D-LC8)	14	-14-K	14	S-1635-2	S-1367-2-8	
TAN (D-LC9)	14	-14-10	50	S-1635-2	S-1367-2-8	
D-LC7	14		52	S-1493-2	S-1636-2	
D-LC6	14		52	S-1493-2	S-1636-2	
D-LC1	14		3	S-1493-2	S-1367-2-8	
WIRE CODE NO	GA	MATERIAL	LG	TERMINALS		SERIALS

WIRE TABLE

ITEM NO	PART NO.	DESCRIPTION	
7	4505	LANDING LIGHT	
6	S-1694-6	HOUSING	
5	S-1690-6	HOUSING	
4	1270082-2	DIODE ASSY	
3	S-2023-1	TERM ADAPTER	
2	S-2160-1	SWITCH	
1	S-1360-20L	CIRCUIT BREAKER	

EQUIPMENT TABLE

CES-1000 IS APPLICABLE
VENDOR CODES PER S-1400
CES-XXXX=CESSNA SPEC. NO.
S-XXX OR CMXXXX=CESSNA STD. NO.

SUPERSEDES: PG 11.3.1

SUPERSEDED BY:

CONTRACT NO:

	NAME	DATE
DESIGN		
GROUP	H. Wise	10-11-73
DRAWN	JL OLLEE	10-11-73
CHECK	McGUIGAN	10-11-73
STRESS		
PROJ	W. m...	11-27-73
APPD		
OTHER		

Cessna AIRCRAFT CO.

COMMERCIAL AIRCRAFT DIV.
5800 E. PAWNEE
WICHITA, KANSAS

TITLE
WIRING DIAGRAM — LANDING LIGHTS

SIZE	CODE IDENT. NO.	DWG NO
C	71379	0770610

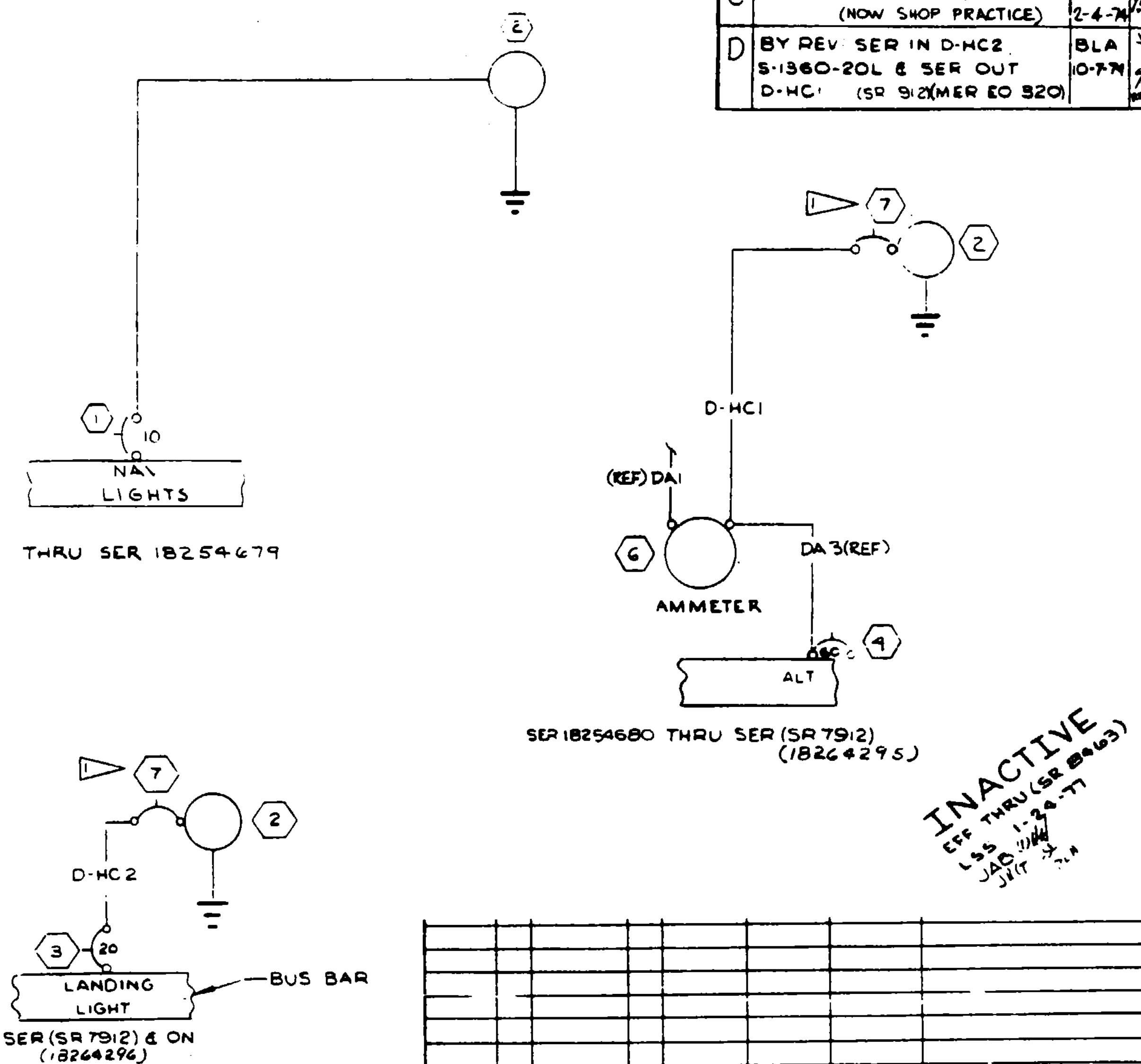
SCALE: NONE | 182 | PAGE: 11.14

182625-6

NOTE:

1. CIRCUIT BREAKER IS RESET BY INSERTING A PROBE INTO THE 1/8 DIA HOLE IN BREAKER FACE AND PUSHING LIGHTLY UNTIL A CLICK IS HEARD.

CHG LET	REVISION	BY / DATE	CHK / APPD
A	ADD 60232-1 CKT BKR TO CIGAR LIGHTER. ADD D HC1 WIRE ADD NOTE 1. 0713602-1 & S-1232-50 (SR 4081)	GLW 12-10-62	
B	ADDED WIRE LENGTH TO W/T; S-1360-50 WAS S-1232-50; C669502-0103 WAS 0713602-1; REMOVED 0713607-1 & 0770610-DA2 FROM E/T;	WJR 8-14-64	
C	BY REV: ADD DA1(REF), DA3(REF). (NOW SHOP PRACTICE)	BAH 2-4-74	JCY
D	BY REV SER IN D-HC2 S-1360-20L & SER OUT D-HC1 (SR 912)(MER EO 320)	BLA 10-7-74	JCY



WIRE CODE NO	GA	MATERIAL	LG	TERMINALS			SERIALS
D-HC2	16			S-1367-2-6	S-1367-2-8		SER (SR 7912) & ON
D-HC1	16		12	S-1367-2-10	S-1367-2-8		SER 18254680 THRU SER (SR 7912)

WIRE TABLE

ITEM NO	PART NO	DESCRIPTION	INSTALLED ON
7	60232-1	CKT BKR (CUE)	
6	C669502-0103	INST CLUSTER KIT	
5			
4	S-1360-60	CIRCUIT BREAKER	
3	S-1360-20	CIRCUIT BREAKER	
2	0513052-3	CIGAR LIGHTER	
1	S-1232-10	CIRCUIT BREAKER	

EQUIPMENT TABLE

CESSNA AIRCRAFT CO COMMERCIAL AIRCRAFT DIVISION WICHITA KANSAS

	NAME	DATE
DRAWN	RIDDER	10-5-62
GROUP		
CHECK	R. Sluck	10-23-62
PROJ	H. McC...	11-29-62

TITLE: WIRING DIAGRAM — CIGAR LIGHTER

Cessna.

DWG NO 0770610

SUPERSEDED BY	SUPERSEDES	MODEL 182	REV C	PAGE 13.1

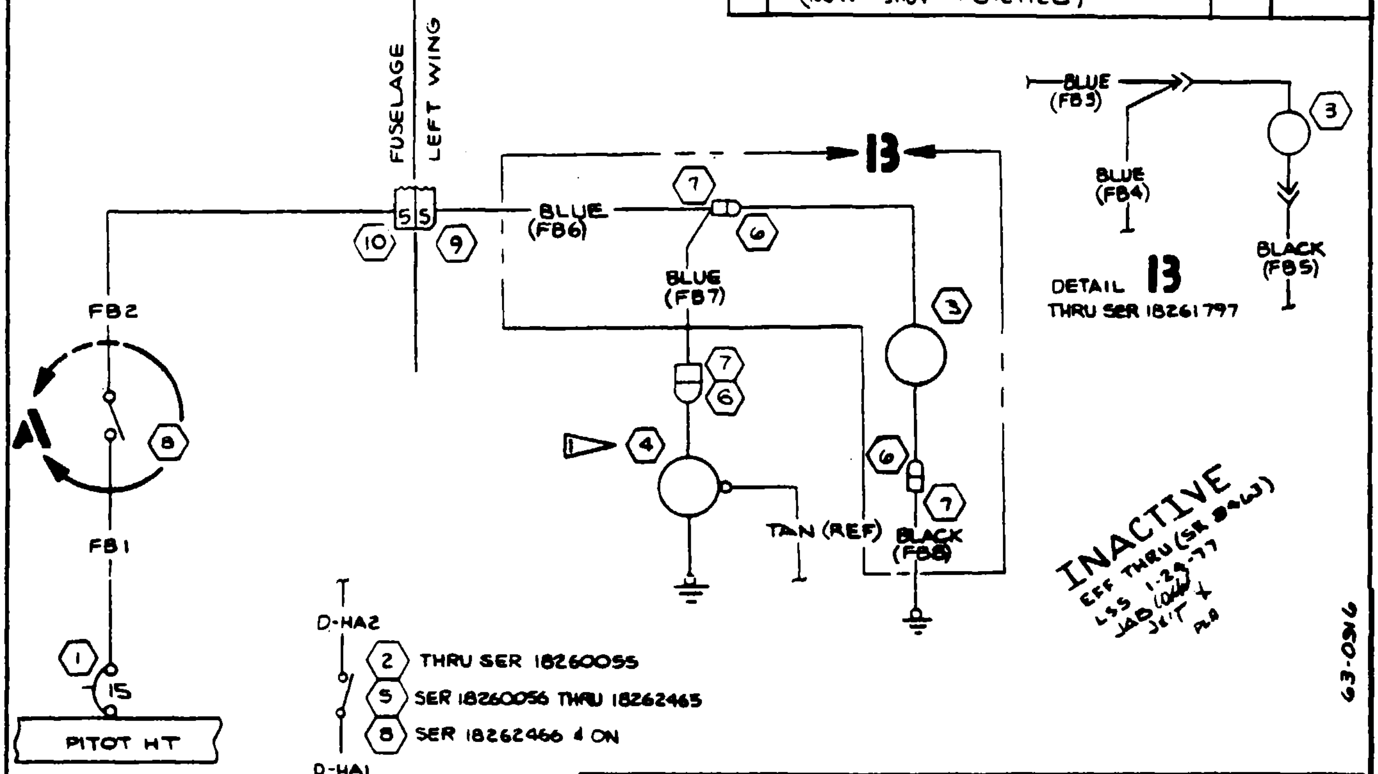
E	BY REV: S-1640-6 WAS S-1637-1; S-1641-6 WAS S-1637-2; SER IN FB1 & FB2, SER OUT HA1 & HA2, 35/BLU(FB7) WAS 46, 55/BLU(FB6) WAS 75, BLU(FB8) WAS BLU(1), BLU(FB4) WAS BLU(2), BLK(FB5) WAS BLK, BLU(FB6) WAS BLU(3), BLU(FB7) WAS BLU(4), BLK (FB8) WAS BLK(1) (MER 18260196) (SR80372)	BRF 5-22-74	

REVISION

LET	DESCRIPTION	DATE	APPD
A	BY: SER OUT S-1845-1-1; SER IN S-1845-1-2; ADD DETAIL A EDERR 10486 (SR6030) IX	DLB 6-12-68	
B	BY REV: SER OUT BLU (1) BLU(2) & BLACK; SER IN BLU(3) BLU(4) & BLK(1); ADD DETAIL B & SER (SR 7320)	JCY 11-6-72	
C	BY REV: ADD S-2160-1 & SER; SER OUT S-1845-1-2 (SR7380) IX	DLP 4-73	
D	BY REV: S-1635-1/BLU (3) WAS S-341-1/BLU (3), S-1836-2/HA2 WAS S-341-1/HA2 (NOW SHOP PRACTICE)	11-6-73	

NOTES:

1. ONLY HEATER CIRCUIT SHOWN, FOR STALL WARNING CIRCUIT SEE PAGE 15.1



FB2	16		95	S-1493-2	S-1636-2		SER 1826290 & ON
FB1	16		7	S-13672-8	S-1493-2		SER 1826240 & ON
BLK(FB8)	18	-18-0	8	S-1636-2	S-1367-1-8		SER 18261798 & ON
BLU(FB7)	16	-16-6	35	SEE BLU(FB6)	S-1636 2		SER 18261798 & ON
BLU(FB6)	16	-16-6	55	S-1636-2	S-1635-1		SER 18261798 & ON
BLK(FB5)	18	-18-0	8	S-1635-2	S-1367-1-8		THRU SER 18261797
BLU(FB4)	16	-16-6	46	SEE BLU(FB3)	S-1369-2		THRU SER 18261797
BLU(FB3)	16	-16-6	75	S-341-1	S-341-1		THRU SER 18261797
D-HA2	16		22	S-1493-2	S-1636-2		THRU SER 1826239
D-HA1	16		2	S-13672-8	S-1493-2		THRU SER 1826239
WIRE CODE NO.	GA	MATERIAL	LG	TERMINALS			SERIALS

WIRE TABLE

ITEM NO.	PART NO.	DESCRIPTION
10	S-1641-6	HOUSING - SCKT
9	S-1640-6	HOUSING - PIN
8	S-2160-1	SWITCH
7	S-1637-2	HOUSING - PLUG
6	S-1637-1	HOUSING - CAP
5	S-1845-1-2	SWITCH
4	0511062-5	XMTR STALL WARN, HTD
3	0721106-15	PITOT TUBE, HTD
2	S-1845-1-1	SWITCH
1	S-1360-15L	CIRCUIT BKR

EQUIPMENT TABLE

CES-1000 IS APPLICABLE VENDOR CODES PER S-1400 CES-XXXX=CESSNA SPEC. NO. S-XXX OR CMXXXX=CESSNA STD. NO.

SUPERSEDES: P 13.2

SUPERSEDED BY:

CONTRACT NO:

	NAME	DATE
DESIGN	SIPES VR	6/3/68
GROUP		6-27-68
DRAWN	YOUNGERS	6-25-68
CHECK		6-27-68
STRESS		
PROJECT		
APPD	SWANEY	6-27-68

Cessna AIRCRAFT CO. COMMERCIAL AIRCRAFT DIV. 5800 E. PAWNEE WICHITA, KANSAS

TITLE: WIRING DIAGRAM — HEATED PITOT TUBE & HEATED STALL WARNING (OPT)

SIZE	CODE IDENT. NO.	DWG NO.
C	71379	0770610

SCALE: NONE | 182 | PAGE: 13.3

ED&RR 02383 (SR5852) IX (18259306)

NOTES:

1. THESE SWITCHES PART OF C301002-0101 ACTUATOR ASSY

REVISION			
LET	DESCRIPTION	DATE	APPD
A	BY REV: ITEM 10 WAS S-1641-6, ITEM 9 WAS S-1640-6, WIRE LENGTH ON CC57 WAS 32, CC49 WAS 140, CC47 WAS 140, CC45 WAS 140 CC59 WAS 140 CC54 WAS 32 CC55 WAS 32 & CC56 WAS 32 ADD WIRE LENGTH TO CC53 CC52 CC51 CC50 CC48 CC46 & CC58 NOW SHOP PRACTICE	RS 4-2-74	JRS
B	BY REV: LG105 WAS 140/RED(CC59) ORN(CC45) GRN(CC47) & BLU(CC49); PIN 8 WAS PIN 6, PIN 6 WAS PIN 5, PIN 7 WAS PIN 5 & PIN 9 WAS PIN 2 ON S-1640-9 & S-1641-9 (MER 182E0196) (SR80372)	BRF 5-22-74	JRS
C	BY REV: VDH WAS DH/CC54, CC55, CC56, CC57, CC33, CC22 & CC28 (SR7649)	MEM 6-15-74	JRS
D	BY REV: ITEM 3 & 4: PIN 3 WAS PIN 1. PIN 1 WAS PIN 2 PIN 2 WAS PIN 3 182 E0269	BLA 3-4-75	JRS

INACTIVE
EFF THRU (SR 8963)
LSS 1-24-77
JAB

WIRE CODE NO	GA	MATERIAL	LG	TERMINALS			SERIALS
VDH-CC57	16		62	S-1367-2-4	S-1636-2		
GREEN							
(D-CC53)	16	16-6	13	S-1493-2	S-1635-2		
ORANGE							
(D-CC52)	16	16-3	13	S-1493-2	S-1635-2		
BLUE							
(D-CC51)	16	16-7	13	S-1493-2	S-1635-2		
BLACK							
(D-CC30)	16	16-0	13	S-1636-2	S-1493-2		
BLUE							
(D-CC49	16	16-6	105	S-1635-2	S-1636-2		
VIOLET							
(D-CC48	16	16-7	19	S-1493-2	S-1367-2-8		
GREEN							
(D-CC47)	16	16-5	105	S-1635-2	S-1636-2		
VIOLET							
(D-CC46)	16	16-7	19	S-1493-2	S-1367-2-8		
ORANGE							
(D-CC45)	16	16-3	105	S-1635-2	S-1636-2		
RED							
(D-CC58	16	16-2	13	S-1635-2	S-1636-2		
RED							
(D-CC59)	16	16-2	105	S-1636-2	S-1635-2		
VDH-CC54	16		102	S-1367-2-4	S-1636-2		
VDH-CC33	16		6	S-1367-2-4	S-1367-2-4		
VDH-CC28	16		10	S-1367-2-4	S-1367-2-8		
VDH-CC56	16		62	S-1636-2	S-1367-2-4		
VDH-CC55	16		62	S-1367-2-4	S-1636-2		
VDH-CC22	16		36	S-1367-2-6	S-1367-2-4		

WIRE TABLE

	PART NO	DESCRIPTION	
10	S-1641-9	HOUSING-SOCKET	
9	S-1640-9	HOUSING-PIN	
8	S-1638-1	HOUSING-PLUG	
7	S-1638-2	HOUSING-CAP	
6	V3-1-D9	SWITCH	
5	C301002-0101	ACTUATOR ASSY	
4	S-1641-6	HOUSING-PLUG	
3	S-1640-6	HOUSING-PIN	
2	S-1906-1	SWITCH	
1	S-1360-15L	CIRCUIT BREAKER	

EQUIPMENT TABLE

CES-1000 IS APPLICABLE VENDOR CODES PER S-1400 CES-XXXX=CESSNA SPEC. NO. S-XXX OR CMXXXX=CESSNA STD. NO.

SUPERSEDES: PAGE: 14.3.2

SUPERSEDED BY:

CONTRACT NO:

	NAME	DATE
DESIGN		
GROUP	H. Wiese	10-29-73
DRAWN	NEARHOOD	10-17-73
CHECK	McGUIGAN	10-23-73
STRESS		
PROJ	H. McCarter	10-31-73
APPD		
OTHER		

Cessna AIRCRAFT CO. COMMERCIAL AIRCRAFT DIV. 5800 E. PAWNEE WICHITA, KANSAS

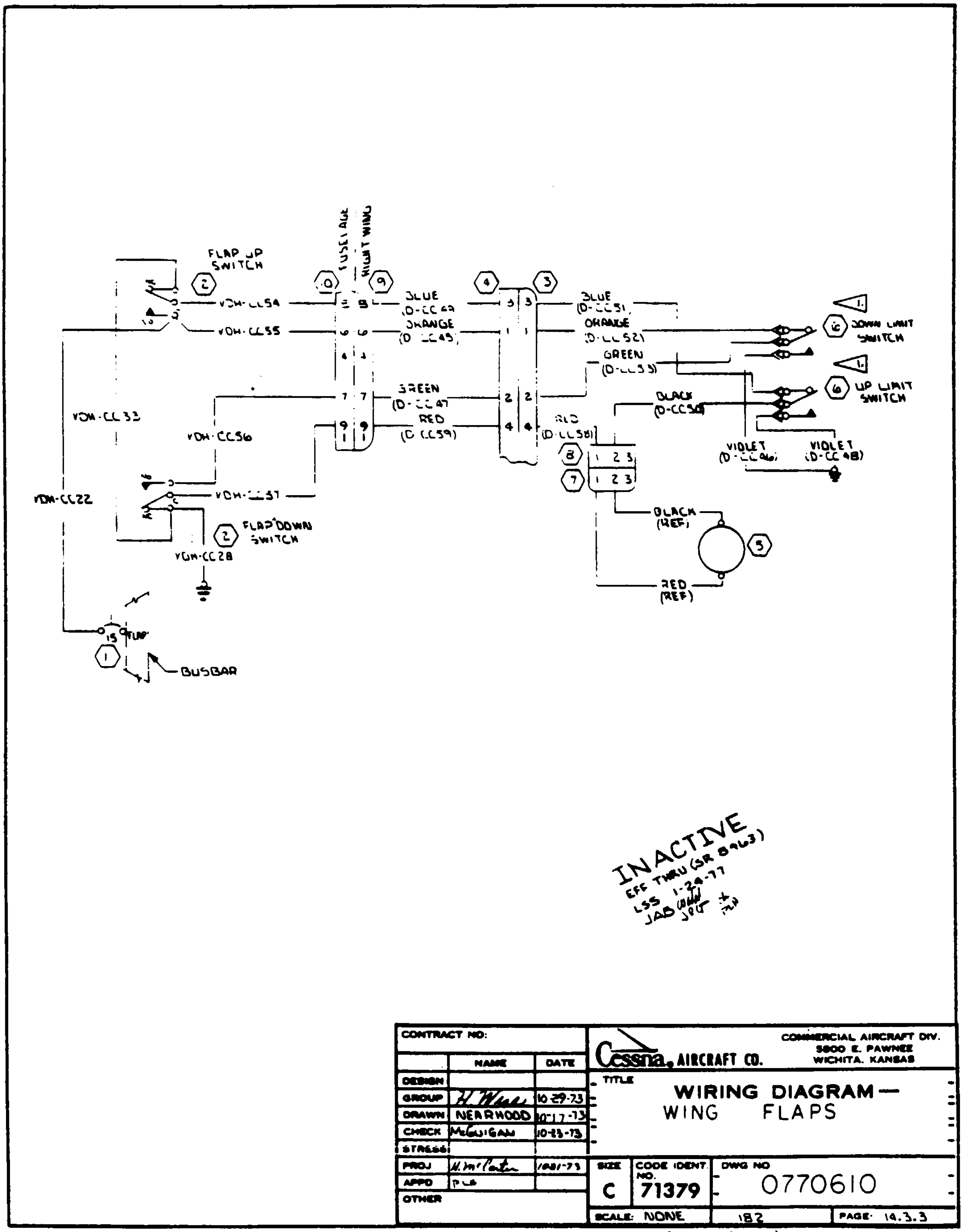
TITLE: WIRING DIAGRAM — WING FLAPS

SIZE: C | CODE IDENT NO: 71379 | DWG NO: 0770610

SCALE: NONE | 1E2 | PAGE: 14.3.3

(SR7380) REF) (18262466)

Wing Flap (Sheet 1 of 2)



(SR7380) REF
(18262466)

Wing Flap (Sheet 2 of 2)

REVISION			
LET	DESCRIPTION	DATE	APPD
A	BY REV: ADD D-CD11, DETAIL 'A' & SERIAL. S-2035-1 & S-2035-2 WERE S-1640 & S-1641 6 MER E0591 (SR8142)	PH 8-16-76	

INACTIVE
EFF THRU (SR 8463)
LSS 1-24-77
JAD
JIG

63-0916

WIRE CODE NO	GA	MATERIAL	LG	TERMINALS			SERIALS
D-CD11	20			S-13671-8	S-1656-1		SER (SR8142) & ON
D-CD7	20			SEE CD4	S-1636-1		
D-CD6	20			SEE CD5	S-1636-1		
D-CD5	20			S-1635-1	S-1636-1		
D-CD4	20			S-1635-1	S-1636-1		
D-CD10	20			S-1636-1	S-1636-2		
D-CD9	20			S-1636-1	S-1636-2		
D-CD8	20			S-1636-1	S-1367-1-8		
YEL	20	-20-4		SOLDER			
RED	20	-20-2		SOLDER			
ORN	20	-20-3		SOLDER			
BRN	20	-20-1			SOLDER		
D-CD3	20			S-1635-1	S-1636-1		THRU SER (SR8142)
D-CD2	20			S-1367-1-8	S-1636-1		THRU SER (SR8142)
D-CD1	20			S-1367-1-8	S-1367-1-8		

WIRE TABLE

ITEM NO	PART NO.	DESCRIPTION	
19	S-2035-2	HOUSING - PIN	
18	S-2035-1	HOUSING PIN	
17	C610502-0101	TRIM MOTOR	
16	FTC-750 J	CLUTCH	
15	305-4304	PITCH TRIM SW	
14	S-1695-2	SWITCH (TRIM	DISENGAGE)
13	1570308-1	CABLE ASSY	
12	1570307-2	CABLE ASSY	
11	1570307-1	CONNECTOR ASSY	
10	3421-0000	SOCKET	
9	S-1962-2-0	HOUSING	
8	S-1962-1-0	HOUSING	
7	S-1960-2-0	HOUSING	
6	S-1960-1-0	HOUSING	
5			
4			
3	S-1637-2	HOUSING	
2	S-1637-1	HOUSING	
1	S-1360-5L	CIRCUIT BREAKER	

EQUIPMENT TABLE

CES-1000 IS APPLICABLE
VENDOR CODES PER S-1400
CES-XXXX=CESSNA SPEC. NO.
S-XXX OR CMXXXX=CESSNA STD. NO.

SUPERSEDES:

SUPERSEDED BY:

CONTRACT NO:

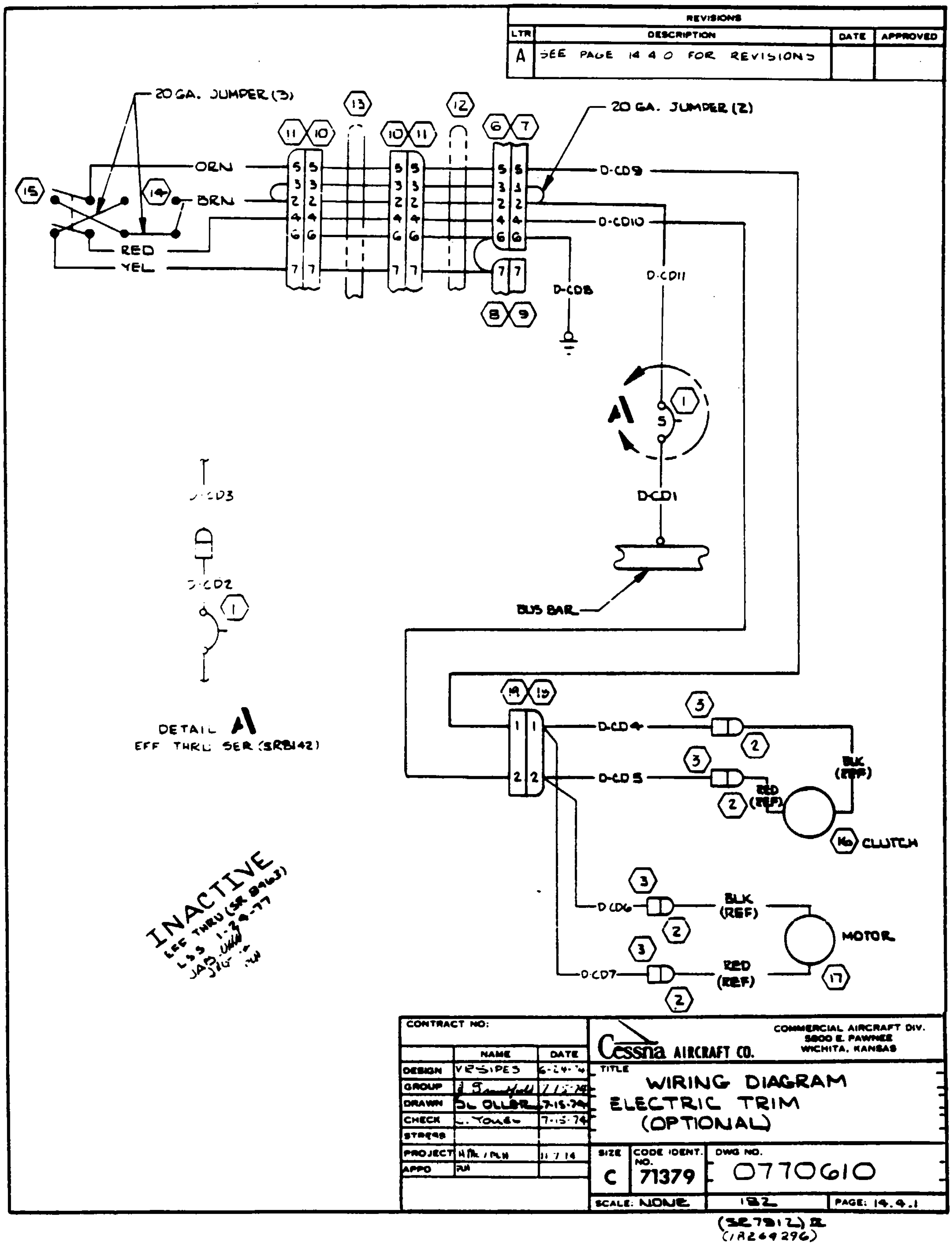
	NAME	DATE
DESIGN	VR SIPES	6-24-74
GROUP		7-15-74
DRAWN	D. L. OLLER	7-15-74
CHECK	J. YOUEL	7-15-74
STRESS		
PROJ		11-7-74
APPD		
OTHER		

Cessna AIRCRAFT CO. COMMERCIAL AIRCRAFT DIV. 5800 E. PAWNEE WICHITA, KANSAS

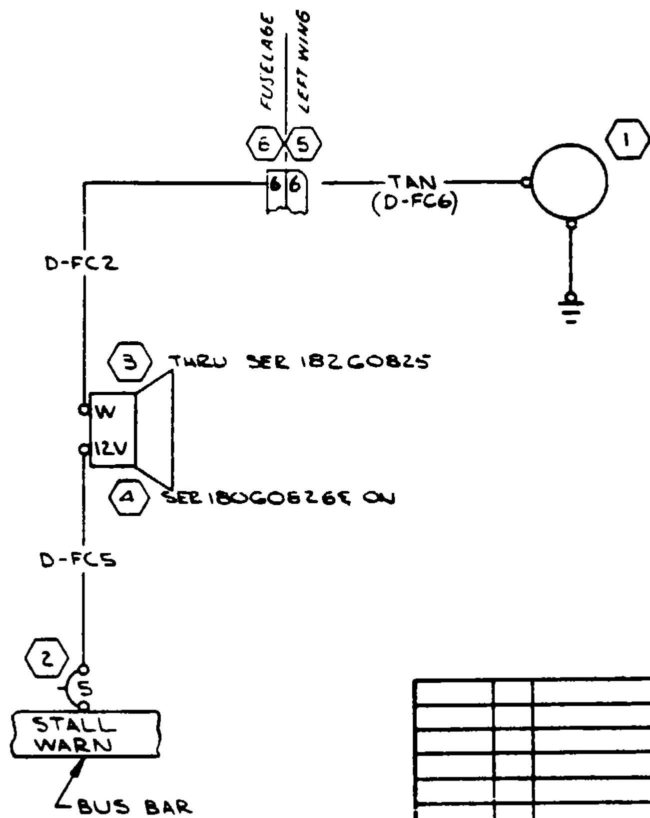
TITLE WIRING DIAGRAM — ELECTRIC TRIM (OPTIONAL)

SIZE	CODE IDENT. NO.	DWG NO
C	71379	0770610
SCALE: NONE	182	PAGE: 14.4.0

(SR7912) II
(18264296)


REVISIONS
LTR
DESCRIPTION
DATE
APPROVED
A
SEE PAGE 14.4.0 FOR REVISIONS
20 GA. JUMPER (3)
20 GA. JUMPER (2)
ORN
BRN
RED
YEL
D-CD9
D-CD10
D-CD11
D-CD8
D-CD3
D-CD2
D-CD1
BUS BAR
DETAIL A
EFF THRU SER (SR8142)
D-CD4
D-CD5
D-CD6
D-CD7
BLK (REF)
RED (REF)
CLUTCH
MOTOR
INACTIVE
EFF THRU (SR 8963)
CONTRACT NO:
NAME
DATE
DESIGN
GROUP
DRAWN
CHECK
STRESS
PROJECT
APPD
Cessna AIRCRAFT CO.
COMMERCIAL AIRCRAFT DIV.
5800 E. PAWNEE
WICHITA, KANSAS
TITLE
WIRING DIAGRAM
ELECTRIC TRIM
(OPTIONAL)
SIZE
C
CODE IDENT. NO.
71379
DWG NO.
0770610
SCALE: NONE
182
PAGE: 14.4.1
(SR7912) R
(18264296)

REVISION			
LET	DESCRIPTION	DATE	APPD
A	BY REV: ADD S-2077-5 & SER; SER OUT S-1407-6 SER 182G0825	RCA 9-20-72	[illegible]
B	BY REV: ADDED WIRE LENGTHS S-1367-1-8 WAS S-1367-1-1 PER FCS (NOW SHOP PRACTICE)	BRM 5-2-73	[illegible]
C	BY REV: 1635-2 AND 1636-2 WAS S-341-2; ADD S-1637-1 & S-1637-2 (NOW SHOP PRACTICE)	GGC 11-6-73	[illegible]
D	BY REV: S-1640-6 WAS S-1637-1, S-1641-6 WAS S-1637-2, TAN(FC6) WAS TAN, LG 85 WAS 110/TAN(FC6) (MER 182E0196) (SR 80372)	BRF 5-22-74	[illegible]



INACTIVE EFF THRU (SR 80402) 1-24-77

WIRE CODE NO	GA	MATERIAL	LG	TERMINALS			SERIALS
TAN(D-FC6)	18		85	S-1367-1-6	S-1635-2		
D-FC5	18		52	S-1367-1-6	S-1367-1-8		
D-FC2	18		68	S-1367-1-6	S-1636-2		

WIRE TABLE

ITEM NO	PART NO.	DESCRIPTION
6	S-1641-6	HOUSING-SCKT
5	S-1640-6	HOUSING-PIN
4	S-2077-5	HORN ASSY
3	S-1407-6	HORN ASSY
2	S-1360-5L	CIRCUIT BKR
1	0511062-4	XMTR, STALL WARN

EQUIPMENT TABLE

CES-1000 IS APPLICABLE VENDOR CODES PER S-1400 CES-XXXX=CESSNA SPEC. NO S-XXX OR CMXXXX=CESSNA STD. NO.

SUPERSEDES P 15.1

SUPERSEDED BY

CONTRACT NO:

	NAME	DATE
DESIGN	H WISE	7-18-69
GROUP	[illegible]	7-18-69
DRAWN	D.L. BURKE	6-12-69
CHECK	R YOUNG	6-24-69
STRESS	W C DALE	7-17-69
PROJ	[illegible]	[illegible]
APPD	[illegible]	7-16-69
OTHER		

Cessna AIRCRAFT CO. COMMERCIAL AIRCRAFT DIV. 5800 E. PAWNEE WICHITA, KANSAS

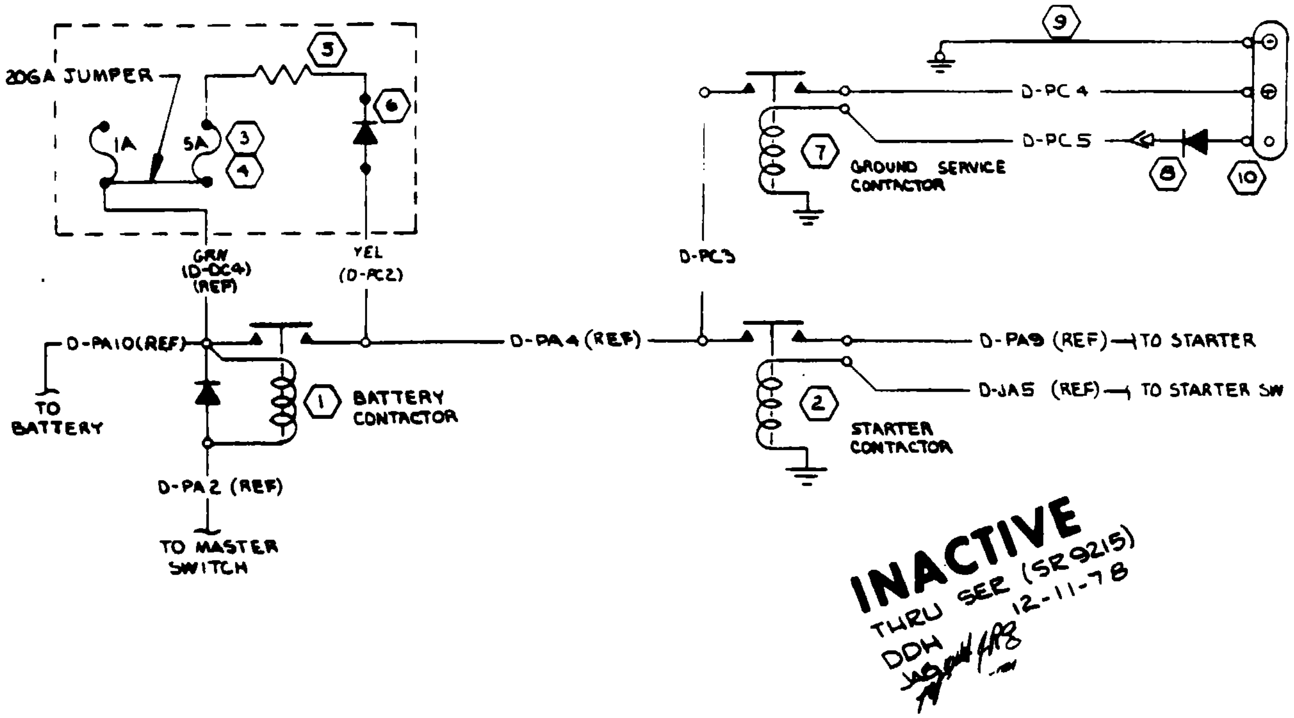
TITLE WIRING DIAGRAM — STALL WARNING SYSTEM (NON-HEATED)

SIZE	CODE IDENT. NO.	DWG NO
C	71379	0770610

SCALE NONE 182 PAGE: 15.2

ED & RR 10508 (SR6030) IX

REVISION			
LET	DESCRIPTION	DATE	APPD
A	BY REV: D-PA10(REF) WAS D-PA1(REF) (SR9087)	CS 4-25-78	



WIRE CODE NO	GA	MATERIAL	LG	TERMINALS			SERIALS
D-PC 5	22			S-1367-1-10	S-1493-1		
D-PC4	4	S-1562-4-9		S-1367-6-14	S-1367-6-15		
D-PC3	4	S-1562-4-9		S-1367-6-15	S-1367-6-14		
(YEL D-PC2)	22	-22-4		SOLDER	S-1367-1-13		

WIRE TABLE

	PART NO.	DESCRIPTION
10	MS-3506-1	RECEPTACLE
9	0312155	GND STRAP
8	1570043	DIODE BOARD ASSY
7	S-1577-1	GROUND SERVICE CONTACTOR
6	20H3P	DIODE
5	X-26263	.75 Ω RESISTOR
4	S-1680-2	FUSE HOLDER
3	S-1091-5	FUSE
2	S-1577-1	STARTER CONTACTOR
1	S-1580-1	BATTERY CONTACTOR

EQUIPMENT TABLE

CES-1000 IS APPLICABLE VENDOR CODES PER S-1400 CES-XXXX-CESSNA SPEC. NO. S-XXX OR CXXXXX-CESSNA STD. NO.

SUPERSEDES: 0770610 P 4.1.2

SUPERSEDED BY: 0770416 P 4.6

CONTRACT NO:

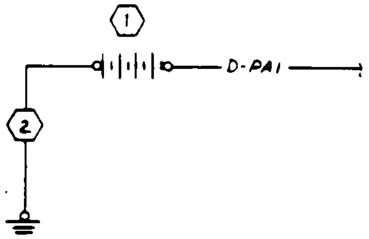
	NAME	DATE
DESIGN	SPENCER	3-31-77
GROUP	D.H.Harding	4-7-77
DRAWN	R SWANSON	3-7-77
CHECK	Borlesko	3-9-77
STRESS		
PROJ	PL Hedrick	4-12-77
APPD		
OTHER		

Cessna AIRCRAFT CO. PAWNEE DIVISION 5800 E. PAWNEE WICHITA, KANSAS

TITLE WIRING DIAGRAM — GROUND SERVICE RECEPTACLE (OPT)

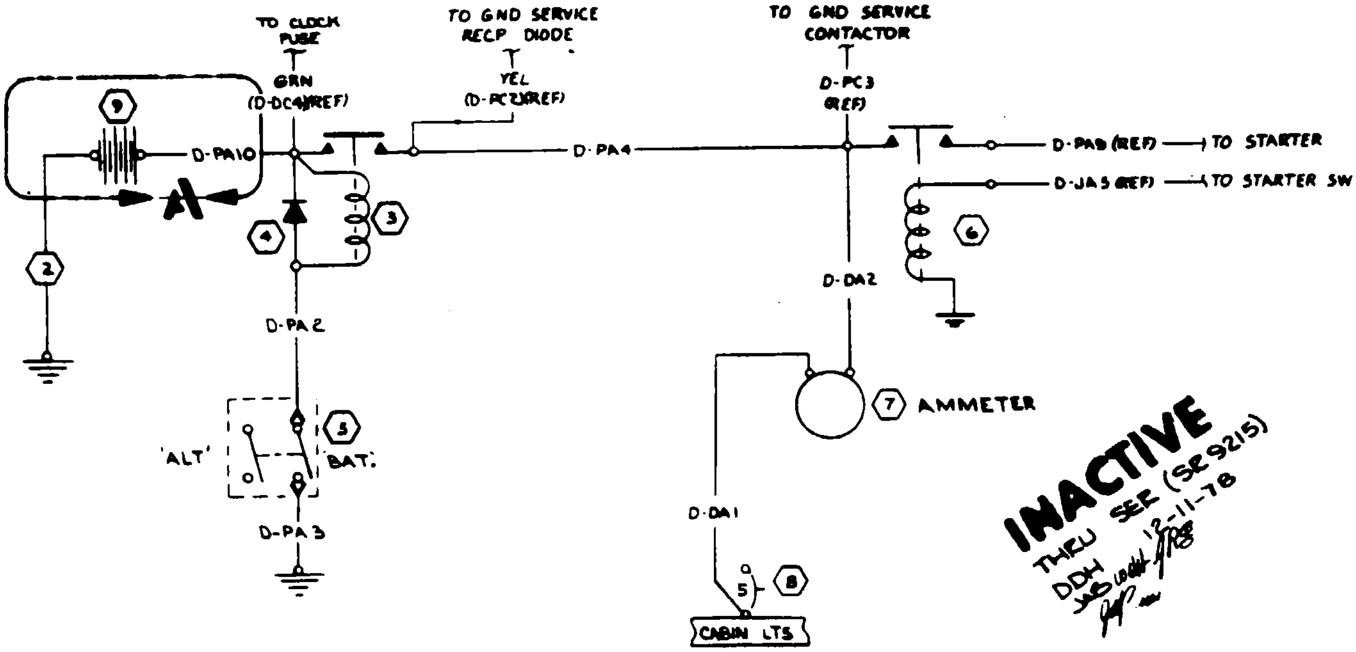
SIZE C | CODE IDENT. NO. 71379 | DWG NO 0770416

SCALE NONE | (SR8463) | PAGE: 4.1



A	BY REV: C614001-0101 WAS 0870060 (SR8861)	GDS 5-10-77	
B	BY REV: C669545-0101 WAS C669560-0211 (SR8783); C614001-0105 WAS -0101 (SR8493)	CRB 2-15-78	
C	BY REV: ADD DETAIL A, D-PA10 & C614002-0101 (SR9087)	GS 4-25-78	

DETAIL A
THRU SER(SR9087)



INACTIVE
THRU SER (SR9215)
DDH 12-11-78

WIRE CODE NO	GA	MATERIAL	LG	TERMINALS			SERIALS
D-PA10	4	S-1562-4-9		S-1367-6-13	S-1367-6-14		SER(SR9087) & ON
D-PA4	4	S-1562-4-9		S-1367-6-13	S-1367-6-13		
D-PA3	22			S-1493-1	S-1367-1-8		
D-PA2	22			S-1367-1-10	S-1493-1		
D-PA1	4	S-1562-4-9		S-1367-6-13	S-1367-6-14		THRU SER(SR9087)
D-DA2	8	S-1562-8-9		S-1367-4-10	S-1367-4-13		
D-DA1	8	S-1562-8-9		S-1367-4-10	S-1367-4-10		

WIRE TABLE

ITEM NO	PART NO	DESCRIPTION	
9	C614002-0101	BATTERY ASSY	
8	S-1360-5L	CKT BKR	
7	C669545-0101	INST CLUSTER	
6	S-1577-1	STARTER CONTACTOR	
5	S-1994-1-1	SWITCH	
4	0770728	DIODE ASSY	
3	S-1580-	BAT CONTACTOR	
2	0412007	BAT GND STRAP	
1	C614001-0105	BATTERY ASSY	

EQUIPMENT TABLE

CES-1000 IS APPLICABLE
VENDOR CODES PER S-1400
CES-XXXX=CESSNA SPEC. NO.
S-XXX OR CMXXXX=CESSNA STD. NO.

SUPERSEDES: 0770610 P 4.12

SUPERSEDED BY: 0770416 P 4.7

CONTRACT NO:

	NAME	DATE
DESIGN	SPENCER	3-31-77
GROUP	Wildhaber	4-6-77
DRAWN	SCHIFFELBEIN	3-7-77
CHECK	BORLESKE	3-9-77
STRESS		
PROJ	PLHBORICK	4-12-77
APPD		
OTHER		

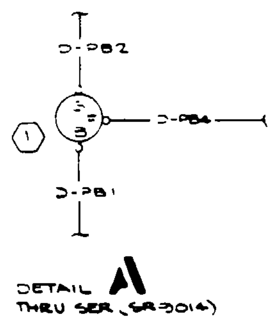
Cessna AIRCRAFT CO.
PAWNEE DIVISION
5800 E PAWNEE
WICHITA, KANSAS

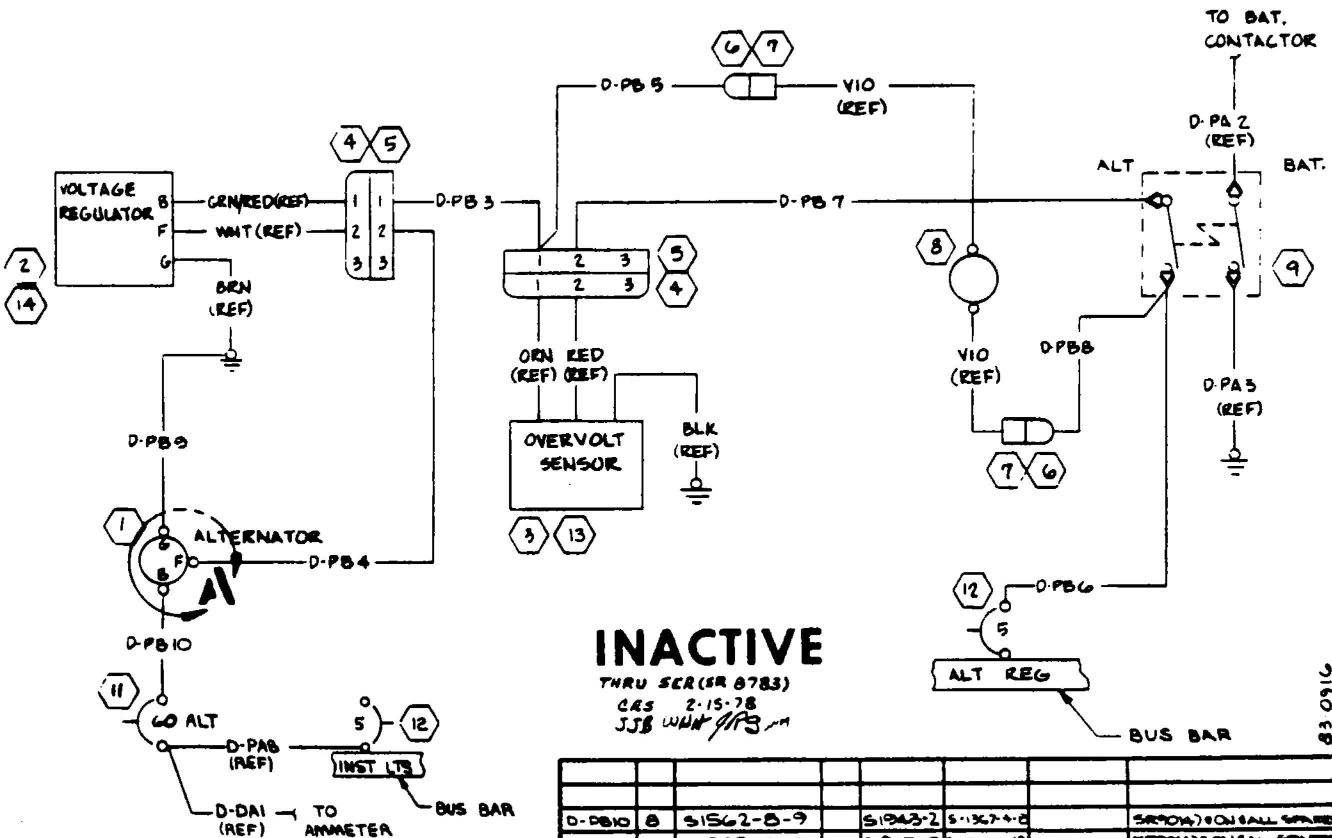
TITLE
WIRING DIAGRAM — BATTERY CIRCUIT

SIZE: C | CODE IDENT. NO. 71379 | DWG NO 0770416

SCALE: NONE | (SR8463 | PAGE: 4.2

REVISION			
LET	DESCRIPTION	DATE	APPD
A	BY REV: ADDED DETAIL A SER IN PB9 & PB10, SER OUT PB1 & PB2. DWG BECOMES INAC (SR8783)(SR9014)	JCM 2-15-78	JJB
B	BY REV. ADDED C593003-0103 OVERVOLT SENSOR (ALT)(REF)(SR 9140) S-1636-1/PB7 WAS S-1635-1; S-1636-2/PB3,PB5 WAS S-1635-2; S-1638-2/C593003-0101 WAS S-1638-1 (NOW SHOP PRACTICE)(MER182-E0653) ADD C611004-0101 (ALT)	TFS 4-12-78 LSS	JAB JPB





D-PB10	8	S1562-8-9		S1943-2	S-1367-4-8		SR9014) & ON & ALL SPARES
D-PB9	8	S1562-8-9		S1943-3	S-1367-4-12		(SR9014) & ON & ALL SPARES
D-PB8	22			SEE D-PB6	S-1635-1		
D-PB7				S 1493-1	S-1636-1		
D-PB6				S-1367-1-6	S-1493-1		
D-PB5				S-1636-1	SEE D-PB3		
D-PB4				S-1636-1	S1367-1-10		
D-PB3	22			S-1636-2	S-1636-1		
D-PB2	8	S-1562-8-9		S-1367-4-10	S-1367-4-12		THRU (SR9014)
D-PB1	8	S-1562-8-9		S-1367-4-10	S-1367-4-12		THRU (SR9014)
WIRE CODE NO	GA	MATERIAL	LG	TERMINALS			SERIALS

WIRE TABLE

ITEM NO.	PART NO.	DESCRIPTION
14	C611004-0101	VOLTAGE REGULATOR (ALT)
13	C593003-0103	OVERVOLT SENSOR (ALT)
12	S-1360-5L	CIRCUIT BREAKER
11	S-1707-60	CIRCUIT BREAKER
10		
9	S-1994-1-1	MASTER SWITCH
8	S-2135-2	LAMP ASSY
7	S-1637-2	HOUSING
6	S-1637-1	HOUSING
5	S-1638-1	HOUSING
4	S-1638-2	HOUSING
3	C593003-0101	OVERVOLT SENSOR
2	C611002-0105	VOLTAGE REGULATOR
1	C611503-0102	ALTERNATOR

EQUIPMENT TABLE

CES-1000 IS APPLICABLE
VENDOR CODES PER S-1400
CES-XXXX=CESSNA SPEC. NO.
S-XXX OR CMXXXX=CESSNA STD. NO.

SUPERSEDES: 0770610 P 472 & 473

SUPERSEDED BY: 0770416 PG 4.5

CONTRACT NO:

	NAME	DATE
DESIGN	SPENCER	3-31-77
GROUP	W. H. Harden	4-6-77
DRAWN	HARVEY	3-7-77
CHECK	BORLESKE	3-9-77
STRESS		
PROJ	PLHSDRICK	4-12-77
APPD	JPB	
OTHER		

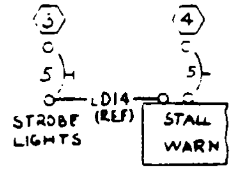
Cessna AIRCRAFT CO.
PAWNEE DIVISION
5800 E. PAWNEE
WICHITA, KANSAS

TITLE
WIRING DIAGRAM — ALTERNATOR SYSTEM 60 AMP

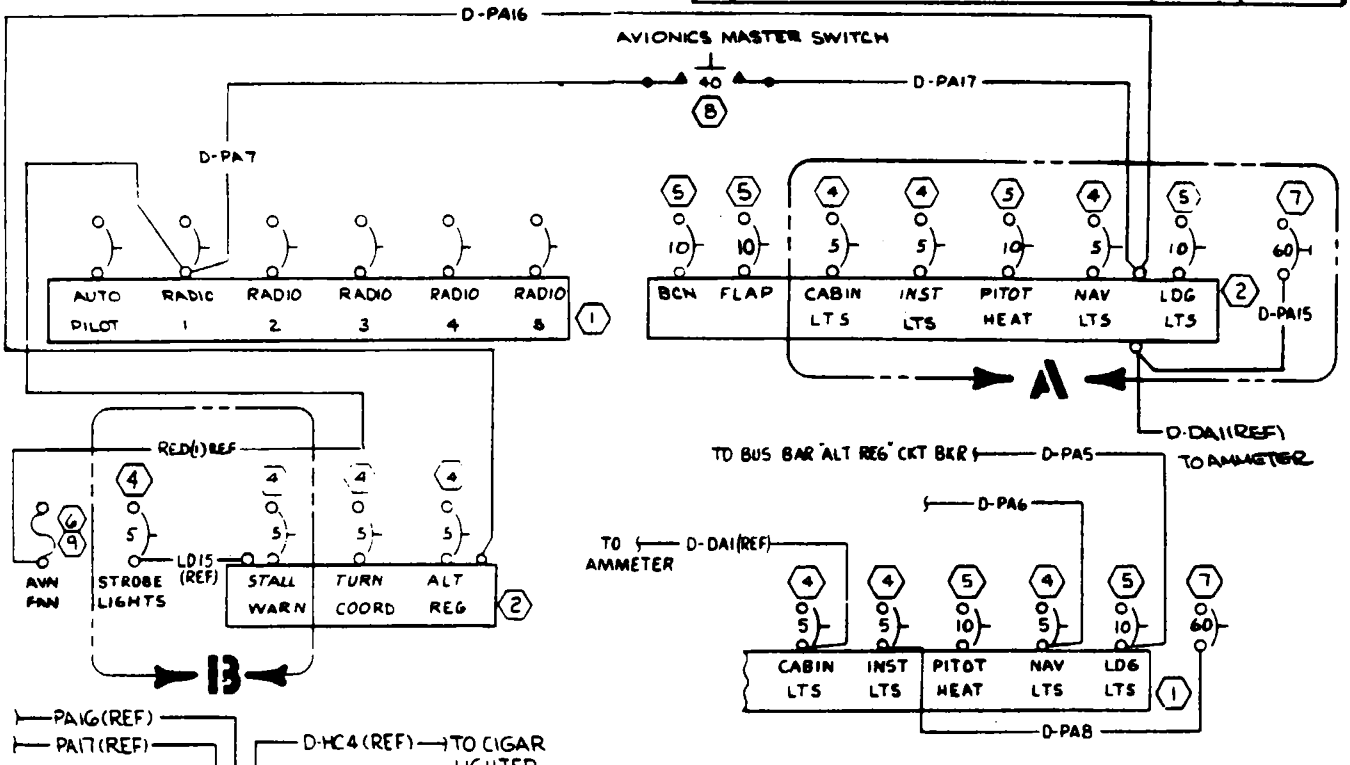
SIZE	CODE IDENT. NO.	DWG NO
C	71379	0770416

SCALE: NONE (SR8463) PAGE: 4.5

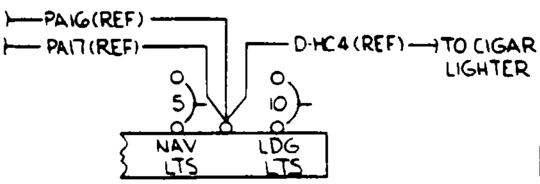
REVISION			
LET	DESCRIPTION	DATE	APPD
A	BY REV: S-1232-60 WAS S-1707-60, "FLAP" BKR WAS S-1360-15L; (SR9115)	PSM 2-15-79	
B	BY REV: LDG LTS CIRCUIT BREAKER WAS S-1360-15L (SR8463)(REF) BY REV: ADD DETAIL "A", 0770780, S-1232-5 & SER (SR9633)	NTL RAO 3-14-80	
C	BY REV: PA17 WAS PA14 (SR9633)(REF)	MKM 9-22-80	
D	BY REV: ADD DETAIL "A" (SR10068)	GW 1-12-81	JAB
E	BY REV: ADD DETAIL "B", S-2582-1, S-2565-1 (SR10100)	REK 2-9-82	



DETAIL B
THRU SER (SR10100)



DETAIL A
THRU SER (SR9633)



DETAIL A
THRU SER (SR10068)

D-PA15	8	S-1562-8-9		S-1367-4-8	S-1367-4-10		SER (SR9633) & ON
D-PA17	10	S-1562-10-9		S-1367-3-8	S-1367-3-10		SER (SR9633) & ON
D-PA16	14			S-1367-2-10	S-1367-2-8		SER (SR9633) & ON
D-PA8	8	S-1562-8-9		S-1367-4-6	S-1367-4-10		THRU SER (SR9633)
D-PA7	10	S-1562-10-9		S-1367-3-8	S-1367-3-6	(OPT)	
D-PA6	10	S-1562-10-9		S-1367-3-6	S-1367-3-8		THRU SER (SR9633)
D-PA5	14			S-1367-2-6	S-1367-2-6		THRU SER (SR9633)
WIRE CODE NO	GA	MATERIAL	LG	TERMINALS			SERIALS

WIRE TABLE

9	S-2565-1	FUSE	
8	CM3589-40	SWITCH	
7	S-1232-60	CIRCUIT BREAKER	
6	S-2582-1	FUSEHOLDER	
5	S-1360-10L	CIRCUIT BREAKER	
4	S-1360-5L	CIRCUIT BREAKER	
3	S-1232-5	CIRCUIT BREAKER	
2	0770780	BUS BAR	
	0713854	BUS BAR	
ITEM NO	PART NO.	DESCRIPTION	

EQUIPMENT TABLE

CES-1000 IS APPLICABLE
VENDOR CODES PER S-1400
CES-XXXX=CESSNA SPEC. NO.
S-XXX OR CMXXXX=CESSNA STD. NO.

SUPERSEDES: 0770610 P+8
SUPERSEDED BY:

CONTRACT NO:

	NAME	DATE
DESIGN	SPENCER	3-31-77
GROUP		4-1-77
DRAWN	SCHIFFELBEIN	3-7-77
CHECK	BORLESKE	3-9-77
STRESS		
PROJ	PLHEDRICK	4-11-77
APPD		
OTHER		

Cessna AIRCRAFT CO.
PAWNEE DIVISION
5800 E. PAWNEE
WICHITA, KANSAS

TITLE
WIRING DIAGRAM —
CIRCUIT BREAKERS

SIZE C | CODE IDENT. NO. 71379 | DWG NO 0770416
SCALE: NONE | (SR8463) | PAGE: 4.4

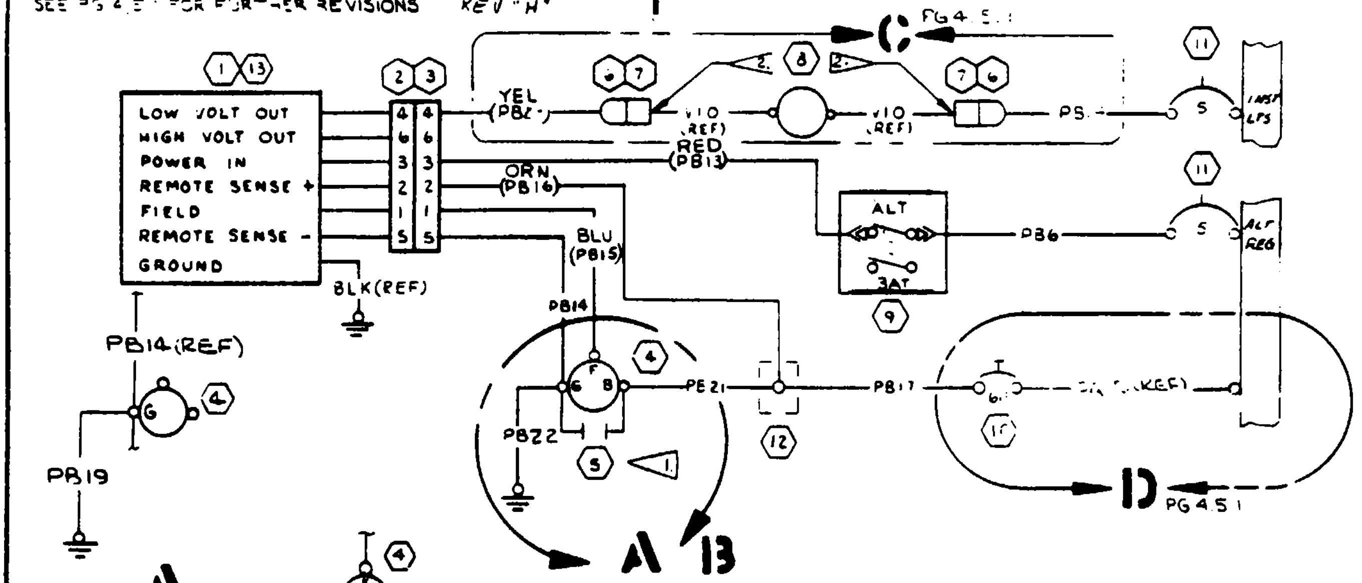
E	BY REV: 20GA WAS 22GA/PB12, PB13 PB14 16GA WAS 22GA PB15, S-2099-8 WAS S-2099-6, S-1367-2-10 WAS S-1367-1-10 (NOW SHOP PRACTICE) [illegible] PB12, [illegible] PB12, RED (PB 3) WAS PB13, ORN (PB16) WAS PB16, BLU(PB15) WAS PB15 (USE EXISTING STOCK)	RLK HHG 9-5-79	JAB
F	BY REV: ADD C611005-0102 NOW SHOP PRACTICE) BY REV: PA15 REF WAS PA15(REF) (SR9633) BY REV: ADD DETAIL B PB 21, PB 22, 0570315 WAS 0570314 (SR 9785)	SEB RAO 3-4-80	
G	BY REV: ADD PAGE 4.5.1 [illegible] PB24 SER OUT PB11 & PB12 [illegible] (SR10100)(REF)	GLS 6/21/83	

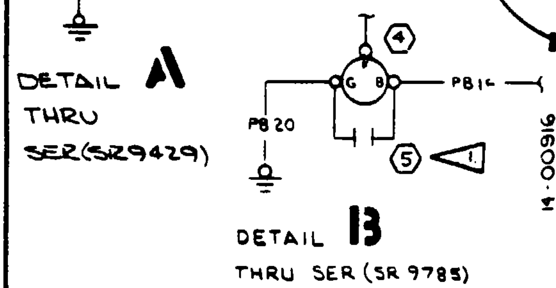
SEE PG 4.5.1 FOR FURTHER REVISIONS REV "H"

REVISION			
LET	DESCRIPTION	DATE	APPD
A	BY REV: S-1943-2 WAS S-1943-1 (SR8783)	RLY 4-10-78	JAB
B	BY REV: PB19 WAS PB9 (SR8783)	CRS 8-7-78	JAB
C	BY REV: ADD DETAIL "A" & NOTE 2. (SR9429)	RLY 10-5-78	
D	BY REV S-1232-60 WAS S-1707-60 SR 9113)	PSM 2-19-79	

NOTES:

1. PART OF BASIC AVIONICS KIT
2. TERMINATE VENDOR FURNISHED WIRES WITH S-1236-1 PIN





PB24	22			S-1367-1-6	S-1635-1		SER(SR10100) & ON
YEL(PB23)	20	-20-4		S-1635-1	S-2099-6		SER(SR10100) & ON
PB 22	8	S-1562-8-9		S-1943-1	S-1943-3		SER (SR 9785) & ON
PB 21	8	S-1562-8-9		S-1943-2	S-1943-1		SER(SR 9785) & ON
PB20	8	S-1562-8-9		S-1943-2	S-1943-3	SER(SR	9429) THRU (SR 9785)
PB17	8	S-1562-8-9		S-1943-2	S-1367-4-8		
ORN(PB16)	20	-20-3		S-2099-6	S-1367-1-12		
BLU(PB15)	16	-16-6		S-2099-8	S-1367-2-10		
PB14	20			S-2099-6	S-1367-1-10		
RED(PB13)	20	-20-2		S-2099-6	S-1493-1		
YEL(PB12)	20	-20-4		S-1635-1	S-2099-6		THRU SER (SR10100)
PB11	22			S-1367-1-6	S-1635-1		THRU SER(SR10100)
PB6	22			S-1367-1-6	S-1493-1		
PB18	8	S-1562-8-9		S-1943-2	S-1943-2	THRU SER (SR 9785)	
PB13	8	S-1562-8-9		S-1943-3	S-1367-4-12	THRU SER(SR29429)	
WIRE CODE NO	GA	MATERIAL	LG	TERMINALS			SERIALS

WIRE TABLE

		ALT CONTROL UNIT	(ALT)
12	0570315	TERMINAL BOARD	
11	S-1360-5L	CIRCUIT BREAKER	
10	S-1232-60	CIRCUIT BREAKER	
9	S-1994-1-1	MASTER SWITCH	
8	S-2135-2	LAMP ASSY	2
7	S-1637-2	HOUSING	
6	S-1637-1	HOUSING	
5	S-1915-1	CAPACITOR	1
4	C611503-0102	ALTERNATOR ASSY	
3	S-2373-2	CONNECTOR	
2	S-2373-1	CONNECTOR	
1	C611005-0101	ALT CONTROL UNIT	
ITEM NO	PART NO.	DESCRIPTION	

EQUIPMENT TABLE

CES-1000 IS APPLICABLE VENDOR CODES PER S-1400 CES-XXXX=CESSNA SPEC. NO. S-XXX OR CMXXXX=CESSNA STD. NO.

SUPERSEDES: 0770416 P 4.3

SUPERSEDED BY:

CONTRACT NO:

	NAME	DATE
DESIGN	SPENCER	2-23-78
GROUP		3-6-78
DRAWN	SHAVER	2-15-78
CHECK	J BLISS	2-16-78
STRESS		
PROJ		
APPD		
OTHER		

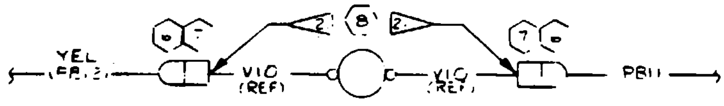
Cessna AIRCRAFT CO. PAWNEE DIVISION 5800 E. PAWNEE WICHITA, KANSAS

TITLE WIRING DIAGRAM — ALTERNATOR SYSTEM 60 AMP

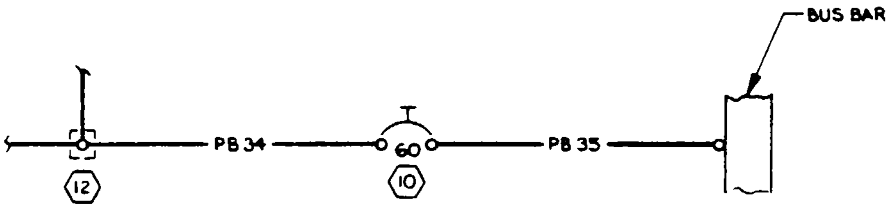
SIZE C | CODE IDENT NO. 71379 | DWG NO 0770416

SCALE: NONE | (SR 8783) | PAGE: 4.5

REVISION			
LET	DESCRIPTION	DATE	APPD
H	BY REV: ADD DETAIL "D" (SR 10414)	KWL 10-18-84	



DETAIL C PG 4.5
(THRU SER(SR10100))



DETAIL D PG 4.5
APPLIES WHEN
STANDBY VACUUM PUMP
IS INSTALLED
SER (SR 10414) & ON

H-0091G

WIRE CODE NO	GA	MATERIAL	LG	TERMINALS			SERIALS
PB35	8			S-1367-4-8	S-1367-4-8		SER (SR 10414) & ON
PB34	8			S-1367-4-8	S-1943-2		SER (SR 10414) & ON

WIRE TABLE

ITEM NO	PART NO.	DESCRIPTION

EQUIPMENT TABLE

CES-1000 IS APPLICABLE
VENDOR CODES PER S-1400
CES-XXXX=CESSNA SPEC. NO.
S-XXX OR CMXXXX=CESSNA STD. NO.

SUPERSEDES:

SUPERSEDED BY:

CONTRACT NO:

	NAME	DATE
DESIGN	G STAMM	6/21/83
GROUP		
DRAWN	G STAMM	6/21/83
CHECK	E E HAIR	6/22/83
STRESS		
PROJ		7/24/83
APPD		
OTHER		

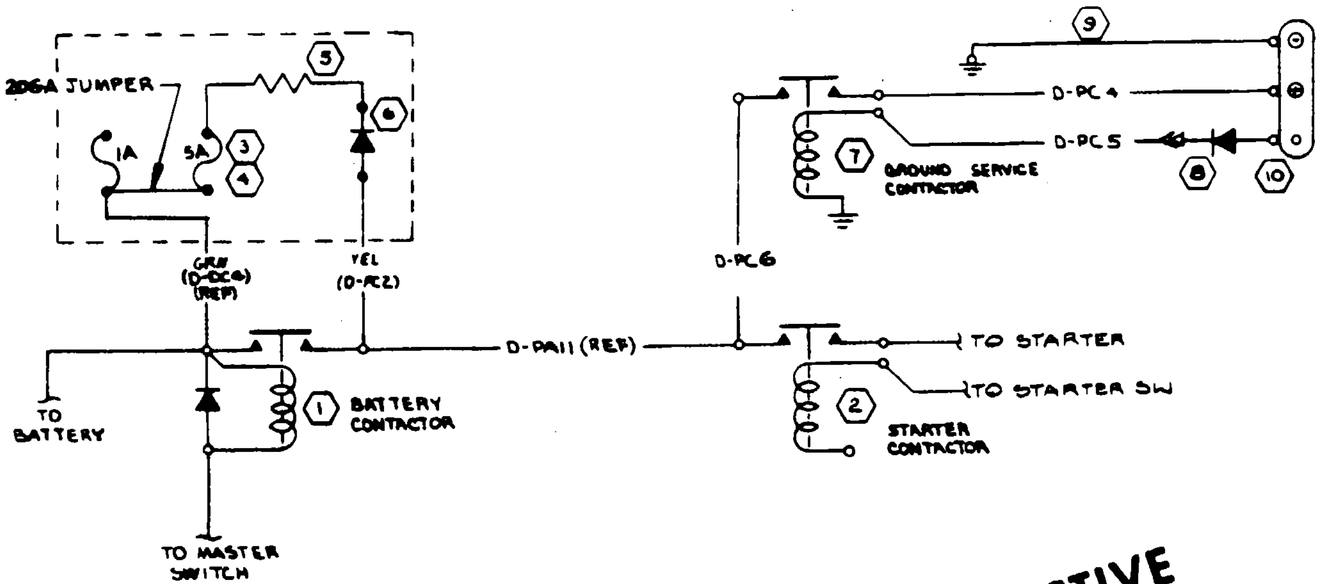
Cessna. AIRCRAFT CO.
PAWNEE DIVISION
5800 E. PAWNEE
WICHITA, KANSAS

TITLE
WIRING DIAGRAM — ALTERNATOR SYSTEM 60 AMP

SIZE	CODE IDENT. NO.	DWG NO
C	71379	0770416

SCALE NONE (SR10100) PAGE: 4.5.1

REVISION			
LET	DESCRIPTION	DATE	APPD



INACTIVE
THRU SER (9R9633) 2-22-80

WIRE CODE NO	GA	MATERIAL	LG	TERMINALS			SERIALS
D-PC5	22			S-1367-1-10	S-1493-1		
D-PC4	4	S-1562-4-9		S-1367-6-14	S-1367-6-13		
D-PC6	4	S-1562-4-9		S-2447-4	S-1367-6-13		
(D-PC2)	22	-22-4		SOLDER	S-1367-1-13		

WIRE TABLE

ITEM NO.	PART NO.	DESCRIPTION
10	MS-3506-1	RECEPTACLE
9	0312155	GND STRAP
8	1570043	DIODE BOARD ASSY
7	S-1577-1	GROUND SERVICE CONTACTOR
6	20H3P	DIODE
5	X-26263	.75 Ω RESISTOR
4	S-1090-2	FUSE HOLDER
3	S-1091-5	FUSE
2	S-2443-1	STARTER CONTACTOR
1	S-1580-1	BATTERY CONTACTOR

EQUIPMENT TABLE

CES-1000 IS APPLICABLE VENDOR CODES PER S-1400 CES-XXXX-CESSNA SPEC. NO. S-XXX OR CMXXXX-CESSNA STD. NO.

SUPERSEDES: 0770416 P4.1

SUPERSEDED BY: 0770416 P4.8

CONTRACT NO:

	NAME	DATE
DESIGN	WATSON	12-14-78
GROUP	[illegible]	12-20-78
DRAWN	HAUN	12-11-78
CHECK	BORLESKE	12-12-78
STRESS		
PROJ	[illegible]	[illegible]
APPD	[illegible]	
OTHER		

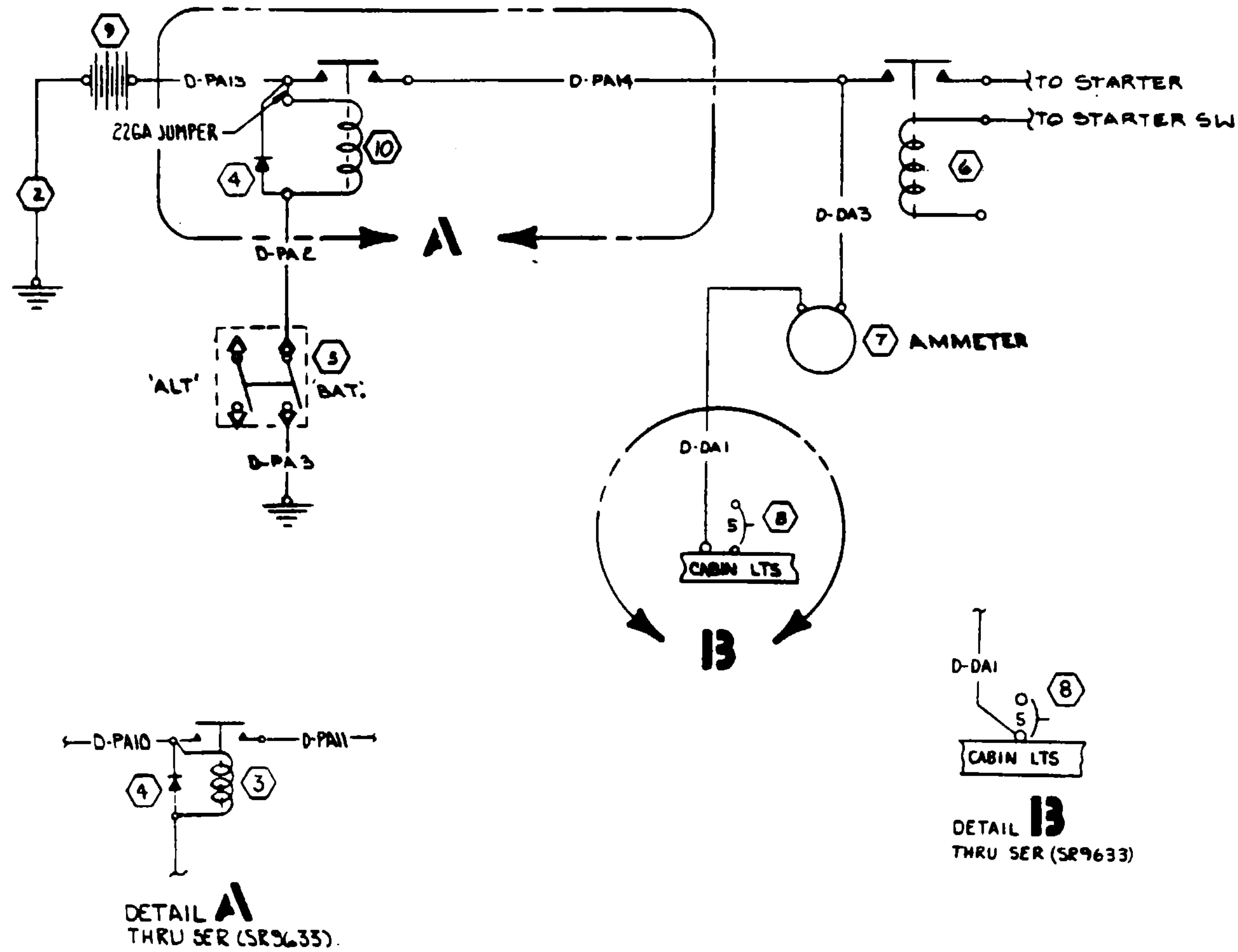
Cessna AIRCRAFT CO. PAWNEE DIVISION 5800 E. PAWNEE WICHITA, KANSAS

TITLE: WIRING DIAGRAM — GROUND SERVICE RECEPTACLE (OPT)

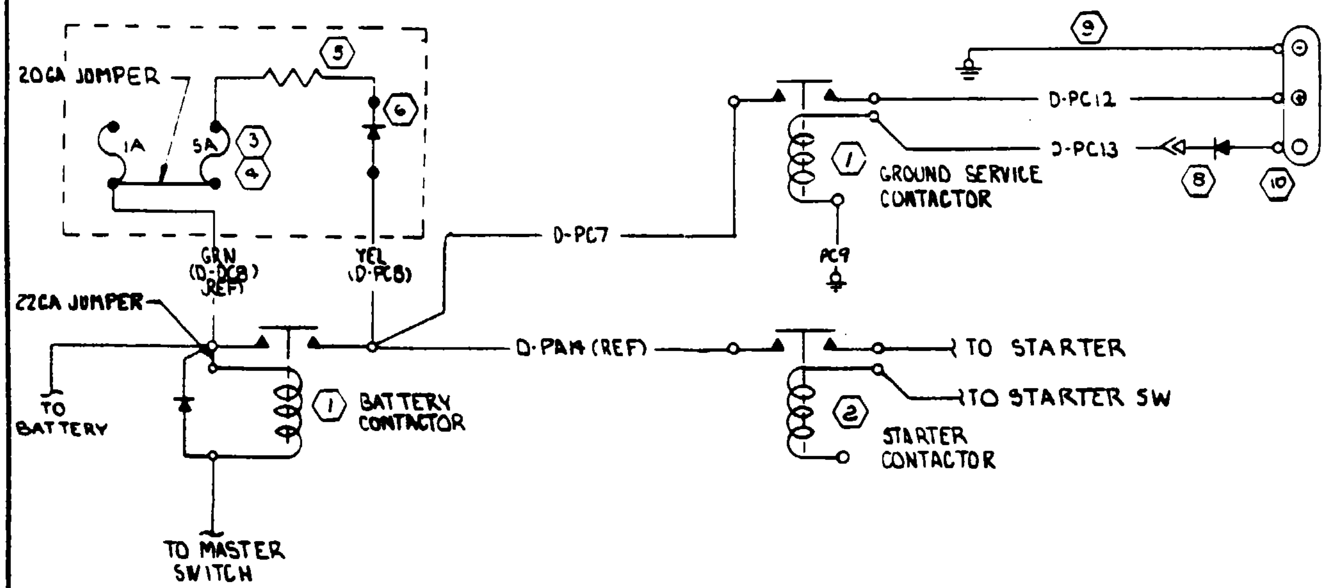
SIZE: C | CODE IDENT. NO. 71379 | DWG NO 0770416

SCALE: NONE | SR 9215 | PAGE: 4.6

REVISION			
LET	DESCRIPTION	DATE	APPD
A	BY REV: ADD DETAIL "A". ADD S-2475-1 ADD DETAIL "B" (SR9633)	NTL 2-22-80	
B	BY REV: S-2443-2 WAS S-2443-1; S-2475-2 WAS S-2475-1 (SR 10213)	REK 8-24-81	JAB DES



REVISION			
LET	DESCRIPTION	DATE	APPD
A	BY REV: D-PC12 WAS D-PC4; D-PC13 WAS D-PC5 (MER 82E0871) (SR9633)(REF)	DFS 8-1-80	[illegible]
B	BY REV: S-2443-2 WAS S-2443-1, S-2475-2 WAS S-2475-1 (SR 10213)	REK 8-26-81	JAB MBS DES JRB



WIRE CODE NO	GA	MATERIAL	LG	TERMINALS			SERIALS
D-PC13	22			S-1367-1-10	S-1493-1		
D-PC12	4	S-1562-4-9		S-1367-6-14	S-2447-4		
D-PC9	22			S-1367-1-10	S-1367-1-8		
D-PC7	4	S-1662-4-9		S-2447-4	S-2447-4		
YEL (D-PC8)	22	-22-4		SOLDER	S-1367-1-13		

WIRE TABLE

ITEM NO.	PART NO.	DESCRIPTION
10	MS-3506-1	RECEPTACLE
9	0553010	GND STRAP
8	1570043	DIODE BOARD ASSY
6	20H3P	DIODE
5	X-26263	.75 Ω RESISTOR
4	S-1090-2	FUSE HOLDER
3	S-1091-5	FUSE
2	S-2443-2	STARTER CONTACTOR
1	S-2475-2	BATTERY CONTACTOR

EQUIPMENT TABLE

CES-1000 IS APPLICABLE VENDOR CODES PER S-1400 CES-XXXX-CESSNA SPEC. NO. S-XXX OR CMXXXX-CESSNA STD. NO.

SUPERSEDES: 0770416 P4.6

SUPERSEDED BY:

CONTRACT NO:

	NAME	DATE
DESIGN	G. STAMM	3-5-80
GROUP	[illegible]	3-7-80
DRAWN	LANCASTER	2-25-80
CHECK	BOELESKE	2-27-80
STRESS		
PROJ	[illegible]	3-8-80
APPD	[illegible]	
OTHER		

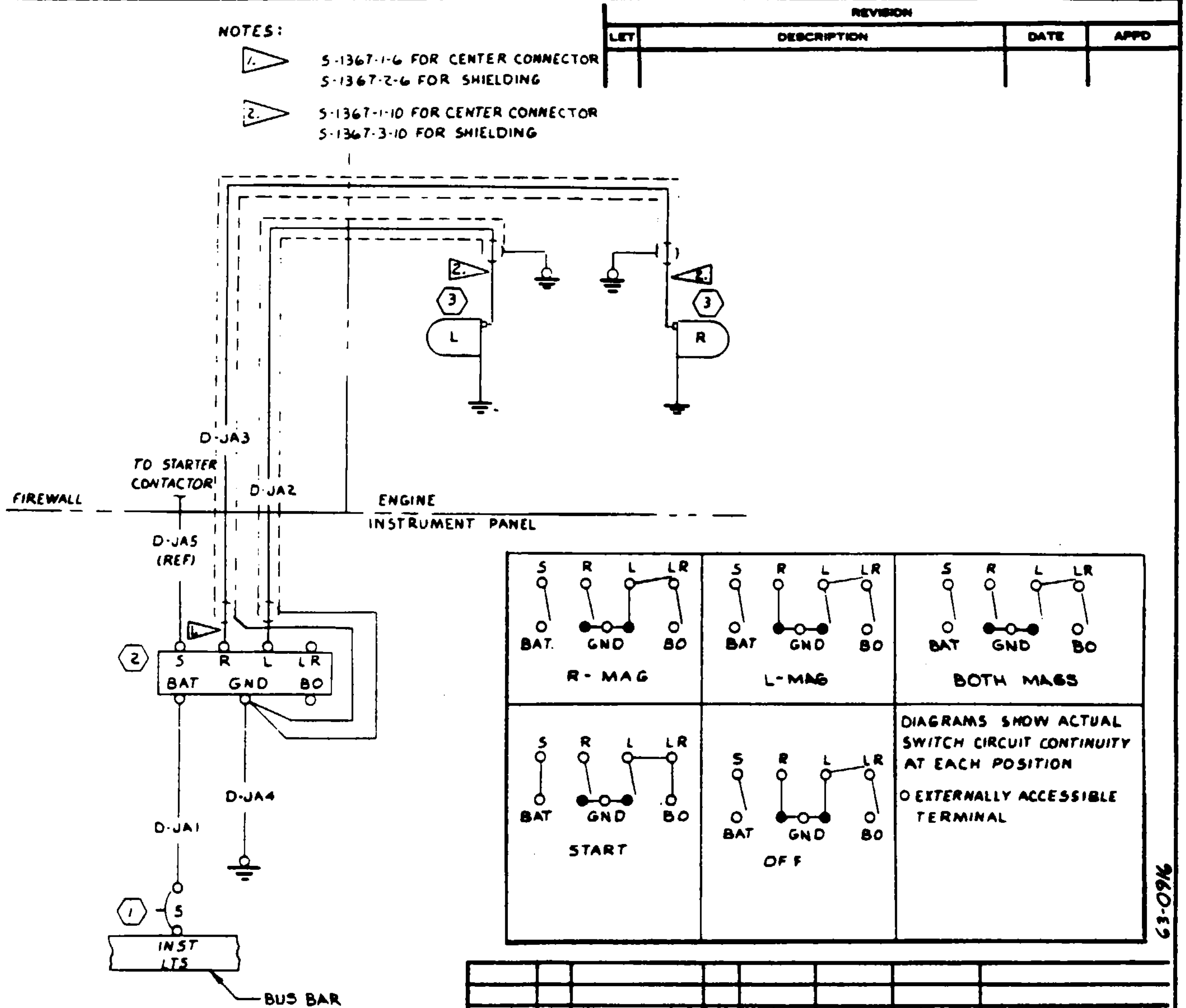
Cessna AIRCRAFT CO. PAWNEE DIVISION 5800 E. PAWNEE WICHITA, KANSAS

TITLE: WIRING DIAGRAM — GROUND SERVICE RECEPTACLE (OPT)

SIZE	CODE IDENT. NO.	DWG NO
C	71379	0770416

SCALE: NONE | SR 9633 | PAGE: 4.8

REVISION			
LET	DESCRIPTION	DATE	APPD



WIRE CODE NO	GA	MATERIAL	LG	TERMINALS		SERIALS
D-JA4	20			S-1367-1-6	S-1367-1-8	
D-JA3	18S			1	2	
D-JA2	18S			1	2	
D-JA1	20			S-1367-1-6	S-1367-1-6	

WIRE TABLE

ITEM NO	PART NO.	DESCRIPTION
3	SLICK # 662	MAGNETO
2	C292501-0105	IGNITION SWITCH
1	S-1360-5L	CIRCUIT BREAKER

EQUIPMENT TABLE

CES-1000 IS APPLICABLE VENDOR CODES PER S-1400 CES-XXXX=CESSNA SPEC. NO. S-XXX OR CMXXXX=CESSNA STD. NO.

SUPERSEDES: 0770610 P 5.2

SUPERSEDED BY:

CONTRACT NO:

	NAME	DATE
DESIGN	SPENCER	3-31-77
GROUP	D. H. Hardin	4-8-77
DRAWN	SCHIFFELBEIN	3-7-77
CHECK	BORLESKE	3-9-77
STRESS		
PROJ	PLHIEDRKK	4-12-77
APPD	[illegible]	
OTHER		

Cessna AIRCRAFT CO. PAWNEE DIVISION 5800 E. PAWNEE WICHITA, KANSAS

TITLE WIRING DIAGRAM — MAGNETO SYSTEM

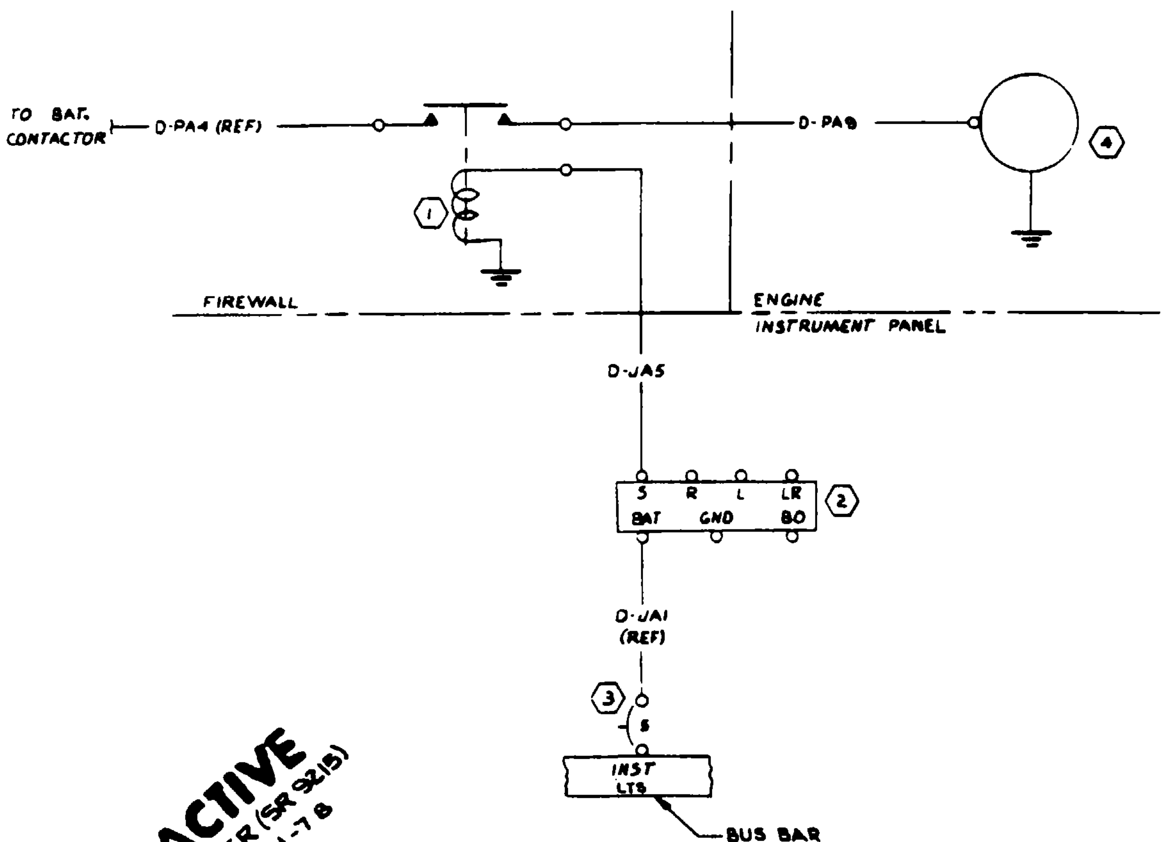
SIZE	CODE IDENT. NO.	DWG NO
C	71379	0770416

SCALE: NONE (SR6463) PAGE: 5.1

REVISION			
LET	DESCRIPTION	DATE	APPD

NOTES.

1. PART OF 0750201 ENGINE INSTALLATION



INACTIVE THRU SER (SR 9215) DDH 12-11-78 JAS

D-PA9	4	S-1564-9		S-1367-6-14	S-1367-6-13		
D-JA5	22			S-1367-1-6	S-1367-1-10		
WIRE CODE NO.	GA	MATERIAL	LG	TERMINALS			SERIALS

WIRE TABLE

4	1	STARTER	
3	S-1360-5L	CIRCUIT BREAKER	
2	C292501-0105	IGNITION SWITCH	
1	S-1577-1	STARTER CONTACTOR	
ITEM NO.	PART NO.	DESCRIPTION	

EQUIPMENT TABLE

CES-1000 IS APPLICABLE
VENDOR CODES PER S-4400
CES-XXXX-CESSNA SPEC. NO.
S-XXX OR CMXXXX-CESSNA STD. NO.

SUPERSEDES: 0770610 P 6.1

SUPERSEDED BY: 0770416 P 6.2

CONTRACT NO:

	NAME	DATE
DESIGN	SPENCER	3-31-77
GROUP	W.H. Harden	4-4-77
DRAWN	SCHIFFELBEIN	3-7-77
CHECK	BORLESKE	3-3-77
STRESS		
PROJ	PLAHBRIUK	4-12-77
APPD		
OTHER		

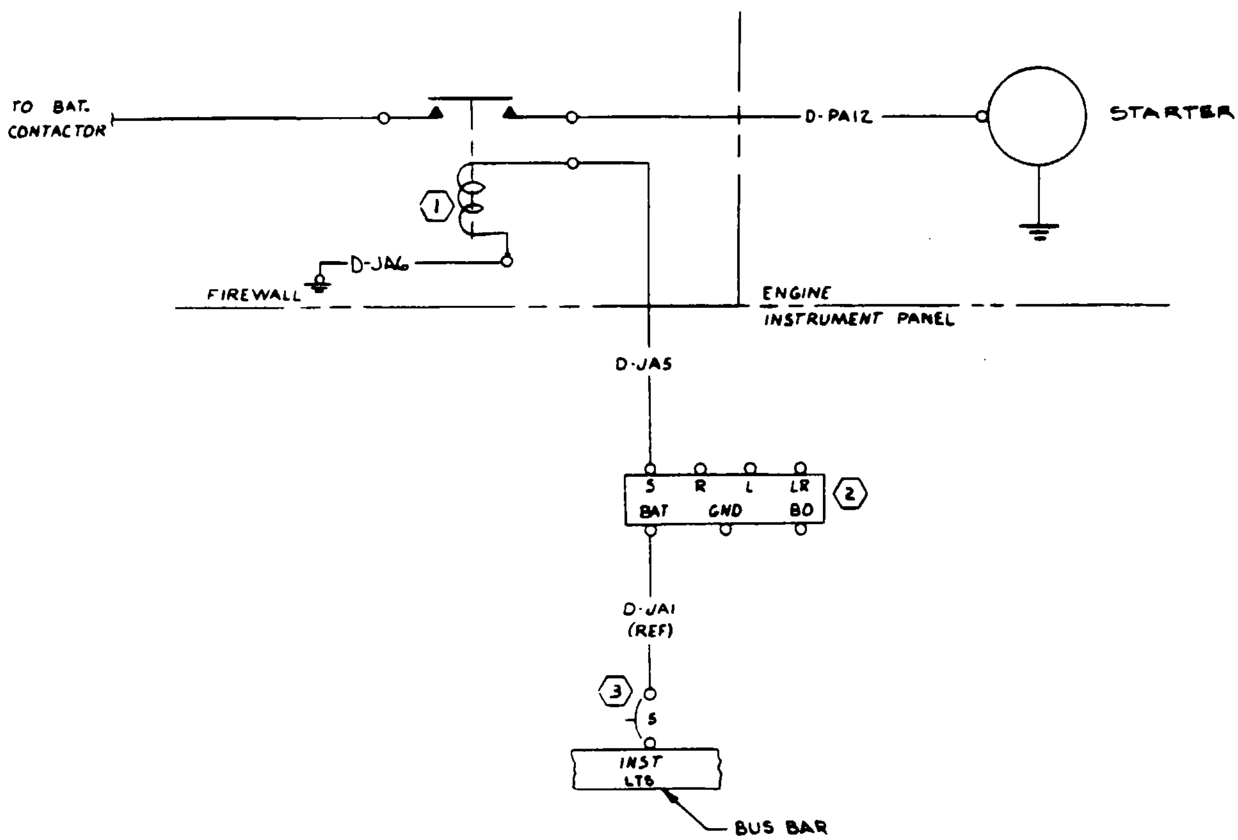
Cessna AIRCRAFT CO. PAWNEE DIVISION 5800 E. PAWNEE WICHITA, KANSAS

TITLE WIRING DIAGRAM — STARTER SYSTEM

SIZE C | CODE IDENT. NO. 71379 | DWG NO 0770416

SCALE: NONE (SR8463) PAGE: 6.1

REVISION			
LET	DESCRIPTION	DATE	APPD
A	BY REV: S-2443-2 WAS S-2443-1 (SR 10213)	REK 8-24-81	JAS



WIRE CODE NO	GA	MATERIAL	LG	TERMINALS			SERIALS
D-PA12	4	S-1562-4-9		S-2447-4	S-1367-6-13		
D-JA6	22			S-1367-1-10	S-1367-1-12		
D-JA5	22			S-1367-1-6	S-1367-1-10		

WIRE TABLE

ITEM NO.	PART NO.	DESCRIPTION
3	S-1360-5L	CIRCUIT BREAKER
2	C292501-0105	IGNITION SWITCH
	S-2443-2	STARTER CONTACTOR

EQUIPMENT TABLE

CES-1000 IS APPLICABLE
VENDOR CODES PER S-1400
CES-XXXX=CESSNA SPEC. NO.
S-XXX OR CMXXXX=CESSNA STD. NO.

SUPERSEDES: 0770416 P 6.1

SUPERSEDED BY:

CONTRACT NO:

	NAME	DATE
DESIGN	WHITSON	12-14-78
GROUP	D. Harden	12-20-78
DRAWN	HAUN	12-11-78
CHECK	BORLESKE	12-12-78
STRESS		
PROJ		
APPD		
OTHER		

Cessna AIRCRAFT CO.
PAWNEE DIVISION
5800 E. PAWNEE
WICHITA, KANSAS

TITLE
WIRING DIAGRAM — STARTER SYSTEM

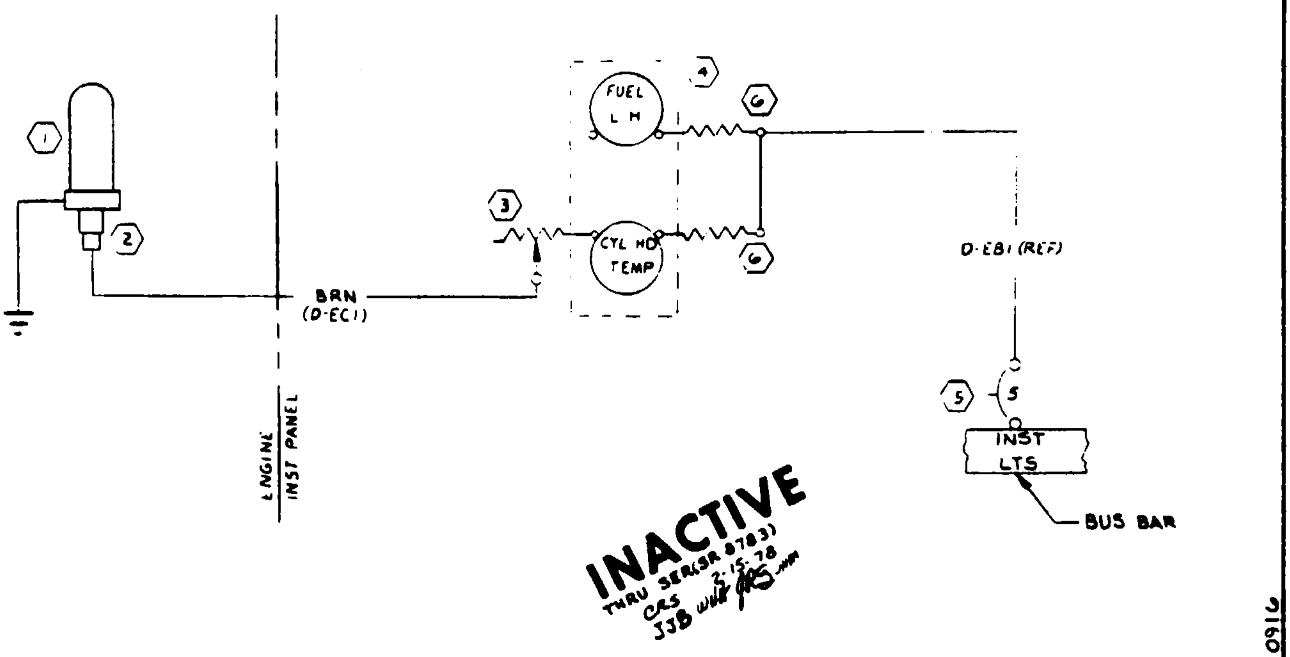
SIZE	CODE IDENT. NO.	DWG NO
C	71379	0770416

SCALE: NONE | SR 3215 | PAGE: 6.2

REVISION			
LET	DESCRIPTION	DATE	APPD

NOTES:

1. MATERIAL IS ALPHA 5857/7 (VENDOR CODE 92194) OR BELDEN 83009-1 (VENDOR CODE 10903)
2. CRIMP S-1636-5 TERMINAL AROUND WIRE INSULATION BEND .25 OF STRIPPED WIRE BACK OVER CRIMP & SOLDER PER CES 1040. USE MOLEX HT 1921 CRIMPING TOOL ONLY.



83 0916

WIRE CODE NO	GA	MATERIAL	LG	TERMINALS			SERIALS
BRN (D-EC1)	18	1		S-1367-1-8	S-1636-5	2	

WIRE TABLE

ITEM NO.	PART NO.	DESCRIPTION
6	819210	RESISTOR ASSY
5	S-1360-5L	CIRCUIT BREAKER
4	C669502-0202	INST CLUSTER
3	0713602	POTENTIOMETER
2	S-1637-4	HOUSING - PLUG
1	S-1372-2	SENDING UNIT-CYL HD TEMP

EQUIPMENT TABLE

CES-1000 IS APPLICABLE
VENDOR CODES PER S-1400
CES-XXXX=CESSNA SPEC. NO.
S-XXX OR CMXXXX=CESSNA STD. NO.

SUPERSEDES: 0770610 P8.1
SUPERSEDED BY: 0770416 P. 8.5

CONTRACT NO:

	NAME	DATE
DESIGN	SPENCER	3-31-77
GROUP	[illegible]	4-4-77
DRAWN	SCHIFFELBEIN	3-7-77
CHECK	BORLESKE	3-9-77
STRESS		
PROJ	PLAEDRICK	4-12-77
APPD	[illegible]	
OTHER		

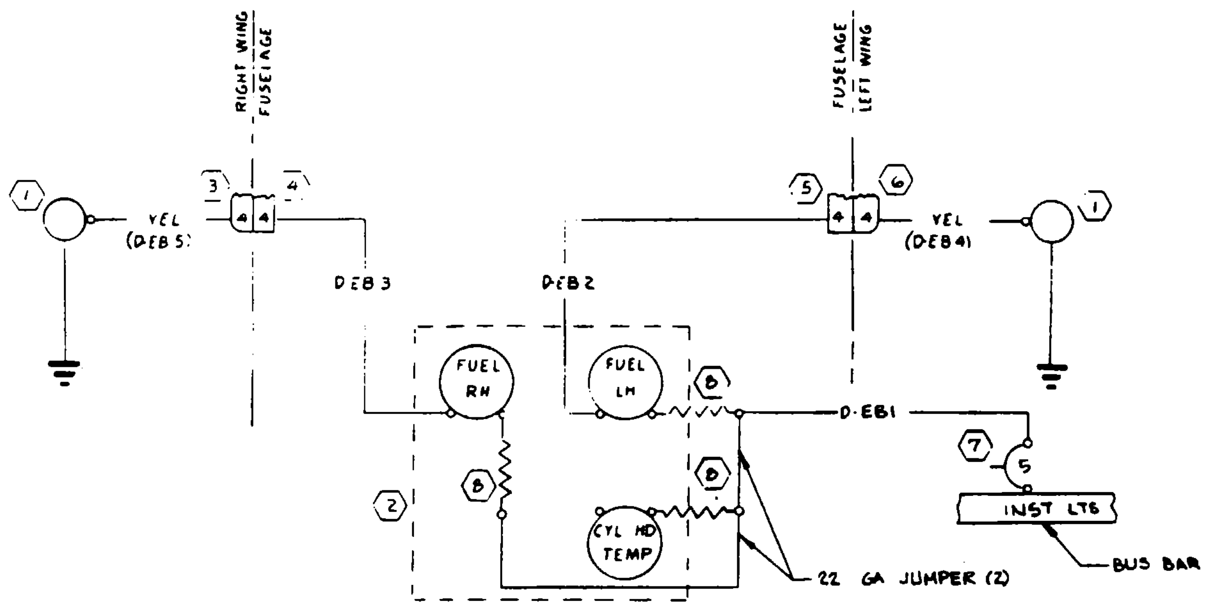
Cessna AIRCRAFT CO.
PAWNEE DIVISION
5800 E. PAWNEE
WICHITA, KANSAS

TITLE
WIRING DIAGRAM — CYLINDER HEAD TEMPERATURE

SIZE C | CODE IDENT. NO. 71379 | DWG NO 0770416

SCALE: NONE | (SR 8463) | PAGE: 8.1

REVISION			
LET	DESCRIPTION	DATE	APPD



INACTIVE
THRU SER (SR8783)
CRS 2-15-78
JJB

WIRE CODE NO	GA	MATERIAL	LG	TERMINALS			SERIALS
YEL (DEB5)	22	-22-4		5-1367-1-10	5-1635-1		
YEL (DEB4)	22	-22-4		5-1367-1-10	5-1635-1		
DEB 3	22			5-1367-1-10	5-1636-1		
DEB 2	22			5-1367-1-10	5-1636-1		
DEB 1	22			5-1367-1-6	5-1367-1-8		

WIRE TABLE

ITEM NO	PART NO.	DESCRIPTION	
8	819210	RESISTOR ASSY	
7	S-1360-5L	CIRCUIT BREAKER	
6	S-1640-6	HOUSING	
5	S-1641-6	HOUSING	
4	S-1641-9	HOUSING	
3	S-1640-9	HOUSING	
2	C669502-0202	INST CLUSTER	
1	0726110	XMTR FUEL LEVEL	

EQUIPMENT TABLE

CES-1000 IS APPLICABLE
VENDOR CODES PER S-1400
CES-XXXX=CESSNA SPEC. NO.
S-XXX OR CMXXXX=CESSNA STD. NO.

SUPERSEDES: C770610 PB.2

SUPERSEDED BY: 0770416 PG 8.6

CONTRACT NO:

	NAME	DATE
DESIGN	SPENCER	3-31-77
GROUP	W A Vandam	4-2-77
DRAWN	SCHIFFELBEIN	3-7-77
CHECK	BORLESKE	3-3-77
STRESS		
PROJ	PLHEDRICK	4-12-77
APPD	RPG	
OTHER		

Cessna AIRCRAFT CO. PAWNEE DIVISION 5800 E. PAWNEE WICHITA, KANSAS

TITLE WIRING DIAGRAM — FUEL QUANTITY INDICATOR

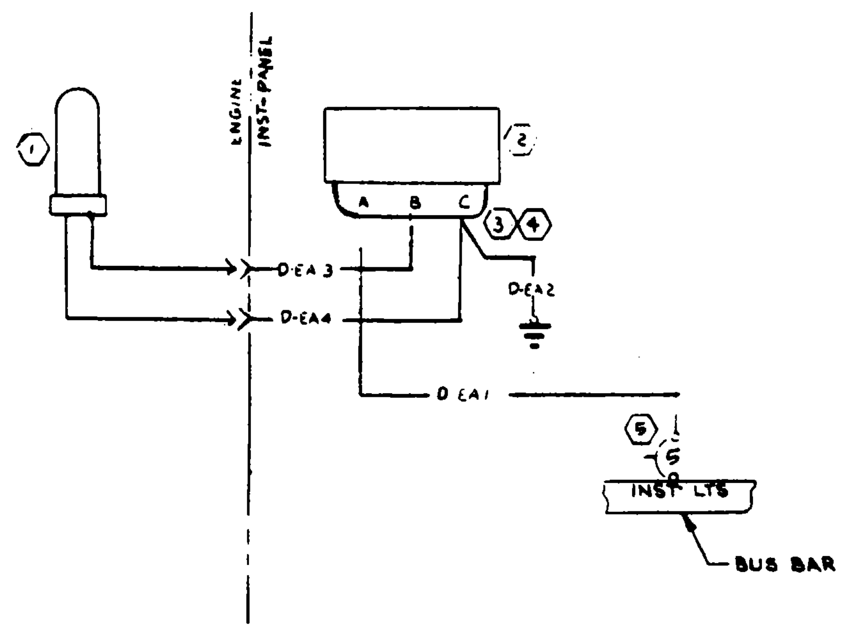
SIZE	CODE IDENT. NO	DWG NO
C	71379	0770416

SCALE: NONE (CR8463) PAGE: 8.2

REVISION			
LET	DESCRIPTION	DATE	APPD

NOTES:

1. BURNDY Y214-H FURNISHED WITH 0550209



63-0916

D-EA4	22			SOLDER	Y214-H	1	
D-EA3	22			SOLDER	Y214-H	1	
D-EA2	22			SOLDER	S1367-1-8		
D-EA1	22			SOLDER	S1367-1-6		
WIRE CODE NO.	GA	MATERIAL	LG	TERMINALS			SERIALS

WIRE TABLE

ITEM NO.	PART NO.	DESCRIPTION	
5	S-1360 5L	CIRCUIT BREAKER	
4	MS3106A 14S 1S	PLUG	
3	MS 3057-6A	CLAMP	
2	S-2311-4	INDICATOR	
1	0550209-1	SENDING UNIT-CARB AIR	

EQUIPMENT TABLE

CES-1000 IS APPLICABLE
VENDOR CODES PER S-1400
CES-XXXX=CESSNA SPEC. NO.
S-XXX OR CMXXXX=CESSNA STD. NO.

SUPERSEDES: 0770610 P 8.3

SUPERSEDED BY:

CONTRACT NO:

	NAME	DATE
DESIGN	SPENCER	3-31-77
GROUP	W H Harder	4-7-77
DRAWN	SCHIFFELBEIN	3-7-77
CHECK	BORLESKE	3-9-77
STRESS		
PROJ	PLINDERICK	4-12-77
APPD		
OTHER		

Cessna AIRCRAFT CO.
PAWNEE DIVISION
5800 E. PAWNEE
WICHITA, KANSAS

TITLE

WIRING DIAGRAM — CARBURETOR AIR TEMP (OPT)

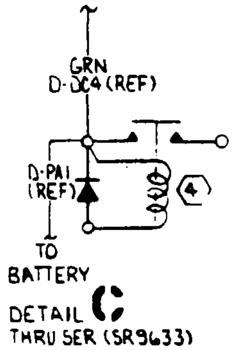
SIZE	CODE IDENT. NO.	DWG NO
C	71379	0770416

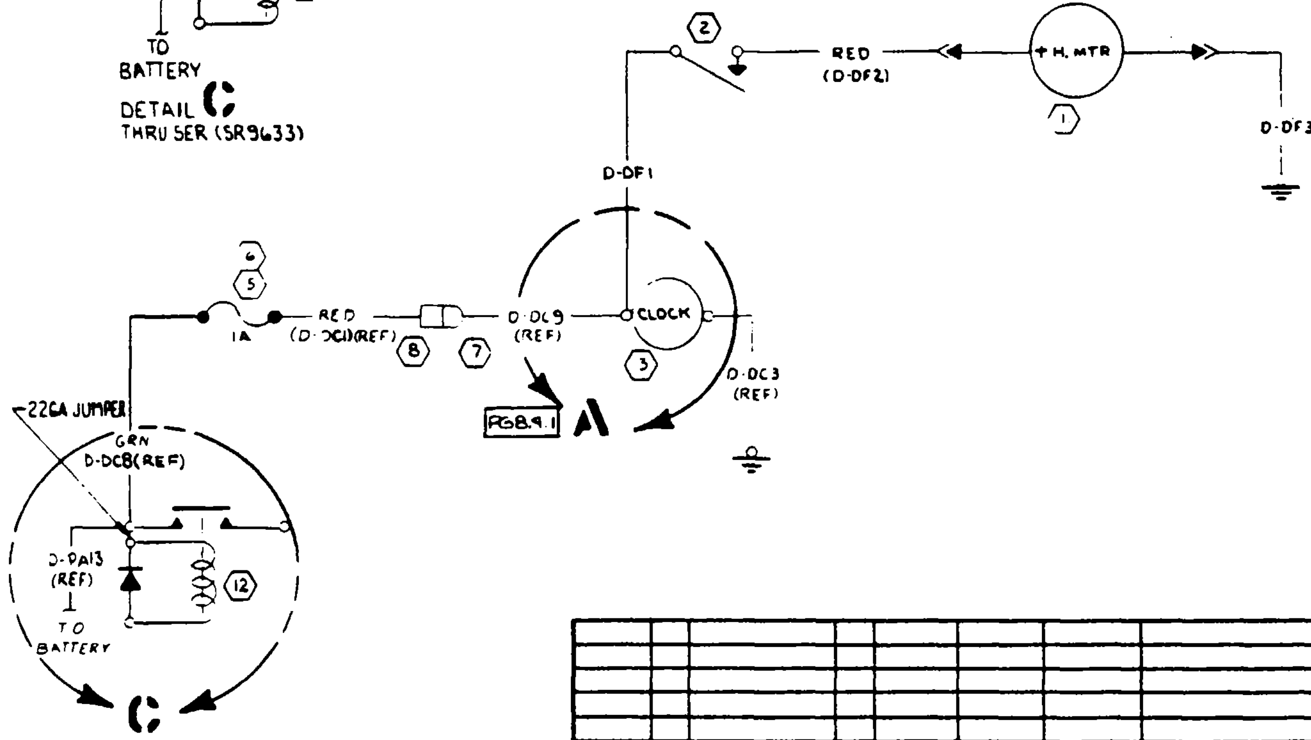
SCALE: NONE (SR8463) PAGE: 8.3

NOTES:

1. REQD ONLY WHEN OPT DIGITAL CLOCK C664511 IS INSTALLED

REVISION			
LET	DESCRIPTION	DATE	APPD
A	BY REV: C664503-0101 WAS C664502-0101; ADD RED(DF4), NOTE 1, C664511-0101, S1360-5L, DETAIL A & PG. 8.4.1 (SR9080)(REF)(SR9187)	CMK 7-13-78	
B	BY REV: ADD DETAIL "B", C664511-0102 (SR9583) ADD DETAIL "C", S-2475-1 (SR9633)	HHG NTL 2-19-80	
C	BY REV: D-DC9 WAS D-DC8 & GRN (D-DC8)(REF) WAS GRN (D-DC9)(REF) (SR9633)	NTL 2-27-80	
D	BY REV: S1367-1-8/DF1, DF2, & DF4 WAS S1367-1-6 (NOW SHOP PRACTICE) UNER 15260967)	GW 7-8-82	





12	S-2475-1	BATTERY CONTACTOR
11	C664511-0102	DIGITAL CLOCK
10	C664511-0101	DIGITAL CLOCK
9	S-1360-5L	CIRCUIT BREAKER
8	S-1637-2	HOUSING
7	S-1637-1	HOUSING
6	S-1090-22	FUSE HOLDER
5	S-1091-1	FUSE
4	S-1580-1	BATTERY CONTACTOR
3	C664506-0101	CLOCK ASSY
2	S-1711-1	OIL PRESSURE SW
	C664503-0101	HOURMETER
ITEM NO	PART NO	DESCRIPTION

EQUIPMENT TABLE

WIRE CODE NO	GA	MATERIAL	LG	TERMINALS			SERIALS
RED(DF4)	22	-22-2		S-1367-1-8	S-1635-2	1.	
D-DF3	22			S-1493-1	S-1367-1-8		
RED (D-DF2)	22	-22-2		S-1493-1	S-1367-1-8		
D-DF1	22			S-1367-1-6	S-1367-1-8		

WIRE TABLE

CES-1000 IS APPLICABLE
VENDOR CODES PER S-1400
CES-XXXX=CESSNA SPEC. NO.
S-XXX OR CMXXXX=CESSNA STD. NO.

SUPERSEDES: 0770416 P E 4

SUPERSEDED BY:

CONTRACT NO:

	NAME	DATE
DESIGN	SPENCER	3-31-77
GROUP	W H Harder	4-6-77
DRAWN	SCHIFFELBEIN	3-7-77
CHECK	SORLESKE	3-3-77
STRESS		
PROJ	PLANFORDT	4-12-77
APPD	JRS	
OTHER		

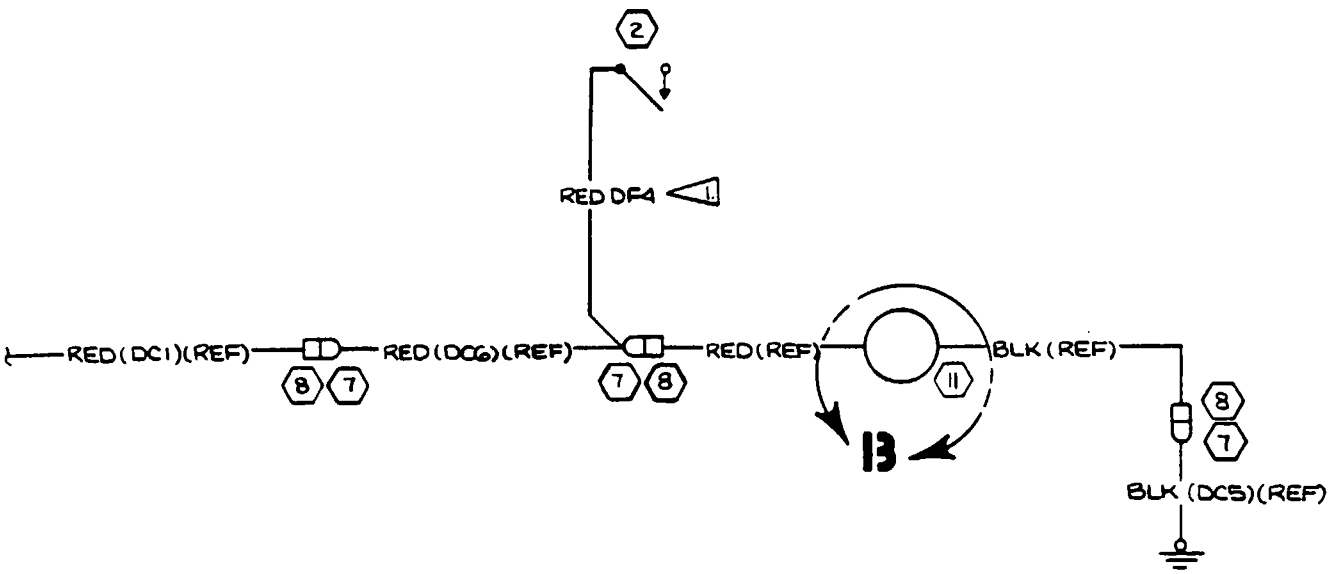
Cessna AIRCRAFT CO.
PAWNEE DIVISION
5800 E. PAWNEE
WICHITA, KANSAS

TITLE

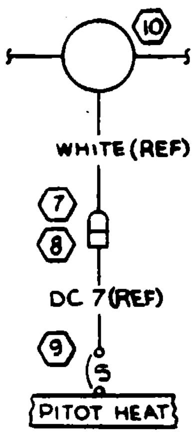
WIRING DIAGRAM — HOURMETER (OPT)

SIZE	CODE IDENT. NO	DWG NO
C	71379	0770416
SCALE: NONE	(SEB4E3	PAGE: 8.4.0

REVISION			
LET	DESCRIPTION	DATE	APPD
C	SEE PG 8.4.0 FOR REVISION		



DETAIL A PG 8.4.0
(REQD WHEN OPT DIGITAL CLOCK IS INSTALLED)



DETAIL B
THRU SER (SR 9583)

CONTRACT NO:			Cessna AIRCRAFT CO. PAWNEE DIVISION 5800 E. PAWNEE WICHITA, KANSAS
	NAME	DATE	TITLE WIRING DIAGRAM - HOURMETER (OPT)
DESIGN	G. STAMM	7-20-78	
GROUP	[illegible signature]	7-24-78	
DRAWN	C KING	7-13-78	
CHECK	BORLESKE	7-14-78	
STRESS			
PROJ	J.H. MOORE	7-24-78	SIZE C · CODE IDENT. NO. 71379 · DWG NO. 0770416
APPD			
OTHER			SCALE: NONE · (SR9187) · PAGE: 8.4.1

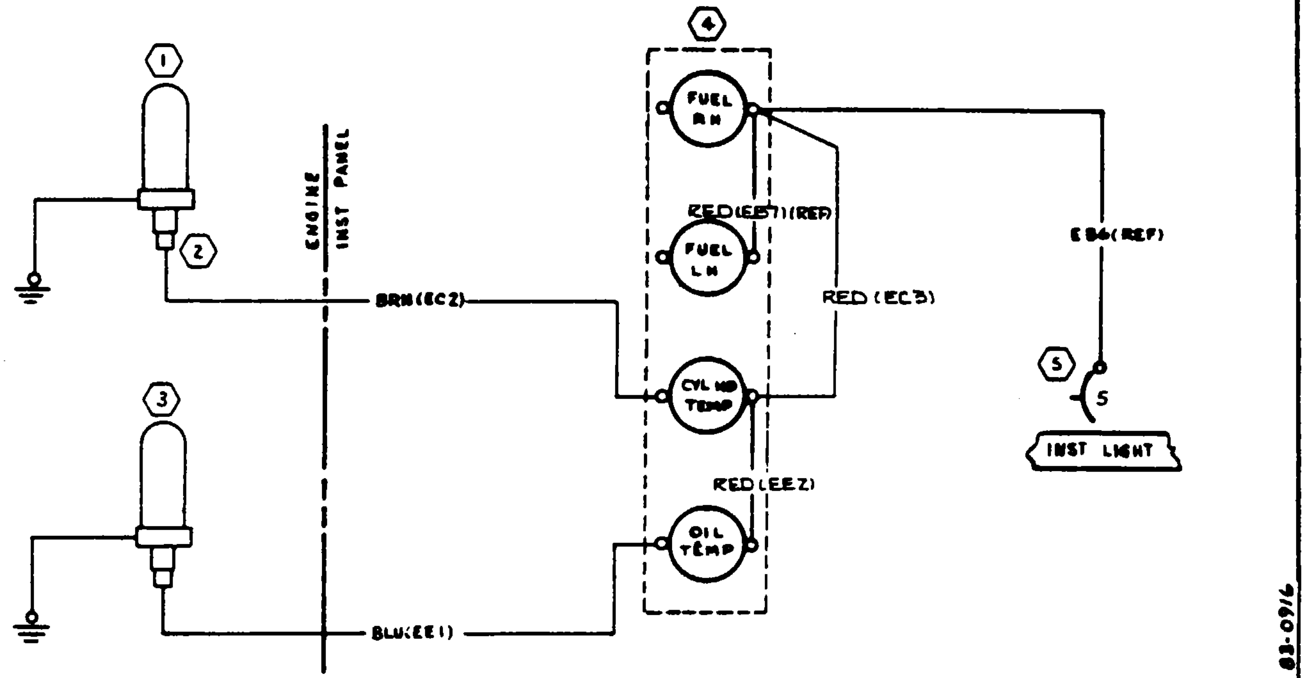
REVISION			
LET	DESCRIPTION	DATE	APPD
A	BY REV: C669545-0103 WAS C669545-0101 S-1367-1-10 WAS S-1636-5/EE1	[illegible]	[illegible]
B	BY REV: ADD RED(EC3), RED(EE2) & RED(EB7)(REF); DELETE 22 GA JUMPER (3); S-2334-2 WAS S-2334-1 (SR8783)	CMK 4-28-78 LSS	[illegible]

NOTES:

1. MATERIAL IS ALPHA 5857-7 (VENDOR CODE 92194) OR BELDEN 83009-1 (VENDOR CODE 70903)

2. MATERIAL IS ALPHA 5857-6 (VENDOR CODE 92194) OR BELDEN 83009-6 (VENDOR CODE 70903)

3. CRIMP S-1636-5 TERMINAL AROUND WIRE INSULATION, BEND .25 OF STRIPPED WIRE BACK OVER CRIMP AND SOLDER PER CES1040, USE MOLEX HT-1921 CRIMPING TOOL ONLY



WIRE CODE NO	GA	MATERIAL	LG	TERMINALS			SERIALS
RED(EE2)	22	-22 -2		S-1367-1-10	S-1367-1-10		
RED(EC3)	22	-22 -2		S-1367-1-10	S-1367-1-10		
BRN(EC2)	18	1		S-1636-5	S-1367-1-10	3	
BLU(EE1)	18	2		S-1367-1-10	S-1367-1-10		

WIRE TABLE

ITEM NO.	PART NO.	DESCRIPTION
5	S-1360-5L	CIRCUIT BREAKER
4	C669545-0103	INST CLUSTER
3	S-2335-1	SENDING UNIT
2	S-1637-4	HOUSING-PLUG
1	S-2334-2	SENDING UNIT

EQUIPMENT TABLE

CES-1000 IS APPLICABLE VENDOR CODES PER S-1400 CES-XXXX=CESSNA SPEC. NO. S-XXX OR CMXXXX=CESSNA STD. NO.

SUPERSEDES: 0770416 . P 8.1

SUPERSEDED BY:

CONTRACT NO:

	NAME	DATE
DESIGN	SPENCER	2-23-78
GROUP	[illegible]	3-6-78
DRAWN	SHAVER	2-15-78
CHECK	J. BLISS	2-16-78
STRESS		
PROJ	J.H. MOORE	3-7-78
APPD	[illegible]	
OTHER		

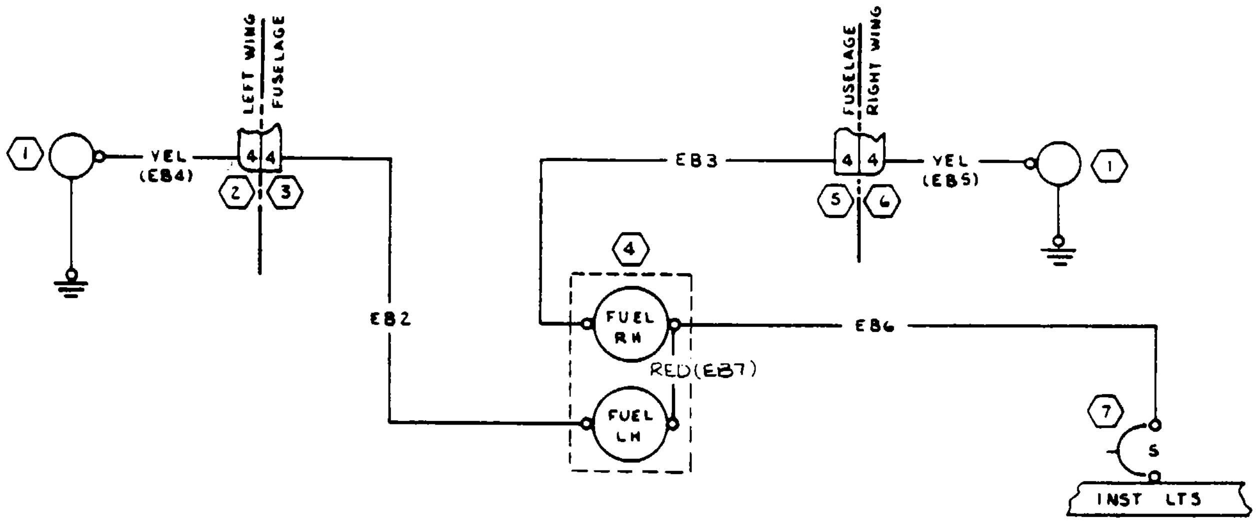
Cessna AIRCRAFT CO. PAWNEE DIVISION 5800 E. PAWNEE WICHITA, KANSAS

TITLE WIRING DIAGRAM — CYLINDER HEAD TEMP & OIL TEMPERATURE

SIZE C | CODE IDENT. NO. 71379 | DWG NO 0770416

SCALE: NONE | (SR8783) | PAGE: 8.5

REVISION			
LET	DESCRIPTION	DATE	APPD
A	BY REV: C663545-0103 WAS C66A545-0101	ZLT 3-28-78	JAB
B	BY REV: ADD RED(EB7); DELETE ...GA JUMPER (3), CIL TEMP & CYL HD TEMP INDICATORS (SR8783)	CMK 5-5-78	



WIRE CODE NO	GA	MATERIAL	LG	TERMINALS			SERIALS
RED(EB7)	22	-22-2		S-1367-1-10	S-1367-1-10		
EB6	22			S-1367-1-10	S-1367-1-8		
EB5(YEL)	22	-22-4		S-1367-1-10	S-1635-1		
EB4(YEL)	22	-22-4		S-1367-1-10	S-1635-1		
EB3	22			S-1367-1-10	S-1636-1		
EB2	22			S-1367-1-10	S-1636-1		

WIRE TABLE

	PART NO.	DESCRIPTION
7	S-1360-5L	CIRCUIT BREAKER
6	S-1640-9	HOUSING
5	S-1641-9	HOUSING
4	C669545-0103	INST CLUSTER
3	S-1641-6	HOUSING
2	S-1640-6	HOUSING
1	C668050	FUEL LEVEL XMTR

EQUIPMENT TABLE

CES-1000 IS APPLICABLE
VENDOR CODES PER S-1400
CES-XXXX=CESSNA SPEC. NO.
S-XXX OR CMXXXX=CESSNA STD NO.

SUPERSEDES: 0770416 P 8.2

SUPERSEDED BY:

CONTRACT NO:

	NAME	DATE
DESIGN	SPENCER	2-23-78
GROUP	W.H. Harden	3-6-78
DRAWN	Shaver	2-15-78
CHECK	J. BLISS	2-16-78
STRESS		
PROJ		
APPD	JBS	
OTHER		

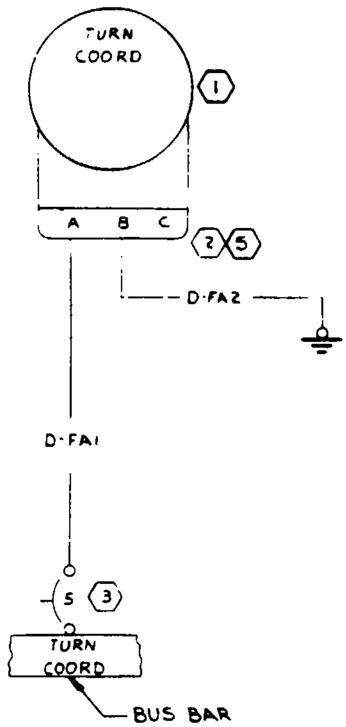
Cessna AIRCRAFT CO.
PAWNEE DIVISION
5800 E. PAWNEE
WICHITA, KANSAS

TITLE
WIRING DIAGRAM — FUEL QUANTITY INDICATORS

SIZE: C | CODE IDENT. NO. 71379 | DWG NO 0770416

SCALE: NONE | (SR 8783) | PAGE: 8.6

REVISION			
LET	DESCRIPTION	DATE	APPD
A	BY REV: DELETE S1303-2 TURN & BANK IND (SR8463)	JCS 6-27-77	



67-0916

WIRE CODE NO	GA	MATERIAL	LG	TERMINALS			SERIALS
D-FA2	22			SOLDER	S-1367-1-8		
D-FA1	22			S-1367-1-6	SOLDER		

WIRE TABLE

ITEM NO	PART NO.	DESCRIPTION	
5	MS 3057-4A	CLAMP	
4			
3	S-1360-5L	CIRCUIT BREAKER	
2	MS3106A10SL3S	CONNECTOR	
1	C66.003-0505	TURN COORDINATOR	

EQUIPMENT TABLE

CES-1000 IS APPLICABLE VENDOR CODES PER S-1400 CES-XXXX=CESSNA SPEC. NO. S-XXX OR CMXXXX=CESSNA STD. NO.

SUPERSEDES. 0770610 P 94295

SUPERSEDED BY:

CONTRACT NO:

	NAME	DATE
DESIGN	SPENCER	3-31-77
GROUP		4-1-77
DRAWN	SCHIFFELBEIN	3-7-77
CHECK	BORLESKE	3-9-77
STRESS		
PROJ	PLHADRICK	4-12-77
APPD		
OTHER		

Cessna AIRCRAFT CO. PAWNEE DIVISION 5800 E. PAWNEE WICHITA, KANSAS

TITLE WIRING DIAGRAM — TURN COORDINATOR

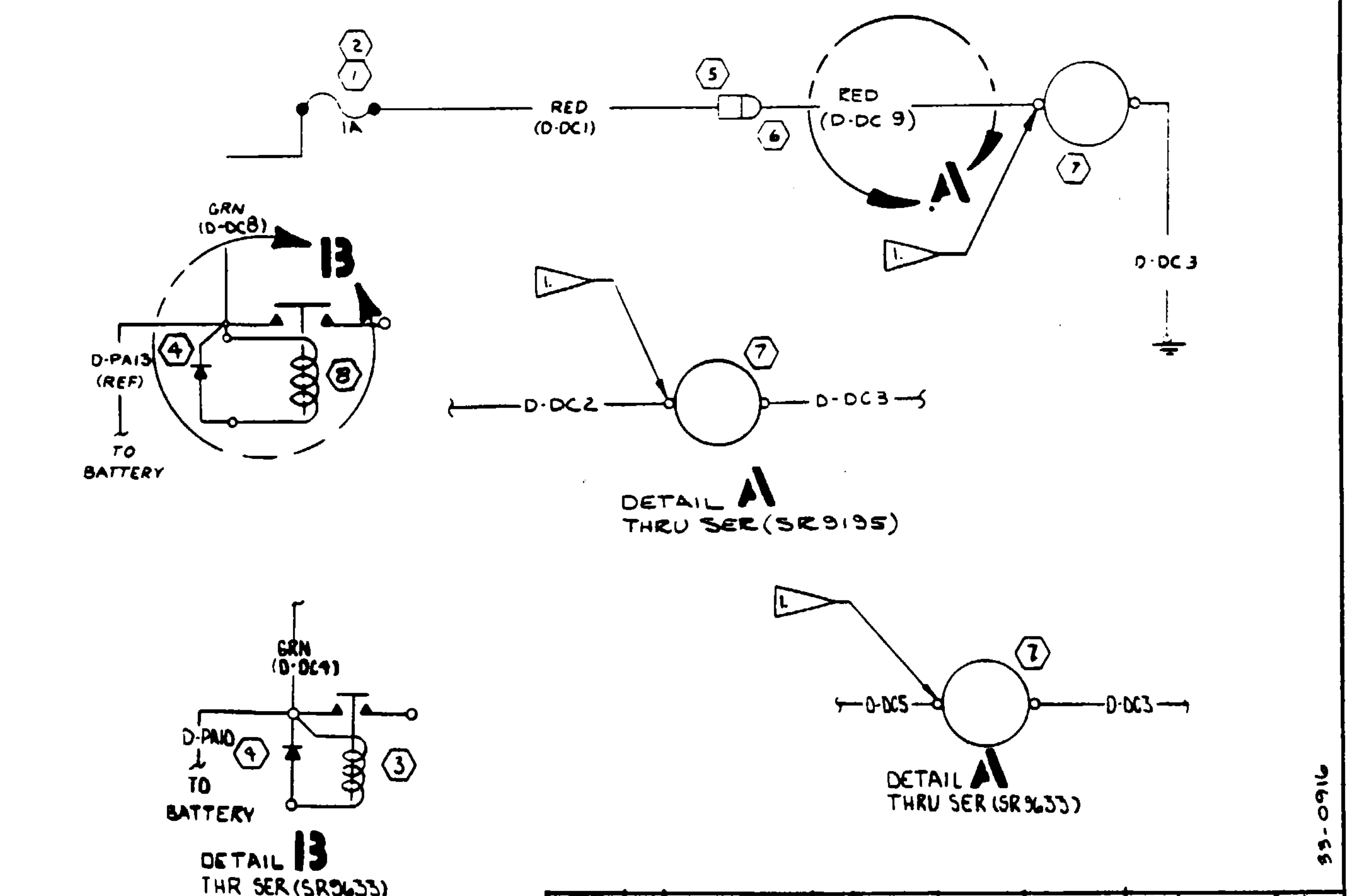
SIZE	CODE IDENT. NO	DWG NO
C	71379	0770416

SCALE: NONE (SR8463) PAGE: 9.1

NOTES:

1. CAUTION POWER WIRE MUST BE CONNECTED TO BATT TERMINAL OF CLOCK OTHERWISE INTERNAL DAMAGE TO UNIT WILL RESULT

REVISION			
LET	DESCRIPTION	DATE	APPD
A	BY REV: D-PA10(REF) WAS D-PA1 (REF) (SR9087)	CS 4-25-78	
B	BY REV: ADD NOTE 1 & RED D-DC5; ADD DETAIL 'A' & SER, C664508-0102 WAS C664508-0101 (SR9195)(REF)	BGK 10-6-78	JAB
C	BY REV: ADD DETAIL "B". RED(DC9) GRN(DC8) & S-2475-1 (SR9633)	NTL 2-25-80	JAB



RED (D-DC9)	22	-22-2		S-1635-1	S-1367-1-6		SER(SR9633)& ON
GRN (D-DC8)	22	-22-5		SOLDER	S-1367-1-8		SER(SR9633)& ON
RED D-DC5	22	-22-2		S-1635-1	S-1367-1-6		THRU SER (SR9633)
GRN (D-DC4)	22	-22-5		SOLDER	S-1367-1-8		THRU SER (SR9633)
D-DC3	22			S-1367-1-6	S-1367-1-8		
D-DC2	22			S-1635-1	S-1367-1-6		THRU SER(SR9195)
RED (D-DC1)	22	-22-2		S-1636-1	SOLDER		
WIRE CODE NO	GA	MATERIAL	LG	TERMINALS			SERIALS

WIRE TABLE

B	S-2475-1	BATT. CONTACTOR
7	C664508-0102	CLOCK ASSY
6	S-1637-1	HOUSING
5	S-1637-2	HOUSING
4	0770728	DIODE ASSY
3	S-1580-1	BATTERY CONTACTOR
2	S-1090-22	FUSE HOLDER
1	S-1091-1	FUSE
	PART NO.	DESCRIPTION

EQUIPMENT TABLE

CES-1000 IS APPLICABLE VENDOR CODES PER S-1400 CES-XXXX-CESSNA SPEC. NO. S-XXX OR CMXXXX-CESSNA STD. NO.

SUPERSEDES: 0770610 P 10.1

SUPERSEDED BY:

CONTRACT NO:

	NAME	DATE
DESIGN	SPENCER	3-31-77
GROUP		4-6-77
DRAWN	SCHIFFELBEIN	3-7-77
CHECK	BORLESKE	3-9-77
STRESS		
PROJ	PLHRDRICK	4-12-77
APPD		
OTHER		

Cessna AIRCRAFT CO. PAWNEE DIVISION 5800 E. PAWNEE WICHITA, KANSAS

TITLE WIRING DIAGRAM — CLOCK

SIZE C | CODE IDENT. NO. 71379 | DWG NO 0770416

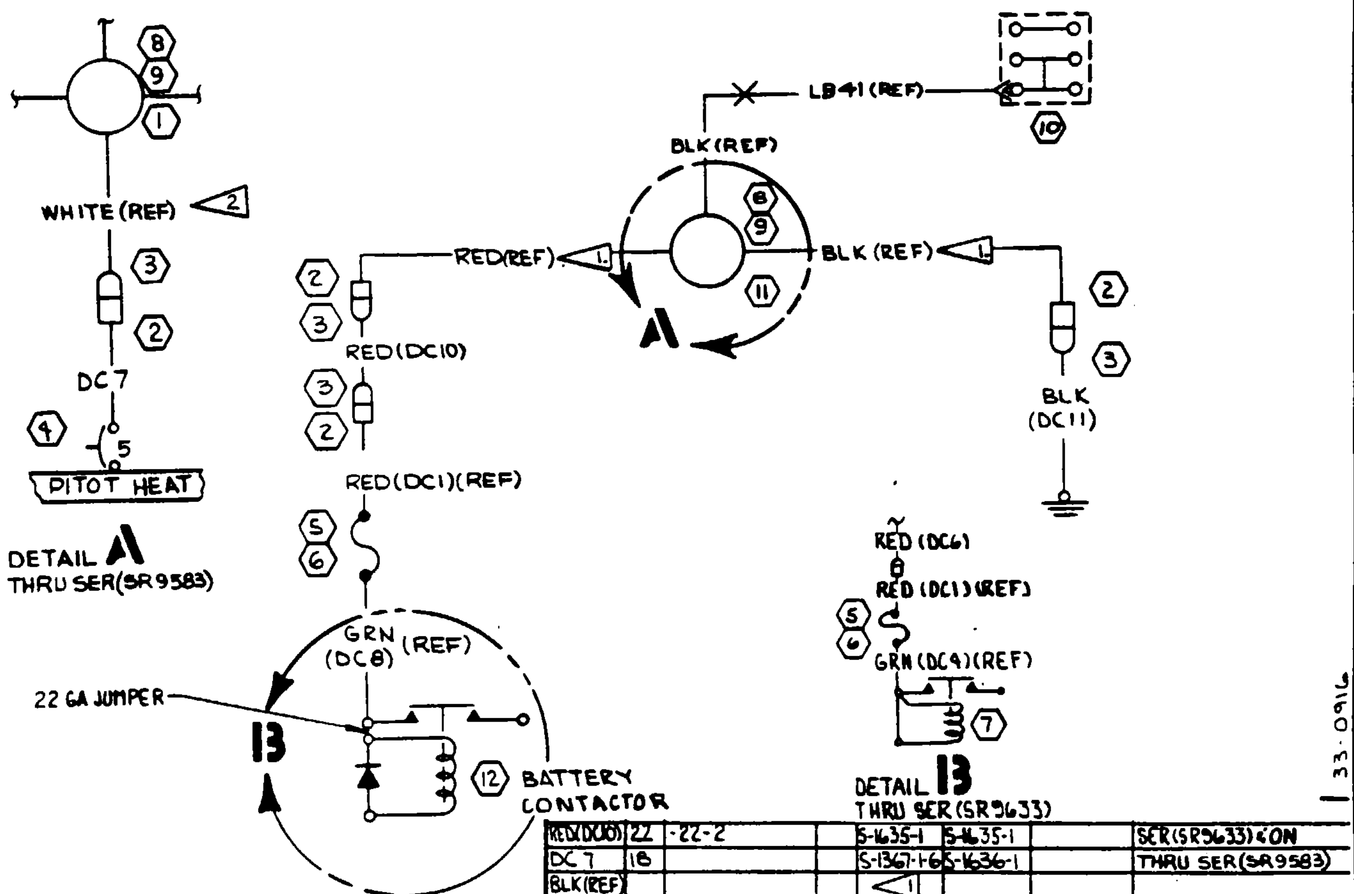
SCALE: NONE | (SR8463) | PAGE: 10.1

LET	DESCRIPTION	DATE	APPD
C	BY REV: GRN(DC8)(REF) WAS GRN(DC4)(REF) & RED(DC10) WAS RED(DC8) (SR9633)	NTL 2-27-80	
D	BY REV: BLK(DC11) WAS BLK(DC5) (NOW SHOP PRACTICE)	GLS 9-2-81	

REVISION			
LET	DESCRIPTION	DATE	APPD
A	BY REV: RED(DC6) WAS BLU(DC6); RED(REF) WAS BLU(REF); WHITE (REF) WAS RED(REF); GRN(DC4)(REF) WAS GRN(DC4) (SR9187)	CMK 7-13-78	JAB
B	BY REV: ADD DETAIL 'A' / C664511-0102 (SR 9583) ADD DETAIL B & S-2475-1 (SR9633)	HHG NTL 2-19-80	JAB

NOTES:

1. INSTALL S-1636-1 ON VENDOR WIRE
2. INSTALL S-1635-1 ON VENDOR WIRE



WIRE CODE NO	GA	MATERIAL	LG	TERMINALS		SERIALS
RED(DC10)	22	-22-2		S-1635-1	S-1635-1	SER(SR9633)&ON
DC7	18			S-1367-1-6	S-1636-1	THRU SER(SR9583)
BLK(REF)				1		
WHT(REF)				2		THRU SER(SR9583)
RED(REF)				1		
RED (DC6)	22	-22-2		S-1635-1	S-1635-1	THRU SER(SR9633)
BLK (DC11)	18	-18-0		S-1635-1	S-1367-1-8	

WIRE TABLE

ITEM NO	PART NO.	DESCRIPTION
12	S-2475-1	BATT. CONTACTOR
11	C664511-0102	DIGITAL CLOCK
10	34003-817	TERMINAL BLOCK
9	S-2413-1	SOCKET
8	MS25231-1819	LIGHT
7	S-1580-1	CONTACTOR
6	S-1091-1	FUSE
5	S-1090-22	FUSEHOLDER
4	S-1360-5L	CIRCUIT BREAKER
3	S-1637-1	HOUSING
2	S-1637-2	HOUSING
1	C664511-0101	DIGITAL CLOCK

EQUIPMENT TABLE

CES-1000 IS APPLICABLE VENDOR CODES PER S-1400 CES-XXXX=CESSNA SPEC. NO S-XXX OR CMXXXX=CESSNA STD. NO.

SUPERSEDES

SUPERSEDED BY

CONTRACT NO

	NAME	DATE
DESIGN	G STAMM	4-12-78
GROUP	D.H. WARDEN	4-12-78
DRAWN	R. YOUNGERS	4-11-78
CHECK	BORLESKE	4-11-78
STRESS		
PROJ	J.H. MOORE	4-14-78
APPD		
OTHER		

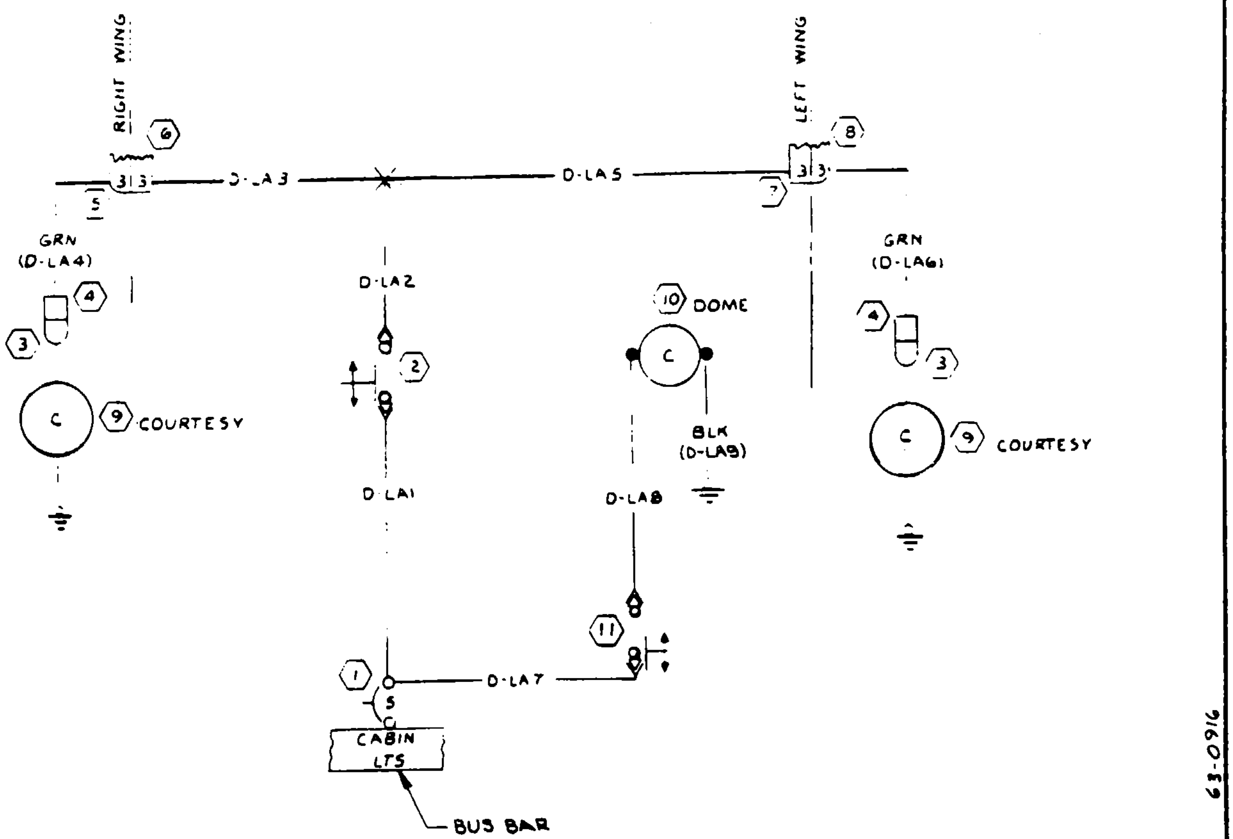
Cessna AIRCRAFT CO. PAWNEE DIVISION 5800 E. PAWNEE WICHITA, KANSAS

TITLE WIRING DIAGRAM — DIGITAL CLOCK (OPT)

SIZE	CODE IDENT. NO.	DWG NO
C	71379	0770416

SCALE: NONE (SR9187) PAGE: 10.2

REVISION			
LET	DESCRIPTION	DATE	APPD
A	BY REV MS25231-313 WAS GE-1821 (NOW SHOP PRACT)	1-11-78	
B	BY REV: ADD S-2160-1 SWITCH ITEM 11; S-2160-1 WAS S-1831-1 SWITCH PER DOME LT SWITCH; S-1493-1 WAS S-1830-1 TERMINAL ON LA7 & LA8 WIRES (SR9920)(REF)	GLS 6/23/81	



WIRE CODE NO	GA	MATERIAL	LG	TERMINALS		SERIALS	
BLK (D-LA8)	22	-22-0		SOLDER	S-1367-1-8	STD	
D-LA8	22			S-1493-1	SOLDER		
D-LA7	22			S-1367-1-6	S-1493-1		
GRN (D-LA6)	22	-22-5		S-1635-1	S-1636-1		
D-LA5	22			SEE D-LA2	S-1636-1		
GRN (D-LA4)	22	-22-5		S-1635-1	S-1636-1		
D-LA3	22			SEE D-LA2	S-1636-1		
D-LA2	22			S-1830-1	S-1370-2		
D-LA1	22			S-1367-1-6	S-1830-1	STD	

WIRE TABLE

ITEM NO	PART NO.	DESCRIPTION	
11	S-2160-1	SWITCH	
10	MS25231-313	LAMP	
9	MS15584 B	LAMP	
8	S-1640-6	HOUSING - PIN	
7	S-1641-6	HOUSING SOCKET	
6	S-1641-9	HOUSING - SOCKET	
5	S-1640-9	HOUSING - PIN	
4	S-1637-2	HOUSING - SOCKET	
3	S-1637-1	HOUSING - PIN	
2	S-1831-1	SWITCH	
1	S-1360-5L	CIRCUIT BREAKER	

EQUIPMENT TABLE

CES-1000 IS APPLICABLE VENDOR CODES PER S-1400 CES-XXXX=CESSNA SPEC. NO. S-XXX OR CMXXXX=CESSNA STD. NO.

SUPERSEDES: 0770610 P.1.1.1

SUPERSEDED BY:

CONTRACT NO:

	NAME	DATE
DESIGN	SPENCER	3-31-77
GROUP		4-4-77
DRAWN	SCHIFFELBEIN	3-7-77
CHECK	BORLESKE	3-9-77
STRESS		
PROJ	PLANFDRICK	4-12-77
APPD		
OTHER		

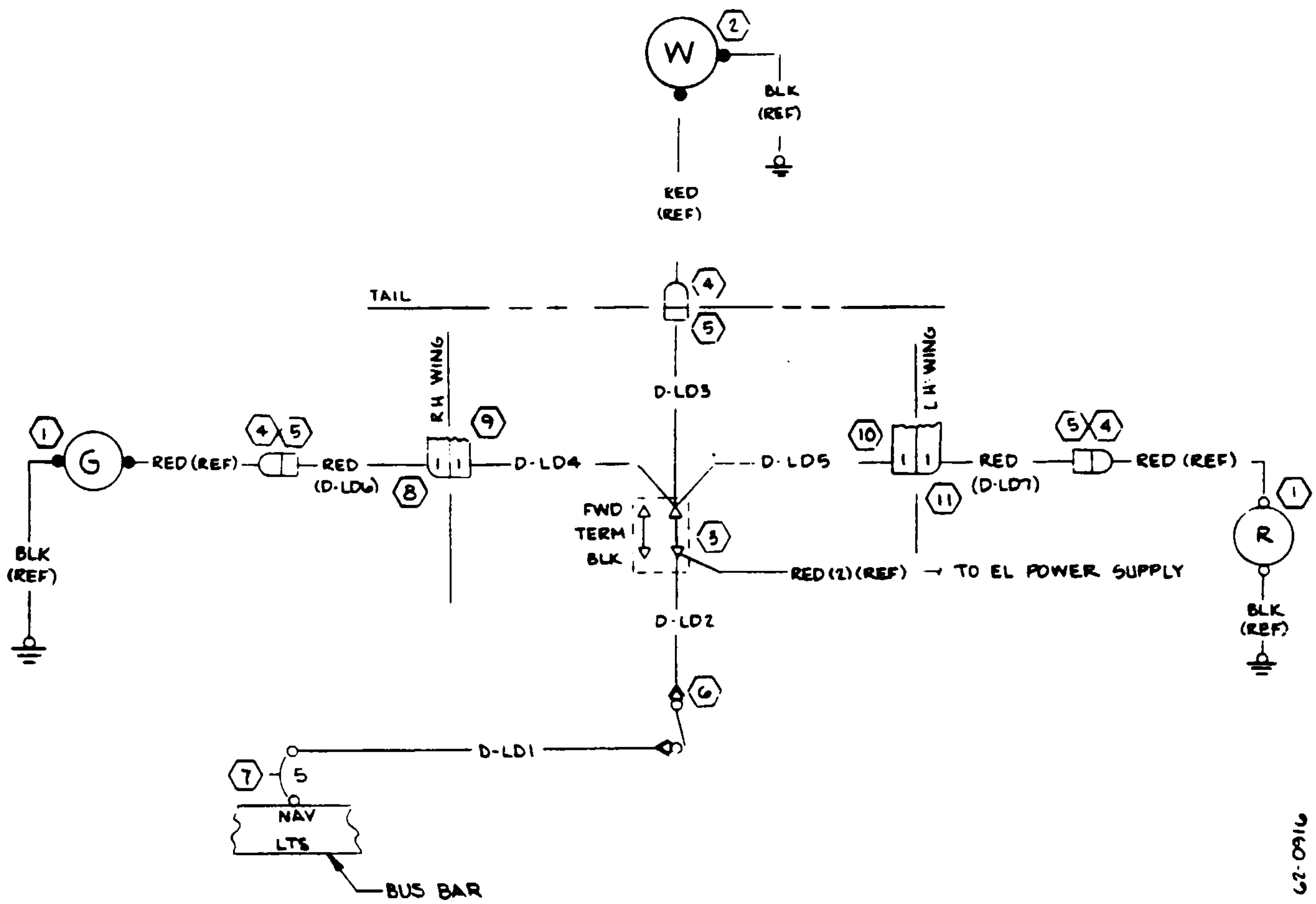
Cessna AIRCRAFT CO. PAWNEE DIVISION 5800 E. PAWNEE WICHITA, KANSAS

TITLE **WIRING DIAGRAM — DOME LIGHT (STD) & COURTESY LIGHTS (OPT)**

SIZE	CODE IDENT. NO.	DWG NO
C	71379	0770416

SCALE: NONE (SR8463) PAGE: 11.1

REVISION			
LET	DESCRIPTION	DATE	APPD



WIRE CODE NO	GA	MATERIAL	LG	TERMINALS			SERIALS
RED (D-LD7)	20	-20-2		S 1635-1	S-1636-1		
RED (D-LD6)	20	-20-2		S-1635-1	S-1636-1		
D-LD5	22			S-1636-1	S-1829-1		
D-LD4	22			S-1636-1	S-1829-1		
D-LD3	20			S-1636-1	S-1829-1		
D-LD2	22			S-1829-1	S-1493-1		
D-LD1	22			S1367-1-6	S-1493-1		

WIRE TABLE

ITEM NO	PART NO.	DESCRIPTION	
11	S-1640-6	HOUSING-PIN	
10	S-1641-6	HOUSING-SOCKET	
9	S-1641-9	HOUSING-SOCKET	
8	S-1640-9	HOUSING-PIN	
7	S-1360-5L	CIRCUIT BREAKER	
6	S-2160-1	SWITCH	
5	S-1637-2	HOUSING	
4	S-1637-1	HOUSING	
3	34002-55	TERM BLOCK	
2	C622001-0401	LIGHT ASSY	
1	C622001-0202	LIGHT ASSY	

EQUIPMENT TABLE

CES-1000 IS APPLICABLE
VENDOR CODES PER S-1400
CES-XXXX=CESSNA SPEC. NO.
S-XXX OR CMXXXX=CESSNA STD. NO.

SUPERSEDES: 0770610 P 11.4.2

SUPERSEDED BY:

CONTRACT NO:

	NAME	DATE
DESIGN	SPENCER	3-31-77
GROUP	[illegible signature]	4-4-77
DRAWN	HARVEY	3-7-77
CHECK	BORLESKE	3-9-77
STRESS		
PROJ	PLHRDRICK	4-12-77
APPD	[illegible signature]	
OTHER		

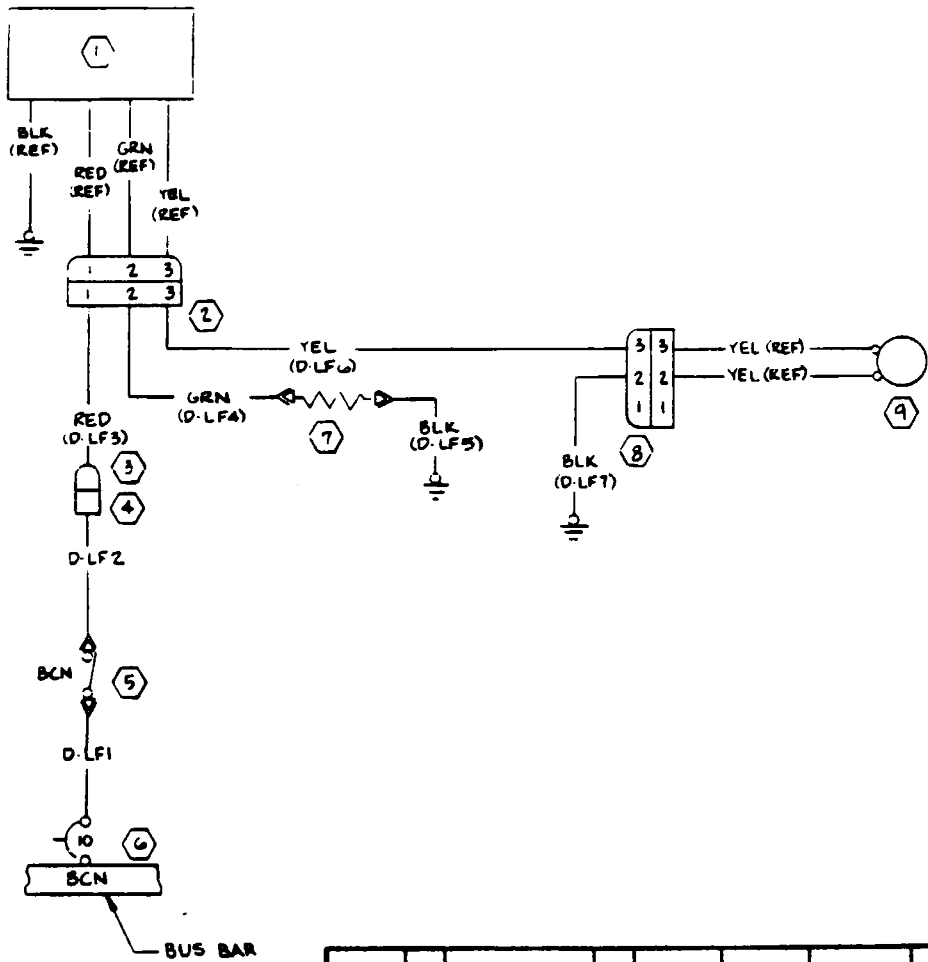
Cessna. AIRCRAFT CO.
PAWNEE DIVISION
5800 E. PAWNEE
WICHITA, KANSAS

TITLE
WIRING DIAGRAM — NAVIGATION LIGHTS

SIZE	CODE IDENT. NO.	DWG NO
C	71379	0770416

SCALE: NONE (SR8463) PAGE: 11.2

REVISION			
LET	DESCRIPTION	DATE	APPD



63-0816

BLK (D-LF7)	18	-18-0		S-1635-1	S-1367-1-8		
YEL (D-LF6)		-18-4		S-1636-1	S-1635-1		
BLK (D-LF5)		-18-0		S-1493-1	S-1367-1-8		
GRN (D-LF4)		-18-5		S-1636-1	S-1493-1		
RED (D-LF3)		-18-2		S-1635-1	S-1636-1		
D-LF2				S-1493-1	S-1636-1		
D-LF1	18			S-1367-1-6	S-1493-1		
WIRE CODE NO	GA	MATERIAL	LG	TERMINALS			SERIALS

WIRE TABLE

9	C621001-0102	LIGHT ASSY	
8	S-1638-2	HOUSING	
7	OR95-6	RESISTOR	
6	S-1360-10L	CIRCUIT BREAKER	
5	S-2160-1	SWITCH	
4	S-1637-2	HOUSING	
3	S-1637-1	HOUSING	
2	S-1638-1	HOUSING	
1	C594502-0101	FLASHER ASSY	
ITEM NO.	PART NO.	DESCRIPTION	

EQUIPMENT TABLE

CES-1000 IS APPLICABLE
VENDOR CODES PER S-1400
CES-XXXX=CESSNA SPEC. NO.
S-XXX OR CMXXXX=CESSNA STD. NO.

SUPERSEDES: 0770610 P 115.3

SUPERSEDED BY:

CONTRACT NO:

	NAME	DATE
DESIGN	SPENCER	3-31-77
GROUP	D.L. Harden	4-1-77
DRAWN	HARVEY	3-7-77
CHECK	Sorleske	3-9-77
STRESS		
PROJ	PLHEDRICK	4-12-77
APPD	[illegible]	
OTHER		

Cessna AIRCRAFT CO.
PAWNEE DIVISION
5800 E. PAWNEE
WICHITA, KANSAS

TITLE
WIRING DIAGRAM — FLASHING BEACON LIGHT (OPT)

SIZE	CODE IDENT. NO.	DWG NO
C	71379	0770416

SCALE: NONE (SR8463) PAGE: 11.3

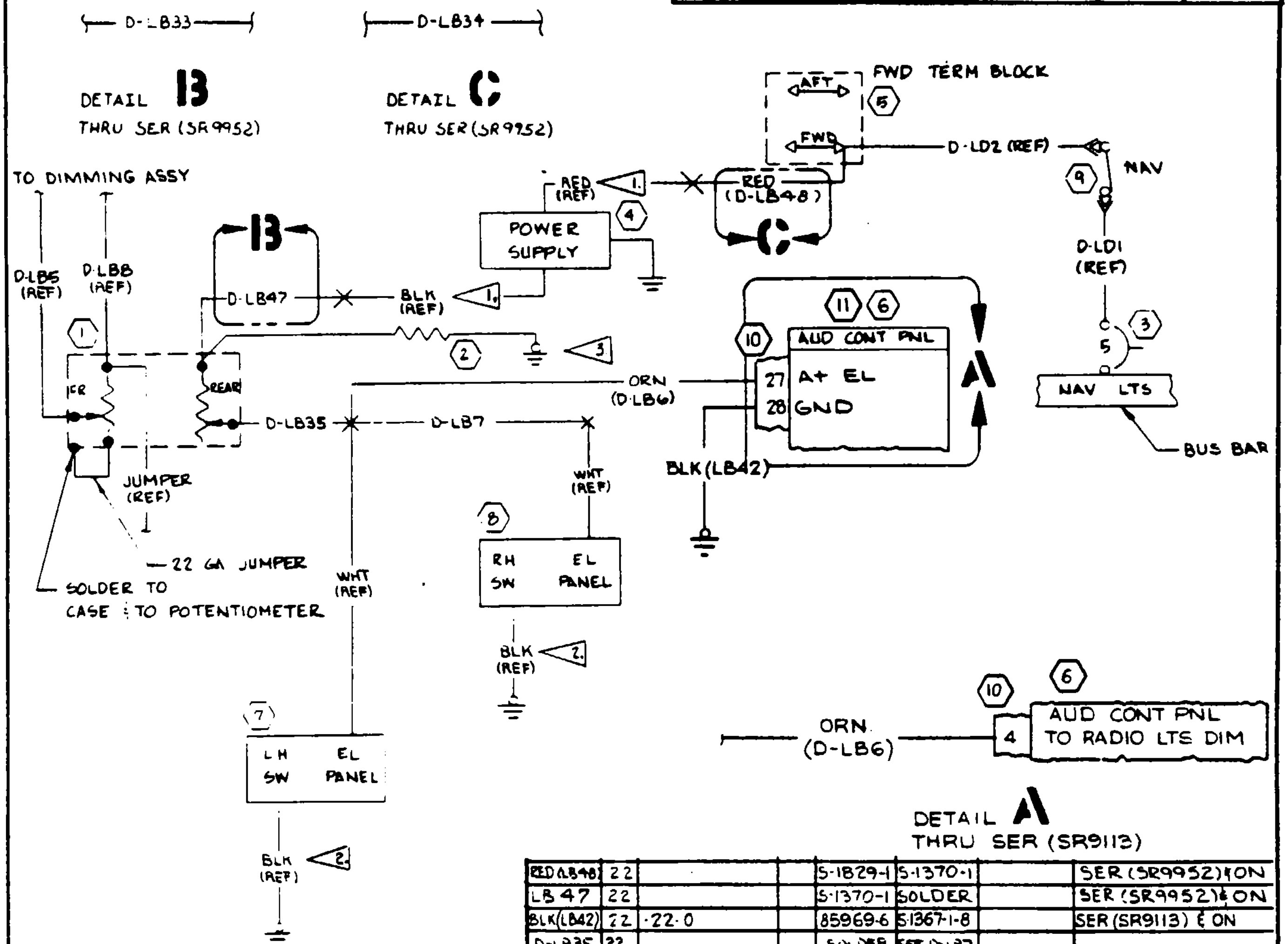
NOTES

1. TO BE RETAINED IN TERMINAL WIRE MUST BE STRIPPED DOUBLED & TWISTED

2. TERMINATE VENDOR FURNISHED WIRE WITH S-1367-1-8

3. THIS END OF RESISTOR TERMINATED WITH S-1367-1-14 TERMINAL & INSTALLED ON SHAFT OF TANDEM POT ASSY DUE TO HEAT DISSIPATION RESISTOR MUST BE KEPT FROM WIRE BUNDLE

REVISION			
LET	DESCRIPTION	DATE	APPD
A	BY REV: TERM WAS S-1367-1-14/ NOTE 2; ADD DETAIL A, LB42 & SER (SR8465) REF (SR9113)	DLP 2-20-79	
B	BY REV: LB45 WAS LB33, LB46 WAS LB34 (SR9952)	GLS 2/9/81	
C	BY REV: LB47 WAS LB45, RED (LB48) WAS RED (LB46); ADD DETAIL B & C (SR9952)	REK 7-28-81	



RED (LB48)	22			S-1829-1	S-1370-1		SER (SR9952) & ON
LB47	22			S-1370-1	SOLDER		SER (SR9952) & ON
BLK (LB42)	22	-22-0		85969-6	S-1367-1-8		SER (SR9113) & ON
D-LB35	22			SOLDER	SEE D-LB7		
D-LB33	22			S-1370-1	SOLDER		THRU SER (SR9952)
ORN (D-LB6)	22	-22-3		SEE D-LB7	85969-6		
D-LB7	22			S-1370-2	S-1370-1		
RED (D-LB34)	22	-22-2		S-1829-1	S-1370-1		THRU SER (SR9952)
WIRE CODE NO	GA	MATERIAL	LG	TERMINALS			SERIALS

WIRE TABLE

ITEM NO	PART NO	DESCRIPTION	
11	2470003	AUDIO CONTROL PNL	
10	87149-1	CONNECTOR	
9	S-2160-1	SWITCH	
8	1213363	EL PANEL	
7	0713577	EL PANEL	
6	0570442	AUDIO CONTROL PNL	
5	34002-55	TERMINAL BOARD	
4	C613001-0101	POWER SUPPLY	
3	S-1360-5L	CIRCUIT BREAKER	
2	VAL 5-6000	RESISTOR	
.	S-2091-3	POT ASSY	

EQUIPMENT TABLE

CES-1000 IS APPLICABLE VENDOR CODES PER S-1400 CES-XXXX=CESSNA SPEC. NO. S-XXX OR CMXXXX=CESSNA STD. NO.

SUPERSEDES: 0770610 P 19 2.0 F.1 f.2

SUPERSEDED BY:

CONTRACT NO

	NAME	DATE
DESIGN	SPENCER	3-31-77
GROUP		4-8-77
DRAWN	HARVEY	3-7-77
CHECK	SORLESKE	3-9-77
STRESS		
PROJ	PLHIFDRICK	4-12-77
APPD		
OTHER		

Cessna AIRCRAFT CO. PAWNEE DIVISION 5800 E. PAWNEE WICHITA, KANSAS

TITLE WIRING DIAGRAM — ELECTRO LUMINESCENT PANEL (OPT)

SIZE C | CODE IDENT NO 71379 | DWG NO 0770416

SCALE NONE | 126443 | PAGE: 114

NOTES.

1 OXYGEN CONSOLE WIRING APPLICABLE ONLY WHEN OPTIONAL OXYGEN SYSTEM IS INSTALLED

2 INSTALL S-1635-1 TERMINAL ON VENDOR FURNISHED LEAD AS INDICATED

3 INSTALL S-1367-1-7 TERMINAL ON VENDOR FURNISHED WIRES AS INDICATED

4 THIS POT IS PART OF S-2091-3 DUAL POT ASSY WHEN OPTIONAL EL LIGHTING IS INSTALLED

5 REQD ONLY WHEN OPT DIGITAL CLOCK C669511 IS INSTALLED

REVISION			
LET	DESCRIPTION	DATE	APPD
A	BY REV: ADD DETAIL A PG 11.5.1 DELETE LB27 S-1637(-1-4-2)/PEDESTAL LTS S-2091-7 WAS -3 (SR8463)(REF)(SR6783)	CRS 2-15-78	
B	BY REV: C669545-0103 WAS C669545-0101	3-28-78	
C	BY REV: ADD LB41, NOTE 5, S2431-1 & MS25231-1819 (SR9187)	CMK 7-13-78	
D	BY REV: 22 GA JUMPER (5) WAS (3) (SR8783)(REF)	LSS 8-23-78	
E	BY REV: ADD DETAIL A & SER, C669545-0107 (SR9437)	HHG 9-25-78	
F	BY REV: ADD RED(LB42) & BLK(LB43), RED (LB44), BLK(REF), WHT(REF); MER 210E0667 RED/WHT(LB32) WAS RED(LB32), S-1636-1 WAS SOLDER/LB16 & LB17, BLK(LB10) WAS LB10 (NOW SHOP PRACTICE)	PSM HHG 2-21-79	

WIRE CODE NO	GA	MATERIAL	LG	TERMINALS			SERIALS
BLK (LB43)	22	-22-0		SOLDER	S-1635-1		
RED (LB42)	22	-22-0		S-1635-1	SOLDER		
D-LB41	20			S-1829-1	S-1370-1	5	
D-LB40	22			S-1829-1	S-1367-1-8		SER(SR8783) THRU SER(SR9437)
D-LB8	22			S-1635-2	SOLDER		
D-LB5	22			S-1635-1	SOLDER		
D-LB4	22			S-1635-1	SOLDER		
D-LB3	18			S-1829-1	S-1635-1		
D-LB2	18			S-1829-1	S-1635-1		
D-LB1	18			S-1367-1-6	SEE D-LB8		
D LB 9	22			S-1370-1	S-1829-1		
BLK (LB10)				S-1370-1	S-1367-1-8		
D LB11				S-1636-1	S-1829-1		
D-LB12				S-1829-1	S-1636-1		
D-LB14				S-1829-1	S-1370-1		
D-LB15				S-1370-1	S-1367-1-8		
D-LB16				S-1636-1	S-1829-1	(OPT)	
D-LB17				S-1636-1	S-1367-1-8	(OPT)	
D-LB18				S-1829-1	S-1370-1		
D-LB19				S-1829-1	S-1370-1		
RED/WHT (LB32)		-22-2		S-1635-1	SOLDER		
RED (LB31)		-22-2		SOLDER	S-1370-1		
RED (LB44)		-22-2		S-1370-1	SEE LB9		
BLK (LB28)		-22-0		S-1370-1	S-1367-1-4		
BLK (LB29)	22	-22-0		SOLDER	SOLDER		
RED/BLUE (LB30)	22	-22-2-6		SOLDER	SOLDER		

WIRE TABLE

	PART NO.	DESCRIPTION	
27	C669545-0107	INST CLUSTER	
26	S-2431-1	SOCKET	5
25	MS25231-1819	LIGHT	5
24	C669545-0103	INST CLUSTER	
23	S-2091-7	DUAL POT ASSY	
22	S-1640-9	HOUSING	
21	S-1641-9	HOUSING	
20	1570301	DIMMING ASSY	
19	1829	LAMP	
18	S1360-5L	CIRCUIT BREAKER	
17	S-2000C201J	RESISTOR	
16	S1904-2	POT ASSY	
15	S1640-6	HOUSING	
14	S1641-6	HOUSING	
13	1570166	DIMMING ASSY	
12	MS15584-8	MINIATURE LAMP	
11	0513208	SOCKET	
10	S-2035-1	HOUSING	
9	S-2035-2	HOUSING	
8	C660501-0102	COMPASS ASSY	
7	S-1637-1	HOUSING	
6	S1637-2	HOUSING	
5	S1695-2	SWITCH	
4	34005-817	TERMINAL BLOCK	
3	S1899	LIGHT ASSY	
2	1270479	LIGHT ASSY	
	1213319	LIGHT ASSY	
ITEM NO.	PART NO.	DESCRIPTION	

EQUIPMENT TABLE

CES-1000 IS APPLICABLE VENDOR CODES PER S-1400 CES-XXXX=CESSNA SPEC. NO. S-XXX OR CMXXXX=CESSNA STD. NO.

SUPERSEDES: 0770610 P11.9.3.0 .1

SUPERSEDED BY:

CONTRACT NO:

	NAME	DATE
DESIGN	SPENCER	3-31-77
GROUP		4-6-77
DRAWN	HARVEY	3-7-77
CHECK	BORLESKE	3-9-77
STRESS		
PROJ	PLANBECK	4-12-77
APPD		
OTHER		

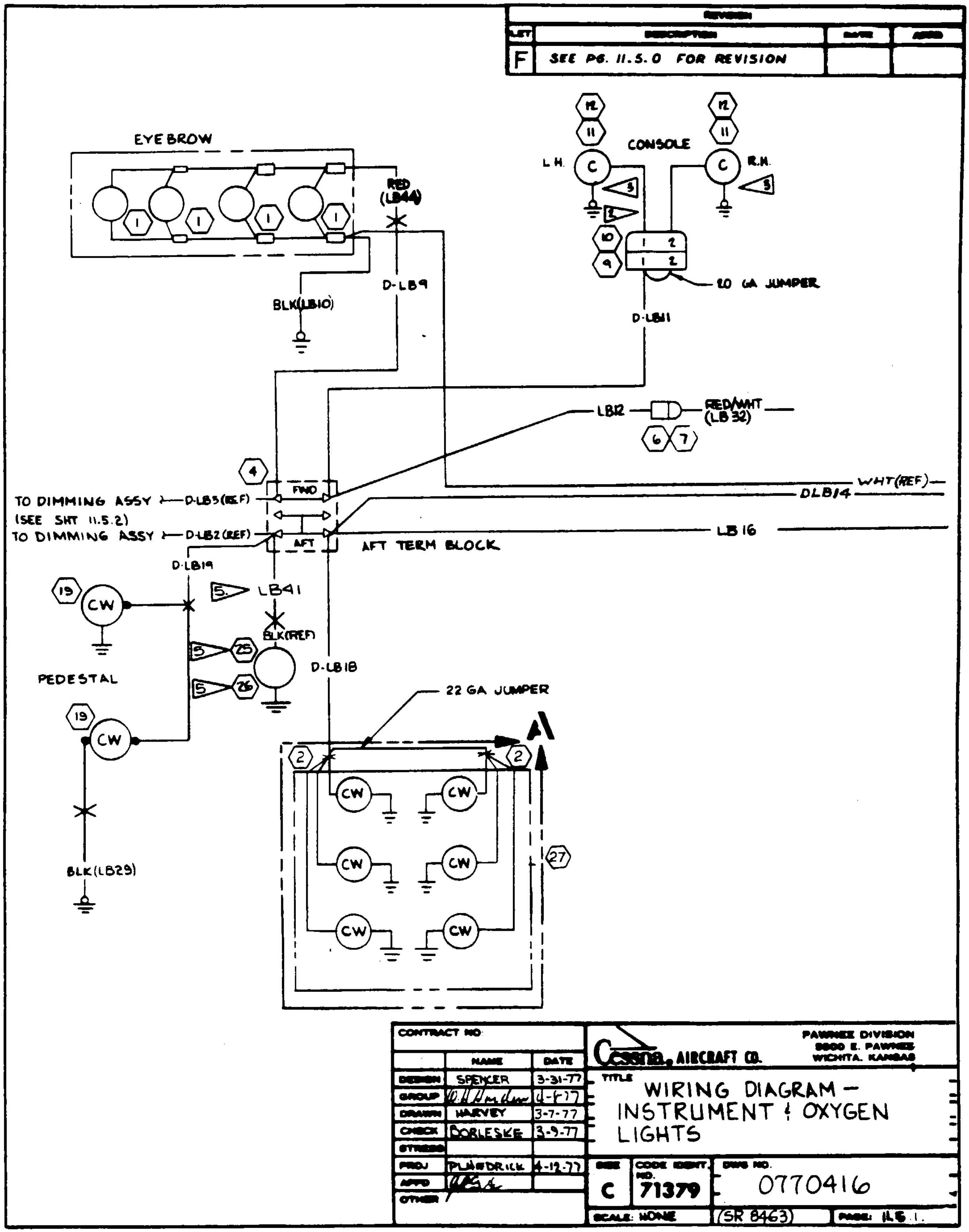
Cessna AIRCRAFT CO.

PAWNEE DIVISION 5800 E. PAWNEE WICHITA, KANSAS

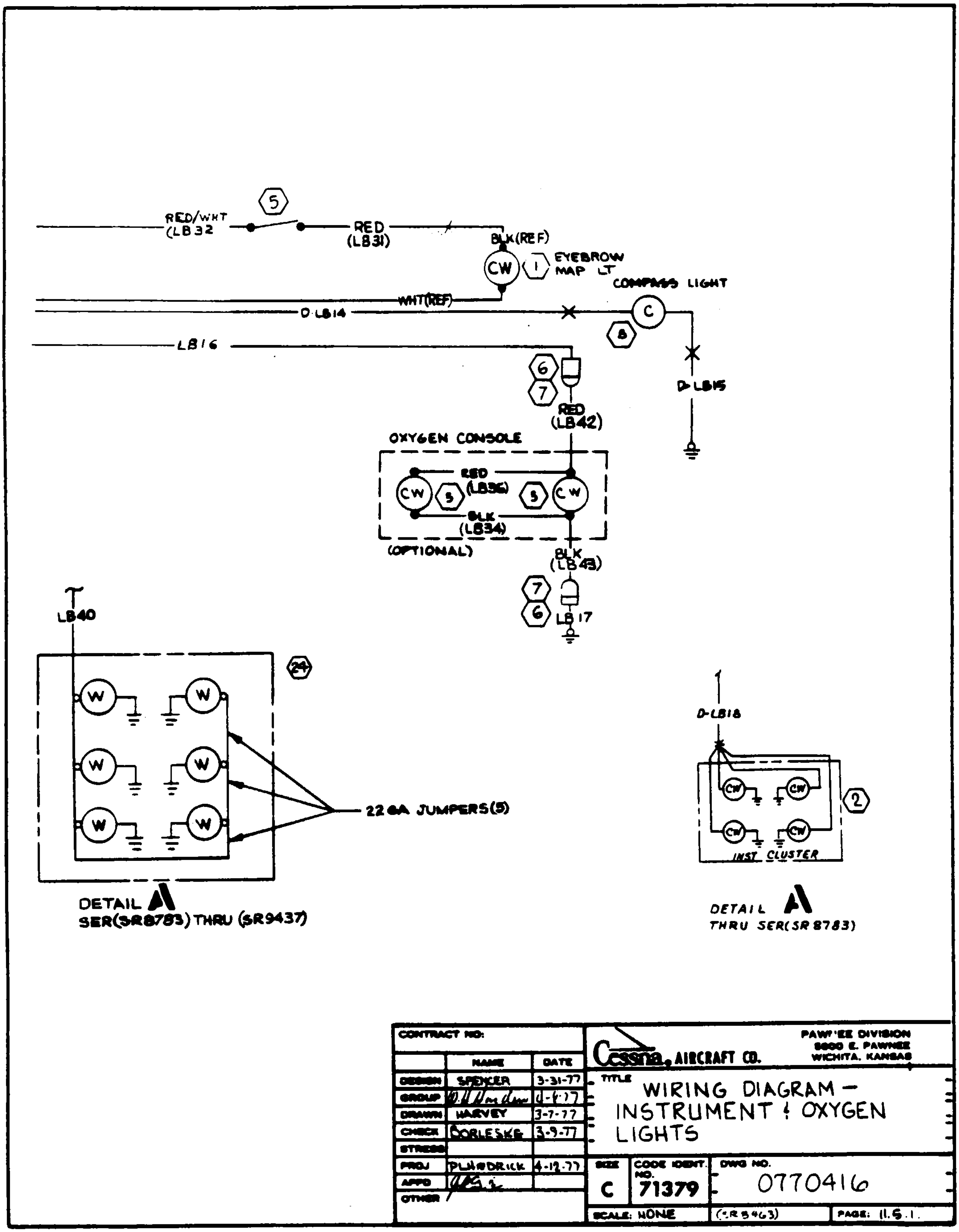
TITLE WIRING DIAGRAM — INSTRUMENT & OXYGEN LIGHTS

SIZE C CODE IDENT. NO. 71379 DWG NO 0770416

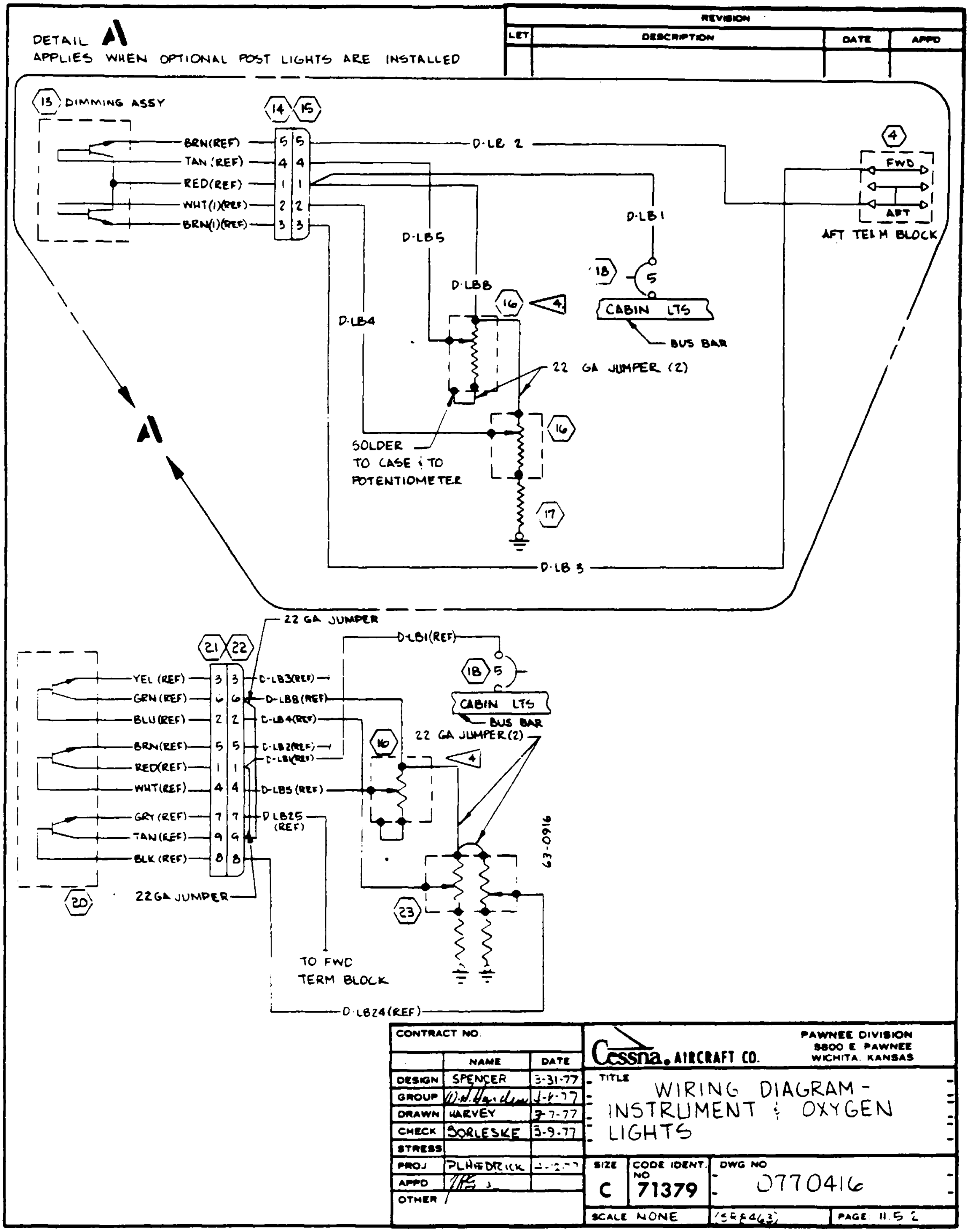
SCALE: NONE (SR8463) PAGE: 11.5.0



Instrument & Oxygen Lights (Sheet 1 of 2)

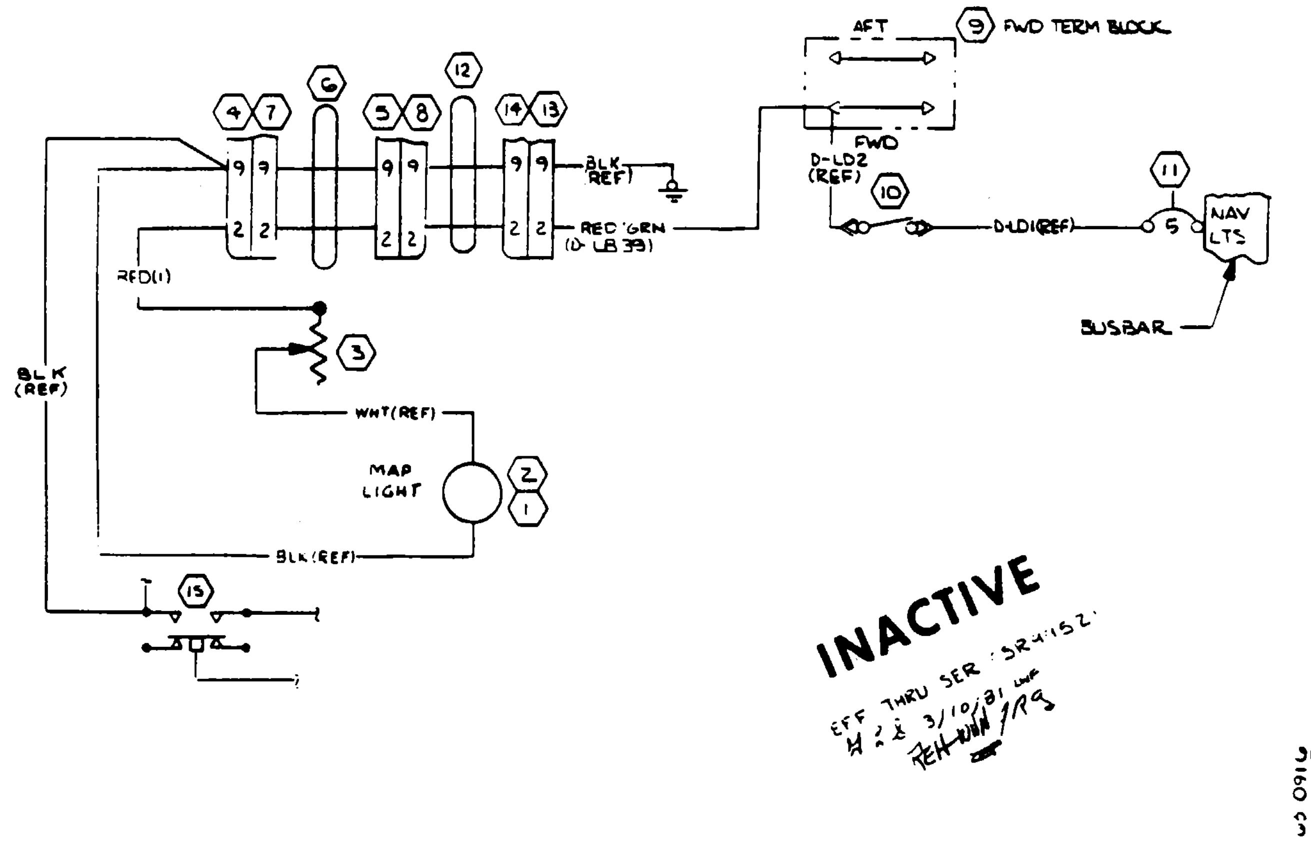


Instrument & Oxygen Lights (Sheet 2 of 2)


REVISION
LET
DESCRIPTION
DATE
APPD
DETAIL A
APPLIES WHEN OPTIONAL POST LIGHTS ARE INSTALLED
13 DIMMING ASSY
14 15
BRN(REF)
TAN (REF)
RED(REF)
WHT(1)(REF)
BRN(1)(REF)
D-LB 2
4
FWD
AFT
AFT TERM BLOCK
D-LB 1
D-LB5
D-LB8
18
5
CABIN LTS
BUS BAR
16
4
D-LB4
22 GA JUMPER (2)
SOLDER
TO CASE & TO
POTENTIOMETER
16
17
A
D-LB 3
22 GA JUMPER
21 22
D-LB1(REF)
YEL (REF)
GRN (REF)
BLU (REF)
BRN(REF)
RED(REF)
WHT(REF)
GRY (REF)
TAN (REF)
BLK (REF)
D-LB3(REF)
D-LB8(REF)
D-LB4(REF)
D-LB2(REF)
D-LB1(REF)
D-LB5 (REF)
D LB25
(REF)
18
5
CABIN LTS
BUS BAR
22 GA JUMPER(2)
16
4
63-0916
20
22GA JUMPER
23
TO FWD
TERM BLOCK
D-LB24(REF)
CONTRACT NO.
NAME
DATE
DESIGN SPENCER 3-31-77
GROUP
DRAWN HARVEY 7-7-77
CHECK SORLESKE 5-9-77
STRESS
PROJ PLHEDRICK
APPD
OTHER
Cessna. AIRCRAFT CO.
PAWNEE DIVISION
5800 E PAWNEE
WICHITA, KANSAS
TITLE
WIRING DIAGRAM -
INSTRUMENT & OXYGEN
LIGHTS
SIZE
C
CODE IDENT. NO
71379
DWG NO
0770416
SCALE NONE
PAGE

REVISION			
LET	DESCRIPTION	DATE	APPD
A	BY REV & ADD S-1985-1 BLK(REF) WAS BLK, WHT(REF) WAS RED(2) (SA 8463)(REF)	CRS 11-21-77	
B	BY REV: BLK(REF) WAS BLK (D-LB38) (NOW SHOP PRACTICE)(MER182-E0-0829)	DFS 3-5-80	

NOTES:
1. FOR INTERCONNECTION WITH ELECTRIC ELEVATOR TRIM SEE PAGE 14.2



RED/GRN (D-LB39)	22	-22-2-5		S-1963-2	S-1879-1	
RED(1)	22	8568-2		SOLDER	SOLDER	
WIRE CODE NO	GA	MATERIAL	LG	TERMINALS		SERIALS

WIRE TABLE

ITEM NO.	PART NO.	DESCRIPTION
15	S-1985-1	MIKE SWITCH
14	S-1961-1-0	HOUSING
13	S-1961-2-0	HOUSING
12	1570307	CABLE ASSY
11	S-1360-5L	CKT BREAKER
10	S-2160-1	SWITCH
9	34002-55	TERM BLOCK
8	1570307	CONNECTOR ASSY
7	3473-3000	SOCKET
6	1270844	CABLE ASSY
5	3421-0000	SOCKET
4	1270842	CONNECTOR ASSY
3	3859AK61-152A	RHEOSTAT
2	4157-001	SOCKET
1	24RB	LAMP

EQUIPMENT TABLE

CES-1000 IS APPLICABLE VENDOR CODES PER S-1400 CES-XXXX=CESSNA SPEC. NO. S-XXX OR CMXXXX=CESSNA STD. NO.

SUPERSEDES: 0770616 P11.11.4

SUPERSEDED BY: PAGE 11.10

CONTRACT NO:

	NAME	DATE
DESIGN	SPENCER	3-31-77
GROUP		4-4-77
DRAWN	HARVEY	3-7-77
CHECK	BORLESKE	3-9-77
STRESS		
PROJ	PLHRDRICK	4-12-77
APPD		
OTHER		

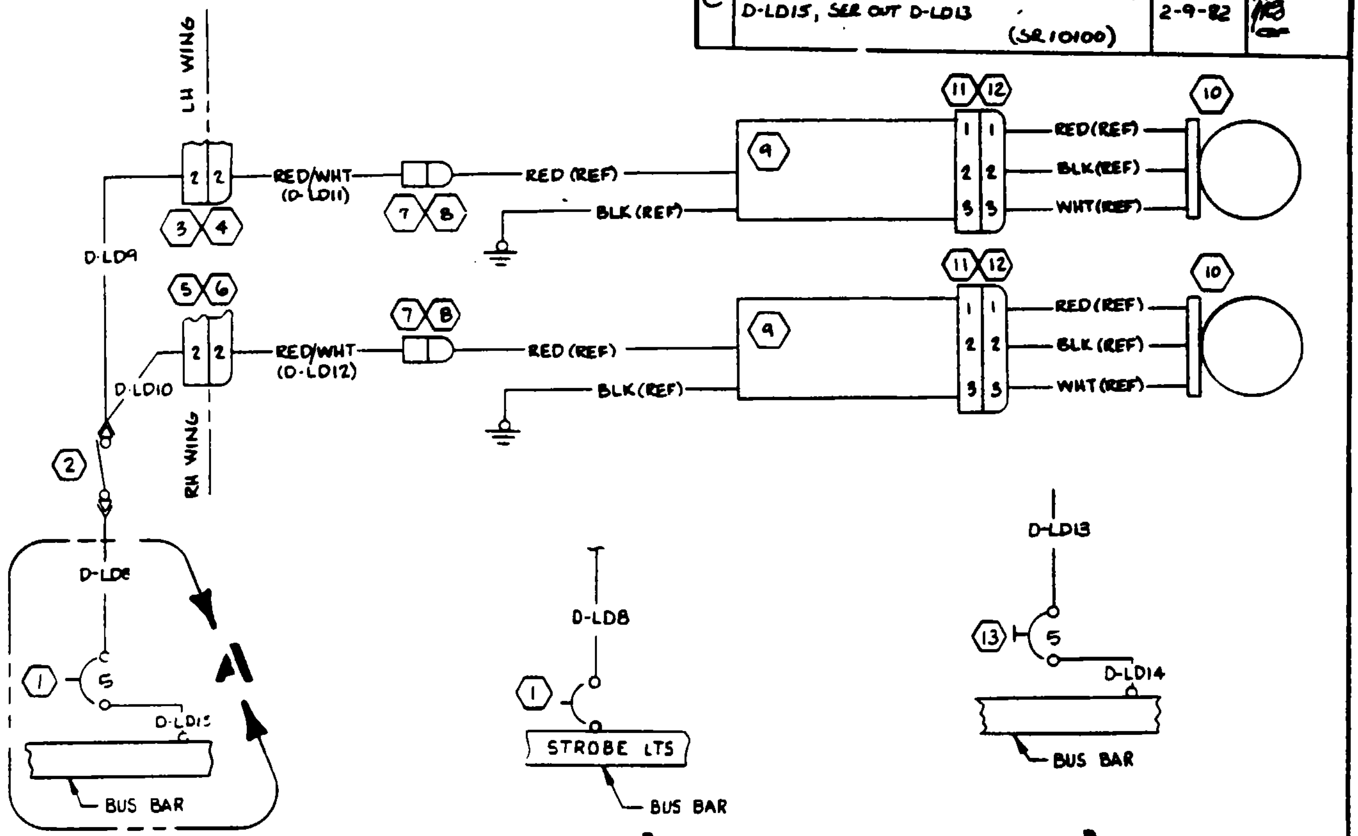
Cessna AIRCRAFT CO. COMMERCIAL AIRCRAFT DIV. 5800 E. PAWNEE WICHITA, KANSAS

TITLE: WIRING DIAGRAM — MAP LIGHT, CONTROL WHEEL (OPT)

SIZE: C | CODE IDENT. NO. 71379 | DWG NO 0770416

SCALE: NONE (SE8463) PAGE: 11.6

REVISION			
LET	DESCRIPTION	DATE	APPD
A	BY REV: C622006-0107 WAS -0101; C622008-0102 WAS C622007-0103 (SR8463)(REF)	DLP 6-2-78	
B	BY REV: ADD DETAIL A, S-1232-5, D-LD13, D-LD14 & SER (SR9633)	RAO 3-14-80	
C	BY REV: ADD DETAIL A; SER IN D-LD8, D-LD15, SER OUT D-LD13 (SR10100)	REK 2-9-82	



DETAIL A
THRU SER (SR9633)

DETAIL A
SER (SR9633) THRU SER (SR10100)

WIRE CODE NO	GA	MATERIAL	LG	TERMINALS			SERIALS
D-LD15	18			S-1367-1-8	S-1367-1-6		SER(SR10100) & ON
D-LD14	18			S-1367-1-8	S-1367-1-8		SER(SR9633) & ON
D-LD13	22			S-1367-1-8	S-1493-1		SER(SR9633) THRU SER(SR10100)
RED/WHT (D-LD12)	20	-20-2-9		S-1636-1	S-1635-1	STD	
RED/WHT (D-LD11)	20	-20-2-9		S-1636-1	S-1635-1		
D-LD10	22			S-1493-1	S-1636-1		
D-LD9	22			S-1493-1	S-1636-1	STD	
D-LD8	22			S-1367-1-6	S-1493-1		SER(SR10100) & ON

WIRE TABLE

ITEM NO	PART NO.	DESCRIPTION	
13	S-1232-5	CIRCUIT BREAKER	
12	S-1638-2	HOUSING	
11	S-1638-1	HOUSING	
10	C622006-0107	LAMP ASSY	
9	C622008-0102	POWER SUPPLY	
8	S-1637-1	HOUSING	
7	S-1637-2	HOUSING	
6	S-1640-9	HOUSING	
5	S-1641-9	HOUSING	
4	S-1640-6	HOUSING	
3	S-1641-6	HOUSING	
2	S-2160-1	SWITCH	
1	S-1360-5L	CIRCUIT BREAKER	

EQUIPMENT TABLE

CES-1000 IS APPLICABLE
VENDOR CODES PER S-1400
CES-XXXX=CESSNA SPEC. NO.
S-XXX OR CMXXXX=CESSNA STD. NO.

SUPERSEDES: 0770610 P 11 13

SUPERSEDED BY:

CONTRACT NO:

	NAME	DATE
DESIGN	SPENCER	3-31-77
GROUP		4-4-77
DRAWN	HARVEY	3-7-77
CHECK	BORLESKE	3-9-77
STRESS		
PROJ	P L HEDRICK	4-11-77
APPD		
OTHER		

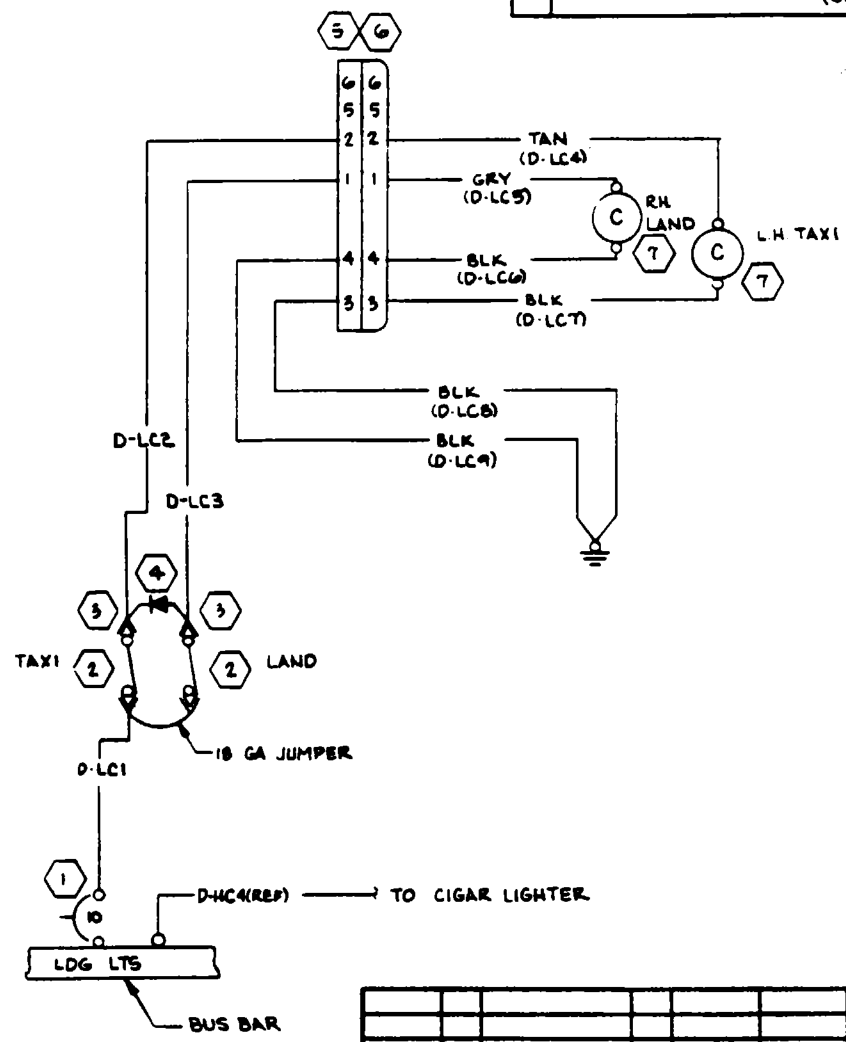
Cessna. AIRCRAFT CO.
PAWNEE DIVISION
5800 E. PAWNEE
WICHITA, KANSAS

TITLE
WIRING DIAGRAM — WING TIP STROBE LIGHTS (OPT)

SIZE	CODE IDENT. NO.	DWG NO
C	71379	0770416

SCALE: NONE (SRB463) PAGE: 11.7

REVISION			
LET	DESCRIPTION	DATE	APPD
A	BY REV: HC4(REF) AT BUS BAR WAS HC1 (REF) TO LDG LTS CIRCUIT BREAKER AT BUS BAR (SR9633)	RAO 3-14-80	



35-0916

WIRE CODE NO	GA	MATERIAL	LG	TERMINALS			SERIALS
BLK (D-LC9)	18	-18-0		S-1636-1	S-1367-1-12		
BLK (D-LC8)	|	-18-0		S-1636-1	S-1367-1-12		
BLK (D-LC7)		-18-0		S-1635-1	S-1367-1-8		
BLK (D-LC6)		-18-0		↕	↕		
GRY (D-LC5)		-18-8					
TAN (D-LC4)		-18-10		S-1635-1	S-1367-1-8		
D-LC3				S-1493-1	S-1636-1		
D-LC2	|			S-1493-1	S-1636-1		
D-LC1	18			S-1493-1	S-1367-1-6		

WIRE TABLE

ITEM NO.	PART NO.	DESCRIPTION	
7	4591	LIGHT	
6	S-1640-6	HOUSING	
5	S-1641-6	HOUSING	
4	12T0082	DIODE ASSY	
3	S-2023-1	TERM ADAPTOR	
2	S-2160-1	SWITCH	
1	S-1360-10L	CIRCUIT BREAKER	

EQUIPMENT TABLE

CES-1000 IS APPLICABLE VENDOR CODES PER S-1400 CES-XXXX=CESSNA SPEC. NO. S-XXX OR CMXXXX=CESSNA STD. NO.

SUPERSEDES: 0770610 P 11.14

SUPERSEDED BY:

CONTRACT NO:

	NAME	DATE
DESIGN	SPENCER	3-31-77
GROUP		4-4-77
DRAWN	HARVEY	3-7-77
CHECK	BORLESKE	3-9-77
STRESS		
PROJ	PLHBORKK	4-12-77
APPD		
OTHER		

Cessna AIRCRAFT CO. PAWNEE DIVISION 5800 E. PAWNEE WICHITA, KANSAS

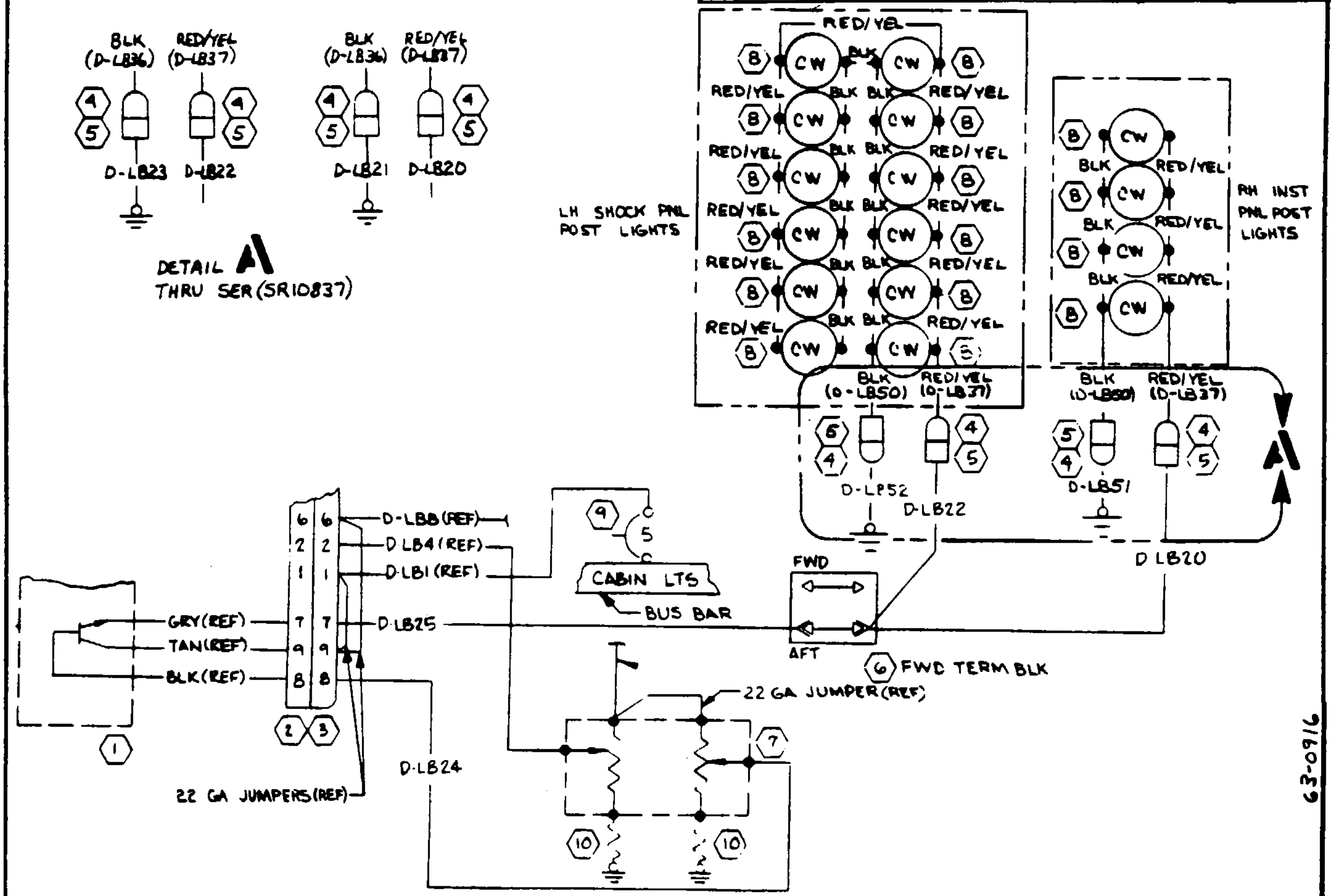
TITLE WIRING DIAGRAM — LANDING LIGHTS

SIZE	CODE IDENT. NO.	DWG NO
C	71379	0770416

SCALE: NONE (SR9633) PAGE: 11.8

LET	DESCRIPTION	DATE	APPD
B	BY REV: ADD DETAIL A; SER IN LB49 LB50/LB51; SER OUT LB21, LB23, LB36 (SR10837)	RCT 9-14-84	
C	BY REV: D-LB52 WAS D-LB49 (SR10837)	KWL 12-14-84	

REVISION			
LET	DESCRIPTION	DATE	APPD
A	BY REV: S-2000C201J WAS S-2000B271J (SR8968) S-2091-7 WAS -3 (SR8463)(REF)	CRS 10-3-77	



LB51	22			S-1635-1	S-1367-1-8		SER (SR10837) & ON
BLK (LB50)	22	-22-0		S-1636-1	SOLDER		SER (SR10837) & ON
D-LB52	22			S-1635-1	S-1637-1-8		SER (SR10837) & ON
BLK	22	-22-0		SOLDER	SOLDER		
RED/YEL	22	-22-2-4		SOLDER	SOLDER		
RED/YEL (LB37)	22	-22-2-4		S-1635-1	SOLDER		
BLK (LB36)	22	-22-0		S-1635-1	SOLDER		THRU SER (SR10837)
D-LB20	22			S-1829-1	S-1636-1		
D-LB21				S-1636-1	S-1367-1-8		THRU SER (SR10837)
D LB22				S-1829-1	S-1636-1		
D-LB23				S-1636-1	S-1367-1-8		THRU SER (SR10837)
D-LB24				S-1635-1	SOLDER		
D-LB25	22			S-1635-1	S-1829-1		
WIRE CODE NO	GA	MATERIAL	LG	TERMINALS			SERIALS

WIRE TABLE

ITEM NO	PART NO.	DESCRIPTION	
10	S-2000C201J	RESISTOR	
9	S-1360-5L	CIRCUIT BREAKER	
8	1513837	LIGHT ASSY	
7	S 2091-7	DUAL POT ASSY	
6	34002-55	TERMINAL BLOCK	
5	S 1637-2	HOUSING	
4	S 1637-1	HOUSING	
3	S-1640-4	HOUSING	
2	S 1641-4	HOUSING	
1	1570301	DIMMING ASSY	

EQUIPMENT TABLE

CES-1000 IS APPLICABLE
VENDOR CODES PER S-1400
CES-XXXX=CESSNA SPEC. NO.
S-XXX OR CMXXXX=CESSNA STD. NO.

SUPERSEDES: 0770616 = 9.6

SUPERSEDED BY:

CONTRACT NO:

	NAME	DATE
DESIGN	SPENCER	3-31-77
GROUP		4-8-77
DRAWN	HARVEY	3-7-77
CHECK	BORLESKE	3-9-77
STRESS		
PROJ		4-12-77
APPD		
OTHER		

Cessna AIRCRAFT CO. PAWNEE DIVISION 5800 E. PAWNEE WICHITA, KANSAS

TITLE WIRING DIAGRAM — POST LIGHTS (OPT)

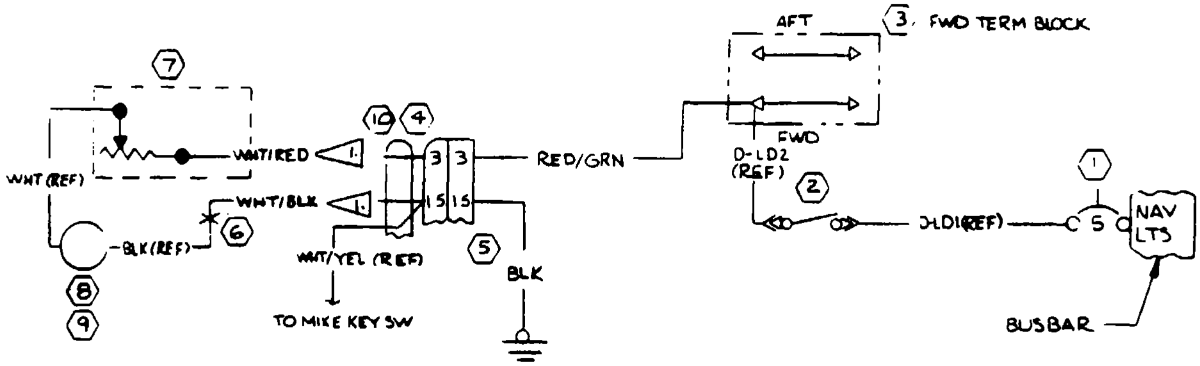
SIZE	CODE IDENT. NO.	DWG NO
C	71379	0770416

SCALE: NONE | PAGE: 119

NOTES:

1. MATERIAL IS RCFS130B COIL CORD VENDOR CODE (C36906)

REVISION			
LET	DESCRIPTION	DATE	APPD
A	BY REV: WHT/BLK WAS WHT/YEL (NOW SHOP PRACTICE)	REK 3-8-82	REK MDP



INACTIVE EFF THRU SER (SR10713) TMS 9-8-83 REH

WIRE CODE NO	GA	MATERIAL	LG	TERMINALS		SERIALS
BLK	22	-22-0		S-1963-2	S-1367-1-8	
WHT/BLK	24	1		S-1370-1	S-1963-3	
WHT/RED	24	1		S-1963-3	SOLDER	
RED/GRN	22	-22-2-5		S-1829-1	S-1963-2	

WIRE TABLE

ITEM NO.	PART NO.	DESCRIPTION
10	2270030	CABLE ASSY
9	24RB	LAMP
8	4157-001	SOCKET
7	3859A161-152A	RHEOSTAT
6	S-1370-1	SPLICE
5	S-1962-2-0	HOUSING
4	S-1962-1-0	HOUSING
3	34002-55	TERMINAL BLOCK
2	S-2160-1	SWITCH
1	S-1360-5L	CIRCUIT BREAKER

EQUIPMENT TABLE

CES-1000 IS APPLICABLE VENDOR CODES PER S-1400 CES-XXXX-CESSNA SPEC. NO. S-XXX OR CMXXXX-CESSNA STD. NO.

SUPERSEDES: PAGE 11 6

SUPERSEDED BY:

CONTRACT NO:

	NAME	DATE
DESIGN	G. STAMM	3/10/81
GROUP		3-24-81
DRAWN	G. STAMM	3/10/81
CHECK		3-11-81
STRESS		
PROJ		4-20-81
APPD		
OTHER		

Cessna AIRCRAFT CO. PAWNEE DIVISION 5800 E. PAWNEE WICHITA, KANSAS

TITLE: WIRING DIAGRAM — MAP LIGHT, CONTROL WHEEL (OPT)

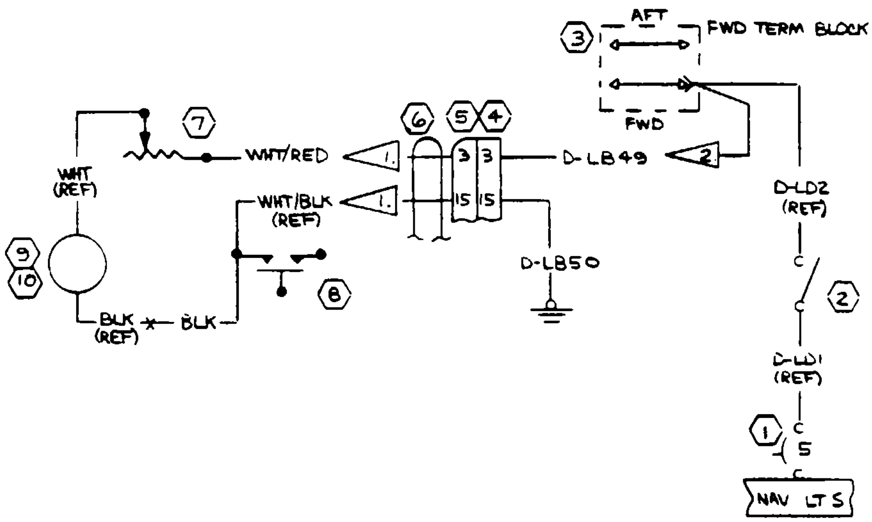
SIZE	CODE IDENT. NO.	DWG NO
C	71379	0770416

SCALE: NONE (SR9952) PAGE: 11.10

NOTES:

1. MATERIAL IS RCF5130B COIL CORD, VENDOR CODE (096906)
2. NOT REQUIRED WHEN INSTALLED WITH OPT ELECTRIC TRIM. REFER TO PG. 14.5.0

REVISION			
LET	DESCRIPTION	DATE	APPD



ITEM NO	PART NO.	DESCRIPTION	
10	4157-001	SOCKET	
9	24RB	LAMP	
8	S-1955-1	MIKE SWITCH	
7	39594161-152A	RHEOSTAT	
6	2270030	CABLE ASSY	
5	S-2350-3	HOUSING	
4	S-2349-1	HOUSING	
3	34002-35	TERMINAL BLOCK	
2	S-2160-1	SWITCH	
1	S-1360-5L	CIRCUIT BREAKER	

EQUIPMENT TABLE

WIRE CODE NO	GA	MATERIAL	LG	TERMINALS			SERIALS
D-LB50	22			S-2099-9	S-1367-1-8		
D-LB49	22			S-2099-9	S-1829-1		
BLK	22			S-1370-1	SOLDER		
WHT/RED	24	1.		SOLDER	S-2353-2		

WIRE TABLE

CES-1000 IS APPLICABLE
VENDOR CODES PER S-1400
CES-XXXX=CESSNA SPEC. NO.
S-XXX OR CMXXXX=CESSNA STD. NO.

SUPERSEDES: PG. 11.10

SUPERSEDED BY:

CONTRACT NO:

	NAME	DATE
DESIGN	SPENCER	9-8-83
GROUP	[illegible]	9-22-83
DRAWN	SPENCER	9-8-83
CHECK	RE HALE	9-12-83
STRESS		
PROJ	[illegible]	10-3-83
APPD	[illegible]	
OTHER		

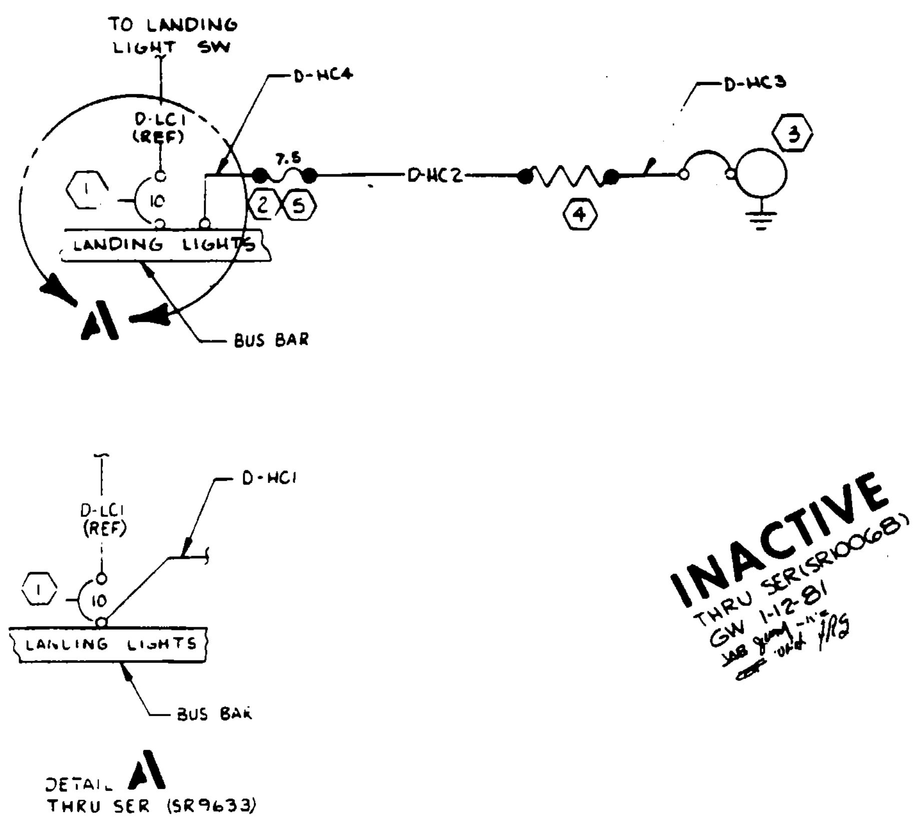
Cessna AIRCRAFT CO.
PAWNEE DIVISION
5800 E. PAWNEE
WICHITA, KANSAS

TITLE
WIRING DIAGRAM — MAP LIGHT - CONTROL WHEEL (OPT)

SIZE	CODE IDENT. NO.	DWG NO
C	71379	0770416

SCALE NONE (SR 0713) PAGE: 11.11

REVISION			
LET	DESCRIPTION	DATE	APPD
A	BY REV: S-2374-7.5 WAS HHH-A, S-2375-7.5 WAS SFE-7.5 (S-1000 CHG) ADD 6 MAX./HC1	CS 10-4-79	
B	BY REV: ADD DETAIL "A" & SER (SR9633)	RAO 3-14-80	LWF



D-HC4	18		6 MAX	S-1367-1-10	SOLDER	SER (SR9633) & ON
D-HC3	18			SOLDER	S-1367-1-8	
D-HC2	18			SOLDER	SOLDER	
D-HC1	18		6 MAX	S-1367-1-6	SOLDER	THRU SER (SR9633)
WIRE CODE NO	GA	MATERIAL	LG	TERMINALS		SERIALS

WIRE TABLE

ITEM NO	PART NO.	DESCRIPTION	
5	S-2374-7.5	FUSEHOLDER	
4	S-2041-50-16	RESISTOR	
3	0513052	CIGAR LIGHTER ASSY	
2	S-2375-7.5	FUSE	
1	S-1360-10L	CIRCUIT BREAKER	

EQUIPMENT TABLE

CES-1000 IS APPLICABLE
VENDOR CODES PER S-1400
CES-XXXX=CESSNA SPEC. NO.
S-XXX OR CMXXXX=CESSNA STD. NO.

SUPERSEDES: 0770610 P 131

SUPERSEDED BY:

CONTRACT NO:

	NAME	DATE
DESIGN	SPENCER	3-31-77
GROUP	D H Harvey	4-4-77
DRAWN	HARVEY	3-7-77
CHECK	BORLESKE	3-9-77
STRESS		
PROJ	PLHEDRICK	4-12-77
APPD		
OTHER		

Cessna AIRCRAFT CO. PAWNEE DIVISION 5800 E PAWNEE WICHITA KANSAS

TITLE: WIRING DIAGRAM — CIGAR LIGHTER

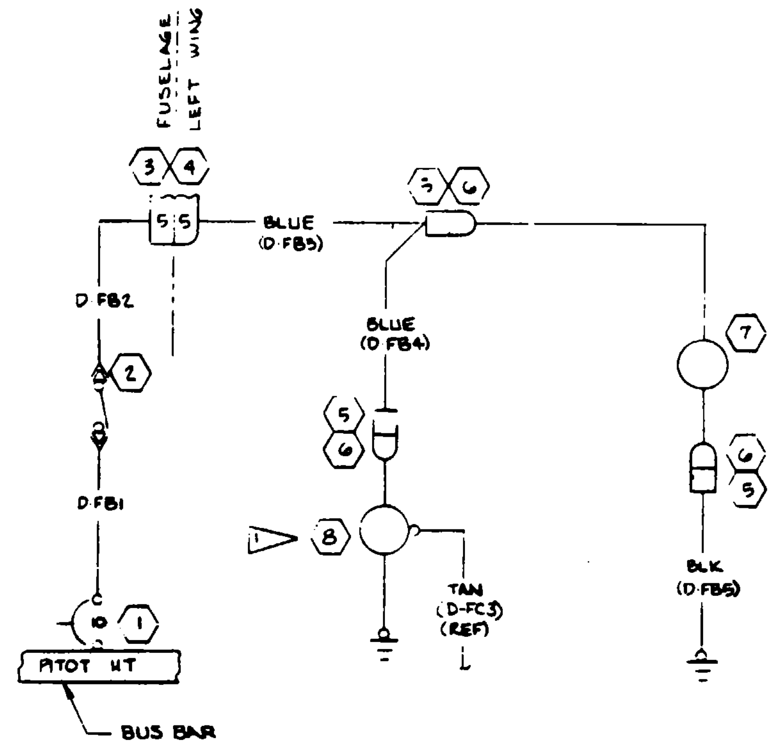
SIZE: C | CODE IDENT. NO. 71379 | DWG NO 0770416

SCALE: NONE | (SR6463) | PAGE: 13 1

REVISION			
LET	DESCRIPTION	DATE	APPD

NOTES

1. ONLY HEATER CIRCUIT SHOWN FOR STALL WARNING CIRCUIT SEE PAGE 15.1



63-0916

WIRE CODE NO	GA	MATERIAL	LG	TERMINALS			SERIALS
BLK (D-FB5)	18	-18-0		S1636-1	S1367-1-8		
BLU (D-FB4)	↑	-18-6		SEE FB3	S1636-1	(STD)	
BLU (D-FB3)	↕	-18-6		S1635-1	S1636 2	(STD)	
D-FB2	↓			S-1493 1	S1636 1		
D-FB1	18			S1367-1-6	S-1493-1		

WIRE TABLE

ITEM NO.	PART NO.	DESCRIPTION	
8	C511062	XMTR STALL WARN, HTD	
7	0721105	PITOT TUBE, HTD	
6	S 1637-1	HOUSING	
5	S-1637-2	HOUSING	
4	S1640-6	HOUSING	
3	S-1641 6	HOUSING	
2	S-2160-1	SWITCH	
1	S-1360-10L	CIRCUIT BREAKER	

EQUIPMENT TABLE

CES-1000 IS APPLICABLE
VENDOR CODES PER S-1400
CES-XXXX-CESSNA SPEC. NO.
S-XXX OR CMXXXX-CESSNA STD. NO.

SUPERSEDES: 0770610 P 15.3

SUPERSEDED BY:

CONTRACT NO:

	NAME	DATE
DESIGN	SPENCER	3-31-77
GROUP	D.H. Vanden	4-4-77
DRAWN	HARVEY	3-7-77
CHECK	BORLESKE	3-9-77
STRESS		
PROJ	PL HIRDRICK	4-12-77
APPD	[illegible]	
OTHER		

Cessna AIRCRAFT CO.
PAWNEE DIVISION
5800 E. PAWNEE
WICHITA, KANSAS

TITLE
WIRING DIAGRAM —
HEATED PITOT TUBE &
HEATED STALL WARNING (OPT)

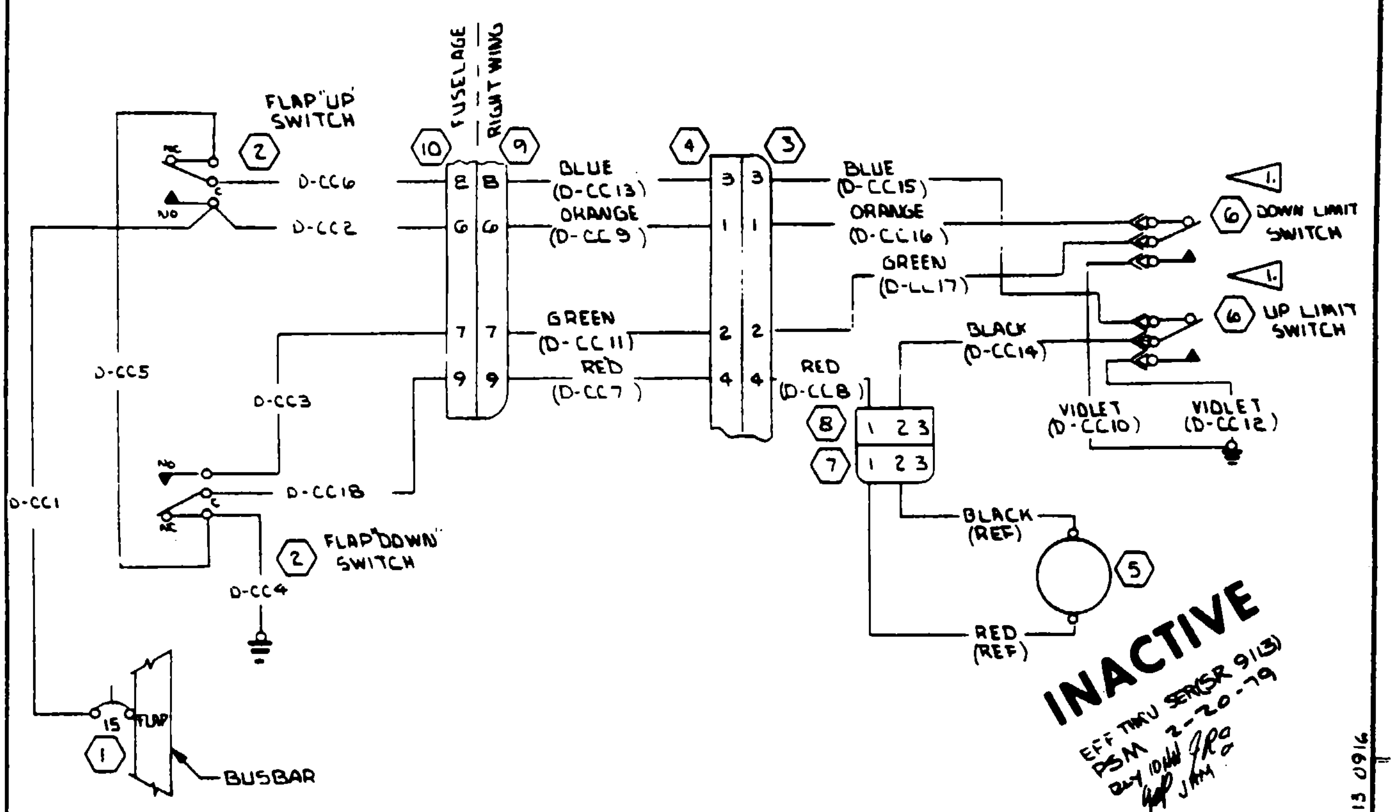
SIZE	CODE IDENT. NO.	DWG NO
C	71379	0770416

SCALE: NONE (SRB463) PAGE: 15.2

NOTES:

1. THESE SWITCHES PART OF C301002-0102 ACTUATOR ASSY

REVISION			
LET	DESCRIPTION	DATE	APPD



WIRE CODE NO	GA	MATERIAL	LG	TERMINALS			SERIALS
D-CC16	16		62	S-1367-2-4	S-1636-2		
GREEN (D-CC17)	16	16-5	13	S-1493-2	S-1635-2		
ORANGE (D-CC16)	16	16-3	13	S-1493-2	S-1635-2		
BLUE (D-CC15)	16	16-7	13	S-1493-2	S-1635-2		
BLACK (D-CC14)	16	16-0	13	S-1636-2	S-1493-2		
BLUE (D-CC13)	16	16-6	105	S-1635-2	S-1636-2		
VIOLET (D-CC12)	16	16-7	19	S-1493-2	S-1367-2-8		
GREEN (D-CC11)	16	16-5	105	S-1635-2	S-1636-2		
VIOLET (D-CC10)	16	16-7	19	S-1493-2	S-1367-2-8		
ORANGE (D-CC9)	16	16-3	105	S-1635-2	S-1636-2		
RED (D-CC8)	16	16-2	13	S-1635-2	S-1636-2		
RED (D-CC7)	16	16-2	105	S-1636-2	S-1635-2		
D-CC6	16		102	S-1367-2-4	S-1636-2		
D-CC5	16		6	S-1367-2-4	S-1367-2-4		
D-CC4	16		10	S-1367-2-4	S-1367-2-8		
D-CC3	16		62	S-1636-2	S-1367-2-4		
D-CC2	16		62	S-1367-2-4	S-1636-2		
D-CC1	16		36	S-1367-2-6	S-1367-2-4		

WIRE TABLE

ITEM NO	PART NO	DESCRIPTION	
10	S-1641-9	HOUSING-SOCKET	
9	S-1640-9	HOUSING - PIN	
8	S-1638-1	HOUSING - PLUG	
7	S-1638-2	HOUSING - CAP	
6	V3-1-D9	SWITCH	
5	C301002-0102	ACTUATOR ASSY	
4	S-1641-6	HOUSING - PLUG	
3	S-1640-6	HOUSING - PIN	
2	S-1906-1	SWITCH	
1	S-1360-15L	CIRCUIT BREAKER	

EQUIPMENT TABLE

CES-1000 IS APPLICABLE VENDOR CODES PER S-1400 CES-XXXX=CESSNA SPEC. NO S-XXX OR CMXXXX=CESSNA STD. NO.

SUPERSEDES: 0770416 F 1443

SUPERSEDED BY:

CONTRACT NO:

	NAME	DATE
DESIGN	SPENCER	3-31-77
GROUP	W. Hadden	4-6-77
DRAWN	HARVEY	3-7-77
CHECK	BORLESKE	3-3-77
STRESS		
PROJ	P. HENDRICK	4-12-77
APPD	JRS	
OTHER		

Cessna AIRCRAFT CO. COMMERCIAL AIRCRAFT DIV. 5800 E. PAWNEE WICHITA, KANSAS

TITLE: WIRING DIAGRAM — WING FLAPS

SIZE	CODE IDENT. NO.	DWG NO
C	71379	0770416

SCALE: NONE (SE 6463) PAGE: 14.1

NOTES:

1. WHEN MIKE KEY IS REQD WITH ELECTRIC TRIM REFER TO 3920199 FOR WIRING OF ELECTRIC TRIM SWITCHES IN CONTROL WHEEL

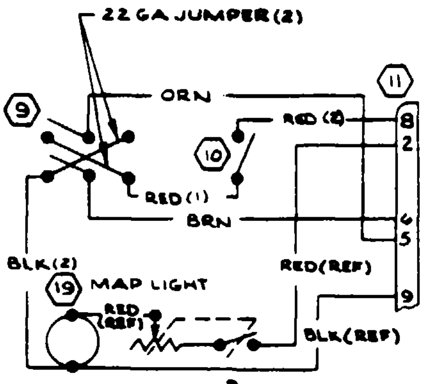
2. INSTALL S-1071-1 TUBING OVER CD17 & CD18 WIRE BEFORE INSTALLING TERMINALS

3. C611003-0101 TRIM REGULATOR WITH MOD "A" OR LATER WILL BE REQD AT SER (SR9369) & ON & ALL SPARES. MOD DESIGNATION WILL BE A SUFFIX TO THE VENDOR PART NUMBER

4. MATERIAL IS RCF51308 COIL CORD VENDOR CODE 096906

REVISION			
LET	DESCRIPTION	DATE	APPD
A	BY REV: S-1963-2 WAS S-1636-1/CD16; S-1367-1-6 WAS S-1367-1-8/CD14 & CD13; SER OUT CD13; SER IN CD17; ADD NOTE 2 & DETAIL "B" (NOW SHOP PRACTICE) (SR9193) ADD NOTE 3 & PG 14.2.1 (SR9369)	2LY CMK 7-13-78	
B	BY REV: SER OUT CD17, CD14 & S-1360-5L SER IN CD18, CD19 & S-1232-5 (SR9633)	2AO 3-14-80	
C	BY REV: BLK (REF) WAS BLK (D-CD8) (NOW SHOP PRACTICE) (MER 182-EO 0829)	JFS 8-5-80	
D	BY REV: ADD NOTE 4, DETAIL C & B, EQUIPMENT ITEMS 21 THRU 28, RCF51308 COIL CORD; SERIAL OUT BLK (1), RED (2) ORN, BRN (SR9952)	GLS 3/10/81	
E	BY REV: PIN 2 WAS PIN 8 / S-1962-1-0 & S-1962-2-0 (SR9952)	GLS 7/8/81	

0770416



DETAIL A
(REQUIRED WITH MAP LIGHT)

INACTIVE

THRU SER (SR10100)
REK 3-8-82

WIRE CODE NO	GA	MATERIAL	LG	TERMINALS			SERIALS
WHT/BLK	24	4		SOLDER	S-1963-3		SER (SR9952) & ON
ORN							SER (SR9952) & ON
WHT/ORN							SER (SR9952) & ON
RED	24	4		SOLDER	S-1963-3		SER (SR9952) & ON
CD19	20			S-1367-1-8	S-1636-1		SER (SR9633) & ON
CD18	14			S-1367-2-8	S-1367-2-10		SER (SR9633) & ON
BRN	22	8568-1		SOLDER	SOLDER		THRU SER (SR9952)
ORN (1)	22	8568-3		SOLDER	SOLDER		THRU SER (SR9952)
CD17	14			S-1367-2-6	S-1367-2-6	SER (SR9193)	THRU SER (SR9633)
RED (2)	22	8568-2		SOLDER	SOLDER		THRU SER (SR9952)
RED (1)		8568-2		SOLDER	SOLDER		
BLK (2)		8568-10		SOLDER	SOLDER		
BLK (1)		8568-10		SOLDER	SOLDER		THRU SER (SR9952)
BLK (D-CD10)		-22-0		S1370-1	S1367-1-8		
YEL (D-CD9)		-22-4		S1636-1	S1636-1		
BLK (D-CD8)		-22-0		S1636-1	S1367-1-8		
WHT (D-CD12)		-22-6		S1636-1	SEE CD4		
GRN (D-CD11)		-22-5		S1636-1	SEE CD7		
[illegible] (D-CD5)		-22-6		S1635-1	S1636-2		
GRN (D-CD7)		-22.5		S1635-1	S1636-2		
ORN (D-CD6)	22	-22-3		S1635-1	S1636-1		
[illegible] (D-CD3)	20	-20-2		S1635-1	S1636-1		
D-CD16	20			S1636-1	S-1963-2		
D-CD2	20			S-1963-2	S1636-1		
D-CD1	20			S-1963-2	S1636-1		
D-CD15	20			S1635-1	S1636-1		
D-CD14	20			S1367-1-6	S1636-1		THRU SER (SR9633)
D-CD13	20			S1367-1-6	S1367-1-6		THRU SER (SR9193)

WIRE TABLE

	PART NO.	DESCRIPTION	
28	S-1370-1	SPLICE	
27	3859A161-152A	RHEOSTAT	
26	24RB	LAMP	
25	S-1985-1	SWITCH-MIKE KEY	
24	S-1232-2	CIRCUIT BREAKER	
23	2270030	CABLE ASSY	
22	S-1962-2-0	HOUSING	
21	S-1962-1-0	HOUSING	
20	S-1232-5	CIRCUIT BREAKER	
19	1260243	MAP LIGHT INSTL	
18	S-1961-2-0	HOUSING	
17	S-1961-1-0	HOUSING	
16	1570307	CABLE	
15	1570307	CONNECTOR ASSY	
14	3421-0000	CONNECTOR SOCKET	
13	1270844	CABLE	
12	3473-3000	CONNECTOR SOCKET	
11	1270842	CONNECTOR ASSY	
10	7101-P1	SWITCH	
9	S-2030-1	SWITCH	
8	S-1360-5L	CIRCUIT BREAKER	
7	C610502-0101	GEAR MOTOR	
6	S1637-1	HOUSING	
5	S1637-2	HOUSING	
4	TC520B	CLUTCH	
3	S1640-6	HOUSING	
2	S1641-6	HOUSING	
1	C611003-0101	TRIM REGULATOR	3

EQUIPMENT TABLE

CES-1000 IS APPLICABLE VENDOR CODES PER S-1400 CES-XXXX=CESSNA SPEC. NO. S-XXX OR CMXXXX=CESSNA STD. NO.

SUPERSEDES: 0770610 P 14.4.0 & 14.1

SUPERSEDED BY: 26 14.4.0 & 14.4.1

CONTRACT NO:

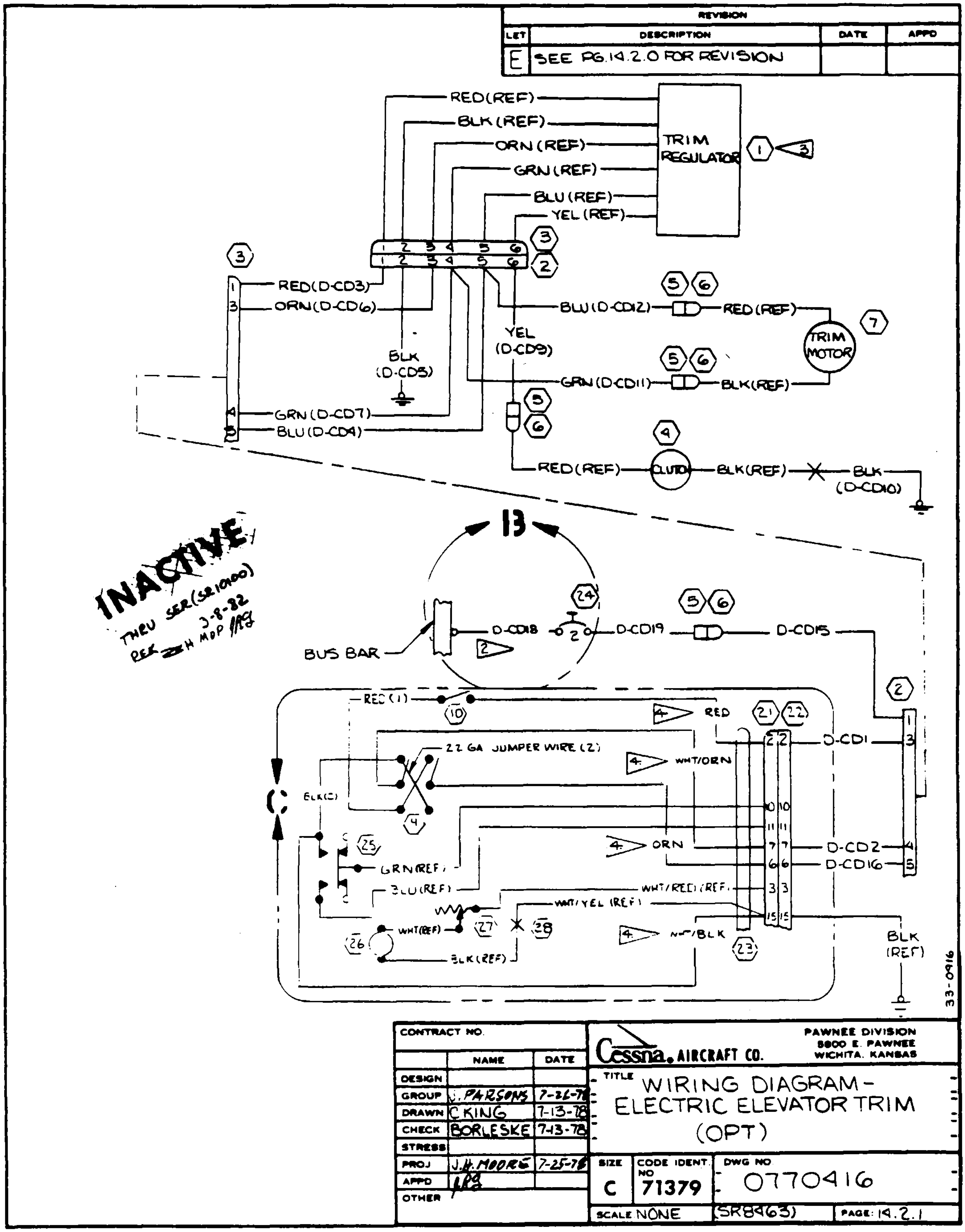
	NAME	DATE
DESIGN	SPENCER	3-31-77
GROUP		4-8-77
DRAWN	HARVEY	3-7-77
CHECK	BORLESKE	3-9-77
STRESS		
PROJ		4-12-77
APPD		
OTHER		

Cessna AIRCRAFT CO. PAWNEE DIVISION 5800 E. PAWNEE WICHITA, KANSAS

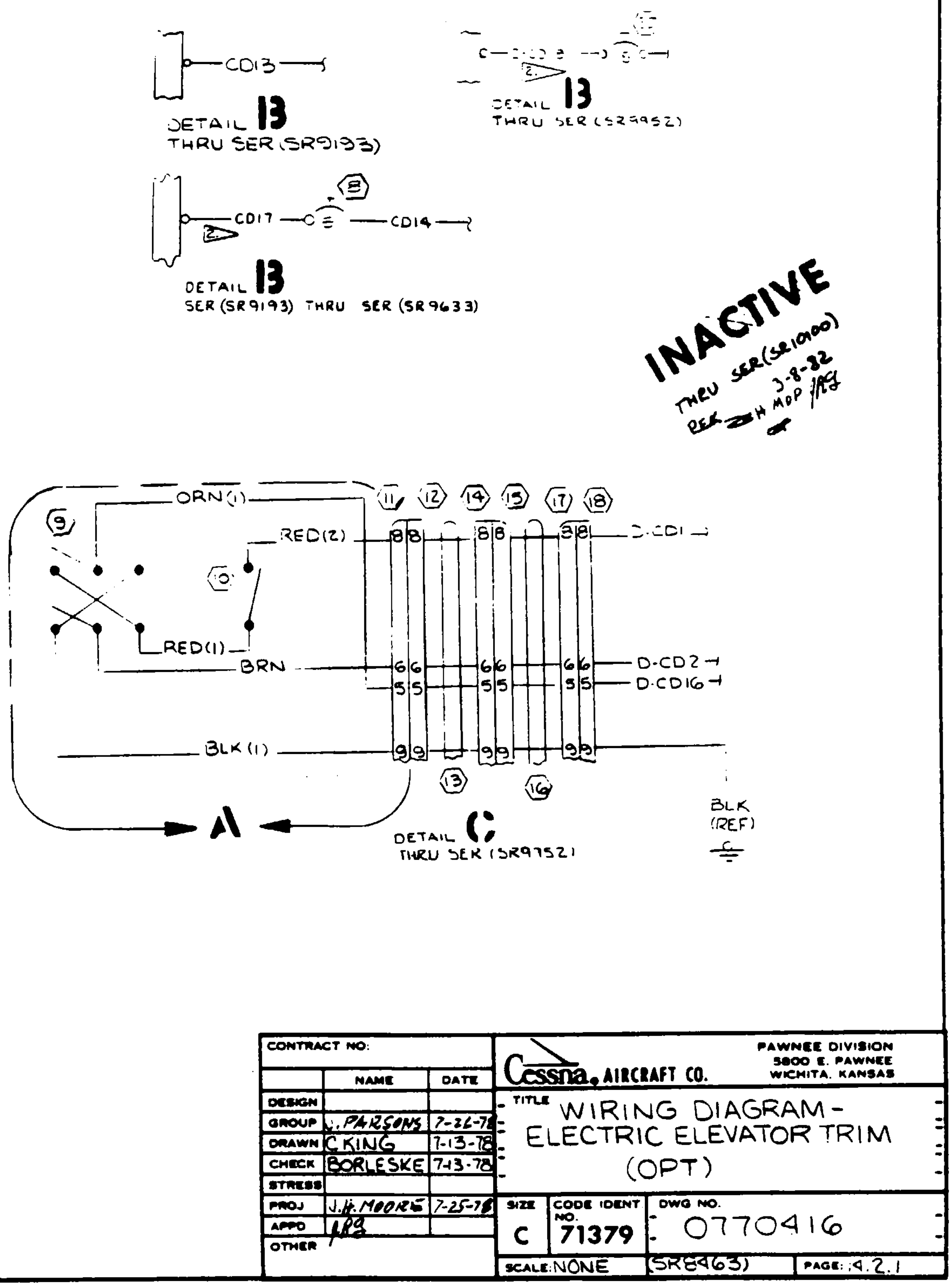
TITLE: WIRING DIAGRAM — ELECTRIC ELEVATOR TRIM (OPT)

SIZE: C | CODE IDENT. NO.: 71379 | DWG NO: 0770416

SCALE: NONE | (SR8463) | PAGE: 14.2.0



Electric Elevator Trim (OPT) (Sheet 1 of 2)

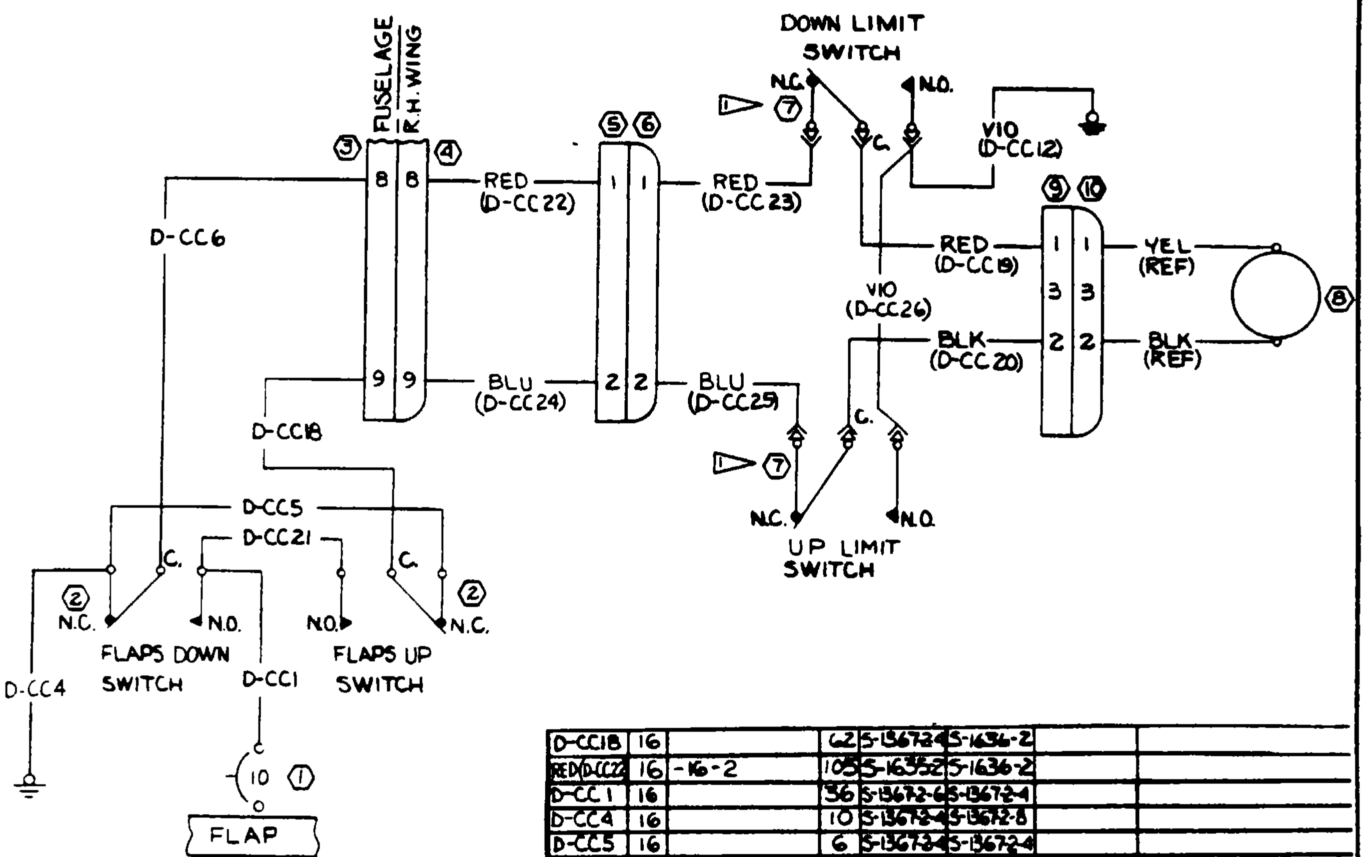


Electric Elevator Trim (OPT) (Sheet 2 of 2)

NOTES:

1. THESE SWITCHES PART OF C301002 ACTUATOR ASSY.

REVISION			
LET	DESCRIPTION	DATE	APPD
A	BY REV: RED(D-CC22) WAS BLU(D-CC13), RED(D-CC23) WAS BLU(D-CC15), BLU(D-CC24) WAS RED(D-CC7), BLU(D-CC25) WAS ORN (D-CC16), ADD S-2035-1, S-2035-2 S-1493-2 WAS S-1367-2-8, VIO(DCC 26) WAS VIO(DCC8) REVERSE SWITCH FUNCTION, VIO(D-CC26) WAS VIO(D-CC10), RELOCATE D-CC26 & DCC4 (MER R182 EO790) (SR9113)	HHG 6-19-79	[illegible]



D-CC18	16		62	S-1367-2-4	S-1636-2	
RED(D-CC22)	16	-16-2	105	S-1635-2	S-1636-2	
D-CC1	16		36	S-1367-2-6	S-1367-2-4	
D-CC4	16		10	S-1367-2-4	S-1367-2-8	
D-CC5	16		6	S-1367-2-4	S-1367-2-4	
D-CC6	16		102	S-1367-2-4	S-1636-2	
BLU(D-CC24)	16	-16-6	105	S-1636-2	S-1635-2	
VIO(D-CC26)	16	-16-7	19	S-1493-2	S-1493-2	
VIO (D-CC12)	16	-16-7	19	S-1493-2	S-1367-2-8	
BLU(D-CC25)	16	-16-6	13	S-1493-2	S-1635-2	
RED(D-CC23)	16	-16-2	13	S-1493-2	S-1635-2	
RED (D-CC19)	16	-16-2		S-1636-2	S-1493-2	
BLK (D-CC20)	16	-16-0		S-1636-2	S-1493-2	
D-CC21	16			S-1367-2-4	S-1367-2-4	
WIRE CODE NO	GA	MATERIAL	LG	TERMINALS		SERIALS

WIRE TABLE

ITEM NO.	PART NO.	DESCRIPTION	
10	S-1638-2	HOUSING	
9	S-1638-1	HOUSING	
8	C301002	ACTUATOR ASSY	
7	V3-1-D9	SWITCH	
6	S-2035-1	HOUSING-CAP	
5	S-2035-2	HOUSING-PLUG	
4	S-1640-9	HOUSING-PIN	
3	S-1641-9	HOUSING-SOCKET	
2	S-1906-1	SWITCH	
1	S-1360-10L	CIRCUIT BREAKER	

EQUIPMENT TABLE

CES-1000 IS APPLICABLE VENDOR CODES PER S-1400 CES-XXXX=CESSNA SPEC. NO. S-XXX OR CMXXXX=CESSNA STD. NO.

SUPERSEDES: 0770416 P 14.1

SUPERSEDED BY:

CONTRACT NO:

	NAME	DATE
DESIGN	SPENCER	2-27-79
GROUP	[illegible]	3-3-79
DRAWN	P MAYFIELD	2-19-79
CHECK	YOUNGERS	2-20-79
STRESS		
PROJ	J.H. MOORE	3-6-79
APPD	[illegible]	
OTHER		

Cessna AIRCRAFT CO. PAWNEE DIVISION 5800 E. PAWNEE WICHITA, KANSAS

TITLE WIRING DIAGRAM — WING FLAPS

SIZE C | CODE IDENT. NO. 71379 | DWG NO 0770416

SCALE: NONE | (SR 9113) | PAGE: 14.3

REVISION			
LET	DESCRIPTION	DATE	APPD
A	BY REV: ADD NOTE 2 & CD18 (SR10100)	REK 5-5-82	

NOTES:

1. MATERIAL IS RCF 51308 COIL CORD, VENDOR CODE (09690)
2. INSTALL S-1071 TUBING OVER CD18 WIRE BEFORE INSTALLING TERMINALS.

INACTIVE
EFF THRU SER (SR10713)
1-8-83

WIRE CODE NO	GA	MATERIAL	LG	TERMINALS			SERIALS
D-CD18 (2)	14			S-1367-2-8	S-1367-2-10		
D-CD32	18			S-1963-2	S-1367-1-8		
D-CD31 BLK	18	-18-0		SOLDER	S-1963-3		
VIO	24	(1)		SOLDER	S-1963-3		
D-CD22	18S	S-1461-18-9		S-1963-2	S-1367-1-8		
D-CD28 GRN	20	-20-5		S-2099-6	S-2099-9		
D-CD27 BLU	20	-20-6		S-2099-6	S-2099-9		
D-CD27 BLK	20	-20-0		S-2099-6	S-1367-1-8		
D-CD30 BLK(1)	18	-18-0		S-1963-2	S-1367-1-8		
D-CD15 [illegible]	20	-20-4			S-2099-9		
D-CD16 [illegible]	20	-20-9-3			S-2099-9		
D-CD24 [illegible]	20	-20-9-4			S-2099-6		
D-CD23 YEL	20	-20-4		S-1963-2	S-2099-9		
RED	24	(1)		SOLDER	S-1963-3		
WHT/ORN							
ORN							
WHT/YEL							
YEL							
BLK(2)	24	(1)		SOLDER	S-1963-3		

WIRE TABLE

ITEM NO	PART NO.	DESCRIPTION	
10	S-1985-3	SWITCH	
9	44430-3257	TRIM ACTUATOR	
8	S-2349-1	CONNECTOR	
7	S-1232-2	CIRCUIT BREAKER	
6	S-1962-2-0	HOUSING	
5	S-1962-1-0	HOUSING	
4	2270030	CABLE ASSY	
3	2270035	RELAY ASSY	
2	S-2349-2	CONNECTOR	
1	7205P4	SWITCH	

EQUIPMENT TABLE

CONTRAC NO:

	NAME	DATE
DESIGN	R. KLEIN	2-2-82
GROUP	M. PAINE	3-10-82
DRAWN	R. KLEIN	2-2-82
CHECK	RE HAIR	3-9-82
STRESS		
PROJ		3-10-82
APPD		
OTHER		

Cessna AIRCRAFT CO. PAWNEE DIVISION 5800 E. PAWNEE WICHITA, KANSAS

TITLE WIRING DIAGRAM — ELECTRIC TRIM (OPT)

CES-1000 IS APPLICABLE VENDOR CODES PER S-1400 CES-XXXX=CESSNA SPEC. NO. S-XXX OR CMXXXX=CESSNA STD. NO.

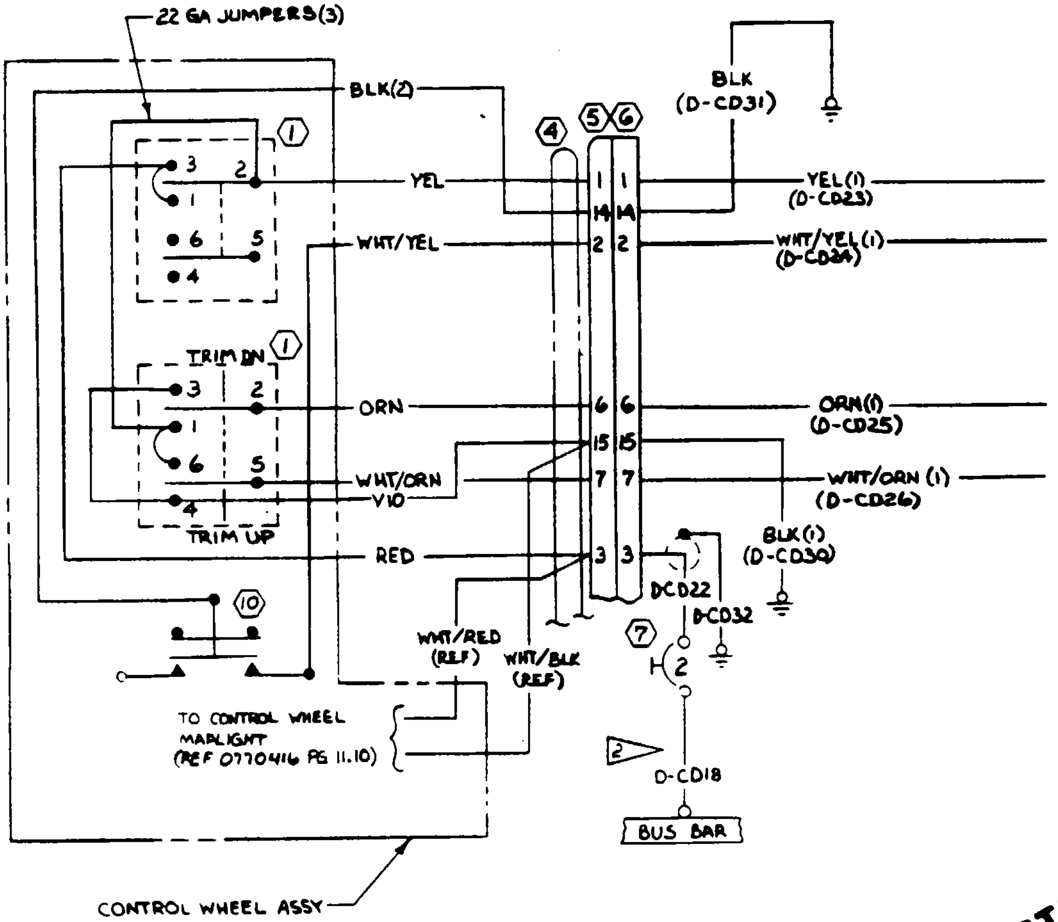
SUPERSEDES: PG 14.2.0 & 14.2.1

SUPERSEDED BY:

SIZE	CODE IDENT. NO.	DWG NO
C	71379	0770416

SCALE: NONE (SR10100) PAGE: 14.4.0

REVISION			
LET	DESCRIPTION	DATE	APPD
A	SEE PAGE 14.4.0 FOR REV.		



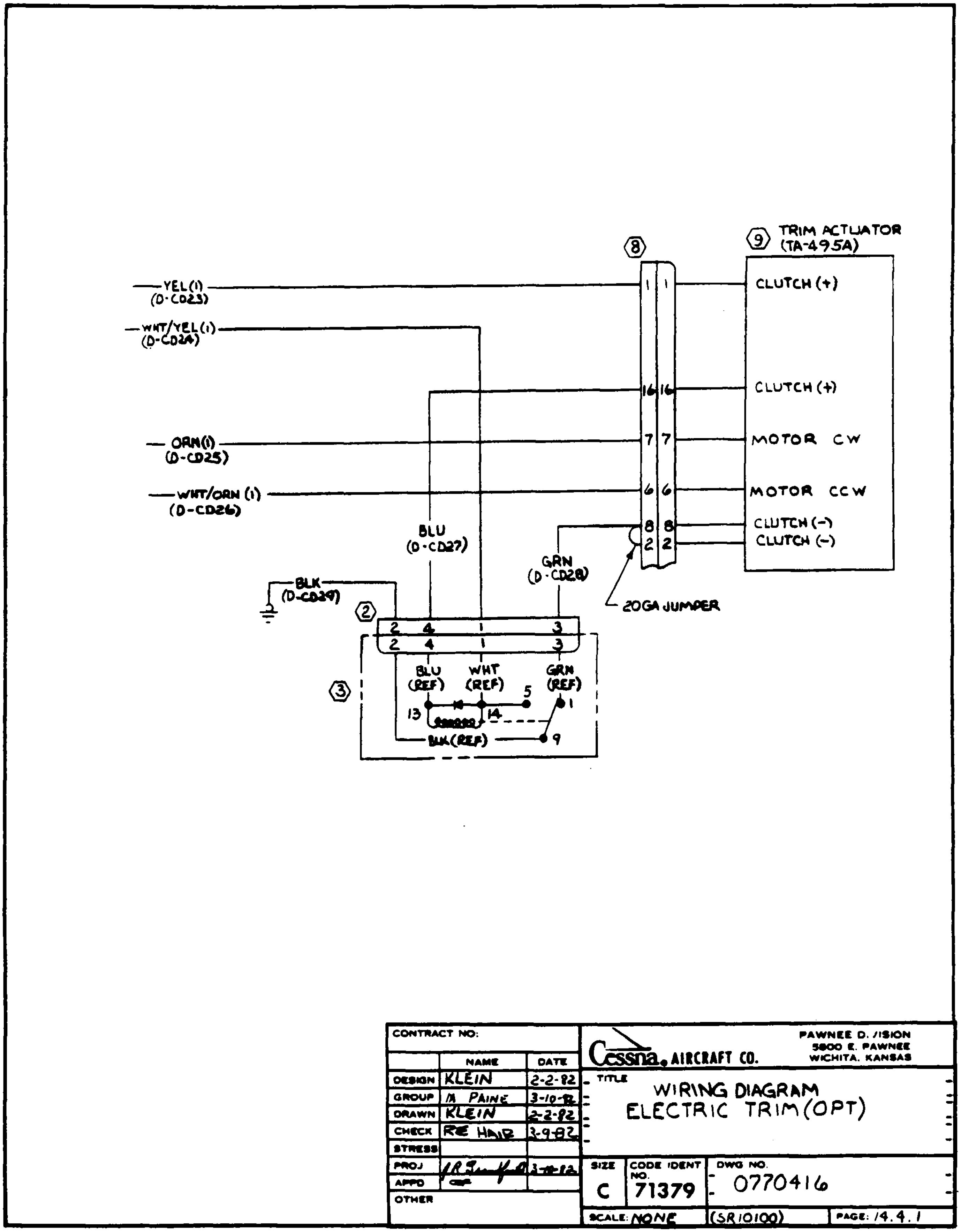
CONTRACT NO.		
	NAME	DATE
DESIGN	KLEIN	2-2-82
GROUP	M PAINE	3-10-82
DRAWN	KLEIN	2-2-82
CHECK	RE HAIR	2-4-82
STRESS		
PROJ		3-10-82
APPD		
OTHER		

Cessna AIRCRAFT CO. PAWNEE DIVISION 5800 E. PAWNEE WICHITA, KANSAS

TITLE WIRING DIAGRAM ELECTRIC TRIM (OPT)

SIZE	CODE IDENT NO	DWG NO
C	71379	0770416
SCALE NONE	(SR10100)	PAGE 14.4.1

Electric Trim (OPT) (Sheet 1 of 2)



Electric Trim (OPT) (Sheet 2 of 2)

NOTES:

1. MATERIAL IS NCFS130B COIL CORD (0969006)
2. INSTALL S-1071 TUBING OVER CD16 WIRE BEFORE INSTALLING TERMINALS

REVISION			
LET	DESCRIPTION	DATE	APPD

WIRE CODE NO	GA	MATERIAL	LG	TERMINALS			SERIALS
RED	24	1.		SOLDER	S-2353-2		
VIO							
WHT/GRN							
ORN							
WHT/YEL							
YEL							
BLK	24	1.		SOLDER	S-2353-2		
D-CD42	20			S-2099-9	S-2099-9		
D-CD40	18			S-2099-8	S-1367-1-8		
D-CD39	18$			S-2099-8	S-1367-1-8		
D-CD38	20			S-2099-6	S-1367-1-8		
D-CD37				S-2099-6	S-2099-8		
D-CD36				S-2099-6	S-2099-9		
D-CD35				S-2099-9	S-2099-9		
D-CD34				S-2099-9	S-2099-9		
D-CD33	20			S-2099-9	S-2099-6		
D-CD32	18			SOLDER	S-1367-1-8		
D-CD16	14			S-1367-2-8	S-1367-2-10		

WIRE TABLE

ITEM NO	PART NO.	DESCRIPTION	
9	4430-3257	TRIM ACTUATOR	
8	S-2349-1	CONNECTOR	
7	S-1232-2	CIRCUIT BREAKER	
6	S-365-3	SWITCH	
5	S-2350-3	CONNECTOR	
4	2270030	CABLE ASSY	
3	2270035	RELAY ASSY	
2	S-2349-2	CONNECTOR	
1	[illegible]	SWITCH	

EQUIPMENT TABLE

CES-1000 IS APPLICABLE
VENDOR CODES PER S-1400
CES-XXXX=CESSNA SPEC. NO.
S-XXX OR CMXXXX=CESSNA STD. NO.

SUPERSEDES: PG. 14.9.0

SUPERSEDED BY:

CONTRACT NO:

	NAME	DATE
DESIGN	SPENCER	9-8-83
GROUP	C.A. Hansen	9-22-83
DRAWN	SPENCER	9-8-83
CHECK	RE Haire	9-12-83
STRESS		
PROJ	[illegible]	10-3-83
APPD		
OTHER		

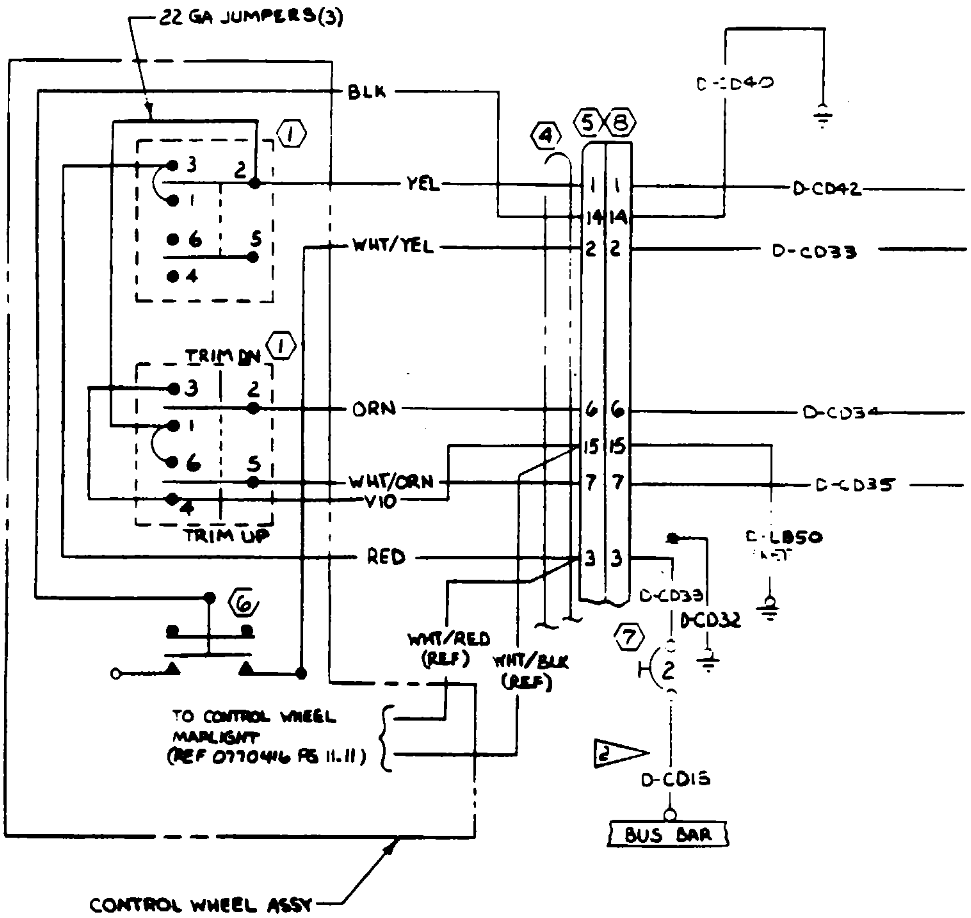
Cessna AIRCRAFT CO.
PAWNEE DIVISION
5800 E PAWNEE
WICHITA, KANSAS

TITLE: WIRING DIAGRAM — ELECTRIC TRIM (OPT)

SIZE	CODE IDENT. NO.	DWG NO
C	71379	0770416

SCALE: NONE (SR 0713) PAGE: 14.5.0

REVISION			
LET	DESCRIPTION	DATE	APPD
	SEE PAGE 14.5.0 FOR REV.		



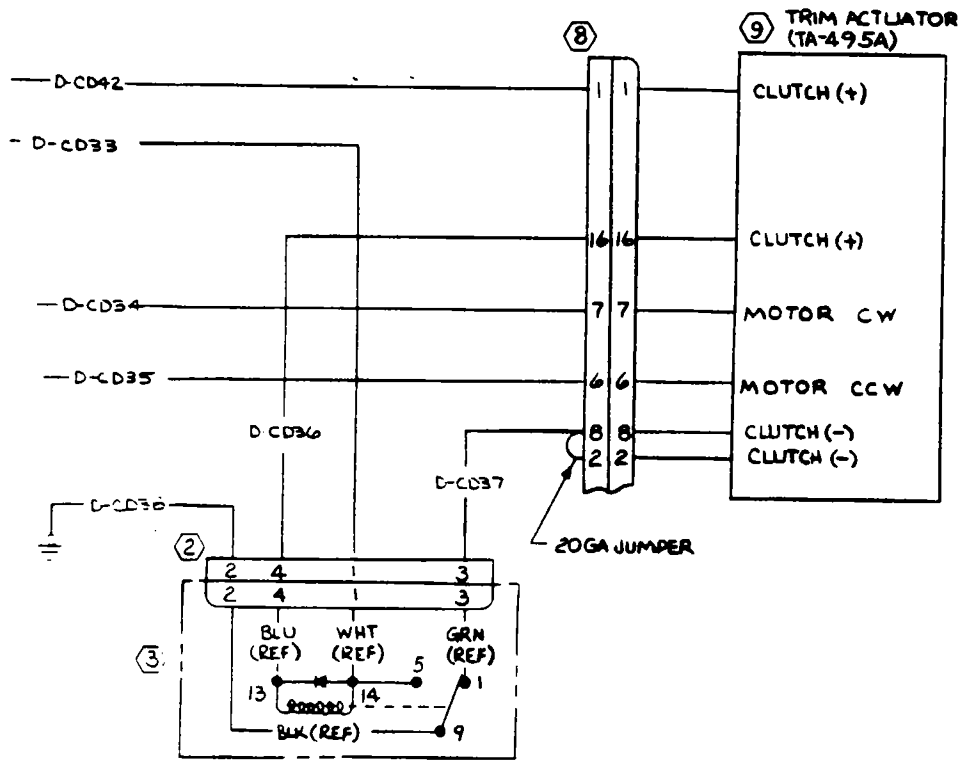
CONTRACT NO:		
	NAME	DATE
DESIGN	SPENCER	9-5-83
GROUP	[illegible]	9-22-83
DRAWN	SPENCER	9-9-83
CHECK	RE [illegible]	9-12-83
STRESS		
PROJ	[illegible]	11-3-83
APPD	[illegible]	
OTHER		

Cessna AIRCRAFT CO. PAWNEE DIVISION 5800 E. PAWNEE WICHITA, KANSAS

TITLE WIRING DIAGRAM ELECTRIC TRIM (OPT)

SIZE	CODE IDENT NO.	DWG NO.
C	71379	0770416
SCALE: NONE	(SR10713)	PAGE: 14.5.1

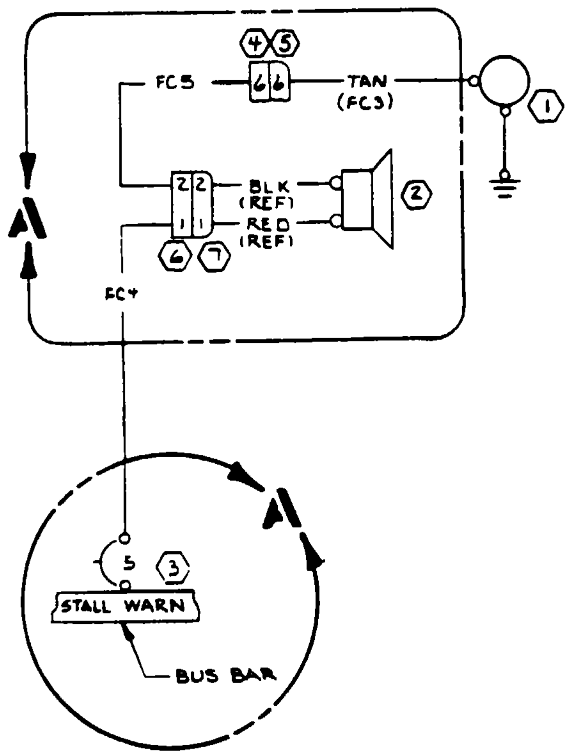
Electric Trim (Sheet 1 of 2)

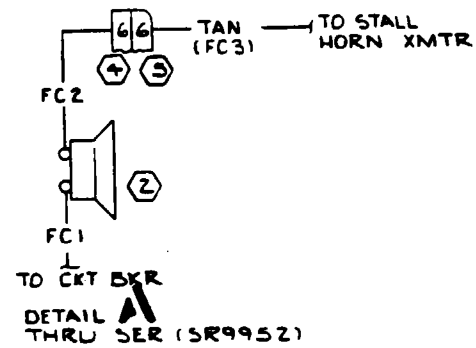


CONTRACT NO			Cessna AIRCRAFT CO.	PAWNEE DIVISION 5800 E. PAWNEE WICHITA KANSAS
	NAME	DATE	TITLE	
DESIGN	SPENCER		WIRING DIAGRAM ELECTRIC TRIM (OPT)	
GROUP				
DRAWN	SPENCER			
CHECK		9.12.83		
STRESS				
PROJ		11-3-83	SIZE C	CODE IDENT NO 71379 · DWG NO 0770416
APPD				
OTHER			SCALE NONE	(SR10713) · PAGE 14.5.1

Electric Trim (Sheet 2 of 2)

REVISION			
LET	DESCRIPTION	DATE	APPD
A	BY REV: ADD DETAIL A, FC4 & FC5; SERIAL OUT FC1, FC2 & FC3; 1670056 WAS S-2077-B HORN (SR9321)(REF) (SR9952)	GLS 2/9/81	
B	BY REV: DELETE SERIAL OUT FC3; S-1636-1 WAS S-1367-1-8/(FC5) (MER T182??952)(NOW SHOP PRACTICE)	REK 9-8-81	





WIRE CODE NO	GA	MATERIAL	LG	TERMINALS			SERIALS
FC5	22			S-1636-1	S-1636-1		SER (SR9952) & ON
FC4	22			S-1367-1-6	S-1636-1		SER(SR9952) & ON
TAN (D-FC3)	22	-22-10		S-1635-1	S-1367-1-8		
D-FC2	22			S-1367-1-6	S-1636-1		THRU SER (SR9952)
D-FC1	22			S-1367-1-6	S-1367-1-6		THRU SER (SR9952)

WIRE TABLE

ITEM NO.	PART NO.	DESCRIPTION
8	S-1232-5	CIRCUIT BREAKER
7	S-2035-1	HOUSING
6	S-2035-2	HOUSING
5	S-1640-6	HOUSING
4	S-1641-6	HOUSING
3	S-1360-5L	CIRCUIT BREAKER
2	1670056	HORN ASSY
1	0511062	XMTR-STALL WARN

EQUIPMENT TABLE

CES-1000 IS APPLICABLE
VENDOR CODES PER S-1400
CES-XXXX=CESSNA SPEC. NO.
S-XXX OR CMXXXX=CESSNA STD. NO.

SUPERSEDES: 0770610 P 15.2

SUPERSEDED BY:

CONTRACT NO:

	NAME	DATE
DESIGN	SPENCER	3-31-77
GROUP	W.H. Hardin	4-8-77
DRAWN	HARVEY	3-7-77
CHECK	BORLESKE	3-9-77
STRESS		
PROJ	PLAGEMANN	4-12-77
APPD	JRS	
OTHER		

Cessna AIRCRAFT CO.
PAWNEE DIVISION
5800 E. PAWNEE
WICHITA, KANSAS

TITLE
WIRING DIAGRAM — STALL WARNING SYSTEM (NON-HEATED)

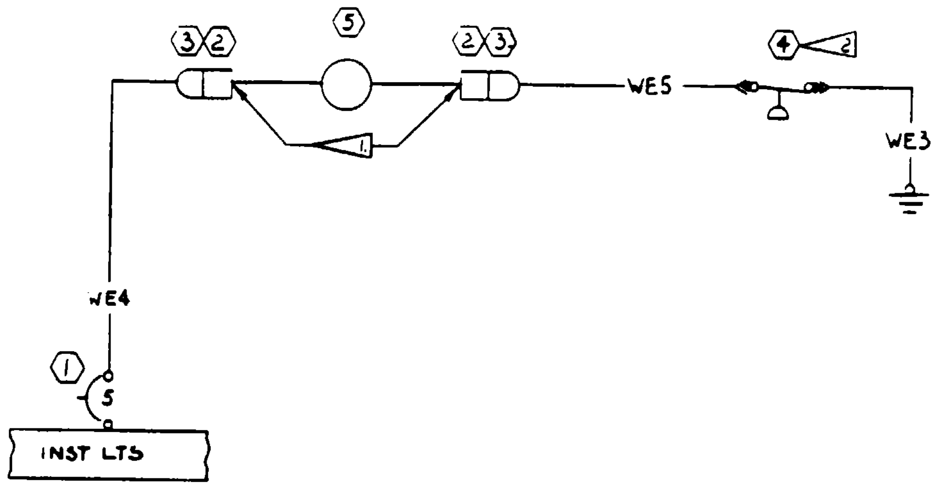
SIZE	CODE IDENT. NO.	DWG NO
C	71379	0770416

SCALE: NONE (SR8463) PAGE: 1

REVISION			
LET	DESCRIPTION	DATE	APPD

NOTES:

1. TERMINATE VENDOR FURNISHED WIRES WITH S-1636-1 PIN
2. VACUUM SWITCH CONTACTS ARE NORMALLY CLOSED, CONTACTS OPEN AT 3.5±.1 INCHES OF MERCURY VACUUM



WIRE CODE NO	GA	MATERIAL	LG	TERMINALS		SERIALS
WE5	22			S-1635-1	S-1493-1	
WE4	22			S-1367-1-6	S-1635-1	
WE3	22			S-1493-1	S-1367-1-8	

WIRE TABLE

ITEM NO.	PART NO.	DESCRIPTION
5	S-2135-2	LAMP
4	S-2571-2	VACUUM SWITCH
3	S-1637-1	HOUSING
2	S-1637-2	HOUSING
1	S-1360-5L	CIRCUIT BREAKER

EQUIPMENT TABLE

CES-1000 IS APPLICABLE
VENDOR CODES PER S-1400
CES-XXXX=CESSNA SPEC. NO.
S-XXX OR CMXXXX=CESSNA STD. NO.

SUPERSEDES:

SUPERSEDED BY:

CONTRACT NO:

	NAME	DATE
DESIGN	R. KLEIN	11-20-81
GROUP	W. DALE	1-19-82
DRAWN	R. KLEIN	11-20-81
CHECK	BORLESKE	1-14-82
STRESS	A. SHOIL	1-18-82
PROJ	J.R. Greenfield	1-19-82
APPD		
OTHER		

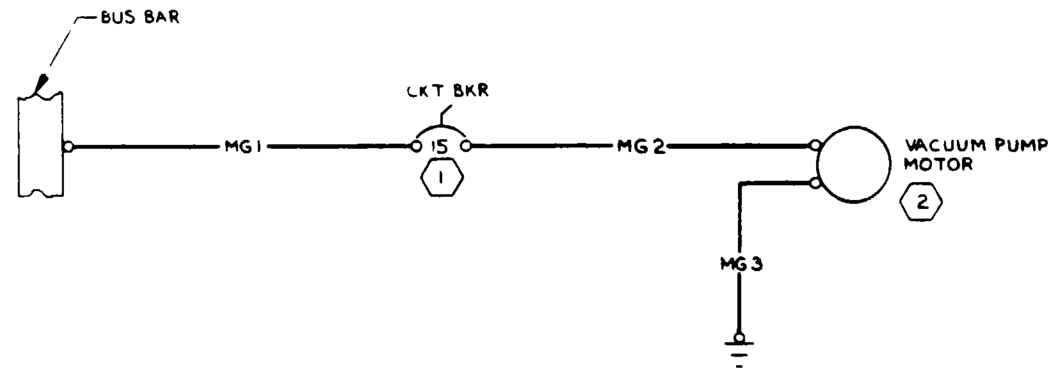
Cessna AIRCRAFT CO.
PAWNEE DIVISION
5800 E. PAWNEE
WICHITA, KANSAS

TITLE WIRING DIAGRAM — VACUUM OUT WARNING SYSTEM - 182

SIZE	CODE IDENT. NO.	DWG NO
C	71379	0770416

SCALE: NONE (SR10100) PAGE: 15.2

REVISION			
LET	DESCRIPTION	DATE	APPD



14-00816

MG 3	16	S-2589		S-1367-2-8	S-1367-2-6		
MG 2	16	S-2589		S-1367-2-8	S-1367-2-8		
MG 1	16	S-2589		S-1367-2-8	S-1367-2-8		
WIRE CODE NO	GA	MATERIAL	LG	TERMINALS			SERIALS

WIRE TABLE

ITEM NO	PART NO.	DESCRIPTION	
2	C165008-0101	VACUUM PUMP	
1	CM2589-15	CKT BKR	

EQUIPMENT TABLE

CES-1000 IS APPLICABLE
VENDOR CODES PER S-1400
CES-XXXX=CESSNA SPEC. NO.
S-XXX OR CMXXXX=CESSNA STD. NO.

SUPERSEDES:

SUPERSEDED BY:

CONTRACT NO:

	NAME	DATE
DESIGN	J.H HARDEN	10-31-84
GROUP	J.H HARDEN	10-31-84
DRAWN	KEN LUNDY	10-3-84
CHECK	[illegible]	[illegible]
STRESS		
PROJ		
APPD	[illegible]	11-1-84
OTHER		

Cessna AIRCRAFT CO.
PAWNEE DIVISION
5800 E. PAWNEE
WICHITA, KANSAS

TITLE
WIRING DIAGRAM — STANDBY VACUUM PUMP MODEL 182

SIZE	CODE IDENT. NO	DWG NO
C	71379	0770416

SCALE NONE (SR 10414) PAGE: 16.1

NOTES:

INSTALL S-1071-3-18.0 TUBING OVER PA1 WIRE BEFORE INSTALLING TERMINALS.

REVISION			
LET	DESCRIPTION	DATE	APPD
A	BY REV PA1 GA8 WAS PA1 GA10, S-1367-4-8 WAS S-1367-3-8, S-1367-4-10 WAS S-1367-3-10 (SR9633) (REF)	MKT 10-31-80	
B	BY REV: S-1232-2 WAS S-1232-5/ ITEM 9 (SR9952)	GLS 7-16-81	

INACTIVE
THRU SER (SR 10100)
REV 11-6-81

WIRE CODE NO	GA	MATERIAL	LG	TERMINALS			SERIALS
PA 1	8	S-1562-10-9		S-1367-4-8	S-1367-4-10		

WIRE TABLE

ITEM NO.	PART NO.	DESCRIPTION	
9	S-1232-2	CIRCUIT BREAKER	
8	2270019	BUS BAR	
7	S-1360-15L	CIRCUIT BREAKER	
6	S-1360-10L	CIRCUIT BREAKER	
5	S-1360-5L	CIRCUIT BREAKER	
4	S-1232-6C	CIRCUIT BREAKER	
3	2270014	BUS BAR	
2	2270020	BUS BAR	
1	S-2281-1	SWITCH	

EQUIPMENT TABLE

CES-1000 IS APPLICABLE
VENDOR CODES PER S-1400
CES-XXXX=CESSNA SPEC. NO.
S-XXX OR CMXXXX=CESSNA STD. NO.

SUPERSEDES:

SUPERSEDED BY:

CONTRACT NO:

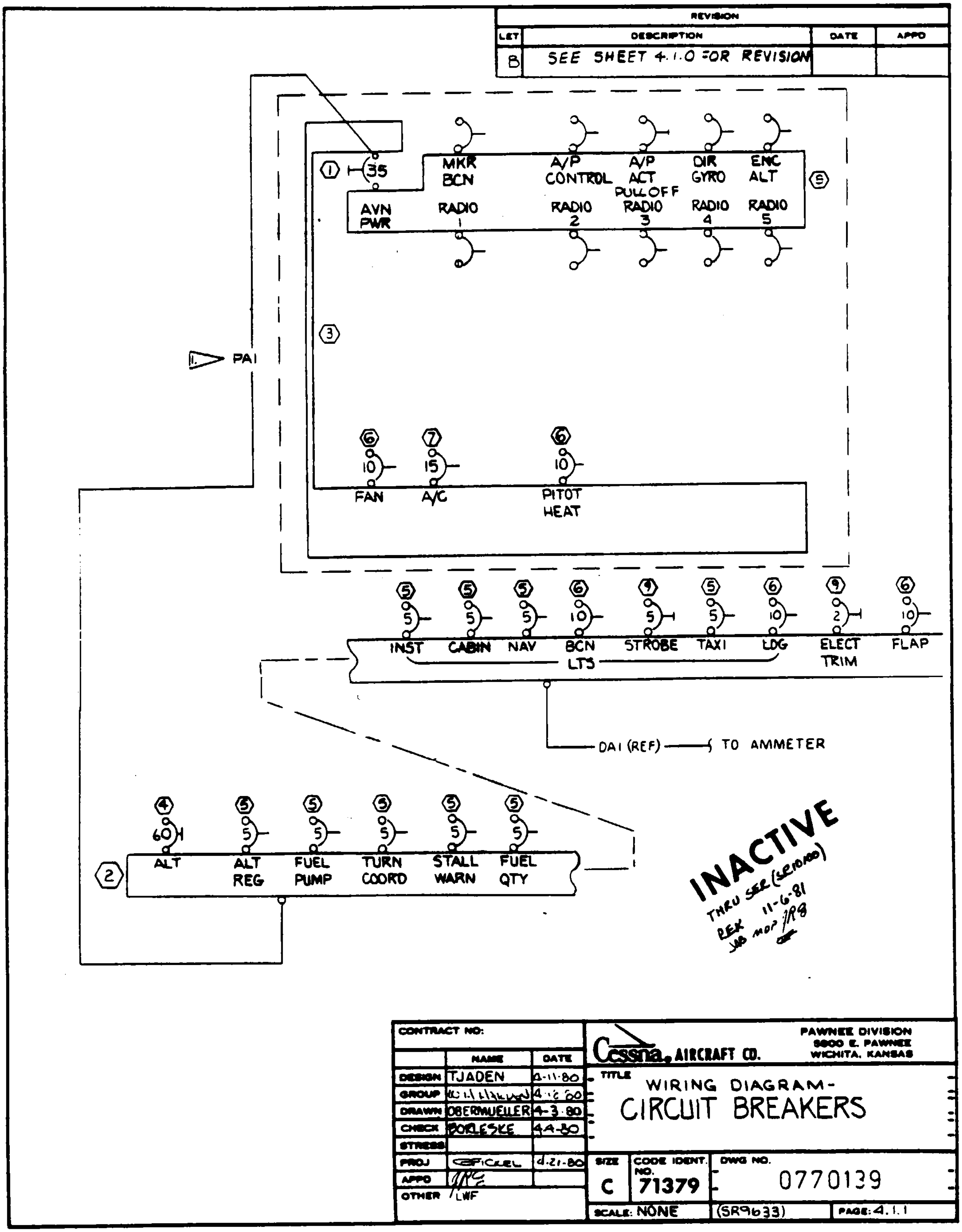
	NAME	DATE
DESIGN	TJADEN	4-11-80
GROUP		4-8-80
DRAWN	BURRIS	4-3-80
CHECK	BORLESKE	4-4-80
STRESS		
PROJ	GEICKEL	4-21-80
APPD		
OTHER		

Cessna AIRCRAFT CO. PAWNEE DIVISION 5800 E. PAWNEE WICHITA, KANSAS

TITLE: WIRING DIAGRAM — CIRCUIT BREAKERS

SIZE	CODE IDENT NO.	DWG NO
C	71379	0770139

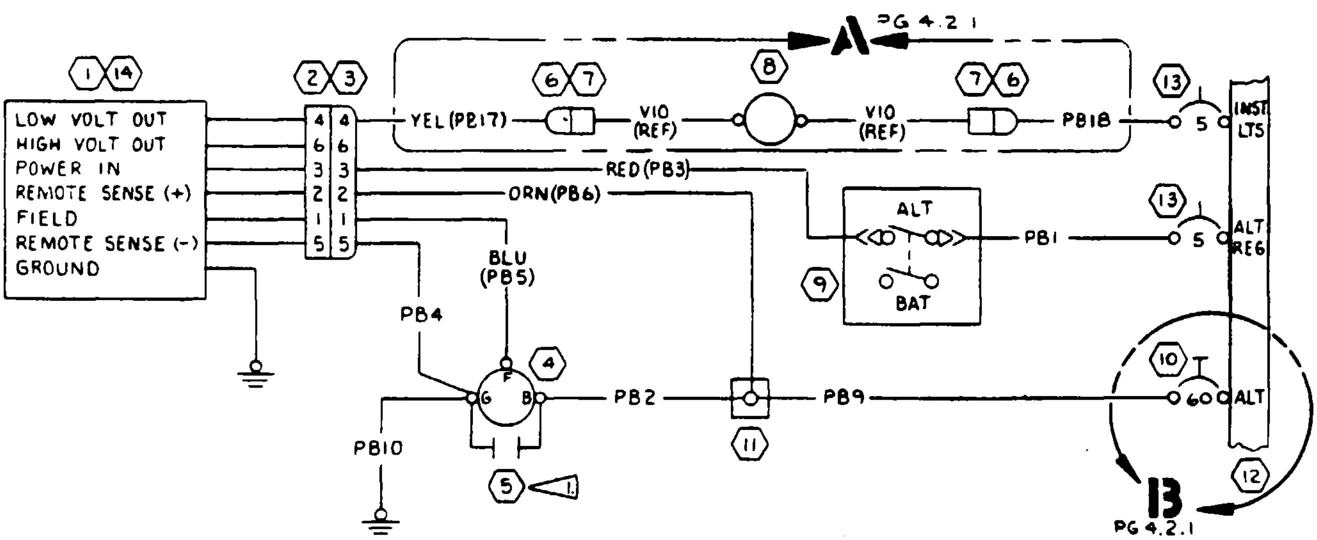
SCALE: NONE (SR 9633) PAGE: 4.1 0


REVISION
LET
DESCRIPTION
DATE
APPD
B
SEE SHEET 4.1.0 FOR REVISION
35
MKR BCN
A/P CONTROL
A/P ACT PULL OFF
DIR GYRO
ENC ALT
AVN PWR
RADIO 1
RADIO 2
RADIO 3
RADIO 4
RADIO 5
PA1
10
FAN
15
A/C
10
PITOT HEAT
5
INST
5
CABIN
5
NAV
10
BCN
LTS
5
STROBE
5
TAXI
10
LDG
2
ELECT TRIM
10
FLAP
DA1 (REF)
TO AMMETER
60
ALT
5
ALT REG
5
FUEL PUMP
5
TURN COORD
5
STALL WARN
5
FUEL QTY
INACTIVE
THRU SER (SE10100)
11-6-81
CONTRACT NO:
NAME
DATE
DESIGN TJADEN 4-11-80
DRAWN OBERMUELLER 4-3-80
CHECK BORLESKE 4-4-80
STRESS
PROJ 4-21-80
APPD
OTHER LWF
Cessna AIRCRAFT CO.
PAWNEE DIVISION
5800 E. PAWNEE
WICHITA, KANSAS
TITLE
WIRING DIAGRAM-
CIRCUIT BREAKERS
SIZE
C
CODE IDENT. NO.
71379
DWG NO.
0770139
SCALE: NONE
(SR9633)
PAGE: 4.1.1

REVISION			
LET	DESCRIPTION	DATE	APPD
A	BY REV: ADD PG 4.2.1; SER IN PB17 & 18; SER OUT PB7 & PB8 T182E01031 (SR10100) (REF)	GLS 6/21/83	
B	BY REV: ADD DETAIL "B" (SR 10414)	KWL 10-18-84	

NOTES:

▷1 PART OF BASIC AVIONICS KIT



14-00916

PB 20	8			S-1367-4-10	S-1367-4-8		SER (SR 10415) & ON
PB 19	8			S-1367-4-8	S-1943-2		SER (SR 10415) & ON
PB18	22			S-1637-1-6	S-1635-1		SER (SR10100) & ON
YEL (PB17)	20	-20-4		S-1635-1	S-2099-6		SER (SR10100) & ON
PB10	8	S-1562-8-9		S-1943-1	S-1943-3		
PB9	8	S-1562-8-9		S-1943-2	S-1367-4-8		
PB8	22			S-1367-1-6	S-1635-1		THRU SER (SR10100)
YEL (PB7)	20	-20-4		S-1635-1	S-2099-6		THRU SER (SR10100)
ORN (PB6)	20	-20-3		S-2099-6	S-1367-1-12		
BLU (PB5)	16	-16-6		S-2099-8	S-1367-2-10		
PB4	20			S-2099-6	S-1367-1-10		
RED (PB3)	20	-20-2		S-2099-6	S-1493-1		
PB2	8	S-1562-8-9		S-1943-2	S-1943-1		
PB1	22			S-1367-1-6	S-1493-1		
WIRE CODE NO	GA	MATERIAL	LG	TERMINALS			SERIALS

WIRE TABLE

14	C611005-0102	ALT CONTROL UNIT	(ALT)
13	S-1360-5L	CIRCUIT BREAKER	
12	2270020	BUS BAR	
11	0570315	TERMINAL BOARD	
10	S-1232-60	CIRCUIT BREAKER	
9	S-1994-1-1	MASTER SWITCH	
8	S-2519-2	LAMP ASSY	
7	S-1637-2	HOUSING	
6	S-1637-1	HOUSING	
5	S-1915-1	CAPACITOR	
4	C611503-0102	ALTERNATOR ASSY	
3	S-2373-2	CONNECTOR	
2	S-2373-1	CONNECTOR	
1	C611005-0101	ALT CONTROL UNIT	
ITEM NO	PART NO.	DESCRIPTION	

EQUIPMENT TABLE

CES-1000 IS APPLICABLE VENDOR CODES PER S-1400 CES-XXXX=CESSNA SPEC. NO. S-XXX OR CMXXXX=CESSNA STD. NO.

SUPERSEDES:

SUPERSEDED BY:

CONTRACT NO.

	NAME	DATE
DESIGN	TJADEN	4-11-80
GROUP	W.H.HARDEN	4-18-80
DRAWN	OBERMUELLER	4-3-80
CHECK	BORLESKE	4-4-80
STRESS		
PROJ	GFICKEL	4-21-80
APPD		
OTHER		

Cessna AIRCRAFT CO.

PAWNEE DIVISION 5800 E. PAWNEE WICHITA, KANSAS

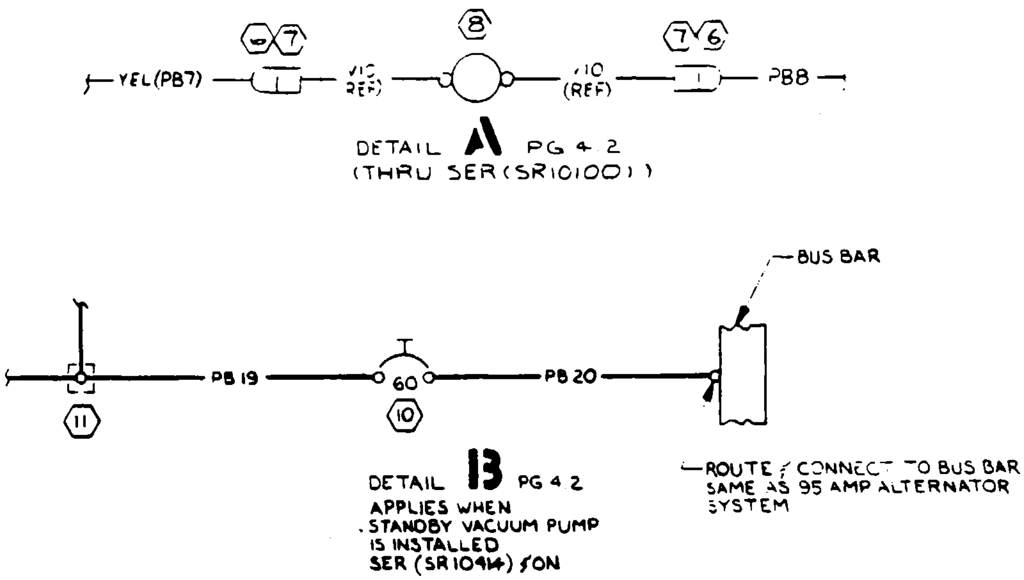
TITLE

WIRING DIAGRAM — ALTERNATOR SYSTEM 60 AMP

SIZE	CODE IDENT. NO	DWG NO
C	71379	0770139

SCALE NONE (SR9633) PAGE: 4.2

REVISION			
LET	DESCRIPTION	DATE	APPD
B	SEE PAGE 4.2 FOR REVISION		



14-00916

WIRE CODE NO	GA	MATERIAL	LG	TERMINALS			SERIALS

WIRE TABLE

ITEM NO.	PART NO.	DESCRIPTION

EQUIPMENT TABLE

CES-1000 IS APPLICABLE
VENDOR CODES PER S-1400
CES-XXXX=CESSNA SPEC. NO.
S-XXX OR CMXXXX=CESSNA STD. NO.

SUPERSEDES:

SUPERSEDED BY:

CONTRACT NO:

	NAME	DATE
DESIGN	G STAMM	6/21/83
GROUP		
DRAWN	G STAMM	6/21/83
CHECK	E.E. Haas	6/22/83
STRESS		
PROJ	J.R. Tranfield	7/6/83
APPD		
OTHER		

Cessna AIRCRAFT CO. PAWNEE DIVISION 5800 E. PAWNEE WICHITA, KANSAS

TITLE **WIRING DIAGRAM — ALTERNATOR SYSTEM 60 AMP**

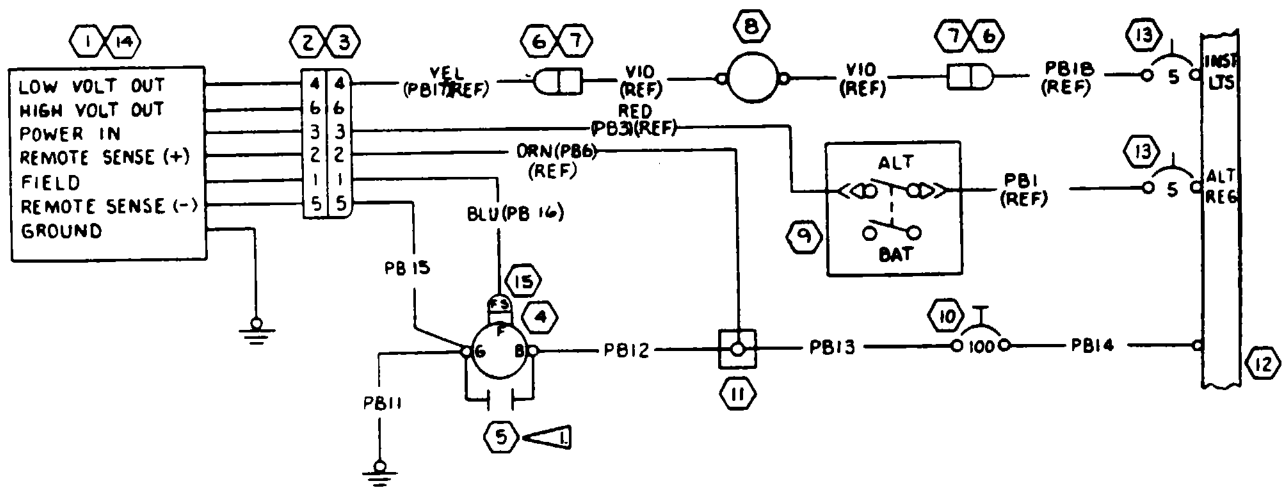
SIZE	CODE IDENT. NO.	DWG NO
C	71379	0770139

SCALE NONE (SR10100) PAGE 4.2.1

REVISION			
LET	DESCRIPTION	DATE	APPD
A	BY REV: YEL(PB17)(REF) WAS YEL(PB7)(REF) PB18(REF) WAS PB8(REF) T182E01031 (SR10100)(REF)	GLS 6/21/83	[illegible]

NOTES:

1. PART OF BASIC AVIONICS KIT



BLU(PB16)	16	-16-6		S-2099-8	S-2376-1		
PB15	20			S-2099-6	S-1367-1-10		
PB14	4	S-1562-4-9		S-1367-6-12	S-1367-6-10		
PB13	4	S-1562-4-9		S-2402-2	S-1367-6-12		
PB12	4	S-1562-4-9		S-2402-2	S-2402-2		
PB11	4	S-1562-4-9		S-2402-1	S-2402-2		
WIRE CODE NO	GA	MATERIAL	LG	TERMINALS			SERIALS

WIRE TABLE

ITEM NO	PART NO.	DESCRIPTION	
15	D208-14489-KA	CONNECTOR	
4	C611005-0102	ALT CONTROL UNIT	(ALT)
13	S-1360-5L	CIRCUIT BREAKER	
12	2270020	BUS BAR	
11	0570315	TERMINAL BOARD	
10	S-2326-1	CIRCUIT BREAKER	
9	S-1994-1-1	MASTER SWITCH	
8	S-2519-2	LAMP ASSY	
7	S-1637-2	HOUSING	
6	S-1637-1	HOUSING	
5	S-1915-1	CAPACITOR	
4	C611505-0101	ALTERNATOR ASSY	
3	S-2373-2	CONNECTOR	
2	S-2373-1	CONNECTOR	
1	C611005-0101	ALT CONTROL UNIT	

EQUIPMENT TABLE

CES-1000 IS APPLICABLE
VENDOR CODES PER S-1400
CES-XXXX=CESSNA SPEC. NO.
S-XXX OR CMXXXX=CESSNA STD. NO.

SUPERSEDES:

SUPERSEDED BY:

CONTRACT NO:

	NAME	DATE
DESIGN	TJADEN	4-11-80
GROUP	W. J. HARDEN	4-16-80
DRAWN	OBERMUELLER	4-3-80
CHECK	BORLESKE	4-4-80
STRESS		
PROJ	STICKEL	4-21-80
APPD	[illegible]	
OTHER	LWF	

Cessna AIRCRAFT CO.
PAWNEE DIVISION
5800 E. PAWNEE
WICHITA, KANSAS

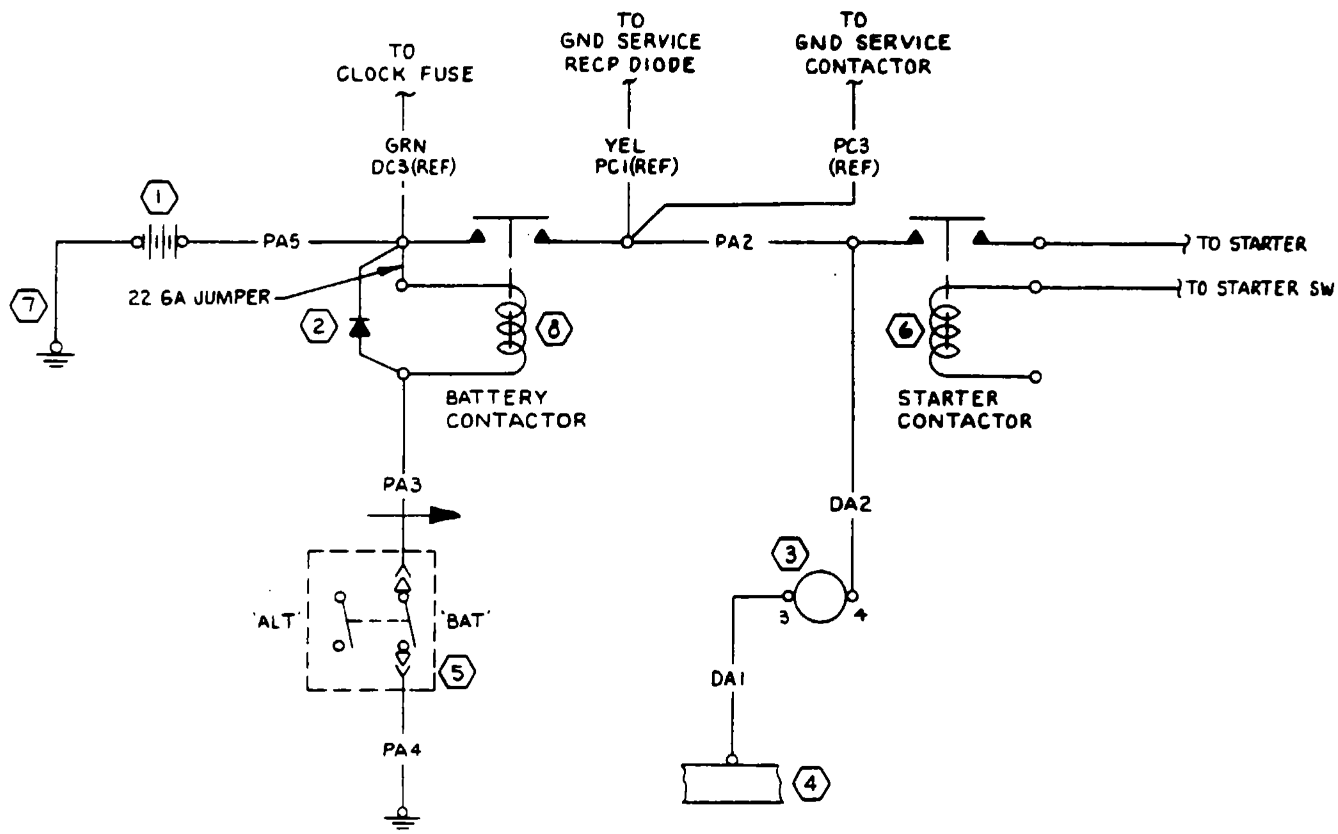
TITLE

WIRING DIAGRAM — ALTERNATOR SYSTEM 95 AMP (OPT)

SIZE	CODE IDENT. NO	DWG NO
C	71379	0770139

SCALE NONE (SR9633) PAGE: 4.3

REVISION			
LET	DESCRIPTION	DATE	APPD
A	BY REV: S-2447-4 WAS S-1367-6-13 ON PA5 WIRE (SR9633)	GLS 8-1-80	
B	BY REV: S-2443-2 WAS S-2443-1; S-2475-2 WAS S-2475-1 (SR10213)	REK 8-25-81	DES



WIRE CODE NO	GA	MATERIAL	LG	TERMINALS			SERIALS
DA2	8	S-1562-8-9		S-2447-8	S-1367-4-13		
DA1	8	S-1562-8-9		S-1367-4-10	S-1367-4-8		
PA5	4	S-1562-4-9		S-2447-4	S-2447-4		
PA4	22			S-1493-1	S-1367-1-8		
PA3	22			S-1367-1-10	S-1493-1		
PA2	4	S-1562-4-9		S-2447-4	S-2447-4		

WIRE TABLE

ITEM NO	PART NO.	DESCRIPTION	
8	S-2475-2	CONTACTOR	
7	0412007	GND STRAP	
6	S-2443-2	CONTACTOR	
5	S-1994-1-1	SWITCH	
4	2270020	BUS BAR	
3	C669545	INST CLUSTER	
2	C770728	DIODE ASSY	
1	C614002-0101	BATTERY ASSY	

EQUIPMENT TABLE

CES-1000 IS APPLICABLE
VENDOR CODES PER S-1400
CES-XXXX=CESSNA SPEC. NO.
S-XXX OR CMXXXX=CESSNA STD. NO.

SUPERSEDES:

SUPERSEDED BY:

CONTRACT NO:

	NAME	DATE
DESIGN	TJADEN	4-11-80
GROUP	W.H. HARDEN	4-18-80
DRAWN	OBERMUELLER	4-3-80
CHECK	BOZLESKE	4-4-80
STRESS		
PROJ	STICKEL	4-21-80
APPD		
OTHER	LWF	

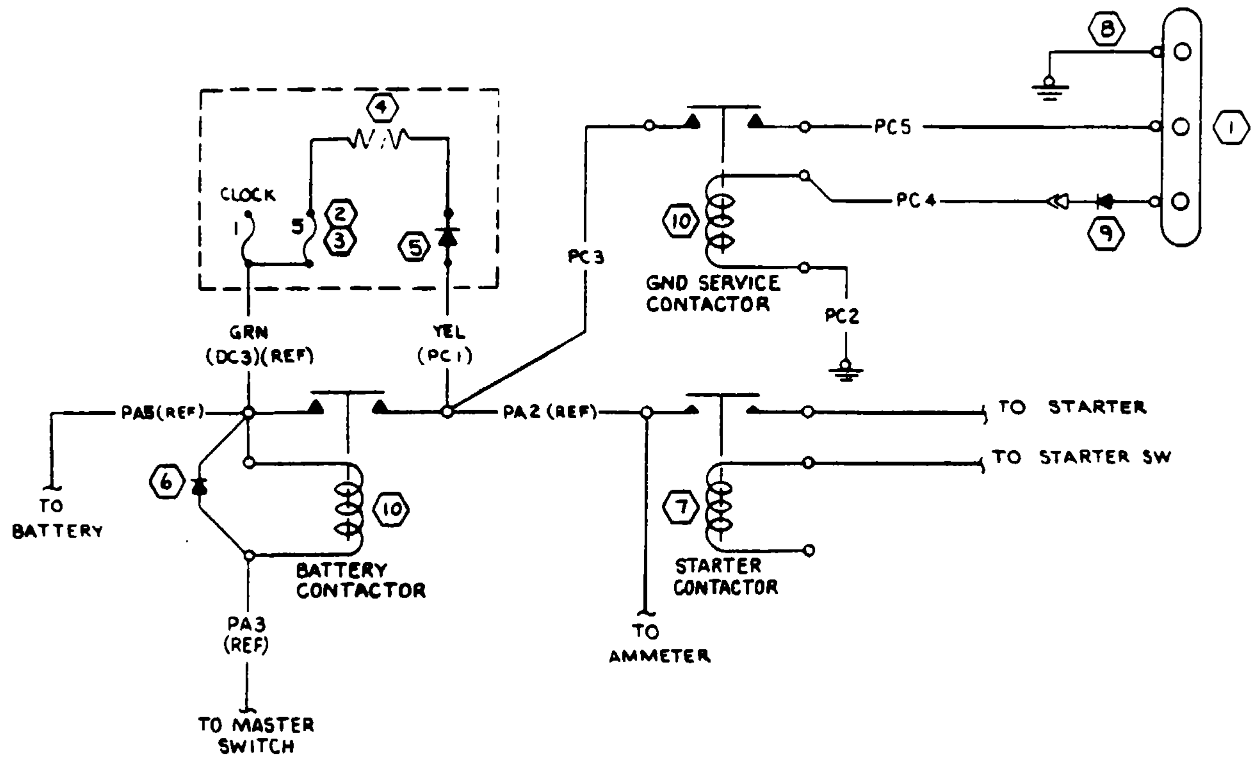
Cessna AIRCRAFT CO.
PAWNEE DIVISION
5800 E. PAWNEE
WICHITA, KANSAS

TITLE
WIRING DIAGRAM — BATTERY CIRCUIT

SIZE	CODE IDENT. NO.	DWG NO
C	71379	0770139

SCALE NONE (SR9633) PAGE: 4.4

REVISION			
LET	DESCRIPTION	DATE	APPD
A	BY REV: S-2443-2 WAS S-2443-1; S-2475-2 WAS S-2475-1 (SR10213)	REK 8-27-81	



WIRE CODE NO	GA	MATERIAL	LG	TERMINALS			SERIALS
PC5	4	S-1562-4-9		S-1367-6-14	S-2447-4		
PC4	22			S-1367-1-10	S-1493-1		
PC3	4	S-1562-4-9		S-2447-4	S-2447-4		
PC2	22			S-1367-1-10	S-1367-1-12		
YEL(PC1)	22	-22-4		SOLDER	S-1367-1-13		

WIRE TABLE

ITEM NO.	PART NO.	DESCRIPTION
10	S-2475-2	CONTACTOR
9	1570043	DIODE BOARD ASSY
8	0553010	GROUND STRAP
7	S-2443-2	CONTACTOR
6	0770728	DIODE ASSY
5	20H3P	DIODE
4	X-26263	.75 Ω RESISTOR
3	S-1090-2	FUSEHOLDER
2	S-1091-5	FUSE
1	MS3506-1	RECEPTACLE

EQUIPMENT TABLE

CES-1000 IS APPLICABLE
VENDOR CODES PER S-1400
CES-XXXX-CESSNA SPEC. NO.
S-XXX OR CMXXXX-CESSNA
STD. NO.

SUPERSEDES:

SUPERSEDED BY:

CONTRACT NO:

	NAME	DATE
DESIGN	TJADEN	4-1-80
GROUP	W.H. WARDEN	4-10-80
DRAWN	OBERMUELLER	4-3-80
CHECK	BOBLESKE	4-4-80
STRESS		
PROJ	STICKEL	4-21-80
APPD		
OTHER	LWF	

Cessna AIRCRAFT CO.
PAWNEE DIVISION
5800 E. PAWNEE
WICHITA, KANSAS

TITLE
WIRING DIAGRAM — GROUND SERVICE RECEPTACLE (OPT)

SIZE	CODE IDENT. NO.	DWG NO
C	71379	0770139

SCALE: NONE (SR9633) PAGE: 4.5

REVISION			
LET	DESCRIPTION	DATE	APPD
A	BY REV: ADD NOTE 3 (SR10100)	EEK 4-12-82	
B	BY REV: DELETE PA9: ADD RED (EEF) (SR10100)	GW 7-2-82	

NOTES:

1. INSTALL S-1071-3-18.0 TUBING OVER PA6 WIRE BEFORE INSTALLING TERMINALS
2. S-1360-15L CIRCUIT BREAKER REQUIRED WITH 2 BLADED PROP S-1360-20L CIRCUIT BREAKER REQUIRED WITH 3 BLADED PROP
3. WIRE NEEDED ONLY WHEN 2270014 BUS BAR INSTALLED.

00-00116

ITEM NO	PART NO.	DESCRIPTION
7	S2565-1	FUSE
6	S2582-1	FUSEHOLDER
15	S-1232-10	CIRCUIT BREAKER
14	S-2326-1	CIRCUIT BREAKER
13	2270020	BUS BAR
12	S-1232-5	CIRCUIT BREAKER
11	2270019	BUS BAR
10	2270014	BUS BAR
9	S-1232-2	CIRCUIT BREAKER
8	S-1360-20L	CIRCUIT BREAKER
7	S-1360-15L	CIRCUIT BREAKER
6	S-1360-10L	CIRCUIT BREAKER
5	S-1360-5L	CIRCUIT BREAKER
4	S-1232-60	CIRCUIT BREAKER
3	S-1232-35	CIRCUIT BREAKER
2	2270020	BUS BAR
1	S-2281-1	SWITCH

EQUIPMENT TABLE

WIRE CODE NO	GA	MATERIAL	LG	TERMINALS			SERIALS
PA8	8	S-1562-8-9		S-1367-4-8	S-1367-4-6		
PA7	8	S-1562-8-9		S-1367-4-8	S-1367-4-6		
PA6	8	S-1562-8-9		S-1367-4-8	S-1367-4-8	(STD)	

WIRE TABLE

CES-1000 IS APPLICABLE
VENDOR CODES PER S-1400
CES-XXXX=CESSNA SPEC. NO.
S-XXX OR CMXXXX=CESSNA STD. NO.

SUPERSEDES: PG 4.10 & 4.11

SUPERSEDED BY:

CONTRACT NO.

	NAME	DATE
DESIGN	KLEIN	10-21-81
GROUP		
DRAWN	KLEIN	10-21-81
CHECK	BOR_ESKE	1-15-82
STRESS		
PROJ		1-2-82
APPD		
OTHER		

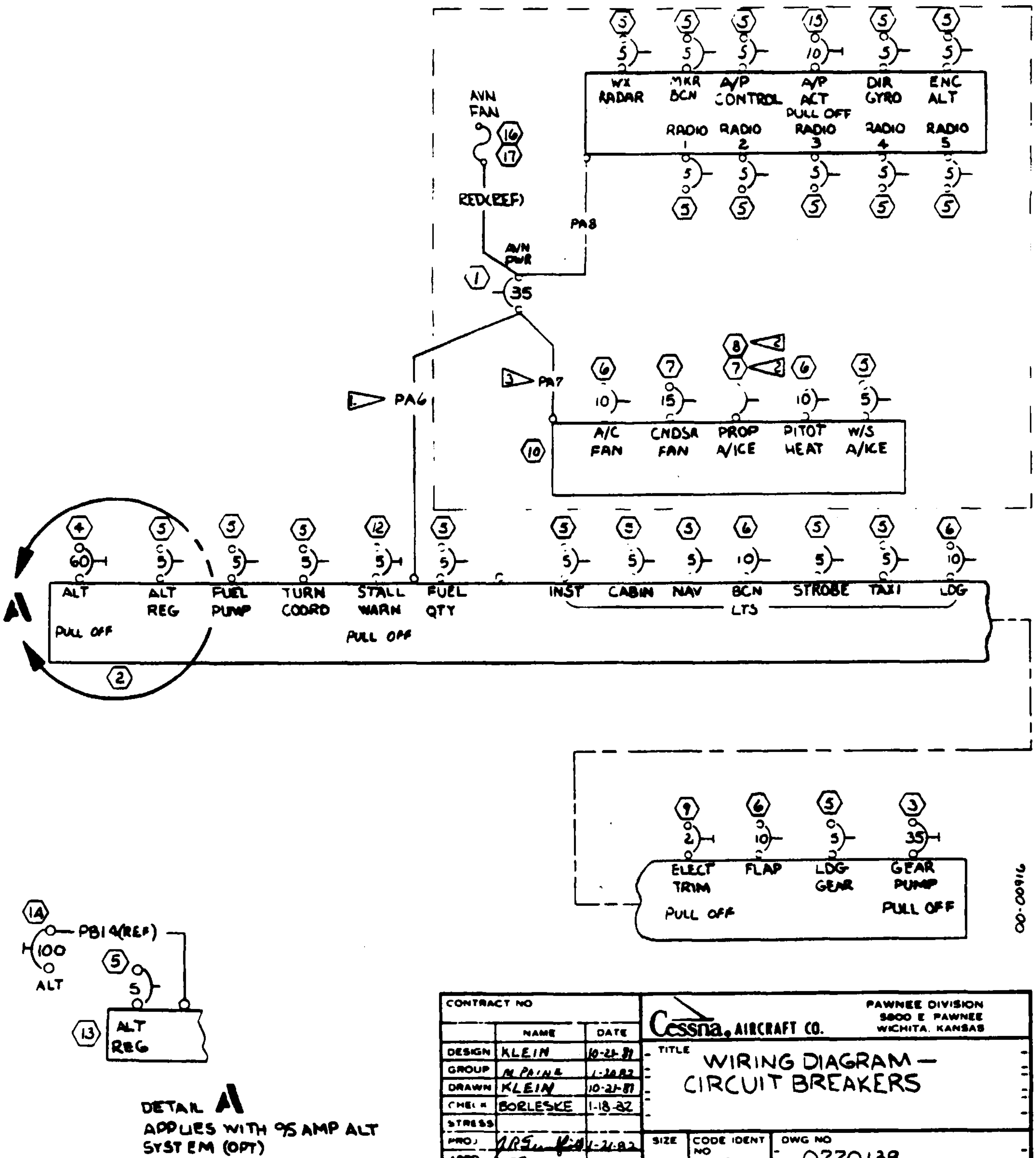
Cessna AIRCRAFT CO.
PAWNEE DIVISION
5800 E. PAWNEE
WICHITA, KANSAS

TITLE
WIRING DIAGRAM — CIRCUIT BREAKERS

SIZE	CODE IDENT. NO	DWG NO
C	71379	0770139

SCALE NONE (SR10100) PAGE: 4.20

REVISION			
LET	DESCRIPTION	DATE	APPD
B	SEE SHEET 4.6.0 FOR REVISION		

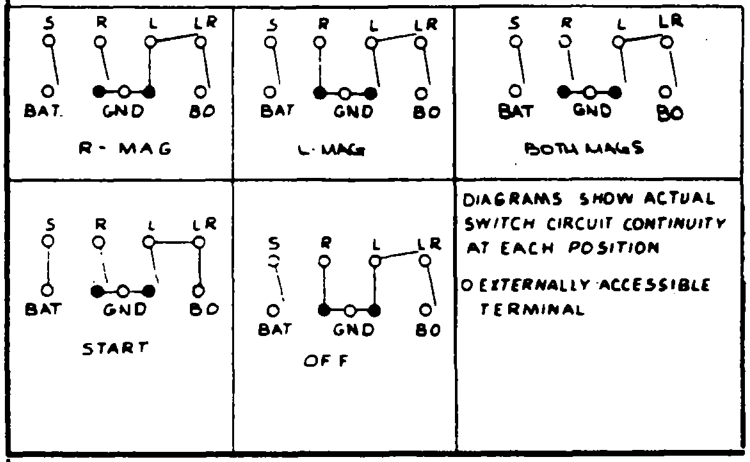


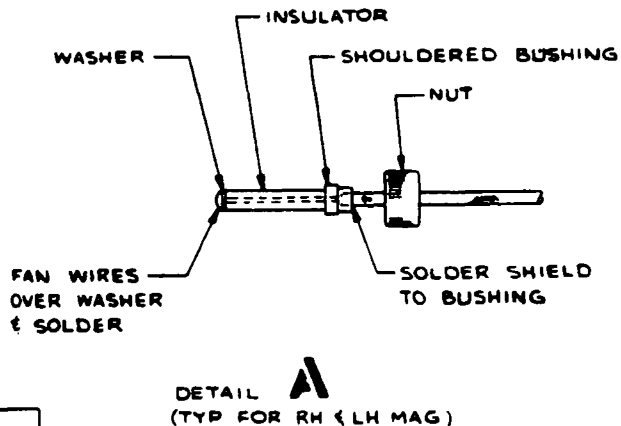
CONTRACT NO			Cessna AIRCRAFT CO. PAWNEE DIVISION 5800 E PAWNEE WICHITA, KANSAS
	NAME	DATE	TITLE WIRING DIAGRAM — CIRCUIT BREAKERS
DESIGN	KLEIN	10-21-81	
GROUP	M PAINE	1-18-82	
DRAWN	KLEIN	10-21-81	
CHECK	BORLESKE	1-18-82	
STRESS			
PROJ		1-21-82	SIZE C · CODE IDENT NO 71379 · DWG NO 0770139
APPD			
OTHER			SCALE NONE · (SR10100) · PAGE: 4.0.1

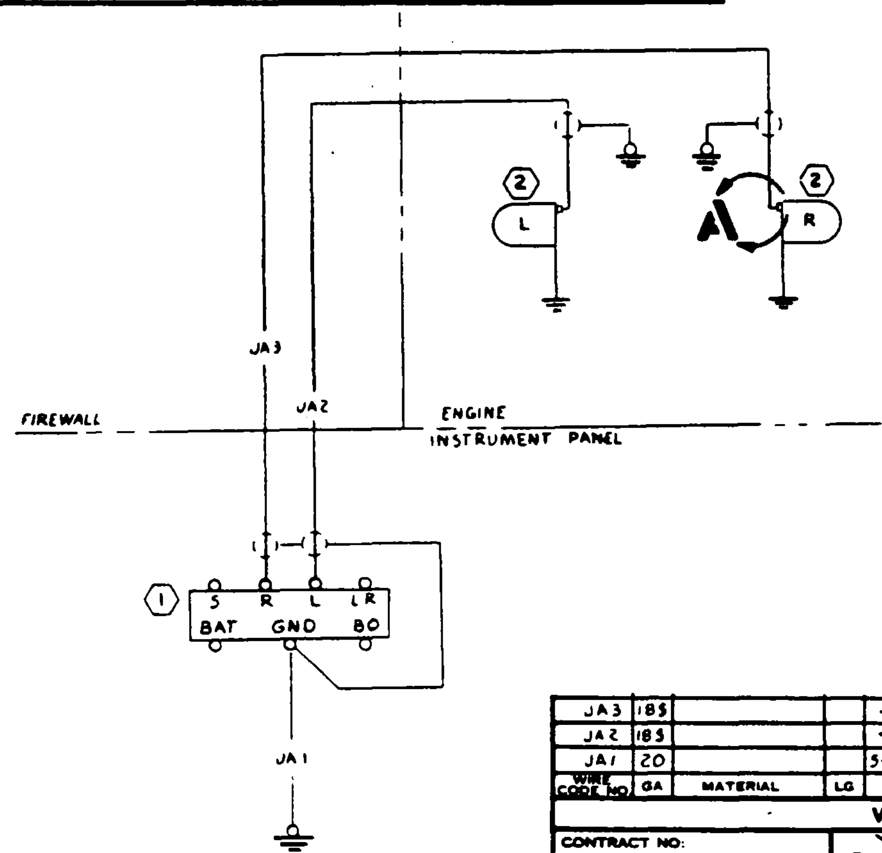
REVISION			
LET	DESCRIPTION	DATE	APPD

NOTES:

1. 5-1367-1-6 FOR CENTER CONDUCTOR
   5-1367-2-6 FOR SHIELDING
2. TERMINALS SUPPLIED WITH ENGINE







33-0916

WIRE CODE NO	GA	MATERIAL	LG	TERMINALS		SERIALS
JA3	18S			1	2	
JA2	18S			1	2	
JA1	20			5-1367-1-6	5-1367-1-8	

WIRE TABLE

ITEM NO	PART NO.	DESCRIPTION
2	D6-N-2031	MAGNETO
1	C292501-0105	IGNITION SWITCH

EQUIPMENT TABLE

CES-1000 IS APPLICABLE VENDOR CODES PER S-1400 CES-XXXX=CESSNA SPEC. NO. S-XXX OR CMXXXX=CESSNA STD. NO.

SUPERSEDES:

SUPERSEDED BY:

CONTRACT NO:

	NAME	DATE
DESIGN	TJADEN	1-11-80
GROUP	[illegible]	4-16-80
DRAWN	OBERMUELLER	4-3-80
CHECK	BORLESKE	4-4-80
STRESS		
PROJ	[illegible]	4-2-80
APPD	[illegible]	
OTHER	[illegible]	

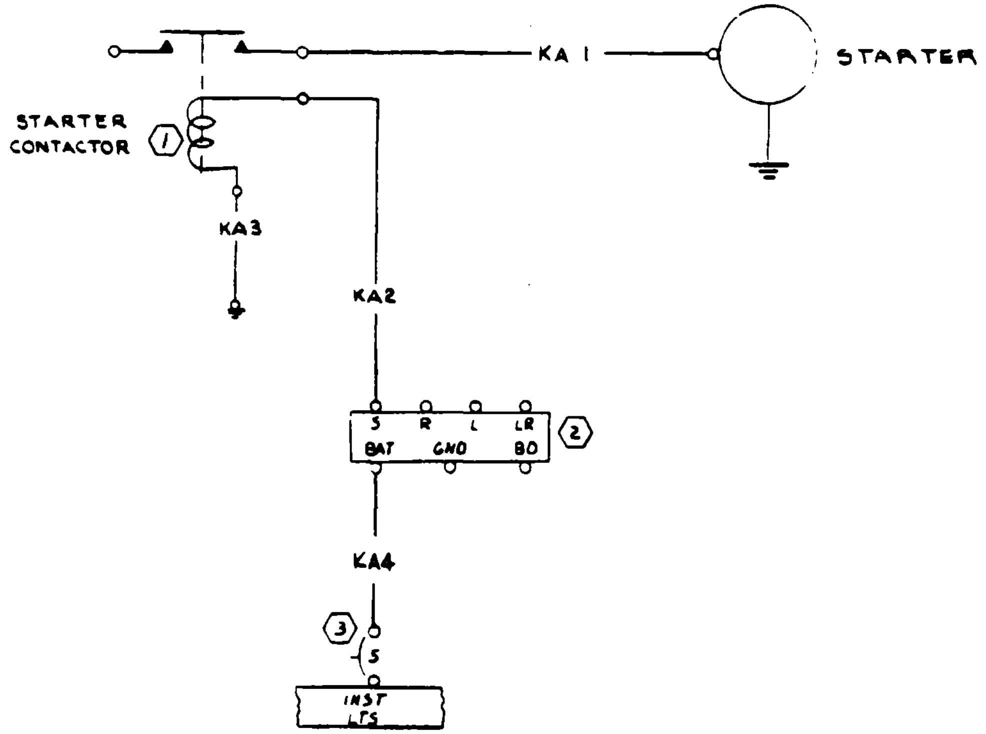
Cessna AIRCRAFT CO.
PAWNEE DIVISION
5800 E. PAWNEE
WICHITA, KANSAS

TITLE WIRING DIAGRAM — IGNITION SYSTEM

SIZE C | CODE IDENT. NO. 71379 | DWG NO 0770139

SCALE: NONE | [illegible] | PAGE: 5.1

REVISION			
LET	DESCRIPTION	DATE	APPD
A	BY REV: S-2443-2 WAS S-2443-1 (SR10213)	REK 8-25-81	JAS DES



KA 4	22			S-1367-1-6	S-1367-1-6		
KA 3	22			S-1367-1-10	S-1367-1-12		
KA 2	22			S-1367-1-10	S-1367-1-6		
KA 1	4	S-1562-4-9		S-1367-6-13	S-2447-4		
WIRE CODE NO	GA	MATERIAL	LG	TERMINALS			SERIALS

WIRE TABLE

3	S-1360-5L	CIRCUIT BREAKER	
2	C292501-0105	IGNITION SWITCH	
1	S-2443-2	STARTER CONTACTOR	
ITEM NO.	PART NO.	DESCRIPTION	

EQUIPMENT TABLE

CES-1000 IS APPLICABLE VENDOR CODES PER S-1400 CES-XXXX-CESSNA SPEC. NO. S-XXX OR CMXXXX-CESSNA STD. NO.

SUPERSEDES:

SUPERSEDED BY:

CONTRACT NO:

	NAME	DATE
DESIGN	J. TJADEN	1-11-80
GROUP	W.L. HARDEN	4-18-80
DRAWN	S. BURRIS	4-3-80
CHECK	BORLESKE	4-4-80
STRESS		
PROJ	GERICKE	4-21-80
APPD		
OTHER	LWF	

Cessna AIRCRAFT CO. PAWNEE DIVISION 5800 E. PAWNEE WICHITA, KANSAS

TITLE

WIRING DIAGRAM — STARTER SYSTEM

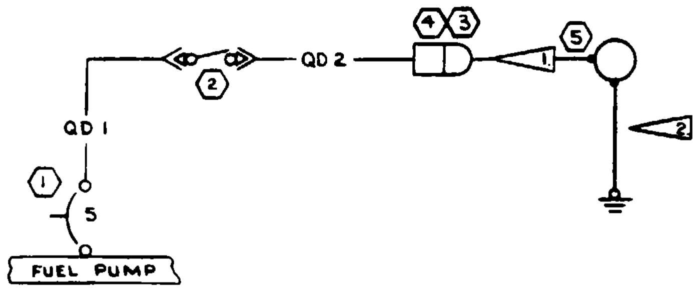
SIZE	CODE IDENT. NO.	DWG NO
C	71379	0770139

SCALE: NONE (SR 9633) PAGE: 6.1

REVISION			
LET	DESCRIPTION	DATE	APPD

NOTES:

1. TERMINATE WITH S-1635-1 PIN
2. TERMINATE WITH S-1367-1-8



33-0916

WIRE CODE NO	GA	MATERIAL	LG	TERMINALS			SERIALS
QD 2	22			S-1493-1	S-1636-1		
QD 1	22			S-1367-1-8	S-1493-1		

WIRE TABLE

ITEM NO	PART NO.	DESCRIPTION	
5	C291504-0201	FUEL PUMP	
4	S-1637-2	HOUSING	
3	S-1637-1	HOUSING	
2	S-2160-1	SWITCH	
1	S-1360-5L	CIRCUIT BREAKER	

EQUIPMENT TABLE

CES-1000 IS APPLICABLE
VENDOR CODES PER S-1400
CES-XXXX=CESSNA SPEC. NO.
S-XXX OR CMXXXX=CESSNA STD. NO.

SUPERSEDES:

SUPERSEDED BY:

CONTRACT NO:

	NAME	DATE
DESIGN	J. TJADEN	4-11-80
GROUP	JH HAZDEN	4-18-80
DRAWN	S BURRIS	4-3-80
CHECK	BOELESKE	4-4-80
STRESS		
PROJ	EFICKEL	4-21-80
APPD		
OTHER	LWF	

Cessna AIRCRAFT CO.
PAWNEE DIVISION
5800 E. PAWNEE
WICHITA, KANSAS

TITLE
WIRING DIAGRAM — FUEL PUMP

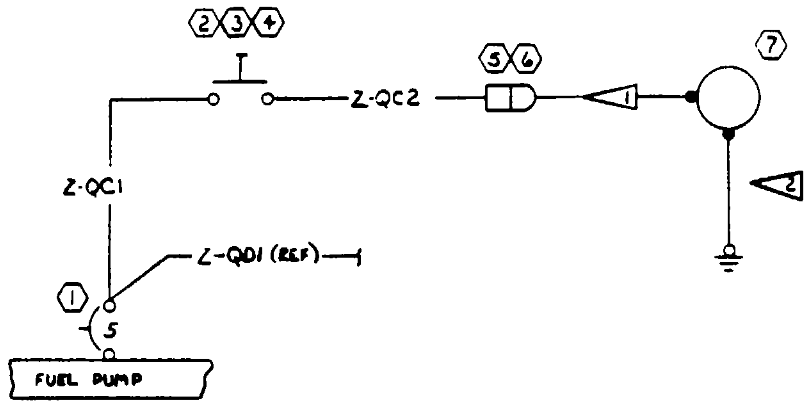
SIZE	CODE IDENT. NO.	DWG NO
C	71379	0770139

SCALE NONE (S4 9633) PAGE: 7.1

REVISION			
LET	DESCRIPTION	DATE	APPD

NOTES:

1. TERMINATE WITH S-1635-1 PIN
2. TERMINATE WITH S-1367-1-8



WIRE CODE NO	GA	MATERIAL	LG	TERMINALS		SERIALS
Z-QC2	22			SOLDER	S-1636-1	
Z-QC1	22			S-1367-4-6	SOLDER	

WIRE TABLE

ITEM NO.	PART NO.	DESCRIPTION	
7	82DX62	VALVE	
6	S-1637-1	HOUSING	
5	S-1637-2	HOUSING	
4	S-2592-3	GUARD	
3	S-2592-2	ADAPTER	
2	S-2592-1	SWITCH	
1	S-1360-5L	CIRCUIT BREAKER	

EQUIPMENT TABLE

CES-1000 IS APPLICABLE
VENDOR CODES PER S-1400
CES-XXXX-CESSNA SPEC. NO.
S-XXX OR CMXXXX-CESSNA
STD. NO.

SUPERSEDES:

SUPERSEDED BY:

CONTRACT NO:

	NAME	DATE
DESIGN	R. KLEIN	1-5-82
GROUP	M. PAINE	1-8-82
DRAWN	R. KLEIN	1-5-82
CHECK	R. E. Hane	2-8-82
STRESS		
PROJ	J.R. Sandford	2-9-82
APPD		
OTHER		

Cessna AIRCRAFT CO. PAWNEE DIVISION 5800 E. PAWNEE WICHITA, KANSAS

TITLE WIRING DIAGRAM — ELECTRIC PRIMER - T182

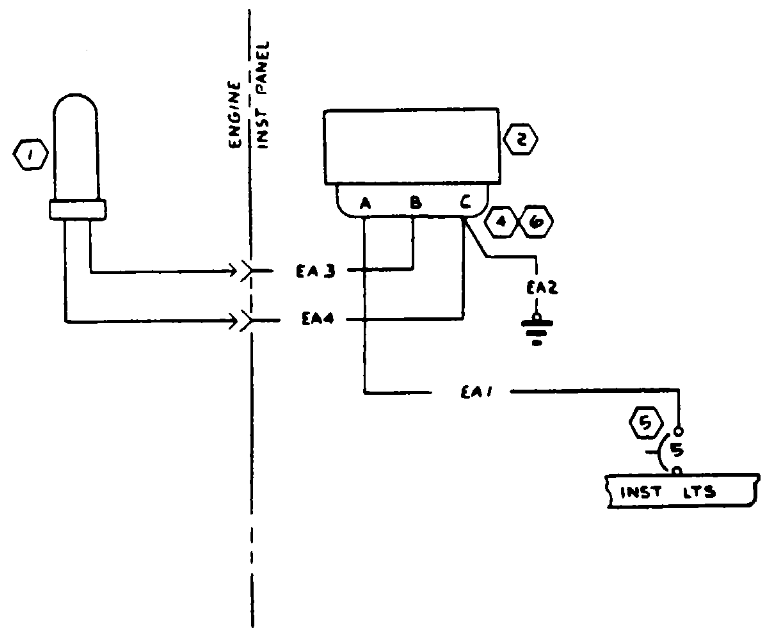
SIZE C | CODE IDENT. NO. 71379 | DWG NO 0770139

SCALE: NONE | (SR10100) | PAGE: 7.2

REVISION			
LET	DESCRIPTION	DATE	APPD

NOTES:

1. BURNDY YZ14-H FURNISHED WITH 0550209 SENDING UNIT



WIRE CODE NO	GA	MATERIAL	LG	TERMINALS			SERIALS
EA4	22			SOLDER	YZ14-H	1.	
EA3	22			SOLDER	YZ14-H	1	
EA2	22			SOLDER	S1367-1-8		
EA1	22			SOLDER	S1367-1-6		

WIRE TABLE

ITEM NO	PART NO.	DESCRIPTION	
6	MS3057-6A	CLAMP	
5	S-1360-5L	CIRCUIT BREAKER	
4	MS3106A-14S-7S	PLUG	
3	C669502-0211	INST CLUSTER	
2	S-1311-4	INDICATOR	
1	0550209	SENDING UNIT-CARB AIR	

EQUIPMENT TABLE

CES-1000 IS APPLICABLE VENDOR CODES PER S-1400 CES-XXXX=CESSNA SPEC. NO. S-XXX OR CMXXXX=CESSNA STD. NO.

SUPERSEDES:

SUPERSEDED BY:

CONTRACT NO:

	NAME	DATE
DESIGN	J TJADEN	4-60
GROUP	W.H. HARDEN	4-15-60
DRAWN	S BURRIS	4-3-80
CHECK	BOELESKE	4-4-80
STRESS		
PROJ	EFICKEL	4-2-80
APPD		
OTHER		

Cessna AIRCRAFT CO.

PAWNEE DIVISION
5800 E. PAWNEE
WICHITA, KANSAS

TITLE
WIRING DIAGRAM — CARBURETOR AIR TEMP

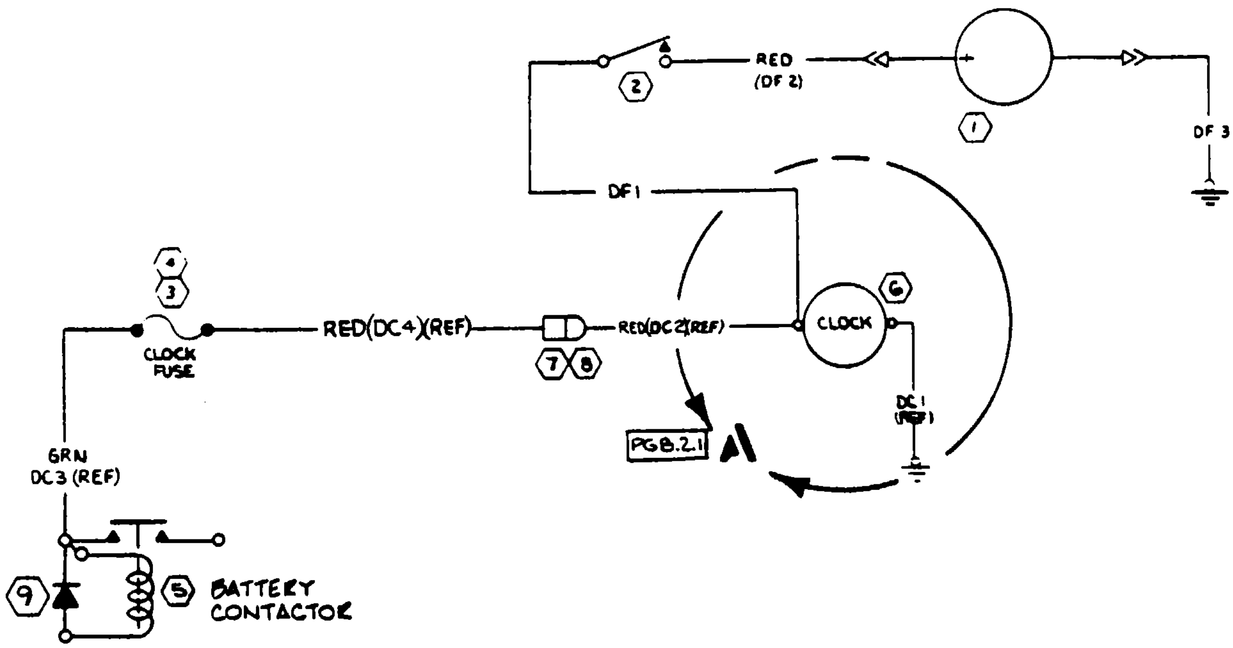
SIZE	CODE IDENT. NO.	DWG NO
C	71379	077C139

SCALE: NONE (SR 5633) PAGE: B.1

REVISION			
LET	DESCRIPTION	DATE	APPD
A	BY REV: S1367-1-8/ DF1, DF2 & DF4 WAS S-1367-1-6 [illegible]	GW 7-8-82	[illegible]

NOTES:

1. REQD ONLY WHEN OPTIONAL DIGITAL CLOCK C664511 IS INSTALLED



RED(DF4)	22	-22-2		S-1367-1-8	S-1635-2	1	
DF3	22			S-1493-1	S-1367-1-8		
RED (DF2)	22	-22-2		S-1493-1	S-1367-1-8		
DF1	22			S-1367-1-6	S-1367-1-8		
WIRE CODE NO	GA	MATERIAL	LG	TERMINALS			SERIALS

WIRE TABLE

10	C664511-0102	DIGITAL CLOCK	
9	0770728	DIODE ASSY	
8	S-1637-1	HOUSING	
7	S-1637-2	HOUSING	
6	C664508-0102	CLOCK ASSY	
5	S-2475-1	BATTERY CONTACTOR	
4	S-1090-22	FUSEHOLDER	
3	S-1091-1	FUSE	
2	S-1711-1	OIL PRESSURE SWITCH	
1	C664503-0101	HOURMETER	
ITEM NO.	PART NO.	DESCRIPTION	

EQUIPMENT TABLE

CES-1000 IS APPLICABLE
VENDOR CODES PER S-1400
CES-XXXX=CESSNA SPEC. NO.
S-XXX OR CMXXXX=CESSNA STD. NO.

SUPERSEDES:

SUPERSEDED BY:

CONTRACT NO:

	NAME	DATE
DESIGN	TJADEN	1-11-80
GROUP	[illegible]	4-18-80
DRAWN	OBERMUELLER	4-3-80
CHECK	BOELESKE	4-4-80
STRESS		
PROJ	[illegible]	4-21-80
APPD	[illegible]	
OTHER	[illegible]	

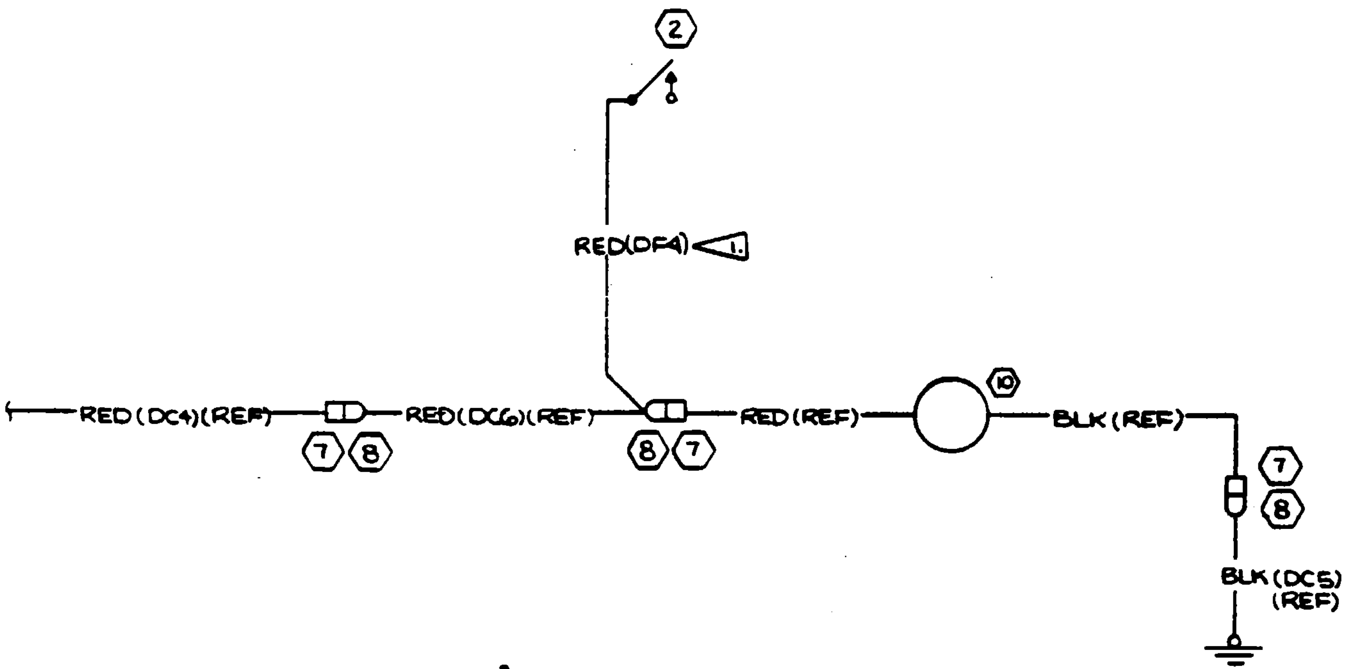
Cessna AIRCRAFT CO.
PAWNEE DIVISION
5800 E. PAWNEE
WICHITA, KANSAS

TITLE
WIRING DIAGRAM — HOURMETER (OPT)

SIZE	CODE IDENT. NO.	DWG NO
C	71379	0770139

SCALE: NONE (SR°633) PAGE: 8.2.0

REVISION			
LET	DESCRIPTION	DATE	APPD



DETAIL A PG8.2.0
(REQD WHEN OPT DIGITAL CLOCK IS INSTALLED)

33-0916

CONTRACT NO:		
	NAME	DATE
DESIGN	J TJADEN	4-11-80
GROUP	W.H. HARDEN	4-18-80
DRAWN	S. BURRIS	4-3-80
CHECK	BORLESKE	6-4-80
STRESS		
PROJ	GF, LEL	6-2-80
APPD	JKG	
OTHER	/ ..r	

Cessna AIRCRAFT CO. PAWNEE DIVISION 5800 E. PAWNEE WICHITA, KANSAS

TITLE WIRING DIAGRAM - HOURMETER (OPT)

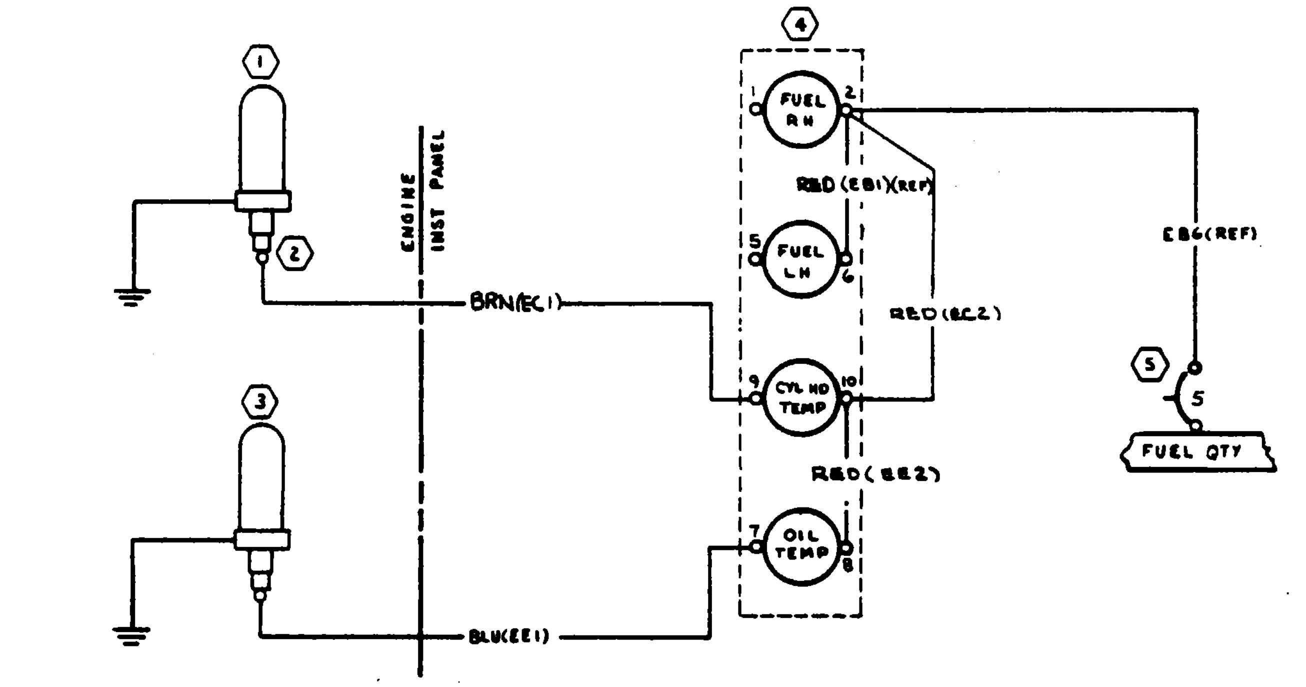
SIZE	CODE IDENT NO	DWG NO
C	71379	0770139
SCALE NONE	(SR9633)	PAGE: 8.2.1

REVISION			
LET	DESCRIPTION	DATE	APPD

NOTES:

1. MATERIAL IS ALPHA 5857-7 (VENDOR CODE 92194) OR BELDEN 83009-1 (VENDOR CODE 70903)

2. MATERIAL IS ALPHA 5857-6 (VENDOR CODE 92194) OR BELDEN 83009-6 (VENDOR CODE 70903)



33-0916

RED(EC2)	22	-22-2		S-1367-1-10	S-1367-1-10		
BRN(EC1)	18	1		S-1367-1-10	S-1362-1-4		
RED(EE2)	22	-22-2		S-1367-1-10	S-1367-1-10		
BLU(EE1)	18	2		S-1367-1-10	S-1367-1-10		
WIRE CODE NO	GA	MATERIAL	LG	TERMINALS			SERIALS

WIRE TABLE

ITEM NO.	PART NO.	DESCRIPTION
5	S-1360-5L	CIRCUIT BREAKER
4	C669545-0108	INST CLUSTER
3	S-2335-1	SENDING UNIT
2	S-1637-4	HOUSING - PLUG
1	S-2334-1	SENDING UNIT

EQUIPMENT TABLE

CES-1000 IS APPLICABLE
VENDOR CODES PER S-1400
CES-XXXX=CESSNA SPEC. NO.
S-XXX OR CMXXXX=CESSNA STD. NO.

SUPERSEDES:

SUPERSEDED BY:

CONTRACT NO:

	NAME	DATE
DESIGN	J. TJADEN	4-11-80
GROUP	W. HARDEN	4-18-80
DRAWN	S. BURRIS	4-3-80
CHECK	BOLESKE	4-4-80
STRESS		
PROJ	FICKEL	4-21-80
APPD	[illegible]	
OTHER	LWF	

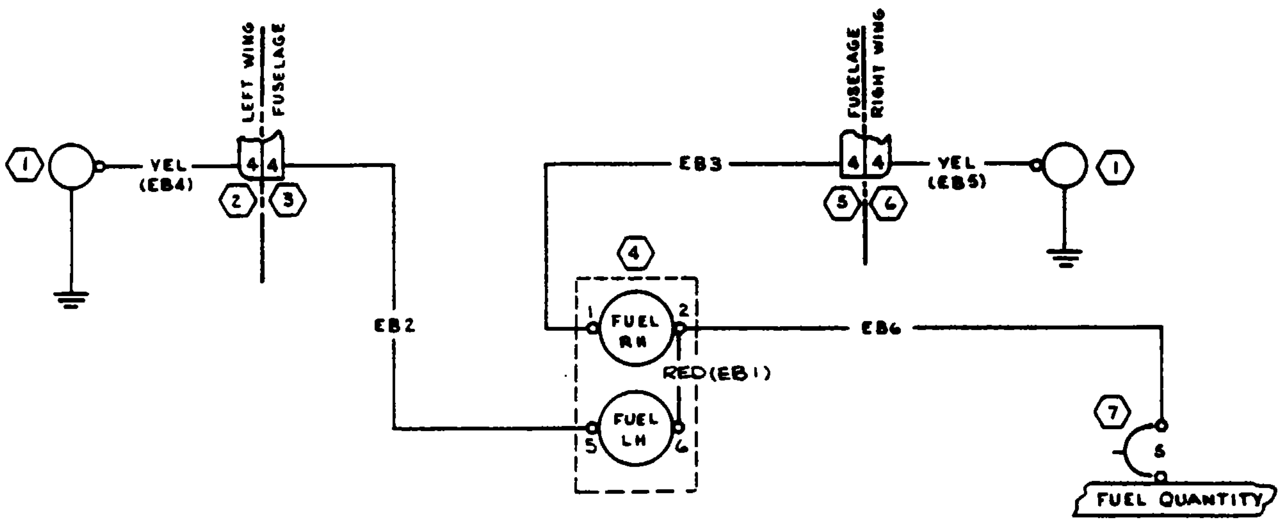
Cessna AIRCRAFT CO.
PAWNEE DIVISION
5800 E. PAWNEE
WICHITA, KANSAS

TITLE
WIRING DIAGRAM — CYLINDER HEAD TEMP & OIL TEMPERATURE

SIZE	CODE IDENT. NO.	DWG NO
C	71379	0770139

SCALE: NONE (SR 9633) PAGE: 8.3

REVISION			
LET	DESCRIPTION	DATE	APPD



33-0916

WIRE CODE NO	GA	MATERIAL	LG	TERMINALS			SERIALS
EB6	22			S-1367-1-10	S-1367-1-6		
YEL(EB5)	22	-22-4		S-1367-1-8	S-1635-1		
YEL(EB4)	22	-22-4		S-1367-1-8	S-1635-1		
EB 3	22			S-1367-1-10	S-1636-1		
EB 2	22			S-1367-1-10	S-1636-1		
RED(EB1)	22	-22-2		S-1367-1-10	S 1367-1-10		

WIRE TABLE

ITEM NO	PART NO.	DESCRIPTION	
7	S-1360-5L	CIRCUIT BREAKER	
6	S-1640-9	HOUSING	
5	S-1641-9	HOUSING	
4	C669545-0108	INST CLUSTER	
3	S-1641-6	HOUSING	
2	S-1640-6	HOUSING	
1	C668050	FUEL LEVEL XMTR	

EQUIPMENT TABLE

CES-1000 IS APPLICABLE VENDOR CODES PER S-1400 CES-XXXX=CESSNA SPEC. NO. S-XXX OR CMXXXX=CESSNA STD. NO.

SUPERSEDES:

SUPERSEDED BY:

CONTRACT NO:

	NAME	DATE
DESIGN	J. TJADEN	4-11-80
GROUP	W. HARDEN	4-18-80
DRAWN	S. BURRIS	4-3-80
CHECK	BORLESKE	4-4-80
STRESS		
PROJ	G. FICKEL	4-21-80
APPD	JRG	
OTHER	/ _WF	

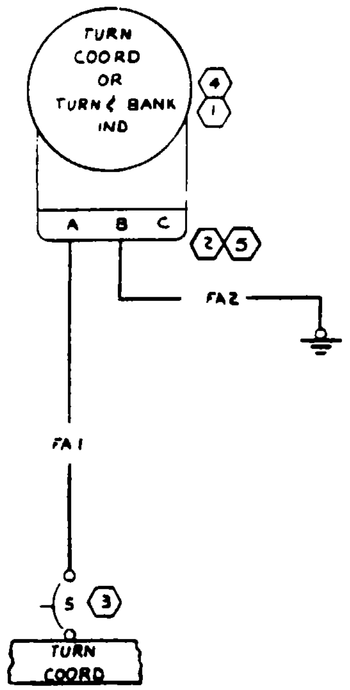
Cessna AIRCRAFT CO. PAWNEE DIVISION 5800 E. PAWNEE WICHITA, KANSAS

TITLE WIRING DIAGRAM — FUEL QUANTITY INDICATORS

SIZE	CODE IDENT. NO.	DWG NO
C	71379	0770139

SCALE: NONE (SR 9633) PAGE: 8.4

REVISION			
LET	DESCRIPTION	DATE	APPD



33-0916

WIRE CODE NO	GA	MATERIAL	LG	TERMINALS		SERIALS
FA2	22			SOLDER	S-1367-1-8	
FA1	22			S-1367-1-6	SOLDER	

WIRE TABLE

ITEM NO.	PART NO.	DESCRIPTION
5	MS 3057-4A	CLAMP
4	S-1303-2	INDICATOR, T & B
3	S-1360-5L	CIRCUIT BREAKER
2	MS3106AICSL3S	CONNECTOR
1	C661003-0506	TURN COORDINATOR

EQUIPMENT TABLE

CES-1000 IS APPLICABLE VENDOR CODES PER S-1400 CES-XXXX=CESSNA SPEC. NO. S-XXX OR CMXXXX=CESSNA STD. NO.

SUPERSEDES:

SUPERSEDED BY:

CONTRACT NO:

	NAME	DATE
DESIGN	J. TJADEN	4-11-80
GROUP	WJ HARDEN	4-8-80
DRAWN	S. BURRIS	4-3-80
CHECK	BOELESKE	4-4-80
STRESS		
PROJ	CB FICKEL	4-21-80
APPD		
OTHER		

Cessna AIRCRAFT CO.

PAWNEE DIVISION
5800 E. PAWNEE
WICHITA, KANSAS

TITLE
WIRING DIAGRAM —
TURN COORDINATOR (STD)
TURN & BANK INDICATOR (OPT)

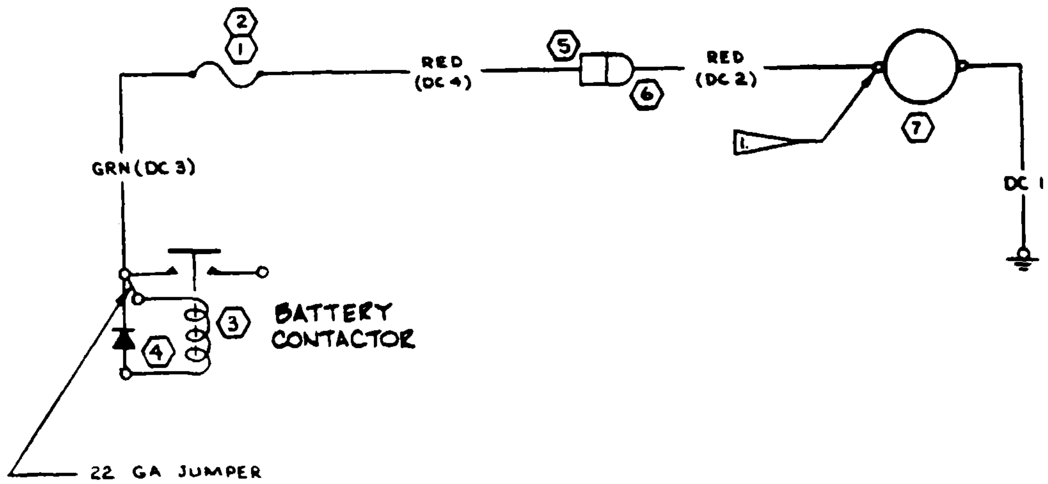
SIZE	CODE IDENT. NO.	DWG NO
C	71379	0770139

SCALE: NONE (SR 9633) PAGE: 9.1

REVISION			
LET	DESCRIPTION	DATE	APPD

NOTES:

1. CAUTION: POWER WIRE MUST BE CONNECTED TO "BATT" TERMINAL OF CLOCK OTHERWISE INTERNAL DAMAGE TO UNIT WILL RESULT



33-0916

WIRE CODE NO	GA	MATERIAL	LG	TERMINALS			SERIALS
RED(DC 4)	22	-22-2		S-1636-1	SOLDER		
GRN(DC 3)	22	-22-5		S-1367-1-14	SOLDER		
RED(DC 2)	22	-22-2		S-1635-1	S-1367-1-6		
DC 1	22			S-1367-1-6	S-1367-1-8		

WIRE TABLE

ITEM NO.	PART NO.	DESCRIPTION	
7	C664508-0102	CLOCK ASSY	
6	S-1637-1	HOUSING	
5	S-1637-2	HOUSING	
4	0770728	DIODE ASSY	
3	S-2475-1	BATTERY CONTACTOR	
2	S-1090-22	FUSE HOLDER	
1	S-1091-1	FUSE	

EQUIPMENT TABLE

CES-1000 IS APPLICABLE
VENDOR CODES PER S-1400
CES-XXXX=CESSNA SPEC. NO.
S-XXX OR CMXXXX=CESSNA STD. NO.

SUPERSEDES:

SUPERSEDED BY:

CONTRACT NO:

	NAME	DATE
DESIGN	J. TJADEN	4-11-80
GROUP	D.H. HARDEN	4-18-80
DRAWN	S. BURRIS	4-3-80
CHECK	BORLESKE	4-4-80
STRESS		
PROJ	CFICKEL	4-21-80
APPD		
OTHER	LWF	

Cessna AIRCRAFT CO.
PAWNEE DIVISION
5800 E. PAWNEE
WICHITA, KANSAS

TITLE
WIRING DIAGRAM — CLOCK

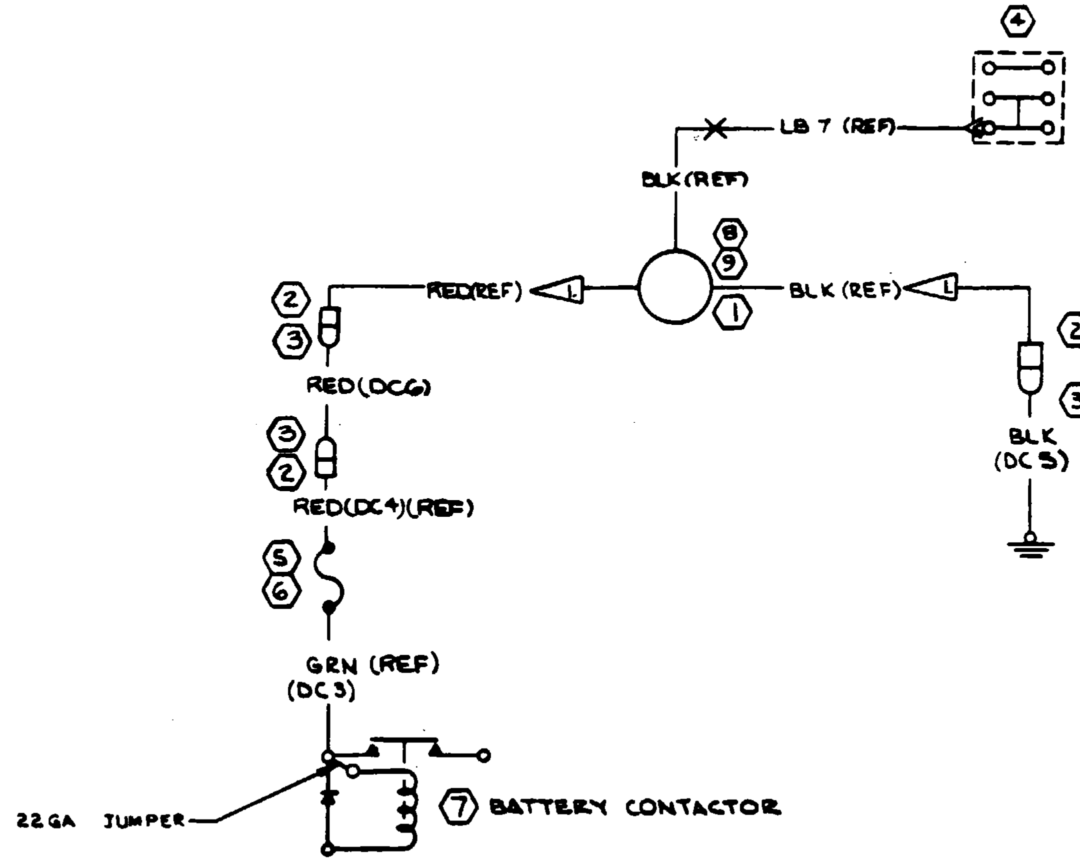
SIZE	CODE IDENT. NO.	DWG NO
C	71379	0770139

SCALE: NONE (SR 9633) PAGE: 10.1

REVISION			
LET	DESCRIPTION	DATE	APPD

NOTES:

1. ▷ INSTALL S-1636-1 ON VENDOR WIRE



33-0916

BLK(REF)				◁1			
RED(REF)				◁1			
RED(DC6)	22	-22-2		S-1635-1	S-1635-1		
BLK(DC5)	18	-18-0		S-1635-1	S-1367-1-8		
WIRE CODE NO	GA	MATERIAL	LG	TERMINALS			SERIALS

WIRE TABLE

ITEM NO.	PART NO.	DESCRIPTION	
9	S-2413-1	SOCKET	
8	MS25231-1619	LIGHT	
7	S-2475-1	CONTACTOR	
6	S-1091-1	FUSE	
5	S-1090-22	FUSEHOLDER	
4	34003-817	TERMINAL BLOCK	
3	S-1637-1	HOUSING	
2	S-1637-2	HOUSING	
1	C664511-0102	DIGITAL CLOCK	

EQUIPMENT TABLE

CES-1000 IS APPLICABLE VENDOR CODES PER S-1400
CES-XXXX-CESSNA SPEC. NO.
S-XXX OR CMXXXX-CESSNA STD. NO.

SUPERSEDES:

SUPERSEDED BY:

CONTRACT NO:

	NAME	DATE
DESIGN	J. TJADEN	4-11-80
GROUP	W.H. HARDEN	4-8-80
DRAWN	S. BURRIS	4-3 80
CHECK	BOKLESKE	4-4-80
STRESS		
PROJ	GFICKEL	4-21-80
APPD	URG	
OTHER	LWF	

Cessna AIRCRAFT CO.
PAWNEE DIVISION
5800 E. PAWNEE
WICHITA, KANSAS

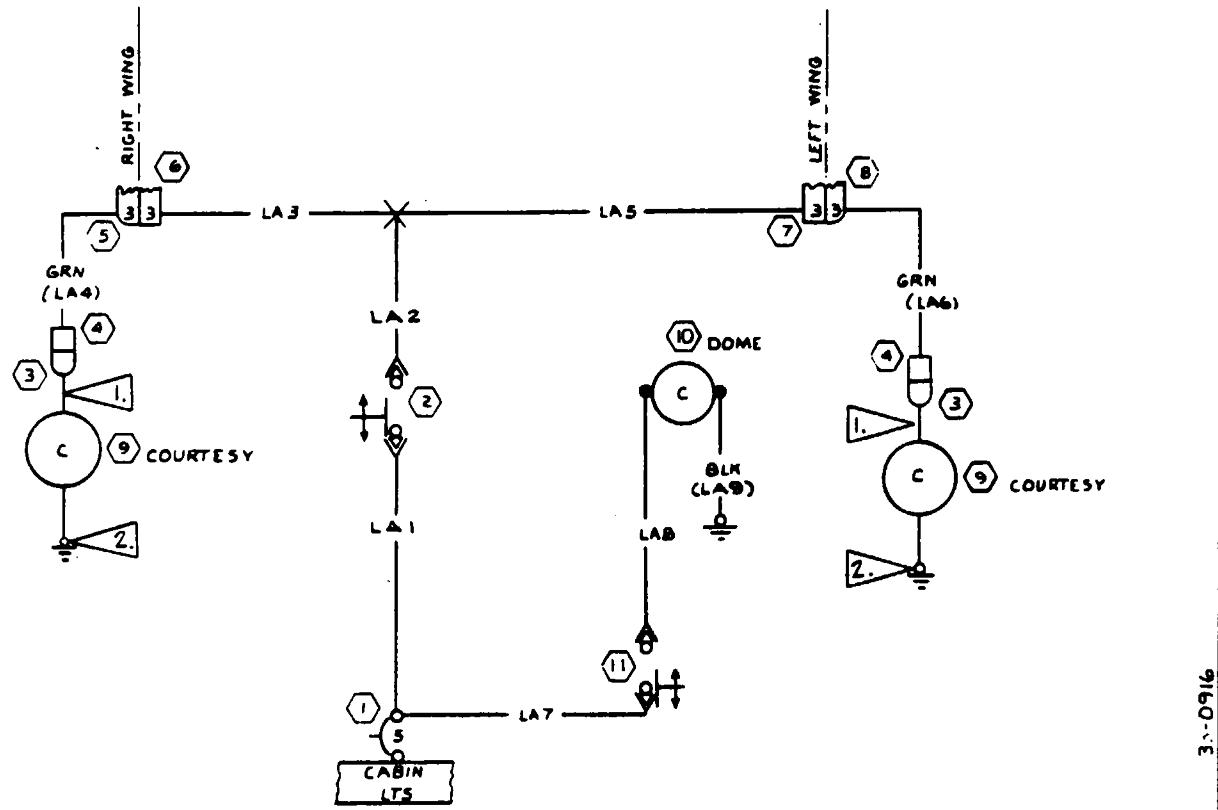
TITLE
WIRING DIAGRAM — DIGITAL CLOCK (OPT)

SIZE	CODE IDENT. NO.	DWG NO	
C	71379	0770139	
SCALE: NONE		(SR9633)	PAGE: 10.2

NOTES

1. INSTALL S-1635-1 TERMINAL ON VENDOR WIRE
2. INSTALL S-1367-1-6 TERMINAL ON VENDOR WIRE

REVISION			
LET	DESCRIPTION	DATE	APPD
A	BY REV: ADD S-2160-1 SWITCH ITEM 11; S-2160-1 WAS S-1831-1 PER DOME LT SWITCH; S-1493-1 WAS S-1830-1 TERMINAL ON LA7 & LA8 WIRES (SR9633)(REF)	GLS 6/23/81	JAB JRG LWF



BLK (LA9)	22	-22-0		SOLDER	S-1367-1-8	(STD)	
LA8	22			S-1493-1	SOLDER		
LA7	22			S-1367-1-6	S-1493-1		
GRN (LA6)	22	-22-5		S-1635-1	S-1636-1		
LA5	22			SEE LA2	S-1636-1		
GRN (LA4)	22	-22-5		S-1635-1	S-1636-1		
LA3	22			SEE LA2	S-1636-1		
LA2	22			S-1830-1	S-1370-1		
LA1	22			S-1367-1-6	S-1830-1	(STD)	
WIRE CODE NO	GA	MATERIAL	LG	TERMINALS			SERIALS

WIRE TABLE

ITEM NO	PART NO.	DESCRIPTION	
11	S-2160-1	SWITCH	
10	MS25231-313	LAMP	
9	MS15584-8	LAMP	
8	S-1640-6	HOUSING - PIN	
7	S-1641-6	HOUSING - SOCKET	
6	S-1641-9	HOUSING - SOCKET	
5	S-1640-9	HOUSING - PIN	
4	S-1637-2	HOUSING	
3	S-1637-1	HOUSING	
2	S-1831-1	SWITCH	
1	S-1360-5L	CIRCUIT BREAKER	

EQUIPMENT TABLE

CES-1000 IS APPLICABLE
VENDOR CODES PER S-1400
CES-XXXX=CESSNA SPEC. NO.
S-XXX OR CMXXXX=CESSNA STD. NO.

SUPERSEDES:

SUPERSEDED BY:

CONTRACT NO:

	NAME	DATE
DESIGN	TJADEN	1-11-80
GROUP	OH HARDIN	4-16-80
DRAWN	OBERMUELLER	4-3-80
CHECK	BORLESKE	4-4-80
STRESS		
PROJ	OFICKEL	4-21-80
APPD		
OTHER	LWF	

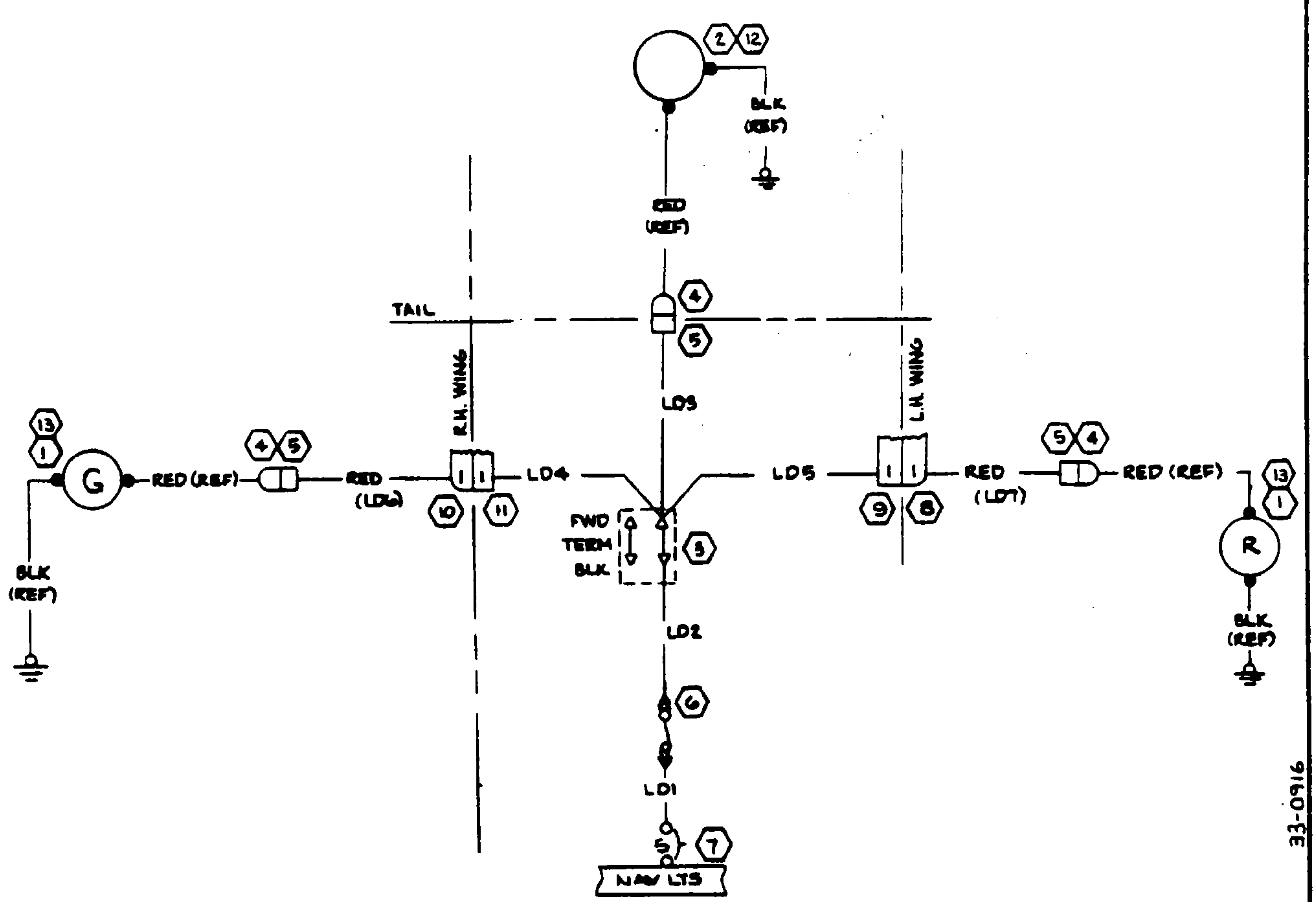
Cessna AIRCRAFT CO.
PAWNEE DIVISION
5800 E. PAWNEE
WICHITA, KANSAS

TITLE
WIRING DIAGRAM — DOME LIGHT (STD) & COURTESY LIGHTS (OPT)

SIZE	CODE IDENT. NO.	DWG NO
C	71379	0770139

SCALE: NONE (SR9633) PAGE: 1 1

REVISION			
LET	DESCRIPTION	DATE	APPD



WIRE CODE NO	GA	MATERIAL	LG	TERMINALS			SERIALS
RED(LD7)	20	-20 -2		S-1665-1	S-1656-1		
RED(LD6)	20	-20 -2		S-1636-1	S-1686-1		
LD5	22			S-1686-1	S-1829-1		
LD4				S-1636-1	S-1829-1		
LD3				S-1636-1	S-1829-1		
LD2				S-1829-1	S-1493-1		
LD1	22			S1367-1-6	S-1493-1		

WIRE TABLE

	PART NO.	DESCRIPTION	
13	MS25309-7512	LAMP	
12	MS35478-307	LAMP	
11	S-1641-9	HOUSING	
10	S-1640-9	HOUSING	
9	S-1641-6	HOUSING	
8	S-1640-6	HOUSING	
7	S-1360-5L	CIRCUIT BREAKER	
6	S-2160-1	SWITCH	
5	S-1657-2	HOUSING	
4	S-1657-1	HOUSING	
3	34002-05	TERM BLOCK	
2	C622001-0102	LIGHT ASSY	
1	C622001-0201	LIGHT ASSY	

EQUIPMENT TABLE

CES-1000 IS APPLICABLE
VENDOR CODES PER S-1400
CES-XXXX=CESSNA SPEC. NO.
S-XXX OR CXXXXX=CESSNA STD. NO.

SUPERSEDES:

SUPERSEDED BY:

CONTRACT NO:

	NAME	DATE
DESIGN	TJADEN	4-11-80
GROUP	D.H. HARDEN	4-18-80
DRAWN	OBERMUELLER	4-3-80
CHECK	BORLESKE	4-4-80
STRESS		
PROJ	GFICKEL	4-21-80
APPD	JKB	
OTHER	LIP	

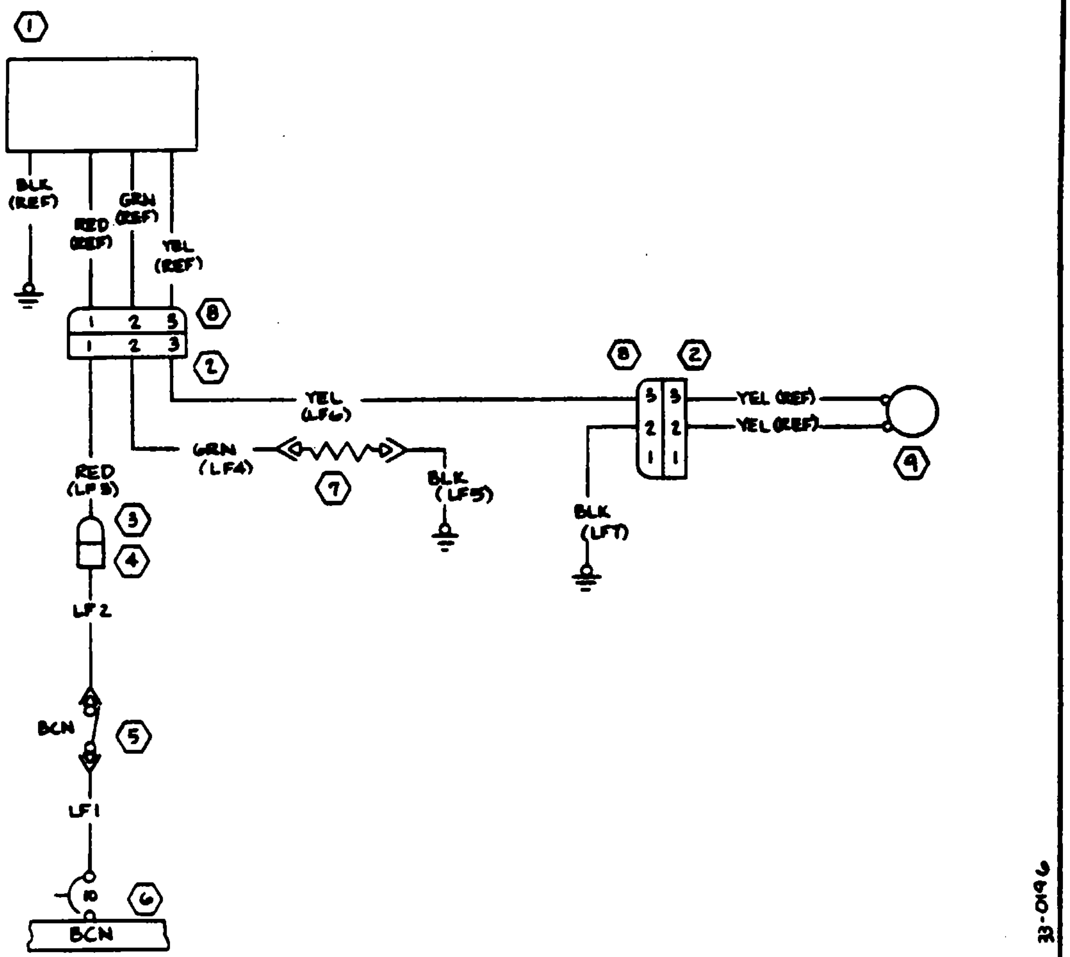
Cessna AIRCRAFT CO.
PAWNEE DIVISION
5800 E. PAWNEE
WICHITA, KANSAS

TITLE
WIRING DIAGRAM — NAVIGATION LIGHTS

SIZE	CODE IDENT. NO.	DWG NO
C	71379	0770139

SCALE: NONE (SR9635) PAGE: 11.2

REVISION			
LET	DESCRIPTION	DATE	APPD



WIRE CODE NO	GA	MATERIAL	LG	TERMINALS			SERIALS
BLK (LF7)	18	-18-0		S-1635-1	S-1367-1-8		
YEL (LF6)		-18-4		S-1636-1	S-1635-1		
BLK (LF5)		-18-0		S-1493-1	S-1367-1-8		
GRN (LF4)		-18-5		S-1636-1	S-1493-1		
RED (LF3)		-18-2		S-1639-1	S-1636-1		
LF2				S-1493-1	S-1636-1		
LF1	18			S-1367-1-6	S-1493-1		

WIRE TABLE

ITEM NO	PART NO.	DESCRIPTION	
9	C621001-0102	LIGHT ASSY	
8	S-1638-2	HOUSING	
7	OR95-6	RESISTOR	
6	S-1360-10L	CIRCUIT BREAKER	
5	S-2160-1	SWITCH	
4	S-1637-2	HOUSING	
3	S-1637-1	HOUSING	
2	S-1638-1	HOUSING	
1	C594502-0102	FLASHER ASSY	

EQUIPMENT TABLE

CES-1000 IS APPLICABLE
VENDOR CODES PER S-1400
CES-XXXX=CESSNA SPEC. NO.
S-XXX OR CMXXXX=CESSNA STD. NO.

SUPERSEDES:

SUPERSEDED BY:

CONTRACT NO:

	NAME	DATE
DESIGN	TJADEN	4-11-80
GROUP	W.H.HARDEN	4-18-80
DRAWN	OBERMUELLER	4-3-80
CHECK	BORLESKE	4-4-80
STRESS		
PROJ	GRICKEL	4-21-80
APPD	JHS	
OTHER	LIF	

Cessna AIRCRAFT CO.
PAWNEE DIVISION
5800 E. PAWNEE
WICHITA, KANSAS

TITLE
WIRING DIAGRAM — FLASHING BEACON LIGHT (OPT)

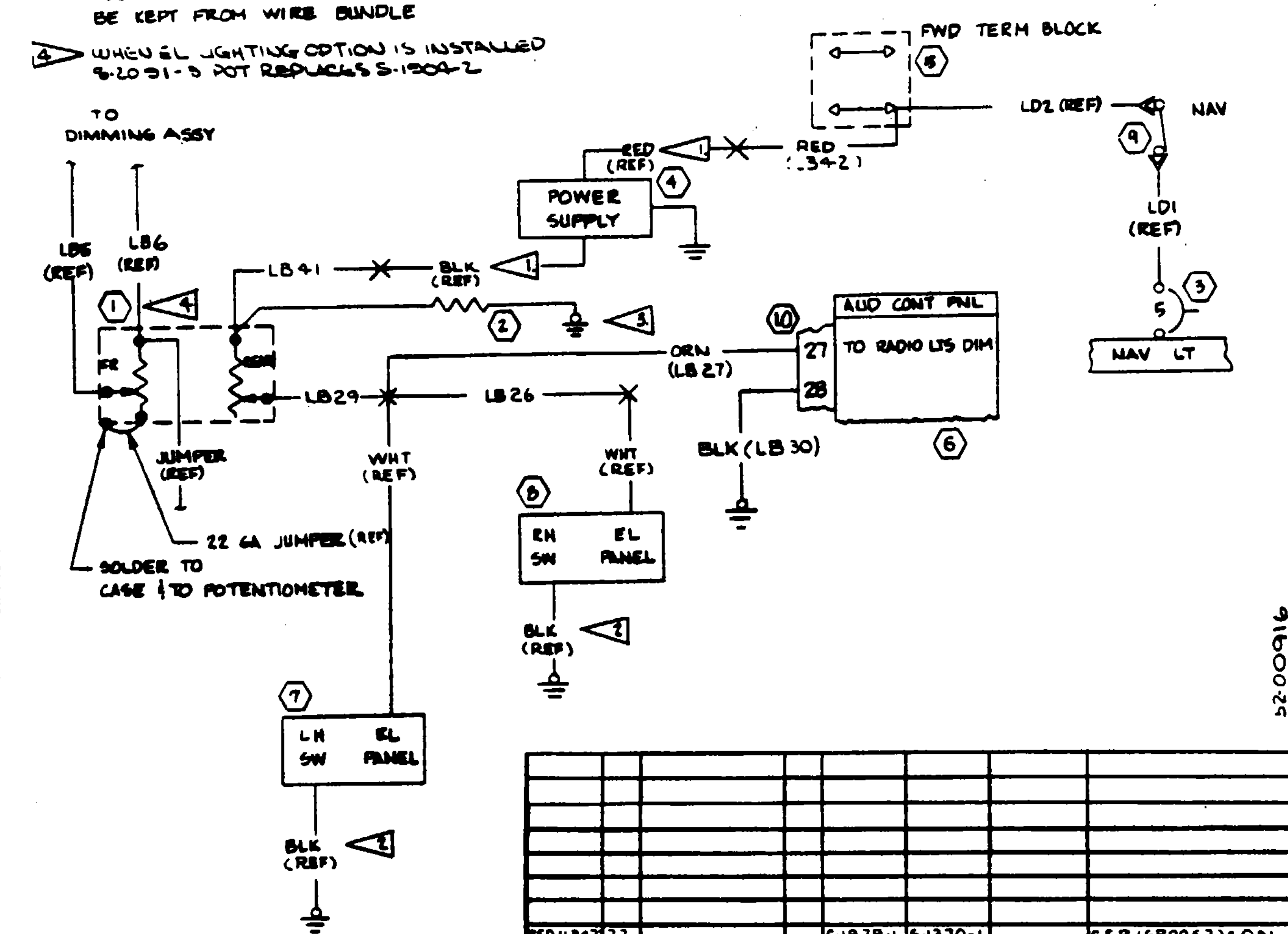
SIZE	CODE IDENT. NO.	DWG NO
C	71379	0770139

SCALE: NONE (SR9633) PAGE: 11.3

NOTES:

1. TO BE RETAINED IN TERMINAL, WIRE MUST BE STRIPPED DOUBLED & TWISTED
2. TERMINATE VENDOR FURNISHED WIRE WITH S-1367-1-8
3. THIS END OF RESISTOR TERMINATED WITH S-1367-1-14 TERMINAL & INSTALLED ON BUSHING OF TANDEM POT ASSY DUE TO HEAT DISSIPATION, RESISTOR MUST BE KEPT FROM WIRE BUNDLE
4. WHEN EL LIGHTING OPTION IS INSTALLED S-2051-3 POT REPLACES S-1509-2

REVISION			
LET	DESCRIPTION	DATE	APPD
A	BY REV: LB41 WAS LB28 - LB42 WAS LB25 (SR9952)	GLS 2/9/81	



RED (LB42)	22			S-1829-1	S-1370-1		SER (SR9952) & ON
LB41	22			S-1370-1	SOLDER		SER (SR9952) & ON
BLK (LB30)	22	-22-0		85969-6	S-1367-1-8		
LB29	22			SOLDER	SEE LB26		
LB28	↑			S-1370-1	SOLDER		THRU SER (SR9952)
ORN (LB27)		-22-3		SEE LB26	85969-6		
LB26	↓			S-1370-2	S-1370-1		
RED (LB25)	22	-22-2		S-1829-1	S-1370-1	—	THRU SER (SR9952)
WIRE CODE NO	GA	MATERIAL	LG	TERMINALS			SERIALS

WIRE TABLE

10	87144-1	CONNECTOR
9	S-2160-1	SWITCH
8	1213363	EL PANEL
7	2213039	EL PANEL
6	2470003	AUDIO CONTROL PNL
5	34002-55	TERMINAL BOARD
4	C613001-0101	POWER SUPPLY
3	S-1360-5L	CIRCUIT BREAKER
2	WL-5-6000	RESISTOR
1	S-2091-3	POT ASSY
	PART NO.	DESCRIPTION

EQUIPMENT TABLE

CES-1000 IS APPLICABLE
VENDOR CODES PER S-1400
CES-XXXX=CESSNA SPEC. NO.
S-XXX OR CXXXXXX=CESSNA STD. NO.

SUPERSEDES:

SUPERSEDED BY:

CONTRACT NO:

	NAME	DATE
DESIGN	TJADEN	4-11-80
GROUP	W. HARDEN	4-18-80
DRAWN	OBERMUELLER	4-3-80
CHECK	BORLESKE	4-4-80
STRESS		
PROJ	GFICKEL	4-21-80
APPD		
OTHER		

Cessna AIRCRAFT CO.
PAWNEE DIVISION
5800 E. PAWNEE
WICHITA, KANSAS

TITLE
WIRING DIAGRAM — ELECTRO LUMINESCENT PANEL (OPT)

SIZE	CODE IDENT. NO.	DWG NO
C	71379	0770139

SCALE: NONE (SR9633) PAGE: 11.4

REVISION			
LET	DESCRIPTION	DATE	APPD
A	BY REV: ADD DETAIL A; SERIAL OUT BLK (LB10) WIRE (SR9952)	GLS 5-6-81	RBH JRS

NOTES:

1. INSTALL S-1635-1 TERMINAL ON VENDOR FURNISHED LEAD AS INDICATED
2. INSTALL S-1367-1-6 TERMINAL ON VENDOR FURNISHED WIRES AS INDICATED
3. THIS POT IS PART OF S-2091-7 DUAL POT ASSY WHEN OPTIONAL EL LIGHTING IS INSTALLED
4. WHEN POST LIGHT OPTION IS INSTALLED 1570301-1 DIMMING ASSY. REPLACES 1570166 & S2091-3 POTENTIOMETER ASSY REPLACES S1904-2.
5. REQD ONLY WHEN OPTIONAL DIGITAL CLOCK C664511 IS INSTALLED
6. S-1370-2 SUPPIED WITH 1270479 LIGHT ASSY

WIRE CODE NO	GA	MATERIAL	LG	TERMINALS			SERIALS
LB7	22			S-1829-1	S-1370-1	5	
LB6	22			S-1635-2	SOLDER		
LB5	22			S-1635-1	SOLDER		
LB4	22			S-1636-1	SOLDER		
LB3	18			S-1635-1	S-1829-1		
LB2	18			S-1635-1	S-1829-1		
LB1	18			S-1367-1-6	SEE LB6		
LB24	22			S-1370-1	S-1829-1		
LB23				S-1370-1	S-1367-1-8		
LB22				S-1636-1	S-1829-1		
LB21				S-1829-1	S-1636-1		
RED/WHT (LB20)		-22-2-9		SOLDER	S-1635-1		
LB19				S-1829-1	S-1370-1		
LB18				S-1370-1	S-1367-1-8		
LB17				S-1829-1	SOLDER		
LB16				SOLDER	S-1367-1-8		
LB15				S-1829-1	6		
LB14				S-1829-1	S-1370-1		
RED(LB13)		-22-2-		S-1635-1	SOLDER		
RED(LB12)		-22-2		SOLDER	S-1636-1		
BLK(LB11)		-22-0		SOLDER	S-1367-1-8		
BLK(LB10)		-22-0		S-1370-1	S-1367-1-8		THRU SER (SR9952)
RED/BLU (LB9)		-22-2-6		SOLDER	SOLDER		
BLK(LB8)	22	-22-0		SOLDER	SOLDER		

WIRE TABLE

ITEM NO.	PART NO.	DESCRIPTION	
22	S2413-1	SOCKET	5
21	MS25231-1819	LIGHT	5
20	C669545-0108	INSTRUMENT CLUSTER	
19	1570166	DIMMING ASSY	
18	S-1360-5L	CIRCUIT BREAKER	
17	S-2000C201J	RESISTOR	
16	S-1904-2	POT ASSY	
15	S-1640-6	HOUSING	
14	S-1641-6	HOUSING	
13	MS25231-1829	LAMP	
12	MS15584-8	MINIATURE LAMP	
11	0513208	SOCKET	
10	S-2035-1	HOUSING	
9	S-2035-2	HOUSING	
8	C660501-0102	COMPASS ASSY	
7	S-1637-1	HOUSING	
6	S-1637-2	HOUSING	
5	S-1695-2	SWITCH	
4	34005 B17	TERMINAL BLOCK	
3	S-1899	LIGHT ASSY	
2	1270479	LIGHT ASSY	
1	1215179	LIGHT ASSY	

EQUIPMENT TABLE

CES-1000 IS APPLICABLE VENDOR CODES PER S-1400 CES-XXXX=CESSNA SPEC. NO. S-XXX OR CMXXXX=CESSNA STD. NO.

SUPERSEDES:

SUPERSEDED BY:

CONTRACT NO:

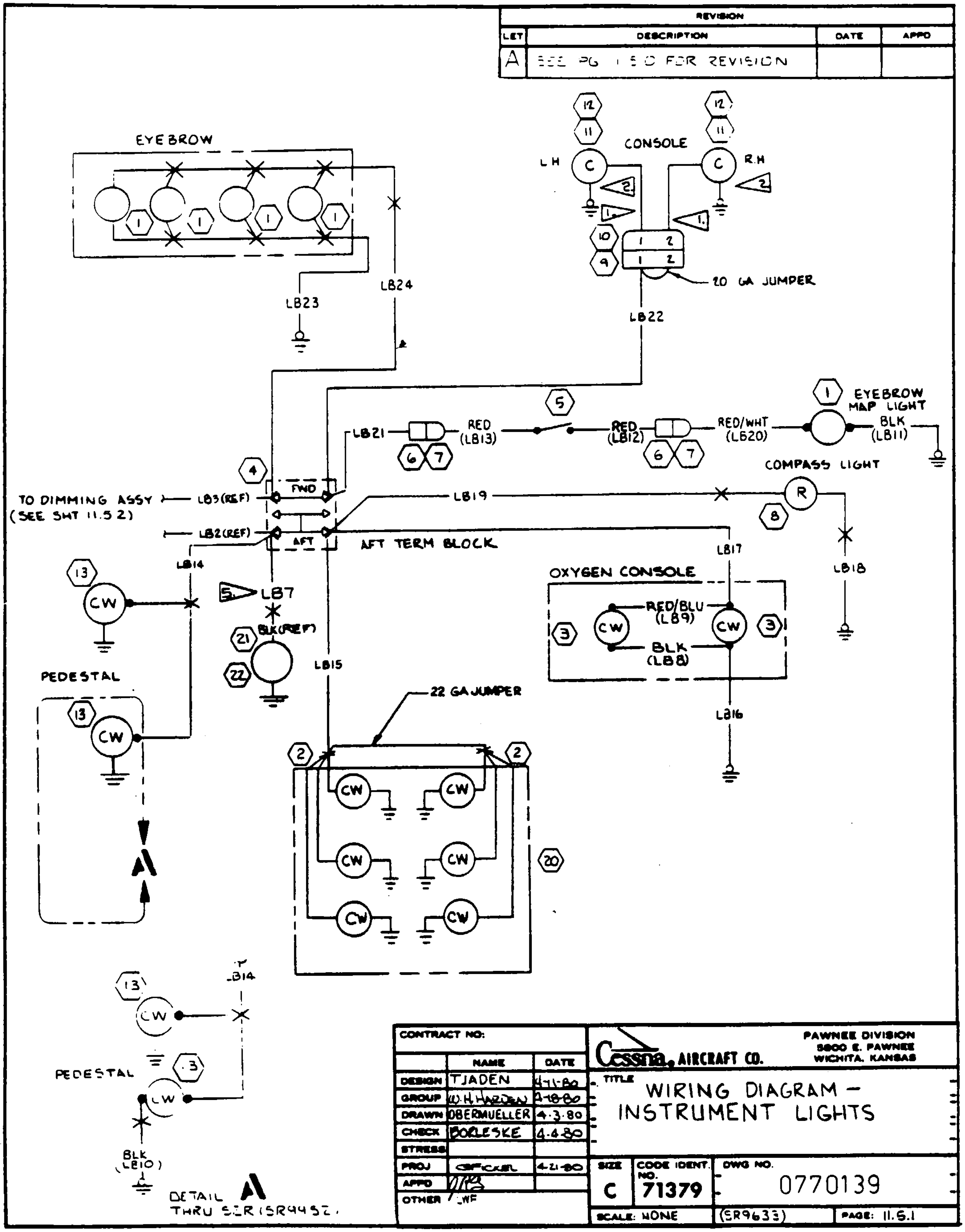
	NAME	DATE
DESIGN	TJADEN	4-1-80
GROUP	W.H. HAZDEN	4-8-80
DRAWN	OBERMUELLER	4-3-80
CHECK	BORLESKE	4-4-80
STRESS		
PROJ		4-21-80
APPD		
OTHER		

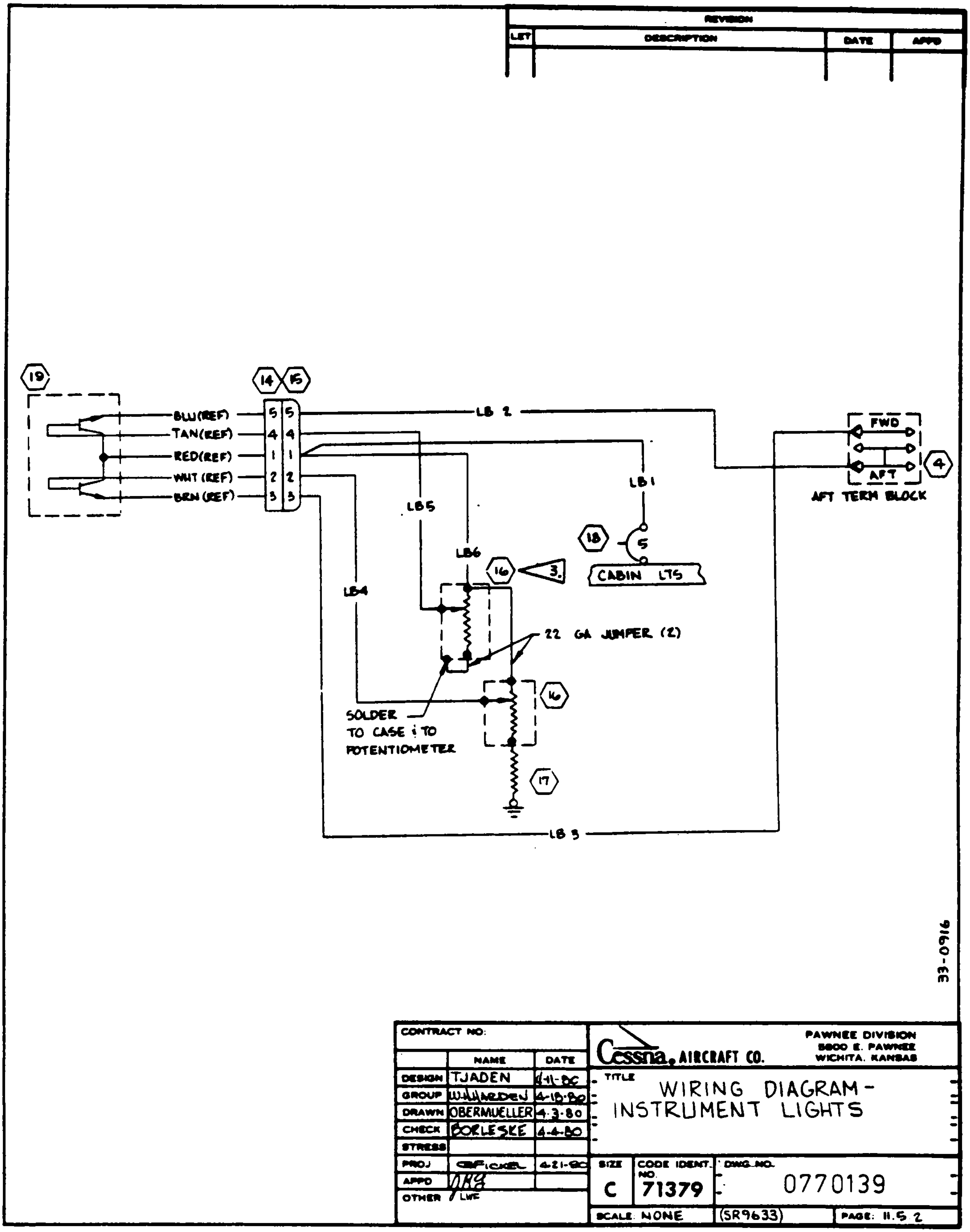
Cessna AIRCRAFT CO. PAWNEE DIVISION 5800 E. PAWNEE WICHITA, KANSAS

TITLE: WIRING DIAGRAM — INSTRUMENT LIGHTS

SIZE: C | CODE IDENT. NO.: 71379 | DWG NO: 0770139

SCALE: NONE (SR9633) PAGE: 11.5.0

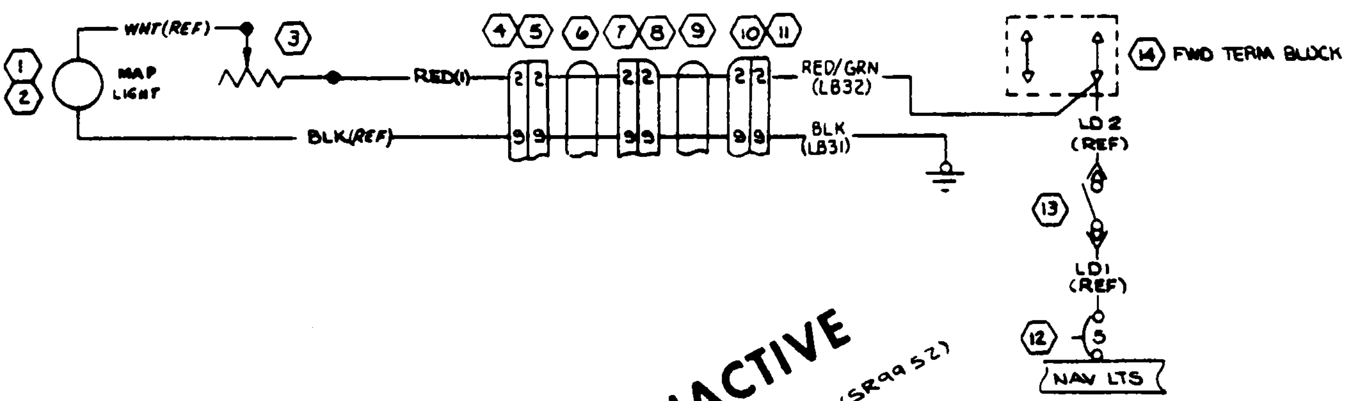

REVISION
LET
DESCRIPTION
DATE
APPD
A
EYEBROW
CONSOLE
LH
RH
20 GA JUMPER
LB22
LB23
LB24
EYEBROW MAP LIGHT
RED (LB13)
RED (LB12)
RED/WHT (LB20)
BLK (LB11)
LB21
COMPASS LIGHT
TO DIMMING ASSY LB3(REF)
(SEE SHT 11.5.2)
LB2(REF)
FWD
AFT
AFT TERM BLOCK
LB19
LB17
LB18
LB14
LB7
BLK(REF)
LB15
OXYGEN CONSOLE
RED/BLU (LB9)
BLK (LB8)
LB16
PEDESTAL
22 GA JUMPER
CW
DETAIL A
BLK (LB10)
CONTRACT NO:
NAME
DATE
DESIGN TJADEN
GROUP
DRAWN OBERMUELLER 4-3-80
CHECK BORLESKE 4-4-80
STRESS
PROJ
APPD
OTHER
Cessna AIRCRAFT CO.
PAWNEE DIVISION
5800 E. PAWNEE
WICHITA, KANSAS
TITLE
WIRING DIAGRAM -
INSTRUMENT LIGHTS
SIZE C
CODE IDENT. NO. 71379
DWG NO. 0770139
SCALE: NONE
PAGE: 11.5.1


REVISION
LET
DESCRIPTION
DATE
APPD
19
14
15
BLU(REF)
TAN(REF)
RED(REF)
WHT (REF)
BRN (REF)
5 5
4 4
1 1
2 2
3 3
LB 2
LB 1
LB 5
LB 6
LB 4
LB 3
FWD
AFT
4
AFT TERM BLOCK
18
5
CABIN LTS
16
3
22 GA JUMPER (2)
16
SOLDER
TO CASE & TO
POTENTIOMETER
17
33-0916
CONTRACT NO:
NAME
DATE
DESIGN TJADEN
GROUP
DRAWN OBERMUELLER 4-3-80
CHECK BORLESKE 4-4-80
STRESS
PROJ
APPD
OTHER
Cessna AIRCRAFT CO.
PAWNEE DIVISION
5800 E. PAWNEE
WICHITA, KANSAS
TITLE
WIRING DIAGRAM -
INSTRUMENT LIGHTS
SIZE C
CODE IDENT. NO. 71379
DWG. NO. 0770139
SCALE NONE
(SR9633)
PAGE: 11.5 2

REVISION			
LET	DESCRIPTION	DATE	APPD

NOTES:

1. FOR INTERCONNECTION WITH ELECTRIC ELEVATOR TRIM SEE PAGE 14.2



INACTIVE

EFF THRU SER (SR9952)

14	34002-55	TERMINAL BLOCK	
13	S-2160-1	SWITCH	
12	S-1360-5L	CIRCUIT BREAKER	
11	S-1961-2-0	HOUSING	
10	S-1961-1-0	HOUSING	
9	1570307	CABLE	
8	1570307	CONNECTOR ASSY	
7	3421-0000	CONNECTOR SOCKET	
6	1270844	CABLE ASSY	
5	3473-3000	SOCKET	
4	1270842	CONNECTOR ASSY	
3	3859A161 152A	RHEOSTAT	
2	24RB	LAMP	
1	4157-001	SOCKET	
FIND NO.	PART NO.	DESCRIPTION	

EQUIPMENT TABLE

WIRE CODE NO	GA	MATERIAL	LG	TERMINALS			SERIALS
RED/GRN (LB32)	22	-22-2-5		S-1963-2	S-1829-1		
RED(1)	22	8568-2		SOLDER	SOLDER		
BLK (LB31)	22	-22-0		S1863-2	S-1367-1-6		

WIRE TABLE

CES-1000 IS APPLICABLE
VENDOR CODES PER S-1400
CES-XXXX=CESSNA SPEC. NO.
S-XXX OR CMXXXX=CESSNA STD. NO.

SUPERSEDES:

SUPERSEDED BY: PAGE 11.10

CONTRACT NO:

	NAME	DATE
DESIGN	TJADEN	4-1-80
GROUP	W.H. HAZDEN	4-18-80
DRAWN	OBERMUELLER	4-3-80
CHECK	BORLESKE	4-4-80
STRESS		
PROJ	[illegible]	4-21-80
APPD	JRB	
OTHER		

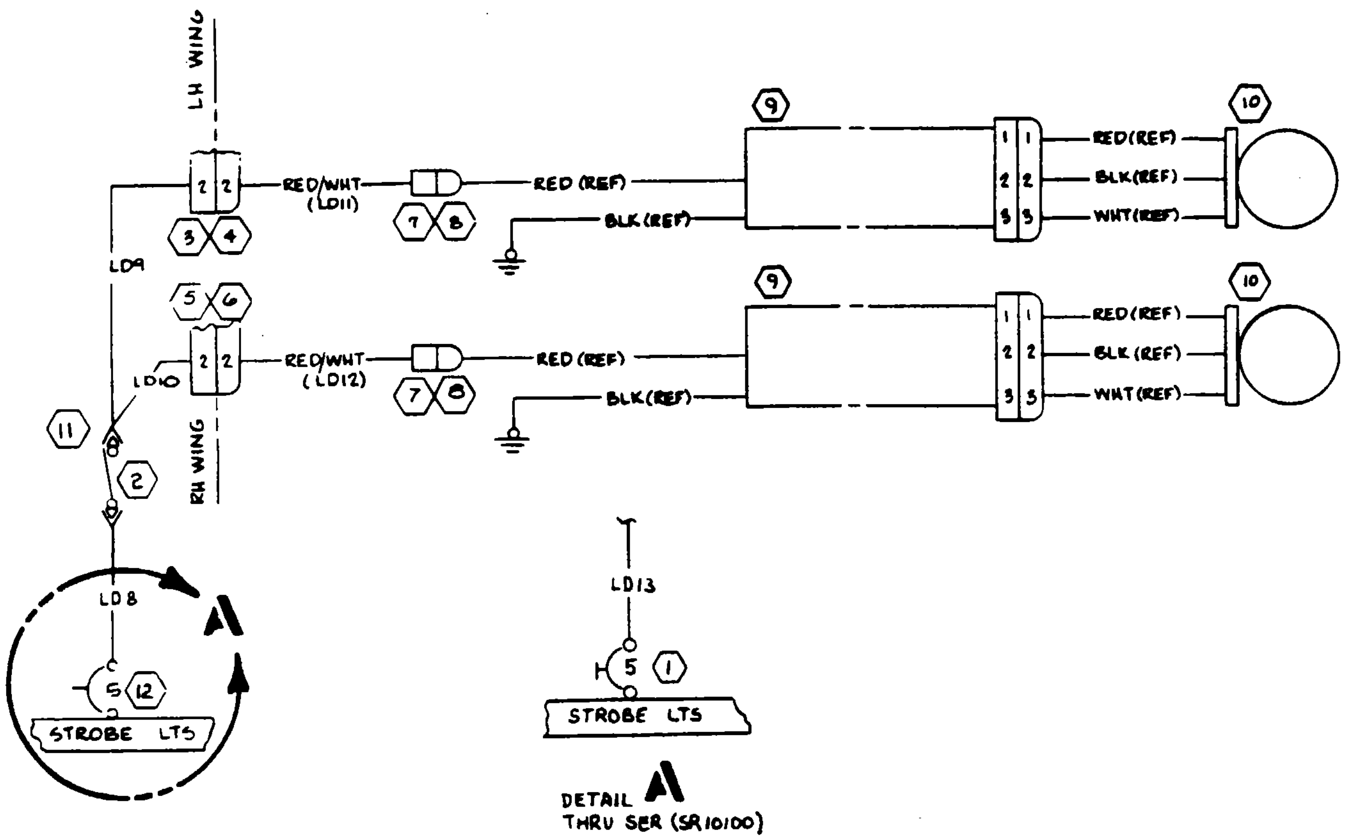
Cessna AIRCRAFT CO. — PAWNEE DIVISION, 5800 E. PAWNEE, WICHITA, KANSAS

TITLE: WIRING DIAGRAM — MAP LIGHT CONTROL WHEEL (OPT)

SIZE: C | CODE IDENT. NO. 71379 | DWG NO 0770139

SCALE: NONE | (SR9633) | PAGE: 11.6

REVISION			
LET	DESCRIPTION	DATE	APPD
A	BY REV: ADD DETAIL A; ADD S-1360-5L, LD13; S-1367-1-8 WAS S-1367-1-6/(LD8) (SR10100)	REK 10-22-81	



LD13	22			S-1367-1-8	S-1493-1		THRU SER (SR10100)
RED/WHT (LD12)	20	-20-2-9		S-1636-1	S-1635-1	(STD)	
RED/WHT (LD11)	20	-20-2-9		S-1636-1	S-1635-1	(STD)	
LD10	22			S-1493-1	S-1636-1	(STD)	
LD9	22			S-1493-1	S-1636-1	(STD)	
LD8	22			S-1367-1-6	S-1493-1		SER (SR10100) & ON
WIRE CODE NO	GA	MATERIAL	LG	TERMINALS			SERIALS

WIRE TABLE

ITEM NO.	PART NO.	DESCRIPTION	
12	S-1360-5L	CIRCUIT BREAKER	
11	S-2023-1	TERMINAL ADAPTOR	
10	C622006-0107	LAMP ASSY	
9	C622008-0102	POWER SUPPLY	
8	S-1637-1	HOUSING	
7	S-1637-2	HOUSING	
6	S-1640-9	HOUSING	
5	S-1641-9	HOUSING	
4	S-1640-6	HOUSING	
3	S-1641-6	HOUSING	
2	S-2160-1	SWITCH	
1	S-1232-5	CIRCUIT BREAKER	

EQUIPMENT TABLE

CES-1000 IS APPLICABLE
VENDOR CODES PER S-1400
CES-XXXX=CESSNA SPEC. NO.
S-XXX OR CMXXXX=CESSNA STD. NO.

SUPERSEDES:

SUPERSEDED BY:

CONTRACT NO:

	NAME	DATE
DESIGN	J TJADEN	4-11-80
GROUP	W. HARDEN	4-18-80
DRAWN	S. BURRIS	4-3-80
CHECK	BORLESKE	4-4-80
STRESS		
PROJ	GFICKEL	4-21-80
APPD		
OTHER		

Cessna AIRCRAFT CO.
PAWNEE DIVISION
5800 E. PAWNEE
WICHITA, KANSAS

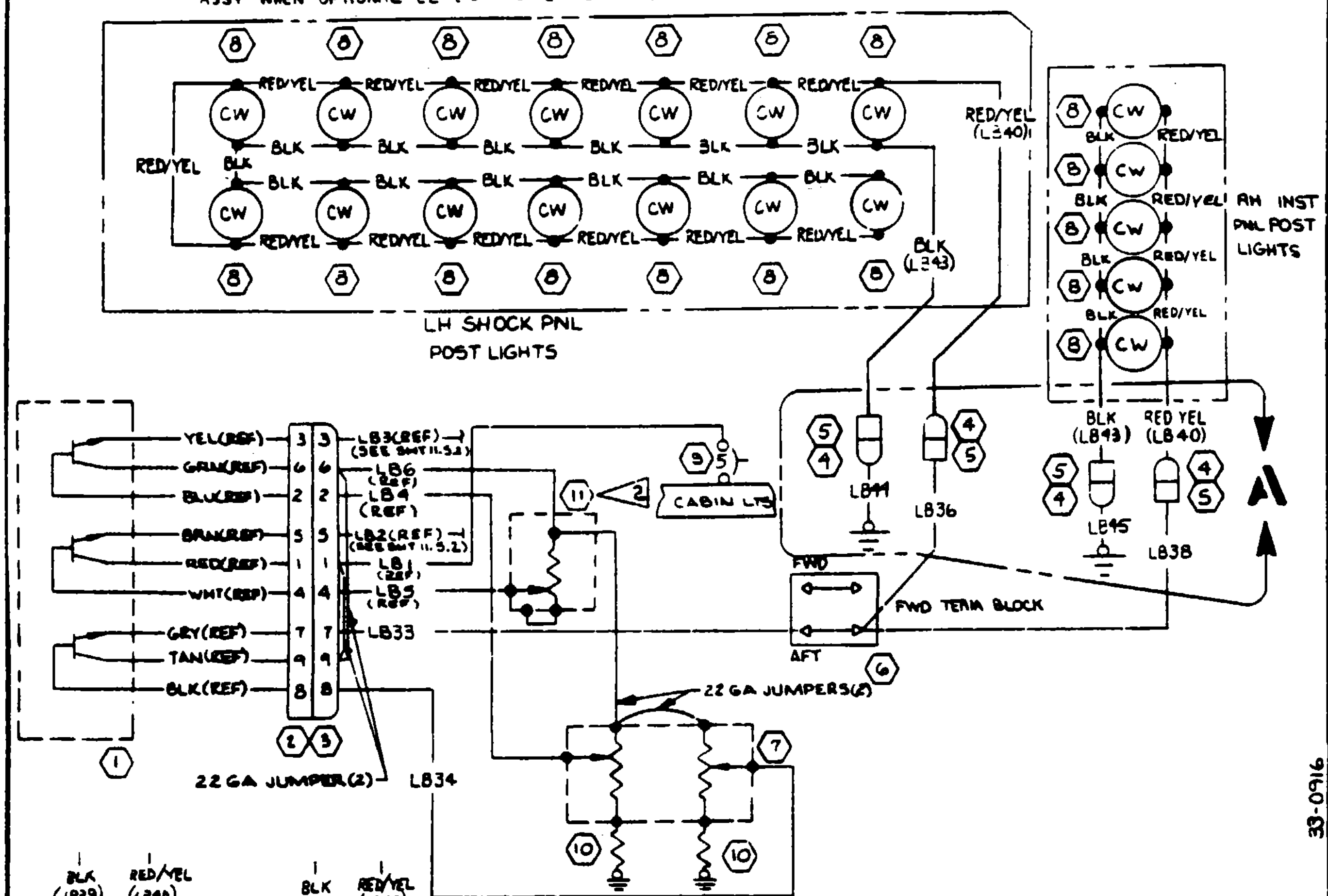
TITLE
WIRING DIAGRAM — WING TIP STROBE LIGHTS (OPT)

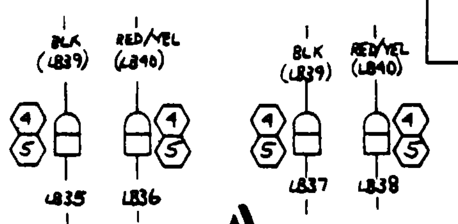
SIZE	CODE IDENT. NO.	DWG NO
C	71379	0770139

SCALE: NONE (SR 9633) PAGE: 11.7

NOTES:
1. WHEN POST LIGHT OPTION IS INSTALLED 1570301-1 DIMMING ASSY REPLACES 1570166 & S2091-7 POTENTIOMETER ASSY REPLACES S1904-2.
2. THIS POT IS PART OF S-2091-2 DUAL POT ASSY WHEN OPTIONAL EL LIGHTING IS INSTALLED

REVISION			
LET	DESCRIPTION	DATE	APPD
A	BY REV: ADD DETAIL 'A' SER N LB43 LB44 LB45 SER CUT LB35 LB37 LB39 (SR10837)	9-14-84	





DETAIL A
THRU SER (SR10837)

ITEM NO.	PART NO.	DESCRIPTION	
11	S-1904-2	POT ASSY	
10	S-2000020IJ	RESISTOR	
9	S-1360-5L	CIRCUIT BREAKER	
8	1513837	LIGHT ASSY	
7	S-2091-7	DUAL POT ASSY	
6	S4002-5S	TERMINAL BLOCK	
5	S-1637-2	HOUSING	
4	S-1637-1	HOUSING	
3	S-1640-9	HOUSING	
2	S-1641-9	HOUSING	
1	1570301	DIMMING ASSY	

EQUIPMENT TABLE

WIRE CODE NO	GA	MATERIAL	LG	TERMINALS			SERIALS
LB45				S-1635-1	S-1367-1-8		SER (SR10837) & ON
LB44	22			S-1635-1	S-1829-1-8		SER (SR10837) & ON
BLK (LB43)	22	-22-0		SOLDER	S-1636-1		SER (SR10837) & ON
BLK	22	-22-0		SOLDER	SOLDER		
RED/YEL		-22-2-4		SOLDER	SOLDER		
RED/YEL (LB40)		-22-2-4		S-1635-1	SOLDER		
BLK (LB39)		-22-0		SOLDER	S-1635-1		THRU SER (SR10837)
LB38				S-1829-1	S-1636-1		
LB37				S-1636-1	S-1367-1-8		THRU SER (SR10837)
LB36				S-1829-1	S-1636-1		
LB35				S-1636-1	S-1367-1-8		THRU SER (SR10837)
LB34				S-1635-1	SOLDER		
LB33	22			S-1635-1	S-1829-1		

WIRE TABLE

CES-1000 IS APPLICABLE VENDOR CODES PER S-1400 CES-XXXX=CESSNA SPEC. NO. S-XXX OR CMXXXX=CESSNA STD. NO.

SUPERSEDES:

SUPERSEDED BY:

CONTRACT NO:

	NAME	DATE
DESIGN	TJADEN	4-11-80
GROUP	W.H.HARDEN	4-18-80
DRAWN	OBERMUELLER	4-3-80
CHECK	BORLESKE	4-4-80
STRESS		
PROJ	PICKEL	4-21-80
APPD		
OTHER	/ LWF	

Cessna AIRCRAFT CO.
PAWNEE DIVISION
5800 E. PAWNEE
WICHITA, KANSAS

TITLE
WIRING DIAGRAM — POST LIGHTS (OPT)

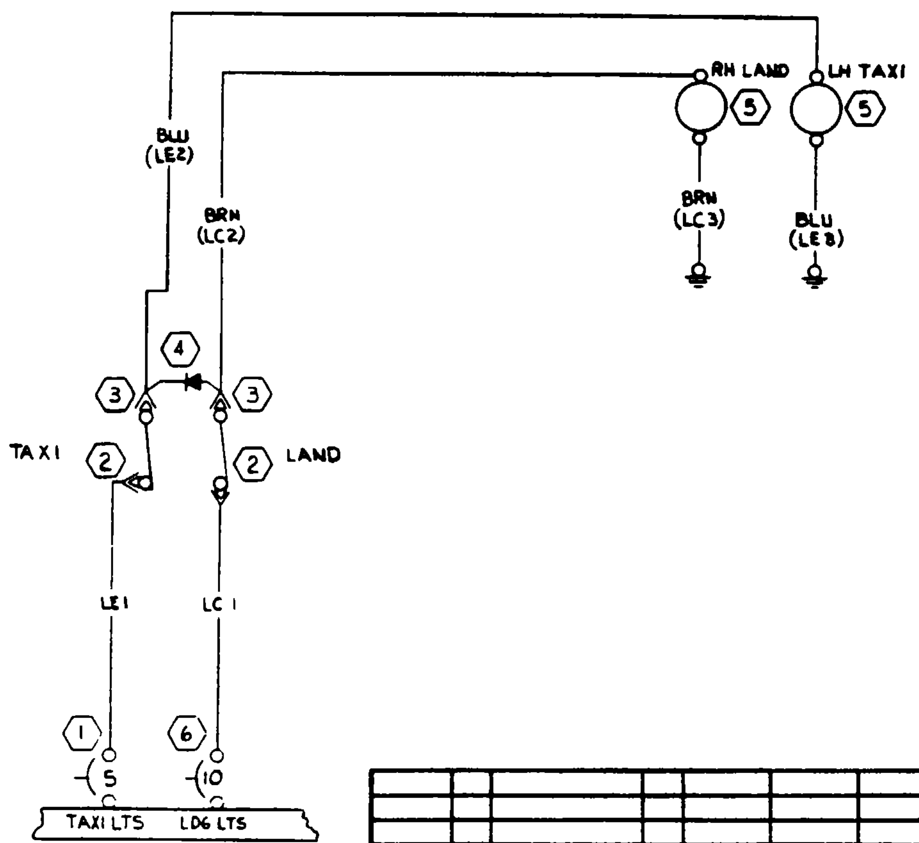
SIZE	CODE IDENT. NO.	DWG NO.
C	71379	0770139

SCALE: NONE (SR9633) PAGE: 11.8

REVISION			
LET	DESCRIPTION	DATE	APPD

NOTES:

1. MATERIAL IS ALPHA 5857-7 (VENDOR CODE 92194) OR BELDEN 83009-1 (VENDOR CODE 70903)
2. MATERIAL IS ALPHA 5857-6 (VENDOR CODE 92194) OR BELDEN 83009-6 (VENDOR CODE 70903)



33-0916

WIRE CODE NO	GA	MATERIAL	LG	TERMINALS			SERIALS
BLU(LE3)	18	2		S-1367-1-8	S-1367-1-8		
BLU(LE2)		2		S-1493-1	S-1367-1-8		
LE 1				S-1367-1-6	S-1493-1		
BRN(LC3)		1		S-1367-1-8	S-1367-1-8		
BRN(LC2)		1		S-1493-1	S-1367-1-8		
LC1	18			S-1367-1-6	S-1493-1		

WIRE TABLE

ITEM NO	PART NO.	DESCRIPTION	
6	S-1360-10L	CIRCUIT BREAKER	
5	4591	LIGHT	
4	1270082	DIODE ASSY	
3	S-2023-1	TERM. ADAPTER	
2	S-2160-1	SWITCH	
1	S-1360-5L	CIRCUIT BREAKER	

EQUIPMENT TABLE

CES-1000 IS APPLICABLE
VENDOR CODES PER S-1400
CES-XXXX=CESSNA SPEC. NO.
S-XXX OR CMXXXX=CESSNA STD. NO.

SUPERSEDES:

SUPERSEDED BY:

CONTRACT NO:

	NAME	DATE
DESIGN	TJADEN	4-1-80
GROUP	W.H. HARDEN	4-18-80
DRAWN	OBERMUELLER	4-3-80
CHECK	BORLESKE	4-4-80
STRESS		
PROJ	GFICKEL	4-21-80
APPD		
OTHER		

Cessna AIRCRAFT CO.
PAWNEE DIVISION
5800 E. PAWNEE
WICHITA, KANSAS

TITLE
WIRING DIAGRAM — LANDING LIGHT

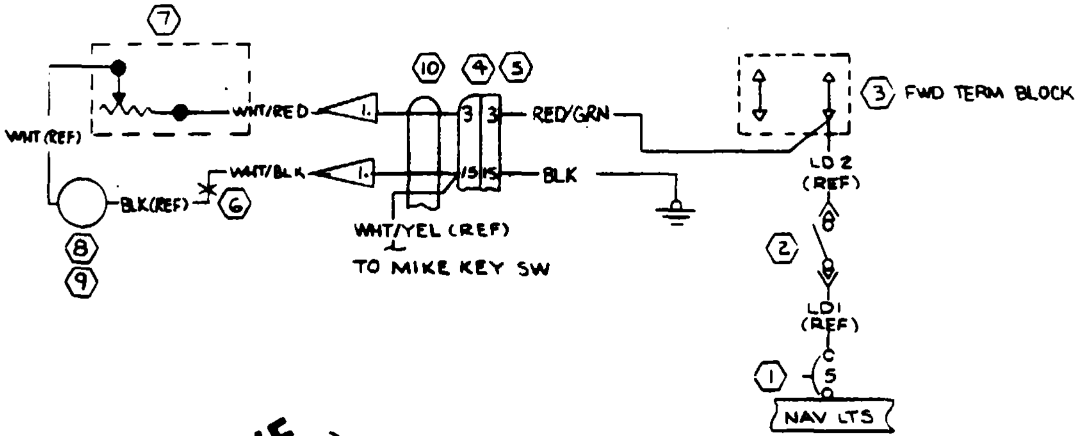
SIZE: C | CODE IDENT. NO. 71379 | DWG NO 0770139

SCALE: NONE | (SR9633) | PAGE: 11.9

REVISION			
LET	DESCRIPTION	DATE	APPD
A	BY REV: WHT/BLK WAS WHT/YEL (NOW SHOP PRACTICE)	REK 3-8-82	REH

NOTES:

1. MATERIAL S RCF5130B COIL CORD VENDOR CODE (096906)



INACTIVE EFF THRU SER (SR10713) TMS 9-8-83 REH IRS

10	2270030	CABLE ASSY
9	24RB	LAMP
8	4157-001	SOCKET
7	3B59A161-152A	RHEOSTAT
6	S-1370-1	SPLICE
5	S-1962-2-0	HOUSING
4	S-1962-1-0	HOUSING
3	34002-5S	TERMINAL BLOCK
2	S-2160-1	SWITCH
1	S-1360-5L	CIRCUIT BREAKER
REQ NO	PART NO.	DESCRIPTION

EQUIPMENT TABLE

WIRE CODE NO	GA	MATERIAL	LG	TERMINALS		SERIALS
BLK	22	-22-0		S-1963-2	S-1367-8	
WHT/BLK	24	1.		S-1370-1	S-1963-3	
WHT/RED	24	1.		S-1963-3	SOLDER	
RED/GRN	22	-22-2-5		S-1829-1	S-1963-2	

WIRE TABLE

CES-1000 IS APPLICABLE VENDOR CODES PER S-1400 CES-XXXX=CESSNA SPEC. NO. S-XXX OR CMXXXX=CESSNA STD. NO.

SUPERSEDES: PAGE 11.6

SUPERSEDED BY:

CONTRACT NO:

	NAME	DATE
DESIGN	G. STAMM	3/10/81
GROUP	W. [illegible]	4-20-81
DRAWN	G. STAMM	3/10/81
CHECK	R.E. Hair	3-11-81
STRESS		
PROJ	[illegible]	4-20-81
APPD		
OTHER		

Cessna AIRCRAFT CO. PAWNEE DIVISION 5800 E. PAWNEE WICHITA, KANSAS

TITLE WIRING DIAGRAM— MAP LIGHT CONTROL WHEEL (OPTION)

SIZE C | CODE IDENT. NO. 71379 | DWG NO 0770139

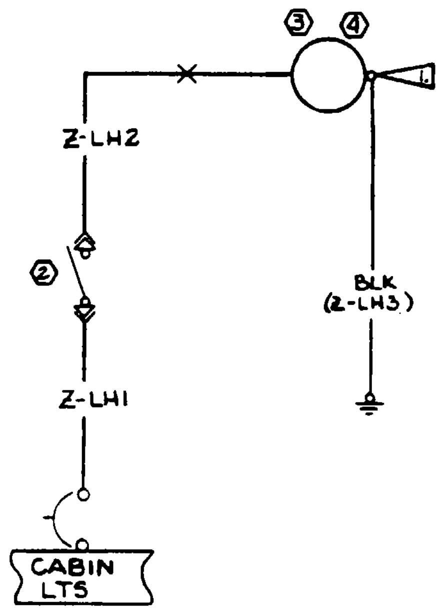
SCALE NONE (SR9952) PAGE: 11.10

20-128A/(20-128B blank)

REVISION			
LET	DESCRIPTION	DATE	APPD

NOTES:

1. CONNECT LH3 BLACK WIRE TO SOCKET BASE BRACKET



WIRE CODE NO	GA	MATERIAL	LG	TERMINALS			SERIALS
BLK (Z-LH4)	22	-22-0		S-1367-1-8	S-1367-1-6		
Z-LH3	22			S-1367-1-4	SEE BLK(LH4)		
Z-LH2	22			S-1493-1	S-1370-1		
Z-LH1	22			S-1367-1-6	S-1493-1		

WIRE TABLE

ITEM NO.	PART NO.	DESCRIPTION	
4	MS25338-7079	LAMP	
3	S-1927	SOCKET	
2	S-2160-3	SWITCH	
1	S-1360-5L	CIRCUIT BREAKER	

EQUIPMENT TABLE

CES-1000 IS APPLICABLE
VENDOR CODES PER S-1400
CES-XXXX=CESSNA SPEC. NO.
S-XXX OR CMXXXX=CESSNA STD. NO.

SUPERSEDES.

SUPERSEDED BY.

CONTRACT NO:

	NAME	DATE
DESIGN	R KLEIN	11-17-81
GROUP	M PAINE	1-29-82
DRAWN	R KLEIN	11-17-81
CHECK	BORLESKE	1-28-82
STRESS		
PROJ	JR [illegible]	1-29-82
APPD	[illegible]	
OTHER		

Cessna AIRCRAFT CO.
PAWNEE DIVISION
5800 E. PAWNEE
WICHITA, KANSAS

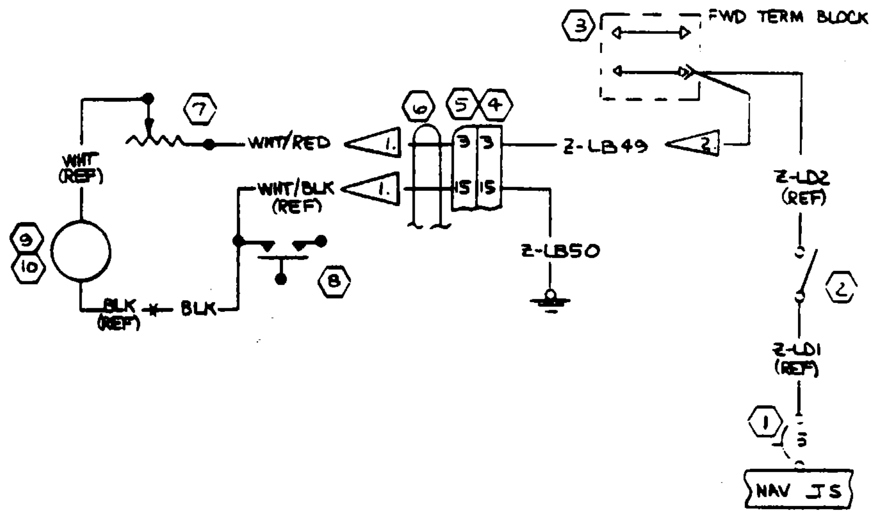
TITLE
WIRING DIAGRAM —
ICE DETECTOR
LIGHT (OPT) T182

SIZE	CODE IDENT. NO.	DWG NO
C	71379	0770139

SCALE: NONE (SR10100) PAGE: 11.11

NOTES:
1. MATERIAL IS PCF5130B COIL CORD, VENDOR CODE (36306)
2. NOT REQUIRED WHEN INSTALLED WITH OPT ELECTRIC TRIM. REFER TO PG. 4.6.0

REVISION			
LET	DESCRIPTION	DATE	APPD



WIRE CODE NO	GA	MATERIAL	LG	TERMINALS			SERIALS
Z-LB50	22			S-2099-9	S-1367-1-8		
Z-LB49	22			S-2099-9	S-1829-1		
BLK	22			S-1370-1	SOLDER		
WHT/RED	24	1		SOLDER	S-2352-2		

WIRE TABLE

ITEM NO.	PART NO.	DESCRIPTION
10	4157-001	SOCKET
9	24RB	LAMP
8	S-1985-1	MIKE SWITCH
7	3459A161-152A	RHEOSTAT
6	2270030	CABLE ASSY
5	S-2356-3	HOUSING
4	S-2349-1	HOUSING
3	34002-5S	TERMINAL BLOCK
2	S-2160-1	SWITCH
1	S-1360-5L	CIRCUIT BREAKER

EQUIPMENT TABLE

CES-1000 IS APPLICABLE
VENDOR CODES PER S-1400
CES-XXXX=CESSNA SPEC. NO.
S-XXX OR CMXXXX=CESSNA STD. NO.

SUPERSEDES: PG. 11.10

SUPERSEDED BY:

CONTRACT NO:

Cessna AIRCRAFT CO. PAWNEE DIVISION 5800 E. PAWNEE WICHITA, KANSAS

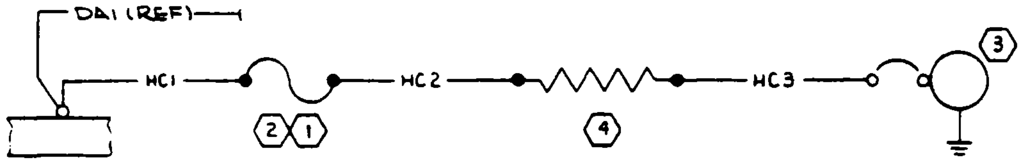
	NAME	DATE
DESIGN	SPENCER	9-8-83
GROUP	[illegible]	9-22-83
DRAWN	SPENCER	9-8-83
CHECK	R6 HAIR	9-12-83
STRESS		
PROJ	[illegible]	10-3-83
APPD	[illegible]	
OTHER		

TITLE: WIRING DIAGRAM — MAP LIGHT - CONTROL WHEEL (OPT)

SIZE	CODE IDENT. NO.	DWG NO
C	71379	0770139

SCALE: NONE (SR10718) PAGE: 11.12

REVISION			
LET	DESCRIPTION	DATE	APPD



INACTIVE
THRU SER (SR10068)
GW 1-12-81

WIRE CODE NO	GA	MATERIAL	LG	TERMINALS			SERIALS
HC3	18			SOLDER	S-1367-1-8		
HC2	18			SOLDER	SOLDER		
HC1	18			S-1367-1-6	SOLDER		

WIRE TABLE

ITEM NO	PART NO.	DESCRIPTION	
4	S-2041-50-1.6	RESISTOR	
3	0513052	CIGAR LIGHTER ASSY	
2	S-2375-7.5	FUSE	
1	S-2374-7.5	FUSEHOLDER	

EQUIPMENT TABLE

CES-1000 IS APPLICABLE
VENDOR CODES PER S-1400
CES-XXXX=CESSNA SPEC. NO.
S-XXX OR CMXXXX=CESSNA STD. NO.

SUPERSEDES:

SUPERSEDED BY:

CONTRACT NO:

	NAME	DATE
DESIGN	TJADEN	1-11-80
GROUP	W.H. HARDEN	4-18-80
DRAWN	OBERMUELLER	4-3-80
CHECK	BORLESKE	4-4-80
STRESS		
PROJ	G. FICKEL	4-21-80
APPD	JRG	
OTHER	LWF	

Cessna AIRCRAFT CO.
PAWNEE DIVISION
5800 E. PAWNEE
WICHITA, KANSAS

TITLE
WIRING DIAGRAM — CIGAR LIGHTER

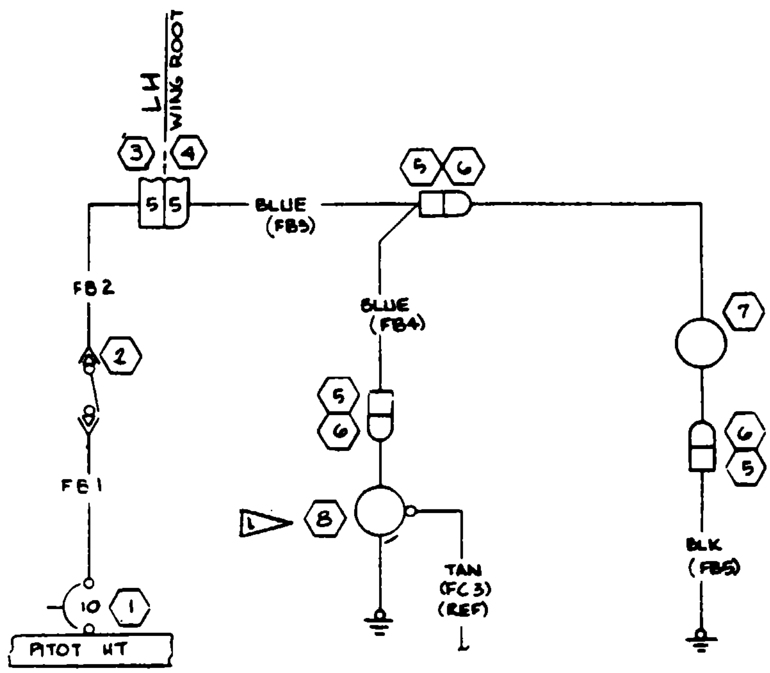
SIZE	CODE IDENT NO	DWG NO
C	71379	0770139

SCALE NONE (SR9633) PAGE: 13.1

REVISION			
LET	DESCRIPTION	DATE	APPD

NOTES.

1. ONLY HEATER CIRCUIT SHOWN, FOR STALL WARNING CIRCUIT SEE PAGE 15.1



WIRE CODE NO	GA	MATERIAL	LG	TERMINALS			SERIALS
BLK (FB 5)	18	-18-0		S1636-1	S1367-1-8		
BLU (FB 4)		-18-6		SEE FB3	S1636-6	(STD)	
BLU (FB 3)		-18-6		S1635-1	S1636-2	(STD)	
FB 2				S-1493-1	S1636-1	(STD)	
FB 1	18			S1367-1-6	S-1493-1		

WIRE TABLE

ITEM NO	PART NO.	DESCRIPTION
8	0511062	STALL DETECTOR HTD
7	0721105	PITOT TUBE HTD
6	S1637-1	HOUSING
5	S-1637-2	HOUSING
4	S1640-6	HOUSING
3	S-1641-6	HOUSING
2	S-2160-1	SWITCH
1	S-1360-10L	CIRCUIT BREAKER

EQUIPMENT TABLE

CES-1000 IS APPLICABLE VENDOR CODES PER S-1400 CES-XXXX=CESSNA SPEC. NO. S-XXX OR CMXXXX=CESSNA STD. NO.

SUPERSEDES:

SUPERSEDED BY:

CONTRACT NO:

	NAME	DATE
DESIGN	J. TJADEN	1-80
GROUP	W. HAZDEN	4-16-80
DRAWN	S. BURRIS	4-3-80
CHECK	BORLESKE	4-4-80
STRESS		
PROJ	GFICKEL	4-2-80
APPD		
OTHER	LWF	

Cessna AIRCRAFT CO. PAWNEE DIVISION 5800 E. PAWNEE WICHITA, KANSAS

TITLE WIRING DIAGRAM — HEATED PITOT TUBE & HEATED STALL WARNING (OPT)

SIZE	CODE IDENT. NO.	DWG NO
C	71379	0770139

SCALE: NONE (SR 4633) PAGE: 15.2

NOTES.

1. REMOVE & DISCARD VENDOR FURNISHED TERMINALS, TERMINATE WITH S-1636-1 TERMINALS.
2. TERMINATE VENDOR FURNISHED LEAD WITH S-1367-1-8.

REVISION			
LET	DESCRIPTION	DATE	APPD
A	BY REV: ADD DETAIL 'A'; SER IN HE13, HE14, HE15, HE16 (SR10100)	REK 2-4-82	MDP
B	BY REV: SER IN HE17, HE18, HE19 & HE20; SER OUT HE2, HE3, HE4 & HE12; REVISE TERMINALS FOR HE13, HE14, HE15 & HE16, REVERSE PINS 1 & 2 ON BLOWER CONNECTORS (SR10100)	REK 3-22-82	MDP

WIRE CODE NO	GA	MATERIAL	LG	TERMINALS			SERIALS
HE20	18			S-1635-1	S-1367-1-8		SER (SR10100) & ON
HE19	18			S-1635-2	S-1493-1		SER (SR10100) & ON
HE18	18			S-1635-2	S-1493-1		SER (SR10100) & ON
HE17	18			S-1635-2	S-1493-1		SER (SR10100) & ON
HE16	18			SEE HE17	S-1635-1		SER (SR10100) & ON
HE15	18			SEE HE18	S-1635-1		SER (SR10100) & ON
HE14	18			SEE HE19	S-1635-1		SER (SR10100) & ON
HE13	18			S-1635-1	S-1367-1-8		SER (SR10100) & ON
HE12	18			S-1635-1	S-1367-1-8		THRU SER (SR10100)
HE11	16			S-1367-2-4	S-1493-2		
HE10	16			S-1635-2	S-1635-2		
HE9	16			SEE HE8	S-1638-2		
HE8	16			S-1493-3	S-1638-2		
HE7	18			S-1493-1	S-1367-1-8		
HE6	18			S-1493-1	S-1493-1		
HE5	18			S-1493-1	S-1493-1		
HE4	18			S-1635-1	S-1493-1		THRU SER (SR10100)
HE3	18			S-1635-1	S-1493-1		THRU SER (SR10100)
HE2	18			S-1635-1	S-1493-1		THRU SER (SR10100)
HE1	18			S-1367-1-6	S-1493-1		

WIRE TABLE

FIND NO.	PART NO.	DESCRIPTION	
15	S-1360-15L	CIRCUIT BREAKER	
14	S-1360-10L	CIRCUIT BREAKER	
13	0882862	HIGH PRESSURE SW	
12	SD508	COMPRESSOR	
11	S-1637-2	HOUSING	
10	S-1637-1	HOUSING	
9	S-2035-2	HOUSING	
8	S-2035-1	HOUSING	
7	6303-2	COOLING FAN	
6	S-1917-2	RELAY	
5	1247243	SWITCH (ARA)	
4	0882590	SWITCH (ARA)	
3	S-1638-5	HOUSING-PLUG	
2	S-1638-4	HOUSING-CAP	
1	1120059	BLOWER ASSY (ARA)	

EQUIPMENT TABLE

CES-1000 IS APPLICABLE VENDOR CODES PER S-1400 CES-XXXX-CESSNA SPEC. NO. S-XXX OR CMXXXX-CESSNA STD. NO.

SUPERSEDES:

SUPERSEDED BY:

CONTRACT NO:

	NAME	DATE
DESIGN	J. TJADEN	4-1-80
GROUP	D.H. HARDEN	4-18-80
DRAWN	S. BURRIS	4-3-80
CHECK	BORLESKE	4-4-80
STRESS		
PROJ	PICKEL	4-21-80
APPD		
OTHER	LWF	

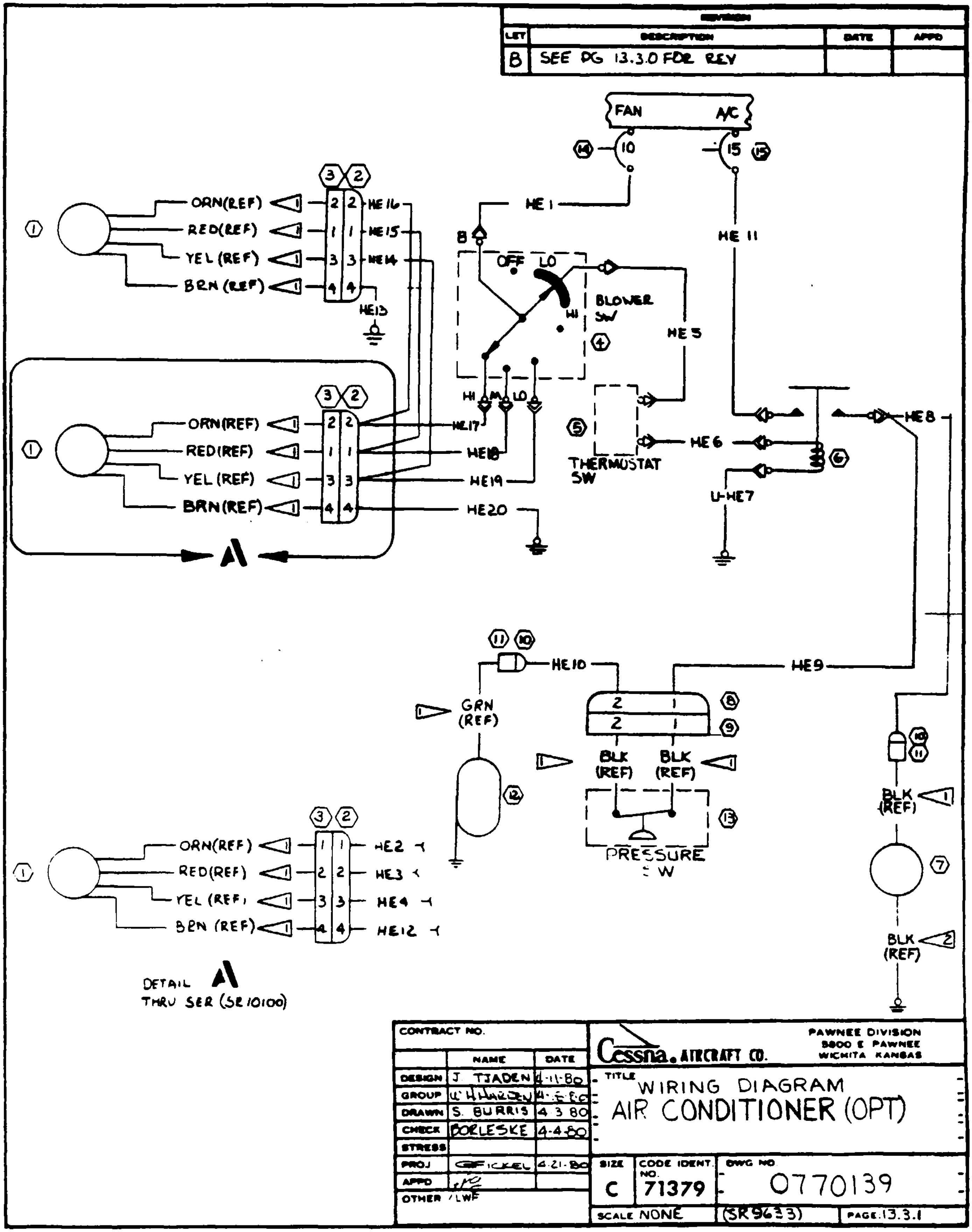
Cessna AIRCRAFT CO.

PAWNEE DIVISION 5800 E. PAWNEE WICHITA, KANSAS

TITLE WIRING DIAGRAM — AIR CONDITIONER (OPT)

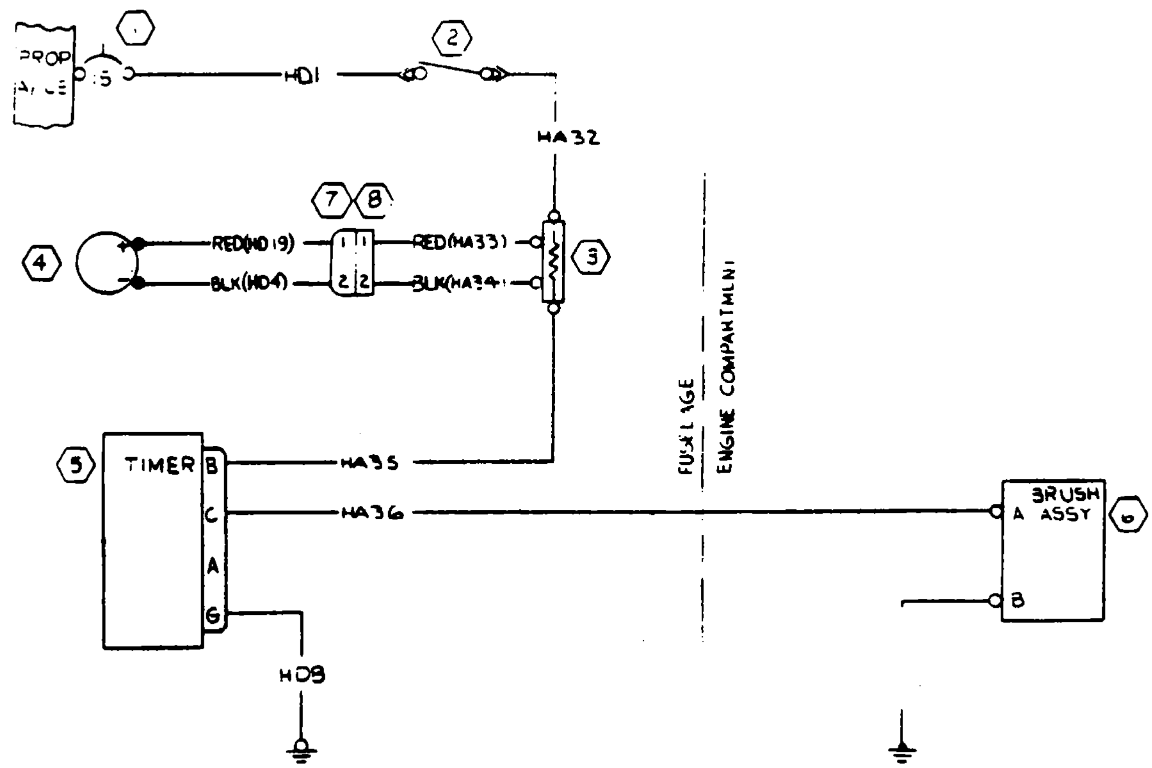
SIZE	CODE IDENT. NO.	DWG NO
C	71379	0770139

SCALE: NONE (SR9633) PAGE: 13.3.0



REVISION
LET
DESCRIPTION
DATE
APPD
B
SEE PG 13.3.0 FOR REV
FAN
A/C
BLOWER SW
THERMOSTAT SW
PRESSURE SW
ORN(REF)
RED(REF)
YEL(REF)
BRN(REF)
GRN (REF)
BLK (REF)
OFF
LO
HI
M
DETAIL A
THRU SER (SE10100)
CONTRACT NO.
NAME
DATE
DESIGN J. TJADEN 4-11-80
DRAWN S. BURRIS 4 3 80
CHECK BORLESKE 4-4-80
STRESS
PROJ
APPD
OTHER
Cessna AIRCRAFT CO.
PAWNEE DIVISION
5800 E PAWNEE
WICHITA KANSAS
TITLE
WIRING DIAGRAM
AIR CONDITIONER (OPT)
SIZE
C
CODE IDENT. NO.
71379
DWG NO
0770139
SCALE NONE
(SR9633)
PAGE 13.3.1

REVISION			
LET	DESCRIPTION	DATE	APPD



WIRE CODE NO	GA	MATERIAL	LG	TERMINALS			SERIALS
RED(HD19)	16	-16-2		SOLDER	S-1635-2		
BLK(HA34)	16	-16-0		S-1636-2	S1367-2-8		
HD8	16			S-1367-2-6	S-1367-2-8		
HD7	16			S-1367-2-6	S-1367-2-8		
RED(HA33)	16	-16-2		S-1636-2	S-1367-2-8		
HA36	16			S-1367-2-6	S-1367-2-6		
BLK(HD4)	16	-16-0		SOLDER	S-1635-2		
HA35	16			S-1367-2-12	S-1367-2-6		
HA32	16			S-1367-2-18	S-1493-2		
HD1	16			S-1367-2-6	S-1493-2		

WIRE TABLE

FIND NO.	PART NO.	DESCRIPTION	
8	S-2035-2	HOUSING	
7	S-2035-1	HOUSING	
6	3E 2071	MODULAR BRUSH ASSY	
5	3E 1899-1	TIMER	
4	C662503-0108	AMMETER	
3	22-370-20	SHUNT	
2	S-2160-1	SWITCH	
1	S-1360-15L	CKT BKR	

EQUIPMENT TABLE

CES-1000 IS APPLICABLE
VENDOR CODES PER S-1400
CES-XXXX=CESSNA SPEC. NO.
S-XXX OR CMXXXX=CESSNA STD. NO.

SUPERSEDES:

SUPERSEDED BY:

CONTRACT NO:

	NAME	DATE
DESIGN	R. KLEIN	11-17-81
GROUP	M PAINE	1-29-82
DRAWN	R KLEIN	11-17-81
CHECK	BORLESKE	1-28-82
STRESS		
PROJ	[illegible]	1-29-82
APPD	[illegible]	
OTHER		

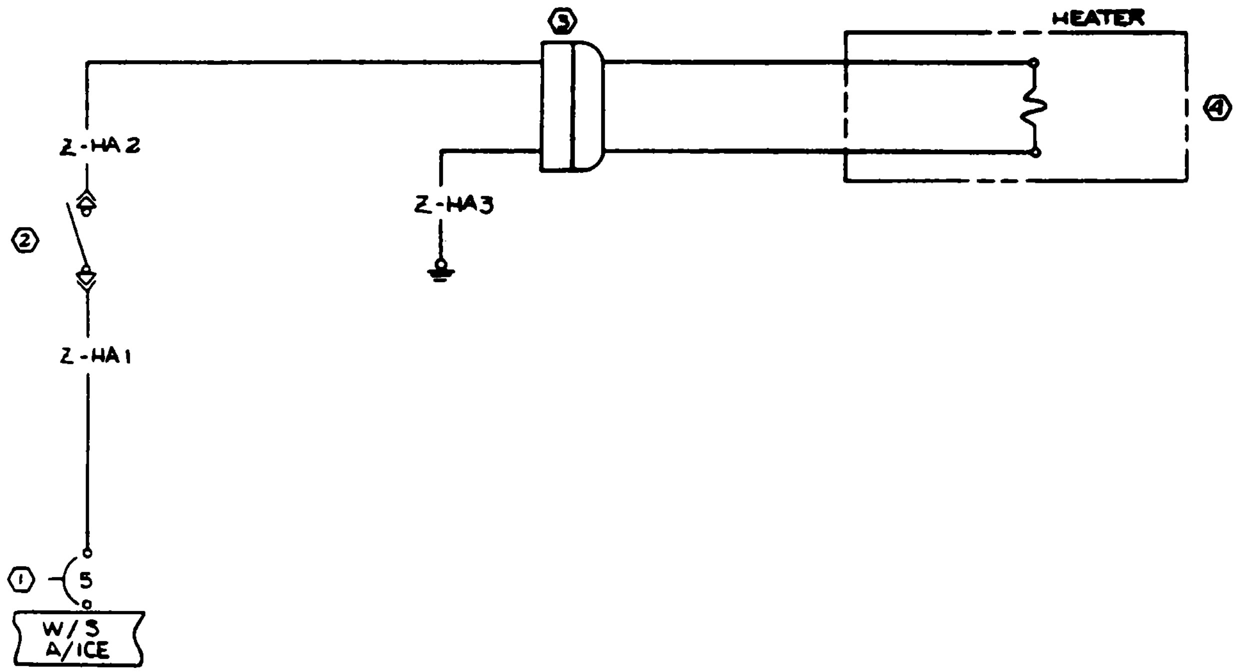
Cessna AIRCRAFT CO. PAWNEE DIVISION 5800 E. PAWNEE WICHITA, KANSAS

TITLE
WIRING DIAGRAM — PROP ANTI-ICE SYSTEM (OPT) T182

SIZE	CODE IDENT. NO.	DWG NO
C	71379	0770139

SCALE: NONE (SR10100) PAGE. 13.4

REVISION			
LFT	DESCRIPTION	DATE	APPD



WIRE CODE NO	GA	MATERIAL	LG	TERMINALS			SERIALS
Z-HA3	20			SOLDER	S-1367-1-8		
Z-HA2	20			S-1493-1	SOLDER		
Z-HA1	20			S-1367-1-6	S-1493-1		

WIRE TABLE

ITEM NO	PART NO.	DESCRIPTION	
4	1513460	HEATER	
3	MS3114E8-2S	CONNECTOR	
2	S-2160-1	SWITCH	
1	S-1360-5L	CIRCUIT BREAKER	

EQUIPMENT TABLE

CES-1000 IS APPLICABLE
VENDOR CODES PER S-1400
CES-XXXX=CESSNA SPEC. NO.
S-XXX OR CMXXXX=CESSNA STD. NO.

SUPERSEDES:

SUPERSEDED BY:

CONTRACT NO:

	NAME	DATE
DESIGN	R. KLEIN	11-17-81
GROUP	M PAINE	1-29-82
DRAWN	R. KLEIN	11-17-81
CHECK	BORLESKE	1-28-82
STRESS		
PROJ	[illegible]	1-29-82
APPD	[illegible]	
OTHER		

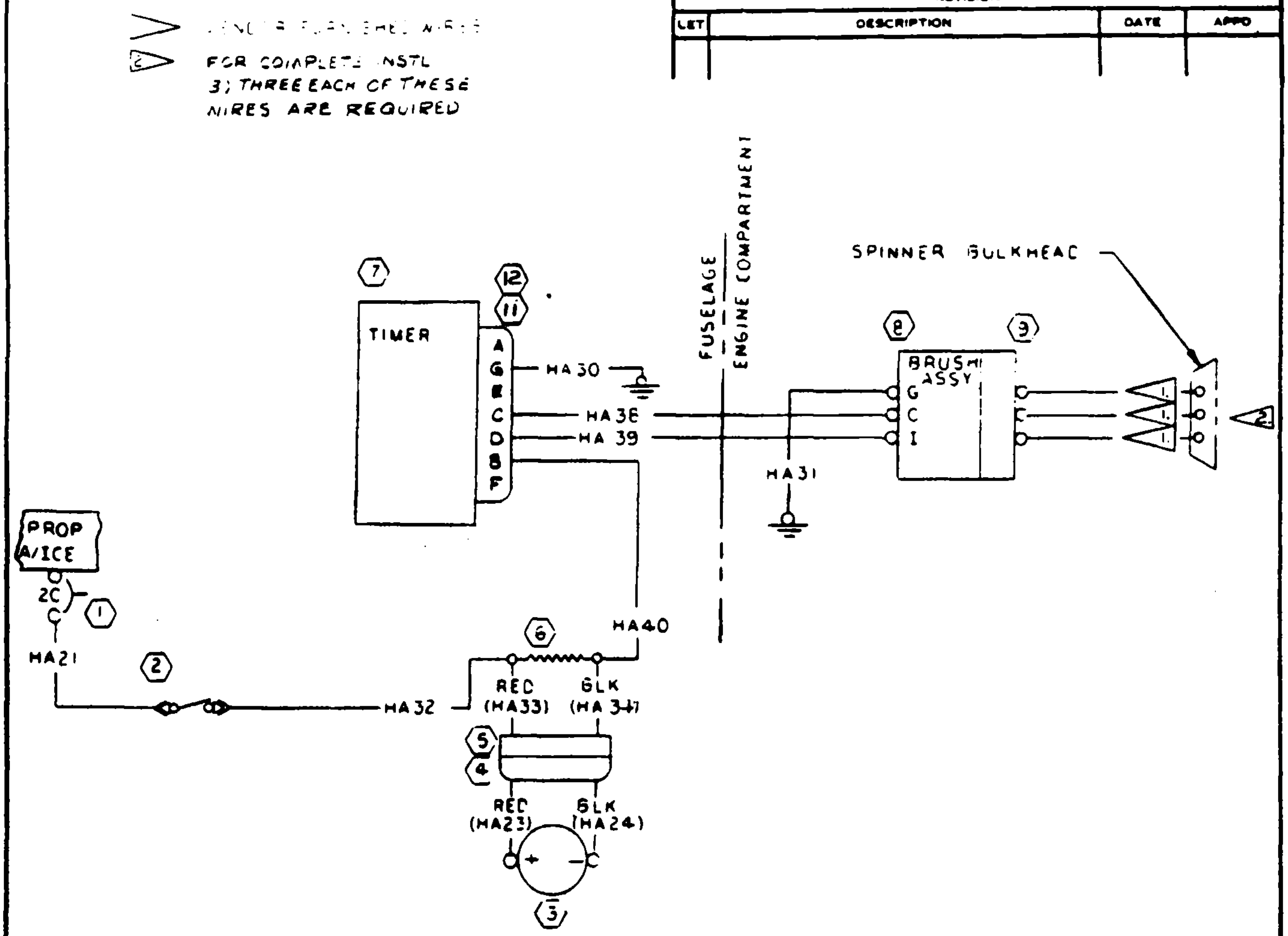
Cessna AIRCRAFT CO.
PAWNEE DIVISION
3800 E. PAWNEE
WICHITA, KANSAS

TITLE
WIRING DIAGRAM — WINDSHIELD ANTI-ICE SYSTEM (OPT) T182

SIZE	CODE IDENT. NO.	DWG NO
C	71379	0770139

SCALE NONE (SR.0100) PAGE: 13.5

REVISION			
LET	DESCRIPTION	DATE	APPD



HA 31	14			S-136726	S-136728		
HA 30	14			SOLDER	S-1367-2-8		
HA39	14			SOLDER	S-1367-2-6		
HA38	14			SOLDER	S-1367-2-6		
BLK(HA34)	14	-14-0		S-1367-2-8	S-1636-2		
RED(HA33)	14	-14-2		S-1367-2-8	S-1636-2		
HA40	14			S-1367-2-12	SOLDER		
BLK (HA24)	14	-14-0		S-1635-2	SOLDER		
RED (HA23)	14	-14-2		S-1635-2	SOLDER		
HA32	14			S-1493-2	S-1367-2-12		
HA21	14			S-136726	S-1493-2		
WIRE CODE NO.	GA	MATERIAL	LG	TERMINALS			SERIALS

WIRE TABLE

12	MS3057-12A	CLAMP	
11	MS3106A20-15S	PLUG	
9	C-40158	SLIP RING ASSY	
8	C-40179	BRUSH BLOCK ASSY	
7	C165020-0101	TIMER	
6	22-370-20	SHUNT	
5	S-2035-2	HOUSING	
4	S-2035-1	HOUSING	
3	C662503	AMMETER	
2	S-2160-1	SWITCH	
1	S-1360-20L	CIRCUIT BREAKER	
ITEM NO.	PART NO.	DESCRIPTION	

EQUIPMENT TABLE

CES-1000 IS APPLICABLE
VENDOR CODES PER S-1400
CES-XXXX-CESSNA SPEC. NO.
S-XXX OR CXXXXX-CESSNA
STD. NO.

SUPERSEDES:

SUPERSEDED BY:

CONTRACT NO:

	NAME	DATE
DESIGN	R. KLEIN	11-18-81
GROUP	M. PAINE	1-29-82
DRAWN	R. KLEIN	11-18-81
CHECK	BORLESKE	1-28-82
STRESS		
PROJ	[illegible]	1-29-82
APPD	[illegible]	
OTHER		

Cessna AIRCRAFT CO.

PAWNEE DIVISION
5800 E. PAWNEE
WICHITA, KANSAS

TITLE
WIRING DIAGRAM —
PROP ANTI-ICING 3 BLADE
(OPTIONAL) T182

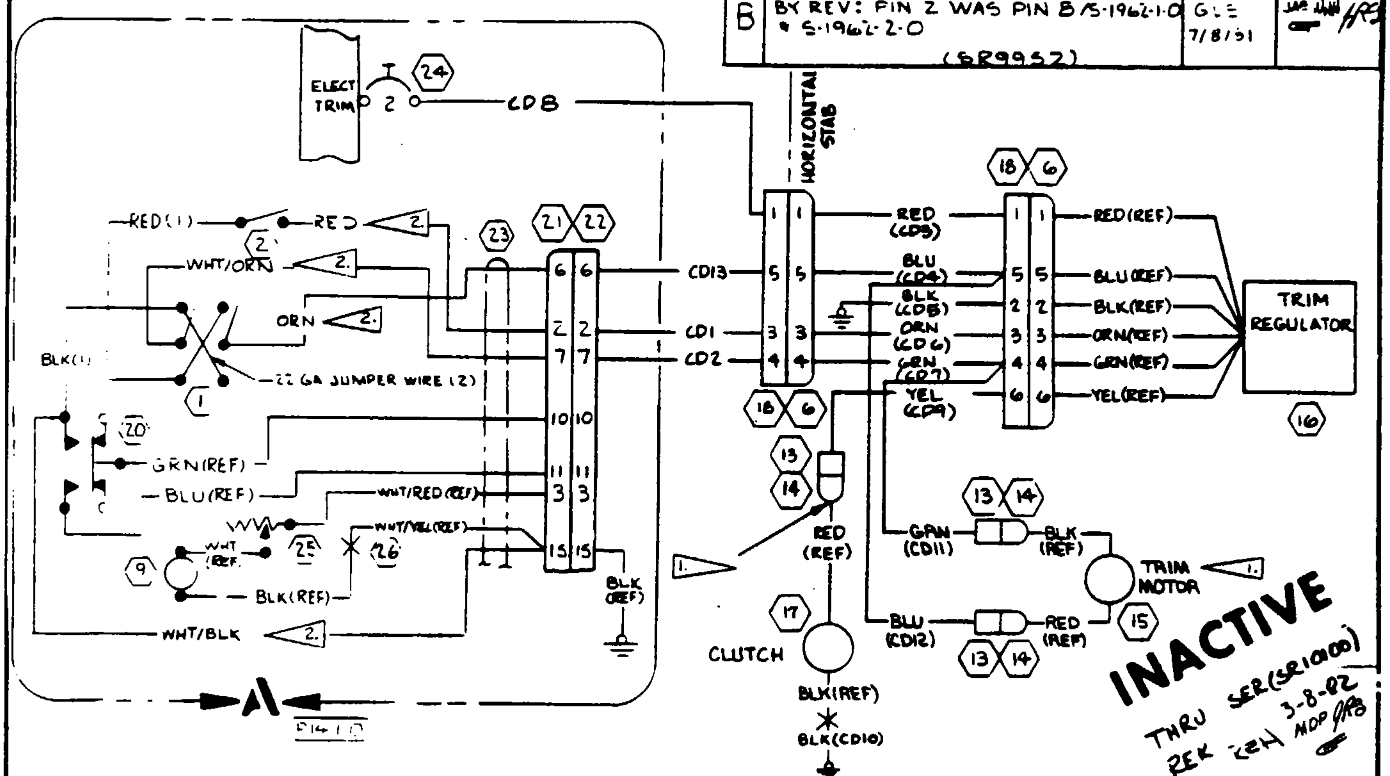
SIZE	CODE IDENT. NO.	DWG NO
C	71379	0770139

SCALE: NONE (SR10100) PAGE: 136

NOTES

1. TERMINATE VENDOR FURNISHED WIRES WITH S-1635-1 TERMINALS
2. MATERIAL IS RCF5130B COIL CORD VENDOR CODE (096906)

REVISION			
LET	DESCRIPTION	DATE	APPD
A	BY REV: ADD NOTE 2, DETAIL A, EQUIPMENT ITEMS 21 THRU 26, PAGE 14.1.1, RCF5130B COIL CORD; SERIAL OUT WIRES RED(2), ORN, BRN (SR9952)	GLS 3/10/81	
B	BY REV: PIN 2 WAS PIN 8 /S-1962-1-0 & S-1962-2-0 (SR9952)	GLS 7/8/81	



RED(2)	22	8568-2		SOLDER	SOLDER	THRU SER (SR9952)
RED(1)	22	8568-2		SOLDER	SOLDER	
ORN	22	8568-3		SOLDER	SOLDER	THRU SER (SR9952)
BRN	22	8568-1		SOLDER	SOLDER	THRU SER (SR9952)
CD13	20			S-1963-2	S-1636-1	
BLU (CD12)	22	-22-6		SEE CD4	S-1636-1	
GRN (CD11)	22	-22-5		SEE CD7	S-1636-1	
BLK (CD10)	22	-22-0		S-1370-1	S-1367-1-8	
YEL (CD9)	22	-22-4		S-1636-1	S-1636-1	
CD8	20			S-1367-1-16	S-1636-1	
GRN (CD7)	22	-22-5		S-1636-1	S-1636-2	
ORN (CD6)	22	-22-3		S-1635-1	S-1636-1	
BLK (CD5)	22	-22-0		S-1367-1-8	S-1636-1	
BLU (CD4)	22	-22-6		S-1635-1	S-1636-2	
RED (CD3)	22	-22-2		S-1635-1	S-1636-1	
CD2	20			S-1963-2	S-1636-1	
CD1	20			S-1963-2	S-1636-1	
WIRE CODE NO	GA	MATERIAL	LG	TERMINALS		SERIALS

WIRE TABLE

20	S-1985-1	SWITCH - MIKE KEY	
19	1570307	CONNECTOR ASSY	
18	S-1641-6	HOUSING	
17	TC5-208	CLUTCH	
16	C611003-0101	VOLTAGE REGULATOR	
15	C610502-0101	TRIM MOTOR	
14	S-1637-1	HOUSING	
13	S-1637-2	HOUSING	
12	S-1961-2-0	HOUSING	
11	S-1961-1-0	HOUSING	
10	3421-0000	CONNECTOR SOCKET	
9	1260243	MAPLIGHT	
8	1570307	CABLE	
7	S-1232-5	CIRCUIT BREAKER	
6	S-1640-6	HOUSING	
5	1270844	CABLE ASSY	
4	3473-3000	SOCKET	
3	1270842	CONNECTOR ASSY	
2	7101-P1	TRIM DISENGAGE SW	
1	S-2030-1	PITCH TRIM SW	
ITEM NO	PART NO.	DESCRIPTION	

EQUIPMENT TABLE

CES-1000 IS APPLICABLE VENDOR CODES PER S-1400 CES-XXXX=CESSNA SPEC. NO. S-XXX OR CMXXXX=CESSNA STD. NO.

SUPERSEDES:

SUPERSEDED BY: 14.3.0 & 14.3.1

CONTRACT NO:

	NAME	DATE
DESIGN	J. TJADEN	4-11-80
GROUP	W. H. HAIDEN	4-15-80
DRAWN	S. BURRIS	4-3-80
CHECK	BORLESKE	4-4-80
STRESS		
PROJ	SFICKEL	4-21-80
APPD		
OTHER	LWF	

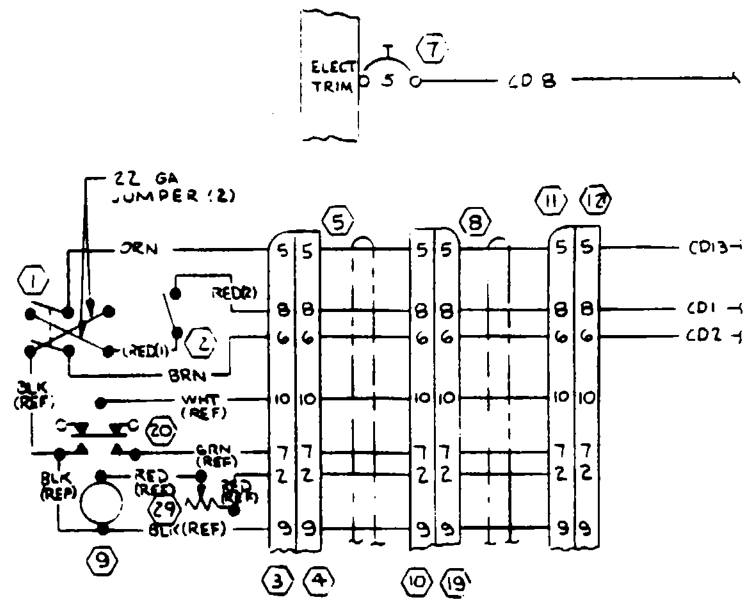
Cessna AIRCRAFT CO. PAWNEE DIVISION 5800 E PAWNEE WICHITA, KANSAS

TITLE
WIRING DIAGRAM — ELECTRIC TRIM (OPT)

SIZE	CODE IDENT. NO.	DWG NO
C	71379	0770139

SCALE: NONE (SR 9633) PAGE 14.1.0

REVISION			
LET	DESCRIPTION	DATE	APPD
A	SEE PAGE 14.0 FOR REVISION		



INACTIVE
THRU SER(SR1C100)
3-8-82
ZEK

DETAIL **A**
THRU SER (SR9952)

WHT/BLK	24	<2		SOLDER	S-1963-3		SER (SR9952) & ON
ORN	↓	↓		↓	↓		SER (SR9952) & ON
WHT/ORN	↓						SER (SR9952) & ON
RED	24	<2		↓	S-1963-3		SER (SR9952) & ON
BLK (1)	22	-22-0		SOLDER	SOLDER		SER (SR9952) & ON
WIRE CODE NO	GA	MATERIAL	LG	TERMINALS			SERIALS

WIRE TABLE

26	S-1370-1	SPLICE	
25	S859A161-152A	RHEOSTAT	
24	S1232-2	CIRCUIT BREAKER	
23	2270030	CABLE ASSY	
22	S-1962-2-0	HOUSING	
21	S-1962-1-0	HOUSING	
ITEM NO.	PART NO.	DESCRIPTION	

EQUIPMENT TABLE

CES-1000 IS APPLICABLE VENDOR CODES PER S-1400 CES-XXXX=CESSNA SPEC. NO. S-XXX OR CMXXXX=CESSNA STD. NO.

SUPERSEDES:

SUPERSEDED BY:

CONTRACT NO:

	NAME	DATE
DESIGN	G. STAMM	3/10/81
GROUP	D. [illegible]	4-20-81
DRAWN	G. STAMM	3/10/81
CHECK	R.E. HAIR	3-11-81
STRESS		
PROJ	J.R. [illegible]	4-20-81
APPD	[illegible]	
OTHER		

Cessna AIRCRAFT CO.
PAWNEE DIVISION 5800 E. PAWNEE WICHITA, KANSAS

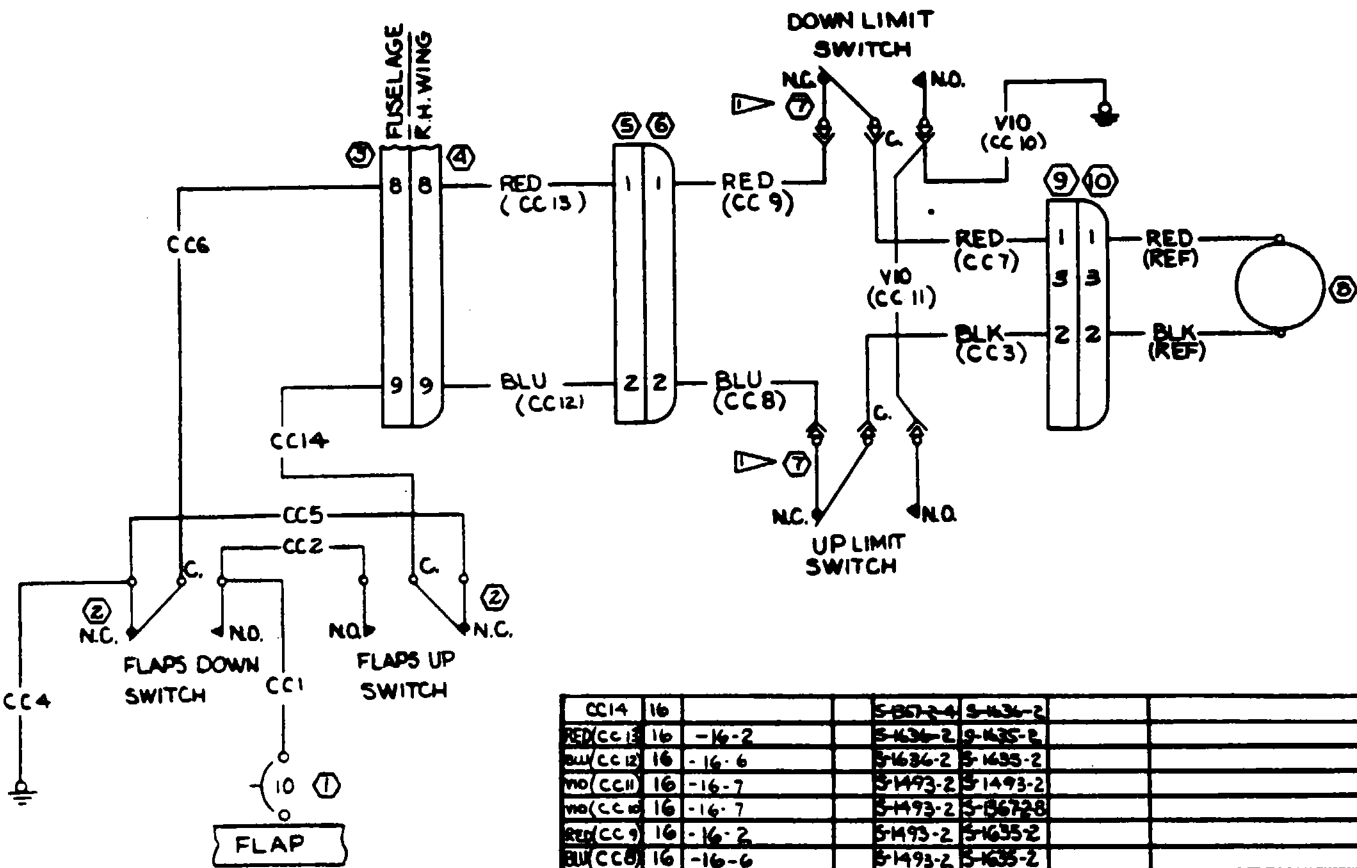
TITLE
WIRING DIAGRAM — ELECTRIC ELEVATOR TRIM (OPTION)

SIZE	CODE IDENT. NO.	DWG NO
C	71379	0770139

SCALE NONE (SR9952) PAGE 14.1

NOTES:
1. THESE SWITCHES PART OF C301002 ACTUATOR ASSY.

REVISION			
LTR	DESCRIPTION	DATE	APPD



WIRE CODE NO	GA	MATERIAL	LG	TERMINALS			SERIALS
CC14	16			S-1367-2-4	S-1636-2		
RED (CC13)	16	-16-2		S-1636-2	S-1635-2		
BLU (CC12)	16	-16-6		S-1636-2	S-1635-2		
VIO (CC11)	16	-16-7		S-1493-2	S-1493-2		
VIO (CC10)	16	-16-7		S-1493-2	S-1367-2-8		
RED (CC9)	16	-16-2		S-1493-2	S-1635-2		
BLU (CC8)	16	-16-6		S-1493-2	S-1635-2		
RED (CC7)	16	-16-2		S-1493-2	S-1636-2		
CC6	16			S-1367-2-4	S-1636-2		
CC5	16			S-1367-2-4	S-1367-2-4		
CC4	16			S-1367-2-4	S-1367-2-8		
BLK (CC3)	16	-16-0		S-1636-2	S-1493-2		
CC2	16			S-1367-2-4	S-1367-2-4		
CC1	16			S-1367-2-6	S-1367-2-4		

WIRE TABLE

ITEM NO.	PART NO.	DESCRIPTION	
10	S-1638-2	HOUSING	
9	S-1638-1	HOUSING	
8	C301002	ACTUATOR ASSY	
7	S-1906-2	SWITCH	
6	S2035-1	HOUSING-CAP	
5	S-2035-2	HOUSING-PLUG	
4	S-1640-9	HOUSING-PIN	
3	S-1641-9	HOUSING-SOCKET	
2	S-1906-1	SWITCH	
1	S-1360-10L	CIRCUIT BREAKER	

EQUIPMENT TABLE

CES-1000 IS APPLICABLE
VENDOR CODES PER S-1400
CES-XXXX=CESSNA SPEC. NO.
S-XXX OR CMXXXX=CESSNA STD. NO.

SUPERSEDES:

SUPERSEDED BY:

CONTRACT NO:

	NAME	DATE
DESIGN	J. TJADEN	4-11-80
GROUP	W.L. HARDEN	4-18-80
DRAWN	S. BURRIS	4-3-80
CHECK	BORLESKE	4-4-80
STRESS		
PROJ	GFICKEL	4-21-80
APPD	WRS	
OTHER	LWF	

Cessna AIRCRAFT CO.
PAWNEE DIVISION
5800 E. PAWNEE
WICHITA, KANSAS

TITLE
WIRING DIAGRAM — WING FLAPS

SIZE	CODE IDENT. NO.	DWG NO
C	71379	0770139

SCALE: NONE (SR 9633) PAGE: 14.2

REVISION			
LET	DESCRIPTION	DATE	APPD

NOTES:

1. MATERIAL IS RCF 51308 COIL CORD, VENDOR CODE (09692)

WIRE TABLE

WIRE CODE NO	GA	MATERIAL	LG	TERMINALS			SERIALS
2-CD32	18			S-1963-2	S-13671-8		
2-CD31 BLK	18	-18-0		SOLDER	S-1963-3		
VIO	24	1		SOLDER	S-1963-3		
2-CD22	18S	S-1461-18-9		S-1963-2	S-13671-8		
2-CD26 GRN	20	-20-5		S-2099-6	S-2099-9		
2-CD27 BLU	20	-20-6		S-2099-6	S-2099-9		
2-CD29 BLK	20	-20-0		S-2099-6	S-13671-8		
[illegible]	18	-18-0		S-1963-2	S-13671-8		
[illegible]	20	-20-4			S-2099-9		
[illegible]	20	-20-9-3			S-2099-9		
[illegible]	20	-20-9-4			S-2099-6		
2-CD23 YEL	20	-20-4		S-1963-2	S-2099-9		
RED	24	1		SOLDER	S-1963-3		
WHT/ORN							
ORN							
WHT/YEL							
YEL							
BLK(2)	24	1		SOLDER	S-1963-3		

EQUIPMENT TABLE

ITEM NO.	PART NO.	DESCRIPTION	
10	S-1985-3	SWITCH	
9	44430-3257	TRIM ACTUATOR	
8	S-2349-1	CONNECTOR	
7	S-1232-2	CIRCUIT BREAKER	
6	S-1962-2-0	HOUSING	
5	S-1962-1-0	HOUSING	
4	2270030	CABLE ASSY	
3	2270035	RELAY ASSY	
2	S-2349-2	CONNECTOR	
1	7205P4	SWITCH	

CES-1000 IS APPLICABLE
VENDOR CODES PER S-1400
CES-XXXX=CESSNA SPEC. NO.
S-XXX OR CMXXXX=CESSNA STD. NO.

SUPERSEDES: PG 14.1.0 & 14.1.1

SUPERSEDED BY:

CONTRACT NO:

	NAME	DATE
DESIGN	R. KLEIN	2-2-82
GROUP	M. PAINE	3-10-82
DRAWN	R. KLEIN	2-2-82
CHECK	R. E. HAIR	3-9-82
STRESS		
PROJ	[illegible]	3-10-82
APPD	[illegible]	
OTHER		

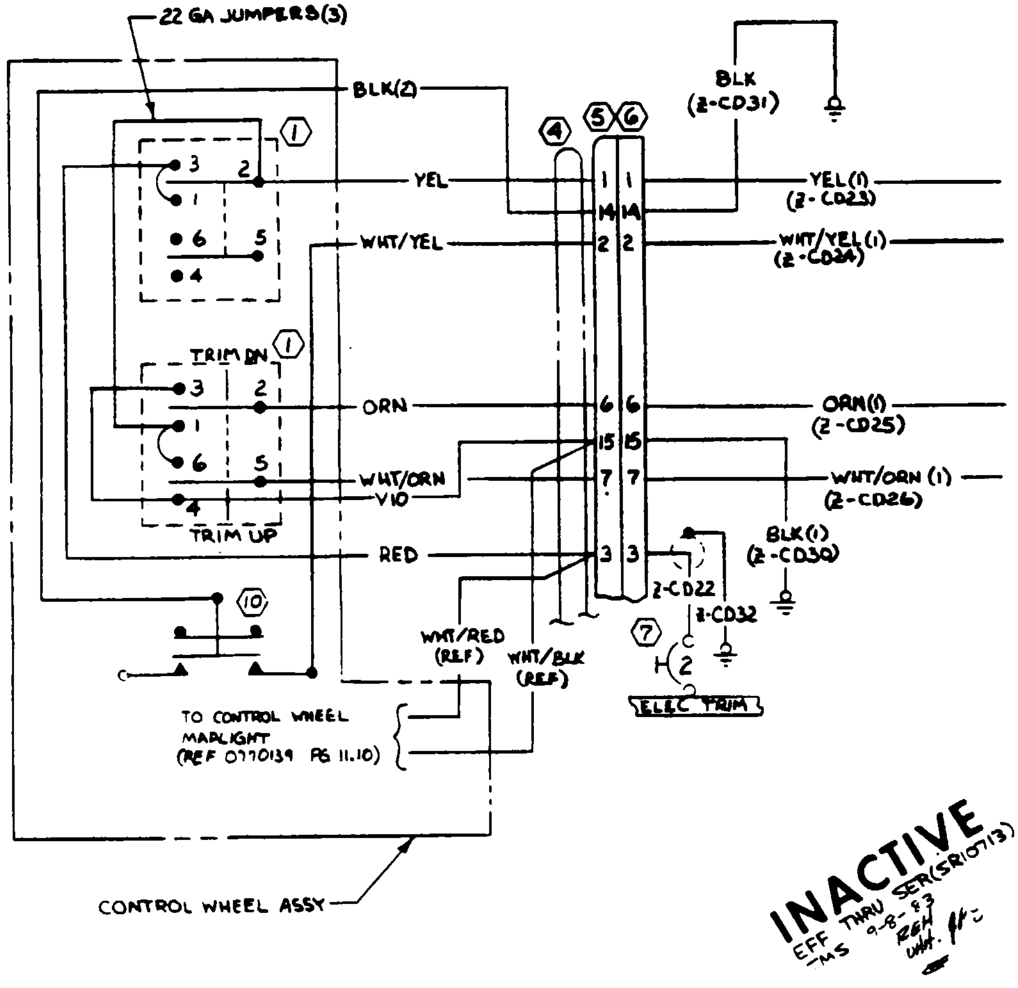
Cessna AIRCRAFT CO.
PAWNEE DIVISION
5800 E. PAWNEE
WICHITA, KANSAS

TITLE
WIRING DIAGRAM — ELECTRIC TRIM (OPT)

SIZE	CODE IDENT. NO.	DWG NO
C	71379	0770139

SCALE: NONE (SR10100) PAGE: 14.3.0

REVISION			
LET	DESCRIPTION	DATE	APPD
	SEE PAGE 14.3.0 FOR REV.		



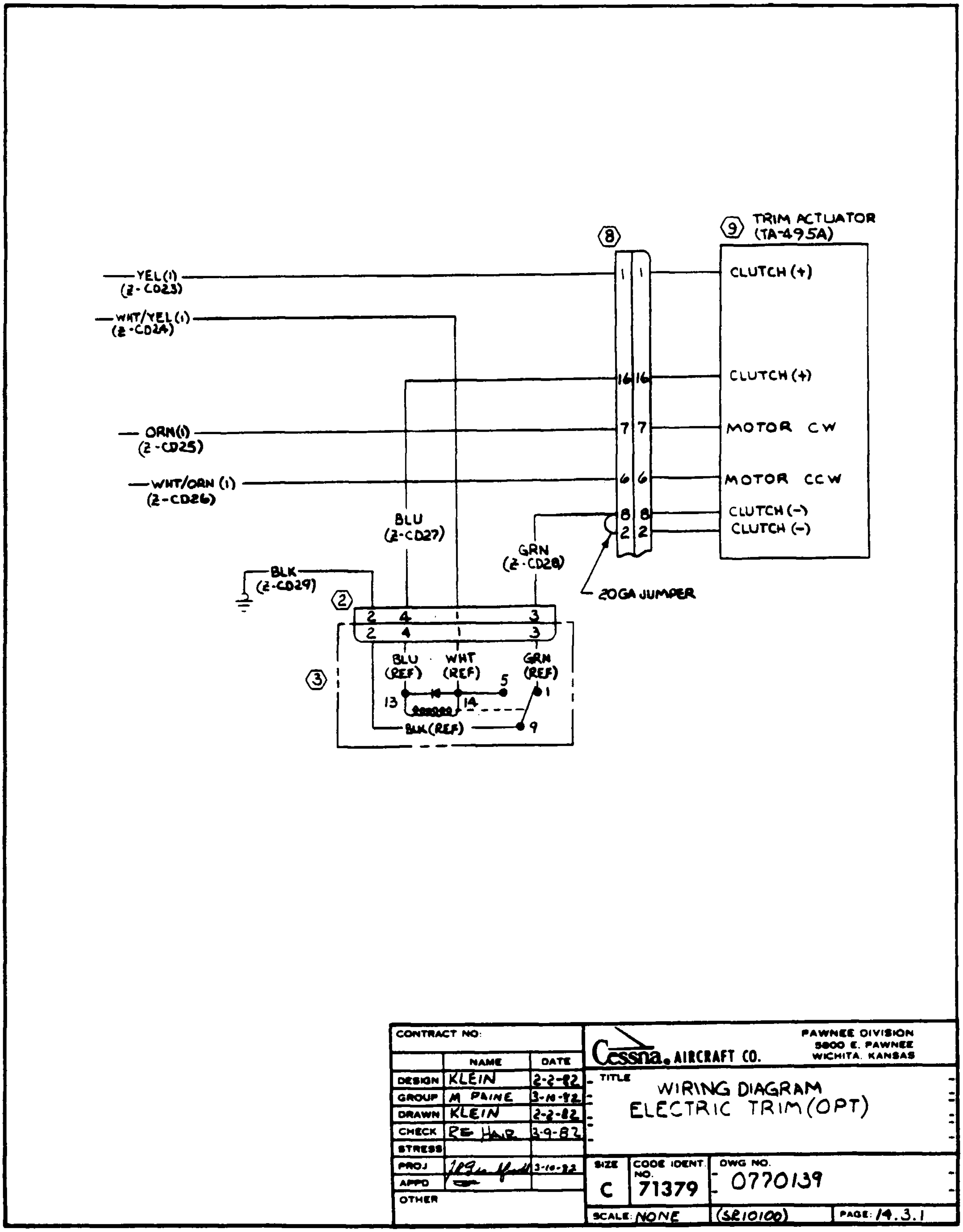
CONTRACT NO		
	NAME	DATE
DESIGN	KLEIN	2-2-82
GROUP	M PAINE	3-10-82
DRAWN	KLEIN	2-2-82
CHECK	RE HAIR	2-9-82
STRESS		
PROJ		3-10-82
APPD		
OTHER		

Cessna AIRCRAFT CO. PAWNEE DIVISION 5800 E PAWNEE WICHITA KANSAS

TITLE WIRING DIAGRAM ELECTRIC TRIM(OPT)

SIZE	CODE IDENT NO	DWG NO
C	71379	0770139
SCALE NONE	(SR10100)	PAGE 14.3.1

Electric Trim (OPT) (Sheet 1 of 2)



Electric Trim (OPT) (Sheet 2 of 2)

NOTES:
1. MATERIAL IS RCF51306 COIL CORD (096906)

REVISION			
LET	DESCRIPTION	DATE	APPD

WIRE CODE NO	GA	MATERIAL	LG	TERMINALS			SERIALS
RED	24	1.		SOLDER	S-2353-2		
VIO							
WHT/ORN							
ORN							
WHT/YEL							
YEL							
BLK	24	1.		SOLDER	S-2353-2		
Z-CD42	20			S-2099-9	S-2099-9		
Z-CD40	18			S-2099-8	S-1367-1-8		
Z-CD39	18$			S-2099-8	S-1367-1-8		
Z-CD38	20			S-2099-6	S-1367-1-8		
Z-CD37				S-2099-6	S-2099-8		
Z-CD36				S-2099-6	S-2099-9		
Z-CD35				S-2099-9	S-2099-9		
Z-CD34				S-2099-9	S-2099-9		
Z-CD33	20			S-2099-9	S-2099-6		
Z-CD32	18			SOLDER	S-1367-1-8		

WIRE TABLE

ITEM NO	PART NO.	DESCRIPTION	
9	44430-3257	TRIM ACTUATOR	
8	S-2349-1	CONNECTOR	
7	S-1232-2	CIRCUIT BREAKER	
6	S-1985-3	SWITCH	
5	S-2350-3	CONNECTOR	
4	2270030	CABLE ASSY	
3	2270035	RELAY ASSY	
2	S-2349-2	CONNECTOR	
1	722524	SWITCH	

EQUIPMENT TABLE

CES-1000 IS APPLICABLE
VENDOR CODES PER S-1400
CES-XXXX=CESSNA SPEC. NO.
S-XXX OR CMXXXX=CESSNA STD. NO.

SUPERSEDES: PG. 14.3.0

SUPERSEDED BY:

CONTRACT NO.

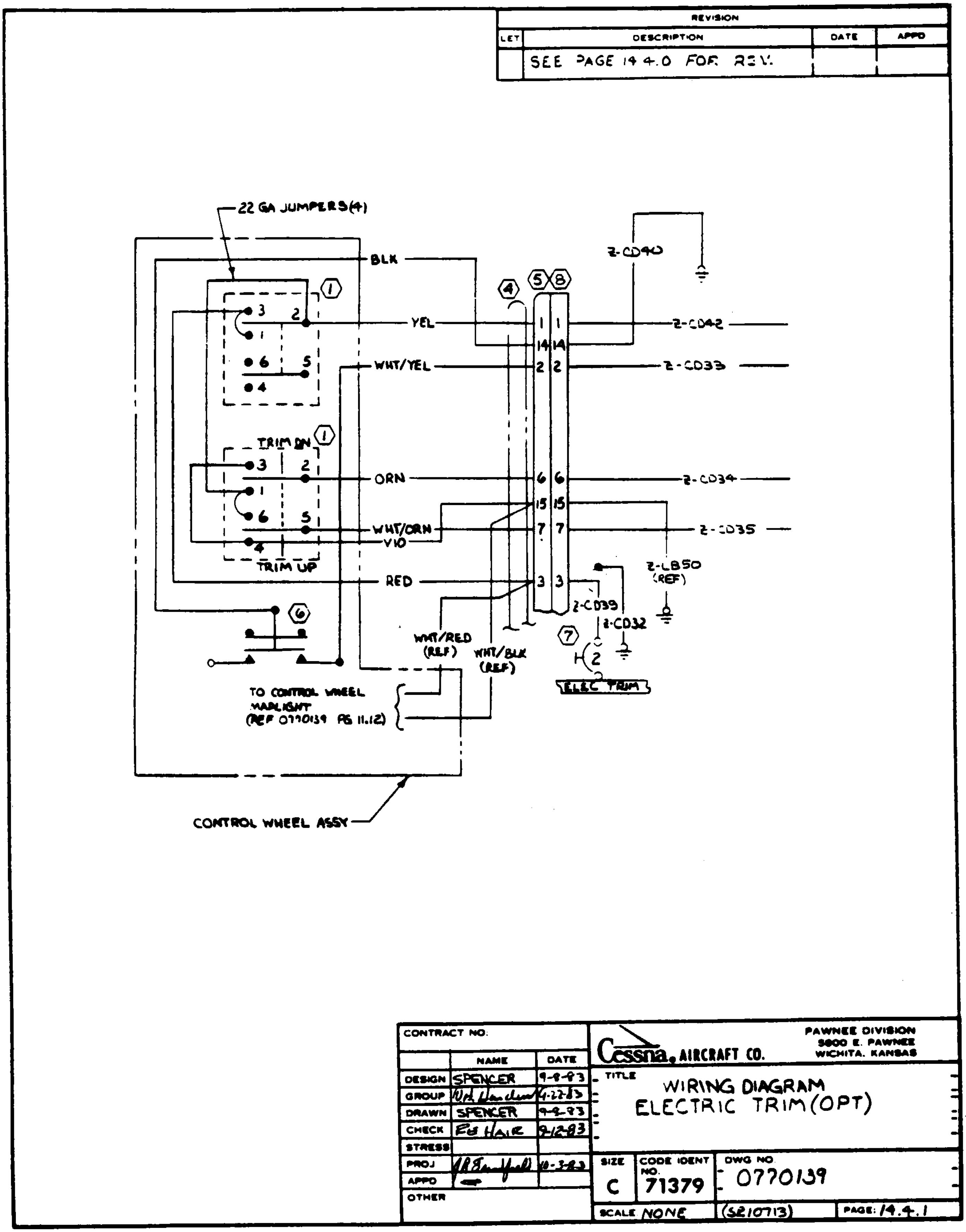
	NAME	DATE
DESIGN	SPENCER	9-8-83
GROUP	[illegible]	1-22-83
DRAWN	SPENCER	9-8-83
CHECK	RG HAIRE	9-12-83
STRESS		
PROJ	JR [illegible]	11-3-83
APPD	CSF	
OTHER		

Cessna AIRCRAFT CO.
PAWNEE DIVISION
5800 E. PAWNEE
WICHITA, KANSAS

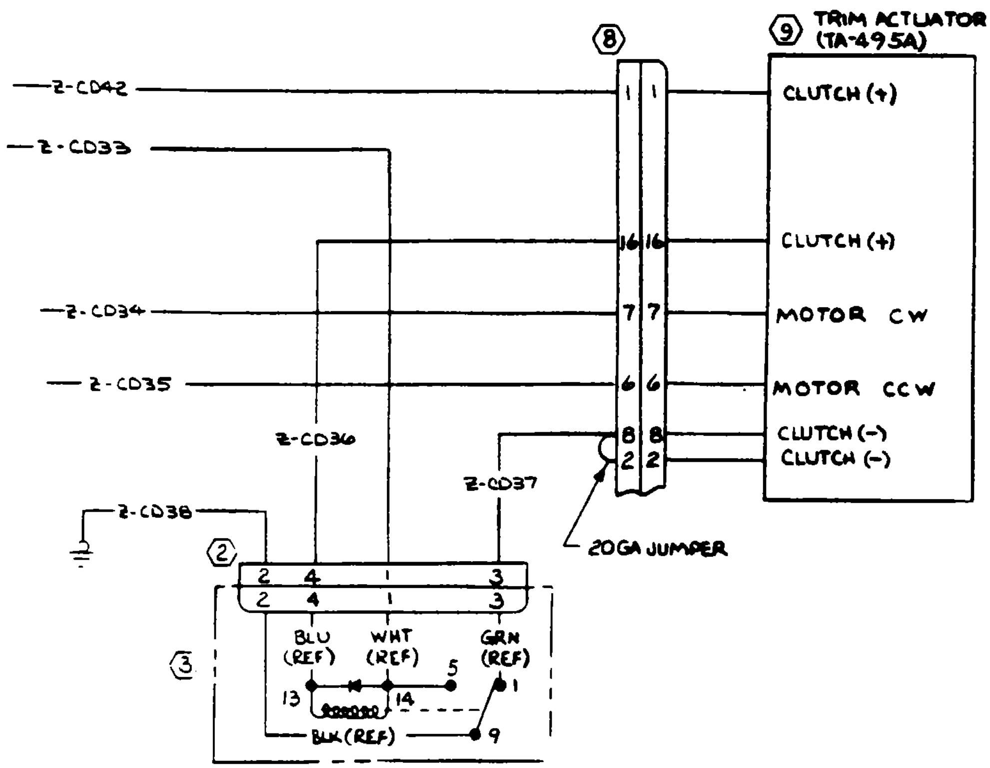
TITLE
WIRING DIAGRAM —
ELECTRIC TRIM (OPT)

SIZE	CODE IDENT. NO.	DWG NO
C	71379	0770139

SCALE NONE (SR10713) PAGE: 14.4.0



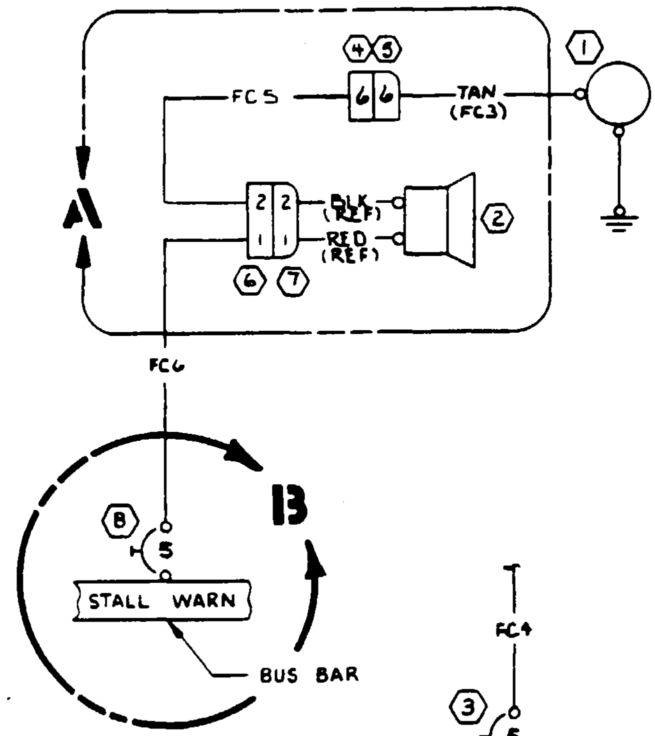
Electric Trim (Sheet 1 of 2)

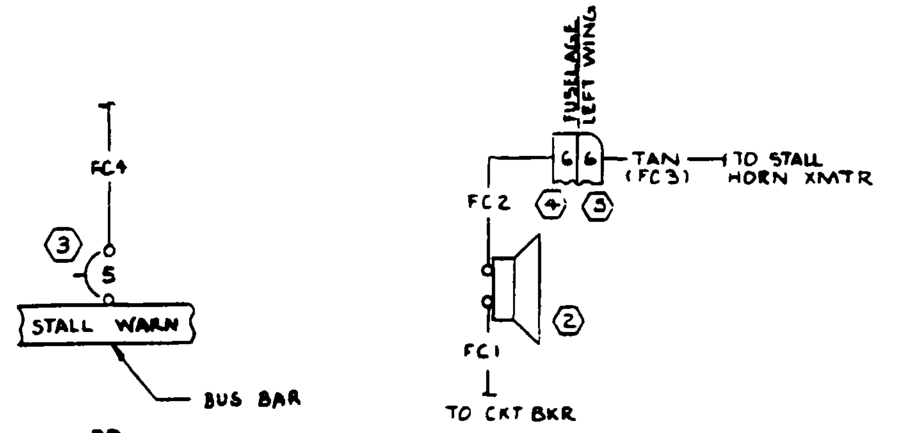


CONTRACT NO			Cessna. AIRCRAFT CO.	PAWNEE DIVISION 5800 E PAWNEE WICHITA KANSAS
	NAME	DATE	TITLE WIRING DIAGRAM ELECTRIC TRIM (OPT)	
DESIGN	SPENCER	9-9-83		
GROUP		9-27-83		
DRAWN	SPENCER	9-5-83		
CHECK		9-12-83		
STRESS				
PROJ		11-3-83	SIZE C	CODE IDENT NO 71379	DWG NO 0770139
APPD				
OTHER			SCALE NONE	(S210713) PAGE 14.4.1

Electric Trim (Sheet 2 of 2)

REVISION			
LET	DESCRIPTION	DATE	APPD
A	BY REV: ADD DETAIL A, FC4 & FC5; SERIAL OUT FC1, FC2 & FC3; 1670056 WAS S-2077-8 HORN (SR9321)(REF) (SR9952)	GLS 2/9/81	
B	BY REV: DELETE SERIAL OUT FC3; S-1636-1 WAS S-1367-1-8 (FC5) (NOW SHOP PRACTICE) ADD DETAIL B; ADD S-1232-5, FC6 & SER (SR 10100)	REK 1-18-82	





DETAIL B
THRU SER (SR 10100)

DETAIL A
THRU SER (SR9952)

WIRE CODE NO	GA	MATERIAL	LG	TERMINALS			SERIALS
FC6	22			S-1367-1-8	S-1636-1		SER (SR 10100) & ON
FC5	22			S-1636-1	S-1636-1		SER (SR9952) & ON
FC4	22			S-1367-1-6	S-1636-1		SER (SR9952) THRU SER (SR 10100)
TAN (FC3)	22	-22-10		S-1635-1	S-1367-1-8		
FC2	22			S-1367-1-6	S-1636-1		THRU SER (SR9952)
FC1	22			S-1367-1-6	S-1367-1-6		THRU SER (SR9952)

WIRE TABLE

ITEM NO	PART NO.	DESCRIPTION	
8	S-1232-5	CIRCUIT BREAKER	
7	S-2035-1	HOUSING	
6	S-2035-2	HOUSING	
5	S-1640-6	HOUSING	
4	S-1641-6	HOUSING	
3	S-1360-5L	CIRCUIT BREAKER	
2	1670056	HORN ASSY	
1	0511062	XMTR-STALL WARN	

EQUIPMENT TABLE

CES-1000 IS APPLICABLE
VENDOR CODES PER S-1400
CES-XXXX=CESSNA SPEC. NO.
S-XXX OR CMXXXX=CESSNA STD. NO.

SUPERSEDES:

SUPERSEDED BY:

CONTRACT NO:

	NAME	DATE
DESIGN	TJADEN	4-11-80
GROUP	W. HARDEN	4-18-80
DRAWN	OBERMUELLER	4-3-80
CHECK	BORLESKE	4-4-80
STRESS		
PROJ	[illegible]ICKEL	4-21-80
APPD		
OTHER	LWF	

Cessna AIRCRAFT CO.
PAWNEE DIVISION
5800 E PAWNEE
WICHITA, KANSAS

TITLE
WIRING DIAGRAM — STALL WARNING SYSTEM (NON-HEATED)

SIZE	CODE IDENT. NO	DWG NO
C	71379	0770139

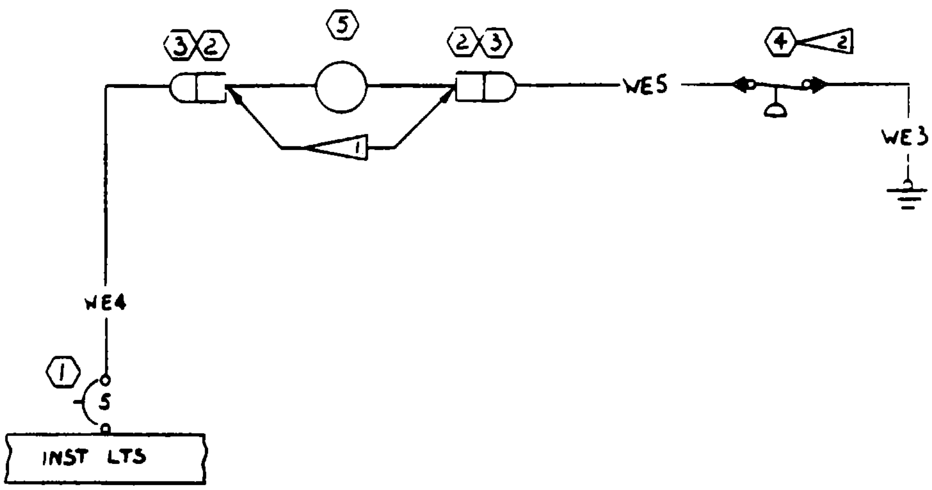
SCALE: NONE (SR9633) PAGE: 15.1

REVISION			
LET	DESCRIPTION	DATE	APPD

NOTES:

1. TERMINATE VENDOR FURNISHED WIRES WITH S-1636-1 PIN

2. VACUUM SWITCH CONTACTS ARE NORMALLY CLOSED; CONTACTS OPEN AT 3.5±1 INCHES OF MERCURY VACUUM.



WIRE CODE NO	GA	MATERIAL	LG	TERMINALS			SERIALS
WE 5	22			S-1635-1	S-1493-1		
WE 4	22			S-1367-1-6	S-1635-1		
WE 3	22			S-1493-1	S-1367-1-8		

WIRE TABLE

ITEM NO.	PART NO.	DESCRIPTION	
5	S-2135-2	LAMP	
4	S-2571-2	VACUUM SWITCH	
3	S-1637-1	HOUSING	
2	S-1637-2	HOUSING	
1	S-1360-5L	CIRCUIT BREAKER	

EQUIPMENT TABLE

CES-1000 IS APPLICABLE VENDOR CODES PER S-1400 CES-XXXX=CESSNA SPEC. NO. S-XXX OR CMXXXX=CESSNA STD. NO.

SUPERSEDES:

SUPERSEDED BY:

CONTRACT NO:

	NAME	DATE
DESIGN	R. KLEIN	11-20-81
GROUP	W. DALE	1-19-82
DRAWN	R. KLEIN	11-20-81
CHECK	BORLESKE	1-14-82
STRESS	A. SHOIL	1-12-82
PROJ	[illegible]	1-19-82
APPD	[illegible]	
OTHER		

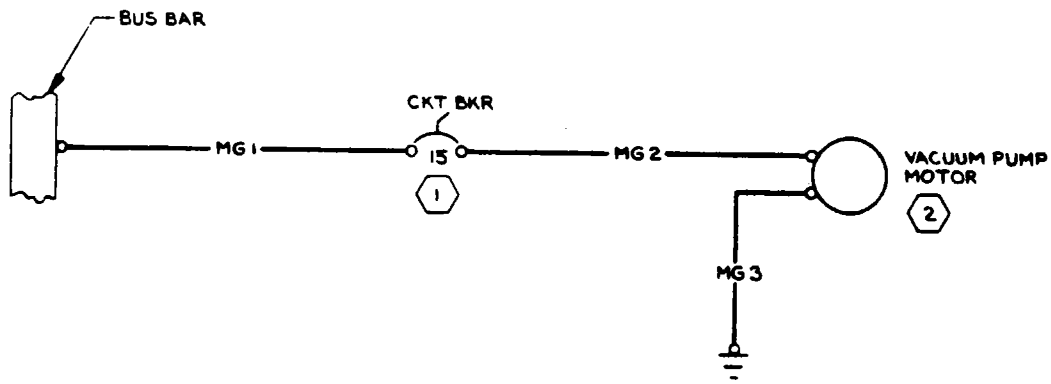
Cessna AIRCRAFT CO. PAWNEE DIVISION 5800 E. PAWNEE WICHITA, KANSAS

TITLE WIRING DIAGRAM — VACUUM OUT WARNING SYSTEM - T182

SIZE C | CODE IDENT. NO. 71379 | DWG NO 0770139

SCALE: NONE | (SR10100) | PAGE: 15.2

REVISION			
LET	DESCRIPTION	DATE	APPD



14-00916

WIRE CODE NO	GA	MATERIAL	LG	TERMINALS			SERIALS
MG 3	16	S-2589		S-1367-2-8	S-1367-2-6		
MG 2	16	S-2589		S-1367-2-8	S-1367-2-8		
MG 1	16	S-2589		S-1367-2-8	S-1367-2-8		

WIRE TABLE

ITEM NO	PART NO.	DESCRIPTION	
2	C165008-0101	VACUUM PUMP	
1	CM3589-15	CKT BKR	

EQUIPMENT TABLE

CES-1000 IS APPLICABLE
VENDOR CODES PER S-1400
CES-XXXX=CESSNA SPEC. NO.
S-XXX OR CMXXXX=CESSNA STD. NO.

SUPERSEDES.

SUPERSEDED BY.

CONTRACT NO:

	NAME	DATE
DESIGN	W.H.HARDEN	10-31-84
GROUP	W.H.HARDEN	10-31-84
DRAWN	KEN LUNDY	10-3-84
CHECK	R.E. HAIR	[illegible]
STRESS		
PROJ	[illegible]	11-1-84
APPD	[illegible]	11-1-84
OTHER		

Cessna. AIRCRAFT CO.
PAWNEE DIVISION
5800 E. PAWNEE
WICHITA, KANSAS

TITLE
WIRING DIAGRAM — STANDBY VACUUM PUMP MODEL T182

SIZE	CODE IDENT. NO.	DWG NO
C	71379	0770139

SCALE NONE (SR 10414) PAGE: 16.1