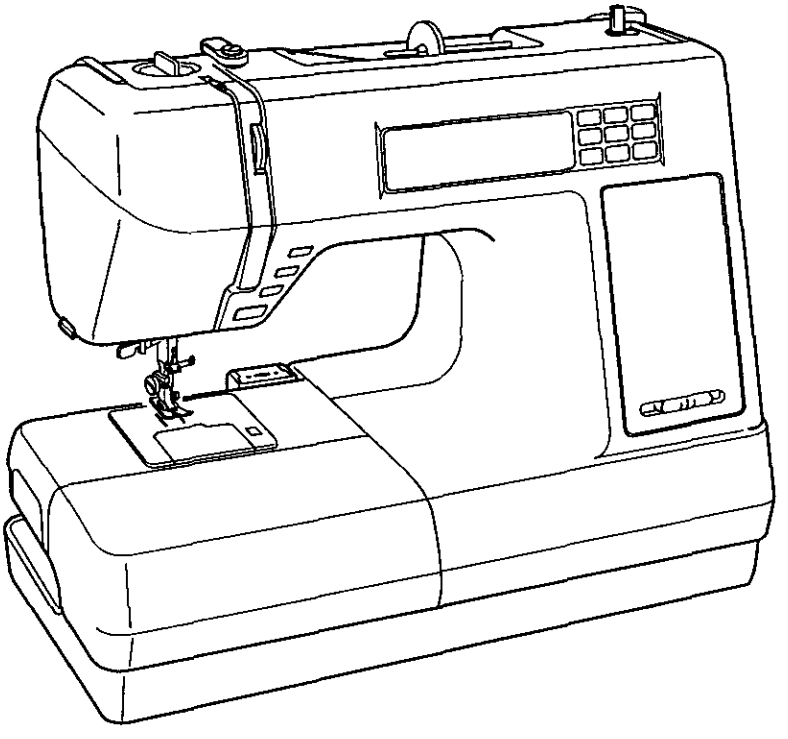
SERVICE MANUAL



SEWING MACHINE MODEL
385.19001890
NOVEMBER,1998

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SPECIFICATIONS

MODEL 385.19001890

(A) GENERAL SPECIFICATIONS

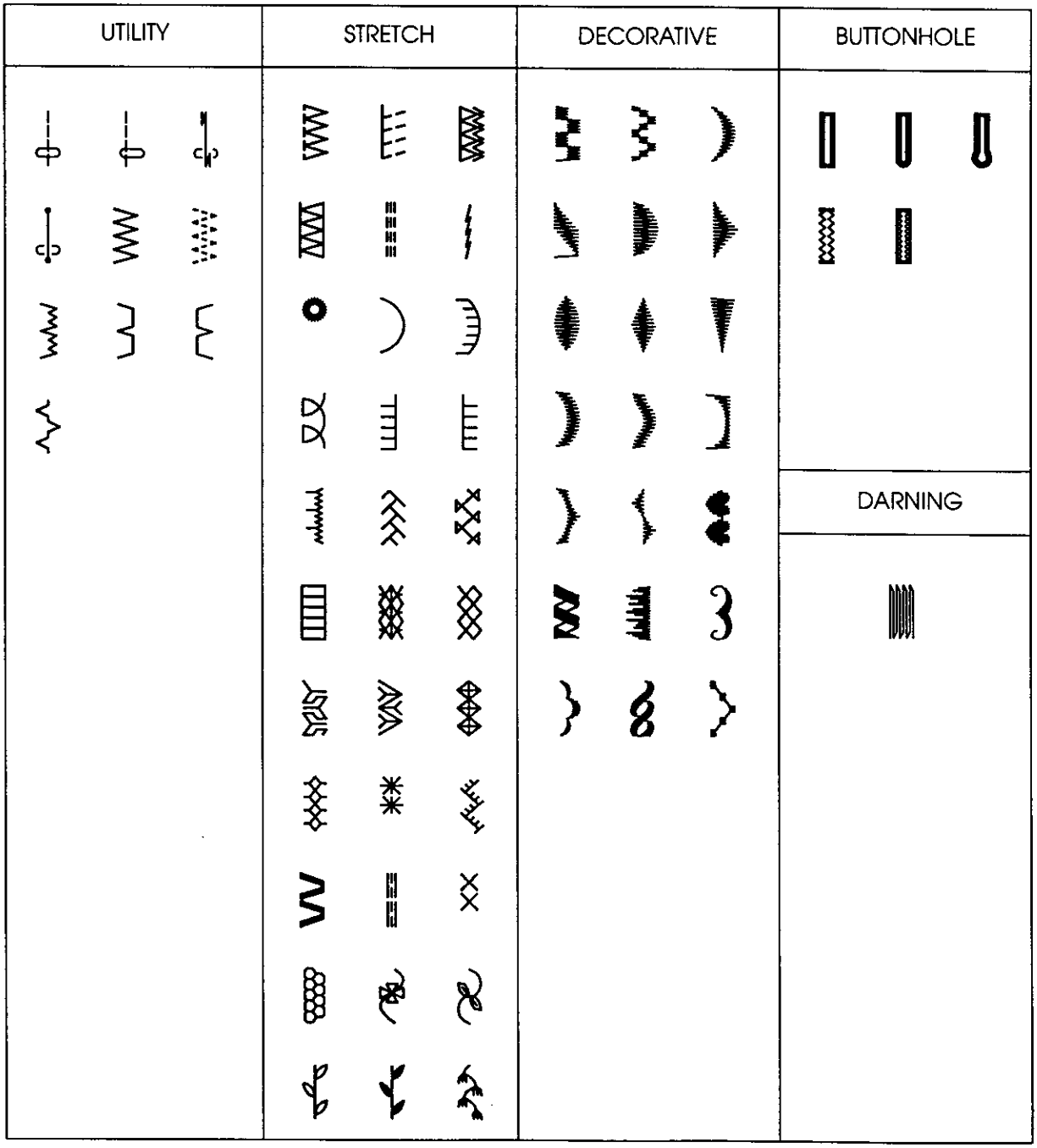
1. TYPE:	FREE ARM, TWO IN ONE (CONVENTIONAL AND EMBROIDERY)
2. CONVERTIBILITY:	EXTENSION TABLE
3. SHUTTLE SYSTEM:	HORIZONTAL FULL ROTARY SHUTTLE
4. STITCH PACKAGE:	65 PLUS 840 BUILT-IN MONOGRAMS
BUILT-IN STITCH:	65 10 (UTILITY) 33 (STRETCH) 21 (DECORATIVE) 1 (DARNING) 840 (MONOGRAMS)
5. ELECTRONIC AUTOMATIC BUTTONHOLER:	5 STYLES REGULAR (SQUARE) X 3 ROUND KEY HOLE
6. BOBBIN WINDING SYSTEM:	AUTOMATIC CLUTCH (AUTO DECLUTCH TYPE)
7. THREADING SYSTEM:	SLIT TAKE-UP LEVER
8. PRESSER FOOT SYSTEM:	HIGH BAR
9. MACHINE COLOR:	WHITE (J-N47)
10. NEEDLE POSITION:	7MM / MULTIPLE NEEDLE POSITIONS
11. EMBROIDERY SIZE:	126 MM (5") X 90 MM (3.5")
12. DROP FEED DOG:	DROP FEED SYSTEM
13. THREAD TENSION MECHANISM:	CONCEALED
14. FEED BALANCE DIAL:	BUILT-IN
15. FOOT FIXING SYSTEM:	SNAP-ON/OFF SYSTEM
16. CONTROL:	ELECTRONIC TOUCH CONTROL PANEL AND ADJUSTMENT
16-1. STITCH WIDTH:	TOUCH SCREEN SYSTEM PRE-PROGRAMMED, ALSO MANUALLY ADJUSTABLE
16-2. STITCH LENGTH:	TOUCH SCREEN SYSTEM PRE-PROGRAMMED, ALSO MANUALLY ADJUSTABLE
16-3. PATTERN SELECTION:	TOUCH SCREEN SYSTEM
16-4. MEMORY:	TOUCH SCREEN SYSTEM (EMBROIDERY ONLY)
16-5. CLEAR:	TOUCH SCREEN SYSTEM (EMBROIDERY ONLY)
17. FUNCTION KEY:	
17-1. START STOP KEY:	PUSH BUTTON SYSTEM (EMBROIDERY ONLY)

18. NEEDLE UP & DOWN:	PUSH BUTTON SYSTEM
19. REVERSE STITCH:	PUSH BUTTON SYSTEM
20. LCD (LIQUID CRYSTAL DISPLAY):	YES
21. HORIZONTAL SPOOL PIN:	YES
22. CARRY HANDLE:	YES
23. BOBBIN COVER PLATE:	POP UP TYPE
24. ADJUSTABLE PRESSER FOOT TENSION:	DIAL TYPE (3 POSITIONS)
25. ACCESSORIES:	
SEAM RIPPER/BUTTONHOLE OPENER	560406104
LARGE SCREW DRIVER	820832005
PLASTIC BOBBIN	102261103
STRAIGHT STITCH FOOT (H)	823801015
SATIN STITCH FOOT (F)	822804118
ZIPPER FOOT (E)	829801002
BLIND HEM FOOT (G)	820817015
OVEREDGE FOOT (C)	822801001
SPOOL PIN FELT	102403109
QUILTER	802422002
SPOOL STAND	829803004
NEEDLE SET	650807008
ADDITIONAL SPOOL PIN	625031500
SPOOL HOLDER (LARGE)	822020503
SPOOL HOLDER (SMALL)	822019509
LINT BRUSH	802424004
AUTOMATIC BH FOOT (R)	753801004
EMBROIDERY FOOT (P)	830810031
EMBROIDERY SCISSORS	822814007
EMBROIDERY HOOP (ROUND)	834809006
STARTER KIT	834812002
MEMORY CARD: SMALL FLOWER SERIES	834811001
26. OPTIONAL MEMORY CARDS:	
*FLOWER SERIES	K-1 (834401004)
*HOLIDAY SERIES	K-2 (834402005)
*LITTLE GREY RABBIT	K-3 (834403006)
*CHILDREN'S SERIES	K-4 (834404007)
*MOTOR SPORTS SERIES	K-5 (834405008)
*WILD ANIMAL SERIES	K-6 (834406009)
*SPECIAL OCCASION SERIES	K-7 (834407000)
*FRUIT AND VEGETABLE SERIES	K-8 (834411007)
*DOG SERIES	K-9 (834412008)
*BIG FLORAL SERIES	K-10 (834448003)
*FLORAL SCRIPT SERIES	K-11 (834449004)

*MUSICAL INSTRUMENT SERIES	K-12 (834450008)
*FLORAL ART AND QUILTING DESIGNS	K-101 (834408001)
*SEWING-RELATED DESIGNS	K-102 (834409002)
*OCEAN LIFE DESIGNS	K-103 (834410006)
*CHRISTMAS DESIGNS I	K-104 (834451009)
*CHRISTMAS DESIGNS II	K-105 (834520000)
*CUTWORK DESIGNS	K-106 (834471005)
*FARM DESIGNS	K-107 (834472006)
*WILD LIFE & FISHING DESIGNS	K-108 (834473007)
*ANGEL DESIGNS	K-109 (834474008)
*BIRD DESIGNS	K-110 (834475009)
*THREE-LETTER MONOGRAM DESIGNS	K-111 (834476000)
*BORDER DESIGNS	K-112 (834481008)
*FLORAL DESIGNS I	K-113 (834482009)
*GOBELIN STITCH FLORAL DESIGNS	K-114 (834483000)
*NOAH'S ARK DESIGNS I , II	K-115 (834484001)
27. SPECIFICATION OF MICRO-COMPUTER:	CPU: ROM 8M BITS RAM 256K BITS VRAM 64K BITS
28. DRIVING MOTOR:	DC MOTOR
29. FOOT CONTROL:	ELECTRONIC FOOT CONTROL
30. STEPPING MOTOR:	ZIG-ZAG WIDTH CONTROL FEEDING CONTROL EMBROIDERY HOOP CONTROL (X-AXIS) EMBROIDERY HOOP CONTROL (Y-AXIS)
31. MAXIMUM SPEED:	820 RPM (STRAIGHT STITCH) 500 RPM (AUTOMATIC BUTTONHOLE) 700 RPM (OTHER STITCHES) 400 PRM (EMBROIDERY)
32. NEEDLE THREADING:	INTEGRATED NEEDLE THREADER
33. THREAD TENSION:	SEMI-AUTO TENSION CONTROL (ROLLER TYPE)
34. HARD COVER:	YES

(B) STITCH PACKAGE DETAIL

1.	TOTAL STITCHES:	65
2.	BUILT-IN STITCHES:	60
	UTILITY:	10
	STRETCH:	33
	DECORATIVE:	21
	DARNING	1
3.	BUILT-IN MONOGRAM	840

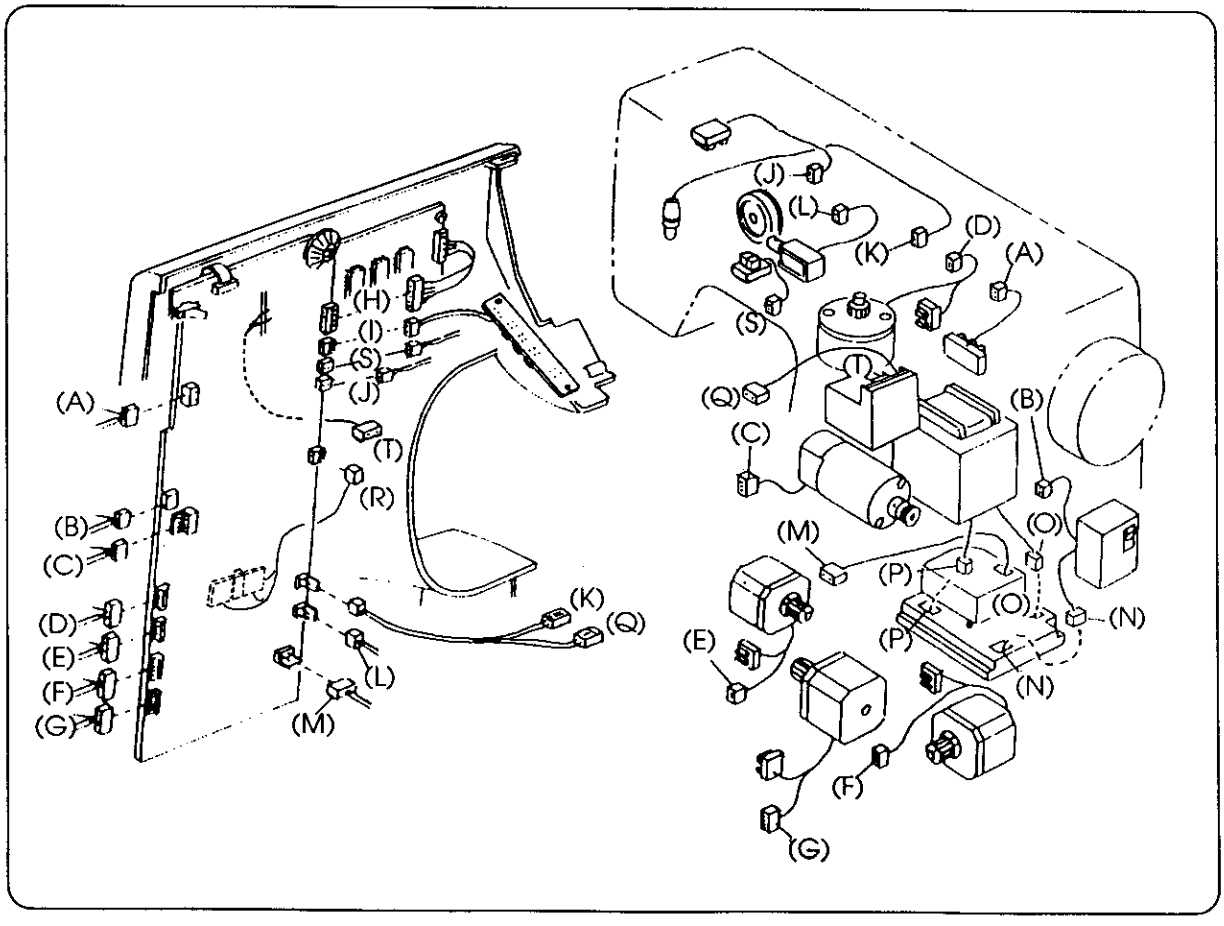


WIRING DIAGRAM

NAME OF ELECTRONIC PARTS AND WIRING

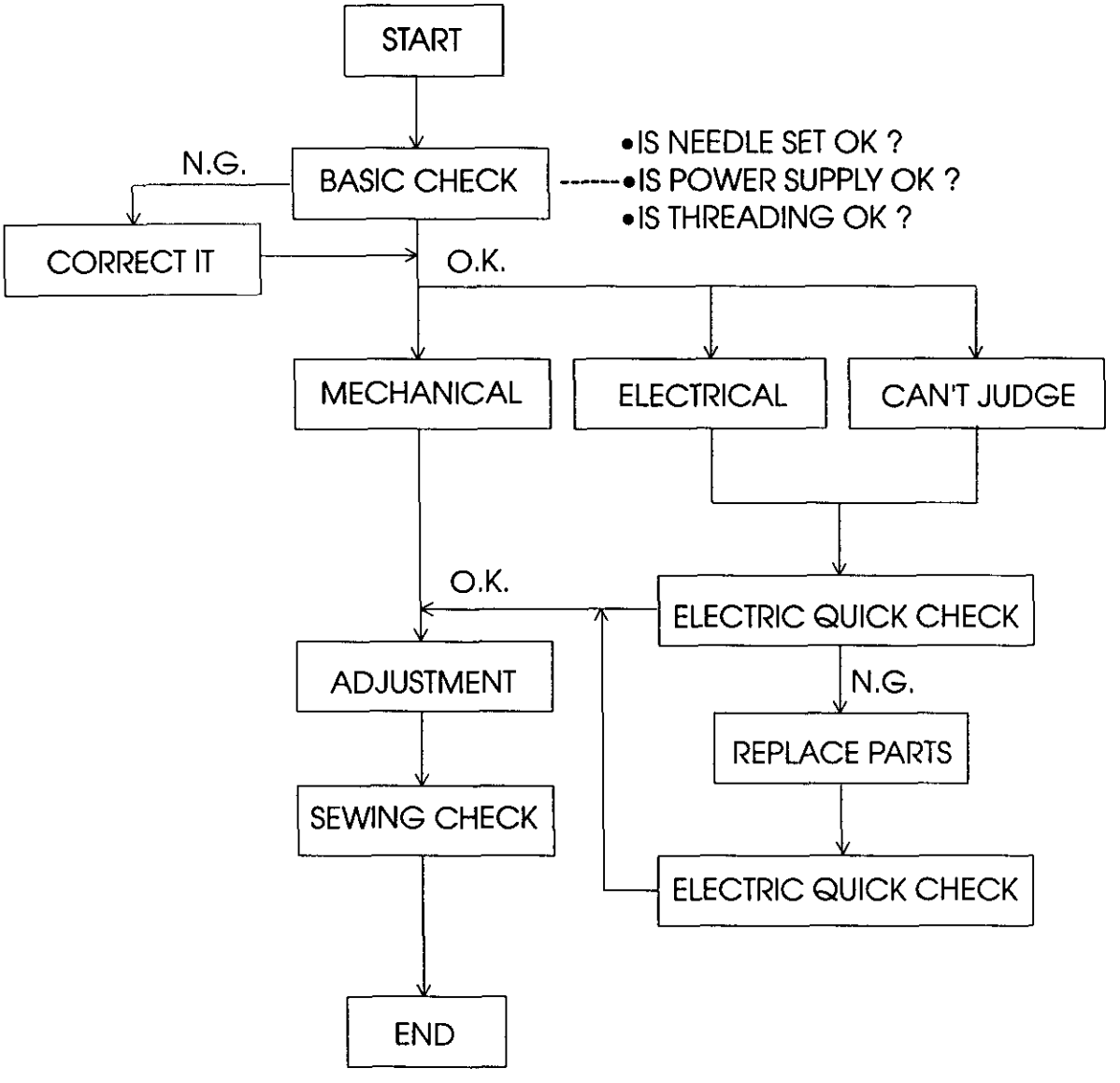
NOTE: EACH CONNECTOR SHOULD BE CONNECTED AS FOLLOWS;
(A)-(A),(B)-(B),(C)-(C),(D)-(D),(E)-(E),(F)-(F),(G)-(G),(H)-(H),(J)-(J),(K)-(K)
(L)-(L),(M)-(M),(N)-(N),(O)-(O),(P)-(P).

(A): UPPER SHAFT SENSOR
(B): MACHINE SOCKET UNIT (SECONDARY)
(C): DC MOTOR
(D): ZIGZAG WIDTH STEPPING MOTOR
(E): FEED STEPPING MOTOR
(F): X-AXIS EMBROIDERY STEPPING MOTOR
(G): Y-AXIS EMBROIDERY STEPPING MOTOR
(H): LCD MODULE
(I): F-BOARD
(J): BUTTONHOLE SENSOR
(K): LAMP
(L): TENSION RELEASE SOLENOID
(M): C-BOARD
(N): MACHINE SOCKET UNIT (PRIMARY)
(O): TRANSFORMER (SECONDARY)
(P): TRANSFORMER (PRIMARY)
(Q): INVERTER
(R): SLIDE VOLUME
(S): THREAD TENSION SENSOR
(T): LCD (BACK LIGHT)



GENERAL TROUBLE SHOOTING PROCEDURE

(MACHINE DOESN'T WORK WELL)



WHAT TO DO WHEN

CONDITION	CAUSE	HOW TO FIX	REFERENCE
1. SKIPPING STITCHES	1. NEEDLE IS NOT INSERTED PROPERLY.	INSERT THE NEEDLE PROPERLY.	
	2. NEEDLE IS BENT OR WORN.	CHANGE THE NEEDLE.	
	3. INCORRECTLY THREADED.	RETHREAD.	
	4. NEEDLE OR THREAD ARE INAPPROPRIATE FOR FABRIC BEING SEWN.	USE THE RECOMMENDED SEWING NEEDLE AND THREAD.	
	5. SEWING ON STRETCH FABRIC	USE A #11 BLUE TIP NEEDLE.	
	6. PRESSER FOOT PRESSURE IS TOO WEAK.	ADJUST THE PRESSER DIAL TO MAKE THE PRESSURE STRONGER.	
	7. INAPPROPRIATE NEEDLE BAR HEIGHT	SEE MECHANICAL ADJUSTMENT "NEEDLE BAR HEIGHT".	P. 26 - 27
	8. INAPPROPRIATE NEEDLE TO SHUTTLE TIMING	SEE MECHANICAL ADJUSTMENT "NEEDLE TO SHUTTLE TIMING".	P. 28 - 29
	9. INAPPROPRIATE NEEDLE TO SHUTTLE CLEARANCE	SEE MECHANICAL ADJUSTMENT "CLEARANCE BETWEEN NEEDLE AND HOOK".	P. 30
	10. STABILIZER IS NOT BEING USED WITH STRETCH OR FINE FABRICS.	USE STABILIZER.	P. 18 (EMBROIDERY ONLY)
	11. FABRIC IS NOT SET PROPERLY ON EMBROIDERY HOOP.	PLACE THE FABRIC TIGHTLY IN THE EMBROIDERY HOOP(NO LOOSE FABRIC).	P. 18 (EMBROIDERY ONLY)
	12. SEWING WHILE PRESSER BAR LIFTER IS RAISED	SEW WITH THE PRESSER BAR LIFTER DOWN.	
2. FABRIC NOT MOVING	1. PRESSER FOOT PRESSURE IS TOO WEAK.	ADJUST THE PRESSER DIAL TO MAKE THE PRESSURE STRONGER.	(CONVENTIONAL SEWING ONLY)
	2. INCORRECT FEED DOG HEIGHT.	SEE MECHANICAL ADJUSTMENT "FEED DOG HEIGHT".	P. 32 - 33 (CONVENTIONAL SEWING ONLY)
	3. FEED DOG IS IN DOWN POSITION.	RAISE THE FEED DOG.	(CONVENTIONAL SEWING ONLY)

*ALL ITEMS ARE APPLICABLE TO BOTH CONVENTIONAL AND EMBROIDERY SEWING WHERE OTHERWISE SPECIFIED.

CONDITION	CAUSE	HOW TO FIX	REFERENCE
	4. THREAD ON BOTTOM SIDE OF FABRIC IS JAMMED UP.	MAKE SURE TO BRING BOTH NEEDLE AND BOBBIN THREADS UNDER THE FOOT WHEN STARTING SEWING.	
	5. FEED DOG TEETH ARE WORN.	CHANGE THE FEED DOG.	P. 48 (CONVENTIONAL SEWING ONLY)
3. BREAKING UPPER THREAD	1. INITIAL SEWNG SPEED IS TOO FAST.	START WITH MEDIUM SPEED.	(CONVENTIONAL SEWING ONLY)
	2. THREAD PATH IS INCORRECT	USE THE PROPER THREAD PATH	P. 15 - 16
	3. NEEDLE IS BENT OR DULL.	REPLACE WITH A NEW NEEDLE.	
	4. NEEDLE THREAD TENSION IS TOO TIGHTE.	SEE MECHANICAL ADJUSTMENT "NEEDLE THREAD TENSION."	P. 39
	5. NEEDLE SIZE IS INAPPROPRIATE FOR FABRIC.	USE APPROPRIATE NEEDLE FOR FABRIC AND THREAD IN USE.	
	6. NEEDLE EYE IS WORN.	CHANGE THE NEEDLE.	
	7. NEEDLE HOLE IN NEEDLE PLATE WORN OR BURRED.	REPLACE THE NEEDLE PLATE.	
	8. WHEN STARTING TO SEW, THE NEEDLE THREAD IS NOT SECURED BY THE THREAD HOLDER.	PLACE THE THREAD IN THE THREAD HOLDER.	(EMBROIDERY ONLY)
	9. IN EMBROIDERY SEWING, THE PATTERN IS BEING SEWN OVER ANOTHER PATTERN.	LEAVE SUFFICIENT SPACE BE-FORE SEWING SECOND PAT-TERN.	(EMBROIDERY ONLY)
	10. AFTER CHANGING THE NEEDLE THREAD, IT JAMS AROUND THE SPOOL PIN.	CLEAR OUT THE JAMMING THREAD.	P. 16
	11. WHEN NEEDLE THREAD IS CHANGED, THREAD IS NOT GUIDED INTO THE THREAD TAKE-UP LEVER.	THREAD THE TAKE-UP LEVER CORRECTLY.	P. 16

CONDITION	CAUSE	HOW TO FIX	REFERENCE
4. BREAKING BOBBIN THREAD	1. INCORRECTLY THREADED BOBBIN HOLDER.	THREAD BOBBIN HOLDER CORRECTLY.	P. 15
	2. TOO MUCH THREAD IS WOUND ON THE BOBBIN.	ADJUST THE POSITION OF STOPPER.	
	3. LINT IS STUCK INSIDE THE BOBBIN HOLDER.	CLEAN THE SHUTTLE.	P. 69
	4. THREAD QUALITY IS TOO LOW.	CHANGE TO A HIGH QUALITY SEWING THREAD.	
	5. THREAD IS JAMMING AROUND THE BOBBIN.	CLEAR OUT THE JAMMING THREAD.	
5. NEEDLE BREAKS	1. NEEDLE IS HITTING THE NEEDLE PLATE.	SEE MECHANICAL ADJUSTMENT "NEEDLE POSITION".	P. 25
	2. NEEDLE IS BENT OR WORN.	CHANGE THE NEEDLE.	
	3. NEEDLE IS HITTING THE SHUTTLE.	SEE MECHANICAL ADJUSTMENT "CLEARANCE BETWEEN NEEDLE AND HOOK".	P. 30
	4. THE FABRIC MOVES WHILE THE NEEDLE IS PIERCING IT, OR THE NEEDLE ZIGZAGS WHILE IN FABRIC.	SEE MECHANICAL ADJUSTMENT "UPPER SHAFT SHIELD PLATE POSITION".	(CONVENTIONAL SEWING ONLY) P. 34
	5. FABRIC IS BEING PULLED TOO STRONGLY WHILE SEWING.	GUIDE THE FABRIC GENTLY WHILE SEWING.	(CONVENTIONAL SEWING ONLY)
	6. THE NEEDLE THREAD TENSION IS TOO TIGHTE.	SEE MECHANICAL ADJUSTMENT "NEEDLE THREAD TENSION."	P. 39
	7. IN EMBROIDERY SEWING, THE PATTERN IS BEING SEWN OVER ANOTHER PATTERN.	LEAVE SUFFICIENT SPACE BEFORE SEWING SECOND PATTERN.	(EMBROIDERY ONLY)

CONDITION	CAUSE	HOW TO FIX	REFERENCE
6. NOISY OPERATION	1. BACKLASH BETWEEN SHUTTLE HOOK GEAR AND LOWER SHAFT GEAR IS TOO GREAT.	SEE MECHANICAL ADJUSTMENT " BACKLASH (LOWER SHAFT GEAR)".	P. 31
	2. LOWER SHAFT GEAR IS LOOSE.	ELIMINATE THE LOOSENESS.	
	3. INAPPROPRIATE BELT TENSION	SEE PART REMOVAL AND REPLACEMENT "DC MOTOR UNIT AND BELT TENSION".	P. 57
	4. NOT ENOUGH OIL	OIL ALL MOVING PARTS.	P. 70
7. PATTERN DISTORTION	1. INAPPROPRIATE FEED BALANCE	SEE MECHANICAL ADJUSTMENT " STRETCH STITCH FEED BALANCE ".	P. 37 (CONVENTIONAL SEWING ONLY)
	2. INAPPROPRIATE ZIGZAG SYNCHRONIZATION	SEE MECHANICAL ADJUSTMENT " UPPER SHAFT SHIELD PLATE POSITION".	P. 34 (CONVENTIONAL SEWING ONLY)
	3. UPPER THREAD TENSION IS TOO STRONG.	SEE MECHANICAL ADJUSTMENT "NEEDLE THREAD TENSION".	P. 39
	4. EMBROIDERY FOOT IS NOT BEING USED.	USE EMBROIDERY FOOT.	(EMBROIDERY ONLY)
	5. STABILIZER IS NOT BEING USED WITH STRETCH OR FINE FABRICS.	USE STABILIZER.	P. 18 (EMBROIDERY ONLY)
	6. THE FABRIC IS NOT SET PROPERLY ON THE EMBROIDERY HOOP.	PLACE THE FABRIC TIGHTLY IN THE EMBROIDERY HOOP (NO LOOSE FABRIC).	P. 18 (EMBROIDERY ONLY)
	7. EXTENSION TABLE IS NOT SET CORRECTLY.	SET THE EXTENSION TABLE CORRECTLY.	
	8. EMBROIDERY FOOT CATCHES THE CONNECTING THREAD.	CUT THE CONNECTING THREAD WHEN CHANGING THE COLOR OF THREAD.	(EMBROIDERY ONLY)
	9. FABRIC IS TOO SMALL FOR EMBROIDERY HOOP.	USE A PIECE OF FABRIC LARGER THAN HOOP.	P. 18 (EMBROIDERY ONLY)
8. UPPER THREAD LOOPING	1. UPPER THREAD TENSION IS TOO LOOSE.	SEE MECHANICAL ADJUSTMENT "NEEDLE THREAD TENSION."	P. 39

ELECTRONIC QUICK CHECK

1.CHECKING

TURN THE POWER SWITCH ON.

*IF NOTHING HAPPENS ON THE MACHINE;FIRST,REPLACE THE FUSE (SEE PAGE 50)

1. CHECK ALL WIRE CONNECTIONS (SEE PAGE 5).
2. CHECK THE C-BOARD (SEE PAGE 50).
   CHECK THE TRANSFORMER (SEE PAGE 51).
   CHECK THE SOCKET (SEE PAGE 52).

IF THE C-BOARD,TRANSFORMER AND SOCKET ARE ALL OK, AND NOTHING HAPPENS ON THE MACHINE, REPLACE THE A-BOARD (SEE PAGE 53).

*IF SEWING LIGHT DOES NOT TURN ON;

1. CHECK THE FILAMENT IN THE LIGHT BULB.
   IF THE FILAMENT IS BROKEN, REPLACE THE LIGHT BULB.
2. IF LIGHT BULB IS OK, AND LIGHT STILL DOES NOT TURN ON, REPLACE THE A-BOARD (SEE PAGE 53).

*IF LCD DOES NOT TURN ON;

1. TURN THE SCREEN SHARPNESS ADJUSTMENT DIAL.
2. IF LCD STILL DOES NOT SHOW ANYTHING, REPLACE THE A-BOARD FIRST. IF LCD STILL DOES NOT TURN ON, REPLACE THE LCD.

*IF LCD SHOWS NOTHING;

1. REPLACE A-BOARD FIRST. IF LCD STILL SHOWS NOTHING, REPLACE THE LCD.

2.PREPARATION

*BE CAREFUL IN CHECKING ALL OPERATIONS SINCE THE MACHINE MAY SUDDENLY START RUNNING.

1. TURN THE POWER SWITCH OFF.
2. SET THE BOBBIN WINDER SPINDLE TO THE LEFT.
3. RAISE THE FEED DOG.
4. SHIFT SPEED SETTING SLIDE LEVER TO THE LEFT.
5. DETACH THE PRESSER FOOT AND RAISE THE PRESSER FOOT LIFTER.
6. MOVE THE NEEDLE BAR TO THE UP POSITION.
7. CONNECT THE FOOT CONTROL.
8. LOWER THE BH LEVER.

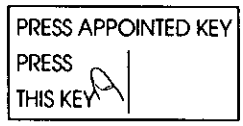
ELECTRONIC QUICK CHECK

CHECK OPERATION

- •THIS QUICK CHECK MUST BE PERFORMED IN THE SEQUENCE SHOWN.FOLLOW EACH STEP CAREFULL,DO NOT SKIP ANY PROCEDURE.

*ON THE FOLLOWING STEPS

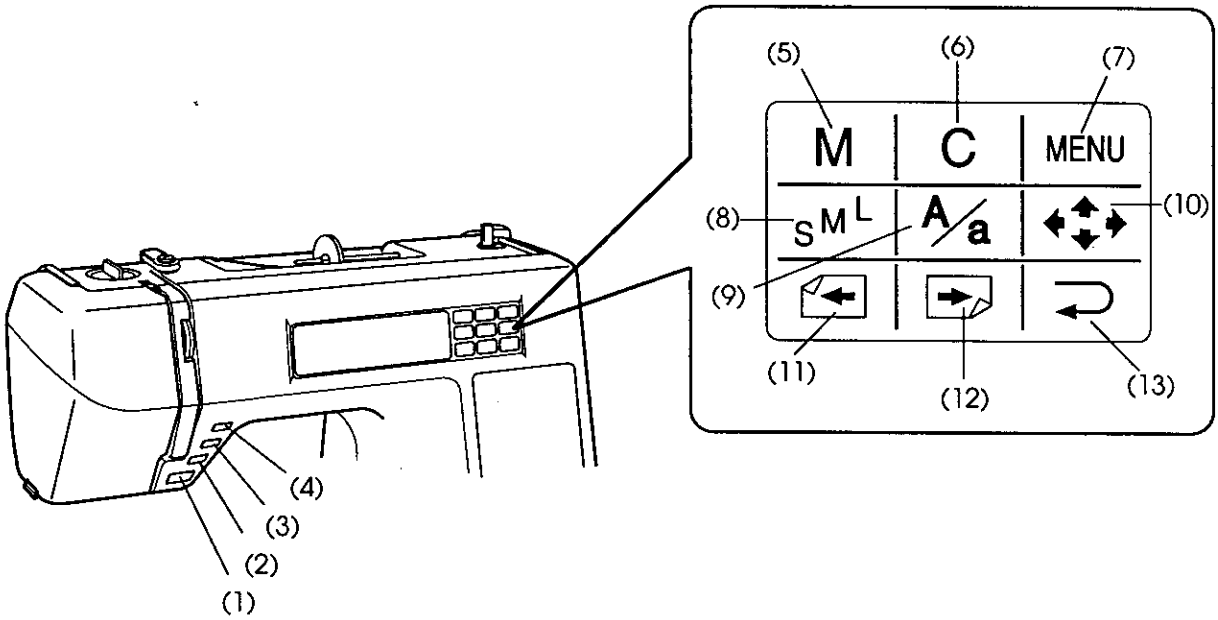
- •PRESS UP/DOWN NEEDLE BUTTON IF CORRECT CONDITION FOR NEXT STEP.
- •PRESS AUTO-LOCK BUTTON IF DEFECT CONDITION.

STEP	TEST	CORRECT CONDITION	DEFECT CONDITION & CORRECTION	
01) BUZZER	TURN ON THE POWER SWITCH WHILE PRESSING REVERSE BUTTON	•BUZZER SOUNDS (LCD SHOWS "BUZZER")	•NO BUZZER SOUNDS AND COULD NOT ENTER TEST MODE •LCD MODULE PROGRAM VERSION. ALSO, PROGRAM WILL BE LOCKED	•REPLACE A-BOARD (SEE P.53)
02) UP/DOWN NEEDLE BUTTON, AUTO-LOCK BUTTON, REVERSE BUTTON, AND START/STOP BUTTON TEST	PRESS FOLLOWING KEYS SEQUENTIALLY •START/STOP BUTTON •REVERSE BUTTON •AUTO-LOCK BUTTON •UP/DOWN BUTTON	(LCD SHOWS "S/S, REV, AL, U/D KEY") •BUZZER SOUNDS FOR NEXT STEP	•NO BUZZER SOUNDS AND PROGRAM WILL BE LOCKED	•FIRST, CHECK THE F-BOARD (SEE P.66) IF F-BOARD IS OK, THEN REPLACE THE A-BOARD (SEE P.53)
03) LCD UNIT	•PRESS "PRESS THIS KEY"ON LEFT SIDE  •PRESS "PRESS THIS KEY" ON RIGHT SIDE	•BUZZER SOUNDS AND INDICATES "PRESS THIS KEY" AT RIGHT HAND SIDE ON LCD •BUZZER SOUNDS FOR NEXT STEP	•NO BUZZER SOUNDS AND PROGRAM WILL BE LOCKED	•FIRST, REPLACE A-BOARD (SEE P.53) IF NO SOUND OCCURS AFTER REPLACING A-BOARD, REPLACE THE LCD UNIT (SEE P.54)
04) BUBBIN WINDER SWITCH TEST	•SHIFT THE BOBBIN WINDER SPINDLE TO THE RIGHT THEN THE LEFT	(LCD SHOWS "SPOOL") •BUZZER SOUNDS EVERY TIME WHEN BOBBIN WINDER SPINDLE IS SHIFTED	•NO BUZZER SOUNDS	•REPLACE A-BOARD (SEE P.53)
05) SPEED SETTING SLIDE LEVER TEST	•SHIFT SPEED SETTING SLIDE LEVER TO RIGHT, THEN TURN BACK TO LEFT	(LCD SHOWS "SLIDING VOLUME") •BUZZER SOUNDS AT LEFT & RIGHT POSITION	•NO BUZZER SOUNDS	•FIRST, CHECK SLIDING VOLUME (SEE P.56). IF SLIDING VOLUME IS OK, REPLACE A-BOARD (SEE P.53)
06) FOOT CONTROLLER TEST	•DEPRESS THE FOOT CONTROLLER FULLY AND RELEASE IT	(LCD SHOWS "CONTROLLER") •BUZZER SOUNDS WHEN FOOT CONTROLLER IS DEPRESSED FULLY AND RELEASED	•NO BUZZER SOUNDS	•FIRST, CHECK FOOT CONTROL (SEE P.66). IF FOOT CONTROL IS OK, REPLACE A-BOARD (SEE P.53)

STEP	TEST	CORRECT CONDITION	DEFECT CONDITION & CORRECTION	
07) PRESSER FOOT SENSOR TEST	(LCD SHOWS "FOOT LEVER") •PRESS U/D NEEDLE BUTTON FOR NEXT STEP			
08) BUTTONHOLE SENSOR TEST	•SHIFT THE BH LEVER BACK & FORTH GENTLY	(LCD SHOWS "BH SENSOR STATE") •WHEN LEVER IS PULLED TOWARD YOU---BUZZER SOUNDS & INDICATES "CLOSED" ON LCD BOARD •WHEN LEVER IS RELEASED---BUZZER SOUNDS & INDICATES "OPEN" ON LCD BOARD	•NO BUZZER SOUNDS	•FIRST, CHECK F-BOARD (SEE P.66). IF F-BOARD IS OK, REPLACE A-BOARD (SEE P.53) IF BOTH F-BOARD & A-BOARD ARE OK, REPLACE BH SENSOR (SEE P.59)
09) UPPER SHAFT POSITIONING SENSOR TEST	•TURN THE HAND WHEEL TOWARD YOU TO MOVE THE NEEDLE BAR TO HIGHEST POSITION AND LOWEST POSITION	(LCD SHOWS "BH SENSOR") •LCD SHOWS "BIGHT" WHEN NEEDLE IS AT HIGHEST POSITION •LCD SHOWS "FEED" WHEN NEEDLE IS AT LOWEST POSITION	•LCD DOES NOT SHOW "BIGHT" OR "FEED". ALSO LCD DOES NOT CHANGE INDICATION WHILE TURNING HANDWHEEL	•FIRST, REPLACE A-BOARD (SEE P.53). IF LCD IS STILL INCORRECT, REPLACE UPPER SHAFT SENSOR (SEE P.60)
10) STEPPING MOTOR TEST	•RAISE THE NEEDLE BAR TO HIGHEST POSITION AND PUSH START/STOP BUTTON •LOWER THE NEEDLE BAR TO LOWEST POSITION AND PUSH START/STOP BUTTON	(LCD SHOWS "STEPPING MOTOR") •ZIGZAG STEPPING MOTOR WILL MOVE THE NEEDLE, LEAVING IT IN THE CENTER POSITION •THE FEED DOGS WILL MOVE BACK AND FORTH IN THE LOWER POSITION, THEN STOP •X AND Y-AXIS STEPPING MOTOR WILL MOVE THE CARRIAGE TO HOME POSITION •FEED DOG TO HOME POSITION	•NOT WORKING CORRECTLY	•FIRST, CHECK STEPPING MOTOR (SEE P.69). IF STEPPING MOTOR IS OK, REPLACE A-BOARD (SEE P.53)
11) MACHINE MOTOR TEST	•PRESS START/STOP BUTTON	(LCD SHOWS "DC MOTOR") •MACHINE RUNS SLOW, AND FAST, THEN NEEDLE BAR STOPS AT THE HIGHEST POSITION	•NOT STOPPING AT THE HIGHEST POSITION OR RUNNING AT UNEVEN SPEED	•FIRST, CHECK THE DC MOTOR (SEE P. 67). IF DC MOTOR IS OK, REPLACE A-BOARD (SEE P.53).

WHEN ALL STEPS ARE DONE, PRESS UP/DOWN BUTTON. CORRECT CONDITION : LCD SHOWS " 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11.***SUMMARY***
OK OK OK OK OK OK OK OK OK OK OK
DEFECT CONDITION : LCD SHOWS "NG" UNDER THE STEP NUMBERS.

MAIN KEY FUNCTION



(1) START/STOP BUTTON ..... CONVENTIONAL AND EMBROIDERY SEWING WITHOUT FOOT CONTROL

(2) REVERSE BUTTON ..... REVERSE STITCHING WHILE PRESSING THIS BUTTON

(3) AUTO-LOOK BUTTON ..... SEWS IN PLACE FOR A FEW STITCHES THEN AUTOMATICALLY STOPS

(4) UP/DOWN NEEDLE BUTTON ... FOR CHANGING THE NEEDLE POSITION (UP OR DOWN)

(5) MEMORY KEY ..... FOR MEMORIZING LETTERS AND NUMBERS (EMBROIDERY ONLY)

(6) CLEAR KEY ..... TO CLEAR THE MEMORIZED MONOGRAMS (EMBROIDERY ONLY)

(7) MENU KEY ..... FOR CHOOSING BETWEEN CONVENTIONAL SEWING AND EMBROIDERY SEWING

(8) LETTER SIZE KEY ..... FOR CHANGING THE SIZE OF LETTERS/NUMBERS (EMBROIDERY ONLY)

(9) UPPER/LOWER CASE KEY ..... FOR SELECTING UPPER OR LOWER CASE LETTERS (EMBROIDERY ONLY)

(10) SPACE CHECK KEY ..... TO MOVE THE CARRIAGE TO THE DESIRED POSITION (EMBROIDERY ONLY)

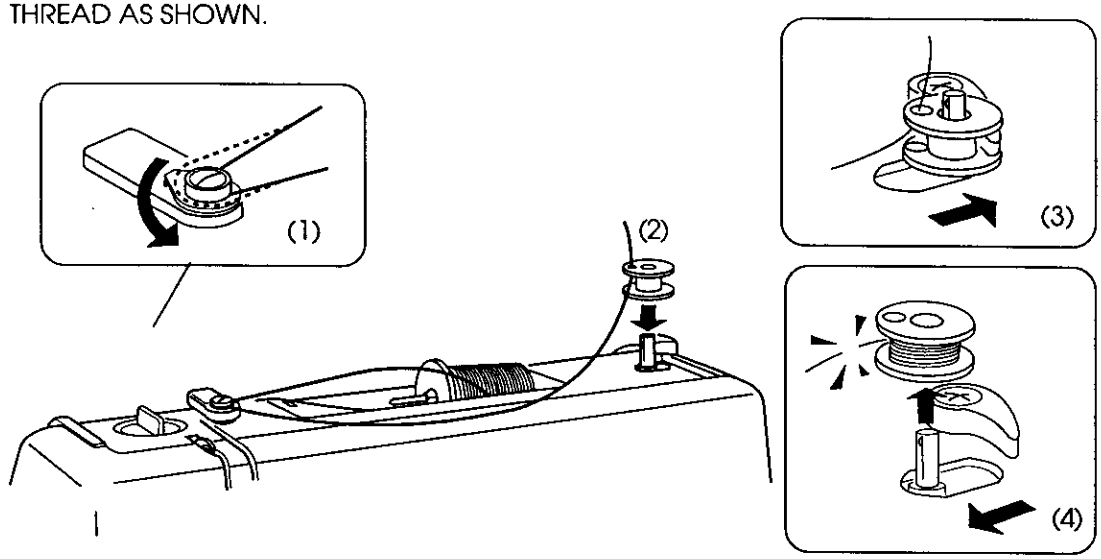
(11) PREVIOUS PAGE KEY ..... TO CHANGE THE PATTERN SCREEN TO PREVIOUS PAGE

(12) NEXT PAGE KEY ..... TO CHANGE THE PATTERN SCREEN TO NEXT PAGE

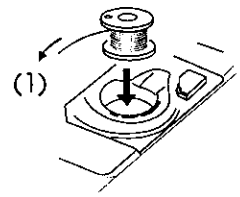
(13) RETURN KEY ..... TO RETURN TO THE PREVIOUS DISPLAY

WINDING THE BOBBIN

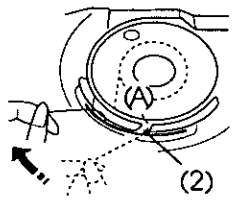
(1) PASS THE THREAD AROUND THREAD GUIDE.
(2) THEN THROUGH THE HOLE IN THE BOBBIN.
(3) PUT THE BOBBIN ON THE BOBBIN WINDER SPINDLE, AND PUSH THE BOBBIN TO THE RIGHT.
(4) WHEN THE BOBBIN IS FULLY WOUND, IT WILL STOP AUTOMATICALLY. RETURN THE BOBBIN WINDER TO ITS ORIGINAL POSITION BY MOVING THE SPINDLE TO THE LEFT, AND CUT THE THREAD AS SHOWN.



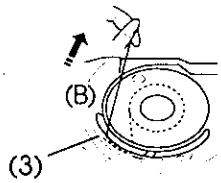
•INSERTING THE BOBBIN



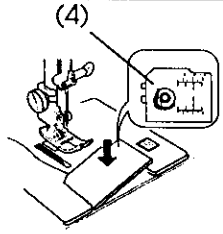
PLACE THE BOBBIN IN THE BOBBIN HOLDER WITH THE THREAD RUNNING OFF IN THE COUNTERCLOCKWISE DIRECTION.
(1) END OF THREAD



GUIDE THE THREAD INTO THE NOTCH (A) ON THE FRONT SIDE OF THE BOBBIN HOLDER.
DRAW THE THREAD TO THE LEFT, SLIDING IT BETWEEN THE TENSION SPRING BLADES.
(2) NOTCH (A)



CONTINUE TO DRAW THE THREAD LIGHTLY UNTIL THE THREAD SLIPS INTO NOTCH (B).
PULL OUT ABOUT 15 CM (6") OF THREAD.
(3) NOTCH (B)

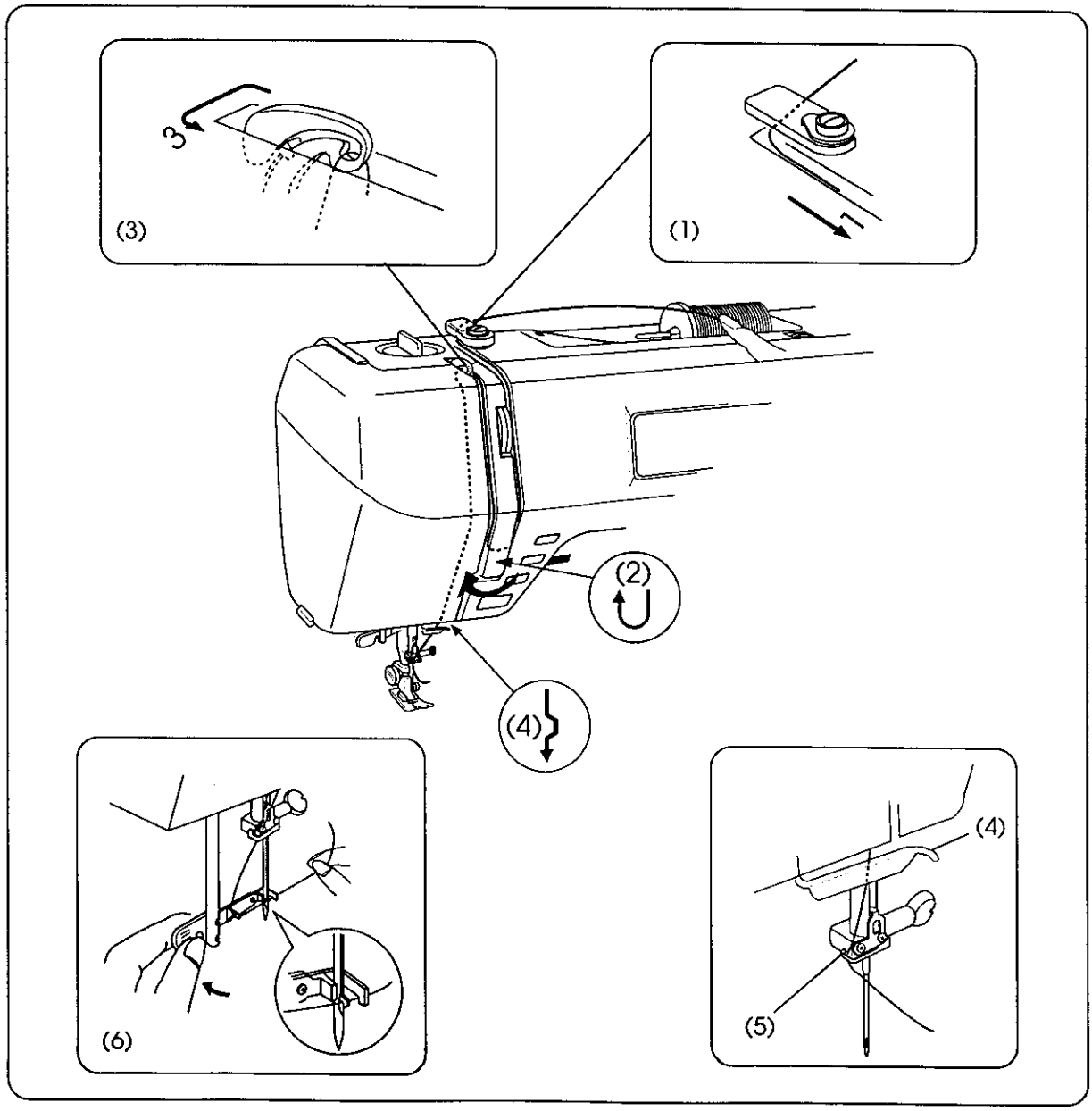


ATTACH THE HOOK COVER PLATE.
CHECK THE THREADING BY REFERRING TO THE CHART SHOWN ON THE HOOK COVER PLATE.
(4) THREADING CHART

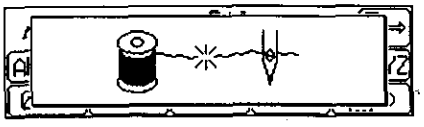
THREADING THE MACHINE

RAISE THE PRESSER FOOT LIFTER, AND PASS THE THREAD THROUGH POINTS (1) TO (6).

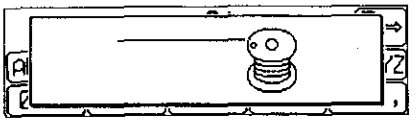
(1) HOLD THE UPPER THREAD AND PASS THE THREAD UNDER THE THREAD GUIDE. PULL THE THREAD DOWN ALONG THE GROOVE.
(2) DRAW THE THREAD AROUND THE CHECK SPRING HOLDER FROM RIGHT TO LEFT, THEN PULL UP THE THREAD.
(3) FIRMLY DRAW THE THREAD FROM RIGHT TO LEFT AND PULL IT TOWARD YOU INTO THE EYE OF THE THREAD TAKE-UP LEVER,THEN DOWN TO THE LOWER THREAD GUIDE.
(4) DRAW THE THREAD FROM RIGHT TO LEFT BEHIND THE LOWER THREAD GUIDE.
(5) SLIDE THE THREAD BEHIND THE NEEDLE BAR THREAD GUIDE FROM THE LEFT.
(6) THREAD THE NEEDLE FROM FRONT TO BACK USING THE NEEDLE THREADER.



WHEN MESSAGES APPEAR ON THE SCREEN



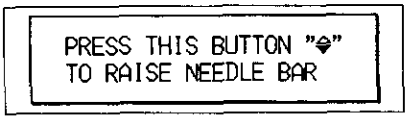
MESSAGE FOR THREAD BROKEN TURN OFF THE POWER SWITCH, AND RE-THREADING.



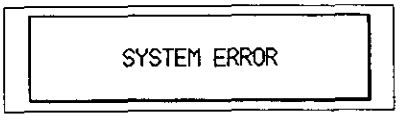
THE VISUAL TOUCH SCREEN SHOWS "BOBBIN WINDING" CONDITION.
AFTER THE BOBBIN IS WOUND, RETURN THE BOBBIN WINDER TO ITS ORIGINAL POSITION BY MOVING THE SPINDLE TO THE LEFT.

RAISE THE NEEDLE BAR BY PRESSING THE UP/DOWN NEEDLE BUTTON.
(THIS MESSAGE WILL APPEAR WHEN THE POWER SWITCH IS TURNED ON WITH THE NEEDLE LOWERED.)

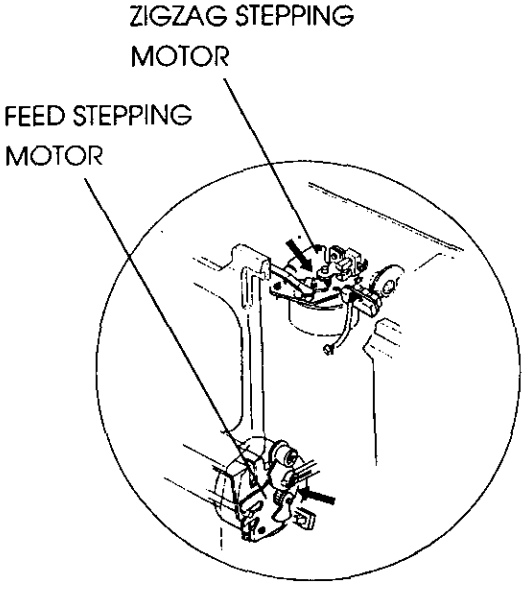
TURN OFF THE POWER SWITCH, AND INSERT THE MEMORY CARD AGAIN.

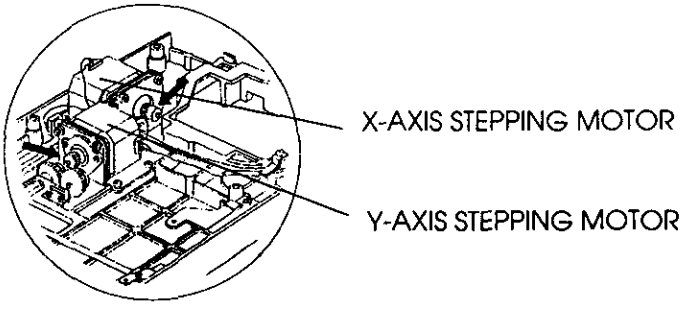


STOP OPERATING THE MACHINE UNTIL THIS MESSAGE DISAPPEARS (ABOUT 15 SECONDS).
(WHEN THE MACHINE IS OVER LOADED.)



1. CHECK THE MECHANISM OF ZIGZAG, FEED AND CARRIGE IF THERE IS ANY FOREIGN OBJECT OR MECHANICAL PROBLEM WHICH OBSTRUCTS MOVEMENT OF STEPPING MOTOR MECHANISM.
2. CHECK THE GEAR AREA OF THE 4 STEPPING MOTORS FOR LINT, AS ILLUSTRATED.
3. CHECK ALL CONNECTORS OF THE STEPPING MOTORS ARE SECURLY CONNECTED.
4. CHECK THE STEPPING MOTOR FUNCTION BY "ELECTRONIC QUICK CHECK".
5. CHECK STEPPING MOTORS BY A ELECTRIC TESTER.



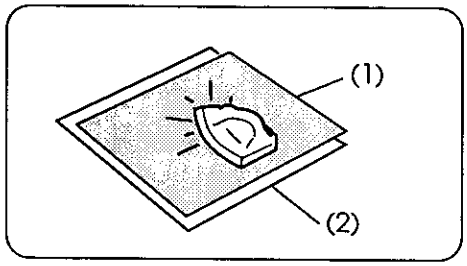


TO ATTACH THE STABILIZER

PLACE THE GLUE (SHINY) SIDE OF THE STABILIZER ON THE FABRIC AND IRON AS ILLUSTRATED USING MEDIUM TEMPERATURE.

(1) STABILIZER

(2) FABRIC



TO SET THE FABRIC IN THE EMBROIDERY HOOP

MARK THE DESIRED EMBROIDERING POSITION ON THE FABRIC AS ILLUSTRATED USING TAILOR'S CHALK.

(3) FABRIC

(4) REFERENCE LINES

PLACE THE TEMPLATE ON THE FABRIC, MATCHING THE REFERENCE LINES LOCATED ON THE TEMPLATE TO THE REFERENCE LINES YOU PREVIOUSLY MARKED ON THE FABRIC.

TAPE THE TEMPLATE TO THE FABRIC AS SHOWN TO HOLD THE TEMPLATE IN PLACE. (SCOTCH TAPE IS RECOMMENDED.)

(5) TAPE

(6) TEMPLATE

PLACE THE FABRIC WITH THE TEMPLATE ATTACHED TO IT AND SET IT ON TOP OF OUTER HOOP.

SET THE INNER HOOP ON TOP OF YOUR FABRIC.

(7) INNER HOOP

(8) RIGHT SIDE OF FABRIC

(9) STABILIZER ON WRONG SIDE OF FABRIC

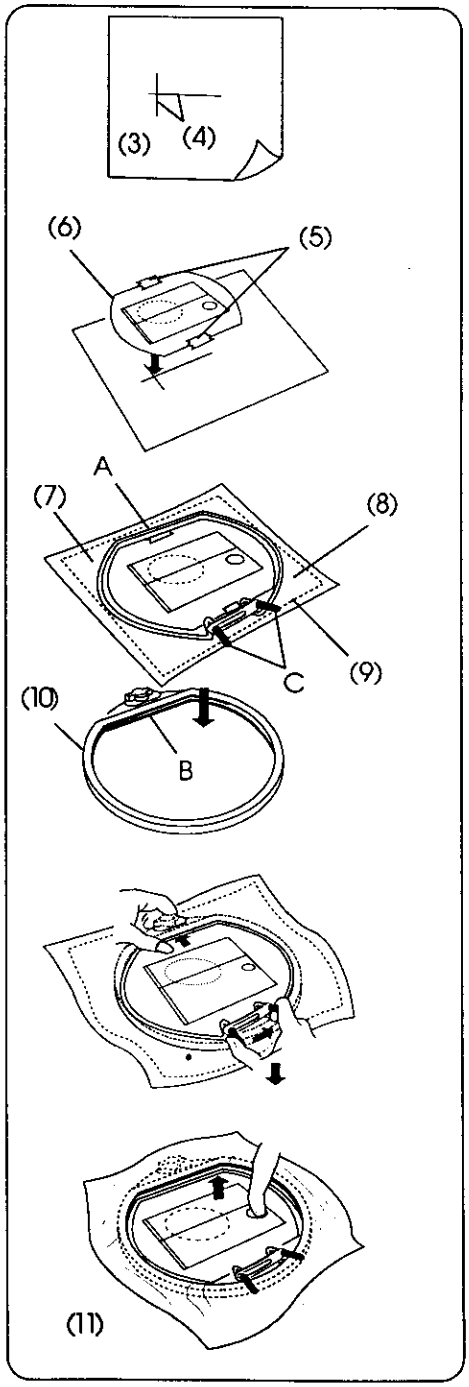
(10) OUTER HOOP

PUSH THE FLAT SIDE "A" OF THE INNER HOOP INTO THE FLAT SIDE "B" OF THE OUTER HOOP.

WHILE SQUEEZING THE HANDLES "C" TOGETHER, PUSH THE ROUND PART OF THE INNER HOOP INTO THE ROUND PART OF THE OUTER HOOP SO THE MATERIAL IS SECURE.

TAKE OUT THE TEMPLATE BY PUTTING YOUR FINGER IN THE THUMB HOLE LOCATED ON THE TEMPLATE AND LIFT UP.

(11) FOR EASY REMOVAL OF TEMPLATE (THUMB HOLE)



SERVICE ACCESS

FACE COVER

TO REMOVE:

1. REMOVE THE 2 SCREWS (A) AND REMOVE THE FACE COVER (B).

TO ATTACH:

2. REPLACE THE FACE COVER BY LIGHTLY TIGHTENING THE 2 SCREWS (A).
3. CLOSE THE FACE COVER, CAREFULLY ALIGNING IT WITH THE BODY. THEN TIGHTEN THE SCREWS FIRMLY.

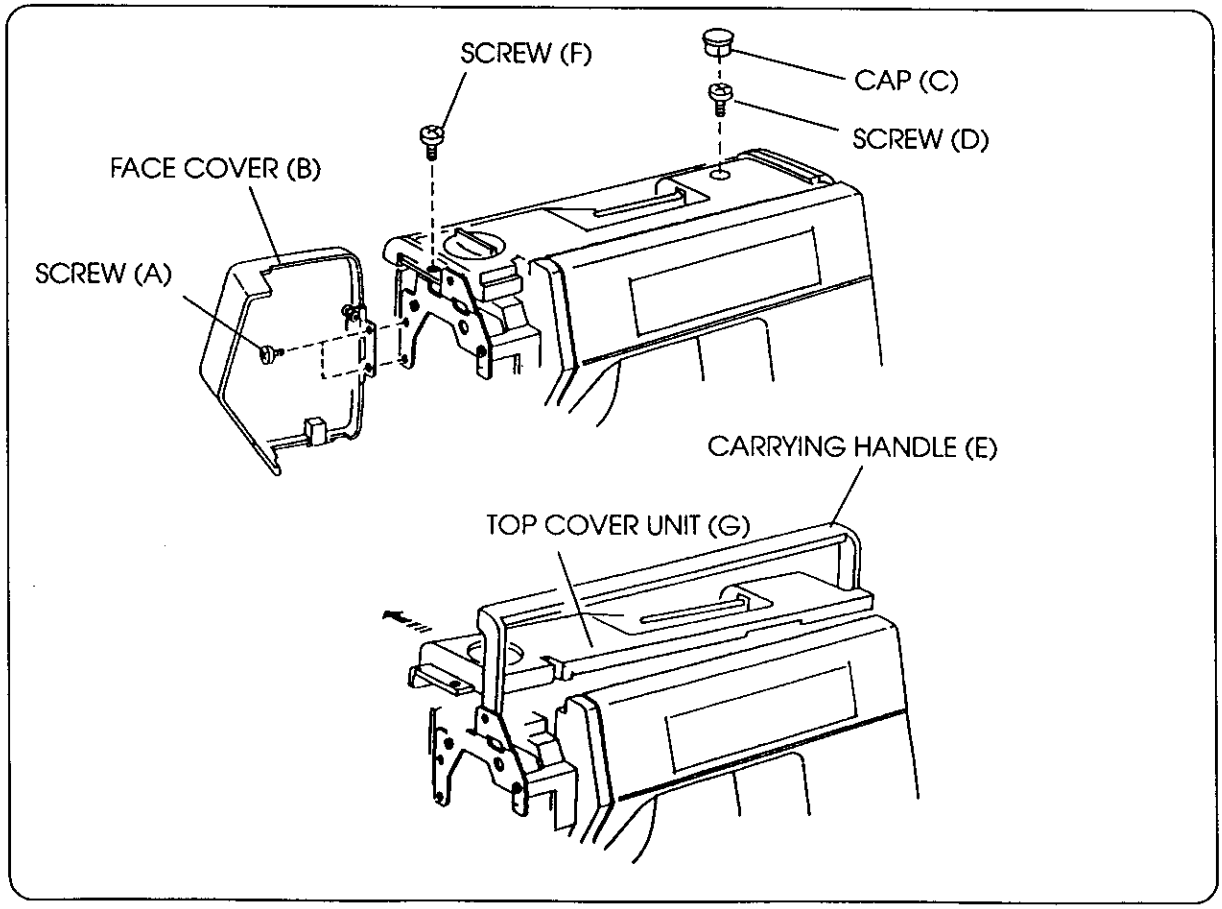
TOP COVER

TO REMOVE:

1. REMOVE THE CAP(C) AND SCREW (D). LIFT THE CARRYING HANDLE (E) UP. REMOVE THE SCREW (F).
2. LIFT THE CARRYING HANDLE UP. REMOVE THE TOP COVER (G) IN THE DIRECTION SHOWN.

TO ATTACH:

3. REVERSE THIS PROCEDURE.



SERVICE ACCESS

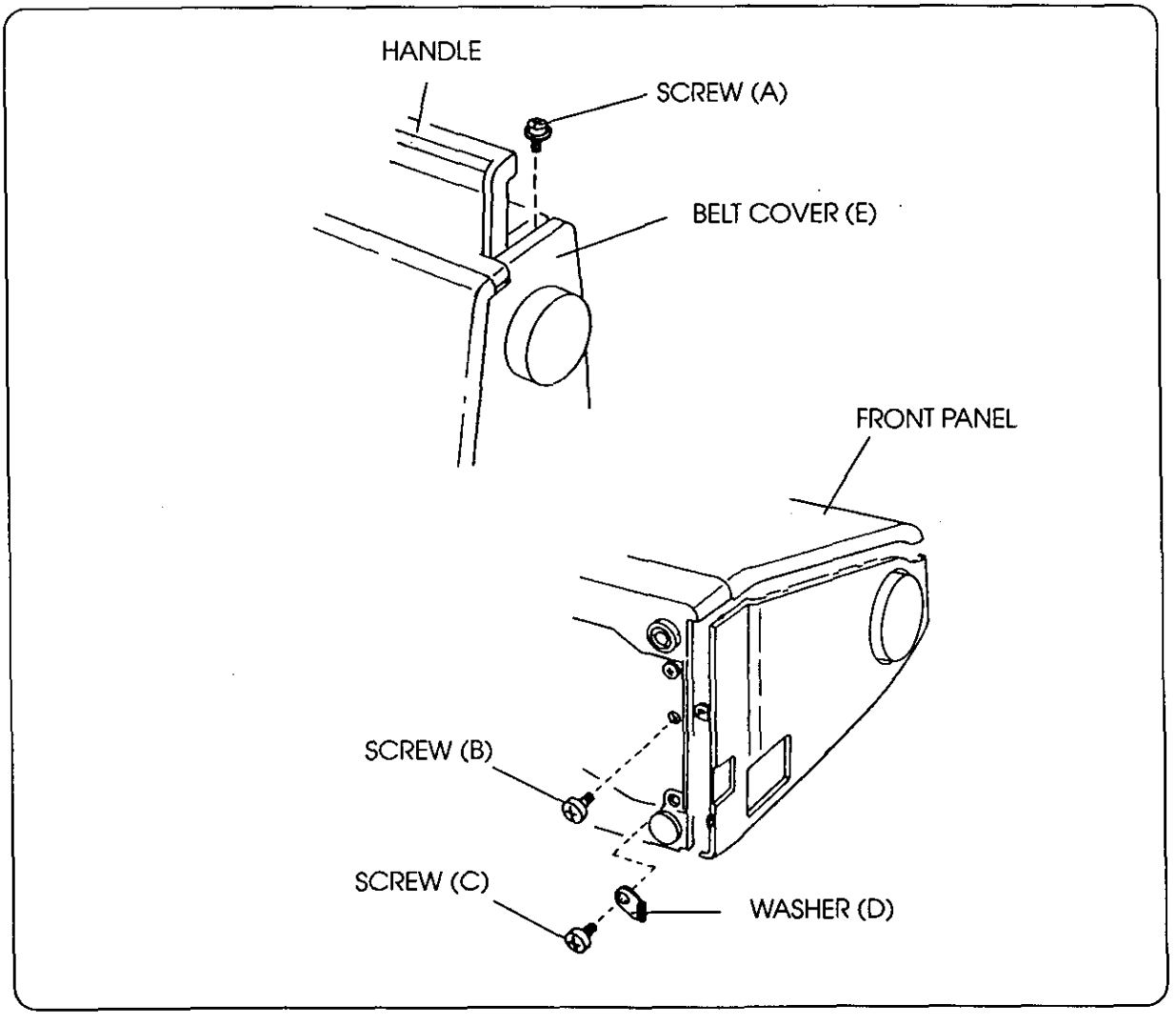
BELT COVER

TO REMOVE:

1. LOOSEN SCREW (A), REMOVE SCREWS (B), (C) AND WASHER (D). THEN REMOVE THE BELT COVER (E).

TO ATTACH:

2. REVERSE THIS PROCEDURE.



SERVICE ACCESS

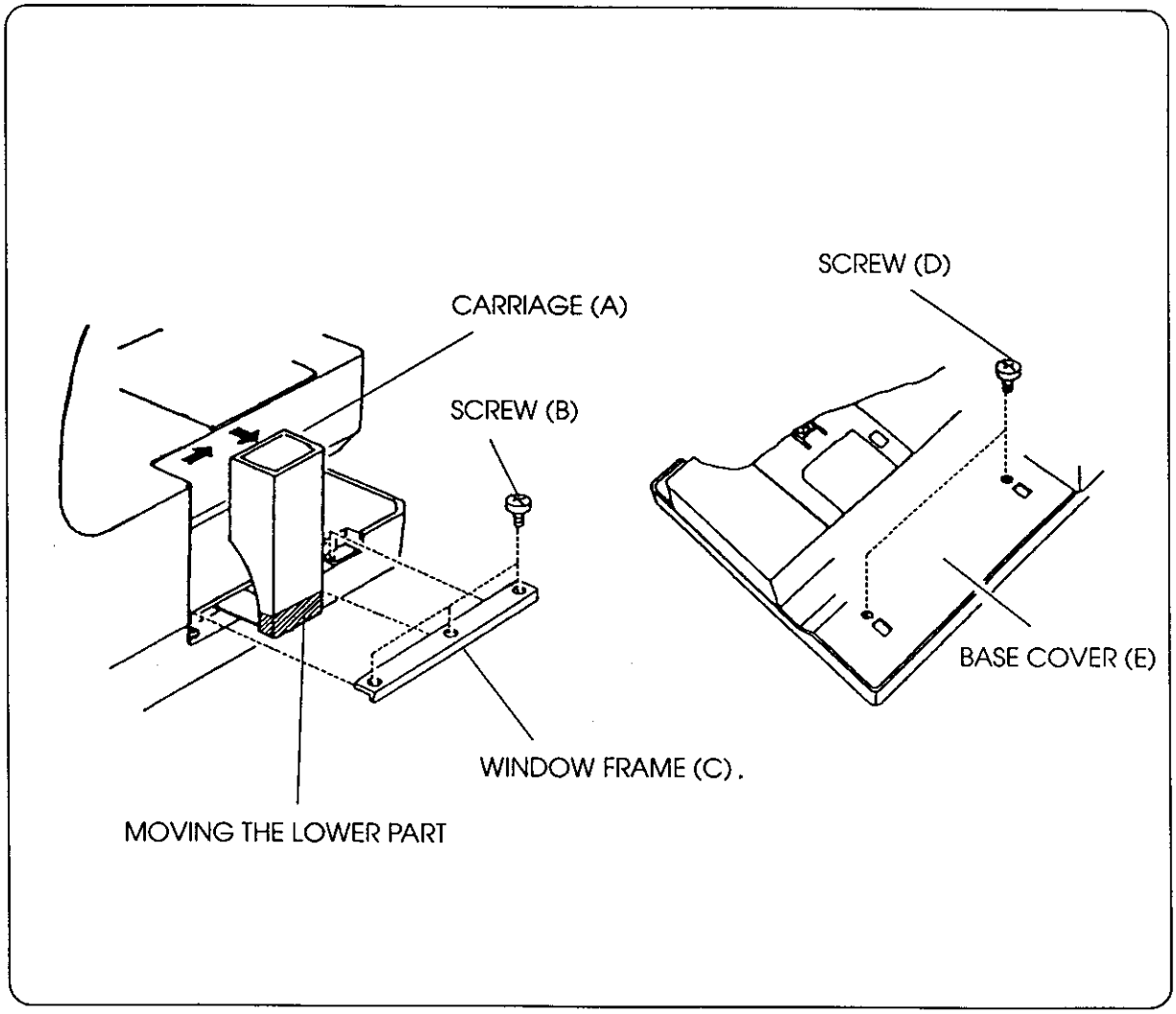
BASE COVER

TO REMOVE:

1. MOVE THE CARRIAGE (A) BY HAND. WHEN MOVING IT, HOLD THE LOWER PART, NEVER THE UPPER PART.
2. REMOVE THE 3 SCREWS (B) AND REMOVE THE CARRIAGE WINDOW FRAME (C).
3. REMOVE THE 2 SCREWS (D) AND REMOVE THE BASE COVER (E).

TO ATTACH:

4. REVERSE THIS PROCEDURE.



SERVICE ACCESS

BED COVER

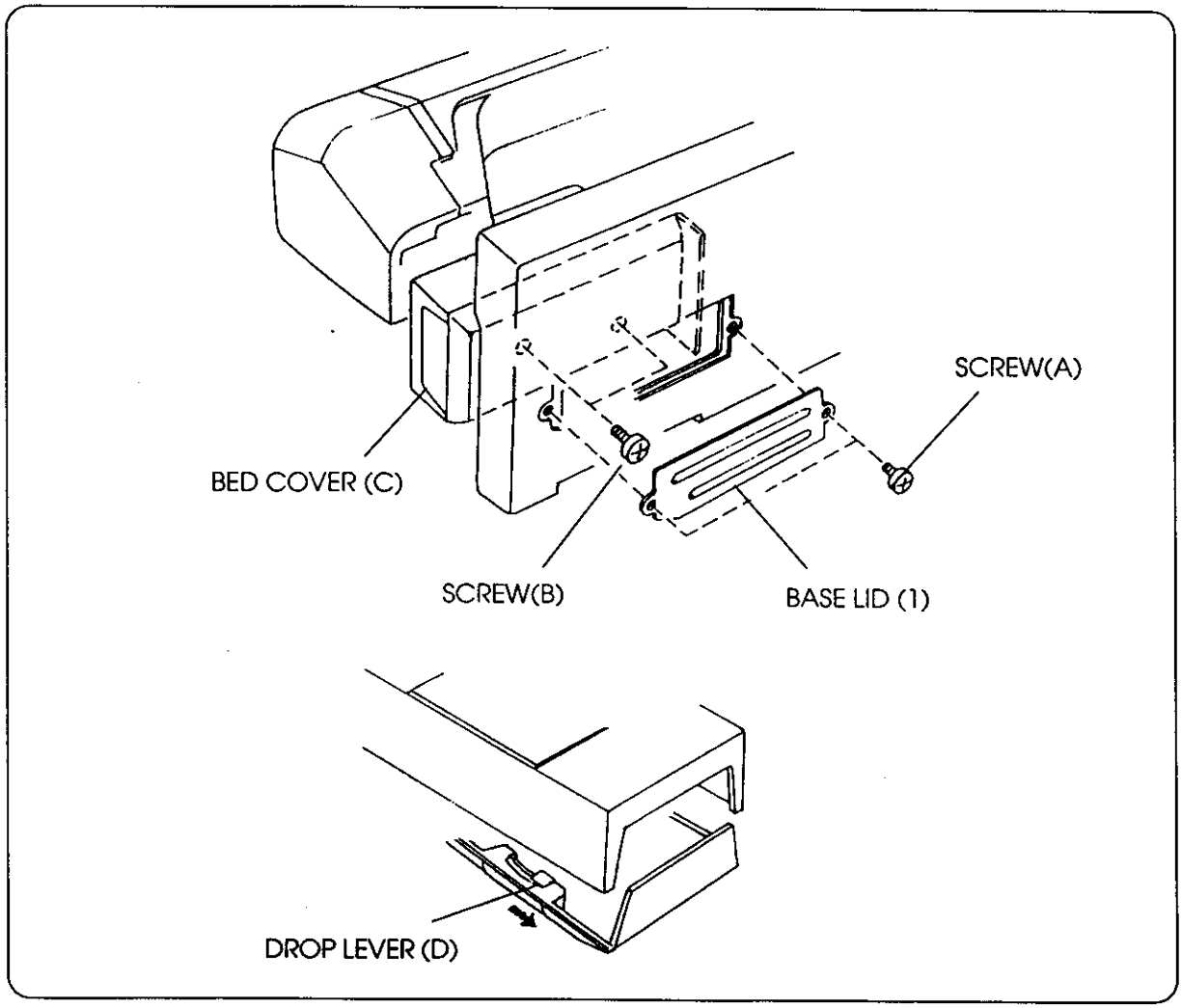
TO REMOVE:

1. REMOVE THE WINDOW FRAME, AND THE BASE COVER.
2. REMOVE THE 2 SCREWS (A), AND REMOVE THE BASE LID (1).
3. REMOBE THE 2 SCREWS (B), AND REMOVE THE BED COVER (C).

TO ATTACH:

4. REVERSE THIS PROCEDURE.

NOTE: MAKE SURE THE POSITION OF THE DROP LEVER (D) IS AS ILLUSTRATED.



SERVICE ACCESS

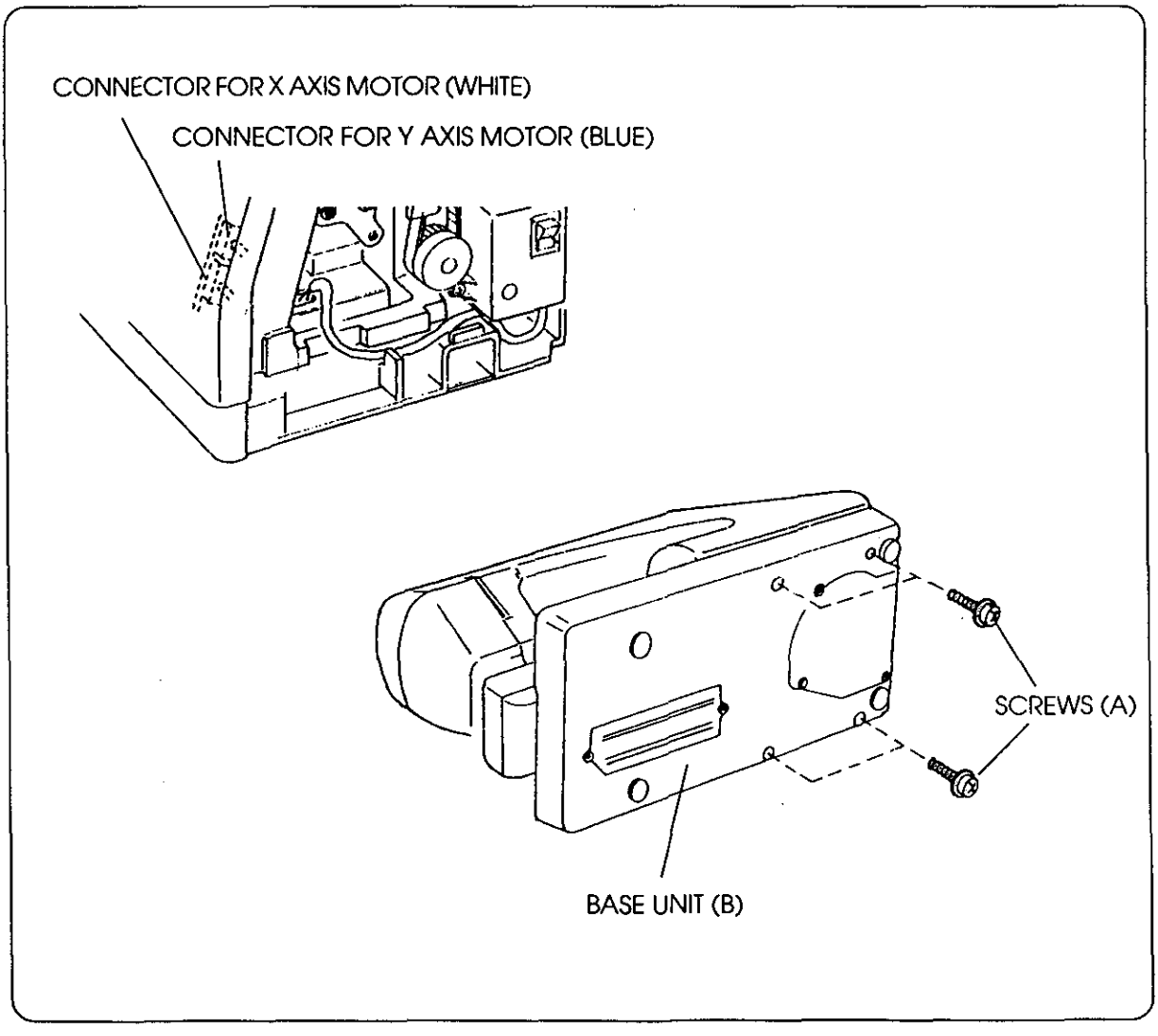
BASE UNIT

TO REMOVE:

1. REMOVE THE BELT COVER.
2. PULL THE CONNECTORS FOR THE X-AXIS (WHITE) AND Y-AXIS (BLUE) MOTORS FROM A-BOARD.
3. REMOVE THE 4 SCREWS (A) AND THE BASE UNIT (B).

TO ATTACH:

4. FOLLOW THE ABOVE PROCEDURE IN REVERSE.



SERVICE ACCESS

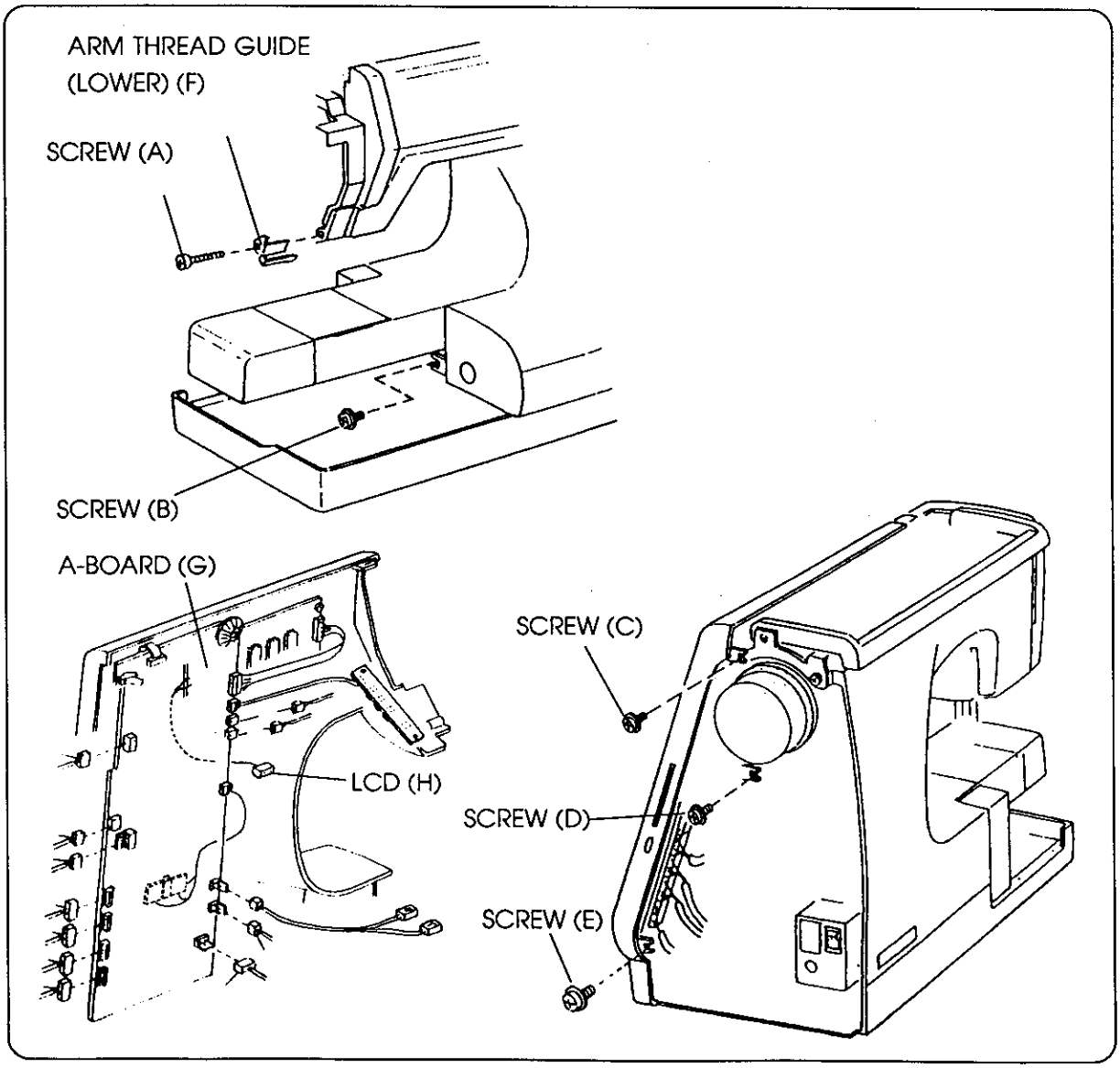
FRONT COVER

TO REMOVE:

1. REMOVE THE TOP COVER AND BELT COVER UNIT.
2. REMOVE THE SCREW(A) AND ARM THREAD GUIDE (LOWER) (F), LOOSEN THE SCREWS (B), (C), (D) AND (E).
3. UNPLUG 12 CONNECTORS FROM A-BOARD (G). AND LCD CONNECTOR (H) FROM INVERTER.
4. REMOVE THE FRONT COVER UNIT.

TO ATTACH:

1. FOLLOW THE ABOVE PROCEDURE IN REVERSE.



MECHANICAL ADJUSTMENT

NEEDLE POSITION

*WHEN THE STRAIGHT STITCH IS SELECTED, THE NEEDLE SHOULD BE AT THE CENTER OF HOLE OF THE NEEDLE PLATE.

*WHEN THE ZIGZAG STITCH IS SELECTED WITH THE ZIGZAG WIDTH SET TO THE MAXIMUM (7.0), THE CLEARANCE BETWEEN THE SIDE OF THE NEEDLE AND THE EDGE OF HOLE OF THE NEEDLE PLATE AT THE LEFT AND RIGHT NEEDLE POSITION SHOULD BE 0.2 MM OR MORE.

MACHINE SETTING:

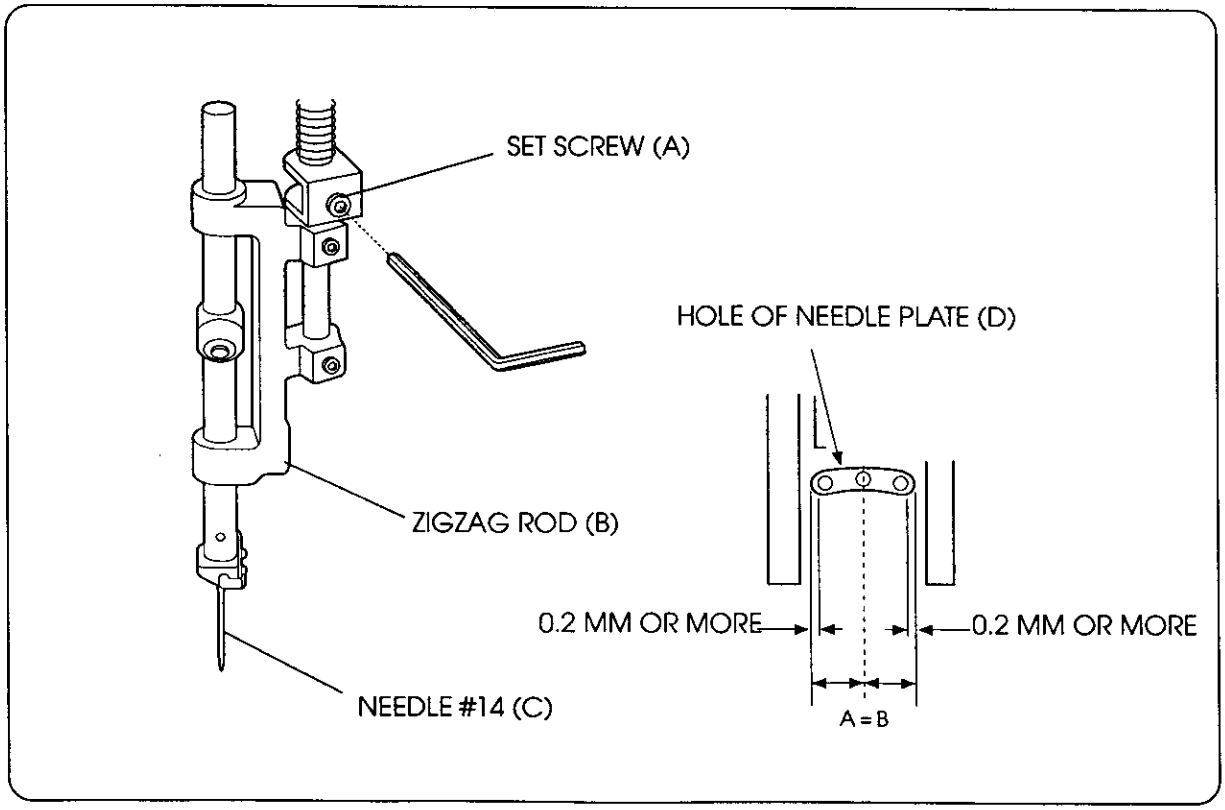
1. PATTERN: NO.1 (STRAIGHT STITCH)
2. NEEDLE BAR : LOWEST POSITION

PREPARATION:

1. OPEN THE FACE COVER AND LOOSEN THE SET SCREW (A).
2. MOVE THE ZIGZAG ROD (B) LEFT OR RIGHT TO SET THE NEEDLE (C) AT THE CENTER OF THE HOLE OF THE NEEDLE PLATE (D). THEN TIGHTEN THE SCREW (A).

TO CHECK:

1. SELECT THE ZIGZAG STITCH (NO.5). SET THE ZIGZAG WIDTH TO THE MAXIMUM (7.0).
2. TURN THE HANDWHEEL TOWARD YOU AND CHECK IF THE CLEARANCE BETWEEN THE SIDE OF THE NEEDLE AND THE EDGE OF HOLE OF THE NEEDLE PLATE, AT THE LEFT AND RIGHT NEEDLE POSITION, IS 0.2 MM OR MORE.



MECHANICAL ADJUSTMENT

NEEDLE BAR HEIGHT

MACHINE SETTING:

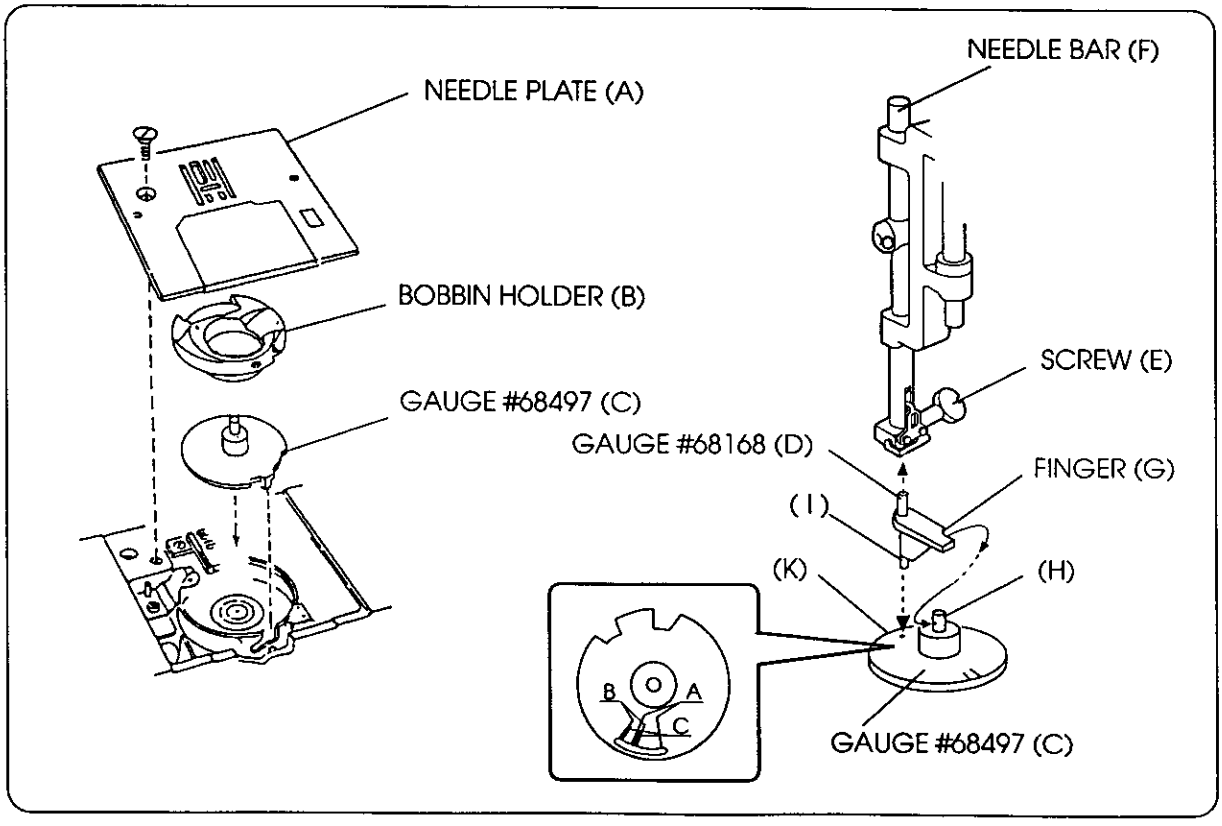
1. PATTERN: NO.1 (STRAIGHT STITCH)
2. TURN THE POWER SWITCH OFF.

PREPARATION:

1 REMOVE THE NEEDLE, PRESSER FOOT, NEEDLE PLATE (A) AND BOBBIN HOLDER (B).
2. INSERT THE RADIAL TIMING GAUGE #68497 (C) INTO THE HOOK.
3. ATTACH THE NEEDLE BAR HEIGHT GAUGE #68168 (D).
   *PUSH IT UP UNITL IT STOPS.
4. TIGHTEN SCREW (E).

TO CHECK:

1. TURN THE POWER SWITCH ON.
2. TURN THE HANDWHEEL TOWARD YOU UNTIL THE NEEDLE BAR (F) REACHES ITS LOWEST POSITION.
   *IF FINGER (G) COMES DOWN ON TOP OF PIN (H) , OR IF PIN (I) TOUCHES THE SURFACE OF GAUGE (K) TOO FORCEFULLY, ADJUST AS DESCRIBED ON THE NEXT PAGE.
3. THE FACE OF FINGER (G) SHOULD HIT THE SIDE OF PIN (H) AND THE END OF PIN (I) SHOULD TOUCH THE SURFACE OF GAUGE (K) WHEN THE NEEDLE BAR (F) REACHES ITS LOWEST POSITION.

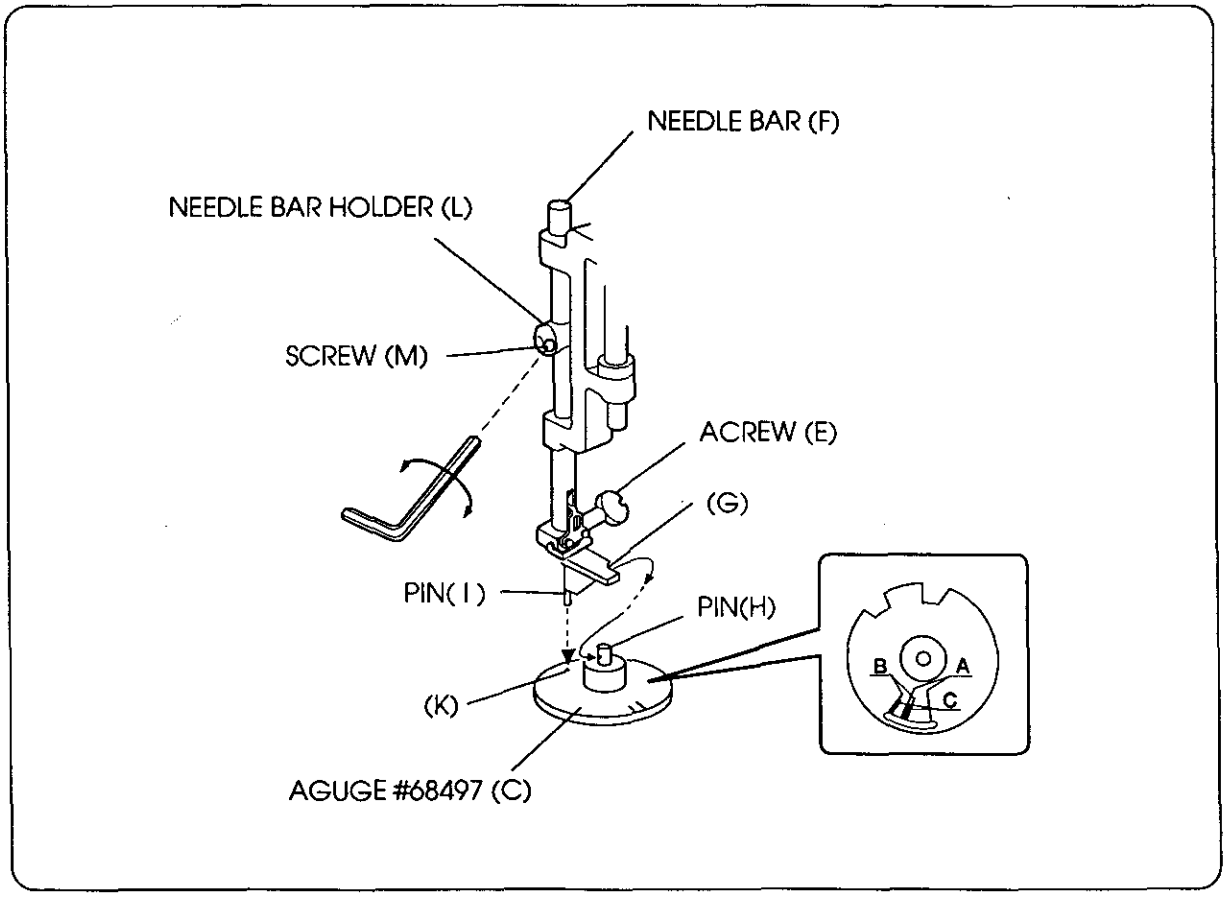


MECHANICAL ADJUSTMENT

NEEDLE BAR HEIGHT

ADJUSTMENT PROCEDURE:

1. OPEN THE FACE COVER.
2. LOOSEN THE SCREW (M) ON THE NEEDLE BAR HOLDER (L).
3. MOVE THE NEEDLE BAR (F) UP OR DOWN TO ADJUST THE POSITION OF THE NEEDLE BAR (F) SO THAT THE FACE (G) HITS THE SIDE OF PIN (H) AND THE END OF PIN (I) TOUCHES THE SURFACE OF GAUGE (K).
4. TIGHTEN THE SCREW (M) SECURELY.



MECHANICAL ADJUSTMENT

NEEDLE TO SHUTTLE TIMING

MACHINE SETTING:

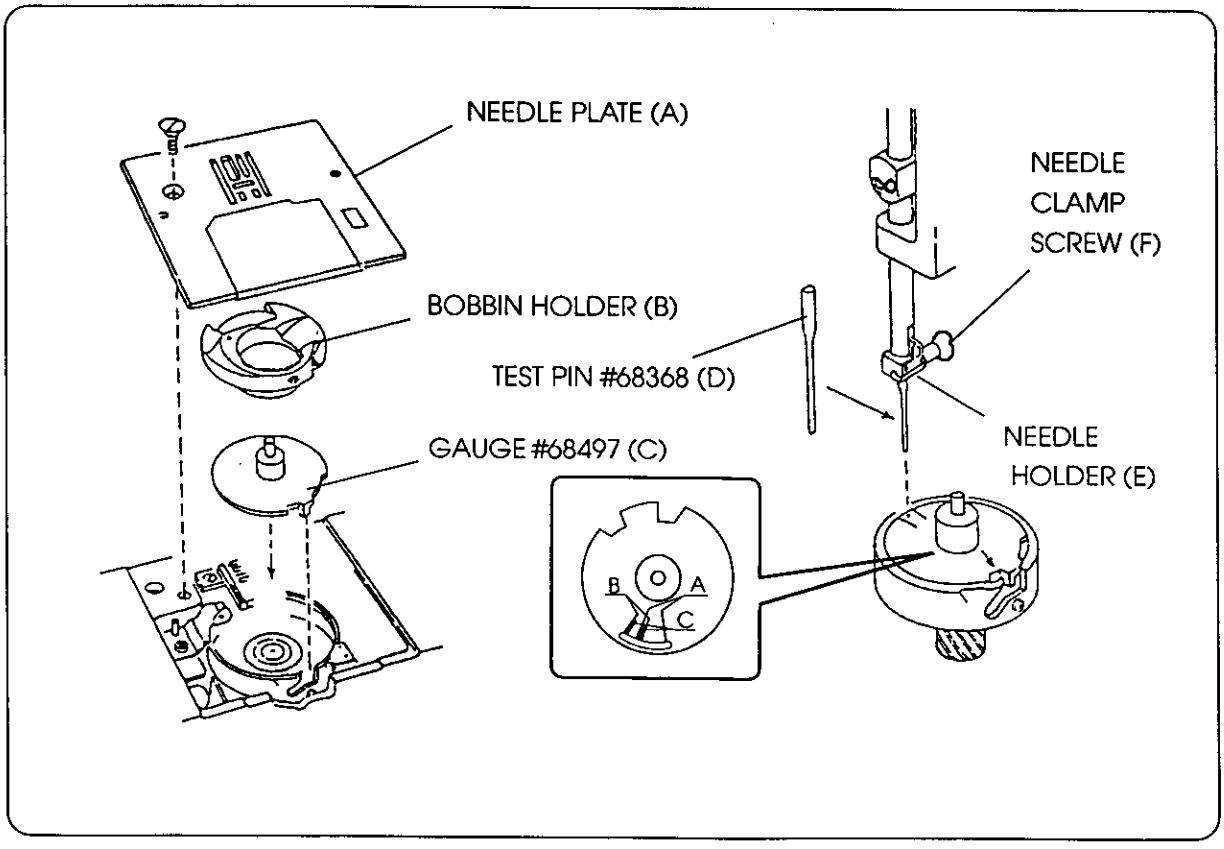
1. PATTERN: NO.1 (STRAIGHT STITCH)
2. TURN THE POWER SWITCH OFF.

PREPARATION:

1. REMOVE THE NEEDLE, PRESSER FOOT, NEEDLE PLATE (A) AND BOBBIN HOLDER (B).
2. INSERT THE RADIAL TIMING GAUGE #68497 (C) SO THAT THE SMALL FINGER ON THE GAUGE FITS INTO THE SLOT NEAR THE TIP OF THE HOOK.
3. PUT THE TEST PIN #68368 (D) IN THE NEEDLE HOLDER (E).
   *PUSH IT UP UNTIL IT STOPS.
4. TIGHTEN THE NEEDLE CLAMP SCREW (F).

TO CHECK:

1. TURN THE POWER SWITCH ON.
2. TURN THE HANDWHEEL TOWARD YOU UNTIL THE TIP OF TEST PIN #68368 (D) SLIGHTLY TOUCHES THE RADIAL TIMING GAUGE #68497 (C).
3. THE TIP OF TEST PIN #68368 (D) SHOULD BE BETWEEN THE TWO WHITE LINES OF THE RADIAL TIMING GAUGE #68497(C).
   *IF THE TEST PIN DOES NOT FALL BETWEEN THE 2 WHITE LINES ON THE RADIAL TIMING GAUGE, ADJUST AS FOLLOWS.

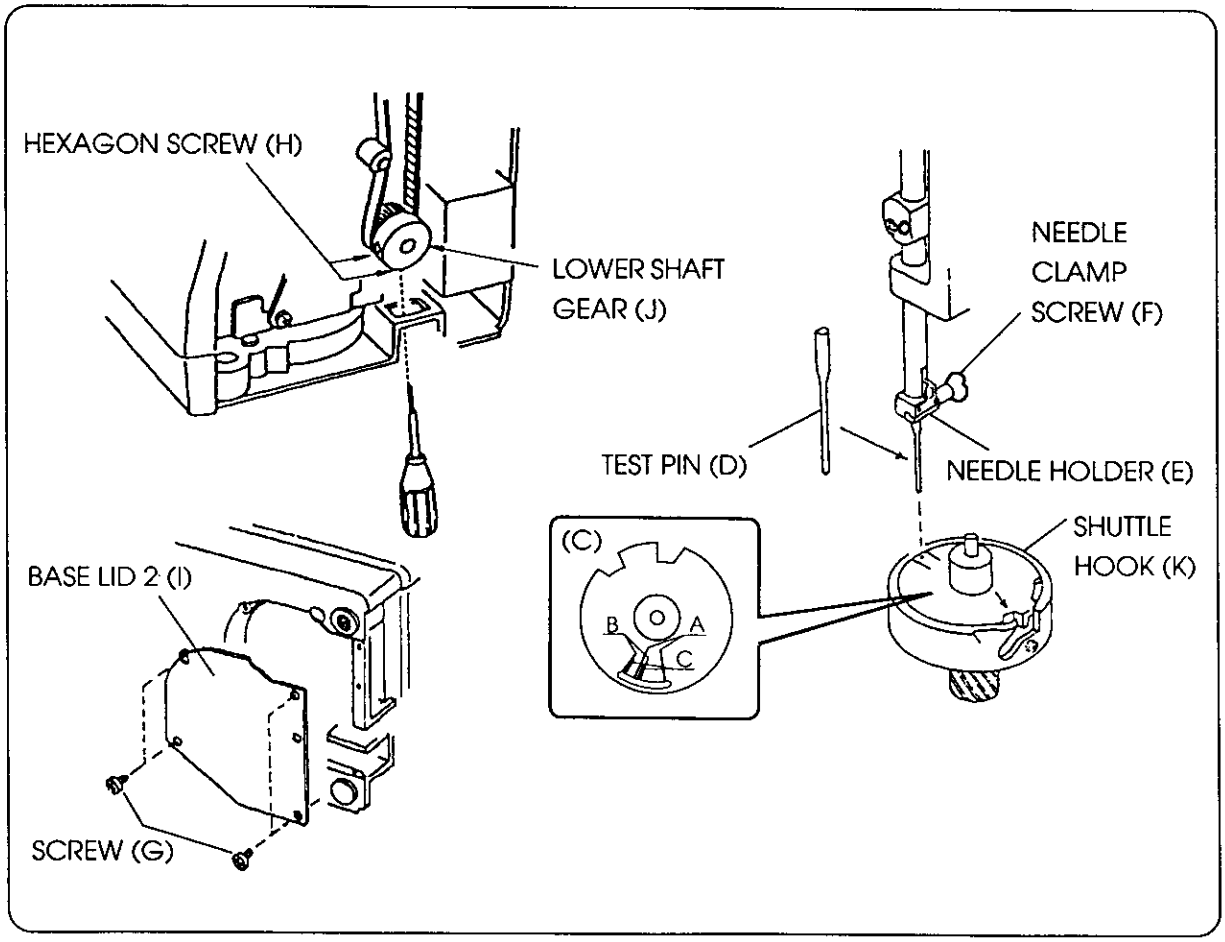


MECHANICAL ADJUSTMENT

NEEDLE TO SHUTTLE TIMING

ADJUSTMENT PROCEDURE:

1. TURN THE POWER SWITCH OFF.
2. REMOVE THE BELT COVER (SEE P.20).
3. REMOVE THE 4 SCREWS (G), THEN BASE LID 2 (I).
4. TURN THE POWER SWITCH ON, AND SELECT PATTERN NO.1 (STRAIGHT STITCH).
5. LOOSEN THE 2 SCREWS IN THE LOWER SHAFT TIMING GEAR (J).
6. TURN THE HANDWHEEL TOWARD YOU UNTIL THE TEST PIN (D) SLIGHTLY TOUCHES THE RADIAL TIMING GAUGE (C).
7. HOLD THE HANDWHEEL SO THAT THE TEST PIN (D) WILL NOT MOVE, AND TURN THE SHUTTLE HOOK (K) BY YOUR FINGER UNTIL THE TEST PIN (D) COMES IN BETWEEN THE TWO WHITE LINES OF GAUGE #68497 (C).
8. TIGHTEN 2 SCREWS (H).
9. ATTACH THE BASE LID (2), BASE COVER, BED COVER, AND BELT COVER.



MECHANICAL ADJUSTMENT

CLEARANCE BETWEEN NEEDLE AND HOOK

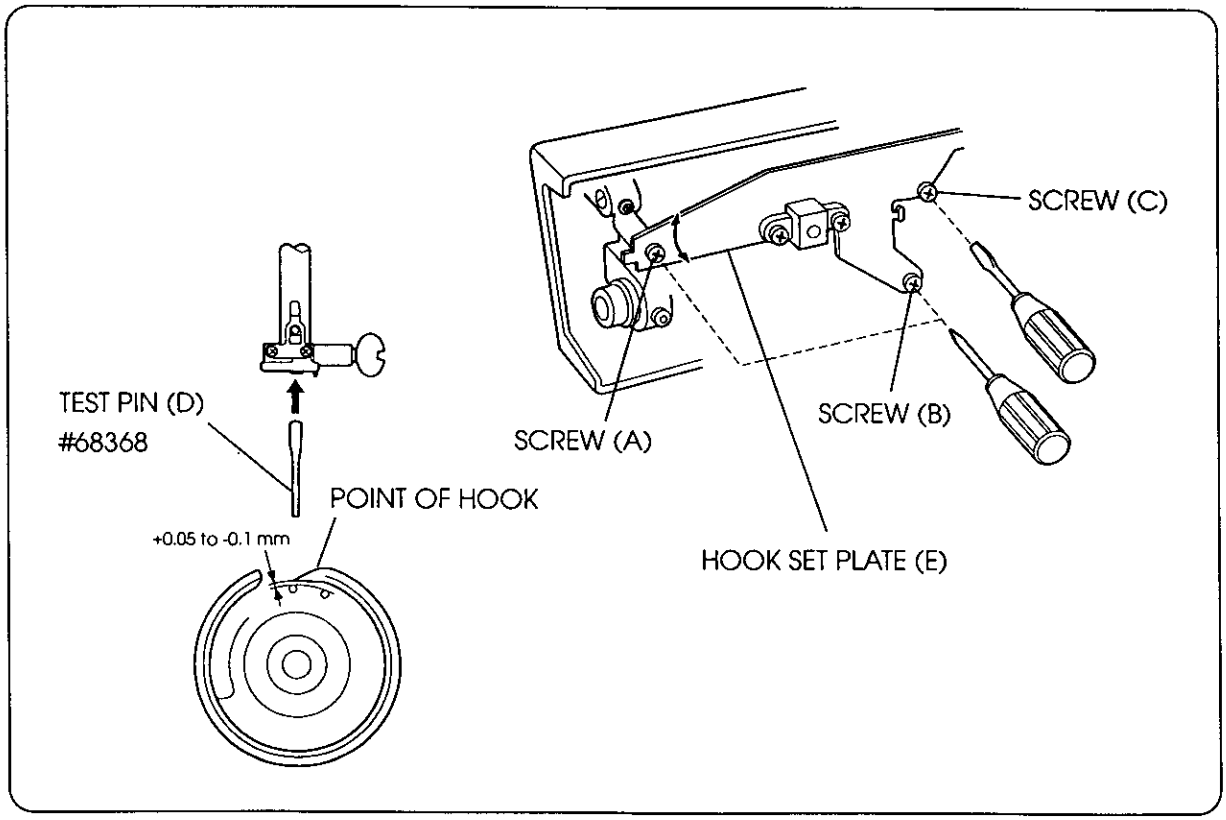
*THE CLEARANCE BETWEEN THE NEEDLE AND THE POINT OF HOOK SHOULD BE -0.1 TO +0.05 MM.

PREPARATION:

1. REMOVE THE NEEDLE PLATE, BOBBIN HOLDER, BASE COVER, BASE LID AND BED COVER UNIT (SEE P.22), AND REPLACE THE NEEDLE WITH THE TEST PIN (D) #68368.
2. TURN THE POWER SWITCH ON, AND SELECT PATTERN NO. 5 (ZIGZAG STITCH).

ADJUSTMENT PROCEDURE:

1. LOOSEN THE SCREWS (A),(B),(C), THEN SLIGHTLY TIGHTEN THE HINGE SCREW(C).
2. TURN THE HANDWHEEL TOWARD YOU, AND ADJUST THE CLEARANCE BETWEEN THE MASTER NEEDLE AND THE POINT OF THE HOOK IN THE LEFT AND RIGHT NEEDLE POSITION TO -0.1 TO +0.05mm BY MOVING THE HOOK SET PLATE (E) UP OR DOWN.
3. TIGHTEN THE SCREWS (A),(B),(C).
4. CHECK THE BACKLASH OF THE HOOK DRIVE, GEAR AND LOWER SHAFT GEAR. IF THE BACKLASH IS TOO GREAT OR NOT ENOUGH, ADJUST THE BACKLASH IN ACCORDANCE WITH "TO ADJUST THE BACKLASH OF HOOK DRIVE GEAR AND LOWER SHAFT GEAR" (SEE P.31).
5. ATTACH THE BED COVER UNIT, BASE COVER, BASE LID, NEEDLE PLATE AND BOBBIN HOLDER, AND REMOVE THE TEST PIN (D).



MECHANICAL ADJUSTMENT

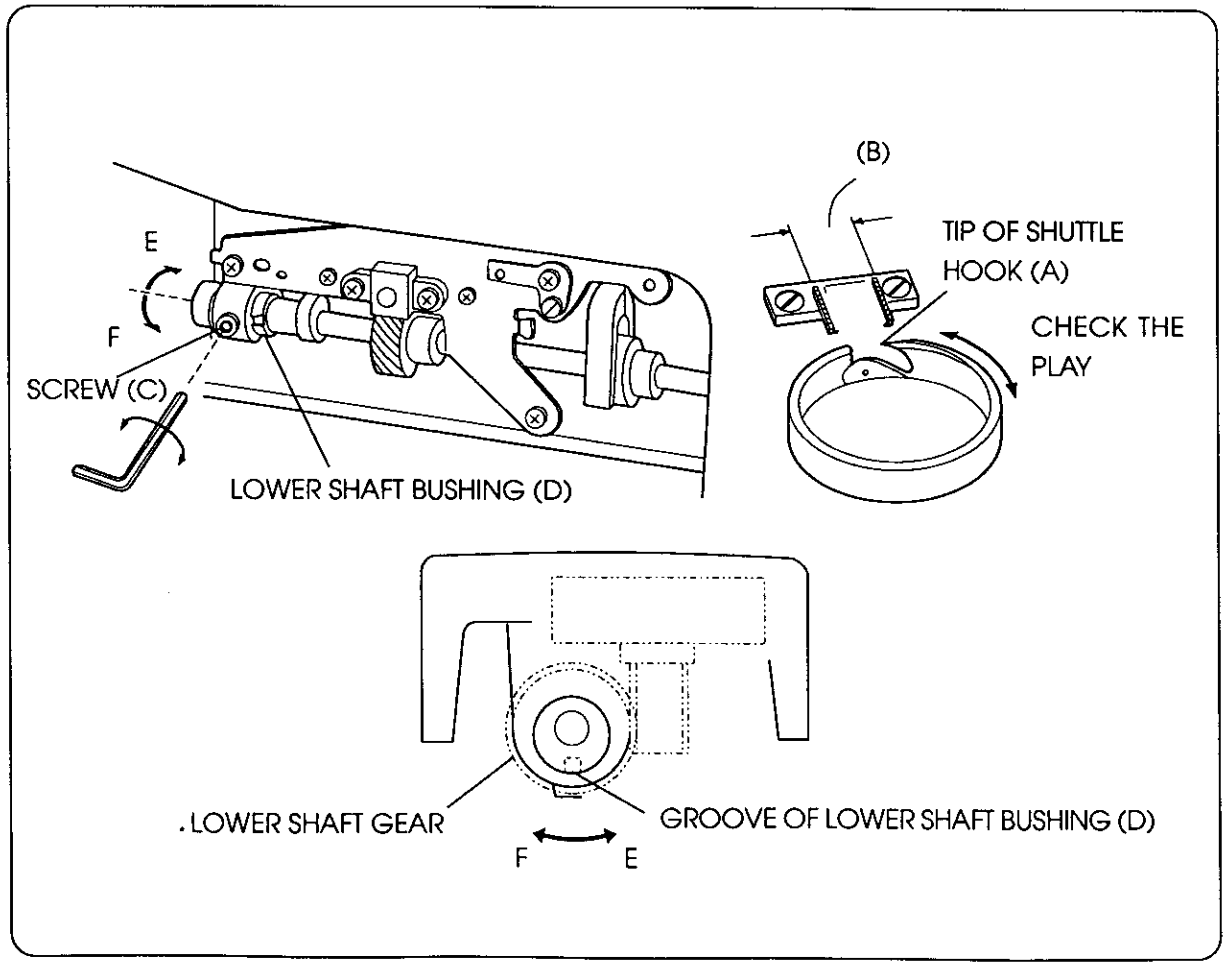
BACKLASH (LOWER SHAFT GEAR)

TO CHECK:

1. TURN THE POWER SWITCH OFF.
2. REMOVE THE NEEDLE PLATE AND BOBBIN HOLDER.
3. TURN THE HANDWHEEL SLOWLY TOWARD YOU UNTIL THE TIP OF THE SHUTTLE HOOK (A) IS BETWEEN BOTH ENDS (B) OF FEED DOG.
4. ROTATE THE HOOK RACE CLOCKWISE AND COUNTERCLOCKWISE BY FINGER. CHECK THE PLAY. IT SHOULD BE WITHIN 0.8 MM.
   "IF THERE IS MORE THAN 0.8 MM BACKLASH BETWEEN THE GEARS, ADJUST AS FOLLOWS.

ADJUSTMENT PROCEDURE:

1. REMOVE THE BED COVER (SEE P.22) AND LOOSEN THE SCREW (C).
2. TURN THE LOWER SHAFT BUSHING (D) (ECCENTRIC), IN THE DIRECTION "E" WHEN THE PLAY AT SHUTTLE HOOK TIP IS TOO SMALL.
3. TURN THE LOWER SHAFT BUSHING (D) (ECCENTRIC), IN THE DIRECTION "F" WHEN THE PLAY AT SHUTTLE HOOK TIP IS TOO LARGE.
4. TIGHTEN SCREW (C) SECURELY AFTER ADJUSTMENT.



MECHANICAL ADJUSTMENT

FEED DOG HEIGHT

MACHINE SETTING:

1. PATTERN: NO.1 (STRAIGHT STICH)
2. STITCH LENGTH: 5.0 (MAX)
3. NEEDLE BAR: HIGHEST POSITION

PREPARATION:

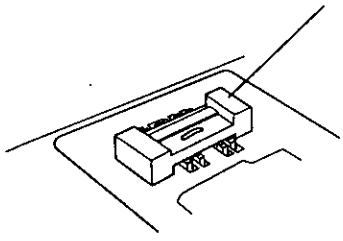
1. REMOVE THE PRESSER FOOT.
2. PUT THE FEED DOG HEIGHT GAUGE#68496 (C) ON THE NEEDLE PLATE.

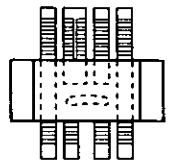
TO CHECK:

1. PLACE THE FEED DOG HEIGHT GAUGE #68496 (C) WITH FACE (A) UP. WHEN THE FEED DOG IS RAISED, THE GAUGE SHOULD NOT MOVE.
2. TURN THE GAUGE OVER SO FACE (B) IS UP. THE GAUGE SHOULD MOVE.
3. IF THE GAUGE DOES NOT MOVE, ADJUST.

GAUGE		FEED DOG HEIGHT
FACE(A) 0.95 MM	FACE(B) 0.75 MM	
NOT MOVING	MOVING	CORRECT
NOT MOVING	NOT MOVING	LOW
MOVING	MOVING	HIGH

#68496 (C)



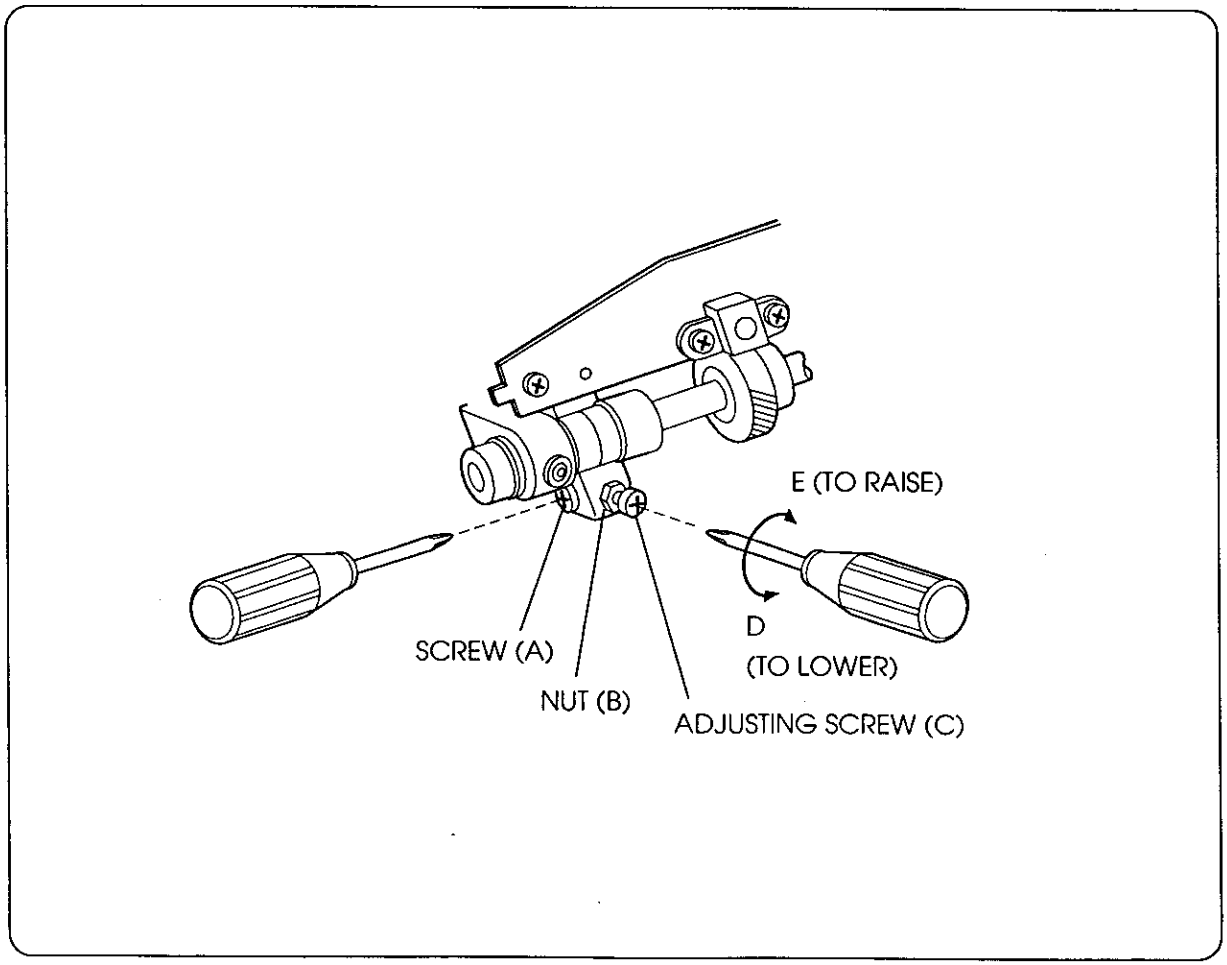


MECHANICAL ADJUSTMENT

FEED DOG HEIGHT

ADJUSTMENT PROCEDURE:

1. REMOVE THE BASE COVER, BASE LID AND BED COVER UNIT (SEE P.22).
2. TURN THE POWER SWITCH ON.
3. TURN THE BALANCE WHEEL TOWARD YOU AND SET THE FEED DOG AT THE HIGHEST POSITION.
4. LOOSEN THE ADJUSTING SCREW (A) AND NUT (B).
5. TO ADJUST THE FEED DOG HEIGHT, TURN THE ADJUSTING SCREW (C) IN THE DIRECTION "D" OR "E".
6. FIRST, TIGHTEN THE NUT (B) AND THEN TIGHTEN THE SCREW (A).
7. ATTACH THE BED COVER UNIT, BASE COVER, AND BASE LID.



MECHANICAL ADJUSTMENT

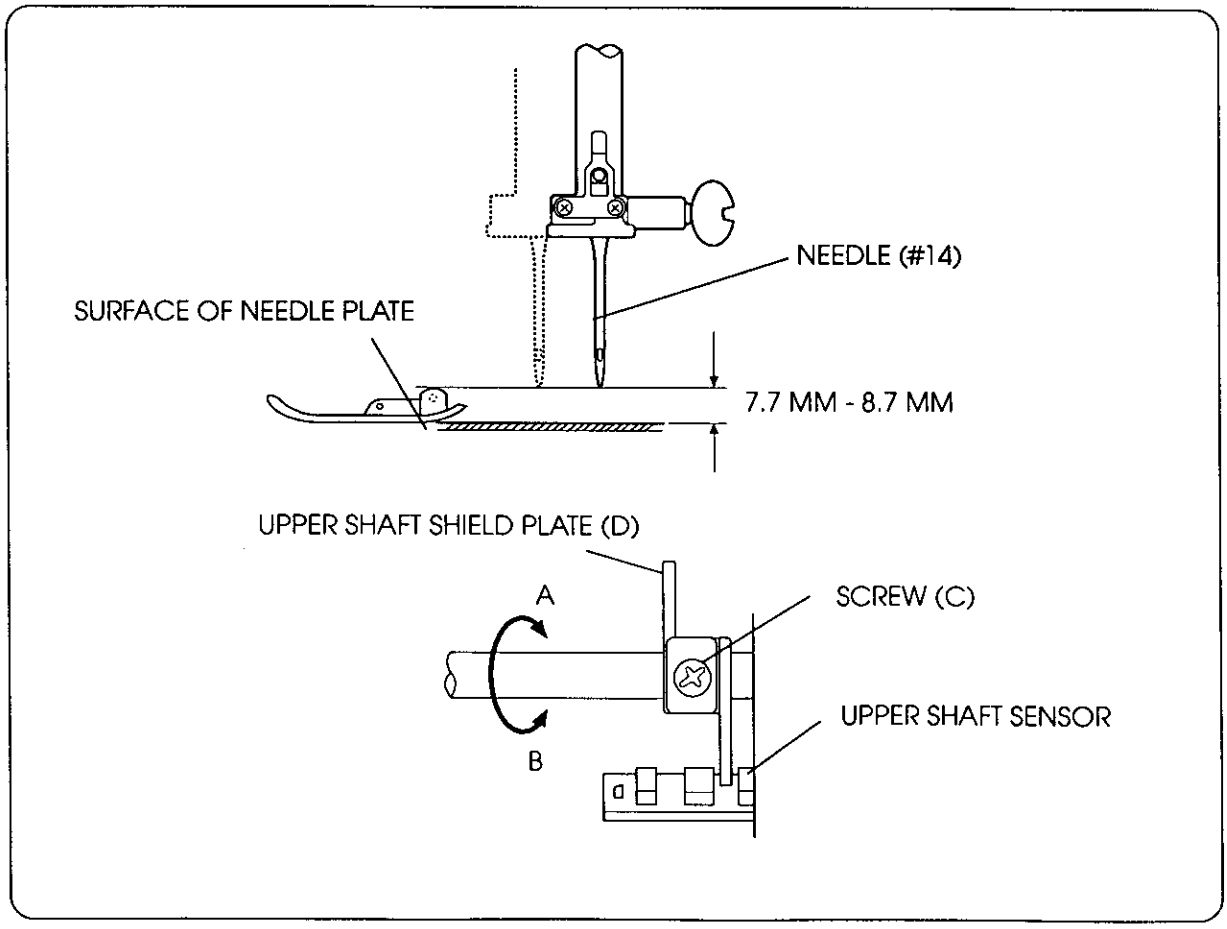
UPPER SHAFT SHIELD PLATE POSITION

TO CHECK:

1. WHEN THE MACHINE IS SET FOR ZIGZAG STITCH, THE NEEDLE SHOULD START TO SWING 7.7 TO 8.7 MM ABOVE THE SURFACE OF THE NEEDLE PLATE.

ADJUSTMENT PROCEDURE:

1. REMOVE THE TOP COVER UNIT (SEE P.19). TURN ON THE POWER SWITCH. SELECT ZIG-ZAG STITCH NO. 5.
2. TURN THE HANDWHEEL TOWARD YOU SLOWLY, WITH YOUR HAND, UNITIL THE NEEDLE STARTS TO SWING.
3. IF HIGHER THAN 8.7MM, LOOSEN THE SCREW (C) AND TURN THE UPPER SHAFT SHIELD PLATE (D) IN DIRECTION "B".
4. IF LOWER THAN 7.7MM, LOOSEN THE SCREW (C) AND TURN THE UPPER SHAFT SHIELD PLATE (D) IN DIRECTION "A".
5. PUSH THE UPPER SHAFT SHIELD PLATE AS CLOSE AS POSSIBLE TO THE LEFT. (IT SHOULD NOT TOUCH THE UPPER SHAFT SENSOR). THEN TIGHTEN THE SCREW.
6. TURN THE BALANCE WHEEL TOWARD YOU. CHECK THE STARTING POINT OF THE NEEDLE SWING. ATTACH THE TOP COVER UNIT.



MECHANICAL ADJUSTMENT

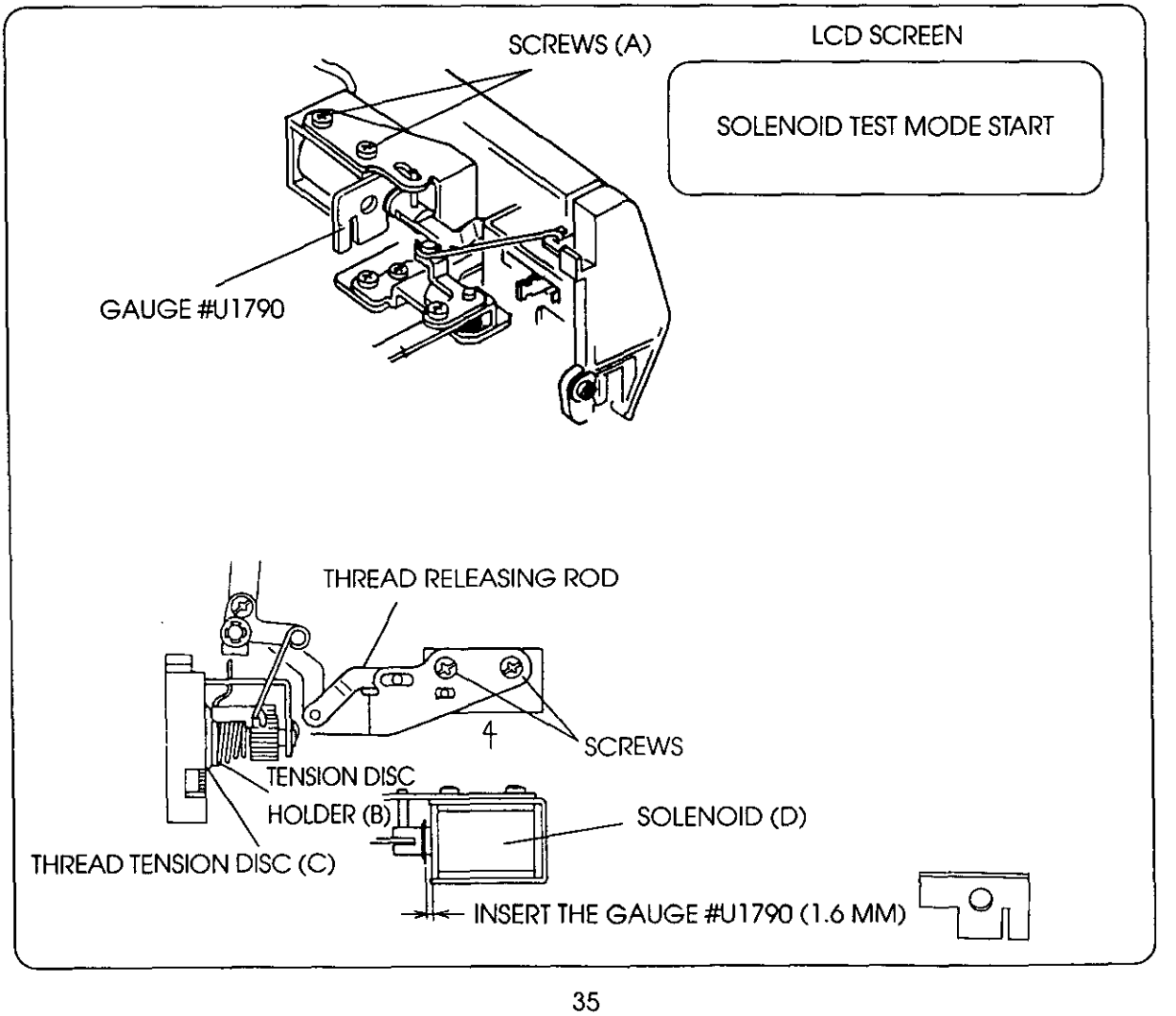
SOLENOID

PREPARATION:

1. LOWER THE PRESSER BAR LIFTER.

ADJUSTMENT PROCEDURE:

1. REMOVE THE TOP COVER (SEE P.19).
2. LOOSEN THE 2 SCREWS (A).
3. INSERT THE GAUGE #U1790 AS SHOWN, AND TIGHTEN THE SCREWS (A).
4. TO DO THE "SOLENOID TEST".
   *WHILE PRESSING THE AUTO-LOCK BUTTON, TURN THE POWER SWITCH ON. "SOLENOID TEST MODE START" WILL APPEAR ON THE LCD. CHECK THAT THE DISC HOLDER (B). IT AUTOMATICALLY MOVES LEFT AND RIGHT CONTINUOUSLY.
   PASS THE THREAD BETWEEN THE TENSION DISC (C) AND DISC HOLDER (B). WHEN THE SOLENOID (D) MOVES TO THE RIGHT (OPEN), MAKE SURE THE THREAD HAS NO TENSION.
5. ATTACH THE TOP COVER.



MECHANICAL ADJUSTMENT

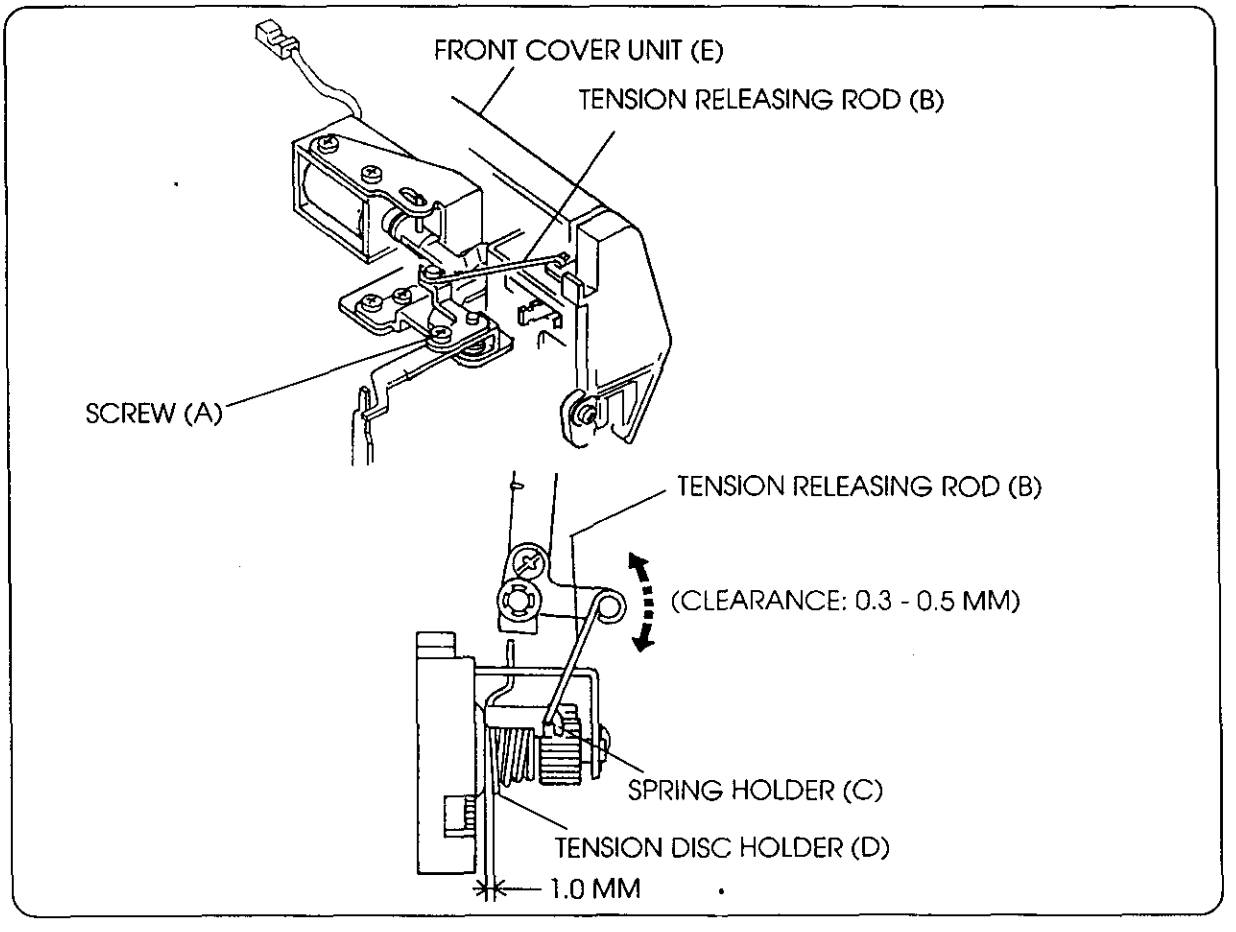
TENSION RELEASE MECHANISM

TO CHECK:

1. WHEN THE PRESSER BAR IS RAISED, THE TENSION DISC HOLDER (D) SHOULD MOVE ABOUT 1.0 MM AS A STANDARD VALUE IN ORDER FOR THE TENSION RELEASE FUNCTION TO WORK CORRECTLY.

ADJUSTMENT PROCEDURE:

1. REMOVE THE TOP COVER UNIT (SEE P.19) AND BELT COVER UNIT (SEE P.20).
2. LOOSEN THE SCREWS WHICH HOLD THE FRONT COVER UNIT(E) (SEE P.24). MOVE THE FRONT COVER UNIT (E) A LITTLE.
3. LOWER THE PRESSER BAR LIFTER AND SET THE THREAD TENSION DIAL AT "9". LOOSEN THE SCREW (A).
4. SET THE CLEARANCE BETWEEN THE THREAD TENSION RELEASING ROD (B) AND THE SPRING HOLDER(C) BETWEEN 0.3-0.5MM AND TIGHTEN SCREW(A).
5. SET THE THREAD TENSION DIAL AT "9" AND RAISE THE PRESSER BAR. MAKE SURE THE TENSION DISC MOVES ABOUT 1.0MM.
   DO THE SAME TEST WITH THE THREAD TENSION DIAL SET AT "0".
6. ATTACH THE TOP COVER, BELT COVER AND FRONT COVER.



MECHANICAL ADJUSTMENT

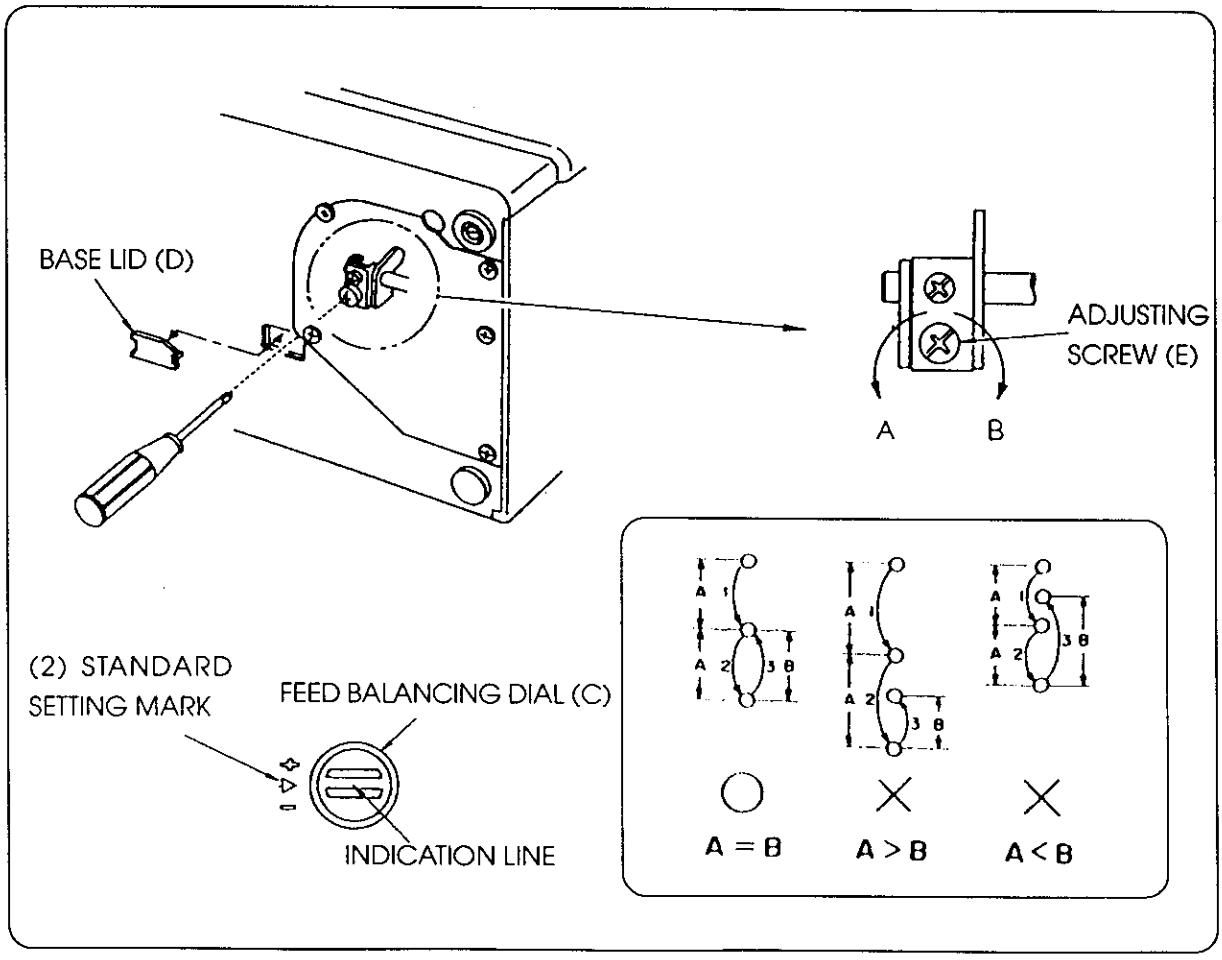
STRETCH STITCH FEED BALANCE

TO CHECK:

1. WHEN A STRETCH PATTERN IS SEWN WITH THE FEED BALANCING DIAL (C) SET AT THE STANDARD SETTING MARK " ▷ ", THE PATTERN SHOULD BE AS INDICATED WITH THE " ○ " MARK IN THE FOLLOWING FIGURE. IF NOT (IF THERE IS NO BALANCE BETWEEN FORWARD FEEDING AND BACKWARD FEEDING), THEN MAKE AN ADJUSTMENT AS FOLLOWS:

ADUSTMENT PROCEDURE:

1. TURN THE POWER SWITCH ON, AND SELECT PATTERN NO.13 (TRIPLE STRETCH STITCH).
2. SET THE SLIT OF THE FEED BALANCING DIAL (C) AT THE STANDARD SETTING MARK " ▷ " ON THE BELT COVER.
3. PUT THE PAPER BETWEEN THE FOOT AND FEED DOG AND LOWER THE PRESSER BAR LIFTER.
4. TURN THE HANDWHEEL, AND CHECK THE NEEDLE POSITION OF "A" AND "B".
5. REMOVE THE BASE LID(D).
6. WHEN A>B, TURN THE ADJUSTING SCREW (E) IN THE DIRECTION OF "A".
   WHEN A<B, TURN THE ADJUSTING SCREW (E) IN THE DIRECTION OF "B".
7. ATTACH THE BASE LID (D).



MECHANICAL ADJUSTMENT

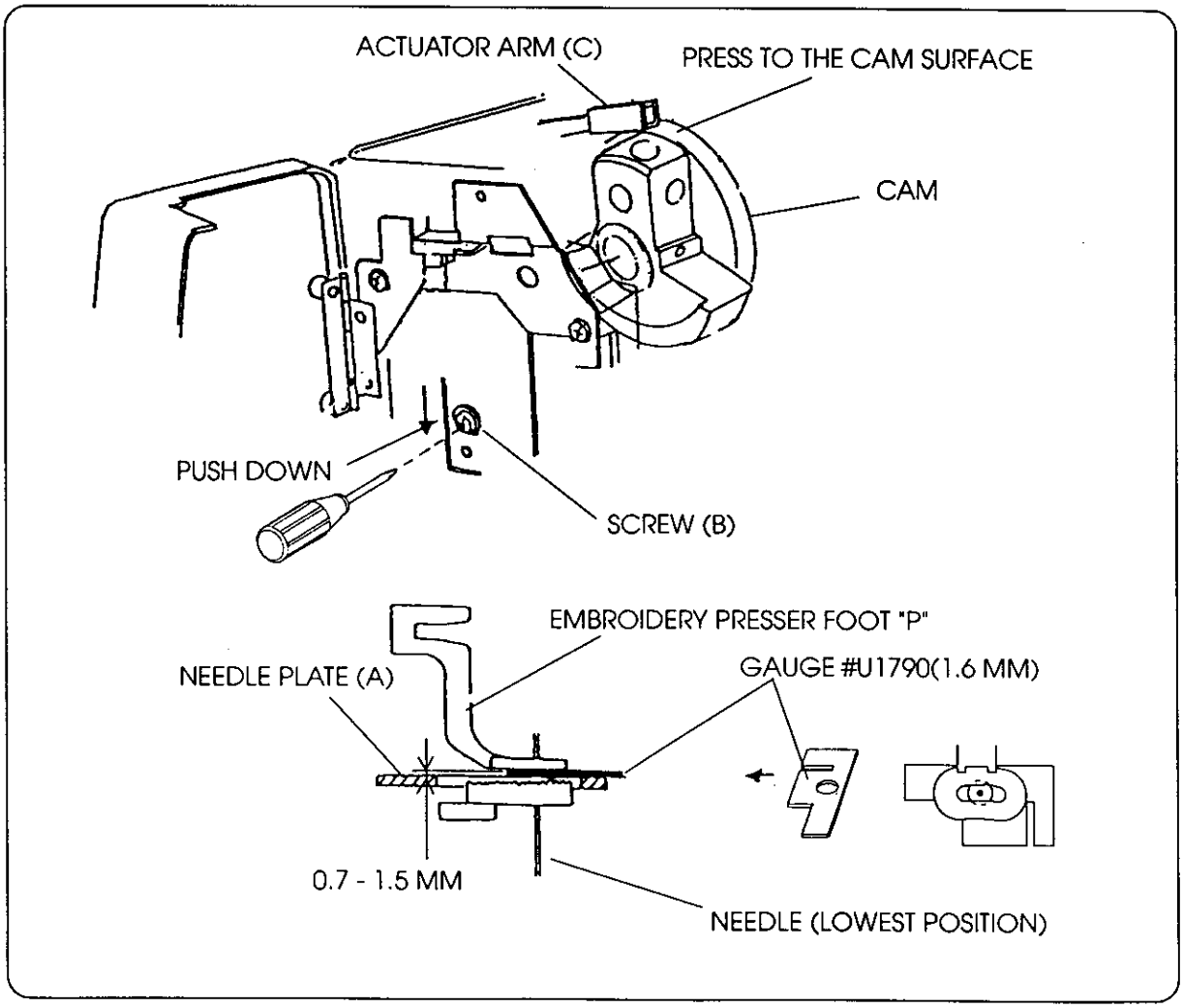
HEIGHT OF EMBROIDERY PRESSER FOOT "P"

TO CHECK:

1. SET THE NEEDLE BAR AT THE LOWEST POINT. LOWER THE PRESSER BAR WITH THE EMBROIDERY FOOT "P" ATTACHED. THE DISTANCE BETWEEN THE BOTTOM PART OF FOOT "P" AND THE SURFACE OF THE NEEDLE PLATE SHOULD BE THE SAME AS THICKNESS OF THE GAUGE #U1790.

ADJUSTMENT PROCEDURE:

1. REMOVE THE TOP COVER (SEE P.19).
2. SET THE NEEDLE BAR TO THE LOWEST POSITION. LOWER THE PRESSER FOOT LIFTER. THEN SET THE PRESSURE DIAL AT "2".
3. INSERT THE GAUGE #U1790 BETWEEN THE PRESSER FOOT "P" AND THE NEEDLE PLATE (A).
4. LOOSEN THE SCREW (B) AND PRESS THE ACTUATOR ARM (C) TO THE CAM SURFACE. THEN TIGHTEN THE SCREW (B) WHILE PUSHING IT DOWN.
5. ATTACH THE TOP COVER UNIT.



MECHANICAL ADJUSTMENT

NEEDLE THREAD TENSION

TO CHECK:

1. WHEN THE POLYESTER SEWING THREAD #50 (WHITE) IS PASSED THROUGH AND PULLED UP AS IN FIG.1, THE THREAD TENSION SHOULD BE 75$^{+10}_{-5}$ GRAMS (THE THREAD PULLING SPEED: APPROX. 110 MM/SEC.) WITH THE THREAD TENSION DIAL SET AT "4".

ADJUSTMENT PROCEDURE:

1. REMOVE THE FRONT COVER UNIT (SEE P.24).
2. PULL THE ADJUSTING PLATE SPRING (C) AWAY FROM THE LEAD SCREW (D) AND ADJUST BY TURNING THE LEAD SCREW (D).
   - WHEN THE TENSION IS STRONG, TURN THE LEAD SCREW IN DIRECTION "A".
   - WHEN THE TENSION IS WEAK, TURN THE LEAD SCREW IN THE DIRECTION "B".
3. ATTACH THE FRONT COVER UNIT.

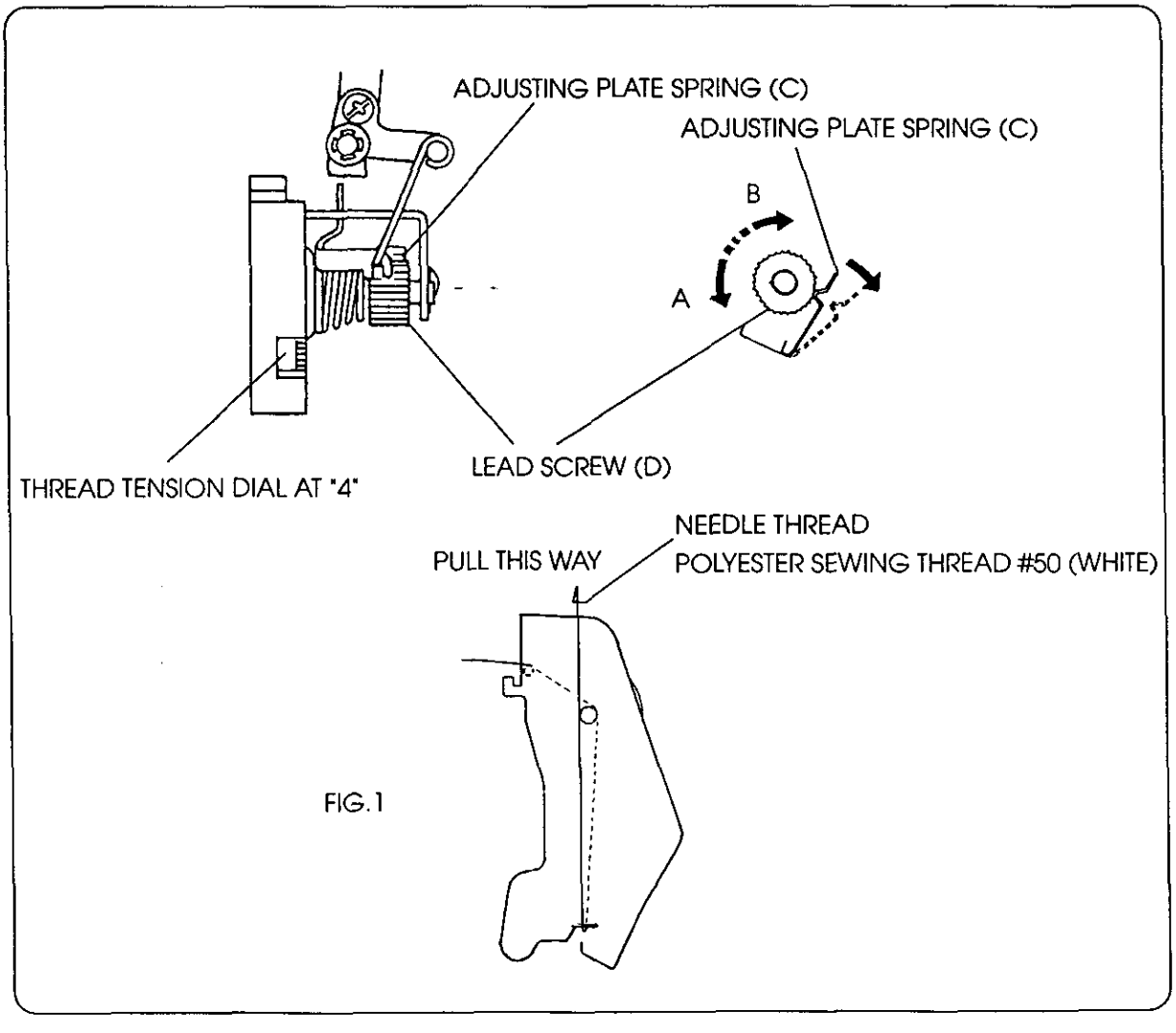


FIG.1

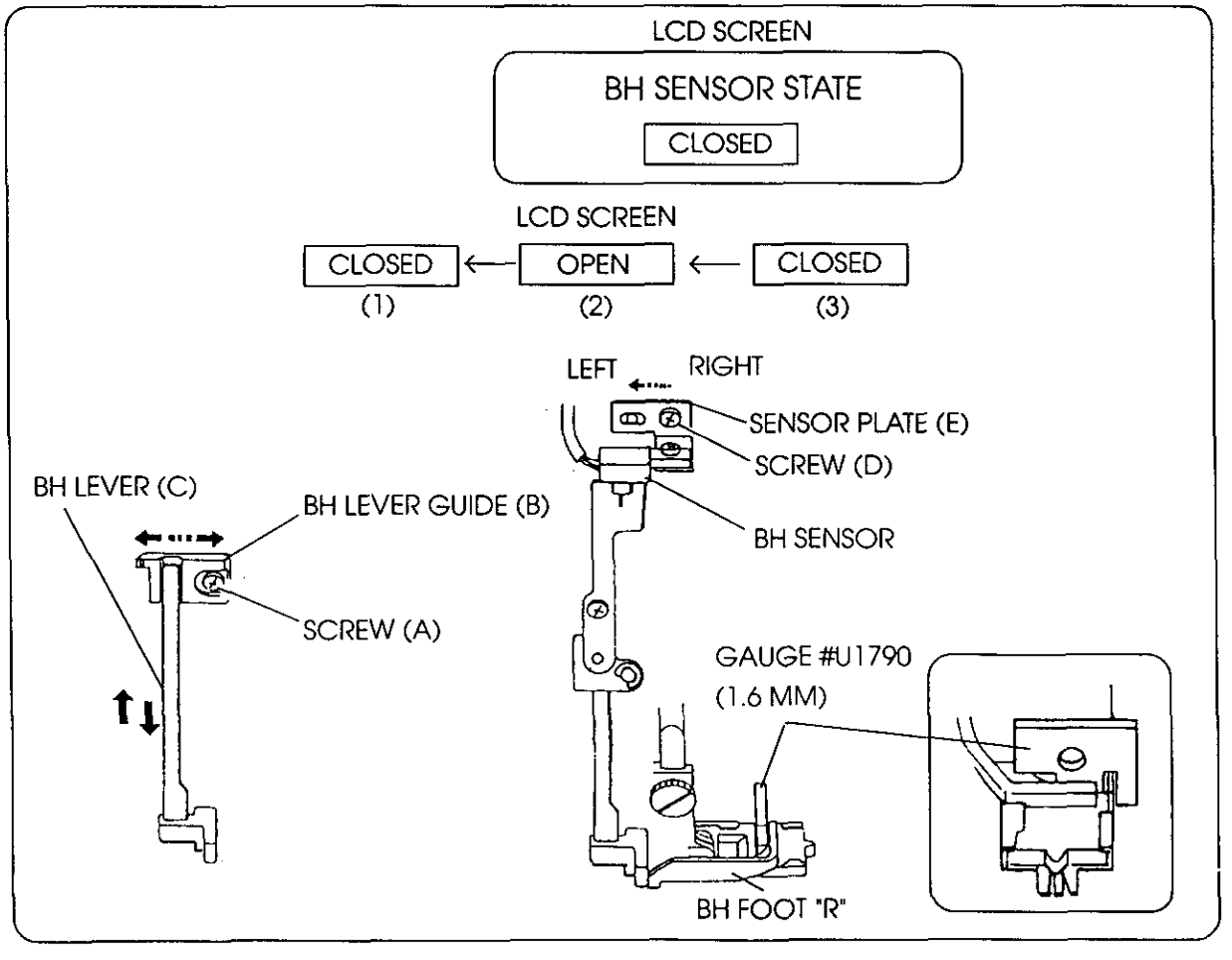
MECHANICAL ADJUSTMENT

BUTTONHOLE LEVER

*IF THE STEPS DO NOT CHANGE OR THE ENDS OF STITCHES ARE NOT IN LINE WHILE BUTTONHOLE SEWING, ADJUST AS FOLLOWS:

1. ENTER ADJUSTING MODE. TURN THE POWER SWITCH ON WHILE PRESSING THE START/STOP KEY AND THE REVERSE KEY. PRESS THE LOCK STITCH KEY AND NEEDLE UP/DOWN KEY WITHIN 2.5 SECONDS. THE LCD SCREEN SHOWS "BH SENSOR STATE CLOSED".
2. LOOSEN THE SCREW (A) AND MOVE THE BH LEVER GUIDE (B). THE LCD SCREEN SHOULD SHOW "OPEN" WHEN THE BH LEVER IS LOWERED. THEN TIGHTEN THE SCREW (A).
3. ATTACH THE BH FOOT "R" AND LOWER THE BH LEVER (C).
4. PUT GAUGE #U1790 IN BETWEEN THE SLIDING PART OF THE AUTOMATIC BUTTONHOLE FOOT AND ITS END, AS SHOWN.
5. LOOSEN SET SCREW (B), MOVE THE SENSOR PLATE (E) FROM RIGHT TO LEFT. TIGHTEN THE SET SCREW (D), AS THE LCD SCREEN CHANGES FROM (2) "OPEN" TO (3) "CLOSED".
6. TURN ON THE SWITCH AGAIN. SELECT BH #15 AND MAKE SURE IT SEWS CORRECTLY.

NOTE: THE LCD SCREEN SHOWS (1) CLOSED (2) OPEN (3) CLOSED WHEN THE SENSOR PLATE IS MOVED FROM RIGHT TO LEFT ON STEP 5. ADJUSTMENT SHOULD BE SET FROM (2) OPEN TO (3) CLOSED POSITION.



MECHANICAL ADJUSTMENT

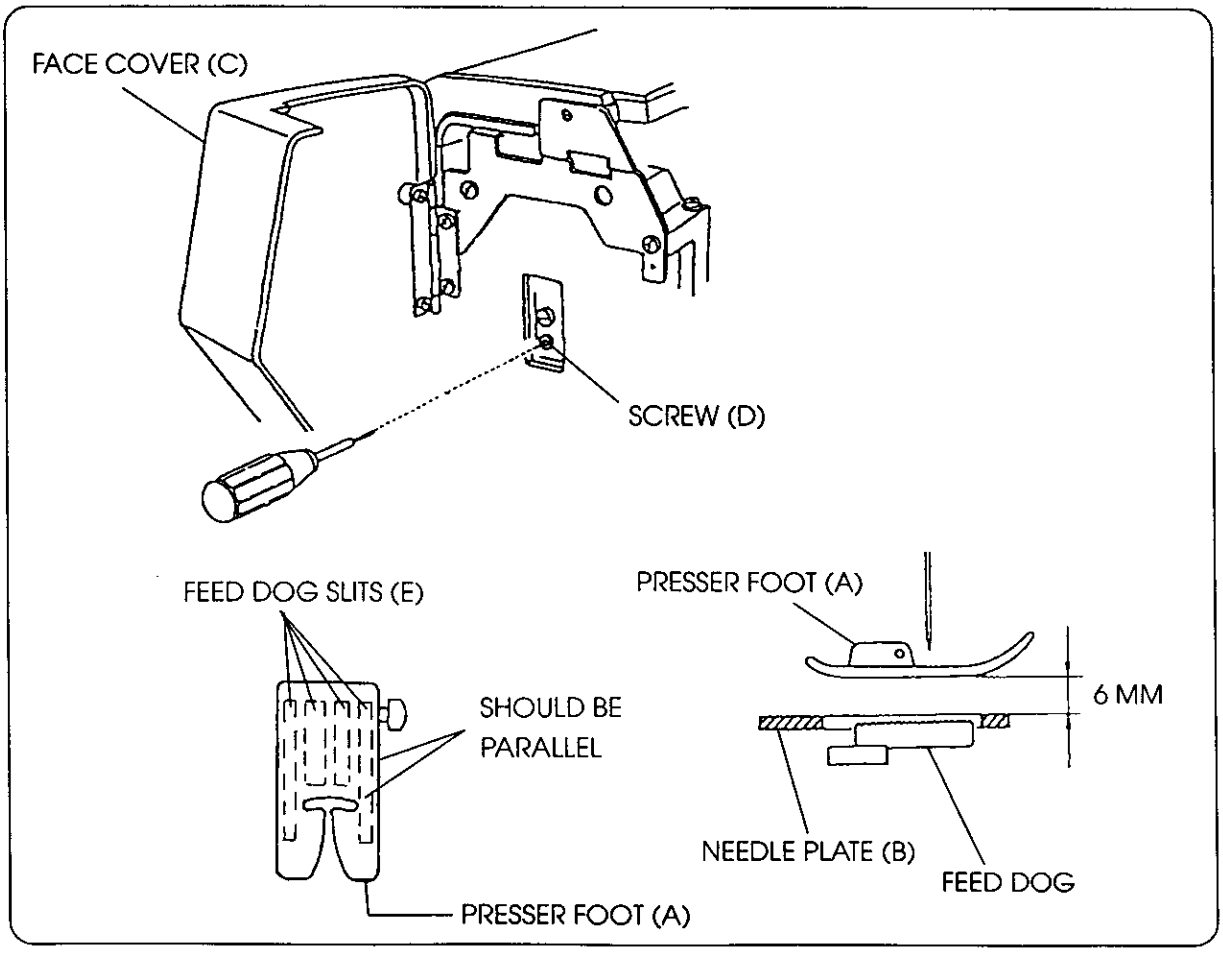
PRESSER BAR HEIGHT AND ALIGNMENT

TO CHECK:

1. RAISE THE PRESSER FOOT LEVER.
2. THE DISTANCE BETWEEN THE ZIGZAG FOOT (A) AND THE NEEDLE PLATE (B) SHOULD BE 6.0 MM (0.24").
   *IF THE HEIGHT IS GREATER OR LESS THAN 6 MM (0.24"), ADJUST AS FOLLOWS.

ADJUSTMENT PROCEDURE:

1. OPEN THE FACE COVER (C).
2. RAISE THE PRESSER FOOT LEVER AND LOOSEN THE SCREW (D).
3. ADJUST THE DISTANCE BETWEEN THE ZIGZAG FOOT (A) AND THE NEEDLE PLATE (B) TO 6.0 MM (0.24").
4. TIGHTEN SCREW (D) SECURELY.
   NOTE: WHEN YOU TIGHTEN SCREW (D), MAKE SURE THAT BOTH SIDES OF THE ZIGZAG FOOT (A) ARE PARALLEL WITH THE FEED DOG SLITS (E).



MECHANICAL ADJUSTMENT

OVER LOAD (1)

* "STOP FOR SAFETY PURPOSES" APPEARS ON THE SCREEN WHEN THE MACHINE IS OVER-LOADED

TO CHECK:

1. CHECK THE THREAD TAKE-UP LEVER AREA. IF THREAD IS JAMMED, REMOVE THE THREAD (SEE P.63). ALSO, CHECK "MOTOR BELT TENSION" (SEE P.57) AND "BACKLASH OF THE SHUTTLE HOOK" (SEE P.31).
2. TURN THE HANDWHEEL TOWARD YOU TO CHECK THE TORQUE. IF IT IS HEAVY, ADJUST THE FOLLOWING:

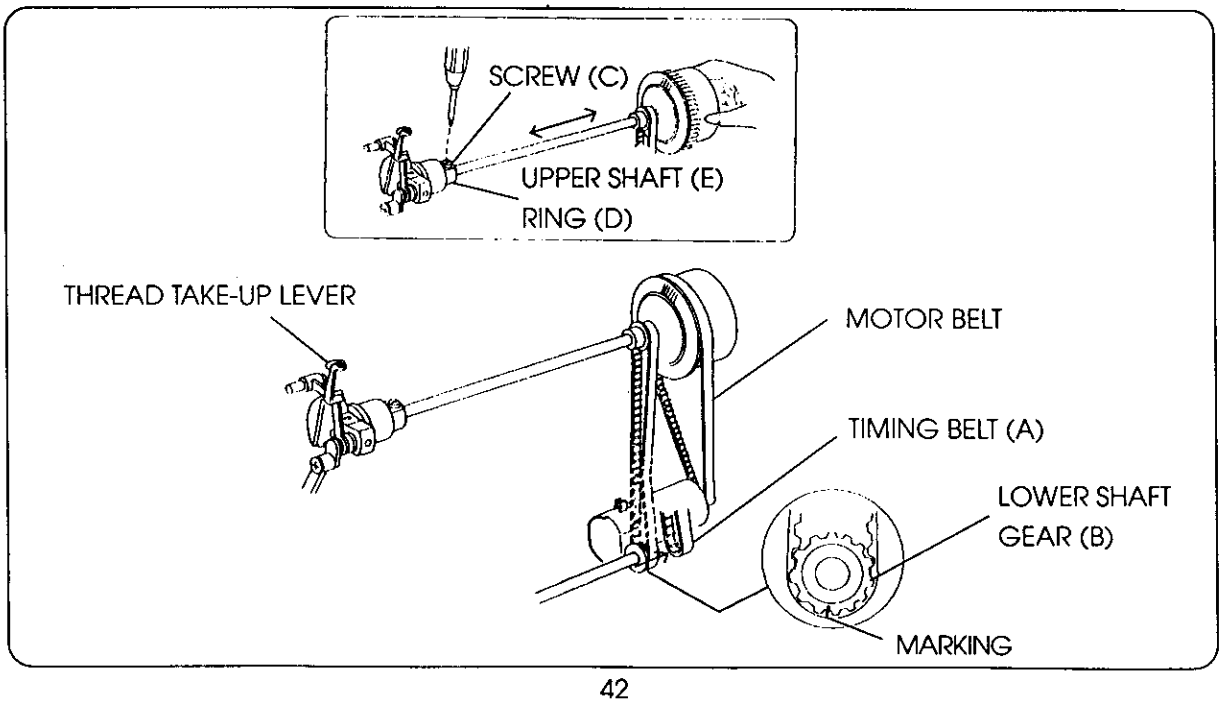
PREPARATION:

1. REMOVE THE TOP COVER (SEE P.19), BELT COVER (SEE P.20), BASE AND BED COVER (SEE P.22).
2. TURN THE HANDWHEEL TOWARD YOU UNTIL THE NEEDLE BAR COMES TO ITS HIGHEST POSITION.
   MARK BOTH THE TIMING BELT (A) AND LOWER SHAFT GEAR (B) WITH A FELT-TIP PEN, AS ILLUSTRATED.
3. REMOVE THE MOTOR BELT AND THE TIMING BELT (A).

ADJUSTMENT PROCEDURE:

UPPER SHAFT

1. LOOSEN THE SCREW (C).
2. SLIDE THE UPPER SHAFT RING (D) TO THE LEFT SO THERE IS NO PLAY AND THE SHAFT TURNS SMOOTHLY.
3. TIGHTEN THE SCREW (C) AND MAKE SURE THE UPPER SHAFT (E) HAS NO PLAY AND TURNS SMOOTHLY BY TURNING THE HANDWHEEL.



MECHANICAL ADJUSTMENT

OVER LOAD (2)

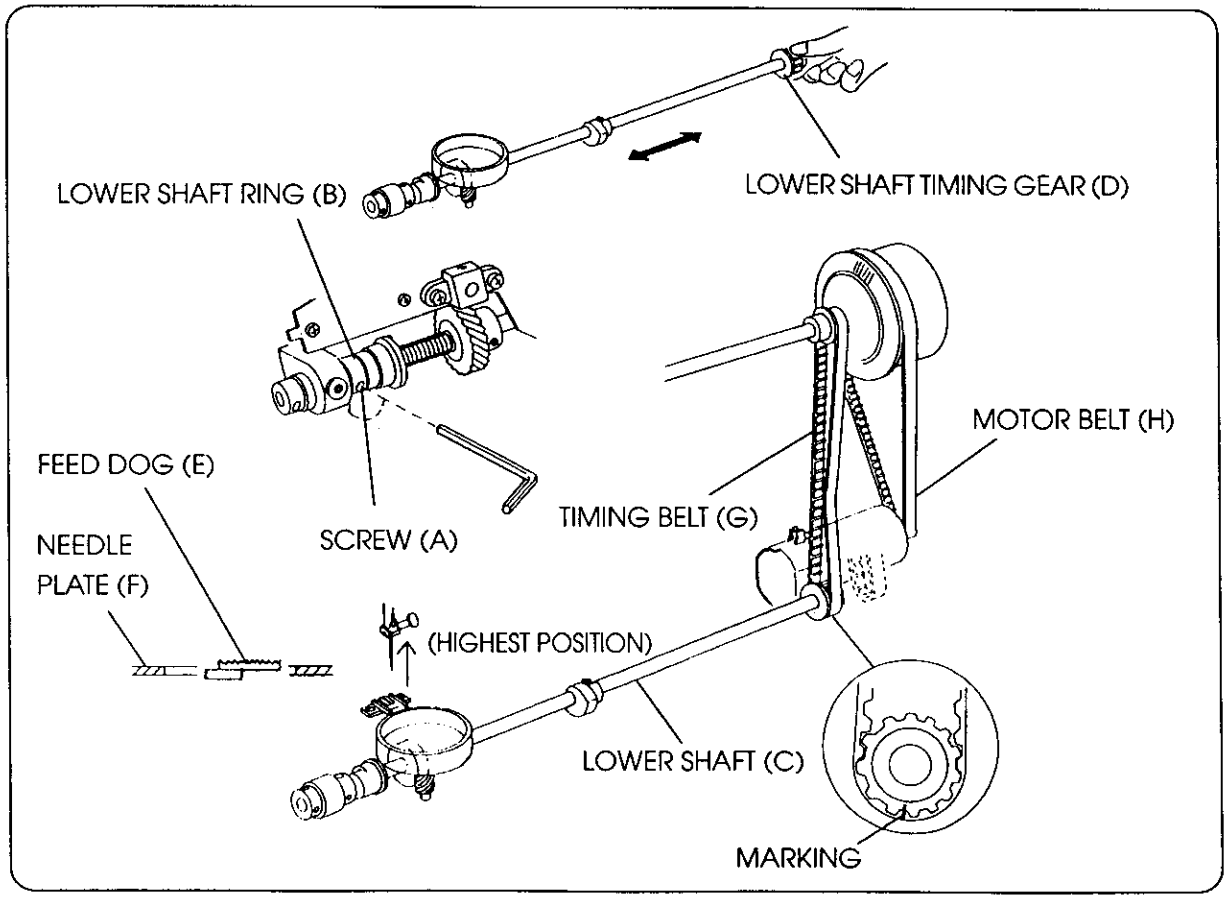
ADJUSTMENT PROCEDURE:

LOWER SHAFT

1. LOOSEN THE 2 SCREWS (A).
2. SLIDE THE LOWER SHAFT RING (B) TO THE LEFT SO THERE IS NO PLAY AND THE SHAFT TURNS SMOOTHLY.
3. TIGHTEN THE 2 SCREWS (A). MAKE SURE THE LOWER SHAFT (C) HAS NO PLAY AND TURNS SMOOTHLY BY TURNING THE LOWER SHAFT TIMING GEAR (D).

HOW TO INSTALL THE TIMING BELT:

1. TURN THE HANDWHEEL TOWARD YOU UNTIL THE NEEDLE BAR COMES TO ITS HIGHEST POSITION.
   TURN THE LOWER SHAFT TIMING GEAR (D) TOWARD YOU UNTIL THE FEED DOG (E) COMES JUST ABOVE THE NEEDLE PLATE (F) IN ITS UPWARD MOTION.
   THEN, ATTACH THE TIMING BELT (G).
   * MAKE SURE THE MARKING ON THE TIMING BELT (G) IS IN LINE WITH THAT OF THE LOWER SHAFT TIMING GEAR (D).
2. CHECK THE "NEEDLE TO SHUTTLE TIMING" (SEE P.28, 29)
3. ATTACH THE MOTOR BELT (H), BED COVER, BASE, BELT COVER AND TOP COVER.



ADJUSTMENT OF TOUCH PANEL

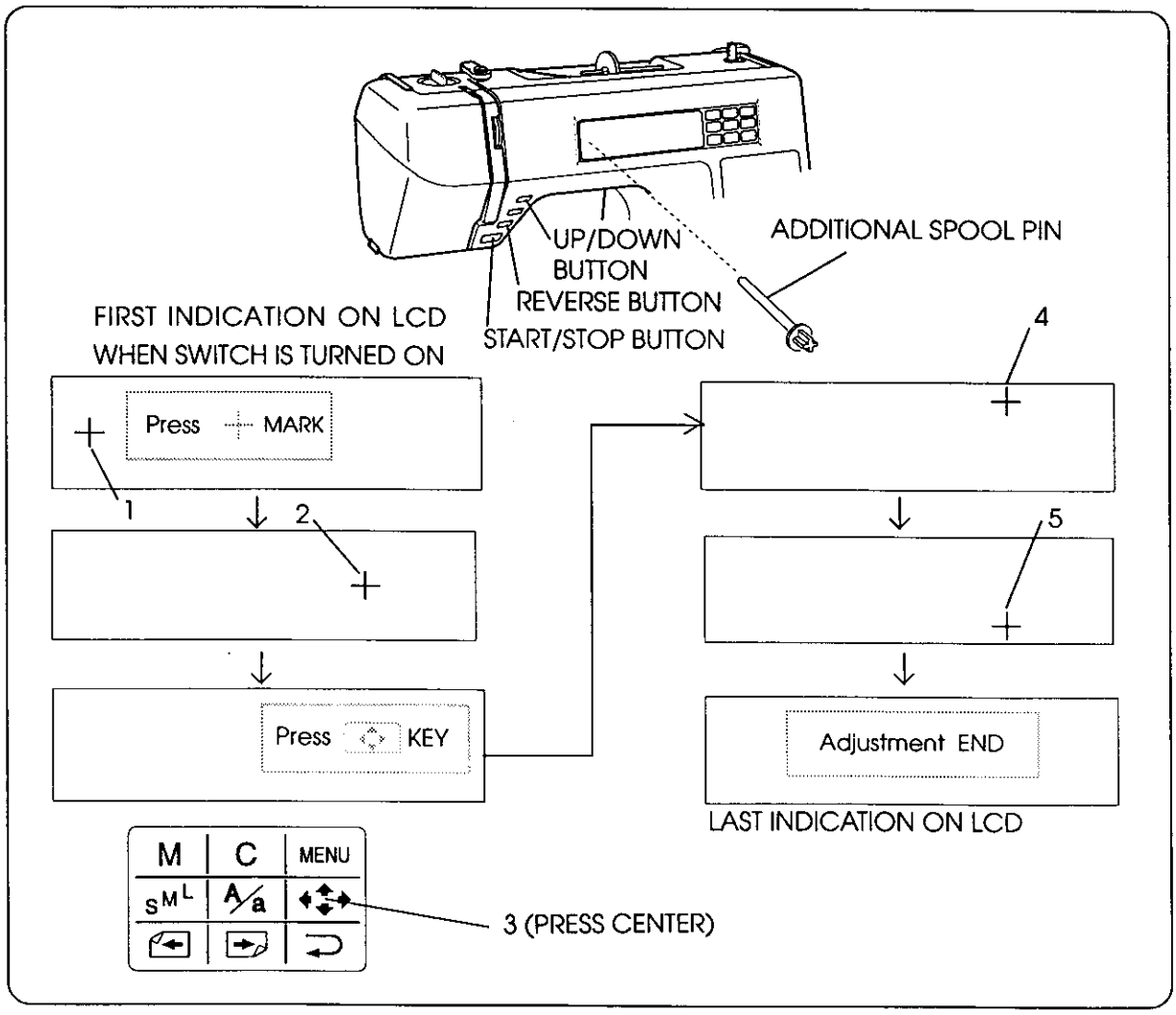
TO CHECK:

1. IF, WHEN PRESSING THE TOUCH PANEL, A DIFFERENT STITCH IS SELECTED. ADJUST AS FOLLOWS.

ADJUSTMENT PROCEDURE:

1. TURN THE POWER SWITCH ON WHILE PRESSING THE UP/DOWN BUTTON, REVERSE BUTTON, AND START/STOP BUTTON SIMULTANEOUSLY. ("PRESS + MARK" AND "+" MARK ARE INDICATED ON THE LCD AT THIS TIME.)
2. PRESS THE CENTER OF THE "+" MARK WITH THE POINT OF THE ADDITIONAL SPOOL PIN. (WHEN PRESSING THE "+" MARK ONCE, THE BUZZER SOUNDS. THE "+" MARK MOVES AS SHOWN IN THE FIGURE BELOW EVERY TIME IT IS PUSHED.)
3. WHEN THE FIFTH "+" MARK IS PRESSED, "ADJUSTMENT END" IS INDICATED ON THE LCD.
4. TURN THE POWER SWITCH OFF.
5. TURN THE POWER SWITCH ON, AND CHECK IF THE ORIGINAL FIRST PAGE APPEARS ON THE LCD.

   NOTE: AFTER ADJUSTMENT, CHECK TO SEE IF PATTERNS ARE SELECTED CORRECTLY.

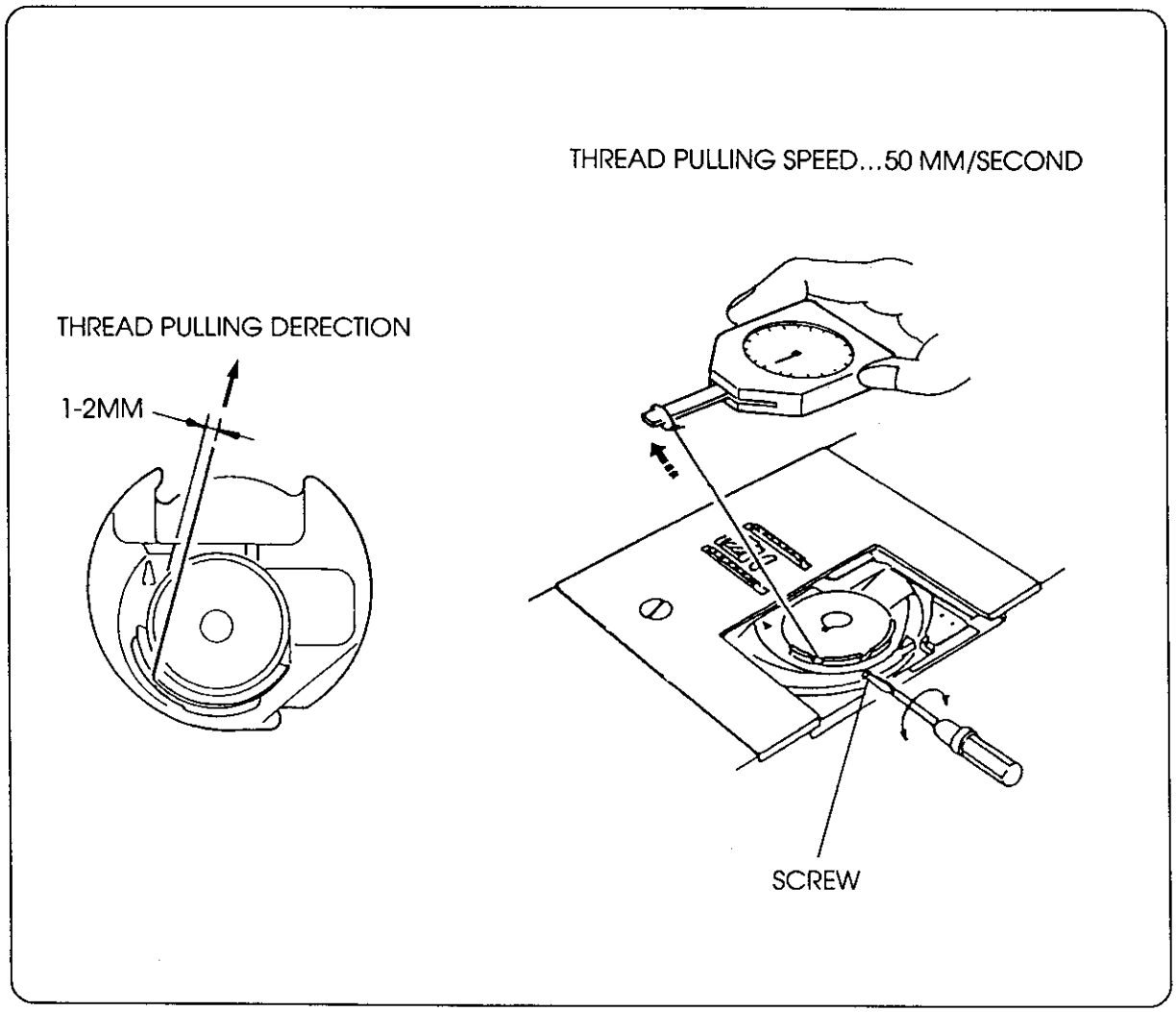


MECHANICAL ADJUSTMENT

BOBBIN THREAD TENSION (1)

*STANDARD BOBBIN THREAD TENSION IS 13 $^{+2}_{-1}$ GRAMS.

1. INSERT A BOBBIN WOUND WITH "KING" MARK POLYESTER THREAD (#50 WHITE) INTO THE BOBBIN HOLDER.
   THREAD THE BOBBIN HOLDER AND ATTACH THE END OF THE BOBBIN THREAD TO THE POINT OF THE TENSION METER.
2. PULL IT IN THE DIRECTION OF THE ARROW AT A SPEED OF 50 MM/SECOND.
   – IF THE TENSION IS TOO STRONG, TURN THE SCREW COUNTERCLOCKWISE.
   – IF THE TENSION IS TOO WEAK, TURN THE SCREW CLOCKWISE.

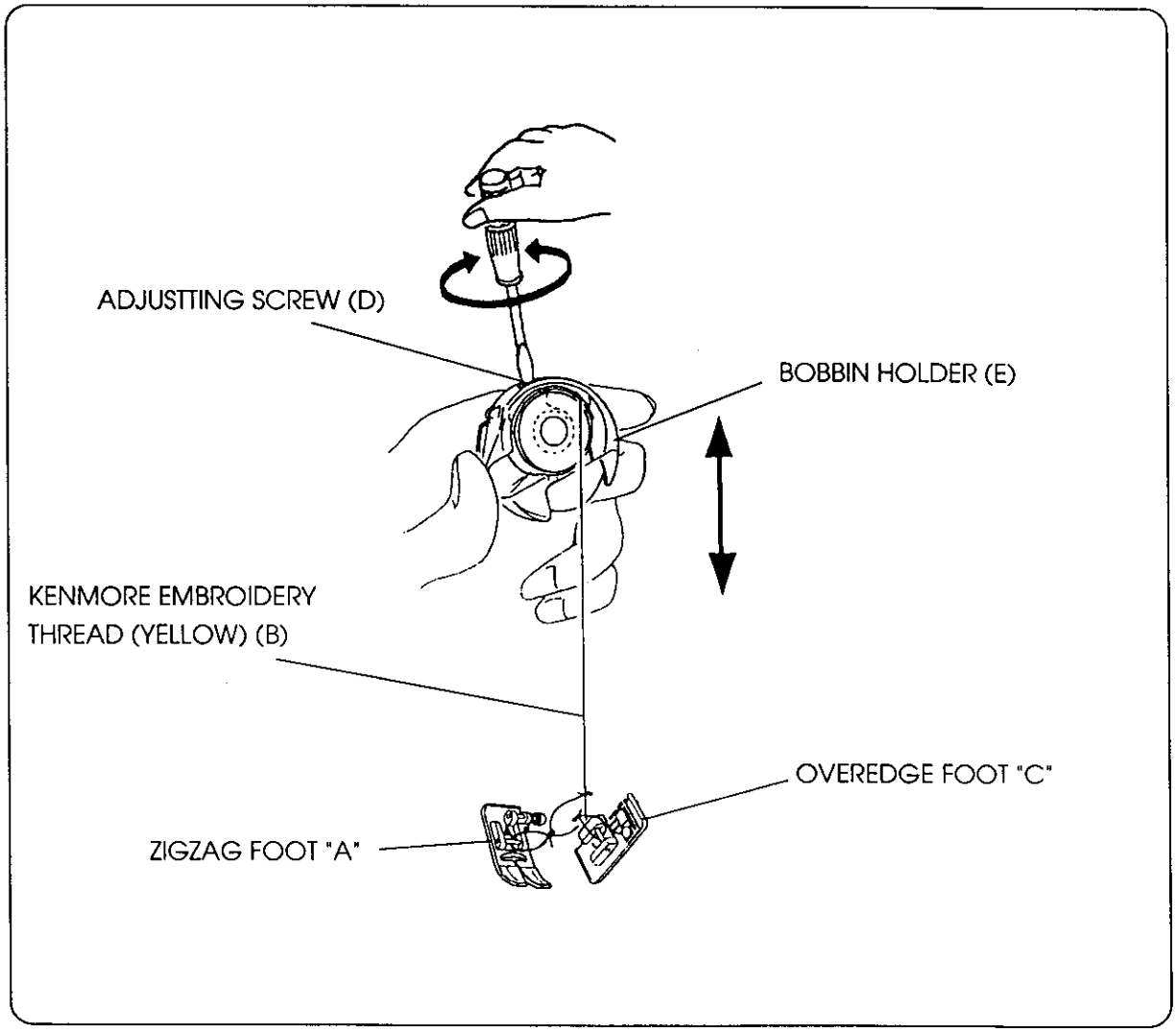


BOBBIN THREAD TENSION (2)

IF A TENSION METER IS NOT AVAILABLE, THE BOBBIN THREAD TENSION CAN BE ADJUSTED AS FOLLOWS:

1. INSERT A BOBBIN WOUND WITH KENMORE EMBROIDERY THRAD (#204 YELLOW)(B) INTO THE BOBBİN HOLDER. THREAD THE BOBBIN HOLDER AND HANG ZIGZAG FOOT "A" AND OVEREDGE FOOT "C" ON THE END OF THE BOBBIN THREAD AS ILLUSTRATED.
2. TURN THE ADJUSTING SCREW (D) SO THAT THE THREAD WILL DRAW OUT SMOOTHLY WHEN YOU SWING THE BOBBIN HOLDER (E) UP AND DOWN GENTLY.

NOTE: THE BOBBIN THREAD TENSION MECHANISM IS VERY SENSITIVE, SO DO NOT ADJUST IT UNLESS YOU CAN NOT OBTAIN THE CORRECT TENSION BALANCE BY OTHER MEANS. REPLACE THE BOBBIN HOLDER IF THE CORRECT TENSION CAN NOT BE OBTAINED BY THIS PROCEDURE.



PART REMOVAL AND REPLACEMENT

NEEDLE THREAD TENSION UNIT

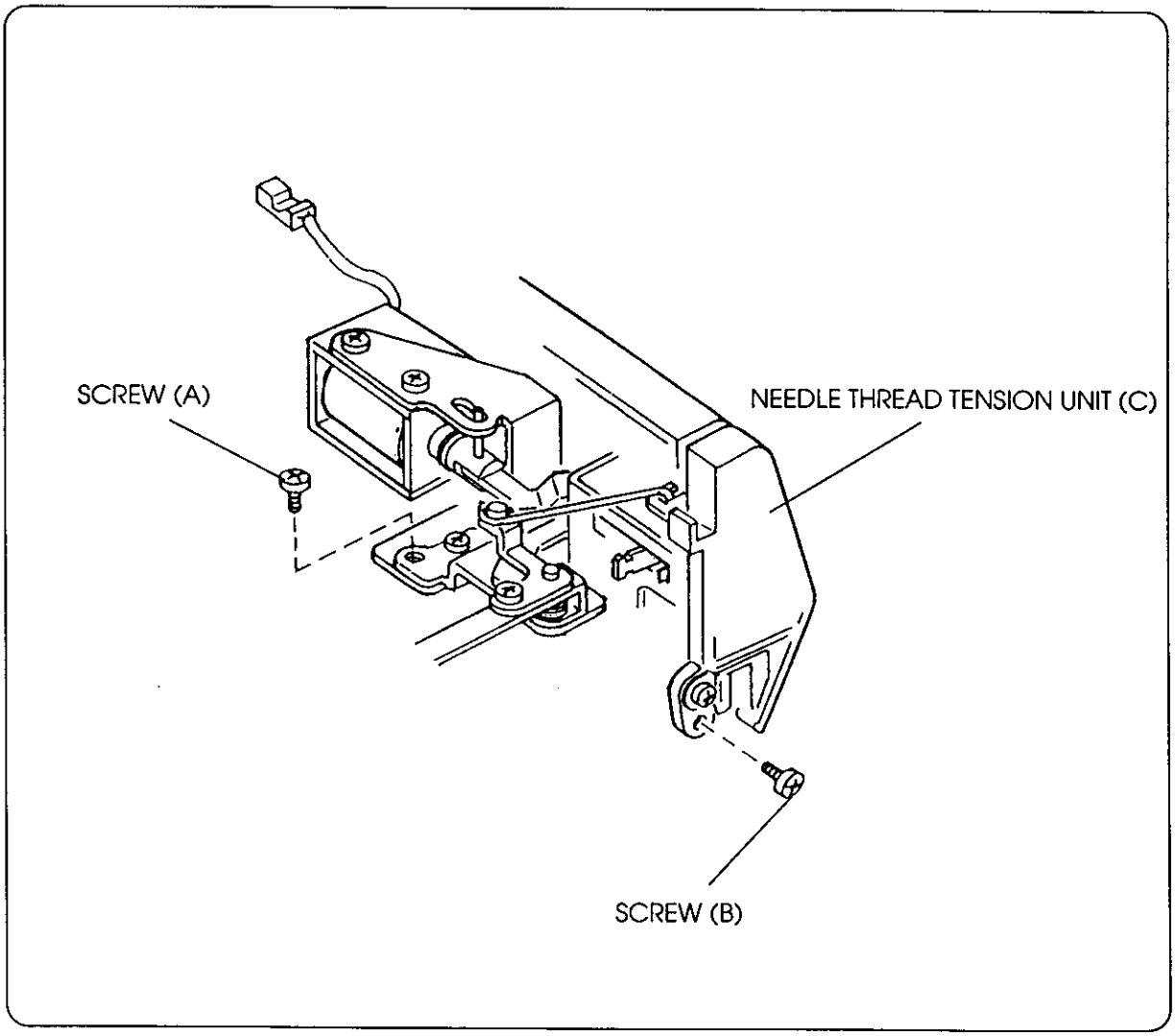
TO REMOVE:

1. REMOVE THE FRONT COVER UNIT (SEE P.24).
2. REMOVE SCREWS (A) AND (B) AND THE NEEDLE THREAD TENSION UNIT (C).

TO ATTACH:

1. REVERSE THIS PROCEDURE.

NOTE: AFTER CHANGING THE NEEDLE THREAD TENSION UNIT, CHECK THE MECHANICAL ADJUSTMENT, "TENSION RELEASE MECHANISM" (SEE P.36), "SOLENOID" (SEE P.35) AND "NEEDLE THREAD TENSION" (SEE P.39).



PART REMOVAL AND REPLACEMENT

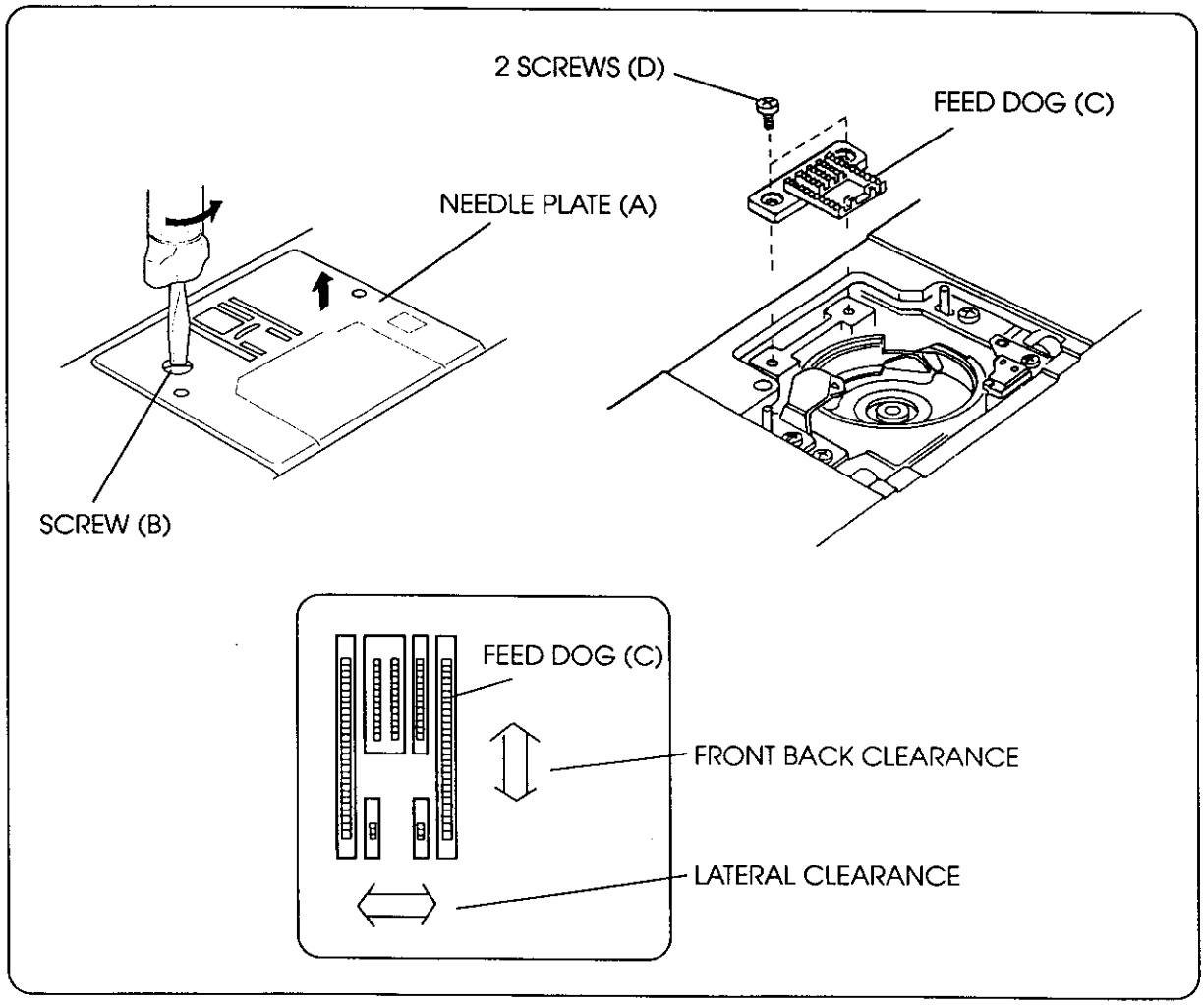
FEED DOG

TO REMOVE:

1. REMOVE THE NEEDLE PLATE (A) BY REMOVING SCREW(B).
2. REMOVE THE FEED DOG (C) BY REMOVING THE 2 SCREWS (D).

TO ATTACH:

1. SET THE FEED DOG BY LIGHTLY TIGHTENING THE 2 SCREWS (D).
2. SET THE NEEDLE PLATE (A) WITH SCREW (B). CHECK THE LATERAL CLEARANCE BETWEEN THE SLOTS FOR THE FEED DOG (C) IN THE NEEDLE PLATE.
3. TURN THE POWER SWITCH ON, SELECT PATTERN NO.1 (STRAIGHT STITCH), AND SET THE STITCH LENGTH AT THE MAXIMUM 5.0. CHECK THE FRONT TO BACK CLEARANCE BETWEEN THE FEED DOG AND THE SLOTS IN THE NEEDLE PLATE, WHILE TURNING THE HANDWHEEL TOWARD YOU.
4. TURN THE POWER SWITCH OFF. REMOVE THE NEEDLE PLATE. RE-ATTACH THE FEED DOG BY TIGHTENING THE 2 SCREWS (D).
5. ATTACH THE NEEDLE PLATE WITH SCREW (B).



PART REMOVAL AND REPLACEMENT

THREADER PLATE

*WHEN THE HOOK (A) OF THE THREADER PLATE (B) IS DAMAGED, CHANGE OR ADJUST THE PART AS FOLLOWS:

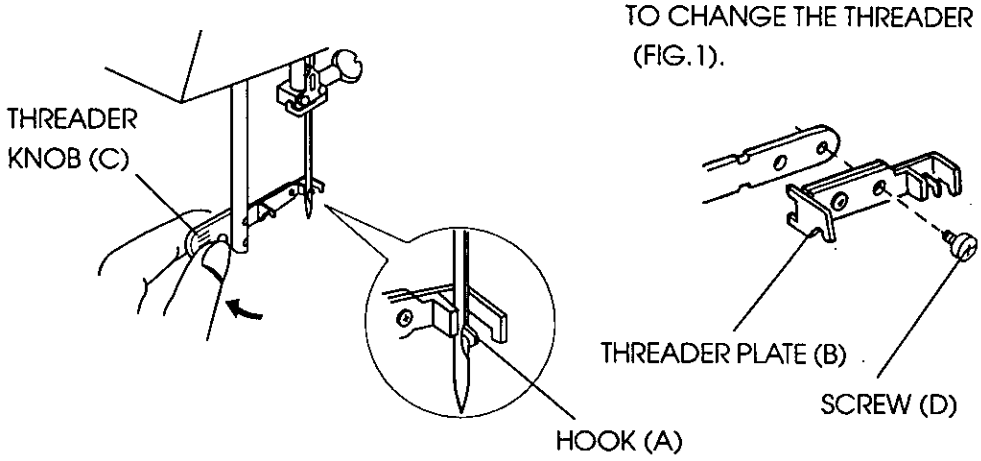
TO CHANGE THE THREADER PLATE:

1. RAISE THE NEEDLE TO ITS HIGHEST POSITION AND LOWER THE THREADER KNOB (C) TO ITS LOWEST POSITION.
2. LOOSEN THE SCREW (D) AND REMOVE THE THREADER PLATE (B) (FIG.1).

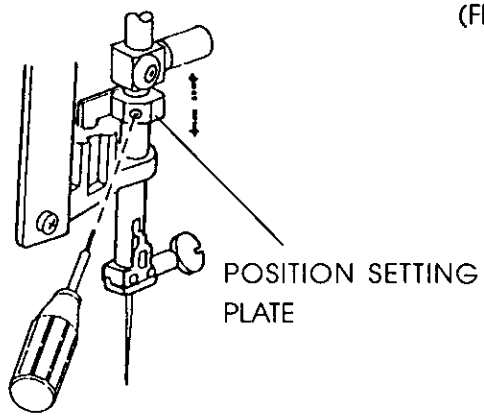
TO CHANGE THE NEEDLE THREADER:

1. IF THE HOOK OF THE THREADER PLATE TOUCHES THE LEFT OR RIGHT SIDE, LOOSEN THE SCREW AND ADJUST THE HOOK POSITION (FIG.2).
2. IF THE HOOK OF THE THREADER PLATE TOUCHES THE TOP OR BOTTOM SIDE OF THE NEEDLE HOLE, LOOSEN THE SCREW AND ADJUST THE HOOK POSITION (FIG.3).

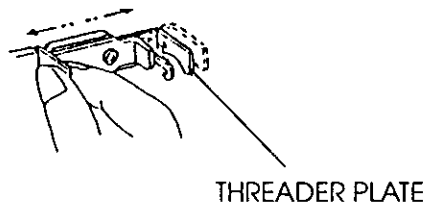
TO CHANGE THE THREADER PLATE (FIG.1).



ADJUST THE DIRECTION OF LEFT OR RIGHT (FIG.3)



ADJUST THE DIRECTION OF LEFT OR RIGHT (FIG.2)



PART REMOVAL AND REPLACEMENT

C-BOARD UNIT

TO REMOVE:

1. REMOVE THE BASE UNIT (A) AND SLIDE THE BASE (SEE P.23).
2. LOOSEN THE 3 SCREWS (B).
3. UNPLUG THE 4 CONNECTORS (C).

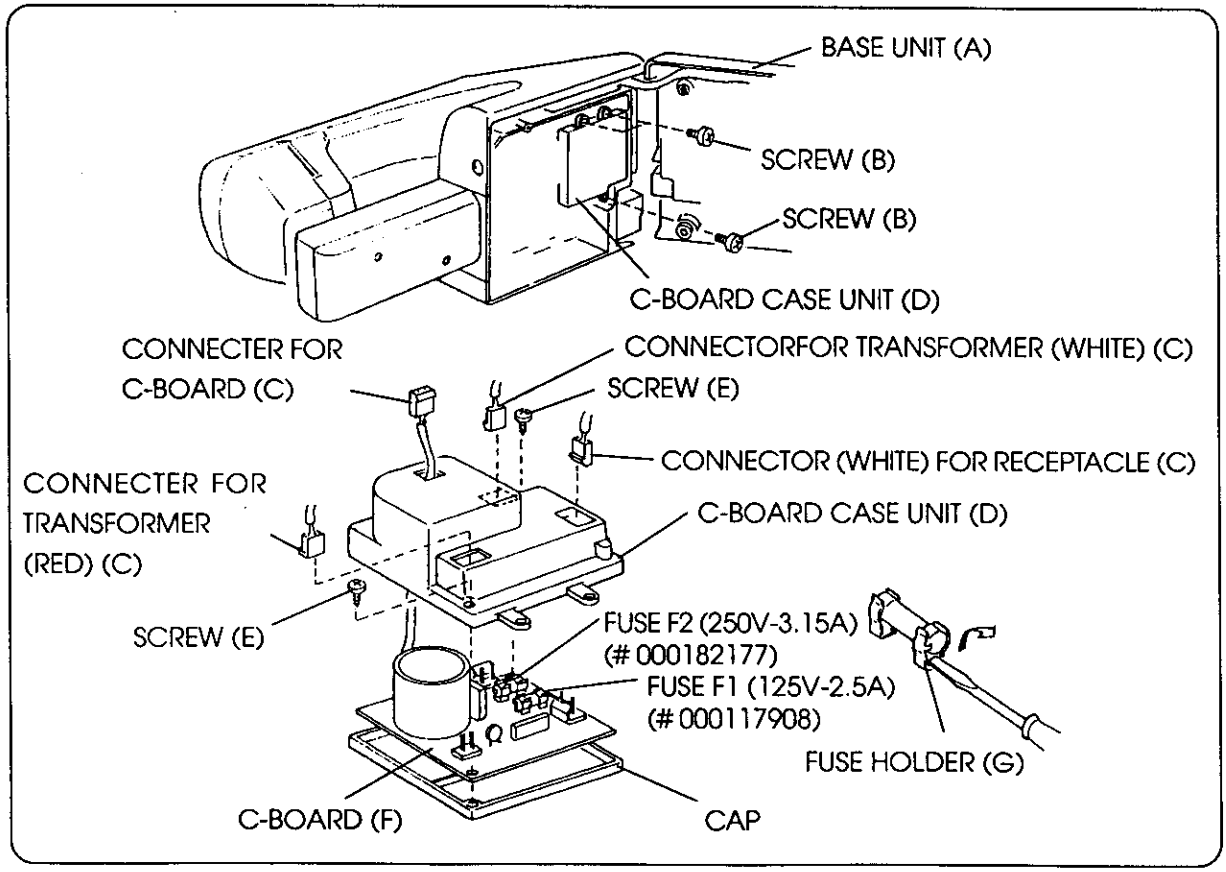
TO ATTACH:

1. REVERSE THIS PROCEDURE.

TO CHANGE THE FUSE

1. AFTER REMOVING THE C-BOARD CASE UNIT (D), REMOVE 2 SCREWS (E) TO PULL OUT THE C-BOARD (F).
2. REPLACE THE FUSE IN THE FUSE HOLDER (G) ON C-BOARD.

- IF FUSE F1 (125V-2.5A) IS BLOWN ..... TRANSFORMER OR C-BOARD IS DAMAGED.
- IF FUSE F2 (250V-3.15A) IS BLOWN ..... TOO MUCH POWER IS ON THE DC MOTOR WHEN THE UPPER SHAFT, LOWER SHAFT OR SHUTTLE RACE HAS HEAVY TORQUE.



PART REMOVAL AND REPLACEMENT

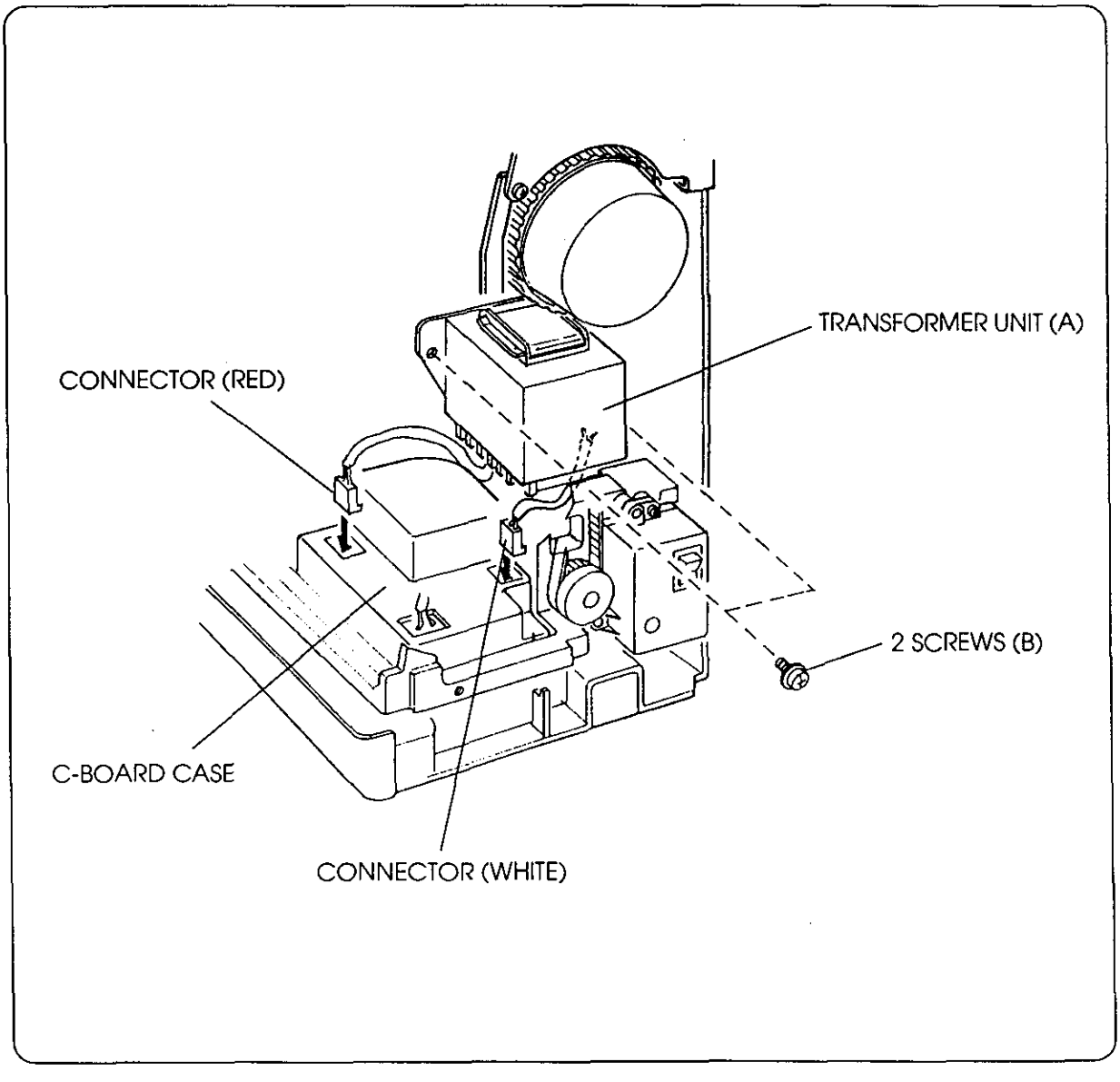
TRANSFORMER

TO REMOVE:

1. REMOVE THE FRONT COVER UNIT (SEE P.24).
2. REMOVE THE 2 CONNECTORS (RED, WHITE) OF THE TRANSFORMER (A) FROM C-BOARD CASE UNIT.
3. REMOVE THE 2 SCREWS (B) AND PULL OUT THE TRANSFORMER (A). THEN CHANGE THE TRANSFORMER.

TO ATTACH:

1. REVERSE THIS PROCEDURE.



PART REMOVAL AND REPLACEMENT

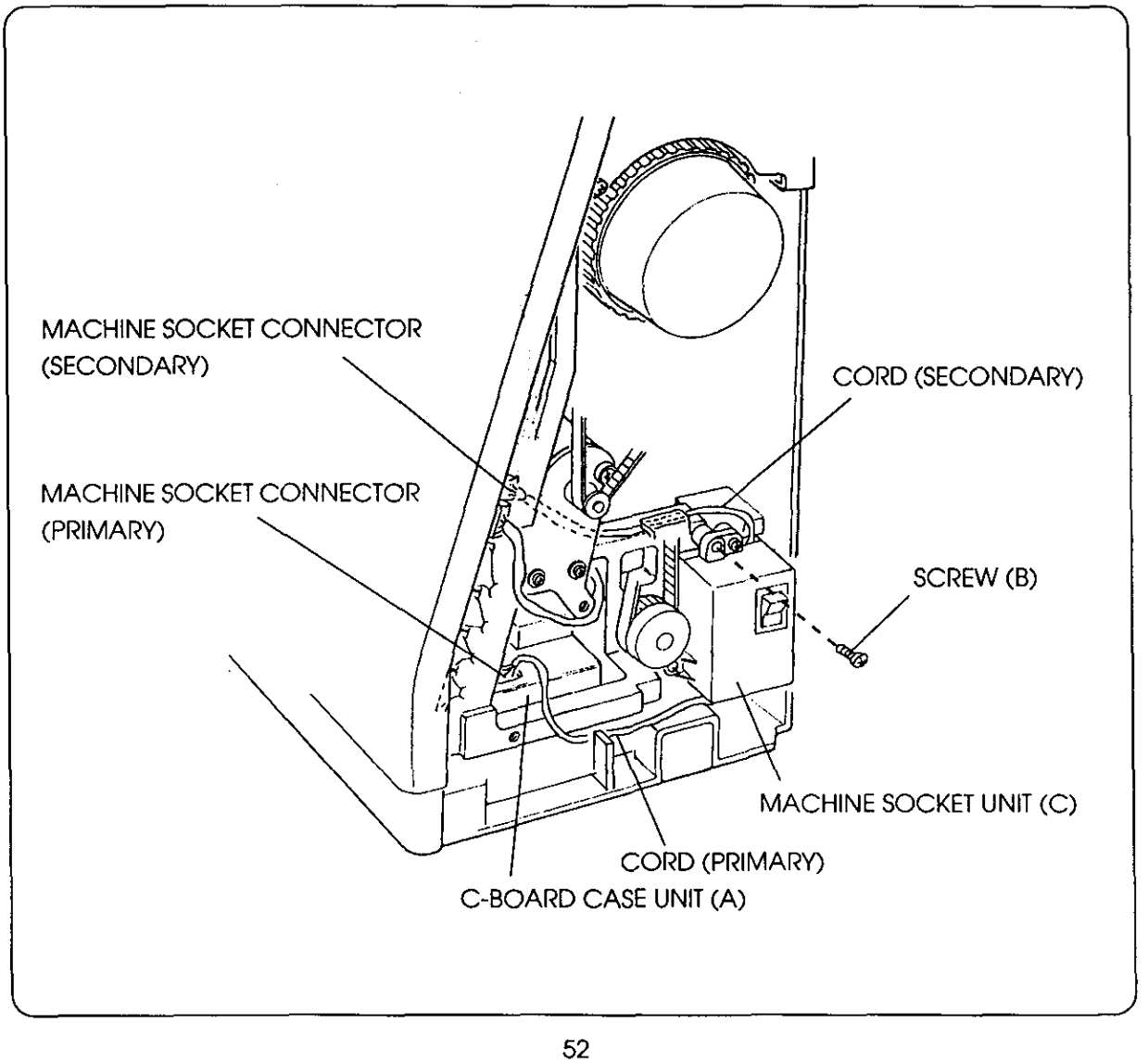
MACHINE SOCKET UNIT

TO REMOVE:

1. REMOVE THE BELT COVER (SEE P.20) AND FRONT COVER UNIT (SEE P.24).
2. PULL OUT THE CONNECTORS FROM C-BOARD CASE UNIT (A).
3. REMOVE THE 2 SCREWS (B) AND CHANGE THE MACHINE SOCKET UNIT (C).

TO ATTACH:

1. REVERSE THIS PROCEDURE.
   *CORDS RUN AS ILLUSTRATED.



PART REMOVAL AND REPLACEMENT

A-BOARD UNIT

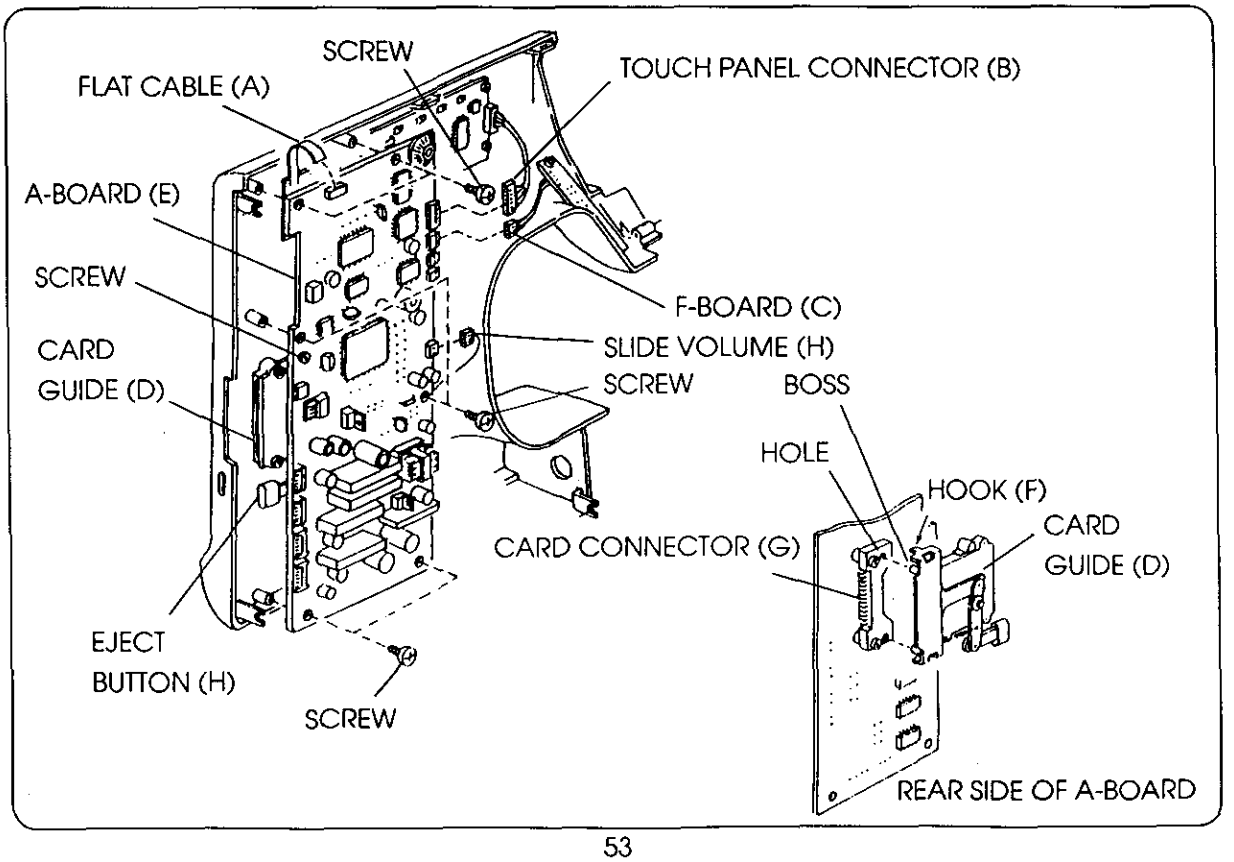
TO REMOVE:

1. REMOVE THE FRONT COVER UNIT (SEE P.24).
2. PULL OUT THE LCD FLAT CABLE (A) BY LIFTING THE CONNECTOR CLAMP. PULL OUT THE TOUCH PANEL CONNECTOR (B), SLIDE VOLUME (H) AND F-BOARD (C) CONNECTOR FROM A-BOARD.
3. REMOVE 7 SCREWS TO DISCONNECT A-BOARD AND CARD GUIDE (D).
4. REMOVE THE HOOK (F) AND CARD GUIDE (D) (SEE THE DRAWING).

TO ATTACH:

1. ATTACH CARD GUIDE (D) TO A-BOARD BY FITTING THE PROJECTION OF THE CARD GUIDE (D) INTO THE ROUND HOLE OF THE CARD CONNECTOR (G). PRESS THE UNIT UNTIL IT IS HOOKED.
2. ATTACH A-BORD WITH 7 SCREWS. INSERT THE FLAT CABLE (A) TO THE CONNECTOR. THEN PUSH DOWN THE CLAMP. (MAKE SURE THE EJECT BUTTON (H) COMES OUT FROM THE HOLE IN THE FRONT COVER.)
3. CONNECT F-BOARD AND TOUCH PANEL.
4. ATTACH THE FRONT COVER UNIT.

NOTE: •CHECK THE ADJUSTMENT OF THE TOUCH PANEL WHEN A-BOARD (E) IS CHANGED.
•DO NOT TOUCH THE CONNECTING PART OF THE FLAT CABLE (A) WITH YOUR FINGER.



PART REMOVAL AND REPLACEMENT

LCD UNIT

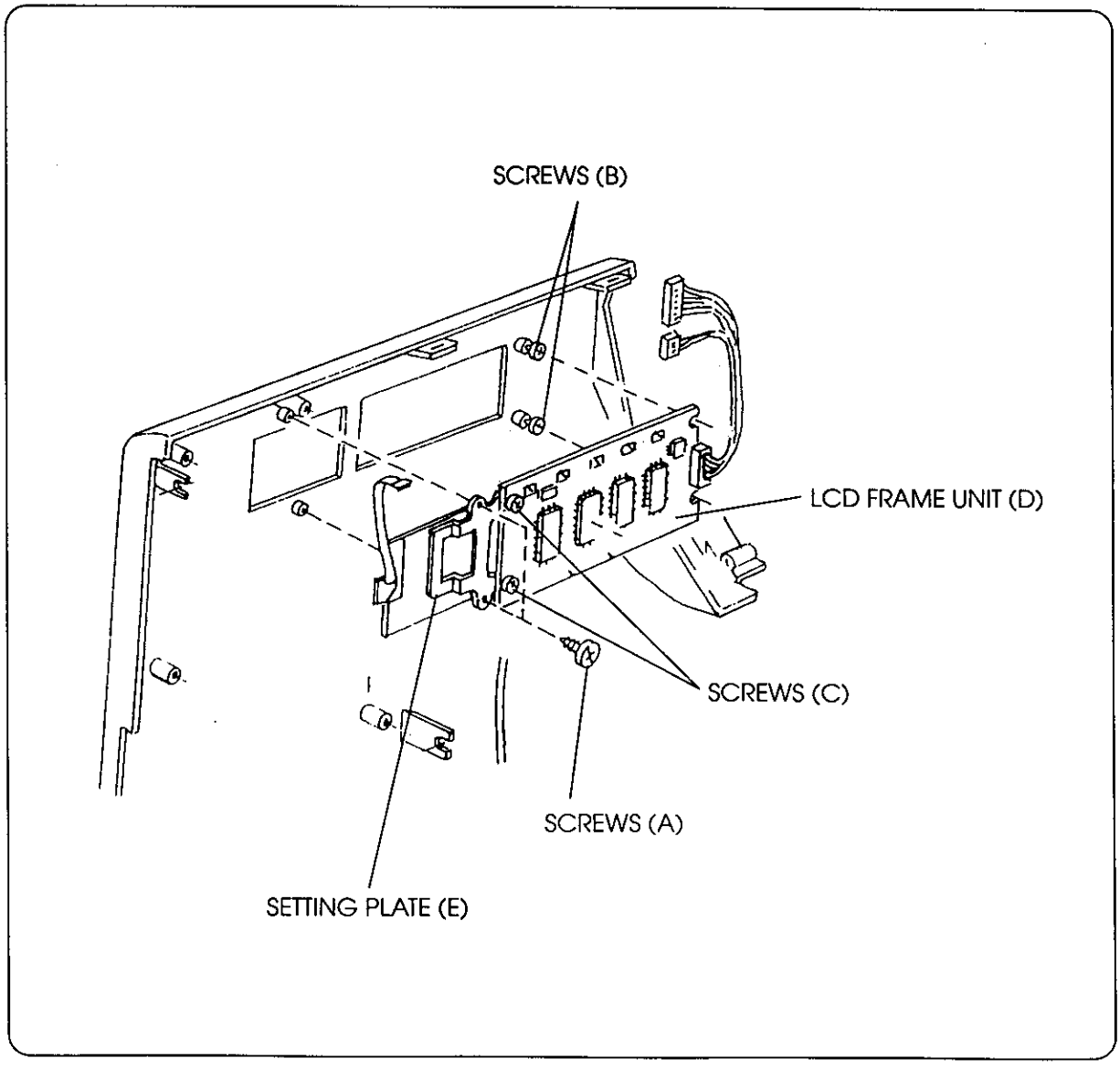
TO REMOVE:

1. REMOVE THE FRONT COVER (SEE P.24) AND A-BOARD (SEE P.53).
2. REMOVE 2 SCREWS (A). LOOSEN 2 SCREWS (B) AND REMOVE THE LCD FRAME UNIT (D).
3. REMOVE 2 SCREWS (C). THEN REMOVE THE SETTING PLATE (E).

TO ATTACH:

1. REVERSE THIS PROCEDURE.

NOTE: DO THE ADJUSTMENT OF "TOUCH PANEL" WHEN LCD FRAME UNIT (D) IS REPLACED.



PART REMOVAL AND REPLACEMENT

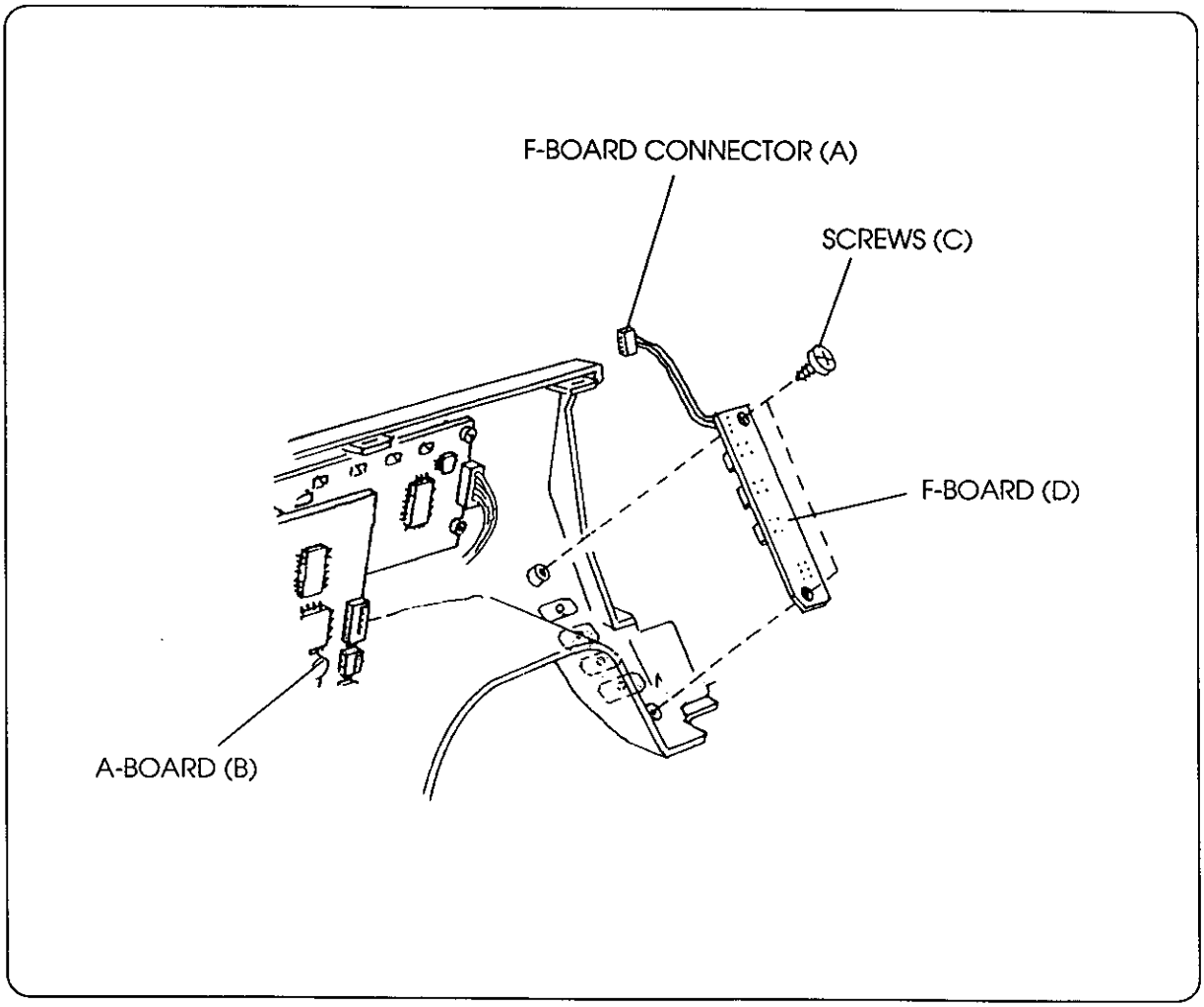
F-BOARD UNIT

TO REMOVE:

1. REMOVE THE FRONT COVER UNIT (SEE P.24).
2. PULL OUT THE F-BOARD CONNECTOR (A) FROM A-BOARD (B).
3. REMOVE THE 2 SCREWS (C), AND CHANGE F-BOARD.

TO ATTACH:

4. REVERSE THIS PROCEDURE.



PART REMOVAL AND REPLACEMENT

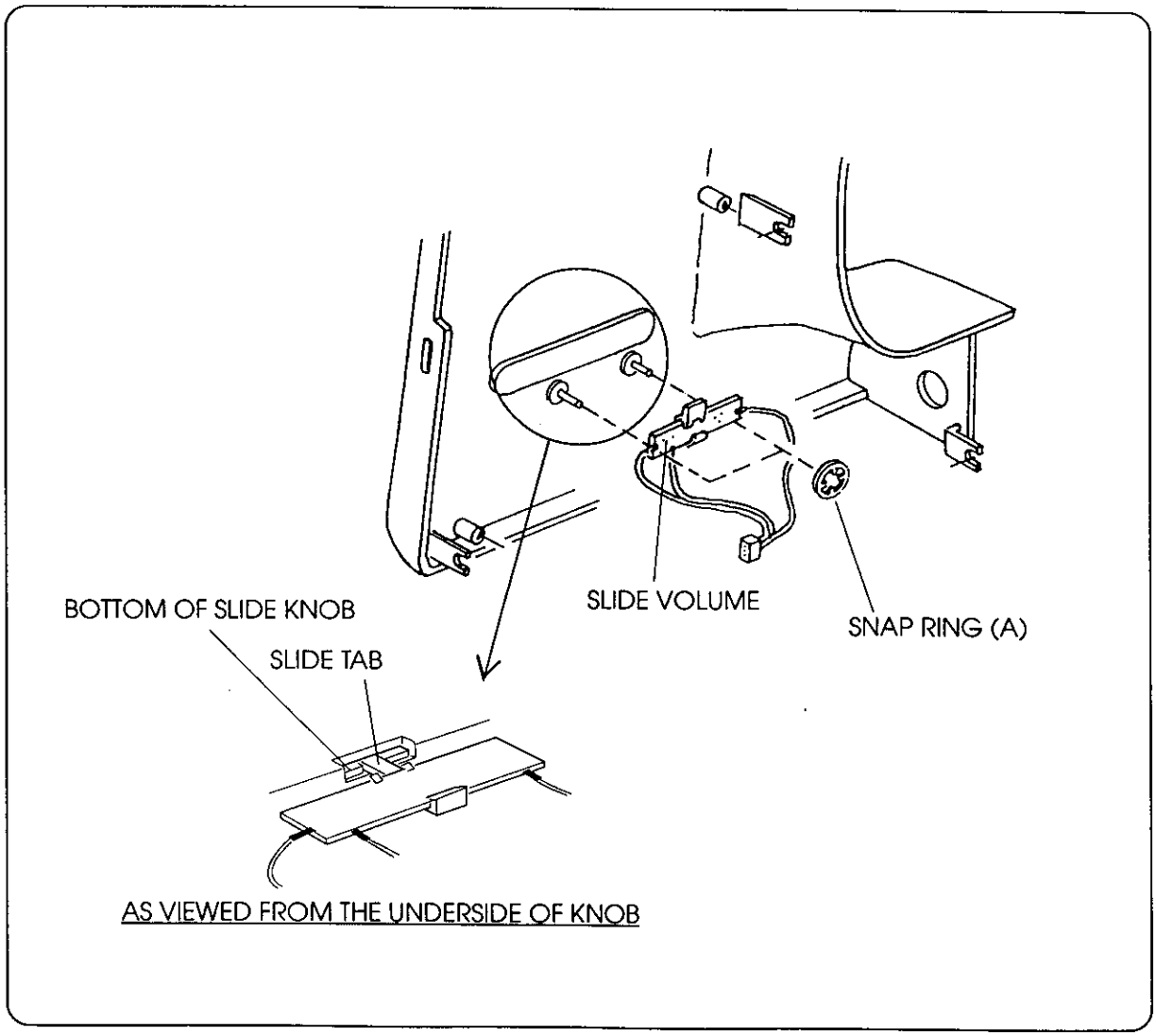
SLIDE VOLUME UNIT

TO REMOVE:

1. REMOVE THE FRONT COVER (SEE P.24) AND A-BOARD (SEE P.53).
2. REMOVE THE SNAP RINGS CS-3 (A), AND CHANGE SLIDE VOLUME.

TO ATTACH:

3. REVERSE THIS PROCEDURE.
   * INSERT THE SLIDE TAB INTI THE LOWER HOLE OF THE SLIDE KNOB.



PART REMOVAL AND REPLACEMENT

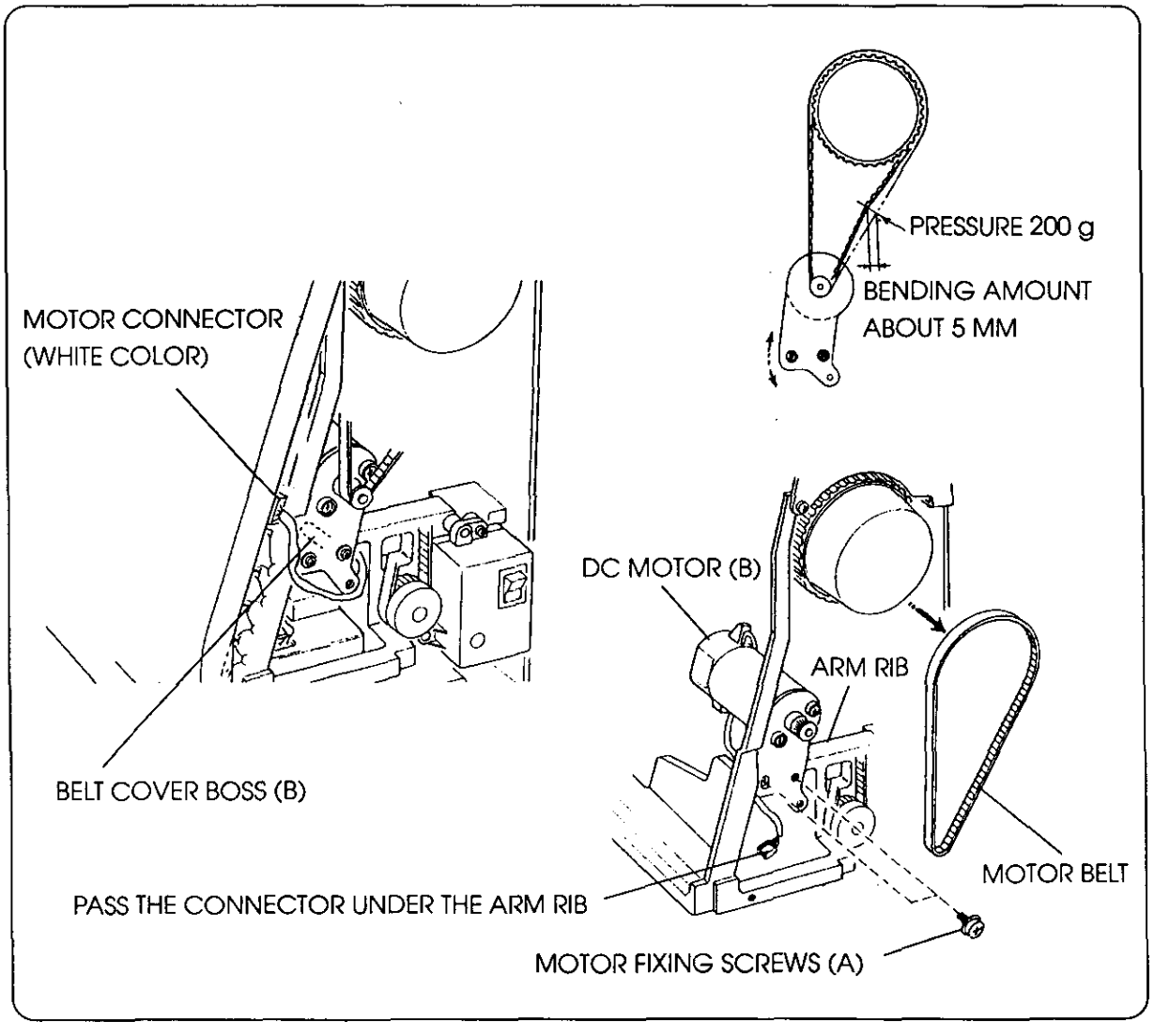
DC MOTOR UNIT AND BELT TENSION

TO REMOVE:

1. REMOVE THE BELT COVER (SEE P.20).
2. PULL OUT THE PLUG CONNECTOR FROM A-BOARD AND REMOVE THE 2 SCREWS (A). THEN REMOVE THE DC MOTOR UNIT (B).

TO ATTACH:

1. PASS THE MOTOR CORD UNDER THE ARM RIB, THEN ATTACH THE MOTOR WITH 2 SCREWS (A) TEMPORARILY AS SHOWN BELOW.
2. TIGHTEN MOTOR FIXING SCREWS (A) FIRMLY WHEN THE MOTOR BELT TENSION IS CORRECT AS SHOWN BELOW.
3. INSERT THE CONNECTOR TO THE A-BOARD.
4. ATTACH THE BELT COVER. THE MOTOR CORD SHOULD BE SET ON THE LEFT SIDE OF THE BELT COVER BOSS (B).



PART REMOVAL AND REPLACEMENT

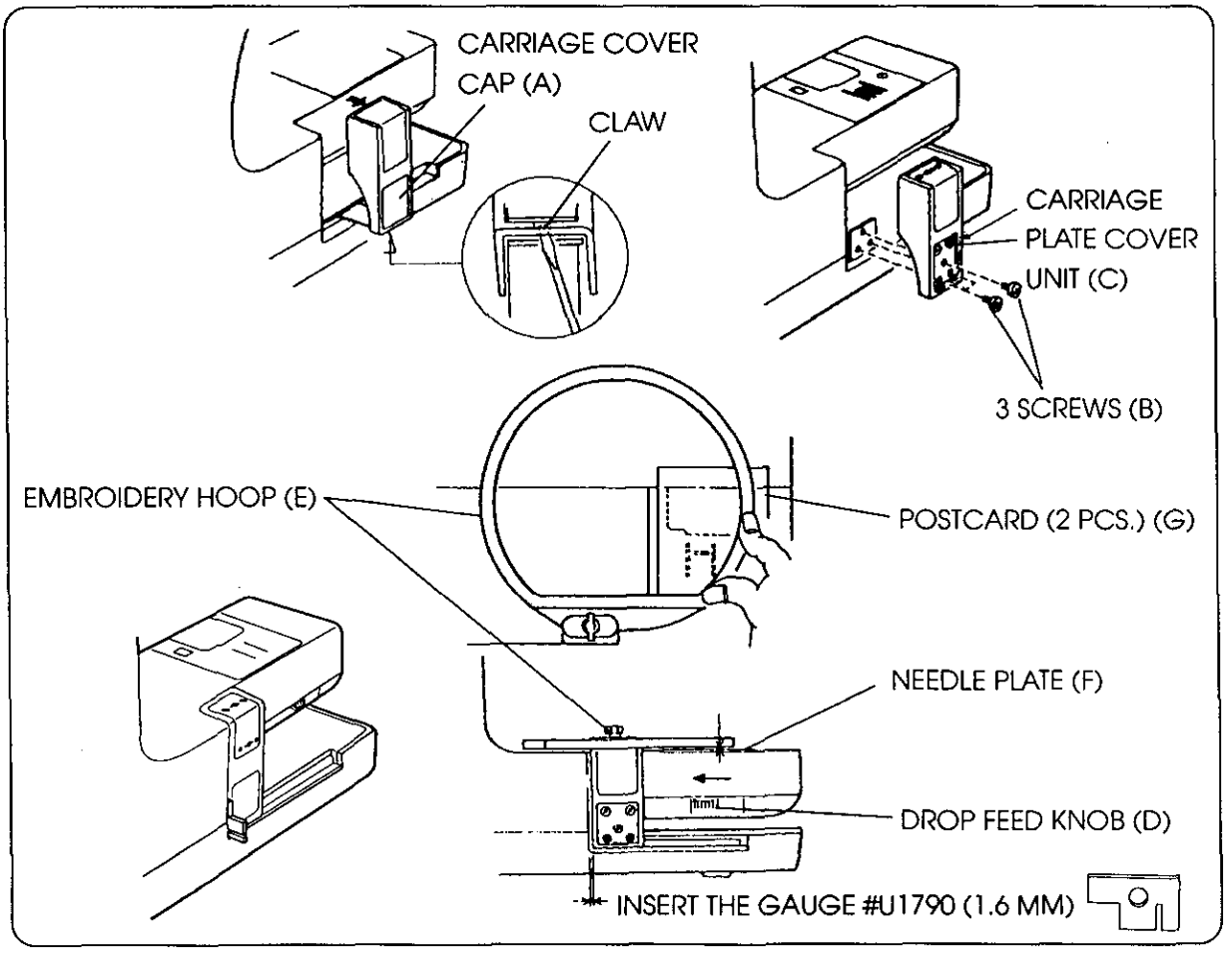
CARRIAGE PLATE COVER UNIT

TO REMOVE:

1. REMOVE THE CARRIAGE COVER CAP (A). (PULL THE CARRIAGE AWAY FROM THE MACHINE A LITTLE AND PRY OFF THE COVER CAP WITH A SCREWDRIVER, AS SHOWN BELOW.)
2. LOOSEN THE 3 SCREWS (B), AND REMOVE THE CARRIAGE PLATE COVER (C).

TO ATTACH:

1. DROP THE FEED DOG. (MOVE THE DROP FEED KNOB (D) IN THE DIRECTION OF THE ARROW.)
2. LIGHTLY TIGHTEN THE CARRIAGE PLATE COVER (C) WITH THREE SCREWS (B).
3. ATTACH THE EMBROIDERY HOOP. ADJUST THE CARRIAGE PLATE COVER UNIT (C).
   *ADJUST THE CLEARANCE BETWEEN THE BOTTOM SIDE OF THE EMBROIDERY HOOP AND THE SURFACE OF THE NEEDLE PLATE (F) AT 0.5 MM AND PARALLEL. (PUT TWO POSTCARDS (G) BETWEEN EMBROIDERY HOOP AND NEEDLE PLATE WHEN ADJUSTING AND HOLD THE EMBROIDERY HOOP.)
   *PUT GAUGE #U1790 BETWEEN THE MACHINE BODY AND CARRIAGE PLATE COVER (C).
4. TIGHTEN THE 3 SCREWS (B), THEN SET THE CARRRIAGE COVER CAP (A).



PART REMOVAL AND REPLACEMENT

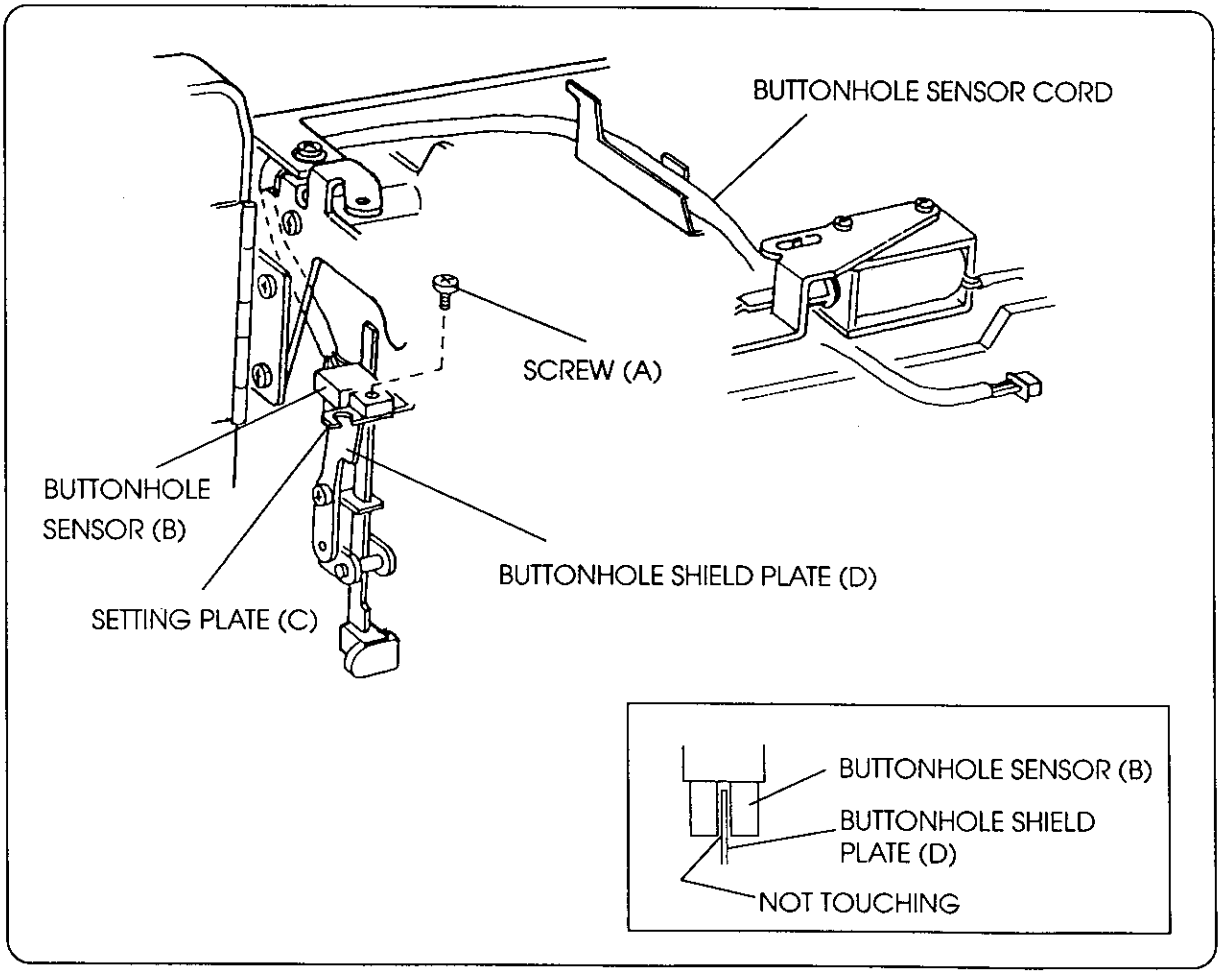
BUTTONHOLE SENSOR

TO REMOVE:

1. REMOVE THE FRONT COVER (SEE P.24).
2. REMOVE SCREW (A), AND DETACH THE BUTTONHOLE SENSOR (B).

TO ATTACH:

1. ATTACH THE BUTTONHOLE SENSOR (B) WITH SCREW (A). PULL THE SENSOR FORWARD SO THAT IT TOUCHES THE SETTING PLATE.
   *MAKE SURE IT DOESN'T TOUCH THE BUTTONHOLE SHIELD PLATE. (SEE ILLUSTRATION.)
2. PASS THE CORD, AND ATTACH THE FRONT COVER AS ILLUSTRATED.
   *AFTER REPLACING THE BUTTONHOLE SENSOR, SEW A FEW BUTTONHOLES. IF SOMETHING IS ABNORMAL, ADJUST THE "BUTTONHOLE LEVER" (SEE P.40).



PART REMOVAL AND REPLACEMENT

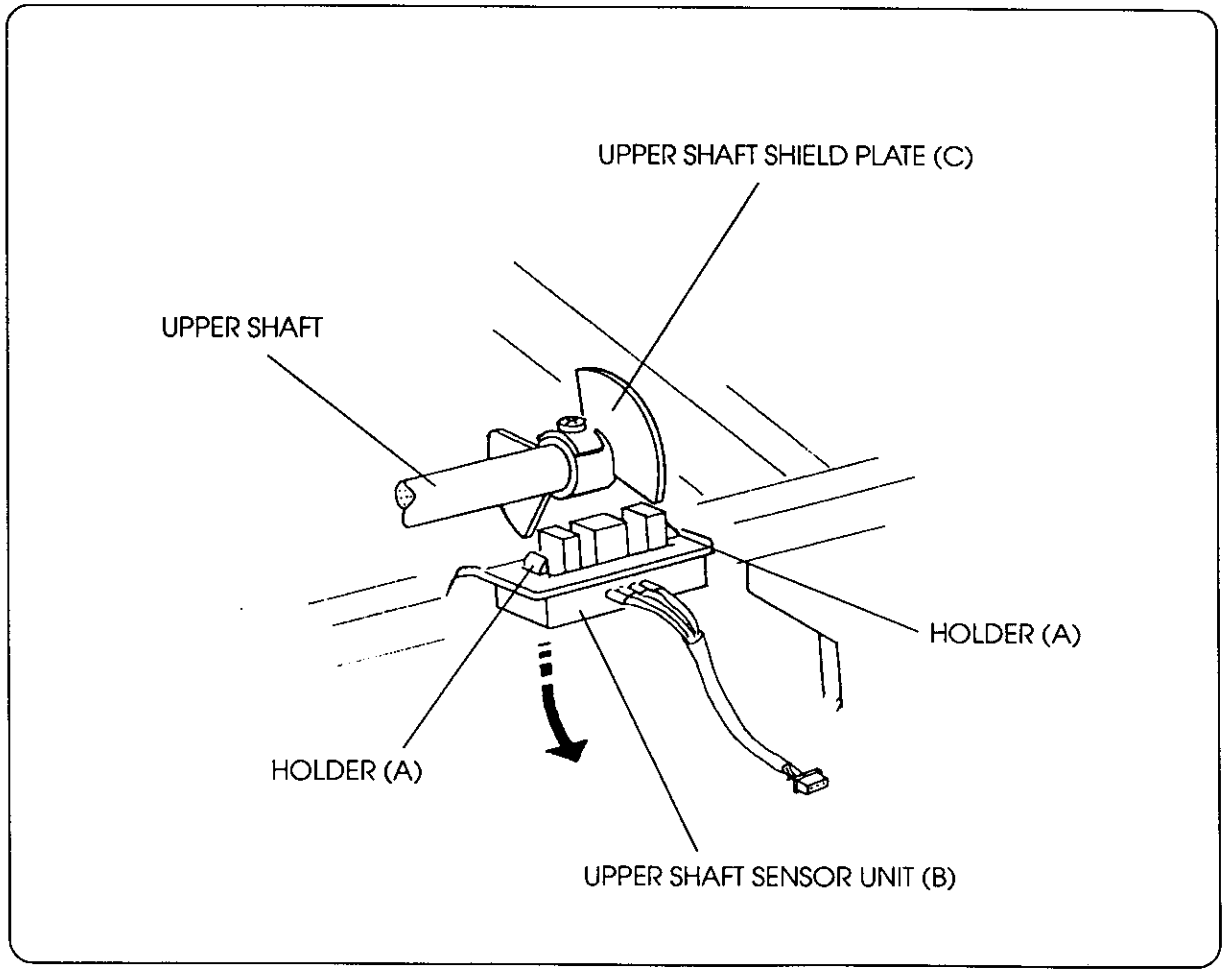
UPPER SHAFT SENSOR

TO REMOVE:

1. REMOVE THE FRONT COVER (SEE P.24).
2. PUSH THE HOLDERS (A) AND REMOVE THE UPPER SHAFT SENSOR UNIT (B).

TO ATTACH:

1. ATTACH THE NEW UPPER SHAFT SENSOR UNIT INTO THE SETTING PLATE.
   *AFTER REPLACING THE UPPER SHAFT SENSOR UNIT, MAKE SURE IT DOESN'T TOUCH THE UPPRE SHAFT SHIELD PLATE (C).
2. ATTACH THE FRONT COVER.



PART REMOVAL AND REPLACEMENT

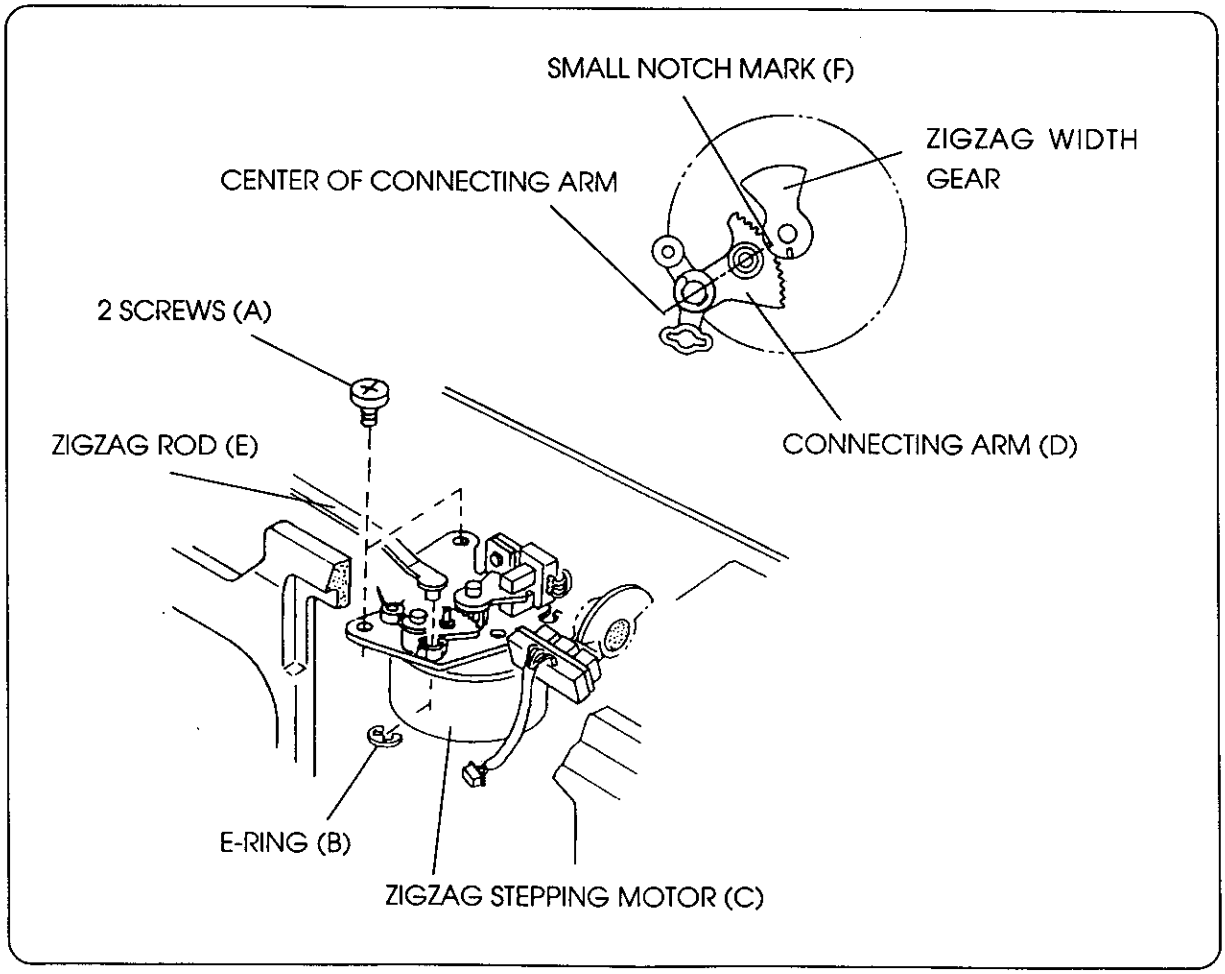
ZIGZAG STEPPING MOTOR

TO REMOVE:

1. REMOVE THE FRONT COVER (SEE P.24).
2. REMOVE THE E-RING (B), AND 2 SCREWS.
3. REMOVE THE MOTOR (C).

TO ATTACH:

1. MAKE SURE THE SMALL NOTCH MARK (F) IS IN LINE WITH THE CENTER OF CONNECTING ARM (D) THEN ATTACH THE ZIGZAG ROD (E) BY TIGHTNING THE 2 SCREWS (A).
2. ATTACH THE E-RING (B).
3. ATTACH THE FORNT COVER.
   *AFTER ATTACHING THE MOTOR, ADJUST THE "NEEDLE POSITION" (SEE PAGE 25).



PART REMOVAL AND REPLACEMENT

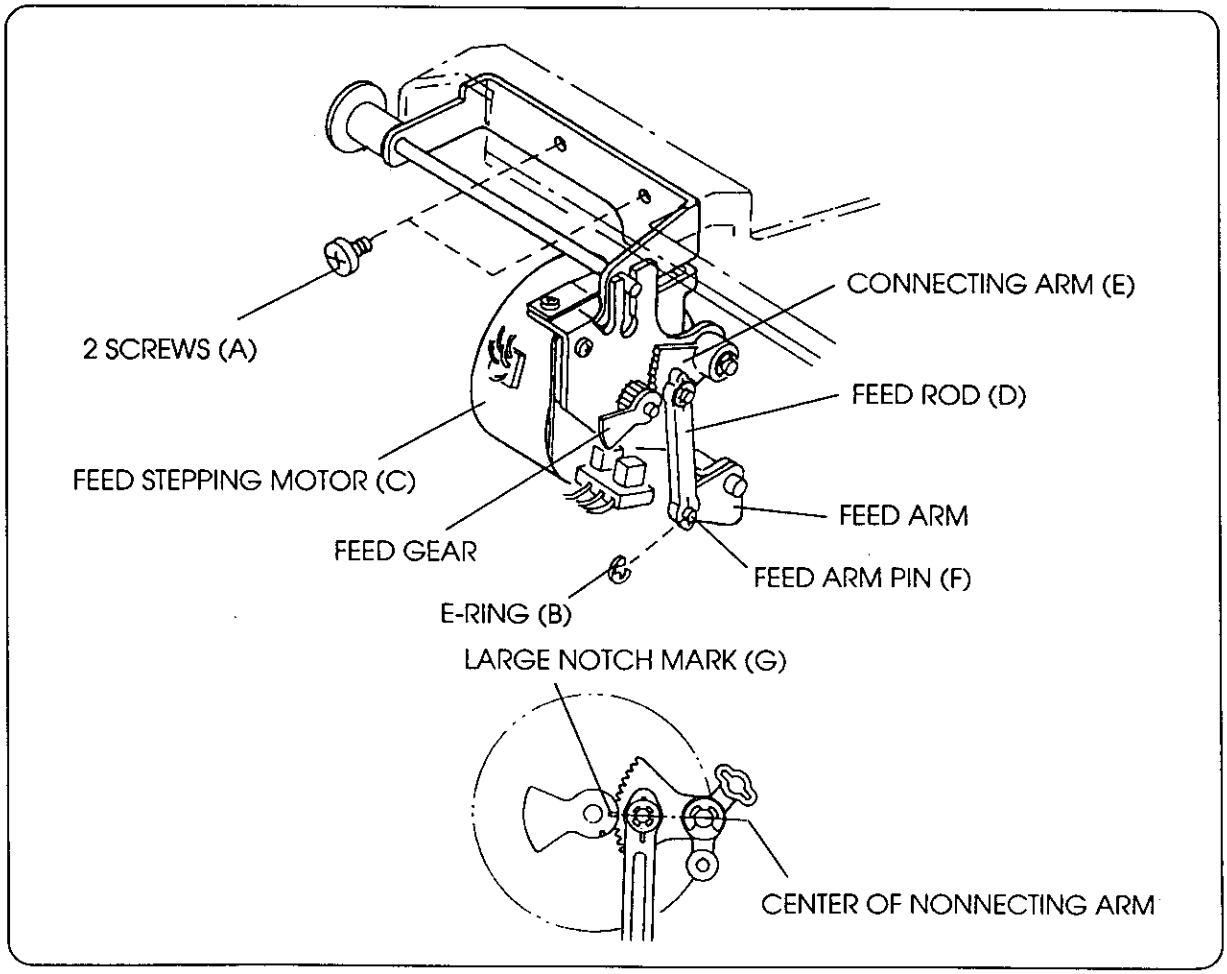
FEED STEPPING MOTOR

TO REMOVE:

1. REMOVE THE FRONT COVER (SEE P.24), AND BASE UNIT (SEE P.23).
2. REMOVE THE E-RING (B), AND 2 SCREWS (A).
3. REMOVE THE MOTOR (C) TOGETHER WITH FEED ROD (D).

TO ATTACH:

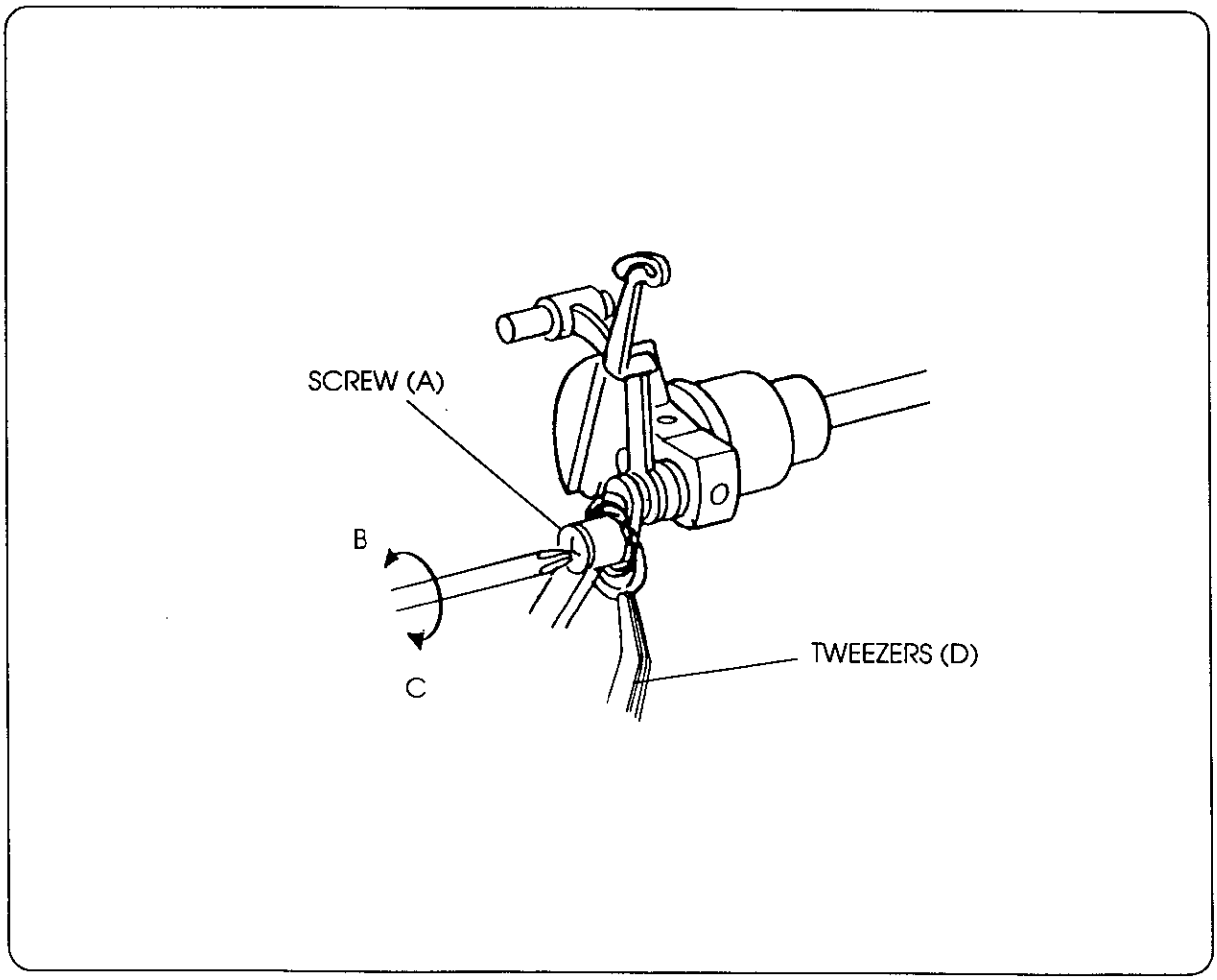
1. MAKE SURE THE LARGE NOTCH MARK (G) IS IN LINE WITH THE CENTER OF THE PINS IN THE CONNECTING ARM (E), THEN SLIDE THE FEED ROD (D) ONTO THE FEED ARM PIN (F). AND THEN ATTACH THE FEED STEPPING MOTOR BY TIGHTNING THE 2 SCREWS (A). (TIGHTEN THE 2 SCREWS AT THE SPOT THAT WHERE THE FEED ARM MOVES SMOOTHLY.)
2. ATTACH THE E-RING (B).
3. ATTACH THE BASE AND FRONT COVER.
   *AFTER ATTACHING THE MOTOR, ADJUST THE "STRETCH STITCH FEED BALANCE" (SEE P.37).



HOW TO FIX A THREAD JAMMING ON THE THREAD TAKE-UP LEVER

1. OPEN THE FACE PLATE AND LOOSEN THE SCREW (A) BY TURNING IN DIRECTION C (CLOCKWISE).
2. REMOVE THE JAMMED THREADS WITH THE TWEEZERS.
3. TIGHTEN SCREW (A) BY TURNING IN DIRECTION OF B (COUNTERCLOCKWISE).

NOTE: SCREW (A) IS A LEFT-HANDED SCREW.

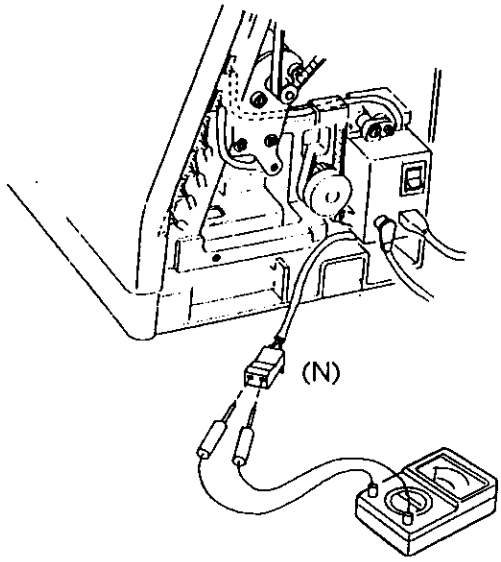


CHECKING ELECTRONIC PARTS

1.MACHINE SOCKET

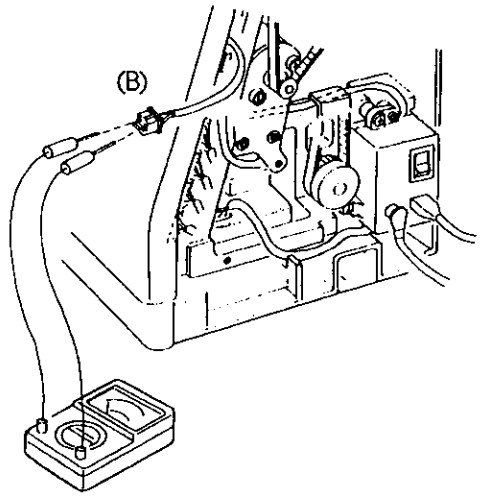
PRIMARY (POWER CORD, POWER SWITCH)

- WITH THE POWER CORD CONNECTED AND THE POWER SWITCH TURNED ON, YOU SHOULD SEE APPROXIMATELY 120 VOLTS AC (WITH A VOLT METER) ON THE PRIMATY CONNECTOR (N) (SEMI-OPAQUE).
- IN THIS CONDITION, WHEN THE POWER SWITCH IS TURNED OFF, MAKE SURE THE POWER ACTUALLY GOES OFF (I.E. THAT THE SWITCH WORKS).



SECONDARY (FOOT CONTROL)

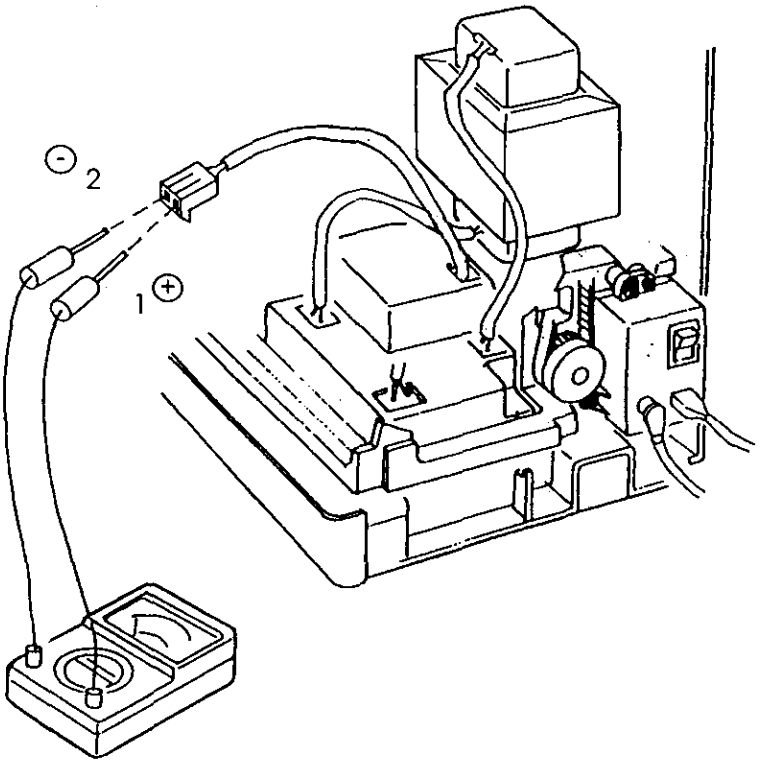
- CONNECT A GOOD WORKING FOOT CONTROL AND CHECK THE RESISTANCE OF THE SECONDARY CONNECTOR (B) (WHITE) WITH THE FOOT CONTROL IN THE UP POSITION. ABOUT ZERO OHMS IS NORMAL.
- WHEN THE CONTROL IS PRESSED ALL THE WAY DOWN, THE MULTI-METER SHOULD SHOW ABOUT 10 KILO-OHMS (AFTER A FEW SECONDS).



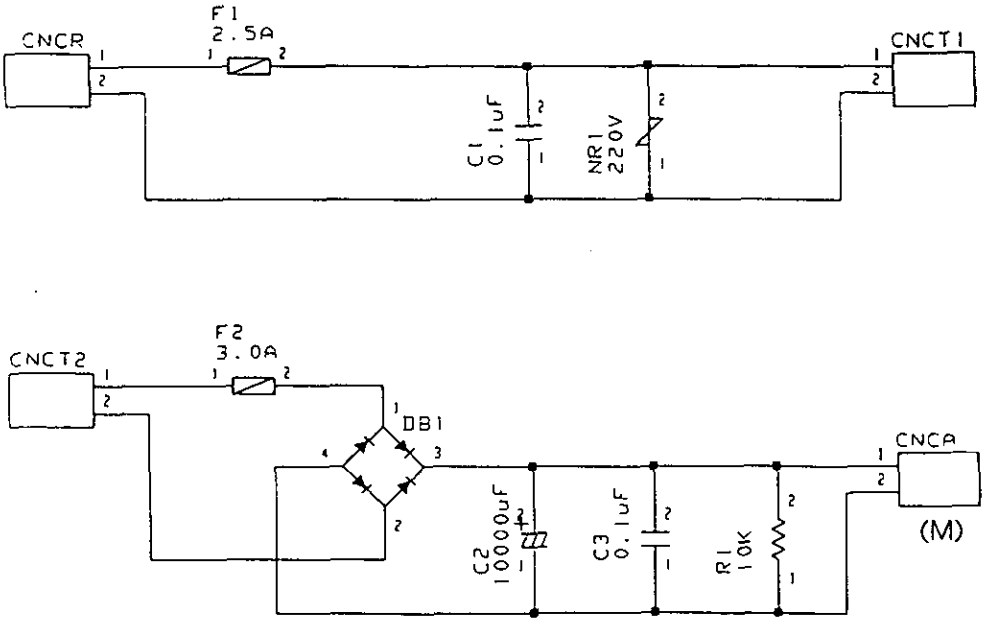
CHECKING ELECTRONIC PARTS

2. C-BOARD

CONNECT THE TRANSFORMER TO C-BOARD AND TURN THE POWER SWITCH ON.
THE MULTI-METER SHOULD SHOW 35-42 VOLTS DC AT THE SECONDARY CONNECTOR (M) (CNCA:BLUE).



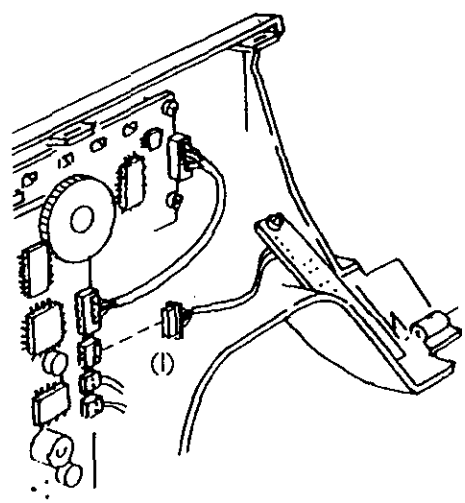
(WIRING DIAGRAM)

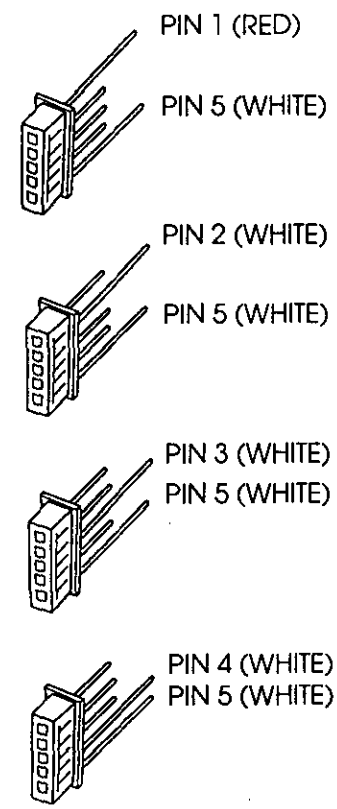


CHECKING ELECTRONIC PARTS

3. F-BOARD (CONNECTOR (I) CNFA)

- WHEN THE START/STOP BUTTON IS PRESSED, PIN 1 IS SHORTED TO PIN 5.
- WHEN THE REVERSE BUTTON IS PRESSED, PIN 2 IS SHORTED TO PIN 5.
- WHEN THE AUTO LOCK BUTTON IS PRESSED, PIN 3 IS SHORTED TO PIN 5.
- WHEN THE NEEDLE UP/DOWN BUTTON IS PRESSED, PIN 4 IS SHORTED TO PIN 5.

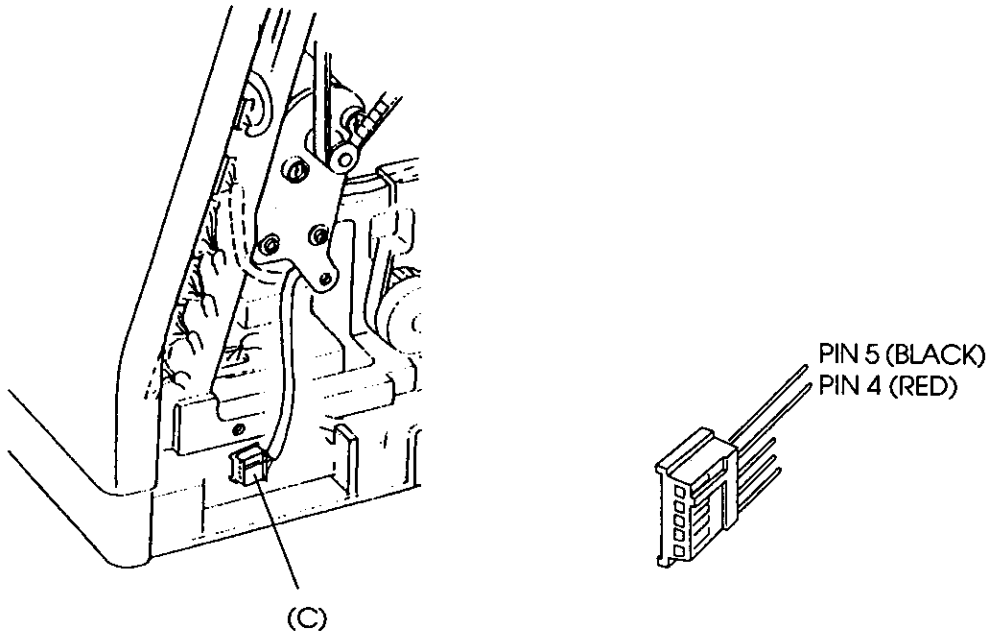




CHECKING FLECTRONIC PARTS

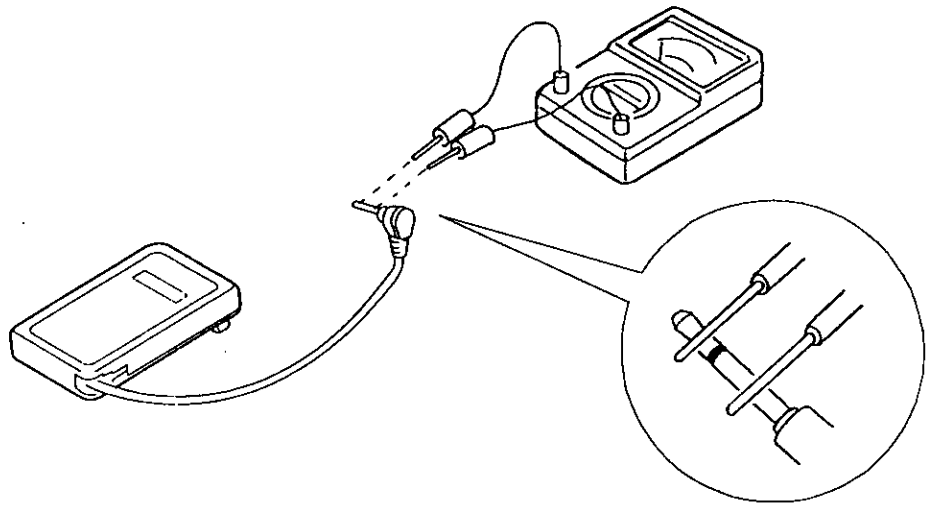
4. DC MOTOR (CONNECTOR (C) CNMA)

•RESISTANCE BETWEEN PIN 4 AND PIN 5 SHOULD BE OVER 1.7 OHMS. (MAKE SURE THE CORD IS NOT CUT.)



5. FOOT CONTROL

•RESISTANCE BETWEEN THE TIP AND THE SLEEVE OF THE JACK SHOULD BE APPROXIMATELY 0 OHMS. WHEN THE CONTROL IS PRESSED ALL THE WAY DOWN, THE MULTIMETER SHOULD SHOW ABOUT 10 KILO-OHMS (AFTER A FEW SECONDS).



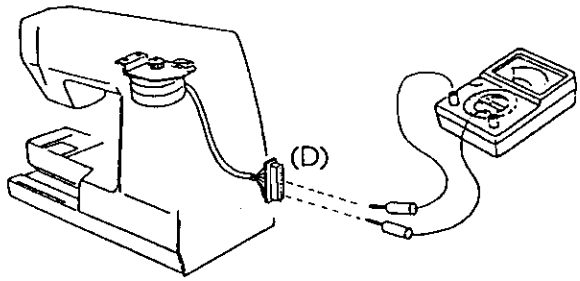
CHECK ELECTRONIC PARTS

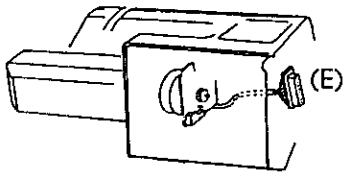
6. STEPPING MOTORS

ZIGZAG (D) AND FEED (E) STEPPING MOTORS:

- RESISTANCE BETWEEN PIN 4 AND PIN 5
  PIN 4 AND PIN 6
  PIN 9 AND PIN 8
  PIN 9 AND PIN 7...

SHOULD ALL BE APPROXIMATELY 12 OHMS.





PIN 5 (YELLOW)
PIN 4 (WHITE)

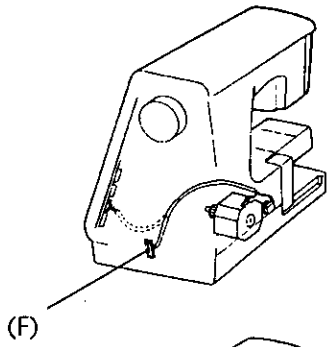
PIN 6 (BROWN)
PIN 4 (WHITE)

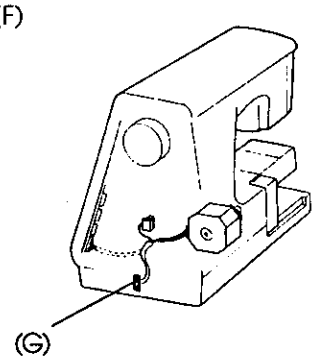
PIN 9 (BLACK)
PIN 8 (BLUE)

PIN 9 (BLACK)
PIN 7 (RED)

X-AXIS (F) AND Y-AXIS (G) STEPPING MOTORS:

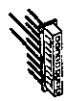
- RESISTANCE BETWEEN ABOVE PINS SHOULD BE APPROXIMATELY 10.7 OHMS.





PIN 5 (YELLOW)
PIN 4 (BLACK)

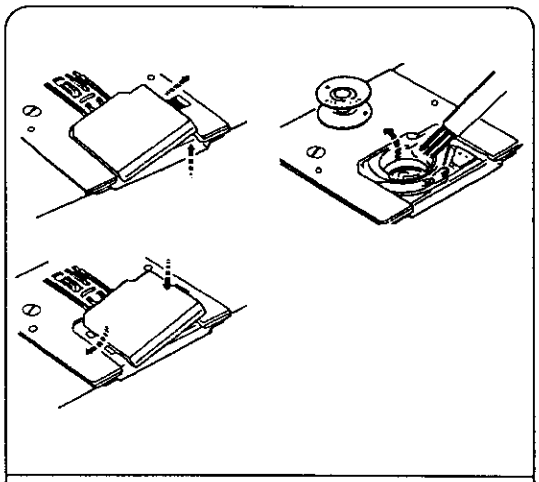
PIN 6 (BLUE)
PIN 4 (BLACK)



PIN 8 (BROWN)
PIN 9 (WHITE)

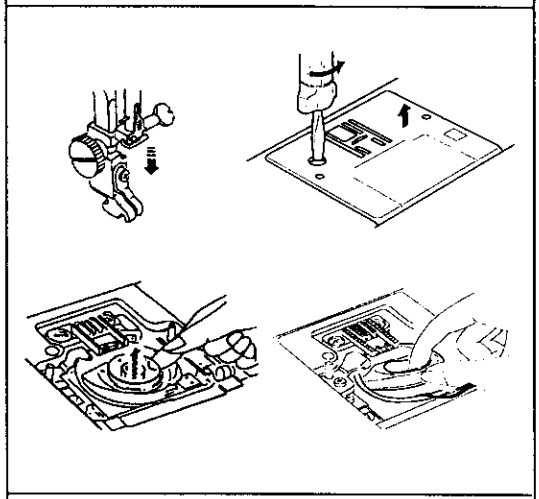
PIN 7 (RED)
PIN 9 (WHITE)

CARE



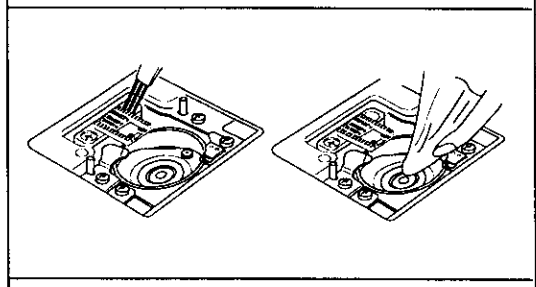
•CLEANING THE BOBBIN HOLDER
LOOSE THREADS AND DUST MAY CAUSE PUCKERED STITCHES AND THREAD BREAKAGE DURING STITCHING. CHECK FOR LINT BUILD-UP AFTER EACH GARMENT IS COMPLETED.
TURN OFF THE POWER SWITCH OR UNPLUG THE MACHINE.

1. REMOVE THE COVER PLATE BY SLIDING THE HOOK COVER PLATE RELEASE BUTTON TO THE RIGHT.
2. REMOVE THE BOBBIN TO BRUSH OUT DUST AND LINT.(YOU MAY ALSO USE A SMALL VACUUM CLEANER.)
3. INSERT THE BOBBIN AND ATTACH THE HOOK COVER PLATE.

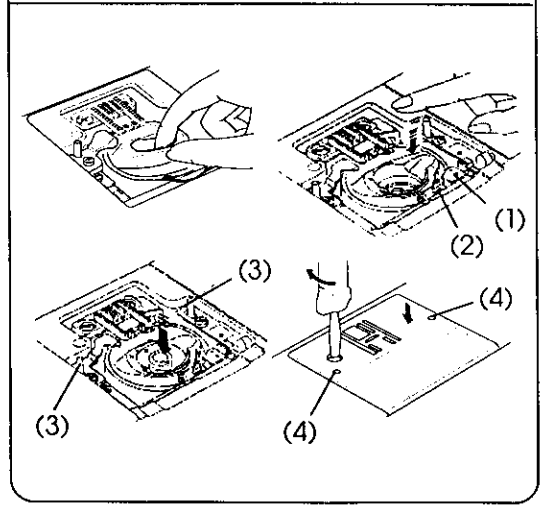


•EXPOSING THE HOOK RACE

1. UNPLUG THE MACHINE AND REMOVE THE PRESSER FOOT AND NEEDLE.
2. REMOVE THE SCREW ON THE LEFT SIDE OF THE NEEDLE PLATE WITH THE SCREWDRIVER SUPPLIED WITH THE MACHINE.
3. REMOVE THE NEEDLE PLATE AND TAKE OUT THE BOBBIN.
4. LIFT UP THE BOBBIN HOLDER AND REMOVE IT.



•CLEANING THE HOOK RACE
CLEAN THE FEED DOGS, HOOK RACE AND BOBBIN HOLDER WITH THE LINT BRUSH AND A SOFT DRY CLOTH.



•REPLACING THE BOBBIN HOLDER
INSERT THE BOBBIN HOLDER SO THAT THE KNOB FITS NEXT TO THE STOPPER IN THE HOOK RACE.
(1) STOPPER
(2) KNOB

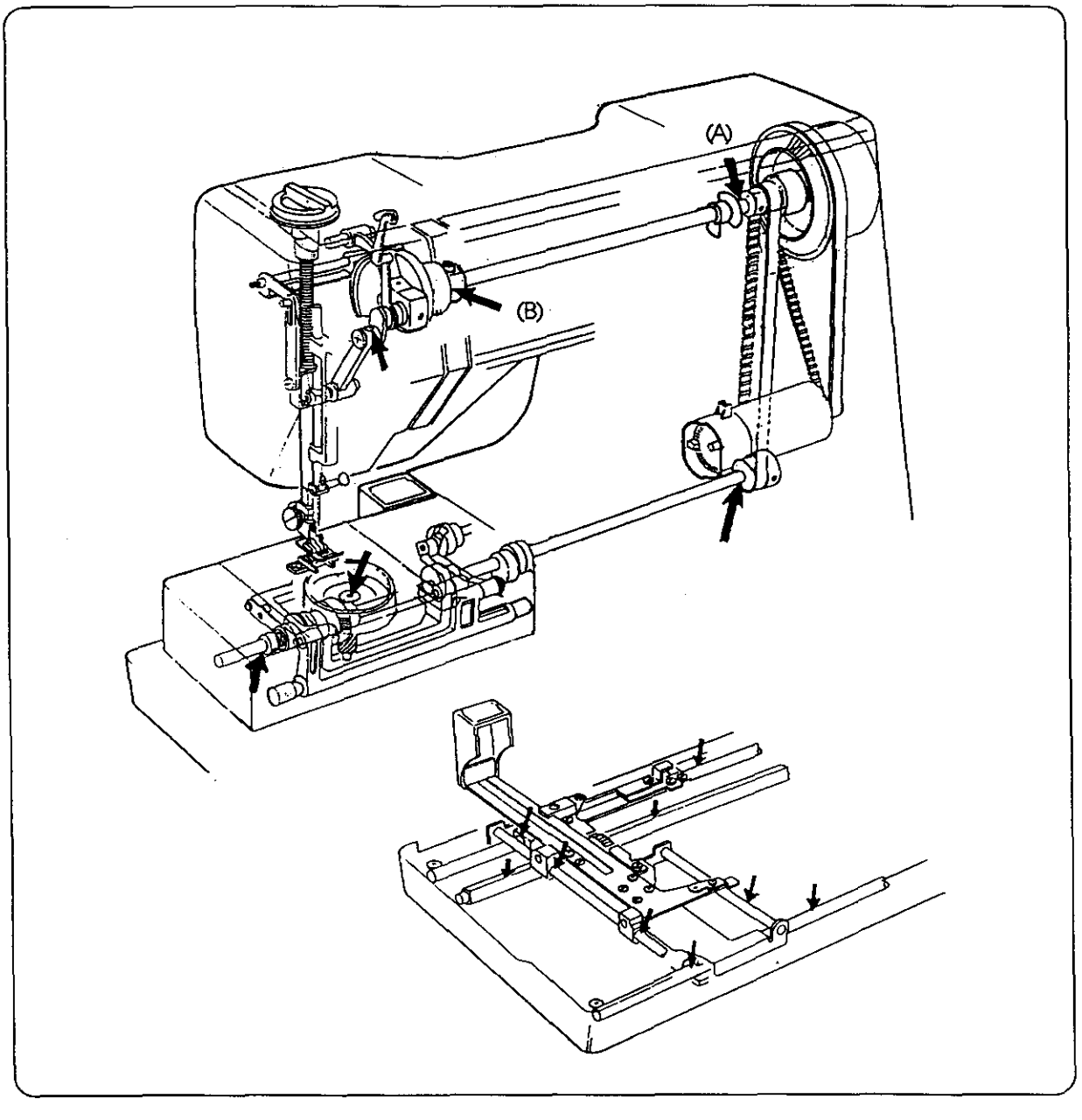
INSERT THE BOBBIN.

REPLACE THE NEEDLE PLATE, INSERTING THE TWO NEEDLE PLATE GUIDE PINS INTO THE HOLES IN THE NEEDLE PLATE.
REPLACE THE SCREW.
(3) NEEDLE PLATE GUIDE PINS
(4) GUIDE HOLES

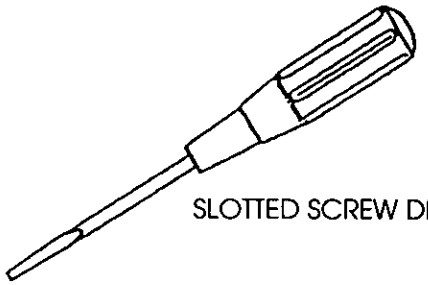
OILING

APPLY A FEW DROPS OF SEWING MACHINE OIL TO THE POINTS INDICATED BY THE ARROWS. RUN THE MACHINE FOR A FEW MINUTES TO LET THE OIL WORK INTO THE BUSHINGS. MOVE THE CARRIAGE BY HAND TO SPREAD OIL OVER THE GUIDE BARS.

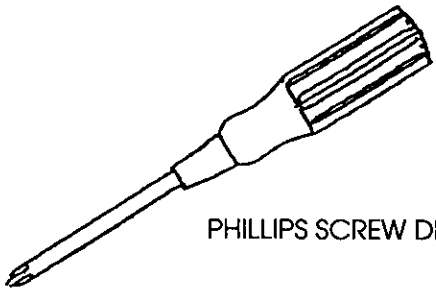
NOTE: MAKE SURE TO AVOID STAINING THE UPPER SHAFT SHIELD PLATE OR CIRCUIT BOARDS WITH OIL WHEN SPPLYING OIL TO POINTS (A) AND (B) BELOW.



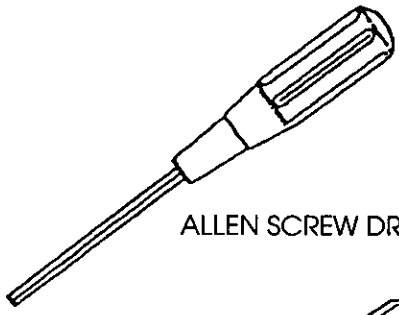
SPECIAL TOOLS REQUIRED



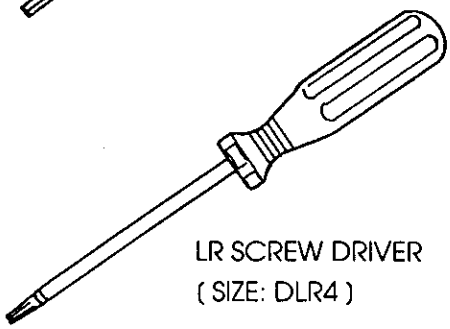
SLOTTED SCREW DRIVER



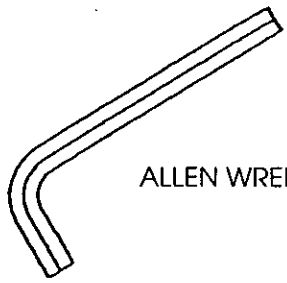
PHILLIPS SCREW DRIVER



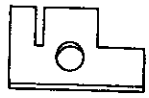
ALLEN SCREW DRIVER



LR SCREW DRIVER
(SIZE: DLR4)



ALLEN WRENCH

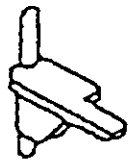


THICKNESS GAUGE #U1790

- *SOLENOID: P.35
- *HEIGHT OF EMBROIDERY PRESSER FOOT P: P.38
- *BUTTONHOLE LEVER P.40
- *CARRIAGE PLATE COVER: P.58

FEED DOG HEIGHT GAUGE #68499

- *FEED DOG HEIGHT: P.32-33

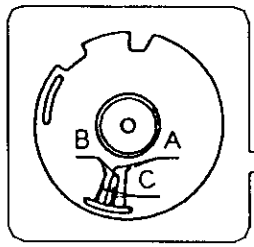


NEEDLE HEIGHT GAUGE #68168

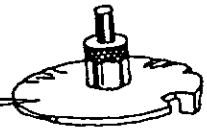
- *NEEDLE BAR HEIGHT: P.26-27

TEST PIN #68368

- *NEEDLE TO SHUTTLE TIMING: P.28-29
- *CLEARANCE BETWEEN NEEDLE AND HOOK: P.30



RADIAL TIMING GAUGE SHEET #U1369C



RADIAL TIMING GAUGE #68497

- *NEEDLE TO SHUTTLE TIMING: P.28-29