



95HD

Backhoe

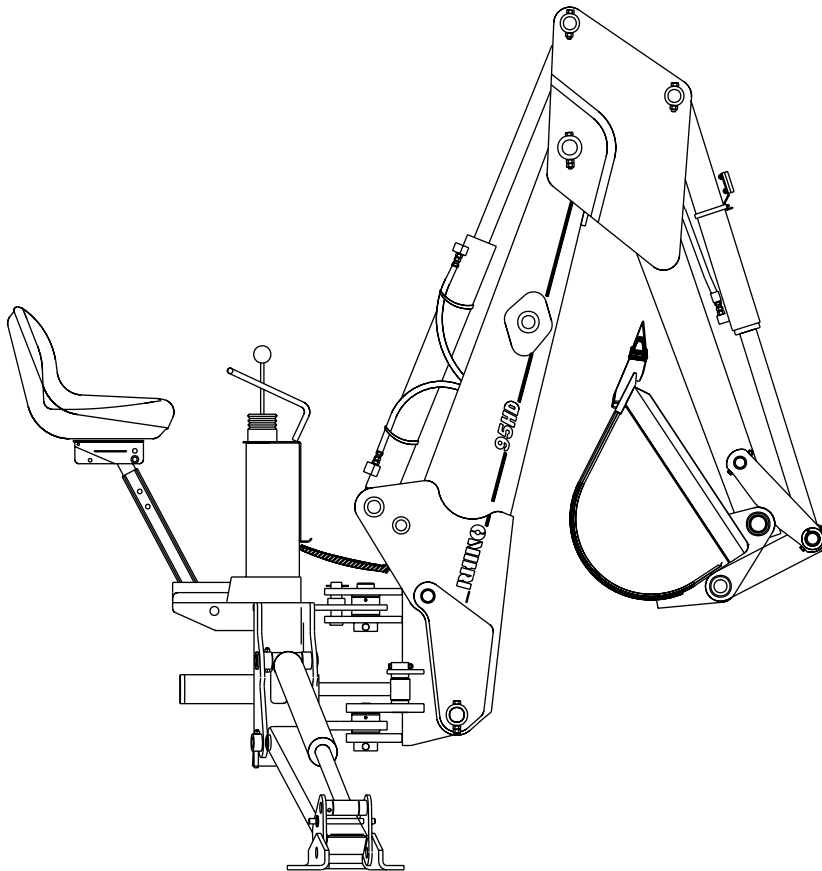
Published 7/04

Part No. F-3788

OPERATOR'S MANUAL



This Operator's Manual is an integral part of the safe operation of this machine and must be maintained with the unit at all times. READ, UNDERSTAND, and FOLLOW the Safety and Operation Instructions contained in this manual before operating the equipment.



Rhino

1020 S. Sangamon Ave.

Gibson City, IL 60936

800-446-5158

email: parts@servis-rhino.com

© 2004 Alamo Group Inc.



TO THE OWNER/OPERATOR/DEALER

All implements with moving parts are potentially hazardous. There is no substitute for a cautious, safe-minded operator who recognizes the potential hazards and follows reasonable safety practices. The manufacturer has designed this implement to be used with all its safety equipment properly attached to minimize the chance of accidents.

BEFORE YOU START!! Read the safety messages on the implement and shown in your manual. Observe the rules of safety and common sense!

SAFETY HAZARD SIGNAL WORDS

There are three levels of hazard intensity identified by signal words DANGER, WARNING and CAUTION. The level of hazard intensity is identified by the following definitions.



DANGER - Immediate hazards which will result in severe injury or death.



WARNING - Hazards or unsafe practices which could result in minor personal injury or death.



CAUTION - Hazards or unsafe practices which could result in minor personal injury or property damage.



THIS SAFETY SYMBOL MEANS

ATTENTION!

BECOME ALERT!

YOUR SAFETY IS INVOLVED!



LEA EL INSTRUCTIVO

Si No Lee Ingles, Pida Ayuda a Alguien Que Si Lo Lea Que le Traduzca las Medidas de Seguridad.

Read and understand the complete Warranty Statement found in this Manual. Fill out the Warranty Registration Form in full and return it within 30 Days. Make certain the Serial Number of the Machine is recorded on the Warranty Card and on the Warranty Form that you retain. The use of "will-fit" parts will void your warranty and can cause catastrophic failure with possible injury or death.

TABLE OF CONTENTS

| | |
|--|------------|
| SAFETY SECTION | 1-1 |
| Safety Precautions | 1-2 |
| Safety Hazard Signal Words | 1-7 |
| Safety Decals. | 1-8 |
| INTRODUCTION SECTION | 2-1 |
| Introduction | 2-2 |
| Specifications. | 2-3 |
| ASSEMBLY SECTION | 3-1 |
| Installing Pump Kit | 3-2 |
| Installing 3-Point Adapter. | 3-3 |
| Mounting Backhoe to Tractor. | 3-4 |
| OPERATION SECTION. | 4-1 |
| Pre-Operation Check List, Operating Directions, Engine Speed | 4-2 |
| Controls, Boom/Swing, Dipperstick/Bucket. | 4-2 |
| Operating Backhoe | 4-3 |
| Seat Adjustment, Mounting and Dismounting Buckets. | 4-4 |
| Placing the Stabilizers | 4-4 |
| Swing Lock, Boom Lock, Transporting the Backhoe, Storage | 4-5 |
| MAINTENANCE SECTION | 5-1 |
| Cylinder Service | 5-2 |
| Beginning of Season, Hydraulic Hoses, Auxiliary PTO Hydraulic System | 5-3 |
| Bucket tooth Points, Lubrication | 5-4 |
| Hydraulic Trouble Shooting. | 5-5 |
| Valve Service. | 5-7 |
| Torque Charts | 5-10 |

Rhino is a registered trademark of Alamo Group Inc.

SAFETY SECTION

Safety Section 1-1

SAFETY

SAFETY

SAFETY PRECAUTIONS



Safety of the operator was a prime consideration in the design of this backhoe. Proper shielding convenient controls, simple adjustments and other safety features have been built into this backhoe.

Accidents can be avoided if the following safety rules are observed:

PREPARATION

Do not operate backhoe unless it is rigidly attached to the tractor.

Know your controls. Read this operators manual and the manual provided with your tractor. Learn how to stop the tractor; the engine; and the backhoe quickly in an emergency.

Provide adequate front end weight to counter balance the backhoe at all times.

Be sure the area is clear of underground utilities or other hazards.

Position a barricade around the work area.

Keep all bystanders a safe distance away.

OPERATION

Never allow anyone to operate the backhoe who is not familiar with safe operating practices.

Do not attempt to enter operators platform by using stabilizers as a step.

Operate from the backhoe operators seat only.

Allow only one person to operate the backhoe at a time.

Never dig with backhoe unless stabilizers are properly set.

Do not dig under stabilizers or tractor with backhoe. Soft ground or sandy soil can cause cave-ins.

Always swing bucket uphill to dump when on a hillside. Keep loaded bucket low.

Set brakes and lock wheels when operating on hills and banks to avoid dangerous run-away.

Watch for overhead wires. Do not touch wires with any part of backhoe.

Never allow a person to work under a raised bucket.

Never lift a person with backhoe.

Do not use bucket as a battering ram.

Always lower bucket to ground when not digging.

Never leave tractor unattended with engine running.

TRANSPORTATION

Do not drive tractor near the edge of a ditch or excavation.

Always use accessory lights when transporting on a road or highway to warn operators of other vehicles.

Check your local government regulations.

Be sure that slow moving vehicle emblem is visible to the rear.

ADJUSTMENTS AND INSPECTION

Check pins and hardware that attach backhoe to tractor and all pivot pins for tightness several times daily. Replace any parts which are bent, broken or missing.

Do not oil, grease or adjust backhoe while it is in motion.

Do not change any backhoe relief valve settings. They are factory set for best backhoe performance and safety.



CAUTION: Escaping hydraulic fluid under pressure can penetrate skin causing serious personal injury.

- *DO NOT use your hand to check for leaks. Use a piece of cardboard or paper to search for leaks.*
- *Stop engine and relieve pressure before connecting or disconnecting hydraulic lines.*
- *Tighten all connections before starting engine or pressurizing lines.*
- *If any fluid is injected into skin, obtain medical attention immediately or gangrene may result.*

Be sure to relieve all pressure before disconnecting lines. Be sure all connections are tight and that lines, pipes and hoses are not damaged before applying pressure to the system.

Do not remove any guards on backhoe or tractor.

Whenever you see this symbol



It means: **ATTENTION!
BECOME ALERT!
YOUR SAFETY IS INVOLVED!**

SAFETY

PELIGRO!



Si no lee Ingles, pida ayuda a alguien que si lo lea para que le traduzca las medidas de seguridad.

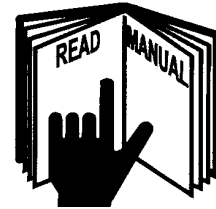


¡LEA EL INSTRUCTIVO!

DANGER!



Never operate the Power Unit or Implement until you have read and completely understand this Manual, the Power Unit Operator's Manual, and each of the Safety Messages found in the Manual or on the Power Unit and Implement. Learn how to stop the Power Unit engine suddenly in an emergency. Never allow inexperienced or untrained personnel too operate the Power Unit and Implement without supervision. Make sure the operator has fully read and understood the manuals prior to operation.



WARNING!



Always maintain the safety decals in good readable condition. If the decals are missing, damaged, or unreadable, obtain and install replacement decals immediately.

WARNING!



Make certain that the "Slow Moving Vehicle" (SMV) sign is installed in such a way as to be clearly visible and legible. When transporting the Equipment use the Power Unit flashing warning lights and follow all local traffic regulations.

WARNING!



Operate this Equipment only with a Tractor equipped with an approved roll-over-protective system (ROPS). Always wear seat belts. Serious injury or even death could result from falling off the tractor—particularly during a turnover when the operator could be pinned under the Operator Protective Structure.



WARNING!



Do not modify or alter this Implement. Do not permit anyone to modify or alter this Implement, any of its components or any Implement function.

DANGER!



BEFORE leaving the Power Unit seat, always engage the brake and/or set the Power Unit transmission in parking gear, disengage the auxiliary hydraulics, stop the engine, remove the key, and wait for all moving parts to stop. Place the Power Unit shift lever into a low range or parking gear to prevent the tractor from rolling. Never dismount a Power Unit that is moving or while the engine is running. Operate the Power Unit controls from the operator seat only.

SAFETY

SAFETY

SAFETY

DANGER!



Never allow children to operate or ride on the Power Unit or Implement.



DANGER!



Do not mount the Power Unit while the Power Unit is moving. Mount the Power Unit only when the Power Unit and all moving parts are completely stopped.



DANGER!



Start the Power Unit only when properly seated in the Power Unit seat. Starting a Power Unit in gear can result in injury or death. Read the Power Unit operator's manual for proper starting instructions.



DANGER!



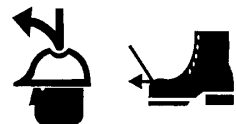
Never work under the Implement, the framework, or any lifted component unless the Implement is securely supported or blocked up to prevent sudden or inadvertent falling which could cause serious injury or even death.



WARNING!



The operator and all support personnel should wear hard hats, safety shoes, safety glasses, and proper hearing protection at all times for protection from injury including injury from items thrown by the equipment.



WARNING!



PROLONGED EXPOSURE TO LOUD NOISE MAY CAUSE PERMANENT HEARING LOSS! Tractors with or without an Implement attached can often be noisy enough to cause permanent hearing loss. We recommend that you always wear hearing protection if the noise in the Operator's position exceeds 80db. Noise over 85db over an extended period of time will cause severe hearing loss. Noise over 90db adjacent to the Operator over an extended period of time will cause permanent or total hearing loss. *Note: Hearing loss from loud noise [from tractors, chain saws, radios, and other such sources close to the ear] is cumulative over a lifetime without hope of natural recovery*



SAFETY

SAFETY

DANGER!



Do not operate this Equipment with hydraulic oil leaking. Oil is expensive and its presence could present a hazard. Do not check for leaks with your hand! Use a piece of heavy paper or cardboard. High-pressure oil streams from breaks in the line could penetrate the skin and cause tissue damage including gangrene. If oil does penetrate the skin, have the injury treated immediately by a physician knowledgeable and skilled in this procedure.



DANGER!

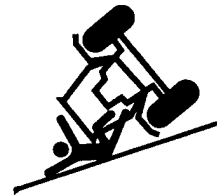


Transport only at safe speeds. Serious accidents and injuries can result from operating this equipment at unsafe speeds. Understand the Power Unit and Implement and how it handles before transporting on streets and highways. Make sure the Power Unit steering and brakes are in good condition and operate properly.



Before transporting the Power Unit and Implement, determine the safe transport speeds for you and the equipment. Make sure you abide by the following rules:

1. Test the Power Unit at a slow speed and increase the speed slowly. Apply the Brakes smoothly to determine the stopping characteristics of the Power Unit and Implement. As you increase the speed of the Power Unit the stopping distance increases. Determine the maximum safe transport speed for you and this Equipment.
2. Test the equipment at a slow speed in turns. Increase the speed through the turn only after you determine that it is safe to operate at a higher speed. Use extreme care and reduce your speed when turning sharply to prevent the Power Unit and Implement from turning over. Determine the maximum safe turning speed for you and this equipment before operating on roads or uneven ground.
3. Only transport the Power Unit and Implement at the speeds that you have determined are safe and which allow you to properly control the equipment.



Be aware of the operating conditions. Do not operate the Power Unit with weak or faulty brakes. When operating down a hill or on wet or rain slick roads, the braking distance increases. Use extreme care and reduce your speed. When operating in traffic always use the Power Unit's flashing warning lights and reduce your speed. Be aware of the traffic around you and watch out for the other guy.

WARNING!

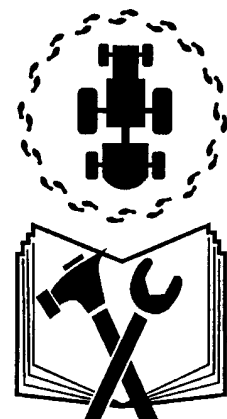


Never attempt to lubricate, adjust, or remove material from the Implement while it is in motion or while Power Unit engine is running. Make sure the Power Unit engine is off before working on the Implement!

WARNING!



Periodically inspect all moving parts for wear and replace when necessary with authorized service parts. Look for loose fasteners, worn or broken parts, and leaky or loose fittings. Make sure all pins have cotter pins and washers. Serious injury may occur from not maintaining this machine in good working order.



SAFETY

SAFETY

WARNING!



Always read carefully and comply fully with the manufacturers instructions when handling oil, solvents, cleansers, and any other chemical agent.



DANGER!



Never run the Power Unit engine in a closed building or without adequate ventilation. The exhaust fumes can be hazardous to your health.

DANGER!



KEEP AWAY FROM ROTATING ELEMENTS to prevent entanglement and possible serious injury or death.



DANGER!



Never allow children to play on or around Power Unit or Implement. Children can slip or fall off the Equipment and be injured or killed. Children can cause the Implement to shift or fall crushing themselves or others.

WARNING!



Do not exceed the rated PTO speed for the Implement. Excessive PTO speeds can cause Implement driveline failures resulting in serious injury.

DANGER!



NEVER use drugs or alcohol immediately before or while operating the Power Unit and Implement. Drugs and alcohol will affect an operator's alertness and coordination and therefore affect the operator's ability to operate the equipment safely. Before operating the Power Unit or Implement, an operator on prescription or over-the-counter medication must consult a medical professional regarding any side effects of the medication that would hinder their ability to operate the Equipment safely. **NEVER** knowingly allow anyone to operate this equipment when their alertness or coordination is impaired. Serious injury or death to the operator or others could result if the operator is under the influence of drugs or alcohol.



DANGER!



Operate the Power Unit and/or Implement controls only while properly seated in the operator's seat with the seat belt securely fastened around you. Inadvertent movement of the Power Unit or Implement may cause serious injury or death.

SAFETY

WARNING!



Never interfere with factory-set hydraulic calibrations. Any change in calibration could cause a failure of the equipment and result in injury.

DANGER!



Always shut the Power Unit completely down, place the transmission in park, and set the parking brake before you or anyone else attempts to connect or disconnect the Backhoe.

DANGER!



Never crawl under a raised implement supported solely by the Power Unit boom. Release of the control lever or mechanical failure will result in the Implement falling and possible injury or death. Always securely block up the Implement before crawling underneath to perform repairs and service.

WARNING!



Relieve hydraulic pressure prior to doing any maintenance or repair work on the implement. Place the Backhoe on the ground or securely supported on blocks or stands, disengage the auxiliary hydraulics and turn off engine. Push and pull the control levers several times to relieve pressure prior to starting any maintenance or repair work.

SAFETY HAZARD SIGNAL WORDS

There are three levels of hazard intensity identified by signal words **DANGER**, **WARNING** and **CAUTION**. The level of hazard intensity is identified by the following definitions.



DANGER - Immediate hazards which will result in severe injury or death.



WARNING - Hazards or unsafe practices which could result in minor personal injury or death.



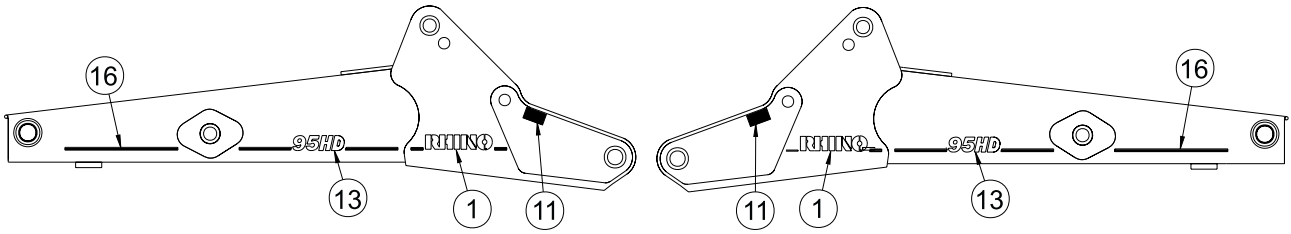
CAUTION - Hazards or unsafe practices which could result in minor personal injury or property damage.



THIS SAFETY SYMBOL MEANS
ATTENTION!
BECOME ALERT!
YOUR SAFETY IS INVOLVED!

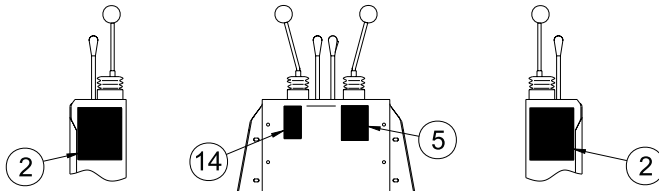
SAFETY

SAFETY



LEFT SIDE - BOOM

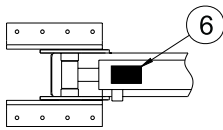
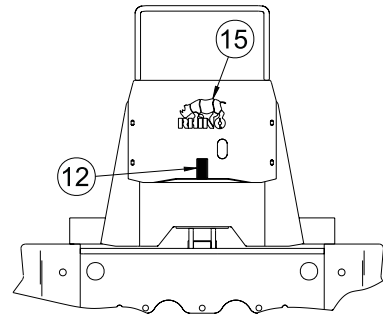
RIGHT SIDE - BOOM



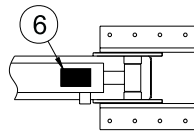
LEFT SIDE

REAR VIEW

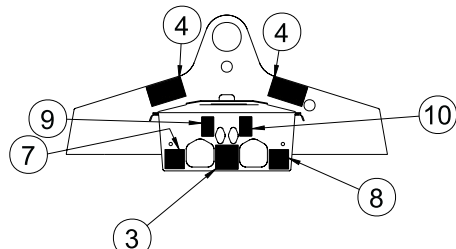
RIGHT SIDE



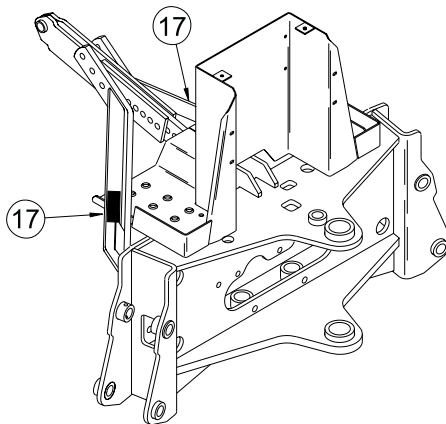
TOP VIEW - LEFT STABILIZER



TOP VIEW - RIGHT STABILIZER



TOP VIEW - COVER PLATE



SAFETY

SAFETY

| ITEM | PART NO. | QTY. | TYPE | DESCRIPTION |
|------|----------|------|-----------|--------------------------------|
| 1 | 50850 | 2 | NAME | RHINO, with Stripe |
| 2 | 45970 | 2 | WARNING | To Prevent Bodily Injury |
| 3 | 44907 | 1 | WARNING | To Prevent Instability |
| 4 | 44895 | 2 | DANGER | Crushing Hazard |
| 5 | 44896 | 1 | WARNING | To Prevent Bodily Injury |
| 6 | 44897 | 2 | DANGER | Crushing Hazard |
| 7 | 44898 | 1 | OPERATION | Boom Operation |
| 8 | 44899 | 1 | OPERATION | Dipperstick & Bucket Operation |
| 9 | 44900 | 1 | OPERATION | Left Side Stabilizer Position |
| 10 | 44901 | 1 | OPERATION | Right Side Stabilizer Position |
| 11 | 44908 | 2 | OPERATION | Boom Lock |
| 12 | 44909 | 1 | OPERATION | Swing Lock |
| 13 | 50851 | 2 | NAME | Model 95HD |
| 14 | 48280 | 1 | ----- | Universal One Call |
| 15 | 49696 | 1 | LOGO | Rhino |
| 16 | 35674-5 | 2 | STRIPE | White, 13" |
| 17 | 45491 | 2 | WARNING | To Prevent Bodily Injury |

SAFETY

SAFETY

NOTE: Safety decal location is listed below each decal. Replace decal if damaged or illegible. Replacement decals are available from your dealer.

⚠ WARNING

TO PREVENT BODILY INJURY

1. Swing lock pin must be in center locked position when detaching backhoe from tractor.
2. When attaching or detaching backhoe to/from tractor always stand on the tractor side of the stabilizer and outside of rear wheel.
3. Never operate unless backhoe manufacturer's mounting kit has been installed as instructed in operators manual.
4. Do not modify or substitute any parts of backhoe mounting kit.

44896

5 -- 44896

⚠ WARNING

TO PREVENT BODILY INJURY

- Read operator's manual before using backhoe. Follow all safety precautions.
- Replacement manuals are available from your local dealer.
- Inspect backhoe daily for loosened, bent or broken parts.
- Before transporting, attach slow moving vehicle sign and engage boom and swing locks.
- A minimum 25% of tractor and equipment weight must be on tractor front wheels with backhoe in transport position.
- Enter and exit operators platform only from between stabilizers and tires.
- Avoid digging in area of stabilizer pads to keep solid base for stabilizers.
- Operate from backhoe operators seat only.
- Keep all guards in place.
- When operating backhoe, keep others away from stabilizers and maximum bucket swing areas.
- Keep others off backhoe and tractor while operating backhoe.
- Consult local utilities before digging. Know location of underground cables and pipelines. Watch for overhead hazards.
- Do not repair or service backhoe unless it is mounted on tractor and securely supported. Loss of oil or removal of parts could cause backhoe to collapse.
- Do not use this unit for lifting, conveying or providing a work platform for personnel.
- Before leaving equipment unattended, raise boom and install transport locks. Fold in dipperstick and bucket. Shut off engine and remove key.

45970

2 -- 45970

⚠ DANGER

**CRUSHING
HAZARD**

44895

4 -- 44895

⚠ DANGER

**CRUSHING
HAZARD**

44897

6 -- 44897

⚠ WARNING

TO PREVENT INSTABILITY RESULTING IN BODILY INJURY TO OPERATOR OR BYSTANDERS:

Do not use backhoe without front loader attached.

Backhoe digging forces can lift and turn tractor over. For maximum stability, set stabilizers to remove weight from rear tractor tires without lifting them off ground.

44907

3 -- 44907

⚠ WARNING

TO PREVENT BODILY INJURY

Do not attach backhoe to tractors which have 3-PT Quick-Attaching Coupler. Backhoe may become unattached from tractor causing serious personal injury.

45491

17 -- 45491

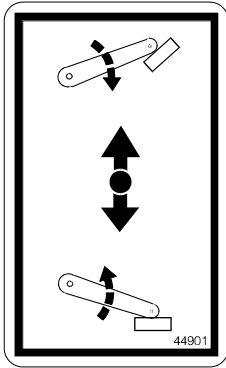
1-888-258-0808
OR CALL LOCAL UTILITY

48280

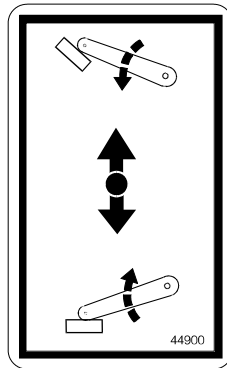
14 -- 48280

SAFETY

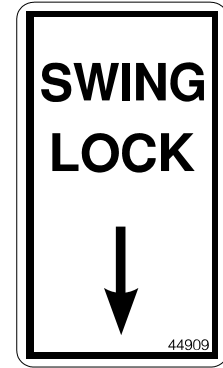
SAFETY



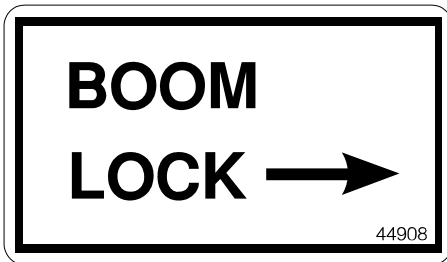
10 -- 44901



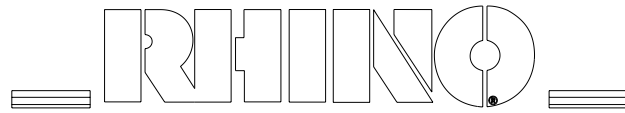
9 -- 44900



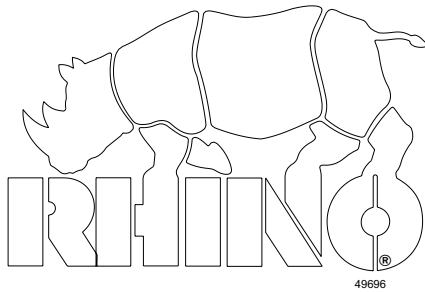
12 -- 44909



11 -- 44908



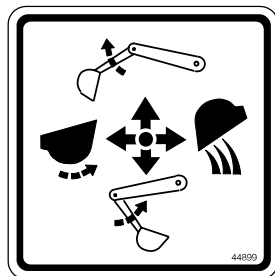
1 -- 50850



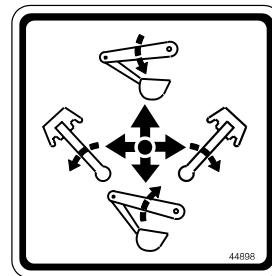
15 -- 49696



16 -- 35674-5
13 -- 50851



8 -- 44899



7 -- 44898

SAFETY

FEDERAL LAWS AND REGULATIONS

This section is intended to explain in broad terms the concept and effect of federal laws and regulations concerning employer and employee equipment operators. This section is not intended as a legal interpretation of the law and should not be considered as such.

Employer-Employee Operator Regulations

U.S. Public Law 91-596 (The Williams-Steiger Occupational and Health Act of 1970) OSHA

This Act Seeks:

"...to assure so far as possible every working man and woman in the nation safe and healthful working conditions and to preserve our human resources..."

DUTIES

Sec. 5 (a) Each employer-

(1) shall furnish to each of his employees employment and a place of employment which are free from recognized hazards that are causing or are likely to cause death or serious physical harm to his employees;

(2) shall comply with occupational safety and health standards promulgated under this Act.

(b) Each employee shall comply with occupational safety and health standards and all rules, regulations and orders issued pursuant to this Act which are applicable to his own actions and conduct.

OSHA Regulations

OSHA regulations state in part: "At the time of initial assignment and at least annually thereafter, the employer shall instruct every employee in the safe operation and servicing of all equipment with which the employee is, or will be involved."

Employer Responsibilities:

To ensure employee safety during Tractor and Implement operation, it is the employer's responsibility to:

1. Train the employee in the proper and safe operation of the Tractor and Implement.
2. Require that the employee read and fully understand the Tractor and Implement Operator's manual.
3. Permit only qualified and properly trained employees to operate the Tractor and Implement.
4. Maintain the Tractor and Implement in a safe operational condition and maintain all shields and guards on the equipment.
5. Ensure the Tractor is equipped with a functional ROPS and seat belt and require that the employee operator securely fasten the safety belt and operate with the ROPS in the raised position at all times.
6. Forbid the employee operator to carry additional riders on the Tractor or Implement.
7. Provide the required tools to maintain the Tractor and Implement in a good safe working condition and provide the necessary support devices to secure the equipment safely while performing repairs and service.
8. Require that the employee operator stop digging if bystanders or passerbys come within 10 yards.

Child Labor Under 16 Years of Age

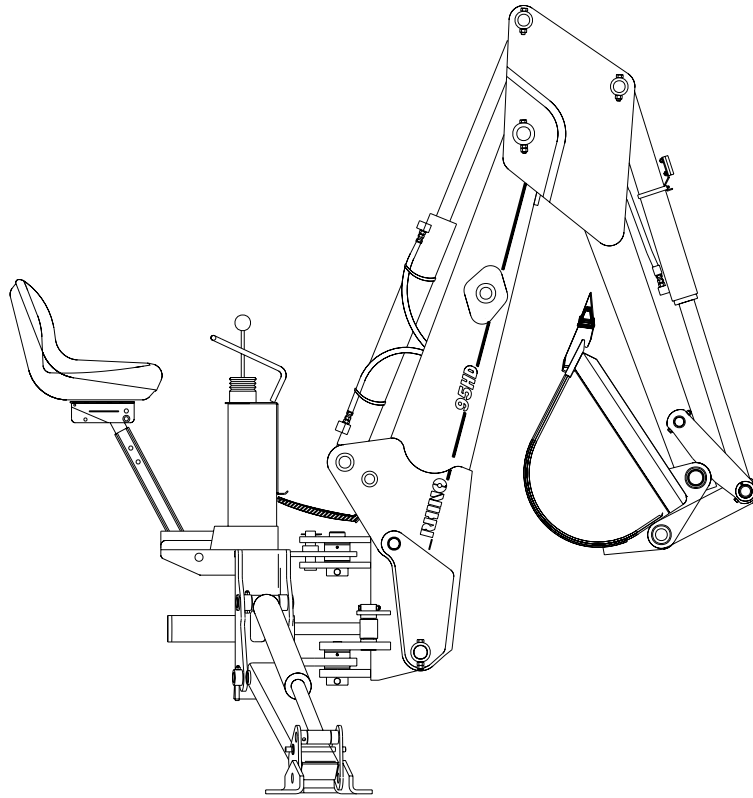
Some regulations specify that no one under the age of 16 may operate power machinery. It is your responsibility to know what these regulations are in your own area or situation. (Refer to U.S. Dept. of Labor, Employment Standard Administration, Wage & Home Division, Child Labor Bulletin #102.)

INTRODUCTION SECTION

Introduction Section 2-1

INTRODUCTION

INTRODUCTION



This manual provides operation, maintenance, assembly and parts identification for your new backhoe. Your backhoe has been designed to give many years of satisfactory service. Successful operation and long life of the backhoe depends on proper maintenance and operation. Please read this manual carefully and follow all instructions. Correct assembly, operation and maintenance will save you much time and expense. Also follow instructions included with backhoe mounting and hydraulic kits to insure that backhoe is installed correctly to tractor.



NOTE: This safety alert symbol identifies important safety messages in this manual. Observe and follow all safety messages to prevent personal injury.

Reference to left-hand and right-hand used in this manual refers to position of operator when seated in the operating position of backhoe.

If at any time you have a service problem with your backhoe or need new parts, contact your local dealer. Your dealer will need your backhoe model number and serial number to give you prompt efficient service.

Parts orders must give complete description, correct part number, total amount required, model number, all necessary serial numbers, method of shipment and shipping address.

INTRODUCTION

SPECIFICATIONS

Specifications may vary depending on tractor model, tire size and bucket used and are subject to change without notification. Tractor must be equipped with ROPS and seat belt that will provide greater safety and installation of backhoe subframe.

95HD

GENERAL DATA

| | | |
|---|---|-----------|
| A | Digging Depth (two foot flat bottom) | 114" |
| B | Reach from center line of Swing Pivot | 153" |
| C | Loading Height (bucket at 60°). | 96" |
| D | Load Reach | 43" |
| E | Maximum Leveling Angle | 11.5° |
| F | Swing Arc | 180° |
| G | Transport Height (maximum). | 100" |
| H | Transport Overhang | 55" |
| I | Bucket Rotation | 185° |
| J | Stabilizer Spread, down position | 117" |
| K | Stabilizer Spread, up position | 67" |
| | Shipping Weight (less bucket) | 1818 lbs. |
| | Bucket Digging Force | 5872 lbs. |
| | Dipperstick Digging Force | 3800 lbs. |
| | Operating Pressure | 2500 PSI |

NOTE: See Illustrations of Specifications on Page 2-4

BUCKET DATA

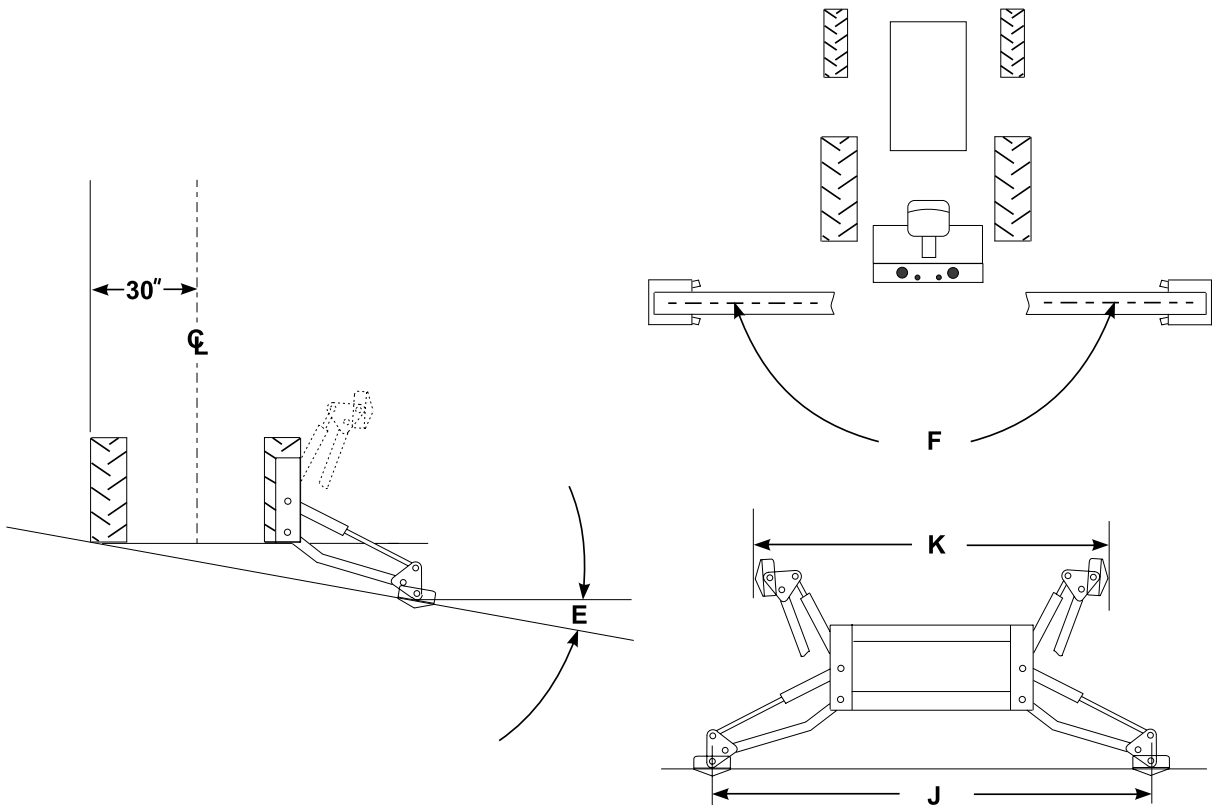
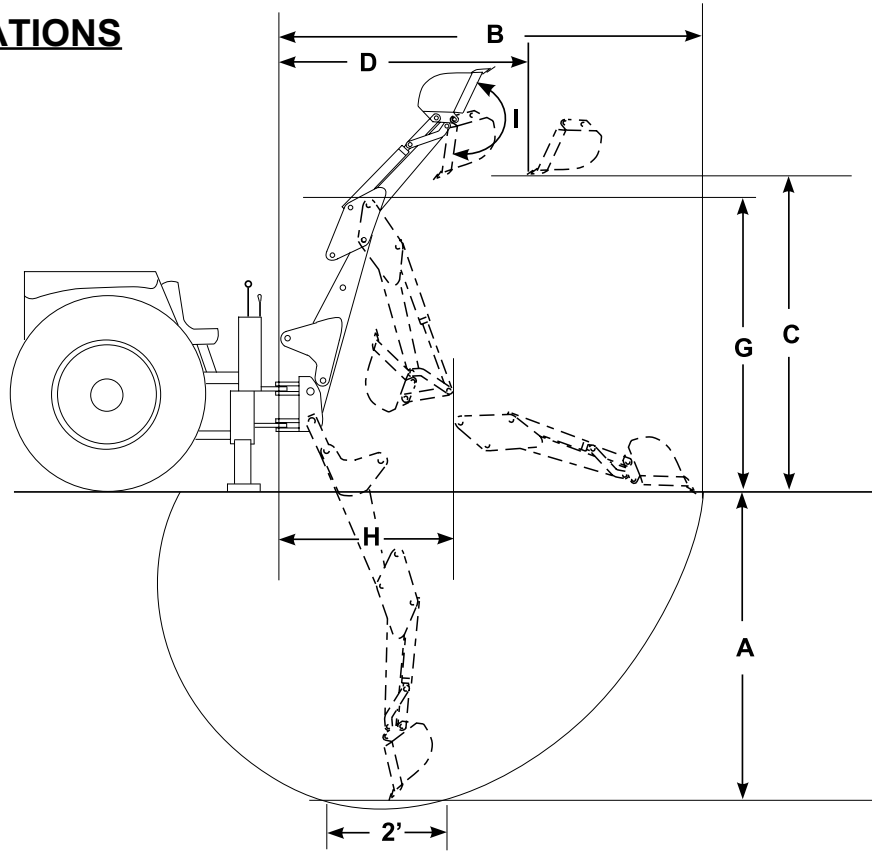
| BUCKET WIDTH | SAE STRUCK CAPACITY | SAE HEAPED CAPACITY | SHIPPING WEIGHT |
|--------------|---------------------|---------------------|-----------------|
| 12" H.D. | 1.80 cu. ft. | 1.95 cu. ft. | 159 lbs. |
| 18" H.D. | 2.70 cu. ft. | 3.03 cu. ft. | 192 lbs. |
| 24" H.D. | 3.60 cu. ft. | 4.12 cu. ft. | 226 lbs. |
| 36" Grave | 4.40 cu. ft. | 5.03 cu. ft. | 279 lbs. |

CYLINDER DATA

| CYLINDER | PISTON DIA. | STROKE | RETRACTED LENGTH | EXTENDED LENGTH | ROD DIA. |
|-------------|-------------|--------|------------------|-----------------|----------|
| Boom | 3.25" | 23.88" | 34.00" | 57.88" | 1.75" |
| Dipperstick | 3.25" | 25.56" | 35.25" | 60.81" | 1.75" |
| Bucket | 3.00" | 22.00" | 32.00" | 54.00" | 2.00" |
| Swing | 3.00" | 10.78" | 7.16" | 17.94" | 1.50" |
| Stabilizer | 3.00" | 17.69" | 26.25" | 43.94" | 1.50" |

INTRODUCTION

SPECIFICATIONS



F3788-7-04

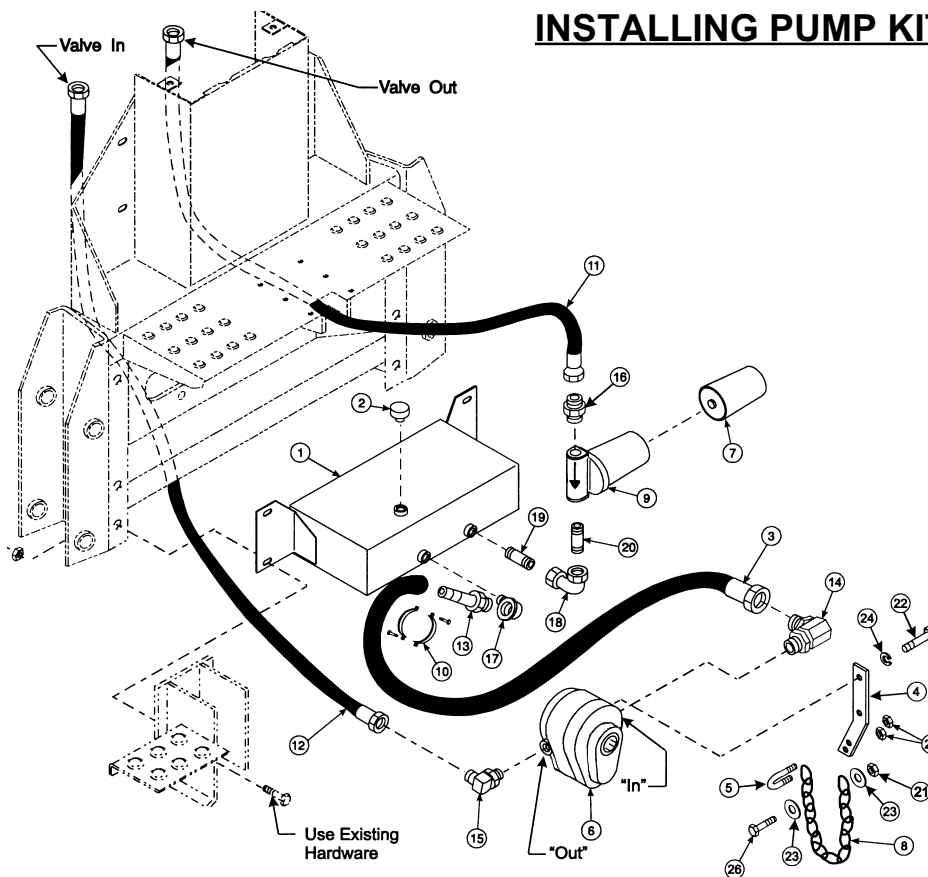
Introduction Section 2-4

ASSEMBLY SECTION

Assembly Section 3-1

ASSEMBLY

INSTALLING PUMP KIT (Option)



ASSEMBLY

INSTALLING PUMP KIT



WARNING: Do not modify or alter this implement. Do not permit anyone to modify or alter this Implement, any of its components or any Implement function.

NOTE: Drawbar may need to be removed if it interferes with reservoir. If drawbar can be left in place, retaining bracket (4) should be installed on left side of pump as shown and positioned on left side of tractor drawbar.

1. Fasten hydraulic pump retaining bracket (4) to pump (6) using 3/8-16 x 1-1/4 cap screws (22) and 3/8 lock washers (24). Fasten one end of chain (8) to pump retaining bracket using wire rope clip (5), and 3/8 lock nuts (25).

NOTE: Wrap chain tightly around hitch bracket on tractor to prevent pump from slipping off PTO shaft.

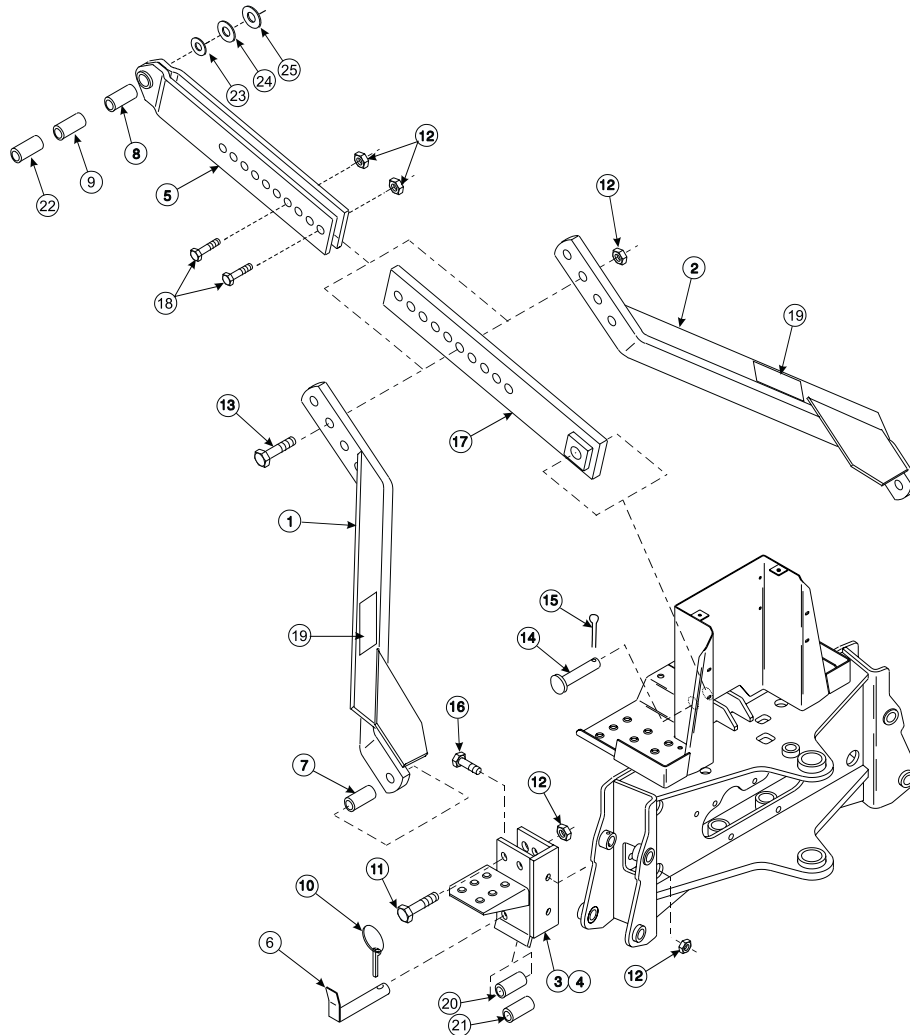
2. Sandwich reservoir (1) between 3-pt mounting brackets or subframe and backhoe using hardware supplied with 3-pt mounting brackets or subframe.
3. Install 1 x 2-1/2 nipple (19), 3/4 x 3/4 elbow (18) and 3/4 x 2 nipple (20) to right tank port. Point 3/4 x 3/4 elbow fitting (18) up.

4. Install filter body (without filter element) to 3/4 nipple (20). Be sure oil flow (arrow on filter body) is correct. Position body so element points right. Install filter element (7).
5. Install 3/4 x 3/4 fitting (16) to filter body.
6. Install 1 x 1 elbow fitting (17) and hose barb (13) to left tank port. Point hose barb up and 45° to left.
7. Install 1-5/16 live swivel elbow (14) to right "IN" port on pump. Install 3/4 x 1-1/16 elbow fitting (15) to left "OUT" port on pump.
8. Connect suction hose (3) to reservoir using hose clamp (10) and to live swivel fitting (14) on pump.
9. Connect pressure hose (12) to "OUT" port on pump and "IN" port on valve. Connect tank hose (11) to "OUT" port on valve and to filter on hydraulic reservoir.
10. Fill reservoir to within two inches from top with 10W or 20W hydraulic oil with SAE J183-M2C33F classification. Dextron 2 ATF fluid and 10W engine oil with API "SD" classification are also acceptable.

NOTE: After cycling all cylinders, recheck oil level.

ASSEMBLY

INSTALLING THREE POINT ADAPTER (Option)



INSTALLING THREE POINT ADAPTER



WARNING: Backhoe is not compatible with 3-pt quick attach device. Tractors with 3-pt quick attach device must remove quick attach device before installing backhoe.

1. Install mounting brackets (3 & 4) to backhoe using 3/4 x 2 cap screws (16) and 3/4 lock nuts (12).
2. Fasten support braces (1 & 2) to backhoe using 3/4 x 3-1/2 cap screws (11), 1.19" bushings (7) and 3/4 lock nuts (12).
3. Connect rear center link (17) to backhoe mainframe using 1-x 3-7/8 clevis pin (14) and 1/2 x 2 cotter pin (15).
4. Using overhead hoist, floor jack or connecting backhoe hydraulics to tractor so stabilizers can be activated.

Position backhoe to achieve 90° and 15-18 inch height as described in figures 3A & 3B.

5. Join support braces (1 & 2), front center link (5) and rear center link (17) to nearest bolt holes which will maintain as close as possible the 90° and 15-18 inch position of backhoe. Leave hardware loose for final adjustment later.

NOTE: Hole locations shown in parts diagram for bolts (13 & 18) are for illustration only and will vary depending on tractor model. However, it is necessary that all three bolts be installed. For some installations support braces (1 & 2) may be installed between bolts (18). Support braces must be fastened to center links within 13 inches from pin point on tractor (Figure 3A).

ASSEMBLY

MOUNTING BACKHOE TO TRACTOR

1. Back tractor close enough to tractor to connect hose kit or pump to tractor.



WARNING: BEFORE leaving the Power Unit Seat, always engage the brake and set the Power Unit transmission in parking gear, disengage the auxiliary hydraulics, stop the engine, remove the key, and wait for all moving parts to stop.

2. Using backhoe hydraulics, lower stabilizers until backhoe can be connected to 3-point hitch. Bottom of backhoe boom pivot should be 15 to 18 inches off ground when attaching to tractor lower 3-point arms.

LOWER LINK:

3. CATEGORY I 3-PT HITCH - Connect to backhoe and secure using hitch pins (6) and lynch pins (10).

CATEGORY II 3 PT HITCH - Use 1-7/8 long x 1-1/8 O.D. bushings (20) hitch pins (6) and lynch pins (10).

CATEGORY III 3-PT HITCH - Use 1-7/8 long x 1-7/16 O.D. bushings (21) hitch pins (6) and lynch pins (10).

UPPER LINK:

4. CATEGORY I, II OR III 3-PT HITCH - Connect center link assembly to upper connecting point on tractor 3-point hitch using clevis pin and lynch pin from tractor. If required, insert bushing (8, 9 or 22) into center front link (5) to match tractor clevis pin diameter.



CAUTION: Upper connecting point where backhoe fastens to tractor is under high load when backhoe stabilizers lift rear of tractor. Check backhoe and tractor components in this area often for signs of fatiguing, loose hardware and wear.

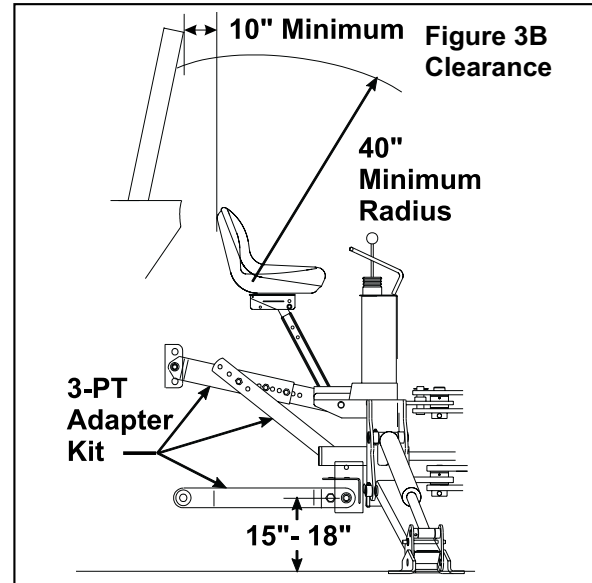
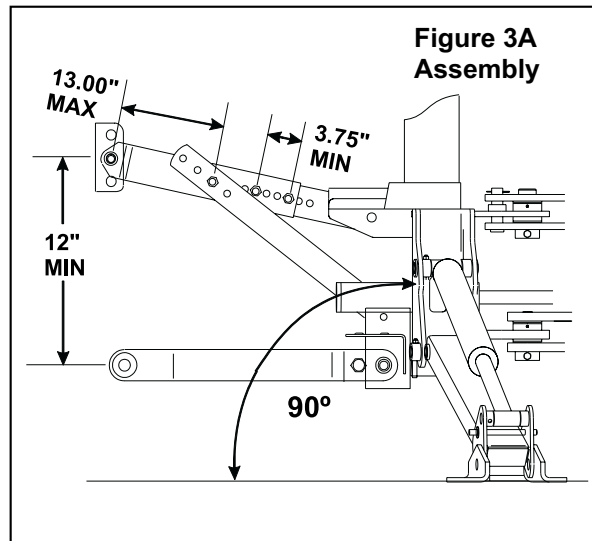
5. Adjust link assembly length if necessary for backhoe mainframe to maintain 90° and 15-18 inch positions (Figures 1 & 2). If upper link interferes with seat, move seat bracket into forward set of holes.
6. Check for proper operator head clearance with ROPS and cab (Figure 3B).
7. Tighten all hardware in upper link assembly to torque specifications in backhoe manual.



WARNING: Escaping hydraulic fluid under pressure can penetrate skin causing serious injury.

- DO NOT use your hands to check for leaks. Use a piece of cardboard or paper to search for leaks.
- Stop engine and relieve pressure before connecting or disconnecting lines.

- Tighten all connections before starting engine or pressurizing lines.
- If any fluid is injected into skin, obtain medical attention immediately or gangrene may result



OPERATION SECTION

Operation Section 4-1

OPERATION



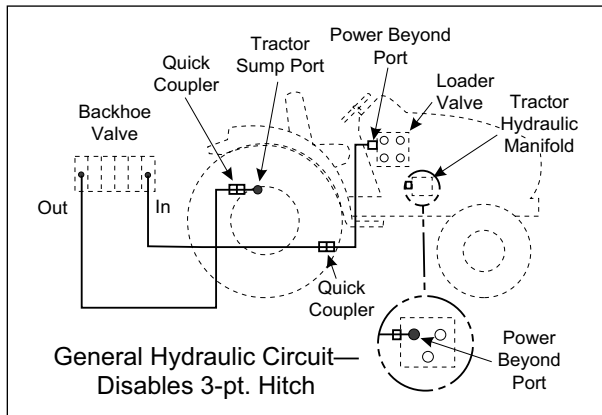
CAUTION: To avoid possible injury, observe the following safety rules **BEFORE OPERATING** backhoe.

- Be sure area is clear of underground utilities or other hazards.
- Position a barricade around work area.
- Keep bystanders a safe distance away.

PRE-OPERATION CHECK LIST

This backhoe is designed for safety, durability and operator convenience. To insure satisfactory performance complete the following check list and make all necessary adjustments before initial operation.

1. All safety shields must be in place.
2. Safety and operation decals must be in place, undamaged and clean.
3. Hydraulic hookup must be correct and all connections tight.



4. All bolts and pins which attach backhoe to tractor must be in place. Check tightness of bolts and check that all pins are retained.
5. Tractor must be in proper operating condition.
6. Lubricate backhoe, see "MAINTENANCE SECTION".
7. Controls must operate properly. See "OPERATION SECTION".
8. Cycle all cylinders slowly to purge air from hydraulic system.
9. Hydraulic system oil level must be correct. Reservoir level should be 2" from top of tank.

OPERATING DIRECTIONS

The terms right, left, front and back shall be from the position of the operator when seated in the operating position on the backhoe.

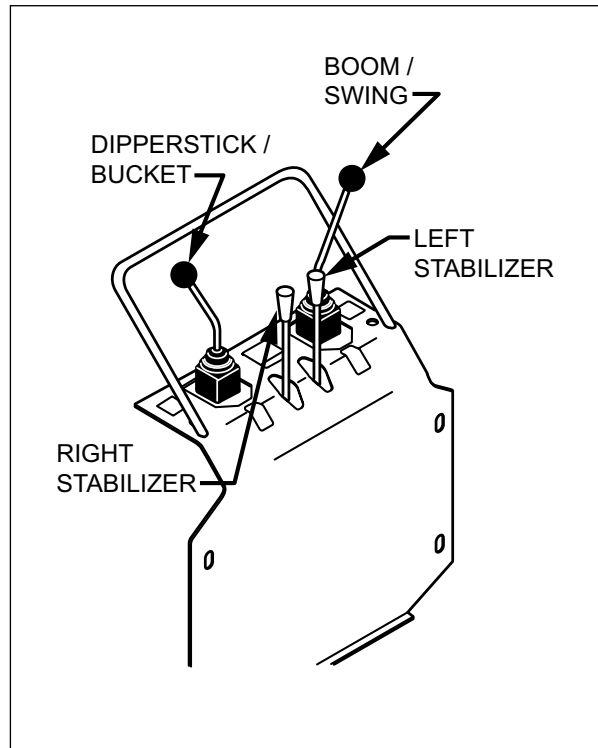
ENGINE SPEED

Speed at which backhoe operates is dependent on tractor PTO RPM. Use a moderate engine speed to start and increase it as your experience permits.

CONTROLS

The backhoe has two major control levers, Boom/Swing and Dipperstick/Bucket. These controls are located on the control panel directly ahead of the operator.

The stabilizer control levers are located between the two major control levers.



BOOM/SWING

Push lever forward, boom moves down, away from operator. Pull lever back, boom moves up, toward operator.

Pushing lever farther forward into detent position puts boom into "float". Float detent position allows boom to drift up or down.

Move lever to left, backhoe swings left. Move lever to right, backhoe swings right.

By moving lever to one of the intermediate positions, boom can be swung left or right at the same time as it is being raised or lowered, performing two operations simultaneously.

Swing left and lower boom by moving control lever forward and to the left.

Swing left and raise boom by moving control lever back and to the left.

Swing right and lower boom by moving control lever forward and to the right.

Swing right and raise boom by moving control lever back and to the right.

OPERATION

DIPPERSTICK/BUCKET

Push lever forward, dipperstick moves away from operator.
Pull lever back, dipperstick moves toward operator.

Move lever to left, bucket curls in. Move lever right, bucket extends out.

By moving lever to one of the intermediate positions, dipperstick can be extended or retracted at the same time as bucket is being loaded or dumped.

Move dipperstick away and extend bucket by moving lever forward and to the right.

Move dipperstick toward operator and curl bucket by moving lever back and to the left.

Move dipperstick away and extend (dump) bucket by moving lever forward and to the right.

Move dipperstick toward operator and extend bucket by moving lever back and to the right.

The two operations of the boom and swing lever combined with the two operations performed by bucket and dipperstick control lever provide four simultaneous operations from the two levers. Oil flow will go to operation which requires the least pressure. The ability to feather valve spools and balance pressure comes with experience resulting in reduced cycle times.

LEFT HAND STABILIZER

Push lever forward, left hand stabilizer lowers. Pull lever back, left hand stabilizer raises.

RIGHT HAND STABILIZER

Push lever forward, right hand stabilizer lowers. Pull lever back, right hand stabilizer raises.

OPERATING BACKHOE



CAUTION: To avoid possible injury, observe the following safety rules WHEN OPERATING backhoe.

- Operate from backhoe operators seat only.
- Lower stabilizers until weight of tractor is supported by stabilizers. Do not lift tractor tires off ground.
- Do not dig near stabilizers.
- Do not attempt to raise tractor off ground or move tractor forward or backward using backhoe dipperstick or bucket.
- Do not lose stability by swinging bucket downhill when positioned on a slope.

It is not difficult to become an efficient operator. Control operating decals are located in front of control levers.

Study these decals. They will assist you in becoming familiar with the controls.

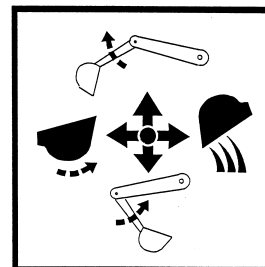
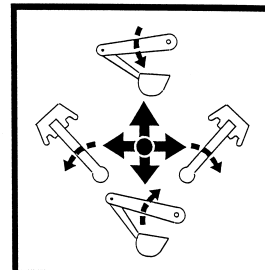
Smooth, light handling of controls will result in the most efficient backhoe operation.

Operate backhoe control levers to become familiar with their speed and movements. Engine speed and PTO RPM will determine speed of cylinder operation.

Swing boom several times to practice controlling the speed of swing. Do not operate swing more than 45 degrees each way for the first few times. Gradually increase the arc.

Best results are obtained by digging near center of swing arc so material can be dumped on either side.

As operator becomes more familiar with operation of backhoe, it will be common practice to operate two controls at one time. For example with bucket extended and dipperstick extended, the lift control and dipperstick control can be operated together to bring bucket toward operator with down pressure on it. As dipperstick approaches operator, the dipperstick and bucket controls can be operated together to close bucket and trap material. At end of stroke, lift and dipperstick controls are operated to move load up and away from operator to save time in clearing excavation.



This dual operation of controls will speed and simplify digging operation. Normally two or more movements will not be equal or even simultaneous but as pressure within the cylinders, and resistance of an operating member of backhoe lessens, it will begin to move. It is balancing the force of one member against another.

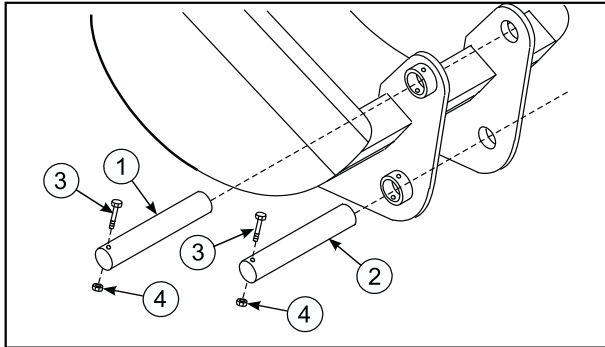
NOTE: Actuating bucket is the key to powerful digging. Operating the dipperstick and bucket controls simultaneously will insure a full bucket and prevent wasted motion and time.

OPERATION

MOUNTING AND DISMOUNTING BUCKETS

Mount buckets using pins (1 & 2), cap screws (3), lock nuts (4) provided.

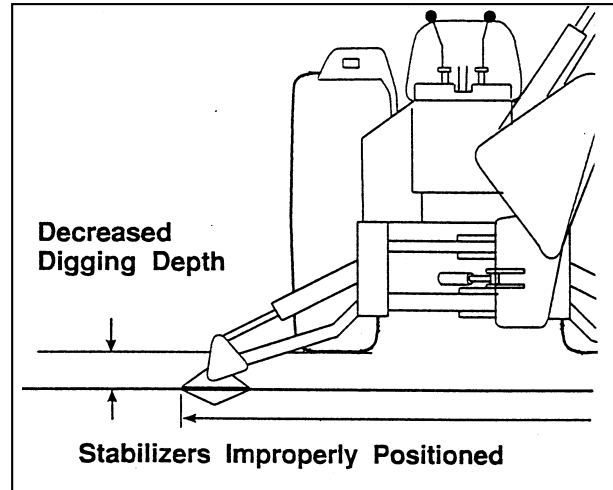
NOTE: Pin (1) with grease fitting is bucket/dipper pivot pin.



PLACING THE STABILIZERS

Set the stabilizers to remove weight from the rear wheels. Rear wheels are to remain touching the ground as this provides for the widest stabilizer stance and lowest center of gravity.

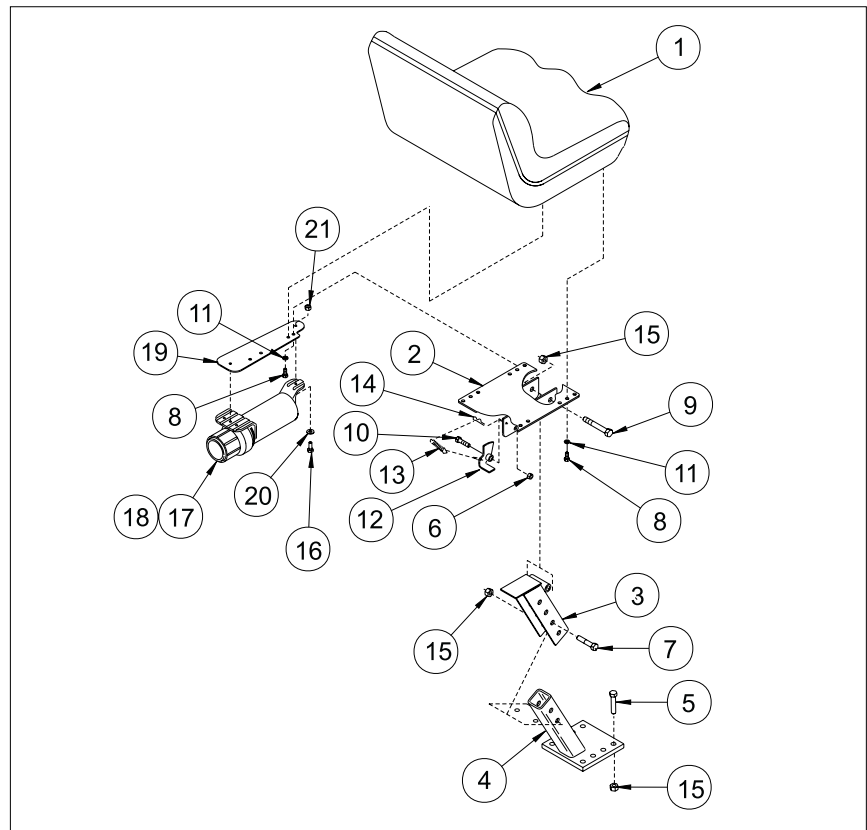
Raising the wheels off the ground will not only reduce stability and digging depth, but impair performance and impose unnecessary stress on the backhoe and tractor.



OPERATION

SEAT ADJUSTMENT

Adjust the seat up or down by removing the 1/2 cap screw (7) and lock nut (15) which secures seat bracket to seat post and raising or lowering the seat. Adjust seat forward or rearward by repositioning seat latch (12) located under mounting plate (2).



OPERATION

SWING LOCK

Use swing lock when transporting or dismounting backhoe.

Position boom straight back and drop pin through holes in swing frame and mainframe. Store pin in hole provided on mainframe.

BOOM LOCK

Use boom lock when transporting backhoe.

1. Completely raise boom and lower dipperstick.
2. Secure boom using boom lock pin and hair pin clip.

TRANSPORTING THE BACKHOE



CAUTION: To avoid possible injury, observe the following safety rules **WHEN TRANSPORTING** the backhoe.

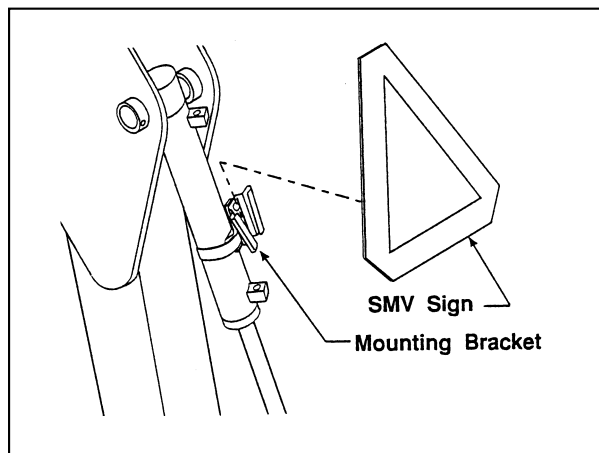
- Travel slowly over rough terrain, on hillsides, and around curves to prevent tipping.
- Do not drive tractor near the edge of a ditch or excavation.
- Use accessory lights and slow moving vehicle emblem when traveling on highways.

Before leaving backhoe operators seat position backhoe for transport by raising boom, swinging to center, curling bucket in, crowding dipperstick in and raising stabilizers.

Install swing and boom lock pins.

When transporting for long distances, periodically examine backhoe and raise boom, stabilizers and bucket back up to full height. It is normal for backhoe to slowly settle while being transported.

IMPORTANT: Position SMV sign on mounting bracket located on bucket cylinder when transporting backhoe. During backhoe operation, position SMV sign on bracket located on tractor.



REMOVAL FROM TRACTOR-STORAGE

Backhoe is self assisting during installation and removal procedures.

1. Put stabilizers down and lift backhoe slightly. Rotate boom straight back.
2. Install swing lock pin.
3. Completely raise boom and lower dipperstick. Curl bucket until bottom of bucket is level with ground. Lower boom until bucket rests firmly on ground.
4. Remove pins which secure backhoe to tractor.
5. Slowly drive forward until tractor clears backhoe. Engage tractor brakes.
6. Lower backhoe by raising stabilizers and boom until backhoe or subframe rests on suitable blocking. Leave stabilizers touching ground.

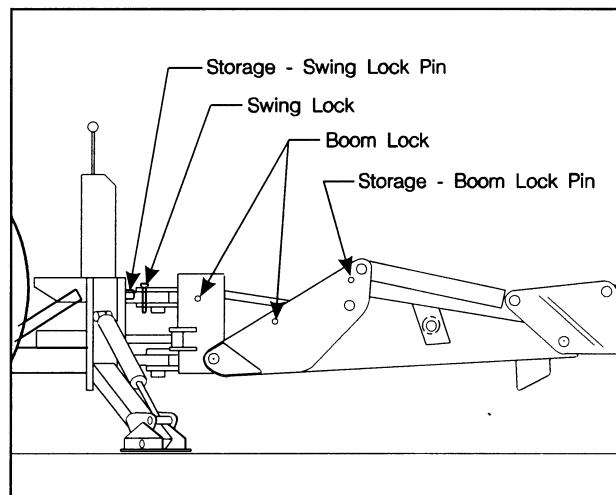
NOTE: For added stability, rest backhoe or subframe on wood blocks or plywood.

7. Shut off tractor. Work handles back and forth to relieve hydraulic pressure. Disconnect hydraulic lines or pump from backhoe.
8. For long term storage coat all exposed cylinder rods with grease.
9. Lubricate all grease fittings, stabilizer pivot pins and complete handle linkage.



WARNING: To avoid injury during removal of backhoe:

- Do not permit bystanders within 15 feet.
- Dismount backhoe on firm level ground.
- Always shut off tractor engine, disengage PTO and relieve pressure before disconnecting oil lines.



MAINTENANCE SECTION

Maintenance Section 5-1

MAINTENANCE

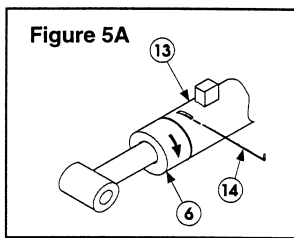
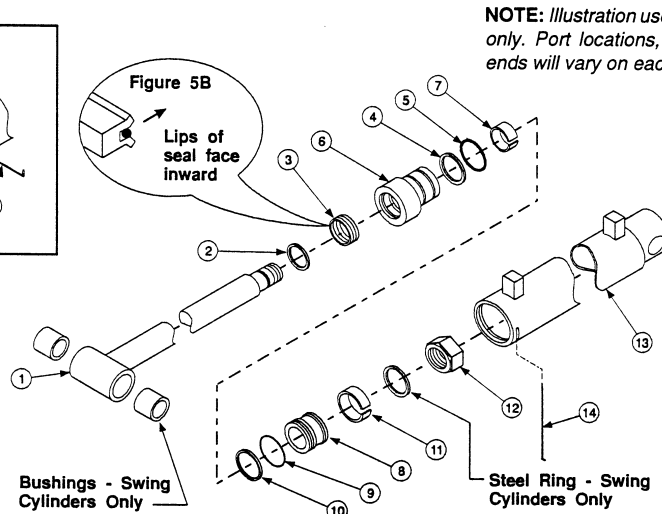


Figure 5
Cylinder Service



NOTE: Illustration used for parts identification only. Port locations, cylinder rod and base ends will vary on each cylinder.

CYLINDER SERVICE

Cylinders are designed to be reliable and easy to service. If a cylinder should malfunction during warranty period, return complete cylinder assembly, without disassembling, to your authorized service department or contact your authorized service department for instructions. Unauthorized disassembly of a cylinder in warranty period will **VOID WARRANTY**.

Following is an outline procedure for disassembling and reassembling cylinders.

CYLINDER

1. Hold cylinder tube (13 figure 5A) stationary and pull wire ring (14) out through slot. Rotate head (6) to ease disassembly.
2. Pull shaft (1), with all assembled parts, out of cylinder tube.

NOTE: Resistance will be felt until head and piston seal (5 & 10) slides over wire retaining ring groove. Seals are usually damaged when cylinder is disassembled.

3. Remove lock nut (12) from end of shaft and slide piston (8) and cylinder head (6) off shaft.
4. Remove piston wear ring (11), piston seal (10), and o-ring (9) from outside grooves on piston (Swing and boom cylinders have additional steel ring between piston and nut).
5. Remove wiper seal (2), rod seal (3) and wear ring (7) from inside of cylinder head and o-ring (5) with backup washer (4) from groove on outside of head.
6. Clean all parts including cylinder tube, in a suitable cleaning solvent, then use air pressure to blow any dirt or excess solvent from all parts.
7. Examine all parts for wear or damage and replace, if necessary.

CYLINDER ASSEMBLY

NOTE: Be careful not to damage seals and o-rings on edges or holes in cylinder tube. Inspect and remove burrs and sharp edges if necessary before reassembly.

1. Place rod seal (3) into groove inside cylinder head.

NOTE: Lips of seal (3) must face inward and seal must be firmly seated in groove (Figure 5B). For easier installation, place seal (3) in 120°F water to warm seal.

2. Install wiper seal (2) with lip of seal facing out and flush with top of cylinder head. Install wear ring (7) inside other end of head.
3. Place o-ring (5) with back-up washer (4) in groove on outside of head. Back-up washer must be on rod side.
4. Remove sharp edges on outer edge of threaded end of shaft (1). Lubricate wiper seal (2) and rod seal (3) in head and carefully slide head onto shaft.
5. Place o-ring (9), piston seal (10) and piston wear ring (11) in grooves on outside of piston.

NOTE: For easier installation, place piston seal (10) in 120°F water to warm seal.

6. Slide piston onto threaded end of shaft with wear ring toward base of cylinder and install lock nut (12). Swing and stabilizer cylinders, tighten lock nut (12) to 300 ft. lbs. Lift, dipperstick and bucket cylinders tighten lock nut (12) to 480 ft. lbs.
7. Lubricate piston wear ring (11) and piston seal (10) on piston, o-ring (5) and backup washer (4) on head and inside of cylinder tube (13), then carefully slide piston and head into cylinder tube.
8. Insert wire retaining ring (14) into slot in cylinder tube (13). Apply pressure to wire ring to thread it into groove while turning cylinder head.

MAINTENANCE



CAUTION: To avoid possible injury, observe the following safety rules when servicing backhoe.

- Do not oil, grease or adjust backhoe while it is in motion.
- Do not change any backhoe relief valve settings. Relief valve settings are factory set for best backhoe performance and safety.
- Escaping fluid under pressure can have sufficient force to penetrate the skin and cause serious injury. Be sure to relieve all pressure before disconnecting lines. Be sure all connections are tight and that lines, pipes and hoses are not damaged before applying pressure to the system.
- Fluid escaping from a very small hole can be almost invisible. Use a piece of cardboard or wood - not your hands - to search for suspected leaks.
- See a doctor at once if injured by escaping fluid. Serious infection or reaction can develop if proper medical treatment is not administered immediately.
- Protect your eyes - wear safety glasses. Guard against injury when driving connecting pins or performing any repair in which particles can chip from work piece or striking tool.

BEGINNING OF SEASON

Remove all protective covering. Remove excessive grease from cylinder rods if unit has been in long term storage.

Check hydraulic hoses for deterioration and replace if necessary. Caution hydraulic hoses may be under pressure. Make sure pressure has been relieved before removing hoses.

Lubricate all grease fittings and oil handle linkage.

Clean and inspect all safety and operation decals. Replace missing or damaged decals.

Replace oil filter.

Fill hydraulic fluid to proper level.

Tighten all loose bolts, nuts and set screws (See torque chart page 5-10).

Sharpen or replace worn bucket teeth.

Operate backhoe slowly for a short time before placing unit under full load.

Fully cycle backhoe through all movements several times to purge air from the system.

HYDRAULIC HOSES



WARNING: Escaping hydraulic fluid under pressure can penetrate skin causing serious injury.

- DO NOT use your hand to check for leaks. Use a piece of cardboard or paper to search for leaks.
- Stop engine and relieve pressure before connecting or disconnecting lines.
- Tighten all connections before starting engine or pressurizing lines.
- Oil leaks on the suction side will draw air into the system, causing oil in reservoir to appear foamy.
- When tightening connections always use two wrenches.

IMPORTANT: Do not over tighten fittings. Make them just tight enough to eliminate leaks.

NOTE: Apply sealant only to all tapered threads unless coupled with swivel adapters. When using teflon tape, wrap tape clockwise (as viewed from end) and wrap tape only twice. Keep sealant away from first two threads of tapered end to prevent contamination of hydraulic fluid. Do not use sealant on o-ring or flare adapter threads.

Hoses on backhoe are very severely worked and will fail in time. Examine them regularly and replace any that show signs of failure. Pay careful attention to routing of hoses so they can move freely, without kinking and cannot be pinched or cut by any part of backhoe.

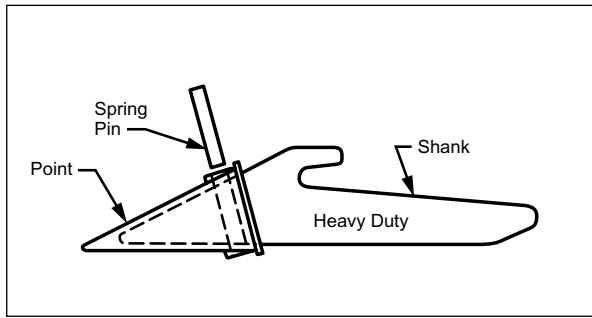
AUXILIARY PTO PUMP HYDRAULIC SYSTEM

Maintain reservoir fluid level at 2 inches below tank top when bucket is extended to full reach, bucket rolled back for loading and resting on the ground, and stabilizers fully raised. If reservoir is over filled, fluid may be forced out of breather cap.

Fill reservoir with 10W or 20W hydraulic oil with SAE J183-M2C33F classification. Dextron 2 ATF fluid and 10W engine oil with API "SD" classification are also acceptable.

Change oil and filter every 200 hours or more often if necessary.

MAINTENANCE



BUCKET TOOTH POINTS

Bucket tooth points are self sharpening and will require little attention. However, points can be replaced when they become badly worn or broken.

If a tooth shank breaks off, becoming lost or damaged so that it cannot hold a tooth point, a new shank should be welded to bucket.

TIGHTENING NUTS AND BOLTS

Periodically check to be sure all bolts and nuts are tight (See torque chart page 5-10).

Check all pivot pins for cotter pins, washers and retainers. If any are missing replace them.

LUBRICATION

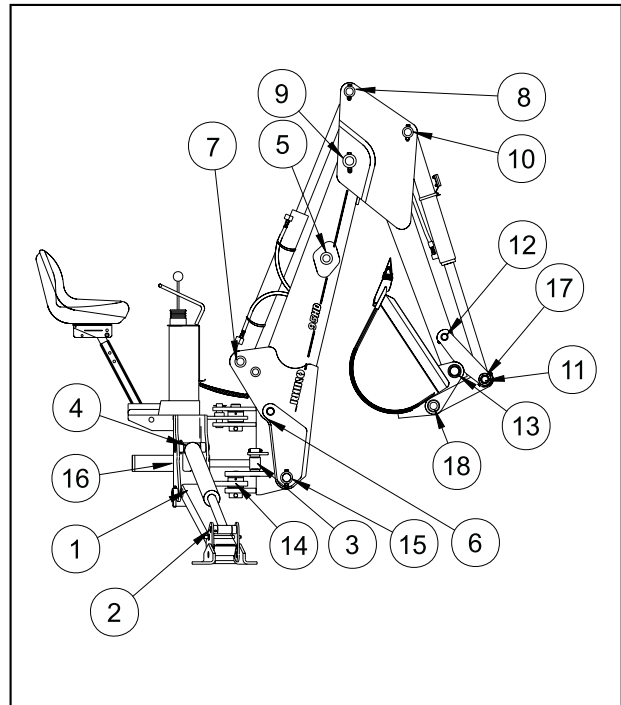
Economical and efficient operation of backhoe is dependent upon regular and proper lubrication of all moving parts with a quality lubricant.

All parts provided with grease fittings should be lubricated with a good quality chassis lube type grease. If any grease fittings are missing, replace them immediately. Clean all fittings thoroughly before using grease gun.

Lubricate all 27 grease fittings at least twice daily (See chart for locations), once at the beginning of operation and again approximately half way through the work day. Grease hourly any joints that operate in water.

Control valve handle linkage should be oiled with SAE 30 oil.

IMPORTANT: Avoid excessive greasing. Dirt collects on exposed grease and greatly increases wear. After greasing wipe off excess grease from fittings.



LUBRICATION CHART

| Item No. | Location Description | Qty. Total |
|----------|----------------------------|------------|
| 1 | Stabilizer Arm | 2 |
| 2 | Rod, Stabilizer Cylinders | 2 |
| 3 | Rod, Swing Cylinders | 2 |
| 4 | Base, Stabilizer Cylinders | 2 |
| 5 | Base, Boom Cylinder | 1 |
| 6 | Rod, Boom Cylinder | 1 |
| 7 | Base, Dipperstick Cylinder | 1 |
| 8 | Rod, Dipperstick Cylinder | 1 |
| 9 | Boom-Dipperstick Pivot | 1 |
| 10 | Base, Bucket Cylinder | 1 |
| 11 | Rod, Bucket Cylinder | 1 |
| 12 | Guide Link - Dipperstick | 1 |
| 13 | Dipperstick-Bucket Pivot | 1 |
| 14 | Swing Post | 2 |
| 15 | Boom to Swing Frame | 1 |
| 16 | Swing Cylinder Base | 4 |
| 17 | Bucket Link - Cylinder | 2 |
| 18 | Bucket Link - Bucket | 1 |

MAINTENANCE

MAINTENANCE

HYDRAULIC TROUBLE SHOOTING

Hydraulic trouble shooting material presented in this section is offered as a guide to diagnosing probable causes and remedies for general operational problems.

Match your problem with the typical problem examples given in the possible cause column. These numbers correspond with the possible cause and correction paragraphs that follow.

NOTE: *If, when using the following chart, it is decided that overhaul of components or pressure adjustment is necessary, it is recommended that your dealer make these repairs. He is equipped to do this work.*

| PROBLEM | POSSIBLE CAUSE |
|---|--|
| Machine fails to operate when initially started. | 1, 2, 5, 7, 15, 23, 31 |
| Machine loses power after initially operating satisfactorily. | 1, 8, 10, 15, 23 |
| Loss of power in lift or dipperstick cylinder, but other cylinders function properly. | 22, 24, 28 |
| Loss of power in any one cylinder including lift and dipperstick. | 8, 9, 10, 11, 12, 13, 22, 23, 24, 25, 28 |
| Loss of power or loss of cushioning action in swing cylinders, but other cylinders function properly. | 8, 9, 10, 11, 12, 13, 22, 23, 25 |
| Maximum swing action cannot be obtained. | 10, 11, 12, 14, 30, 31 |
| Slow operation of machine (lack of power) all cylinders. | 1, 4, 6, 15, 23, 30 |
| Spongy or jerky action of cylinders and/or noisy operation. | 1, 3, 4, 5, 30 |
| Lift dipperstick or bucket cylinders drop under load when lever spools are shifted from neutral. | 10, 11, 25, 26 |
| Load settles. | 8, 10, 13, 24, 25, 26 |
| Leaky cylinders. | 10, 11, 12, 13 |
| Leaky valve. | 8, 15, 16, 27 |
| Sticky valve spool. | 16, 19, 20, 21, 24, 33, 34 |
| Unable to push valve spool in. | 16, 17, 20, 21, 29, 33, 34 |
| Spring centered spools do not return to neutral. | 16, 17, 18, 19, 20, 21, 29 |
| Handle develops excessive play or no longer aligns in center position. | 18, 19, 21, 25 |

| | POSSIBLE CAUSE | CORRECTIVE ACTION |
|----|---|--|
| 1 | Low oil level in reservoir. | Fill reservoir to proper level. |
| 2 | No oil supply to machine. | Coupler not fully engaged. |
| 3 | Air in system. | Purge all circuits of air by operating all cylinders through full movements several times. Check oil in reservoir for foaming. Check all suction lines for leaks. Fill reservoir to correct level. |
| 4 | Oil viscosity too heavy or oil is not at operating temperature. | Use recommended hydraulic fluid. Run machine until it reaches operating temperature. |
| 5 | Pump not running. | Check PTO to be sure it is engaged. Check for sheared key on pump shaft. |
| 6 | Insufficient pumping. | Advance engine throttle. |
| 7 | Improper hose connection. | IMPORTANT: Be sure inlet and return hoses are hooked up correctly. Improper hookup will result in damage to backhoe valve. |
| 8 | Loose hydraulic connections, leaks in fittings or hoses. | Tighten all hose connections and replace all damaged o-rings at leaking o-ring fittings. Check and replace any damaged hoses. |
| 9 | Restrictions in fittings or hoses. | Check and replace any damaged hoses and fittings. Check for pinched hoses. |
| 10 | Oil is bypassing cylinder piston. | Replace or rebuild cylinder. Replace damaged parts. Check if piston is loose on shaft. |
| 11 | Scored piston rods or worn rod guides in cylinder. | Replace or rebuild cylinder. Replace damaged parts. |
| 12 | Bent piston rod in cylinder. | Replace or rebuild cylinder. Replace damaged parts. |
| 13 | Worn or damaged rod seals on cylinder. External leaks. | Re-pack cylinder. Rebuild cylinder replacing damaged parts as necessary. |
| 14 | Swing linkage jammed. | Remove interference. |
| 15 | Excessive back pressure. | Restriction between valve "out" port and reservoir. |
| 16 | Paint on valve spool. Sticking valve spool, or scored valve. | Clean valve spool. Binding may be caused by over tightened plug, mounting bolt, fitting or tie rod bolt. See item 30. |

MAINTENANCE

MAINTENANCE

| POSSIBLE CAUSE | | CORRECTIVE ACTION |
|----------------|---|--|
| 17 | Oil leakage past spool seal into spool cap. | If spool cap contains oil, replace spool seal o-ring. Check for restriction from valve "out" port reservoir. See Fig. 6, item 23. |
| 18 | Broken return springs. | Return springs. See Fig. 6, items 2 & 5. |
| 19 | Bent spool. | Return for factory repair or replace with new spool section. See Fig. 6, items 38, 39, 40. |
| 20 | Foreign particles. | Clean system and valve. |
| 21 | Misalignment of control handle linkage. | Check linkage for binding condition. Fig. 6, items 8, 11, 12. |
| 22 | Spool not moved to full stroke. | Spool travel should be 265" either way or 53" total. See Fig. 11, items 38, 39, 40. |
| 23 | Relief valve setting in control valve too low or defective. | Pressure should be 2500 PSI. Clean or overhaul relief valve or replace cartridge. See Fig. 11, item 18. |
| 24 | Work port relief valve in control valve stuck open or malfunctioning. | Clean relief or replace cartridge. Do not disturb pressure setting. See Fig. 6, items 16, 17, 41. |
| 25 | Worn control valve. | Replace control valve. |
| 26 | Load check poppet in control valve not holding. | Clean check poppet(s) carefully. Ensure free movement and proper seating or replace check poppet(s). See Fig. 6, item 26. |
| 27 | Damaged or worn spool seals. | Replace spool end seals. See Fig. 6, item 23. |
| 28 | Check ball in anti-cavitation is stuck or not seated properly. | Clean anti-cavitation valve carefully. Assure that checks move freely and seat properly or replace cartridge. See Fig. 6, item 17. |
| 29 | Valve cap and center return mechanism binding. | Loosen screws holding cap on valve. See Fig. 6, items 2 & 5. Operate valve spool and retighten screws. |

| POSSIBLE CAUSE | | CORRECTIVE ACTION |
|----------------|---|--|
| 30 | Restrictor in cylinder ports are plugged. | Check restrictors for debris and clean. See Fig. 11, item 3. |
| 31 | Hoses plumbed incorrectly. | Check hose plumbing. See Fig. 11. |
| 32 | Excessive hydraulic pressure due to tractor mechanical forces. | Do not move tractor unless backhoe is up in transport position and backhoe can not contact ground. |
| 33 | After valve has been repaired, grease lubrication on o-rings between sections cause spools to bind due to valve distortion. | Disassemble and remove lubricant from around o-rings. |
| 34 | Valve studs are not torqued to 15 ft. lbs. Distortion causes spool to bind or o-rings to extrude. | Check studs for proper torque. |

This valve is a precision device and is not intended for extensive field adjustment or repair. Field replacement parts are limited to seal kits, cartridges, valve sections and tie rod ends. Beyond replacement of these parts, opening of check cavities and certain relief valve cavities to examine for trapped dirt, or resetting main relief valve with the use of a good pressure gauge, valve should be returned for service.

Dirt and shreds of packing material are the usual causes of valve malfunction. Be sure that oil supply is kept clean. Use only factory supplied packings in cylinder repair. Fittings and hoses must be clean before being removed.

Pages 5-7 & 5-8 explain proper valve repair procedure. Pages 5-9, 6-16 & 6-17 illustrate valve and lists repair parts.

NOTE: Pay close attention to all caution warning notes so valve will not have to be returned to manufacturer for reconditioning.

Troubleshooting guide is designed to help qualified individuals, with valve service training, correct minor problems which may develop. If valve is under warranty do not attempt disassembly for repairs. Contact your authorized dealer.

MAINTENANCE

VALVE SERVICE

REPLACING SECTIONS

For clarification, the inlet cover [cover containing main relief cartridge (18)] will be called the left end of the valve assembly.

Reassemble valve on a flat surface to insure proper section alignment.

1. Remove handle assembly from section being removed.
2. Remove valve from backhoe.
3. Thoroughly clean valve assembly.
4. Before disassembly, mark each section numerically to avoid incorrect reassemble.
5. Remove four hex nuts and lock washers from right (outlet cover) end of valve.
6. Slide outlet cover and each section off tie rods.
7. Replace sections as needed. Reassemble valve.

NOTE: Refer to "Replacing Section Seals" if seals need to be replaced.



WARNING: Do not pre-lube O-ring section seals prior to installation. Compression of lubricants can distort valve causing spool binding.

8. Torque stud nuts evenly to 15ft. Lbs .



CAUTION: If stud nuts are not tightened to proper torque, valve spools may bind or stick, or cause O-ring seals to extrude.

9. Reinstall handle assembly. Use locite 242 (blue) on all screws.

REPLACING SECTION SEALS

1. Disassemble valve as described in previous section.
2. Remove old O-ring section seals. Be careful not to scratch or otherwise damage sealing surface areas.
3. Thoroughly clean O-ring counter bores and surfaces of each valve section.
4. Place valve assembly on a flat surface for reassembly.
5. Replace four O-ring seals. Seal Kit contains the number of section seals required for one work section/inlet cover.
6. Replace work sections on assembly studs in reverse order in which they were removed. O-ring counter bores (with O-rings in place) should be to your right (downstream side of section) with inlet cover on your left.

NOTE: Use care when sliding work sections on tie rods to avoid dislodging O-rings.

7. When all work sections and outlet cover are positioned on the assembly studs, replace lock washers and nuts.
8. Support alve on valve mounting brackets (Item 24, p.22). Tap all sections downward with rubber mallet to align sections evenly against rods.
8. Torque stud nuts evenly 15ft. Lbs.

SPOOL SEAL REMOVAL

1. Remove handle assembly. Center two sections - Remove clevis pin from spool.
2. Remove bonnet and spool positioner assembly from rear of the work section.
3. Carefully slide spool out of valve housing.
4. Remove old spool seals. Be careful not to scratch or damage spool bore and sealing surfaces.
5. Thoroughly clean both seal grooves and exposed end of spool.

SPOOL SEAL INSTALLATION

1. Lightly oil and insert one new spool seal in handle end (front) seal groove of valve housing. Verify seal fit by carefully running your finger around exposed edge of seal. Seal should have a perfect ridge with no kinks or twists.
2. Lightly oil valve spool and, starting from positioner end (rear), reintroduce spool into valve housing.
3. Slowly push spool past seal with a twisting motion. Stop when seal groove is exposed on positioner end.



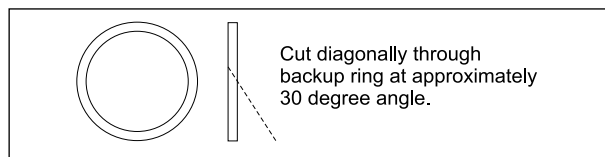
CAUTION: Do not pull spool too far, as this will allow seal in front groove to enter a spool groove. Seal may be cut when spool is pushed back.

4. Lightly oil and insert remaining spool seal in bonnet end seal groove. Verify seal fit by carefully running your finger around exposed edge of seal. Seal should have a perfect ridge with no kinks or twists.
5. Return spool to center position with a twisting motion.
6. Reattach spool positioner. Use loctite 242 (blue) thread locking compound on spool screw holding positioner parts to spool. Be careful not to over torque this screw and twist it off. Use 7ft. lb. maximum torque. Slide bonnet in place. Replace bonnet screws. Torque bonnet screws to 5-7 ft. Lbs.
7. Replace spool clevis pin and handle assembly.

REPLACING DAMAGED BACKUP RINGS

Backup rings are installed at the factory using a special sizing tool.

Do not replace backup rings offered in seal kits unless original ring has been damaged.



1. If backup ring must be replaced, cut replacement backup ring as shown.



CAUTION: Make only one diagonal cut in backup ring. Do not cut backup ring into two pieces.

2. Slip backup ring over cartridge and into place.

MAINTENANCE

INSTALLING "SC" SPOOL POSITIONER KIT (Item 2) AND FLOAT POSITIONER KIT (Item 5)

1. Remove socket head cap screws and bonnet from section.
2. Remove spool from section. Follow instructions in "Spool Seal Removal" section except do not remove seals.
3. Replace parts in spool positioner kit.

NOTE: Spool screw on end of spool is loctited in place. Do not replace unless it is damaged. If spool screw must be replaced, refer to "Replacing Spool Ends" Section.

4. Replace spool in section. Refer to instructions in "Spool Seal Installation" section.
5. Replace bonnet and socket head cap screws.

REPLACING SPOOL ENDS - CENTER TWO SECTIONS

Spool extensions (handle end) are installed at the factory using Loctite 262. Spool screws (positioner end) are installed at the factory using Loctite 242. Do not replace them unless they are damaged. Use following procedure to replace them.

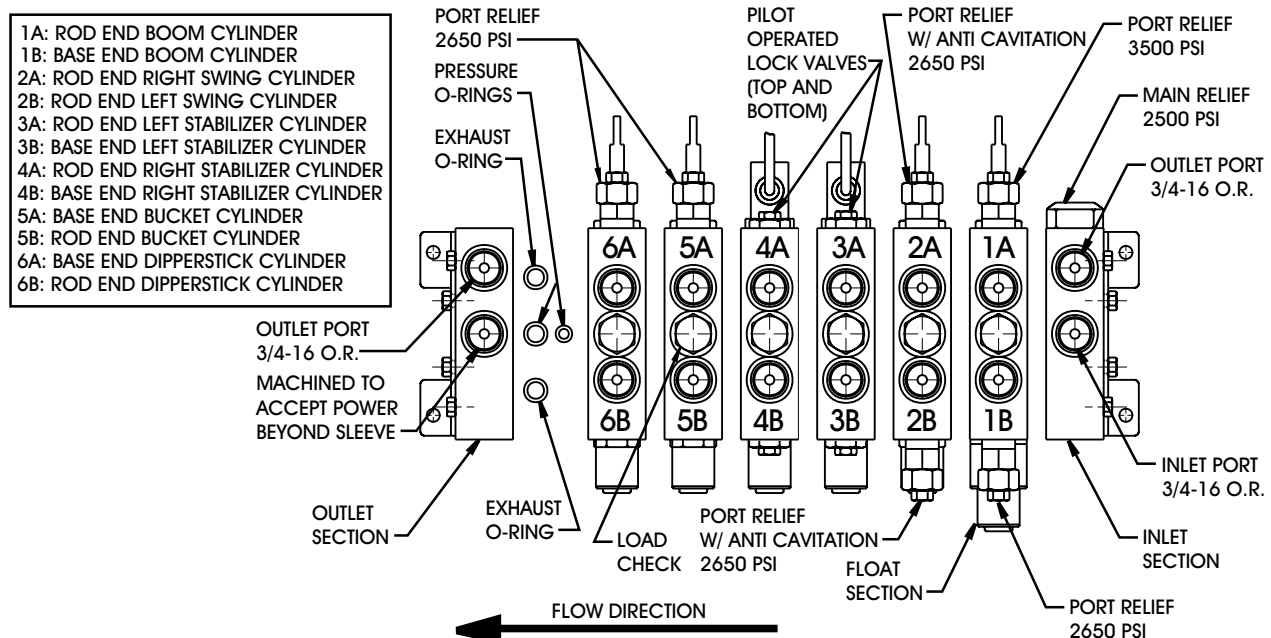
1. Remove spool from section. Follow instructions in "Spool Seal Removal Section" except do not remove seals.
2. Clamp spool using vice grips on land section of spool not machined for valve bore.
3. Unscrew damaged end.

NOTE: Heat may be applied to loosen Loctite.

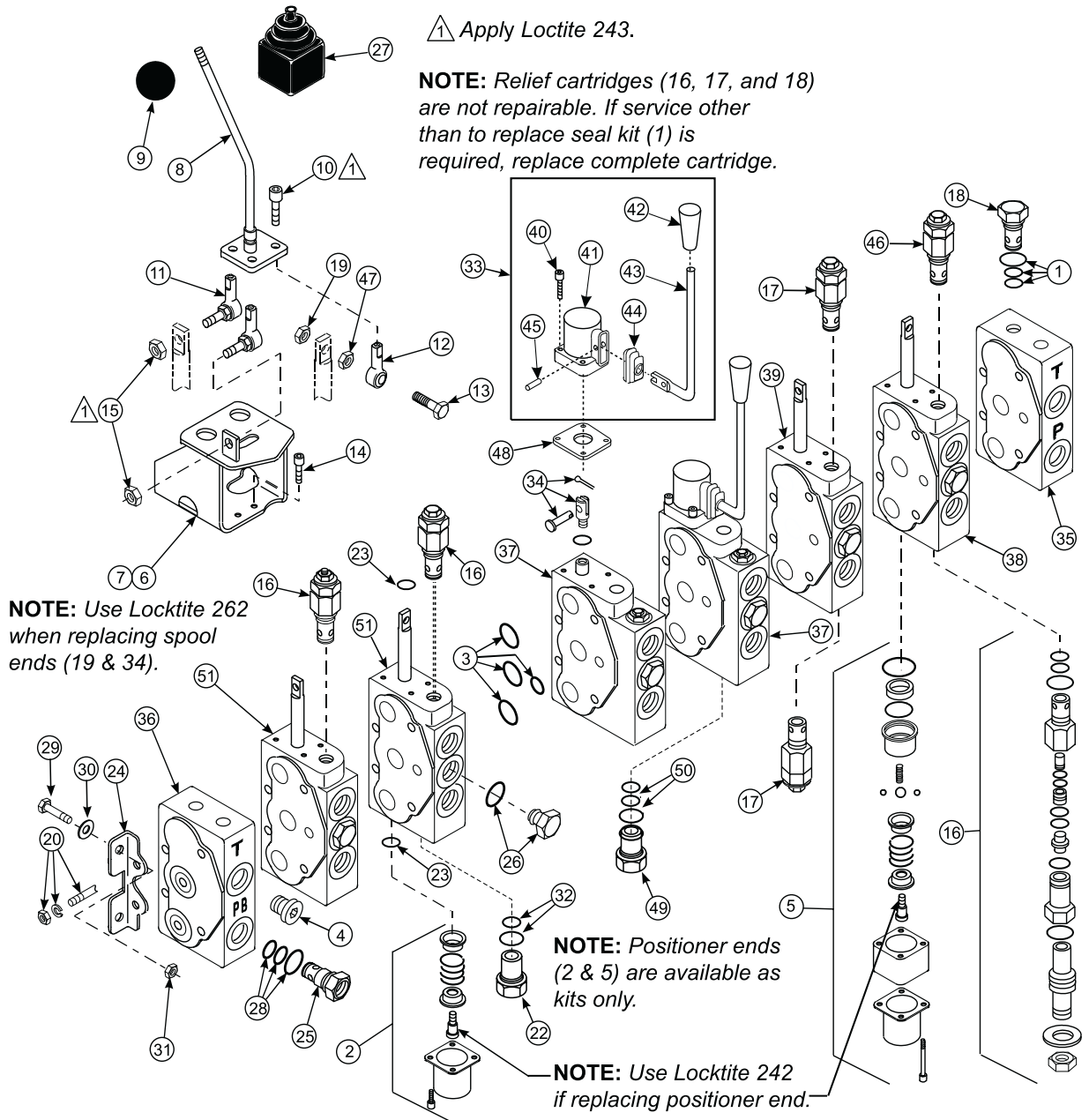
4. Clean threads with Loctite Primer and install using Loctite 262 for handle ends and Loctite 242 for positioner ends.
5. Replace spool in section. Refer to instructions in "Spool Seal Installation" section.

| RELIEF VALVE CARTRIDGE TABLE | | | | |
|------------------------------|-------------------------|---|------|---|
| Relief type | Location | Function | PSI | How to test |
| Main | Inlet section* | Protect all functions of backhoe | 2500 | Plug gauge directly into stabilizer work section and operate stabilizer |
| Port relief | Section 1, A port* | Protect backhoe from bucket digging induced loads | 3500 | A porta-power with an oil pressure gauge is required. |
| Port relief | Section 1, B port* | Protect backhoe from bucket digging induced loads | 2650 | Install porta-power hose directly into working port of relief to be checked. |
| Port relief | Section 2, A & B ports* | Protect swing cylinder circuit from shock loading | 2650 | Pressurize porta-power and observe maximum pressure attained. Port reliefs should "crack" at or down to 200 PSI below specified relief setting. |
| Port relief | Section 5, A port* | Protect backhoe from bucket digging induced loads | 2650 | |
| Port relief | Section 6, A port* | Protect backhoe from bucket digging induced loads | 2650 | |

MAINTENANCE



MAINTENANCE









MAINTENANCE

MAINTENANCE

GENERAL TORQUE SPECIFICATIONS

USE THE FOLLOWING TORQUES WHEN SPECIAL TORQUES ARE NOT GIVEN

| AMERICAN STANDARD CAP SCREWS | | | | | | | | METRIC CAP SCREWS | | | | | | | | | |
|------------------------------|---|------|------|------|---|-----|------|-------------------|--------------|--|------|------|------|---|------|------|------|
| SAE Grade | 5 | | | | 8 | | | | Metric Class | 8.8 | | | | 10.9 | | | |
| |  | | | |  | | | | |   | | | |   | | | |
| Cap Screw | TORQUE | | | | TORQUE | | | | Cap Screw | TORQUE | | | | TORQUE | | | |
| Size | FT-LBS | | Nm | | FT-LBS | | Nm | | Size | FT-LBS | | Nm | | FT-LBS | | Nm | |
| Inches | MIN | MAX | MIN | MAX | MIN | MAX | MIN | MAX | Millimeters | MIN | MAX | MIN | MAX | MIN | MAX | MIN | MAX |
| 1/4-20 | 6.25 | 7.25 | 8.5 | 10 | 8.25 | 9.5 | 11 | 13 | M6x100 | 6 | 8 | 8 | 11 | 9 | 11 | 12 | 15 |
| 1/4-28 | 8 | 9 | 11 | 12 | 10.5 | 12 | 14 | 16 | M8 x 1.25 | 16 | 20 | 215 | 27 | 23 | 27 | 31 | 36.5 |
| 5/16 - 18 | 14 | 15 | 19 | 20 | 18.5 | 20 | 25 | 27 | M10 x 1.50 | 29 | 35 | 39 | 47 | 42 | 52 | 57 | 70 |
| 5/16 - 24 | 17.5 | 19 | 23 | 26 | 23 | 25 | 31 | 34 | M12 x 1.75 | 52 | 62 | 70 | 84 | 75 | 91 | 102 | 123 |
| 3/8 - 16 | 26 | 28 | 35 | 38 | 35 | 37 | 47.5 | 50 | M14 x 2.00 | 85 | 103 | 115 | 139 | 120 | 146 | 163 | 198 |
| 3/8 - 24 | 31 | 34 | 42 | 46 | 41 | 45 | 55.5 | 61 | M16 x 2.50 | 130 | 158 | 176 | 214 | 176 | 216 | 238 | 293 |
| 7/16 - 14 | 41 | 45 | 55.5 | 61 | 55 | 60 | 74.5 | 81 | M18 x 2.50 | 172 | 210 | 233 | 284 | 240 | 294 | 325 | 398 |
| 7/16 - 20 | 51 | 55 | 69 | 74.5 | 68 | 75 | 92 | 102 | M20 x 2.50 | 247 | 301 | 335 | 408 | 343 | 426 | 465 | 577 |
| 1/2 - 13 | 65 | 72 | 88 | 97.5 | 86 | 96 | 116 | 130 | M22 x 2.50 | 332 | 404 | 450 | 547 | 472 | 576 | 639 | 780 |
| 1/2 - 20 | 76 | 84 | 103 | 114 | 102 | 112 | 138 | 152 | MM24 x 3.00 | 423 | 517 | 573 | 700 | 599 | 732 | 812 | 992 |
| 9/16 - 12 | 95 | 105 | 129 | 142 | 127 | 140 | 172 | 190 | M27 x 3.00 | 637 | 779 | 863 | 1055 | 898 | 1098 | 1217 | 1488 |
| 9/16 - 18 | 111 | 123 | 150 | 167 | 148 | 164 | 200 | 222 | M30 x 3.00 | 872 | 1066 | 1181 | 1444 | 1224 | 1496 | 1658 | 2027 |
| 5/8 - 11 | 126 | 139 | 171 | 188 | 168 | 185 | 228 | 251 | | | | | | | | | |
| 5/8 - 18 | 152 | 168 | 206 | 228 | 203 | 224 | 275 | 304 | | | | | | | | | |
| 3/4 - 10 | 238 | 262 | 322 | 355 | 318 | 350 | 431 | 474 | | | | | | | | | |
| 3/4 - 16 | 274 | 305 | 371 | 409 | 365 | 402 | 495 | 544 | | | | | | | | | |
| 7/8 - 9 | 350 | 386 | 474 | 523 | 466 | 515 | 631 | 698 | | | | | | | | | |
| 7/8 - 14 | 407 | 448 | 551 | 607 | 543 | 597 | 736 | 809 | | | | | | | | | |
| 1 - 8 | 537 | 592 | 728 | 802 | 716 | 790 | 970 | 1070 | | | | | | | | | |
| 1 - 14 | 670 | 740 | 908 | 1003 | 894 | 987 | 1211 | 1337 | | | | | | | | | |

NOTE: These values apply to fasteners as received from the supplier, dry or when lubricated with normal engine oil. They do not apply if special graphite or molydisulphide greases or other extreme pressure lubricants are used.

MAINTENANCE

Torque Specifications for 37° JIC Fittings

| Size | Thread Size | Assembly Torque | | Tube Connection F.F.F.T. | Swivel Nut or Hose Connection F.F.F.T. |
|------|-------------|-----------------|----------|--------------------------|--|
| | | in. lb. | ft. lb. | | |
| -4 | 7/16-20 | 140 ± 10 | 12 ± 1 | 2 | 2 |
| -5 | 1/2-20 | 180 ± 15 | 15 ± 1 | 2 | 2 |
| -6 | 9/16-18 | 250 ± 15 | 21 ± 1 | 1 1/2 | 1 1/4 |
| -8 | 3/4-16 | 550 ± 25 | 45 ± 5 | 1 1/2 | 1 |
| -12 | 1 1/16-12 | 1000 ± 50 | 85 ± 5 | 1 1/4 | 1 |
| -16 | 1 5/16-12 | 1450 ± 50 | 120 ± 5 | 1 | 1 |
| -20 | 1 5/8-12 | 2000 ± 100 | 170 ± 10 | 1 | 1 |
| -24 | 1 7/8-12 | 2400 ± 150 | 200 ± 15 | 1 | 1 |
| -32 | 2 1/2-12 | 3200 ± 200 | 270 ± 20 | 1 | 1 |

Torque Specifications for SAE O-Ring Fittings

| Size | Thread Size | Assembly Torque | | F.F.F.T. |
|------|-------------|-----------------|-----------|-----------|
| | | in. lb. | ft. lb. | |
| 2 | 5/16-24 | 90 ± 5 | 7.5 ± 0.5 | 1 ± .25 |
| 3 | 3/8-24 | 170 ± 10 | 14 ± 1 | 1 ± .25 |
| 4 | 7/16-20 | 220 ± 15 | 18 ± 1 | 1 ± .25 |
| 5 | 1/2-20 | 260 ± 15 | 22 ± 1 | 1 ± .25 |
| 6 | 9/16-18 | 320 ± 20 | 27 ± 2 | 1.5 ± .25 |
| 8 | 3/4-16 | 570 ± 25 | 48 ± 2 | 1.5 ± .25 |
| 10 | 7/8-14 | 1060 ± 50 | 90 ± 5 | 1.5 ± .25 |
| 12 | 1 1/16-12 | 1300 ± 50 | 110 ± 5 | 1.5 ± .25 |
| 14 | 1 3/16-12 | 1750 ± 75 | 145 ± 6 | 1.5 ± .25 |
| 16 | 1 5/16-12 | 1920 ± 25 | 160 ± 6 | 1.5 ± .25 |
| 20 | 1 5/8-12 | 2700 ± 150 | 225 ± 12 | 1.5 ± .25 |
| 24 | 1 7/8-12 | 3000 ± 150 | 250 ± 12 | 1.5 ± .25 |
| 32 | 2 1/2-12 | 3900 ± 200 | 325 ± 15 | 1.5 ± .25 |

**RHINO
LIMITED WARRANTY**

1. LIMITED WARRANTIES

- 1.01. Servis-Rhino warrants for one year from the purchase date to the original non-commercial, governmental, or municipal purchaser ("Purchaser") and warrants for six months to the original commercial or industrial purchaser ("Purchaser") that the goods purchased are free from defects in material or workmanship.
- 1.02. Manufacturer will replace for the Purchaser any part or parts found, upon examination at one of its factories, to be defective under normal use and service due to defects in material or workmanship.
- 1.03. This limited warranty does not apply to any part of the goods which has been subjected to improper or abnormal use, negligence, alteration, modification, or accident, damaged due to lack of maintenance or use of wrong fuel, oil, or lubricants, or which has served its normal life. This limited warranty does not apply to any part of any internal combustion engine, or expendable items such as blades, shields, guards, or pneumatic tires except as specifically found in your Operator's Manual.
- 1.04. Except as provided herein, no employee, agent, Dealer, or other person is authorized to give any warranties of any nature on behalf of Manufacturer.

2. REMEDIES AND PROCEDURES.

- 2.01. This limited warranty is not effective unless the Purchaser returns the Registration and Warranty Form to Manufacturer within 30 days of purchase.
- 2.02. Purchaser claims must be made in writing to the Authorized Dealer ("Dealer") from whom Purchaser purchased the goods or an approved Authorized Dealer ("Dealer") within 30 days after Purchaser learns of the facts on which the claim is based.
- 2.03. Purchaser is responsible for returning the goods in question to the Dealer.
- 2.04. It after examining the goods and/or parts in question, Manufacturer finds them to be defective under normal use and service due to defects in material or workmanship, Manufacturer will:
 - (a) Repair or replace the defective goods or part(s) or
 - (b) Reimburse Purchaser for the cost of the part(s) and reasonable labor charges (as determined by Manufacturer) if Purchaser paid for the repair and/or replacement prior to the final determination of applicability of the warranty by Manufacturer.The choice of remedy shall belong to Manufacturer.
- 2.05. Purchaser is responsible for any labor charges exceeding a reasonable amount as determined by Manufacturer and for returning the goods to the Dealer, whether or not the claim is approved. Purchaser is responsible for the transportation cost for the goods or part(s) from the Dealer to the designated factory.

3. LIMITATION OF LIABILITY.

- 3.01. MANUFACTURER DISCLAIMS ANY EXPRESS (EXCEPT AS SET FORTH HEREIN) AND IMPLIED WARRANTIES WITH RESPECT TO THE GOODS INCLUDING, BUT NOT LIMITED TO, MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.
- 3.02. MANUFACTURER MAKES NO WARRANTY AS TO THE DESIGN, CAPABILITY, CAPACITY, OR SUITABILITY FOR USE OF THE GOODS.
- 3.03. EXCEPT AS PROVIDED HEREIN, MANUFACTURER SHALL HAVE NO LIABILITY OR RESPONSIBILITY TO PURCHASER OR ANY OTHER PERSON OR ENTITY WITH RESPECT TO ANY LIABILITY, LOSS, OR DAMAGE CAUSED OR ALLEGED TO BE CAUSED DIRECTLY OR INDIRECTLY BY THE GOODS INCLUDING, BUT NOT LIMITED TO, ANY INDIRECT, SPECIAL, CONSEQUENTIAL, OR INCIDENTAL DAMAGES RESULTING FROM THE USE OR OPERATION OF THE GOODS OR ANY BREACH OF THIS WARRANTY. NOTWITHSTANDING THE ABOVE LIMITATIONS AND WARRANTIES, MANUFACTURERS LIABILITY HEREUNDER FOR DAMAGES INCURRED BY PURCHASER OR OTHERS SHALL NOT EXCEED THE PRICE OF THE GOODS.
- 3.04. NO ACTION ARISING OUT OF ANY CLAIMED BREACH OF THIS WARRANTY OR TRANSACTIONS UNDER THIS WARRANTY MAY BE BROUGHT MORE THAN TWO (2) YEARS AFTER THE CAUSE OF ACTION HAS OCCURRED.

4. MISCELLANEOUS.

- 4.01. Proper Venue for any lawsuits arising from or related to this limited warranty shall be only in Guadalupe County, Texas.
- 4.02. Manufacturer may waive compliance with any of the terms of this limited warranty, but no waiver of any terms shall be deemed to be a waiver of any other term.
- 4.03. If any provision of this limited warranty shall violate any applicable law and is held to be unenforceable, then the invalidity of such provision shall not invalidate any other provisions herein.
- 4.04. Applicable law may provide rights and benefits to purchaser in addition to those provided herein.

KEEP FOR YOUR RECORDS

ATTENTION: Purchaser should fill in the blanks below for his reference when buying repair parts and/or for proper machine identification when applying for warranty.

Rhino Implement Model _____ Serial Number _____
Date Purchased _____ Dealer _____

ATTENTION:
READ YOUR OPERATORS MANUAL

© 2004 Alamo Group Inc.

RHINO
Member of the Alamo Group
1020 S. Sangamon Ave.
Gibson City, IL 60936
800-446-5158





TO THE OWNER/OPERATOR/DEALER

In addition to the standard Limited Warranty shown on the facing page, Rhino also provides:

1. A TWO-YEAR (24 months) LIMITED WARRANTY* on non-perishable structural items such as: Loader Boom, Side Frames, Mount Brackets, Backhoe Boom, Dipper, Main Frame, Stabilizer Legs, Swing Bracket, Subframe and Related Mounting Brackets provided they have not been subjected to abuse or misuse and have been properly maintained as noted.

NOTE – “properly maintained” specifically includes, but is not limited to:

- A) Regular lubrication.
- B) Using proper amounts of correct hydraulic fluid.
- C) Regular torque inspection of all fasteners.

2. *WARRANTY LIMITATIONS – Warranty is ONE-YEAR (12 months) for hydraulic cylinders and seals, pivot pins, wear bushings, hydraulic hoses, buckets or other attachments, wear or cutting edges and tooth bars. After one year (12 months) standard warranty, these items are considered “Wearing Perishable Parts” and replacement is the users’ responsibility.



TO THE OWNER/OPERATOR/DEALER

To keep your implement running efficiently and safely, read your manual thoroughly and follow these directions and the Safety Messages in this Manual. The Table of Contents clearly identifies each section where you can easily find the information you need.

The OCCUPATIONAL SAFETY AND HEALTH ACT (1928.51 Subpart C) makes these minimum safety requirements of tractor operators:

REQUIRED OF THE OWNER:

1. Provide a Roll-Over-Protective Structure that meets the requirements of this Standard; and
2. Provide Seatbelts that meet the requirements of this paragraph of this Standard and SAE J4C; and
3. Ensure that each employee uses such Seatbelt while the tractor is moving; and
4. Ensure that each employee tightens the Seatbelt sufficiently to confine the employee to the protected area provided by the ROPS.

REQUIRED OF THE OPERATOR

1. Securely fasten seatbelt if the tractor has a ROPS.
2. Where possible, avoid operating the tractor near ditches, embankments, and holes.
3. Reduce speed when turning, crossing slopes, and on rough, slick, or muddy surfaces.
4. Stay off slopes too steep for safe operation.
5. Watch where you are going - especially at row ends, on roads, and around trees.
6. Do not permit others to ride.
7. Operate the tractor smoothly - no jerky turns, starts, or stops.
8. Hitch only to the drawbar and hitch points recommended by the tractor manufacturer.
9. When the tractor is stopped, set brakes securely and use park lock, if available.

-
-
- Keep children away from danger all day, every day...**
 - Equip tractors with rollover protection (ROPS) and keep all machinery guards in place...**
 - Please work, drive, play and live each day with care and concern for your safety and that of your family and fellow citizens**

