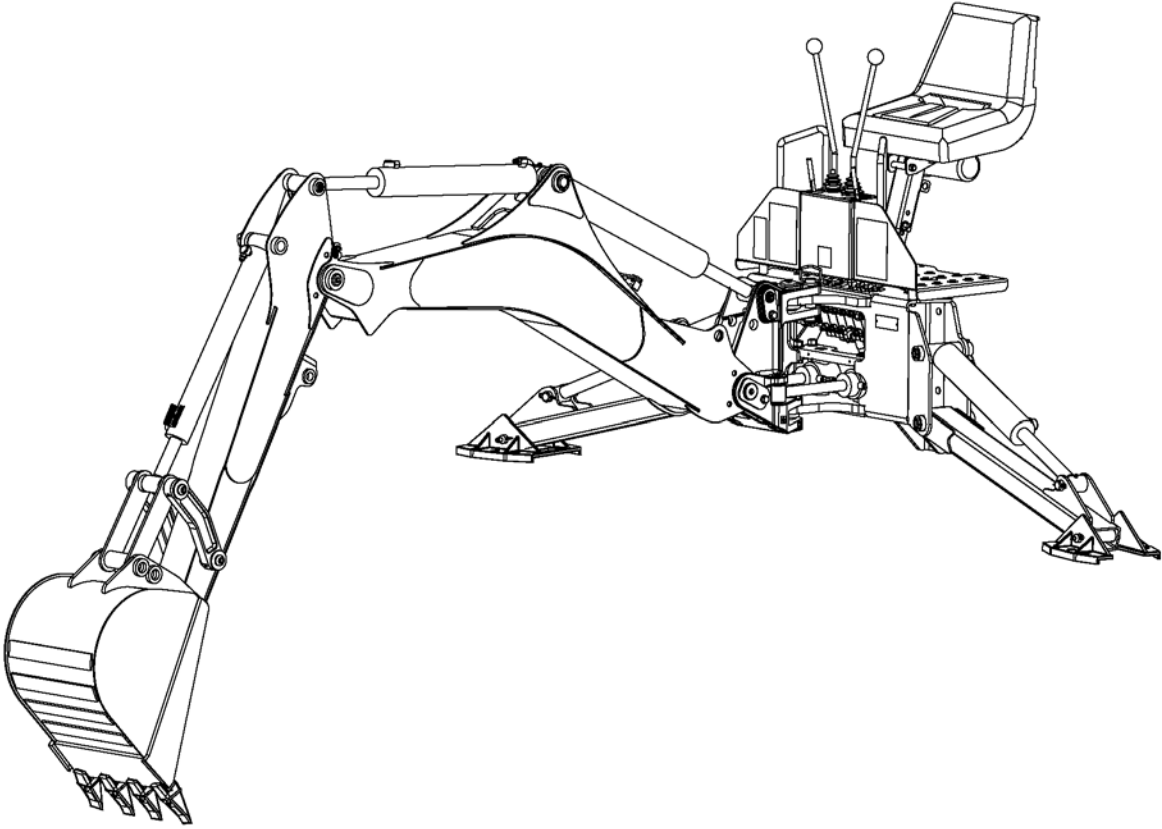


WOODS BACKHOE BH90-X



MAN0451
(Rev. 03/09/2010)

WOODS®

OPERATOR'S MANUAL

TO THE DEALER:

Assembly and proper installation of this product is the responsibility of the Woods® dealer. Read manual instructions and safety rules. Make sure all items on the Dealer's Pre-Delivery and Delivery Check Lists in the Operator's Manual are completed before releasing equipment to the owner.

The dealer must complete the online Product Registration form at the Woods Dealer Website which certifies that all Dealer Check List items have been completed. Please contact your dealer to complete this form. Dealers can register all Woods product at dealer.WoodsEquipment.com under Product Registration.

Failure to register the product does not diminish customer's warranty rights.

TO THE OWNER:

Read this manual before operating your Woods equipment. The information presented will prepare you to do a better and safer job. Keep this manual handy for ready reference. Require all operators to read this manual carefully and become acquainted with all adjustment and operating procedures before attempting to operate. Replacement manuals can be obtained from your dealer. To locate your nearest dealer, check the Dealer Locator at www.WoodsEquipment.com, or in the United States and Canada call 1-800-319-6637.

The equipment you have purchased has been carefully engineered and manufactured to provide dependable and satisfactory use. Like all mechanical products, it will require cleaning and upkeep. Lubricate the unit as specified. Observe all safety information in this manual and safety decals on the equipment.

For service, your authorized Woods dealer has trained mechanics, genuine Woods service parts, and the necessary tools and equipment to handle all your needs.

Use only genuine Woods service parts. Substitute parts will void the warranty and may not meet standards required for safe and satisfactory operation. Record the model number and serial number of your equipment in the spaces provided:

Model: _____ **Date of Purchase:** _____

Serial Number: (see Safety Decal section for location) _____

Provide this information to your dealer to obtain correct repair parts.

Throughout this manual, the term **NOTICE** is used to indicate that failure to observe can cause damage to equipment. The terms **CAUTION**, **WARNING**, and **DANGER** are used in conjunction with the Safety-Alert Symbol (a triangle with an exclamation mark) to indicate the degree of hazard for items of personal safety.



This is the safety alert symbol. It is used to alert you to potential personal injury hazards. Obey all safety messages that follow this symbol to avoid possible injury or death.



Indicates a hazardous situation which, if not avoided, will result in death or serious injury.



Indicates a hazardous situation which, if not avoided, could result in death or serious injury.



Indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.

**IMPORTANT
or NOTICE**

Is used to address practices not related to personal injury.

NOTE

Indicates helpful information.

WOODS®


ALITEC™
BMP®
CENTRAL FABRICATORS®
GANNON®
GILL®
WAIN-ROY®
WOODS®

2 Introduction

Gen'l (Rev. 3/5/2010)


TABLE OF CONTENTS

INTRODUCTION	2
SPECIFICATIONS	4
GENERAL INFORMATION	6
SAFETY RULES	7
SAFETY DECALS	10
OPERATION	12
OWNER SERVICE	18
TROUBLESHOOTING	20
DEALER SERVICE	22
ASSEMBLY	26
DEALER CHECK LIST	32
INDEX TO PARTS LISTS	33
BOLT TORQUE CHART	47
BOLT SIZE CHART & ABBREVIATIONS	48
INDEX	49
REPLACEMENT PARTS WARRANTY	50
PRODUCT WARRANTY	INSIDE BACK COVER



¡LEA EL INSTRUCTIVO!

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



This Operator's Manual should be regarded as part of the machine. Suppliers of both new and second-hand machines must make sure that this manual is provided with the machine.

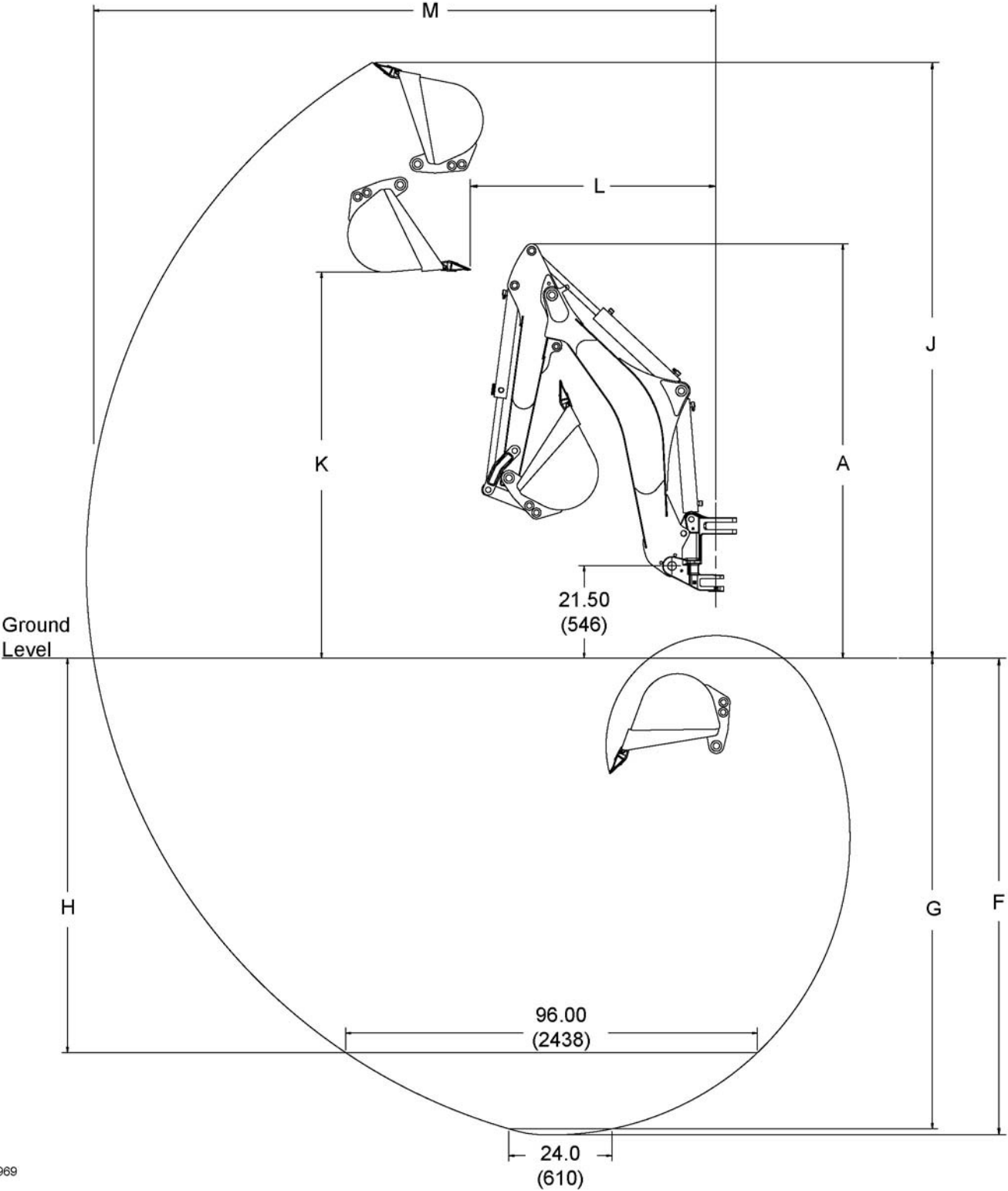
BH90-X SPECIFICATIONS

Description	Illustration	English	Metric
Transport Height*	A	97"	2464 mm
Stabilizer Spread (Transport)*		66"	1676 mm
Angle of Departure		15°	15°
Digging Depth, Maximum*	F	110"	2794 mm
Digging Depth, 2 ft. Flat Bottom*	G	109"	2769 mm
Digging Depth, 8 ft. Flat Bottom*	H	91"	2311 mm
Overall Operating Height*	J	139"	3531 mm
Loading Height*	K	89"	2261 mm
Loading Reach*	L	57"	1448 mm
Reach from Swing Pivot*	M	145"	3683 mm
Bucket Rotation*		180°	180°
Swing Arc*		180°	180°
Stabilizer Spread (Operating)*		100"	2540 mm
Leveling Angle*		10°	10°
Operating Pressure*		2500 psi	17.2 Mpa
Operating Flow		9 - 12 gpm	34 - 45 lpm
Bucket Digging Force*		5070 lbs	22552 N
Dipper Digging Force*		2900 lbs	12900 N

Bucket Capacity (Heaped)		cu.-ft.	cu.-meter
12" (305 mm)		1.64	0.046
16" (406 mm)		2.37	0.067
18" (457 mm)		2.58	0.073
24" (610 mm)		3.72	0.105
36" (914 mm)		3.93	0.111

* Per Definitions in SAE J49 Standard

BH90-X SPECIFICATIONS



CD6969

GENERAL INFORMATION

WARNING

■ Some illustrations in this manual show the backhoe with safety shields removed to provide a better view. The backhoe should never be operated with any safety shielding removed.

The purpose of this manual is to assist in setting up, operating and maintaining your backhoe. Read it carefully. It furnishes information and instructions that will help you achieve years of dependable performance.

These instructions have been compiled from extensive field experience and engineering data. Some information may be general in nature due to unknown and varying conditions. However, through experience and these instructions, you should be able to develop procedures suitable to your particular situation.

The illustrations and data used in this manual were current at the time of printing, but due to possible in-line production changes, your machine may vary slightly in detail. We reserve the right to redesign and change the machines as may be necessary without notification.

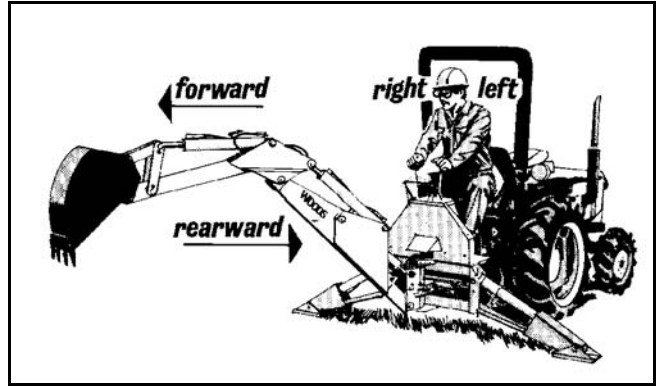


Figure 1. Backhoe Directions

Throughout this manual, references are made to right, left, forward and rearward directions. These are determined from the backhoe operator seat position facing the backhoe as shown in Figure 1.

Terms for backhoe components have some variations throughout the industry. We use SAE designations as shown in Figure 2.

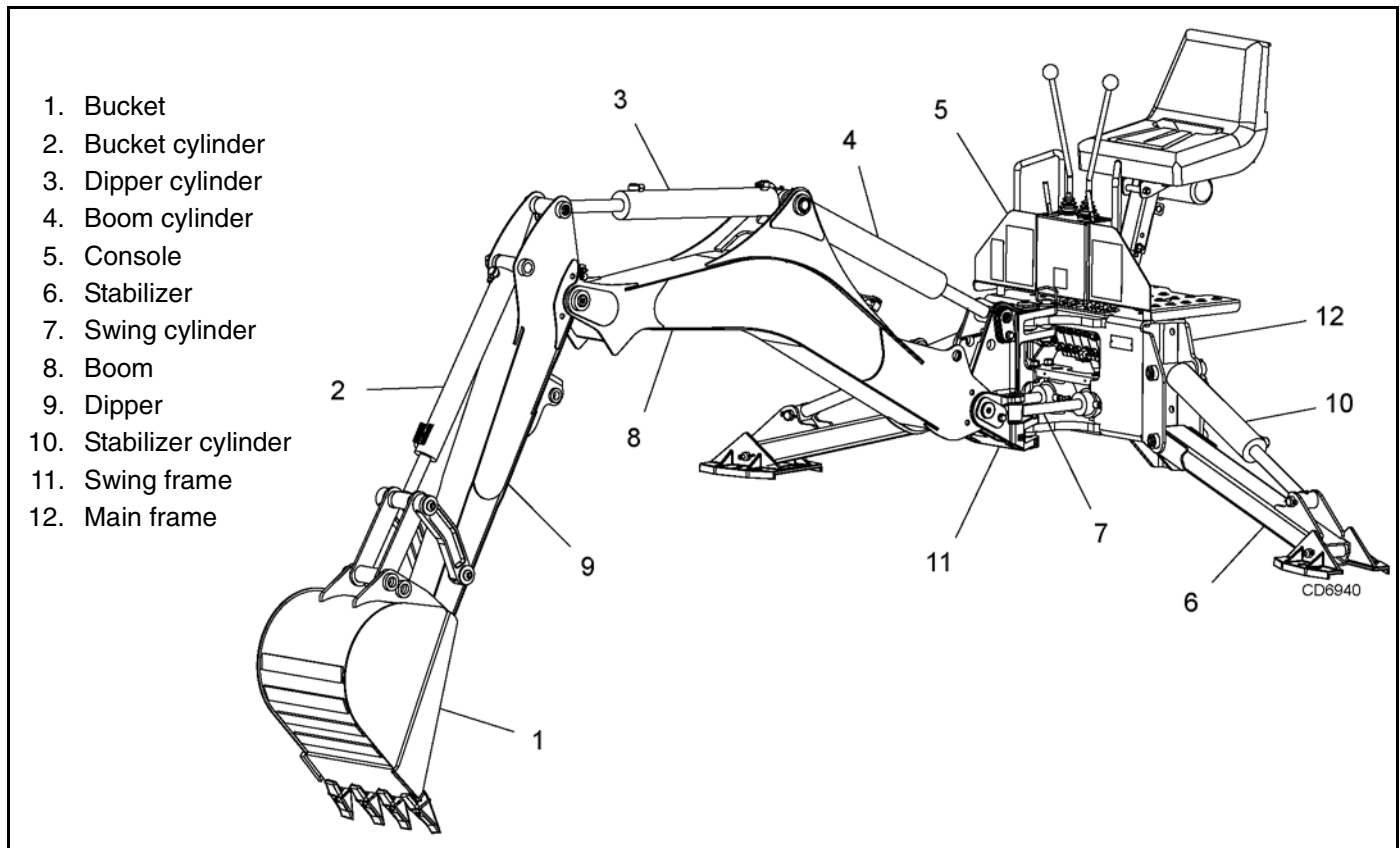


Figure 2. Backhoe Components

SAFETY RULES



ATTENTION! BECOME ALERT! YOUR SAFETY IS INVOLVED!



Safety is a primary concern in the design and manufacture of our products. Unfortunately, our efforts to provide safe equipment can be wiped out by an operator's single careless act.

In addition to the design and configuration of equipment, hazard control and accident prevention are dependent upon the awareness, concern, judgement, and proper training of personnel involved in the operation, transport, maintenance, and storage of equipment.

It has been said, "The best safety device is an informed, careful operator." We ask you to be that kind of operator.

INSTALLATION

■ Hydraulics must be connected as instructed in this manual. Do not substitute parts, modify, or connect in any other way.

■ After connecting hoses, check that all control lever positions function as instructed in the Operator's Manual. Do not put into service until control lever and equipment movements are correct.

TRAINING

■ Safety instructions are important! Read all attachment and power unit manuals; follow all safety rules and safety decal information. (Replacement manuals and safety decals are available from your dealer. To locate your nearest dealer, check the Dealer Locator at www.WoodsEquipment.com, or in the United States and Canada call 1-800-319-6637.) Failure to follow instructions or safety rules can result in serious injury or death.

■ If you do not understand any part of this manual and need assistance, see your dealer.

■ Know your controls and how to stop engine and attachment quickly in an emergency.

■ Operators must be instructed in and be capable of the safe operation of the equipment, its attachments, and all controls. Do not allow anyone to operate this equipment without proper instructions.

■ Keep hands and body away from pressurized lines. Use paper or cardboard, not hands or other body parts to check for leaks. Wear safety goggles. Hydraulic fluid under pressure can easily penetrate skin and will cause serious injury or death.

■ Make sure that all operating and service personnel know that if hydraulic fluid penetrates skin, it

must be surgically removed as soon as possible by a doctor familiar with this form of injury or gangrene, serious injury, or death will result. **CONTACT A PHYSICIAN IMMEDIATELY IF FLUID ENTERS SKIN OR EYES. DO NOT DELAY.**

■ Never allow children or untrained persons to operate equipment.

PREPARATION

■ Check that all hardware is properly installed. Always tighten to torque chart specifications unless instructed otherwise in this manual.

■ Air in hydraulic systems can cause erratic operation and allows loads or equipment components to drop unexpectedly. When connecting equipment or hoses or performing any hydraulic maintenance, purge any air in hydraulic system by operating all hydraulic functions several times. Do this before putting into service or allowing anyone to approach the equipment.

■ After connecting hoses, check that all control lever positions function as instructed in the Operator's Manual. Do not put into service until control lever and equipment movements are correct.

■ Protective hose sleeves must cover all hydraulic hoses within 20 inches of the operator and be secured onto metal hose fittings. Replace hoses or sleeves if damaged or if protective sleeve cannot be properly positioned or secured.

■ Make sure all hydraulic hoses, fittings, and valves are in good condition and not leaking before starting power unit or using equipment. Check and route hoses carefully to prevent damage. Hoses must not be twisted, bent sharply, kinked, frayed, pinched, or come into contact with any moving parts. Operate moveable components through full operational range to check clearances. Replace any damaged hoses immediately.

■ Always wear relatively tight and belted clothing to avoid getting caught in moving parts. Wear sturdy, rough-soled work shoes and protective equipment for eyes, hair, hands, hearing, and head; and respirator or filter mask where appropriate.

■ Make sure spring-activated locking pin or collar slides freely and is seated firmly in tractor PTO spline groove.

■ Make sure attachment is properly secured, adjusted, and in good operating condition.

(Safety Rules continued on next page)

SAFETY RULES



ATTENTION! BECOME ALERT! YOUR SAFETY IS INVOLVED!



(Safety Rules continued from previous page)

- Power unit must be equipped with ROPS or ROPS cab and seat belt. Keep seat belt securely fastened. Falling off power unit can result in death from being run over or crushed. Keep foldable ROPS system in “locked up” position at all times.
- Only mount this backhoe on Category 1 or 2 tractors under 70 hp with 1400 lb. lift capacity at 24” behind 3-point lift arm hitch balls.
- Never put backhoe into service unless backhoe manufacturer's 3-point hitch Saf-T-Lok[®] limiter or sub-frame has been installed and adjusted.
- To avoid possible hitch failure, read and follow the Saf-T-Lok Limiter Installation Instructions in the Assembly section before mounting backhoe to tractor 3-point hitch.
- Remove seat and upper support assembly before installing or removing backhoe from tractor. Failure to comply may result in equipment failure and/or personal injury.
- Do not operate backhoe unless there is adequate operator clearance as shown on safety decal. (Refer to Danger decal in Safety Decal section.)
- Always use the special heavy-duty top link (provided with backhoe) and the OEM high-strength top link pin (provided with tractor) to mount the top link to tractor. Use 3/4" x 3-1/2" grade 5 bolt(s) to mount top link to backhoe.
- Be sure that backhoe is properly mounted, adjusted, and in good operating condition.
- Place and keep 3-point lift quadrant lever in lowered position at all times.
- If tractor is equipped with draft sensing control, set control to “HEAVY” (minimum sensitivity) position.
- Make sure all safety decals are installed. Replace if damaged. (See Safety Decals section for location.)
- Make sure shields and guards are properly installed and in good condition. Replace if damaged.
- A minimum 20% of tractor and equipment weight must be on tractor front wheels with backhoe in transport position. Without this weight, tractor could tip over, causing personal injury or death. The weight may be attained with a loader, front wheel weights, ballast in tires, or front tractor weights. When attaining the minimum 20% weight on the front wheels, you must not exceed the Roll

Over Protection Structure (ROPS) weight certification. Weigh the tractor and equipment. Do not estimate.

- Do not install backhoe and required counterweights on tractor if the total tractor and equipment weight then exceeds the ROPS weight certification of the tractor. To reduce overall weight of unit, remove liquid from rear tires and remove mid-mount mower, if equipped.
- Clean all dirt, trash, and grease from operator's platform and steps.

OPERATION

- Do not allow bystanders in the area when operating, attaching, removing, assembling, or servicing equipment.
- Before operating, make sure stabilizer pads are lowered firmly to the ground. Stabilizer arms provide support for the backhoe and support for the backhoe mounting brackets.
- Consult local utilities before working. Know location of all underground cables, pipelines, overhead wires, and other hazards in working area and avoid contact.
- Keep bystanders away from operator, stabilizer, and maximum bucket swing areas.
- Do not operate or transport equipment while under the influence of alcohol or drugs.
- Operate only in daylight or good artificial light.
- Always comply with all state and local lighting and marking requirements.
- Do not allow riders. Do not lift or carry anybody on the power unit or attachments.
- Power unit must be equipped with ROPS or ROPS cab and seat belt. Keep seat belt securely fastened. Falling off power unit can result in death from being run over or crushed. Keep foldable ROPS system in “locked up” position at all times.
- When operating controls, always sit in backhoe seat.
- The only time the backhoe may be operated from a position other than the operator seat is during backhoe attachment and removal. Operator must:
 - Read Mounting Kit Manual instructions on attaching and removing backhoe and use extreme care.
 - Always stand between rear tire and backhoe stabilizer arms or along side of tractor to avoid

SAFETY RULES



ATTENTION! BECOME ALERT! YOUR SAFETY IS INVOLVED!



being trapped should the boom swing control be accidentally activated.

- Operate tractor PTO at 540 RPM. Do not exceed.
- Always dump spoil at least two feet away from opening.
- Use extreme care when working close to fences, ditches, other obstructions, or on hillsides.
- Be careful when swinging loaded bucket on a hillside. Always dump spoil on uphill side of backhoe to minimize the possibility of upset.
- Never leave equipment unattended with engine running or with bucket in raised position. Always engage swing and boom transport locks, relieve system pressure by operating controls, and remove ignition key before leaving equipment.
- Do not use backhoe for craning; it is primarily designed for digging. Mechanical failures such as hose rupture will cause a load to drop suddenly.

TRANSPORTATION

- Always engage swing and boom transport locks and attach Slow Moving Vehicle (SMV) sign before transporting backhoe.
- Power unit must be equipped with ROPS or ROPS cab and seat belt. Keep seat belt securely fastened. Falling off power unit can result in death from being run over or crushed. Keep foldable ROPS system in “locked up” position at all times.
- Never exceed 20 mph (32.2 km/h) during transport.
- Always comply with all state and local lighting and marking requirements.
- Never allow riders on power unit or attachment.
- Do not operate PTO during transport.
- Do not drive tractor with material in backhoe bucket.
- Do not operate or transport on steep slopes.
- Do not operate or transport equipment while under the influence of alcohol or drugs.

MAINTENANCE

- Do not modify or alter or permit anyone else to modify or alter the equipment or any of its components in any way.

■ Do not allow bystanders in the area when operating, attaching, removing, assembling, or servicing equipment.

■ Your dealer can supply original equipment hydraulic accessories and repair parts. Substitute parts may not meet original equipment specifications and may be dangerous.

■ Adjustment of system relief pressure must be done by a qualified, experienced dealership. Incorrect adjustment can result in system failures and serious personal injury.

■ Always wear relatively tight and belted clothing to avoid getting caught in moving parts. Wear sturdy, rough-soled work shoes and protective equipment for eyes, hair, hands, hearing, and head; and respirator or filter mask where appropriate

■ Dealer service personnel must perform work that requires engine operation during service.

■ Before working on backhoe, extend boom and dipperstick and place bucket on ground. Make sure that all system pressure has been relieved by operating controls before performing maintenance or service or before disconnecting any hydraulic lines.

■ Keep all persons away from operator control area while performing adjustments, service, or maintenance.

■ Tighten all bolts, nuts, and screws to torque chart specifications. Check that all cotter pins are installed securely to ensure equipment is in a safe condition before putting unit into service.

■ Make sure all safety decals are installed. Replace if damaged. (See Safety Decals section for location.)

■ Make sure shields and guards are properly installed and in good condition. Replace if damaged.

STORAGE

■ Block equipment securely for storage.

■ Keep children and bystanders away from storage area.

■ Refer to Removing and Storing Backhoe in Operation section of backhoe manual.

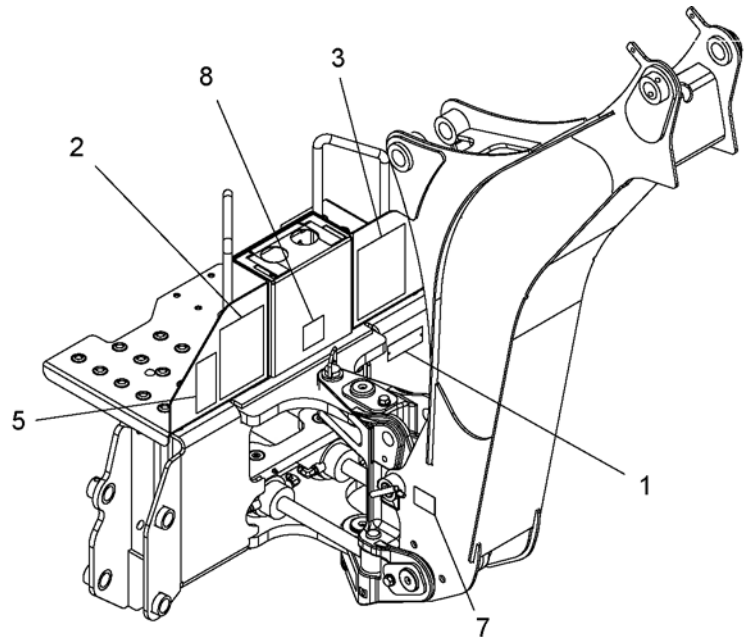
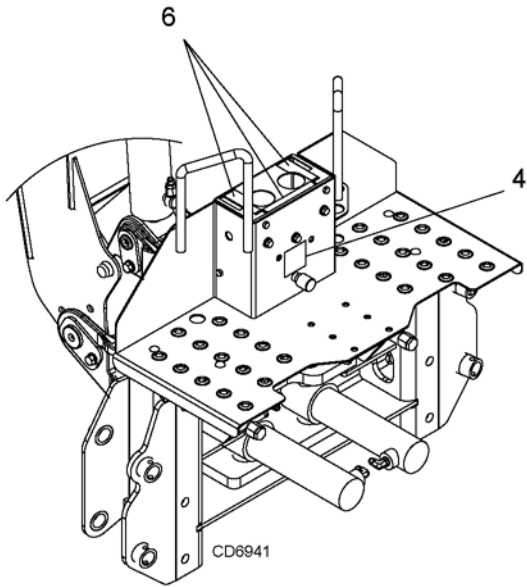
SAFETY & INSTRUCTIONAL DECALS



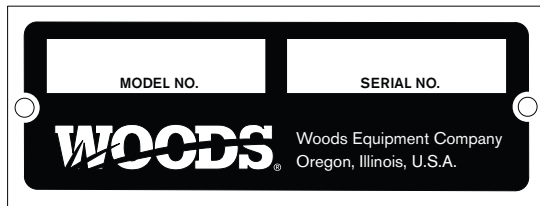
ATTENTION! BECOME ALERT! YOUR SAFETY IS INVOLVED!



Replace Immediately If Damaged!



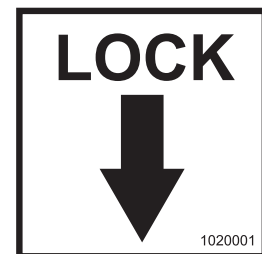
1 - SERIAL NUMBER PLATE



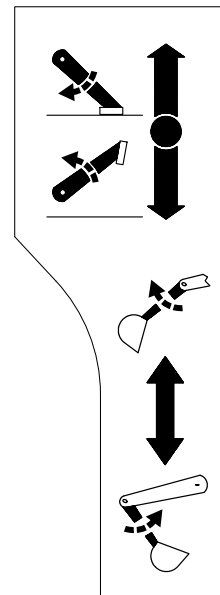
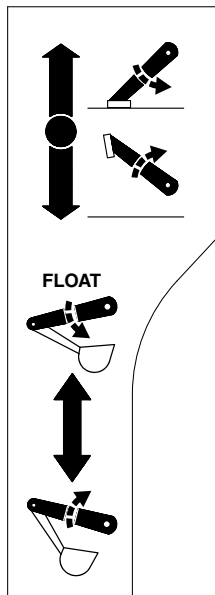
7 - PN 1020002



8 - PN 1020001



6 - PN 1012612



SAFETY & INSTRUCTIONAL DECALS



ATTENTION! BECOME ALERT! YOUR SAFETY IS INVOLVED!



Replace Immediately If Damaged!

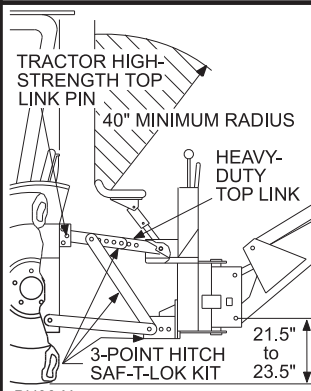
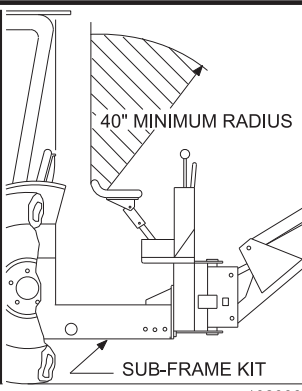
2 - PN 1020003

DANGER

CRUSHING HAZARD

- Never operate without **3-point hitch Saf-T-Lok® kit** or **sub-frame** installed as instructed in Operator's Manual.
- Operator's area (shaded area of 40" radius) must be free from all obstructions.
- Use heavy-duty top link provided in **3-point hitch Saf-T-Lok kit** or **sub-frame kit**.
- Use tractor manufacturer's high-strength top link pin of at least 3/4" diameter. See manual details.

Failure to follow the above instructions may result in serious injury or death from backhoe being thrust upward, forward, or rearward by digging forces.

BH90-X 1020003

BE CAREFUL!

Use a clean, damp cloth to clean safety decals.

Avoid spraying too close to decals when using a pressure washer; high-pressure water can enter through very small scratches or under edges of decals causing them to peel or come off.

Replacement safety decals can be ordered free from your Woods dealer. To locate your nearest dealer, check the Dealer Locator at www.WoodsEquipment.com, or in the United States and Canada call 1-800-319-6637.

3 - PN 1020004

WARNING

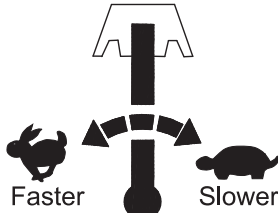
TO AVOID SERIOUS INJURY OR DEATH,

- Before operating, read and follow all safety precautions in Operator's Manual (available from your dealer).
- Make sure all safety decals are installed and readable.
- Make sure all shields are properly installed.
- Never allow riders.
- Remove seat and upper support assembly before installing or removing backhoe.
- Only mount on Category 1 or 2 tractors under 70 hp with 1400 lb lift capacity at 24" behind hitch balls.
- Maximum allowable hydraulic flow is 10 gpm at 2500 psi.
- Do not use "3-point quick attaching coupler".
- Lock out the draft sensing or set control to "Heavy".
- Do not modify or substitute any mounting or backhoe parts.
- A minimum 25% of tractor and equipment weight must be on tractor front wheels with backhoe in transport position.
- Consult local utilities before digging to avoid contacting underground hazards.
- When operating, always sit in backhoe seat; keep bystanders away from maximum swing area.
- Operate PTO at 540 rpm.
- Backhoe digging forces can lift and turn tractor over. Make sure stabilizer pads are on firm ground and avoid soft or deep banks.
- Before transporting, attach SMV sign and engage transport locks.
- Before leaving unattended, raise boom and install transport locks, disengage PTO, relieve pressure on dipperstick and bucket, shut engine off, and remove key.

BH90-X 1020004

4 - PN 1011994


SWING SPEED



1011994

5 - PN 1008365

WARNING



HIGH-PRESSURE HYDRAULIC OIL LEAKS CAN PENETRATE SKIN AND RESULT IN SEVERE INJURY, GANGRENE OR DEATH.

- Check for leaks with cardboard; never use hand.
- Before you loosen fittings: lower load, release pressure, and be sure oil is cool.
- See a doctor at once if oil enters skin.

1008365

OPERATION

The operator is responsible for the safe operation of the backhoe. The operator must be properly trained. Operators should be familiar with the backhoe, the tractor, and all safety practices before starting operation. Read the safety rules and safety decals on pages 7 to 11.

DANGER

- Never put backhoe into service unless backhoe manufacturer's 3-point hitch Saf-T-Lok[®] limiter or sub-frame has been installed and adjusted.
- Do not operate backhoe unless there is adequate operator clearance as shown on safety decal. (Refer to Danger decal in Safety Decal section.)

WARNING

- Make sure all hydraulic hoses, fittings, and valves are in good condition and not leaking before starting power unit or using equipment. Check and route hoses carefully to prevent damage. Hoses must not be twisted, bent sharply, kinked, frayed, pinched, or come into contact with any moving parts. Operate moveable components through full operational range to check clearances. Replace any damaged hoses immediately.
- Make sure that all operating and service personnel know that if hydraulic fluid penetrates skin, it must be surgically removed as soon as possible by a doctor familiar with this form of injury or gangrene, serious injury, or death will result. CONTACT A PHYSICIAN IMMEDIATELY IF FLUID ENTERS SKIN OR EYES. DO NOT DELAY.
- Keep hands and body away from pressurized lines. Use paper or cardboard, not hands or other body parts to check for leaks. Wear safety goggles. Hydraulic fluid under pressure can easily penetrate skin and will cause serious injury or death.
- Consult local utilities before working. Know location of all underground cables, pipelines, overhead wires, and other hazards in working area and avoid contact.
- A minimum 20% of tractor and equipment weight must be on tractor front wheels with backhoe in transport position. Without this weight, tractor could tip over, causing personal injury or death. The weight may be attained with a loader, front wheel weights, ballast in tires, or front tractor weights. When attaining the minimum 20% weight on the front wheels, you must not exceed the Roll Over Protection Structure (ROPS) weight certifica-

tion. Weigh the tractor and equipment. Do not estimate.

START AND STOP OPERATION

WARNING

- Operate tractor PTO at 540 RPM. Do not exceed.

An optional tractor-driven PTO pump supplies hydraulic pressure for backhoe operation. Instructions for engaging and disengaging the PTO are in your tractor manual. Learn how to disengage PTO quickly should an emergency occur.

Never exceed 540 rpm. Operating the pump in excess of 540 rpm will cause overheating and equipment damage.

GENERAL OPERATION

WARNING

- Place and keep 3-point lift quadrant lever in lowered position at all times.
- If tractor is equipped with draft sensing control, set control to "HEAVY" (minimum sensitivity) position.
- Do not use backhoe for craning; it is primarily designed for digging. Mechanical failures such as hose rupture will cause a load to drop suddenly.
- Never allow children or untrained persons to operate equipment.
- Do not drive tractor with material in backhoe bucket.

CAUTION

- When operating controls, always sit in backhoe seat.

Mechanical failures such as a hose rupture will cause a load to drop. Lifting a heavy load with the dipper, then operating the boom, could cause boom to drop. In either case, if anyone is in the operating area (maximum reach of bucket) as shown in Figure 3, serious injury or death could occur.

Do not dig with backhoe unless stabilizers are down and on a firm surface. Stay clear of steep areas or excavation banks that are soft or could give way.

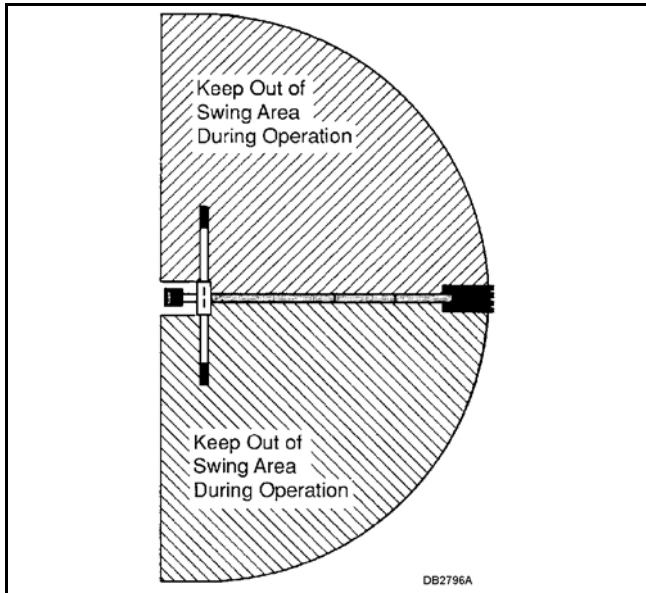


Figure 3. Backhoe Swing Area.

POSITION THE MACHINE

Before operating in an unfamiliar area, walk around the full length of the proposed site and check for hidden holes, drop-offs or obstacles that could cause an accident.

Lower stabilizers until they carry the weight of the backhoe. If tractor is equipped with a front loader, place the bucket flat on the ground. Lower loader lift arms until weight is removed from front tractor tires.

Level the machine using stabilizers and front loader before starting to dig.

Stability is very important when operating backhoe in the extreme swing positions as this causes weight transfer.

CONTROL HANDLE OPERATION

Assume your position in the operator's seat.

When engaging optional PTO-mounted pump, engine rpm should always be low. Once engaged, engine rpm may be increased to desirable operation speed (not to exceed 540 rpm).

When becoming familiar with backhoe controls, start with a lower rpm.

Before operating, perform a functional test by placing control handles in their various positions and making certain correct operation occurs, matching decals on operator's console. Pay specific attention to float position of boom. Do not operate backhoe if functions differ from decal; serious injury or death could occur.

It is not difficult to become a successful operator. Control lever operating decals (shown in Figure 4) are next to the operating control levers. Study these decals; they will assist you in becoming familiar with the controls.

Pushing handle 1 forward will lower left stabilizer; pulling back raises it.

Pushing handle 2 forward will lower right stabilizer; pulling back raises it.

Pulling left control back (toward A) raises boom; pushing it forward (toward C) lowers it. Full forward (toward C) is the float position.

Moving left handle left (toward B) swings boom left; moving it right (toward D) swings boom right.

Pulling right control back (toward E) moves dipper down and toward operator; pushing it forward (toward G) moves it up and away from operator.

Moving right handle left (toward F) curls bucket toward operator; moving it right (toward H) extends bucket out away from operator.

Operate the control levers, swinging the boom several times to practice control. Do not operate the swing more than 45 degrees each way the first few times. Gradually increase arc.

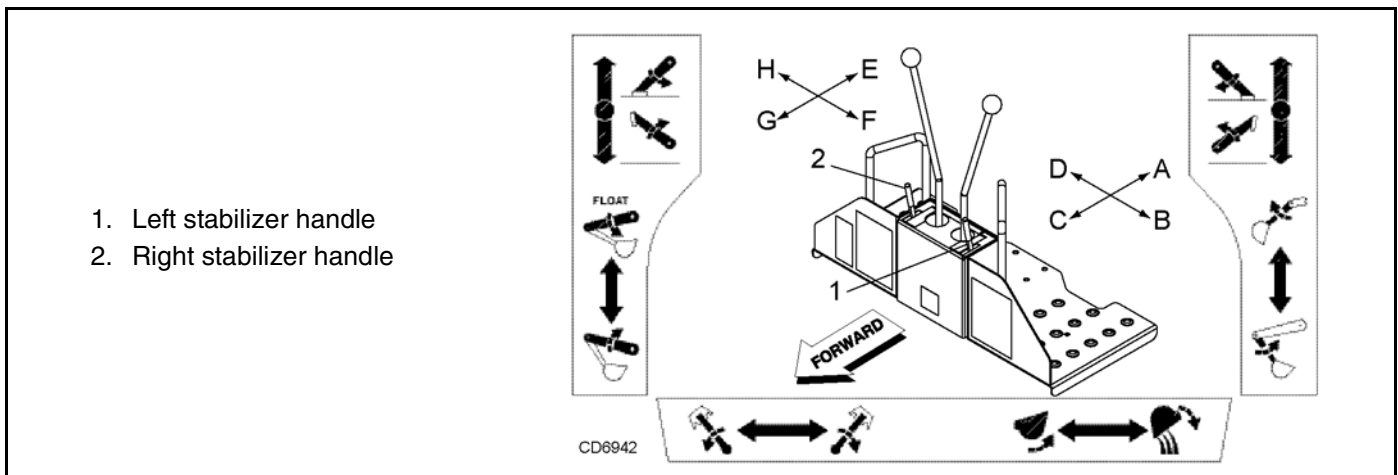


Figure 4. Operator's Controls (Typical View)

After becoming familiar with the backhoe operation, practice coordinated use of the controls in a safe open area at reduced engine speed. Gradually increase engine speed as the technique is mastered.

Operate backhoe gently and smoothly. Avoid swinging boom into mainframe. Sudden stopping or jerking could result in serious damage to tractor and backhoe.

Strive to develop a smooth digging cycle. Avoid abrupt or jerky movements. This is accomplished by operating two or more controls at the same time and not allowing the cylinders to reach the limit of travel.

Should you become confused during operation, simply let go of the controls. The valve control handles will automatically return to neutral.

SWING SPEED CONTROL

The swing speed control valve is located on the back side of the console. This controls the speed of the swing cylinders and allows for easier operation in tight areas. Turn knob to the right to decrease swing speed and to the left to increase swing speed.

EXCAVATION

Starting Excavation

⚠ WARNING

■ Consult local utilities before working. Know location of all underground cables, pipelines, overhead wires, and other hazards in working area and avoid contact.

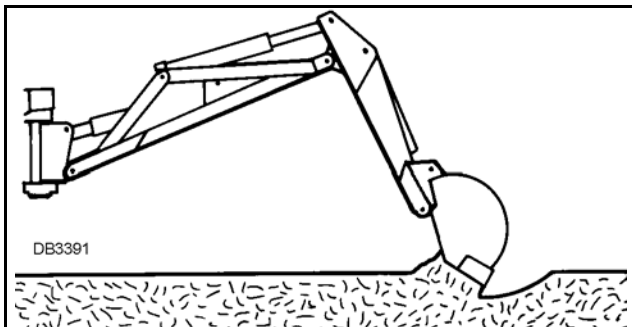


Figure 5. Starting Position

To start the excavation, position backhoe as shown in Figure 5 for maximum breakout force.

Actuate the dipper cylinder to start digging. Approximately halfway through digging cycle, start bucket curl while continuing crowding dipper in. Should bucket stall, raise boom slightly.

Do not use down pressure on the boom when starting to dig, as this will lift the machine and move it out of alignment with the work.

Filling Bucket

Control bucket attitude throughout digging cycle to keep teeth parallel to bottom of excavation. This will provide best penetration angle and minimize dragging and scraping bucket through the ground.

Penetration depth is determined by soil condition and type.

Only use dipper and bucket during the digging cycle. As the dipper moves the bucket through the soil, curl bucket to maintain proper bucket position.

At the end of the pass, or when bucket is full, curl bucket completely, lift bucket from excavation and swing boom to dump site.

To obtain a cleaner trench and avoid material buildup directly in front of backhoe, extend dipper and curl bucket completely while starting to lift it out of the excavation. This will allow excess material to fall back into the excavation.

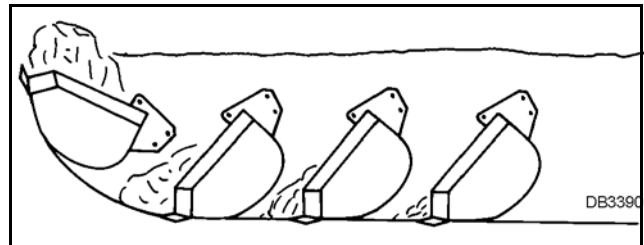


Figure 6. Fill Bucket

Dump and Return Cycle

Keep the swing-dump-return cycle as brief as possible. Keep dipper moving outward and start boom swing as soon as the bucket clears the excavation. Continue extending dipper and, as you approach the spoil pile, start to dump bucket.

When bucket is empty, dipper and bucket are in position to resume digging upon return to the excavation.

Trenching

Refer to Figure 7.

Trenching is the most basic backhoe digging operation. Other operations are variations of this basic function.

To maintain a level trench bottom, set bucket at proper approach angle and while crowding dipper-stick in, continually move bucket curl lever to maintain correct cutting angle. At the same time, place boom control in the full forward (float) position and keep the bucket in the same plane.

When handle is placed in the float position, pressure on both sides of boom cylinder is released.

Digging near center of swing so material may be dumped on either side will produce good results. Never dig near stabilizers.

Continue the trench by moving machine along trench centerline away from existing excavation. Move machine approximately one-half the effective backhoe reach. Moving too far will require excessive down pressure for digging and hand clean-up of trench bottom.

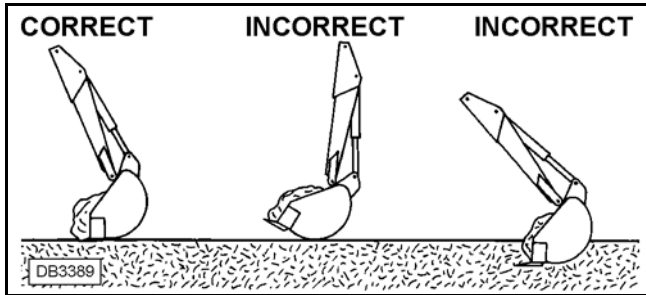


Figure 7. Trenching

Side Slope Trenching



■ Be careful when swinging loaded bucket on hillside. Always dump spoil on uphill side of backhoe to minimize rollover possibility.

When operating on a side slope, the backhoe must be positioned using one of these two methods as shown in Figure 8 or Figure 9.

When operating on a side slope, always place the trench spoil on the uphill side.

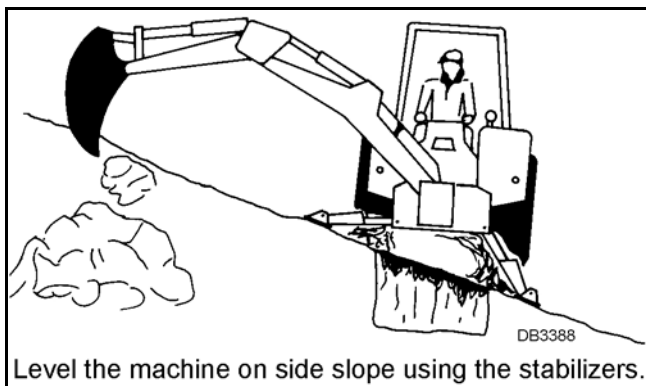


Figure 8. Level with Stabilizers

When leveling with a cut-out, cut a level pad for the uphill side of the machine and use the spoils to build a pad on the downhill side as shown in Figure 9.

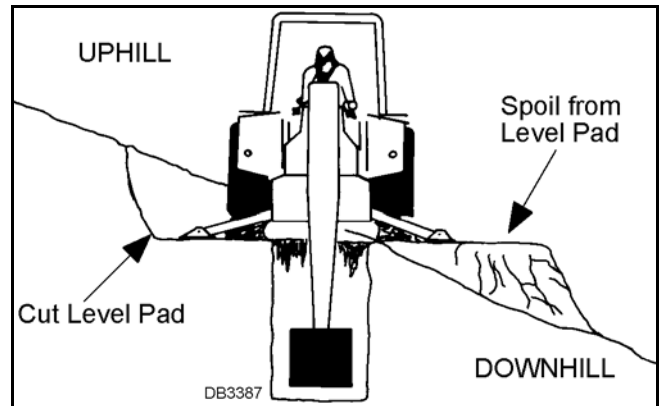


Figure 9. Level with Cut-Out

TRANSPORTING



■ Always engage swing and boom transport locks and attach Slow Moving Vehicle (SMV) sign before transporting backhoe.

■ Power unit must be equipped with ROPS or ROPS cab and seat belt. Keep seat belt securely fastened. Falling off power unit can result in death from being run over or crushed. Keep foldable ROPS system in “locked up” position at all times.

■ Never leave equipment unattended with engine running or with bucket in raised position. Always engage swing and boom transport locks, relieve system pressure by operating controls, and remove ignition key before leaving equipment.

Transport and Swing Lock Installation

NOTICE

■ Before operating backhoe, disengage transport lock pin and swing lock pin. Place pins in storage position and secure with lock pins provided.

Install Transport Lock Pins

1. Retract boom and dipper to the transport position (boom fully raised, dipper back, and bucket fully curled).
2. Center boom from side to side and install swing lock pin through swing frame and main frame. Secure with klik pin. See Figure 10.
3. Install transport lock pin through boom and swing frame and secure with lock pin.

Pin Storage

4. Store swing lock pin and transport pin in the holes provided on the back side of the seat console

during operation. Secure into position with klik and lock pins.

5. Always raise stabilizers before transporting backhoe.

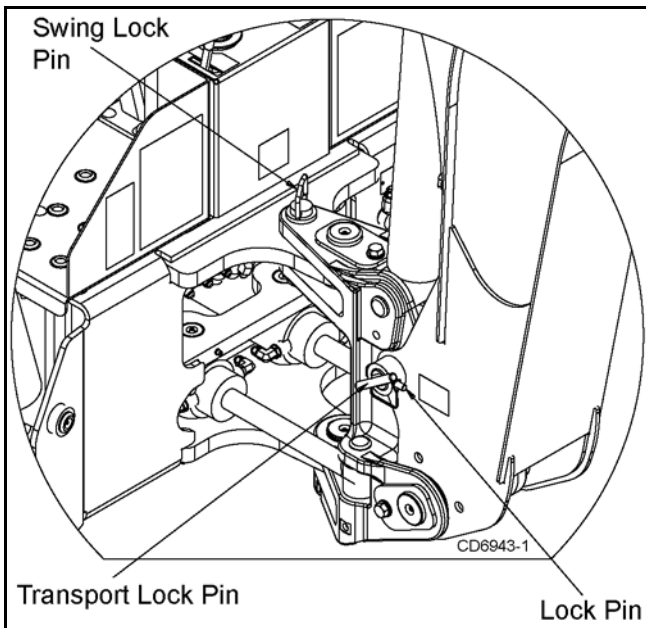


Figure 10. Transport and Swing Lock Pins Installed

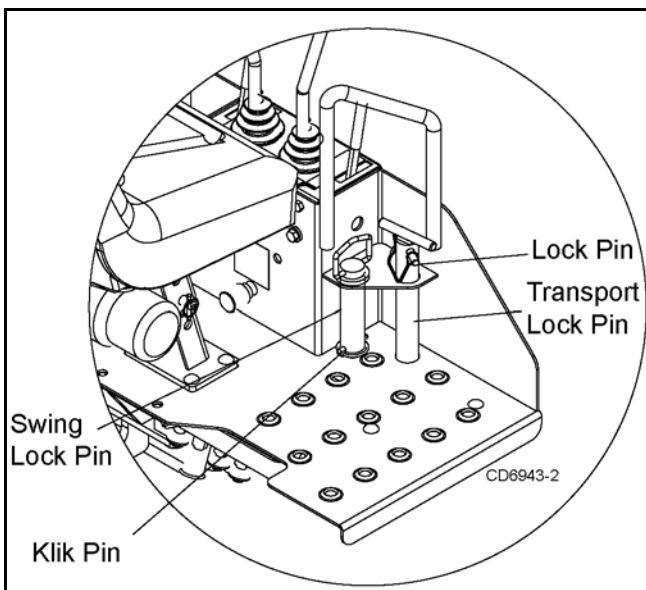


Figure 11. Pin Storage Position

BACKHOE REMOVAL AND STORAGE

! DANGER

■ The only time the backhoe may be operated from a position other than the operator seat is during backhoe attachment and removal. Operator must:

- Read Mounting Kit Manual instructions on attaching and removing backhoe and use

extreme care.

- Always stand between rear tire and backhoe stabilizer arms or along side of tractor to avoid being trapped should the boom swing control be accidentally activated.

! WARNING

- Keep all persons away from operator control area while performing adjustments, service, or maintenance.
- Remove seat and upper support assembly before installing or removing backhoe from power unit. Failure to comply may result in equipment failure and/or personal injury.

3-Point Mount Removal

Position tractor on a hard level surface, remove swing lock pin and transport bar, and center the backhoe boom.

Lower stabilizers and take weight of backhoe off of rear tractor tires.

Lower boom and dipper to form 90-degree angle and rest bucket on the ground.

Remove pin that attaches top link to tractor. Remove lower 3-point arms from backhoe. Place blocks under mainframe and raise stabilizers to lower backhoe mainframe onto blocks. Block backhoe as necessary to make it stable.

Disconnect hydraulic system.

4-Point Sub-Frame Mount Removal

NOTE: See the sub-frame mounting kit manual that fits your tractor for specific instructions.

Position tractor on a hard level surface, remove swing lock pin and transport bar, and center the backhoe boom.

Lower stabilizers and take weight of backhoe off of rear tractor tires.

Lower boom and dipper to form 90-degree angle and rest bucket on the ground.

Remove the seat assembly.

Remove klik pins from bolt and nut assemblies.

Use 1-1/2 inch open end wrench supplied with the mounting kit to remove hex nuts. Return wrench to storage position.

Use the boom to relieve excess pressure on 1-inch bolts and remove bolts.

Tilt backhoe main frame to separate slots on the backhoe brackets from the tractor brackets.

Raise stabilizers (to lower backhoe) until backhoe brackets slide out of hooks on the sub-frame. Lower backhoe approximately 1-1/2 inch.

Move tractor forward to clear backhoe brackets.

Place 6 inch blocks under backhoe mainframe and raise stabilizers to lower backhoe to the storage position on blocks. Boom and dipper should be at 90-degree angle.

Disconnect hydraulic system.

Disconnect Tractor Hydraulics

For Backhoe Powered with Auxiliary Pump

Disengage the PTO, stop tractor engine and remove key. Remove pump from PTO and secure it on backhoe. Move tractor carefully away from backhoe.

For Tractors with Open-Center Valves

NOTE: See the sub-frame mounting kit manual that fits your tractor for specific instructions.

Stop tractor and remove key.

Disconnect pressure and return hoses. Connect tractor pressure and return hoses together to complete open-center circuit.

NOTE: Circuit must be complete to prevent damage to tractor hydraulic system.

Connect backhoe pressure and return hoses together for storage.

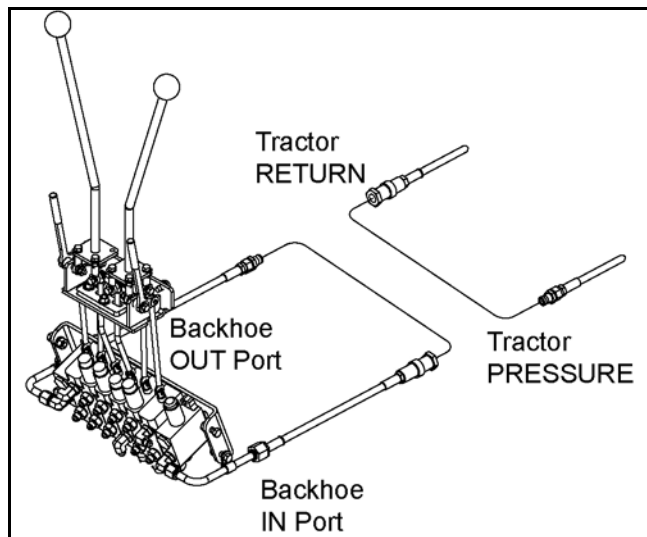


Figure 12. Tractors with Open-Center Valves

THUMB OPERATION

The optional thumb is used for grabbing objects and securing them between the thumb and the bucket.

Become familiar with the geometry and extra weight the thumb adds to the backhoe before operating. Large

heavy objects such as rocks and logs can increase momentum when pivoting backhoe to the side. DO NOT make sudden stops and starts. Be extremely careful lifting and moving long items such as poles or tree limbs which may extend beyond the normal backhoe operating area.

Improper usage can also damage the thumb or backhoe.

- Do not use the thumb to rake material.
- Do not use the thumb to push or pull material.
- Do not use the side of the thumb to move material.
- Do not use as a lifting device with chain or rope.
- Do not use as a pry bar to dislodge objects.

Place thumb in operating position by selecting an appropriate pin location on the telescoping tube. Rotate the bucket to hold material against the thumb.

When normal backhoe operation is required, place thumb in storage position. Remove pin, rotate thumb up against dipper, and insert pin to lock thumb into position.

PRE-OPERATION CHECK LIST

(OWNER'S RESPONSIBILITY)

The operator should perform the following check list before operating backhoe.

- ___ Check that backhoe is properly and securely attached to tractor.
- ___ Make sure all hydraulic connections are tight and all hydraulic lines and hoses are in good condition before engaging tractor PTO.
- ___ Check that there are no leaks in the hydraulic system. Before operating, all hydraulic hoses must be routed properly and not be twisted, bent sharply, kinked, pulled tight or frayed.
- ___ During inspection, check that all nuts and bolts are secure and clevis pins are properly cotter pinned.
- ___ Make sure only original equipment high-strength top link pin, provided with tractor, is used to attach top link to backhoe.
- ___ Use two 3/4" x 3-1/2" grade 5 bolts to mount top link to backhoe.
- ___ Make sure tractor lower lift arm stabilizers (blocks or chains) are positioned to prevent lift arms and backhoe from swaying.
- ___ Place all backhoe controls in neutral position before starting tractor engine.
- ___ Check hydraulic reservoir level.

OWNER SERVICE

The information in this section is written for operators who possess basic mechanical skills. If you need help, your dealer has trained service technicians available. For your protection, read and follow the safety information in this manual.

⚠ WARNING

■ **Keep hands and body away from pressurized lines. Use paper or cardboard, not hands or other body parts to check for leaks. Wear safety goggles. Hydraulic fluid under pressure can easily penetrate skin and will cause serious injury or death.**

■ **Make sure that all operating and service personnel know that if hydraulic fluid penetrates skin, it must be surgically removed as soon as possible by a doctor familiar with this form of injury or gangrene, serious injury, or death will result. CONTACT A PHYSICIAN IMMEDIATELY IF FLUID ENTERS SKIN OR EYES. DO NOT DELAY.**

■ **Before working on backhoe, extend boom and dipperstick and place bucket on ground. Make sure that all system pressure has been relieved by operating controls before maintenance, service, or disconnecting any hydraulic lines.**

⚠ CAUTION

■ **Always wear relatively tight and belted clothing to avoid getting caught in moving parts. Wear sturdy, rough-soled work shoes and protective equipment for eyes, hair, hands, hearing, and head; and respirator or filter mask where appropriate.**

HYDRAULIC HOSES AND FITTINGS

NOTICE

■ **Fittings with O-rings and flange do not require additional sealant; replace damaged O-rings.**

Hydraulic hoses are severely worked on a backhoe. Examine them daily and replace if necessary. Hose routing is very important. Make certain hoses can move freely, without kinking, and cannot be damaged or cut by backhoe action.

When tightening hoses and fittings, always use two wrenches: one to hold hose and one to tighten fitting. This will prevent hose from twisting and kinking.

Always back lock nut off and screw fitting all the way in for fittings that use O-rings for sealing. Then hold in position and tighten lock nut.

RELIEF VALVE

This valve is pre-set at the factory to prevent system pressure from exceeding 2500 psi. Do not attempt to reset the valve for open-center hydraulic systems. If valve is malfunctioning, replace it with an authorized factory replacement part or have service done by a qualified dealer.

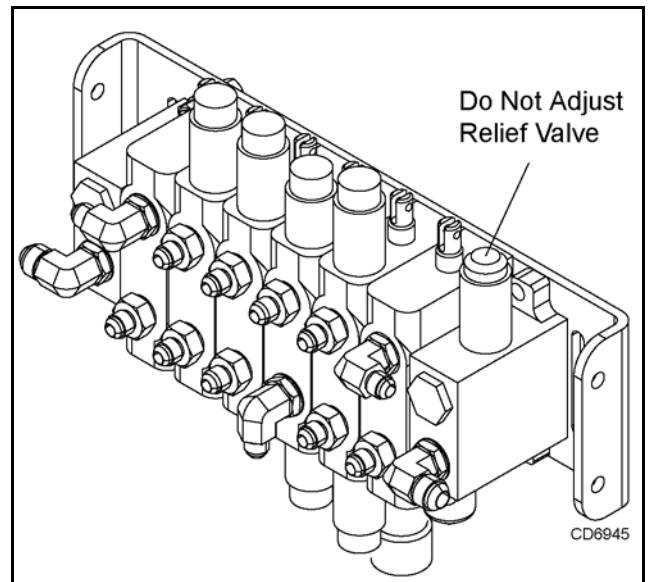


Figure 13. Relief Valve

LUBRICATION

WARNING

■ Keep all persons away from operator control area while performing adjustments, service, or maintenance.

Do not let excess grease collect on or around parts, particularly when operating in sandy areas.

Figure 14 shows lubrication points for the backhoe.

It is recommended that all fittings be lubricated daily or every eight hours of operation. In very wet or dry conditions, lubricate every four hours of operation.

Use an SAE multi-purpose type grease for all locations shown unless otherwise specified. Be sure to clean fitting thoroughly before using grease gun. One good pump of most guns is sufficient.

Position backhoe for easy lubrication by placing boom and dipper at 90° to each other with bucket cutting edge vertical and teeth resting on ground. Lower stabilizers to lubricate cylinders.

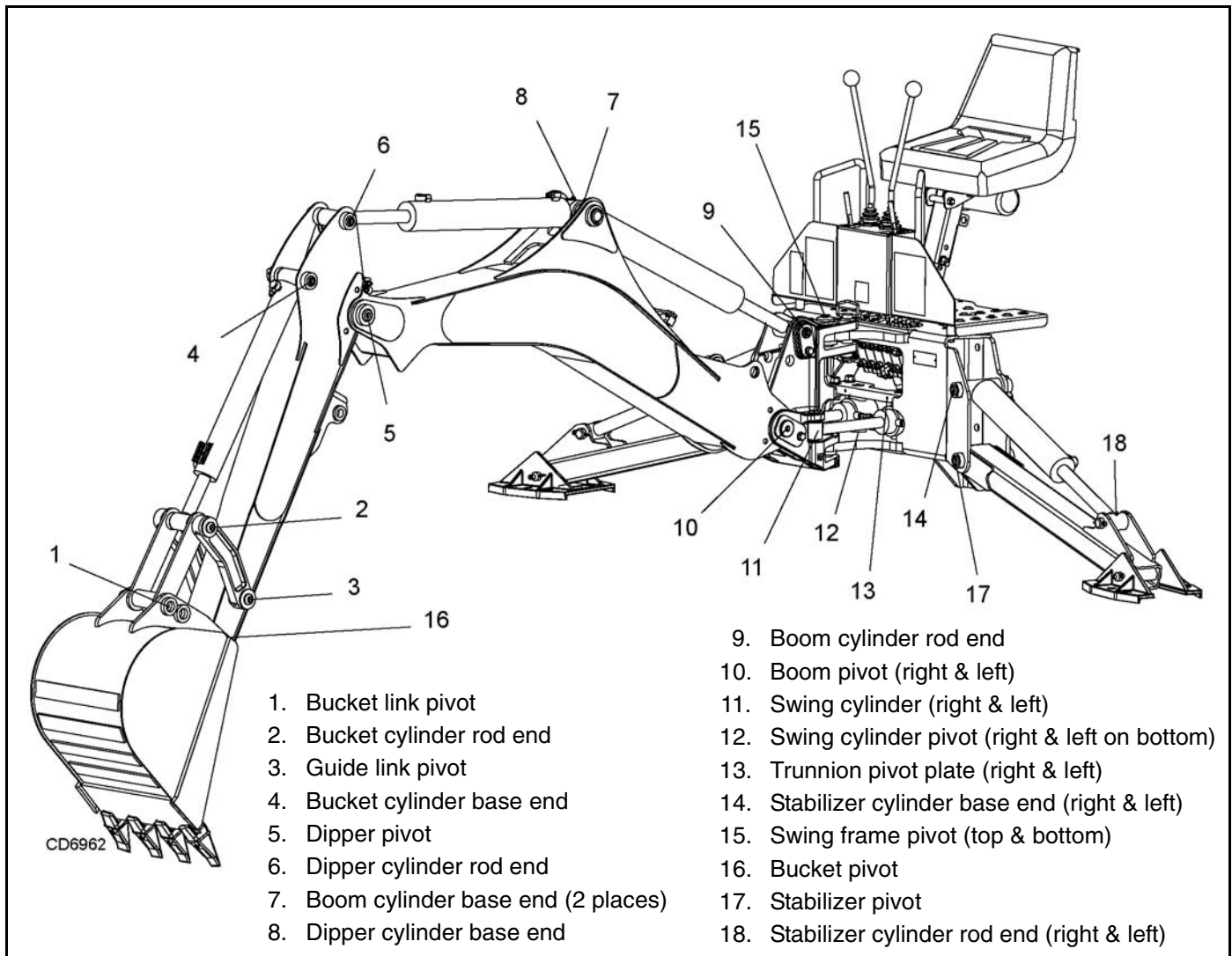


Figure 14. Lubrication Points

HYDRAULIC PUMP SYSTEM (OPTIONAL)

Daily, check the fluid level in reservoir with filler cap dipstick. Contamination will shorten the life of hydraulic system components. Change oil and filter after first 20 hours of operation and then every 200 hours of operation or annually, whichever occurs first. In extremely dusty or dry conditions, more frequent changes may be necessary. System capacity is approximately 5-1/2 to 6 U.S. gallons.

Drain the oil into a suitable container and dispose of properly in a manner compatible with the environment.

NOTICE

■ **Fill with clean oil. Do not mix oil types or grades.**

ENGAGE PTO AND RUN AT IDLE FOR 5 MINUTES, THEN CHECK OIL LEVEL. Add fluid as necessary.

Recommended Oils and Temperature Ranges (Do not mix oil grades or types)

SAE Hydraulic
Transmission Fluid All Temperatures
Type "A" or "F" ATF All Temperatures
SAE 30-30W 90° F and above
SAE 20-20W 35° - 90° F
ASAE 10-10W 35° F and below

CLEANING

After Each Use

- Remove large debris such as clumps of dirt, grass, crop residue, etc. from machine.
- Inspect machine and replace worn or damaged parts.
- Replace any safety decals that are missing or not readable.

Periodically or Before Extended Storage

- Clean large debris such as clumps of dirt, grass, crop residue, etc. from machine.
- Remove the remainder using a low-pressure water spray.
 1. Be careful when spraying near scratched or torn safety decals or near edges of decals as water spray can peel decal off surface.
 2. Be careful when spraying near chipped or scratched paint as water spray can lift paint.
 3. If a pressure washer is used, follow the advice of the pressure washer manufacturer.
- Inspect machine and replace worn or damaged parts.
- Sand down scratches and the edges of areas of missing paint and coat with Woods spray paint of matching color (purchase from your Woods dealer).
- Replace any safety decals that are missing or not readable (supplied free by your Woods dealer). See Safety Decals section for location drawing.



TROUBLESHOOTING

PROBLEM	POSSIBLE CAUSE	SOLUTION
Noisy pump caused by cavitation	Oil too heavy Oil filter plugged Suction line plugged or too small Suction line kinked	Change to proper viscosity. Replace filter. Clean line and check for size. Replace line.
Oil heating	Oil supply low Contaminated oil Setting of relief valve too high or too low Pump operating too fast	Fill reservoir. Drain reservoir, change filter, and refill with clean oil. Set to correct pressure. Do not exceed 540 rpm PTO speed.
Shaft seal leakage	Worn shaft seal	Replace shaft seal.
Foaming oil	Low oil level Air leaking into suction line Wrong kind of oil Moisture in oil	Fill reservoir. Tighten fittings. Drain and refill reservoir with non-foaming oil. Keep oil temperature below 180° and continue to operate as oil dries out, or replace oil and purge system if foaming is excessive.
Boom drops as dipper or bucket cylinder lever is activated while boom control is in raised position	Load check valve leaking	Clean or replace check valve assembly.
Jerky operation	Hydraulic hoses plumbed incorrectly	Check hydraulic plumbing schematic and correct hose routing as required.

DEALER SERVICE

The information in this section is written for dealer service personnel. The repair described here requires special skills and tools. If your shop is not properly equipped or your mechanics are not properly trained in this type of repair, it may be more time and cost effective to replace complete assemblies.

⚠ WARNING

■ **Keep hands and body away from pressurized lines. Use paper or cardboard, not hands or other body parts to check for leaks. Wear safety goggles. Hydraulic fluid under pressure can easily penetrate skin and will cause serious injury or death.**

■ **Make sure that all operating and service personnel know that if hydraulic fluid penetrates skin, it must be surgically removed as soon as possible by a doctor familiar with this form of injury or gangrene, serious injury, or death will result. CONTACT A PHYSICIAN IMMEDIATELY IF FLUID ENTERS SKIN OR EYES. DO NOT DELAY.**

■ **Before working on backhoe, extend boom and dipperstick and place bucket on ground. Make sure that all system pressure has been relieved by operating controls before maintenance, service, or disconnecting any hydraulic lines.**

HYDRAULIC CYLINDER REPAIR

Check stamping on barrel before ordering repair parts. See Parts page 42 and page 43 for correct numbers.

General Hydraulic Repair Information

A clean working area is essential for any hydraulic repair.

All parts must be carefully cleaned before reassembly. We recommend that when repairing hydraulic components, you always replace existing seals with new ones. Clean all components in solvent and blow dry with low pressure air.

Bucket, Swing & Stabilizer Cylinders

Refer to Figure 15 and Figure 16.

Disassembly

On spanner nut style cylinders, unscrew spanner nut (4) using a spanner wrench, or carefully use a punch and hammer.

Tap rod guide (5) into barrel (8) about 1/2". Remove round retaining ring (3B). Pull on rod (1) to remove parts from barrel.

Clamp cross pin end of rod assembly (1) in a vise with protective jaws. Remove lock nut (7) from rod assembly. Remove piston (6) and rod guide (5) from rod.

Remove and discard all seals, wear rings and O-rings. Clean all components in solvent and blow dry with low pressure air.

Inspect inside diameter of barrel (8). Replace cylinder if damaged.

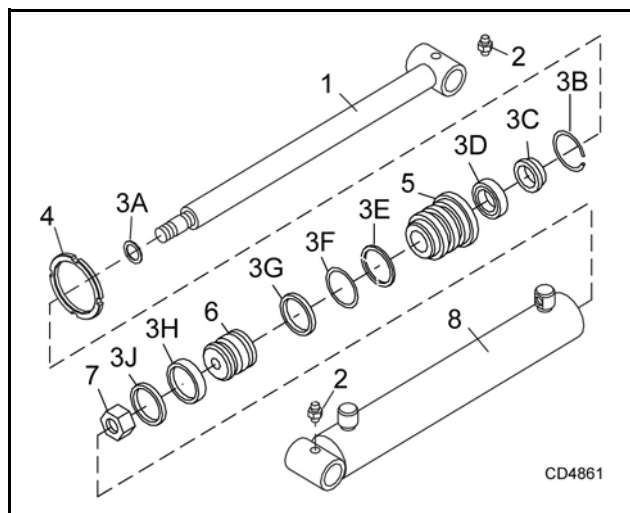


Figure 15. Spanner Nut Cylinder Assembly

Assembly

Lubricate O-rings and seals with clean hydraulic fluid. Install back-up washer (3E) on rod guide (5), then install O-ring (3F) in exterior O-ring groove of rod guide. Install rod seal (3D) into inner groove of rod guide with open portion of V-groove toward piston.

Place rod wiper (3C) in outer rod guide groove. Slide rod guide assembly (5) onto rod (1). Place wear ring (3H) in narrow groove of piston (except on swing cylinder). Place piston seal (3G) in wide piston groove. Place piston ring (3J) in narrow groove on piston (on swing cylinder only).

Lightly coat rod threads with hydraulic oil and slide O-ring (3A) over threads and into groove. Install piston (6) onto rod (1) with wear ring on side away from rod guide. Install lock nut (7) and torque to 175 lbs-ft for swing cylinder. For bucket and stabilizer cylinders, torque to 275 lbs-ft.

Compress wear ring and piston seal and carefully insert piston and rod assembly into barrel. Use care to prevent damage while installing.

Carefully push or tap rod guide (5) into barrel (8) just past groove inside barrel. Insert retaining ring (3B) into groove and pull rod (1) to seat rod guide (5) against ring. Screw spanner nut (4) into rod guide (5) using a spanner wrench, or carefully use a punch and hammer.

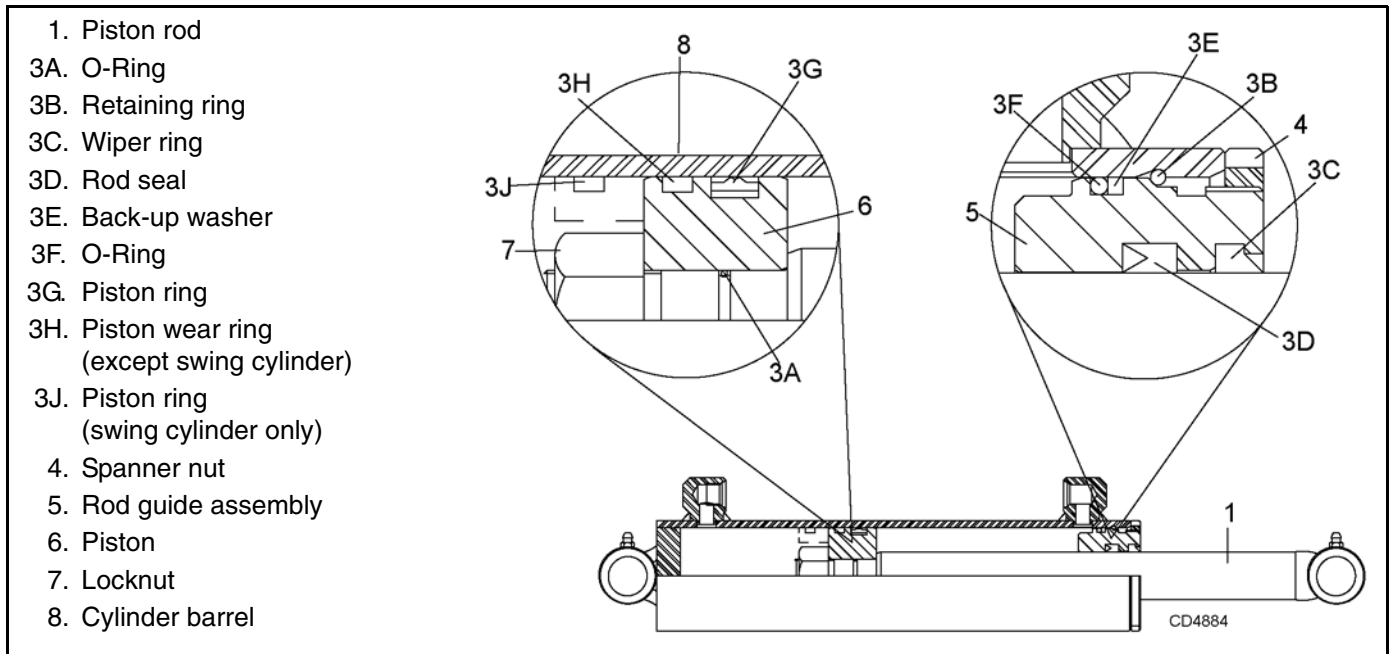


Figure 16. Spanner Nut Cylinder Assembly

Boom and Dipperstick Cylinder

Disassembly (Figure 17)

On threaded guide type cylinders, Figure 16, remove set screw (4), unscrew guide (5) using a spanner wrench, or carefully use a punch and hammer. Pull on rod (1) to remove parts from barrel.

Clamp cross pin end of rod assembly (1) in a vise with protective jaws. Remove locknut (7) from rod assembly. Remove piston (6) and rod guide (5) from rod.

Remove and discard all seals, wear rings and O-rings. Clean all components in solvent and blow dry with low pressure air.

Inspect inside diameter of barrel (8). Replace cylinder if damaged.

Assembly (Figure 17)

Lubricate O-rings and seals with clean hydraulic fluid. Install back-up washer (3D) on rod guide (5), then

install O-ring (3E) in exterior O-ring groove of rod guide. Install rod seal (3C) into inner groove of rod guide with open portion of V-groove toward piston.

Place rod wiper (3B) in outer rod guide groove. Slide rod guide assembly (5) onto rod (1). Place wear ring (3G) in narrow groove of piston. Place piston seal (3F) in wide piston groove.

Lightly coat rod threads with hydraulic oil and slide O-ring (3A) over threads and into groove. Install piston (6) onto rod (1) with ear ring on side away from rod guide. Install locknut (7) and torque to 175 lbs-ft.

Compress wear ring and piston seal and carefully insert piston and rod assembly into barrel. Use care to prevent damage while installing.

Carefully screw rod guide (5) into barrel (8) using a spanner wrench, or carefully use a punch and hammer. Screw set screw (4) into rod guide (5).

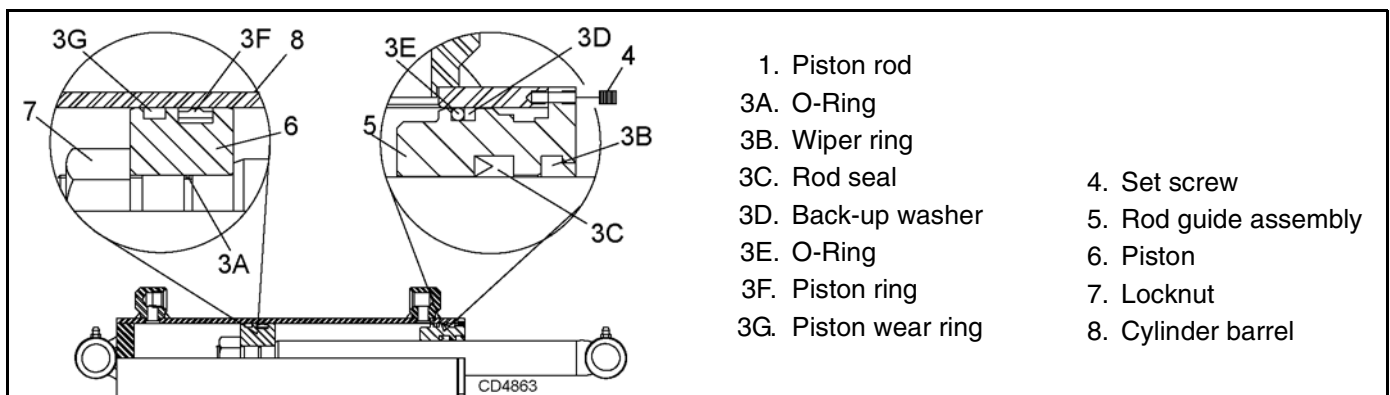


Figure 17. Threaded Guide Cylinder Assembly

HYDRAULIC VALVE REPAIR

Valve repair should be accomplished in a clean work place. Individual components for many of the assemblies are not available as repair parts. This will simplify repair and allow you to replace complete assemblies.

Pressure Settings on Port Relief Valves

Pressure settings on port relief valves are pre-set at the factory. Although they are adjustable, they must not be reset in the field using backhoe hydraulic system. The backhoe or tractor pump will separate or crack if system pressure exceeds the maximum.

Relief valve adjustment requires a test bench and accurate gauges.

Adjusting System Relief Valve Pressure

WARNING

■ Adjustment of system relief pressure must be done by a qualified, experienced dealership. Incorrect adjustment can result in system failures and serious personal injury.

NOTE: When using tractor hydraulic system to power backhoe, determine tractor hydraulic system pressure before changing the pressure setting on the valve. Many tractors will not create 2000 psi. If your tractor does not create 2000 psi, changing the relief valve setting will not improve the backhoe performance.

Place a pressure gauge in the valve inlet line at the valve. When installing pressure gauge, be sure to use steel fittings that will withstand working pressure up to 5000 psi.

Loosen nut. Using an allen wrench, rotate screw clockwise to increase pressure and counter-clockwise to decrease pressure.

Start tractor and engage PTO (for pump kits) set throttle at PTO speed. Set system relief valve pressure at 2500 psi. When pressure is adjusted, shut tractor PTO and tractor off. Tighten nut on system relief valve.

Replacing Port Relief Valves

Port Relief Valve	Pressure Setting
A	2650 psi
*B	2650 psi
C	3500 psi
* Equipped with anti-cavitation check valve	

It is not necessary to remove valve from frame to replace port relief valve cartridges. Remove console

cover and replace desired cartridge. Be sure replacement cartridges are set to the correct pressure. Valves are similar and can be easily mixed up.

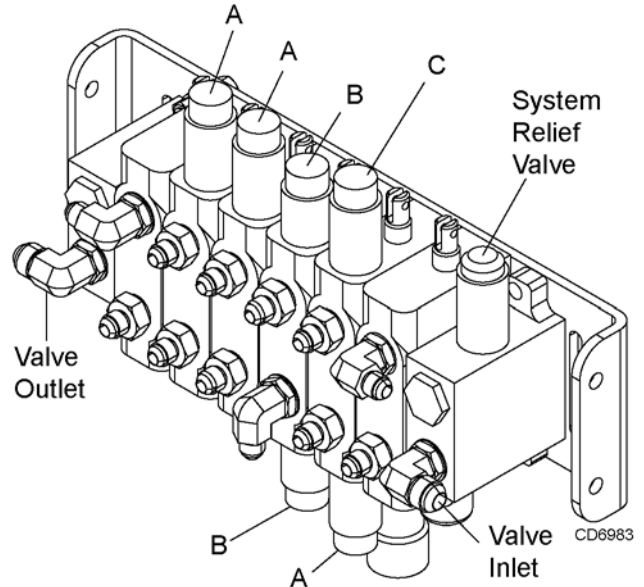


Figure 18. Relief Valve Location

Segment Replacement

Relieve system pressure, disconnect hoses, disconnect control handle linkage, and remove valve from backhoe console. Label hoses for reassembly.

Place valve on a clean, flat work surface.

Remove hex nuts and end cap from one end of valve.

Slide valve sections off until defective section is reached. Keep sections in same order as they were removed.

Replace defective sections and remaining sections in reverse order. Make sure O-ring, poppet, and spring are between each section. Note the orientation of poppet and spring (Figure 19). They must be placed in the load check cavity between valve sections as shown.

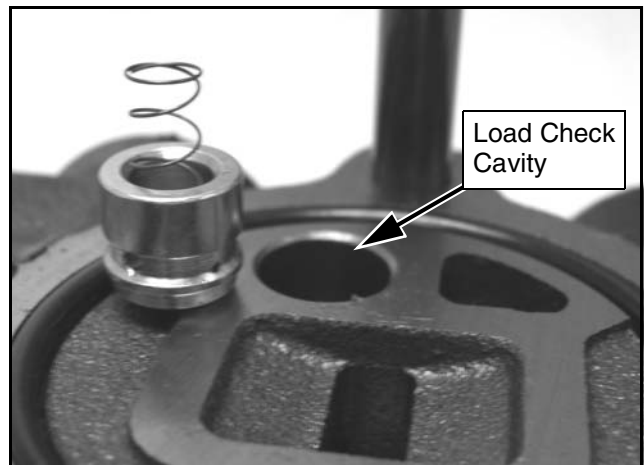


Figure 19. Poppet and Spring Placement

Place end cap on last spool section and hand tighten tie rod nuts.

Position valve assembly on a flat surface with the end cap mounting pads facing down. For proper alignment of end caps to valve sections, apply downward pressure on the end caps. Snug tie rods to approximately 10 lbs-ft.

Use care when torquing nuts on tie rods. This must be done in steps - that is to say, gradually increasing the tightening torque up to 14 lbs-ft for 1/2" nuts and 33 lbs-ft for the 9/16" nut. Torque in an alternating sequence. Non-uniform or excessive tightening can cause binding of spools. Failure to attain the proper torque can result in leaks. Always use a torque wrench.

Install valve assembly to backhoe console using hardware previously removed. Reconnect control valve linkage and hoses.

CONTROL VALVE LINKAGE ADJUSTMENT

Remove control valve cover.

Loosen the three bolts securing valve linkage mounting bracket to the back of backhoe console and two bolts on the guide plate.

Position valve linkage mounting bracket up and down or side to side as needed to position control handle as shown in Figure 20. Make sure excess free play is take out of the valve linkage. Once control handles are positioned correctly, tighten the three bolts on the back of

the console. Tighten the two bolts on the guide plate to eliminate handle rotation.

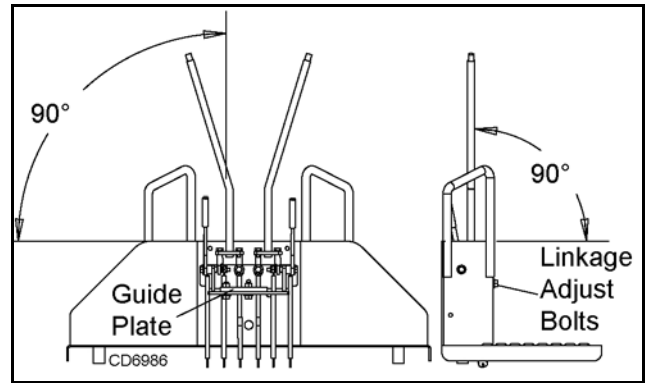


Figure 20. Control Handle Position

When completing a maintenance function on the valve, perform a functional test by placing control handles in their various positions and make certain the correct operation occurs corresponding to the decals on the operator's console. Pay specific attention to the float position of the boom. Do not operate backhoe if functions differ from the decal.

If the functions differ from the decal, check to make sure control linkage is correctly installed and check plumbing schematics to make sure hoses are correctly connected



ASSEMBLY

GENERAL ASSEMBLY INSTRUCTIONS

Backhoe assembly is the responsibility of the WOODS dealer. The backhoe should be delivered to the owner completely assembled, lubricated and adjusted for normal operating conditions.

Set backhoe up as received from the factory with these instructions and illustrations.

The backhoe must only be mounted with a tractor 3-point hitch using WOODS 3-Point Mount Kit or a WOODS Sub-Frame Kit. See WOODS 3-Point Mount manual for mount installation instructions.

When mounting this backhoe on a tractor using a sub-frame mount, special assembly instructions (which are contained in another manual furnished with the sub-frame) apply to some of the assembly procedures.

The backhoe is shipped partially assembled. Assembly will be easier if components are aligned and loosely assembled before tightening hardware.

NOTE: References to right, left, forward and rearward directions are determined from the backhoe operator seat position facing the backhoe.

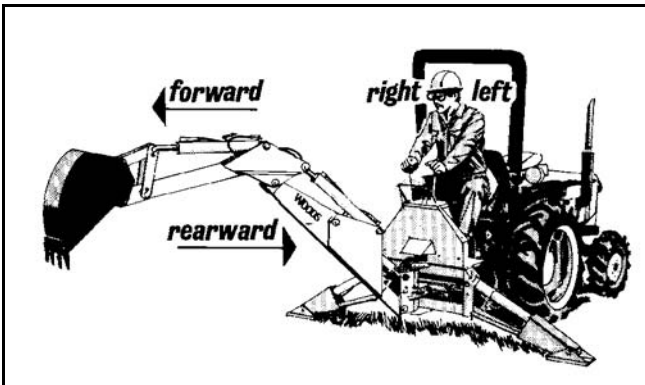


Figure 18. Backhoe Directions

WARNING

■ Keep all persons away from operator control area while performing adjustments, service, or maintenance.

■ Only mount this backhoe on Category 1 or 2 tractors under 70 hp with 1400 lb. lift capacity at 24" behind 3-point lift arm hitch balls.

■ Keep hands and body away from pressurized lines. Use paper or cardboard, not hands or other body parts to check for leaks. Wear safety goggles. Hydraulic fluid under pressure can easily penetrate skin and will cause serious injury or death.

WARNING

■ Make sure that all operating and service personnel know that if hydraulic fluid penetrates skin, it must be surgically removed as soon as possible by a doctor familiar with this form of injury or gangrene, serious injury, or death will result. CONTACT A PHYSICIAN IMMEDIATELY IF FLUID ENTERS SKIN OR EYES. DO NOT DELAY.

CAUTION

■ Always wear relatively tight and belted clothing to avoid getting caught in moving parts. Wear sturdy, rough-soled work shoes and protective equipment for eyes, hair, hands, hearing, and head; and respirator or filter mask where appropriate.

Stabilizer Installation

Remove stabilizer arms from pallet.

Remove pivot pins (4) from their shipping position. Attach stabilizer arm (3) to main frame (1) with pivot pin (4) and secure with cap screw (5) and lock nut (6).

Attach stabilizer cylinder (3) to stabilizer arm with pivot pin (7) and secure with two cotter pins (8).

1. Main frame
2. Stabilizer arm w/pad
3. Stabilizer cylinder
4. Pivot pin, 1.25 x 7.49
5. 3/8 NC x 3 HHCS
6. 3/8 NC Lock nut
7. Pin
8. 1/4 x 1-3/4 Cotter pin

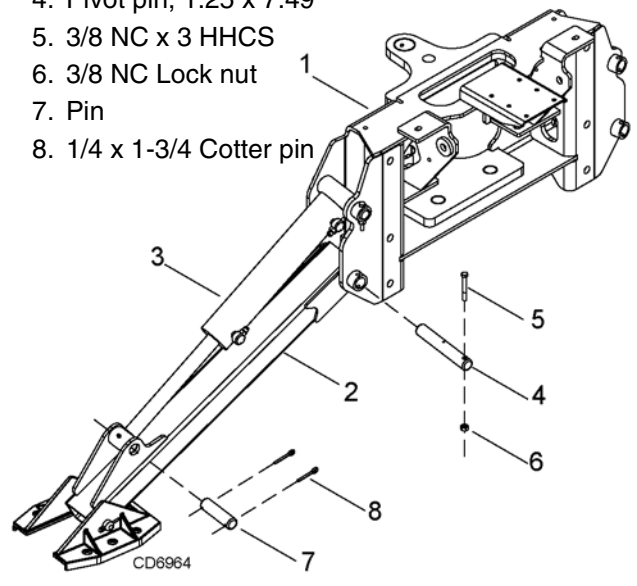


Figure 19. Stabilizer Arm Assembly - Left Side

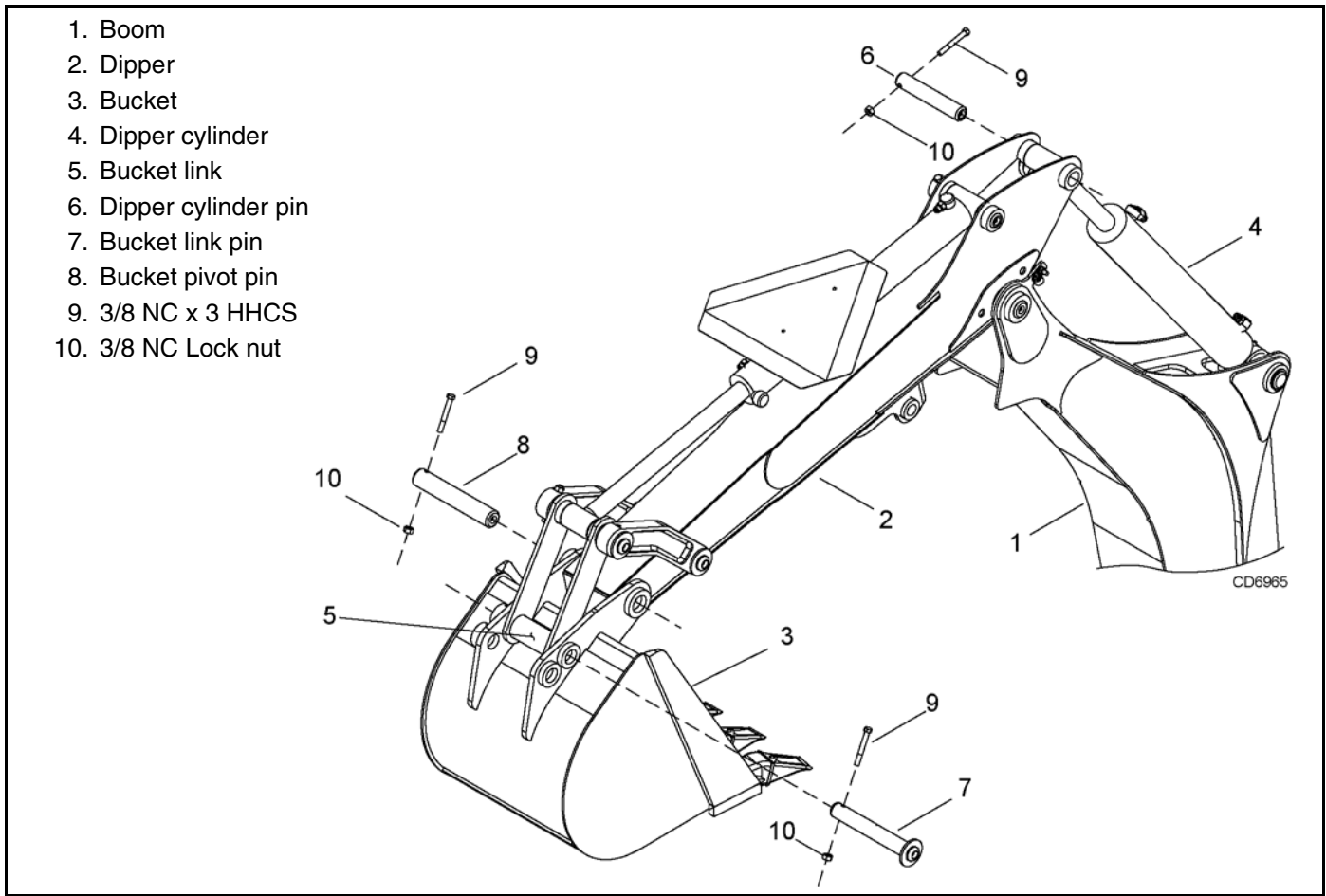


Figure 20. Dipper and Bucket Installation

Dipper Cylinder Installation

Remove pivot pin (6) from end of dipper (2). Attach dipper cylinder (4) to dipper (2) with pivot pin and secure with bolt (3) and lock nut (10). Make sure hydraulic hoses are not twisted after boom and dipper are assembled.

Bucket Installation

12", 16", 18", 24" and 36" buckets are available with this backhoe. Remove pivot pins (7 & 8) from end of bucket link (5) and dipper (2). Attach bucket (3) to the end of the dipper with pivot pins (8). Attach bucket link (5) to the bucket using pivot pin (7). Secure both pins using bolts (9) and lock nuts (10).

HYDRAULIC INSTALLATION

⚠ WARNING

■ Keep hands and body away from pressurized lines. Use paper or cardboard, not hands or other body parts to check for leaks. Wear safety goggles.

Hydraulic fluid under pressure can easily penetrate skin and will cause serious injury or death.

⚠ WARNING

■ Make sure that all operating and service personnel know that if hydraulic fluid penetrates skin, it must be surgically removed as soon as possible by a doctor familiar with this form of injury or gangrene, serious injury, or death will result. CONTACT A PHYSICIAN IMMEDIATELY IF FLUID ENTERS SKIN OR EYES. DO NOT DELAY.

■ Make sure shields and guards are properly installed and in good condition. Replace if damaged.

Power to the backhoe can be supplied directly from the tractor hydraulic system. A hydraulic requirement of 9-12 gallons per minute and 2500 PSI is necessary to operate the backhoe efficiently. 1/2" diameter hoses (SAE 100 R1 with 3000 PSI working pressure) should be used to connect the hydraulic source to the backhoe valve. These hoses must be long enough to allow ease of removal or attachment of backhoe. Hoses must include external shielding to prevent oil from spraying on operator if hose fails.

Open-Center Valve

NOTICE

- Damage to valve will result if oil is routed backwards through the valve.
- Valve damage will occur if back pressure exceeds 450 psi.
- Do not route return oil through tractor remote valve. Use a low pressure port, such as a motor return port.

NOTE: See the sub-frame mounting kit manual for specific tractor and hydraulic hose kit instructions.

Locate the IN and OUT ports on the control valve under the operator's platform. Connect hoses to these ports. Attach male and female couplers compatible to the tractor on opposite end of the hoses.

NOTE: The backhoe will not function if oil is routed backwards through the valve. Connect the tractor PRESSURE hose to the backhoe valve IN port and the RETURN hose to the backhoe valve OUT port. Tighten all fittings securely. Start engine and run at low rpm. Activate hydraulic circuit and check for leaks.

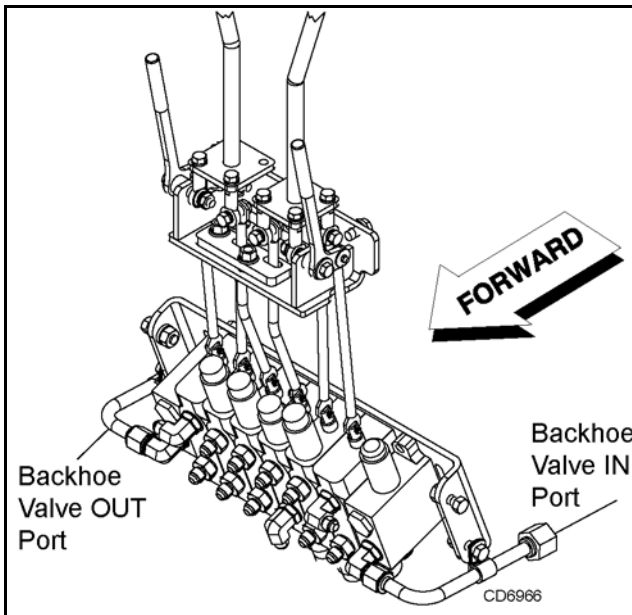


Figure 21. Backhoe Valve Ports

HYDRAULIC PUMP INSTALLATION (OPTIONAL)

Refer to Figure 23.

NOTICE

- Clean all fittings and use care to prevent foreign material from entering hydraulic system.

NOTE: Use thread sealant on all pipe fittings.

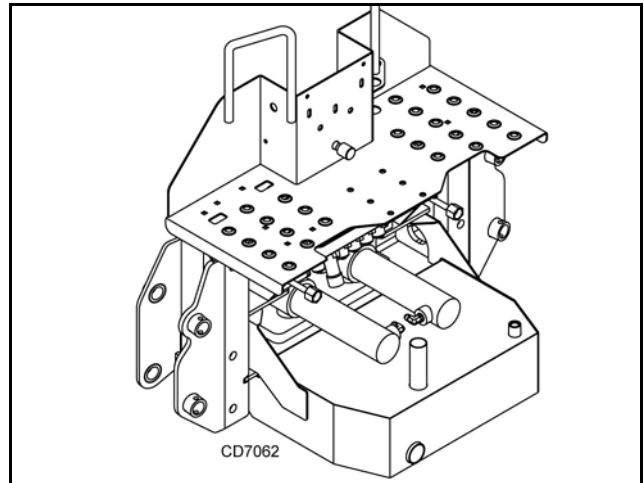


Figure 22. Reservoir Installed

1. Attach outlet side of filter assembly (4) to the top of the reservoir as shown.
 2. Attach adapter (6) and elbow (3) to the opposite side of the filter assembly. Position elbow toward the backhoe.
 3. Install strainer (10) and elbow (11) into reservoir as shown with elbow pointing up.
 4. Install hydraulic reservoir (1) to bottom of backhoe main frame using four cap screws (7) hardened flat washers (8), and hex nuts (9).
- NOTE:** The reservoir mounts below the swing cylinders as shown in Figure 22.
5. Attach reducer (15) and elbow (14) to the IN side of the hydraulic pump.
 6. Attach reducer (25) and elbow (17) to the OUT side of the hydraulic pump.
 7. Install hose (13) between elbows (11) and (14) and secure using two hose clamps (12).
- NOTE:** To properly install hydraulic fittings with O-rings, completely loosen lock nut, screw fitting in completely to desired position, hold, and tighten locknut using two wrenches.
8. Attach hose (23) to the backhoe control valve OUT port and hose (24) to the IN port.
 9. Attach hose (23) to elbow (3).
 10. Attach hose (24) to elbow (17).
 11. Attach pump mounting bracket (18) to the hydraulic pump (16) using two cap screws (19) and lock nuts (20).

NOTE: The pump mounting bracket is designed to slip over the tractor drawbar and prevent the pump from rotating.

NOTE: When backhoe is attached to tractor, it may be necessary to reposition filter and hoses to eliminate interference.

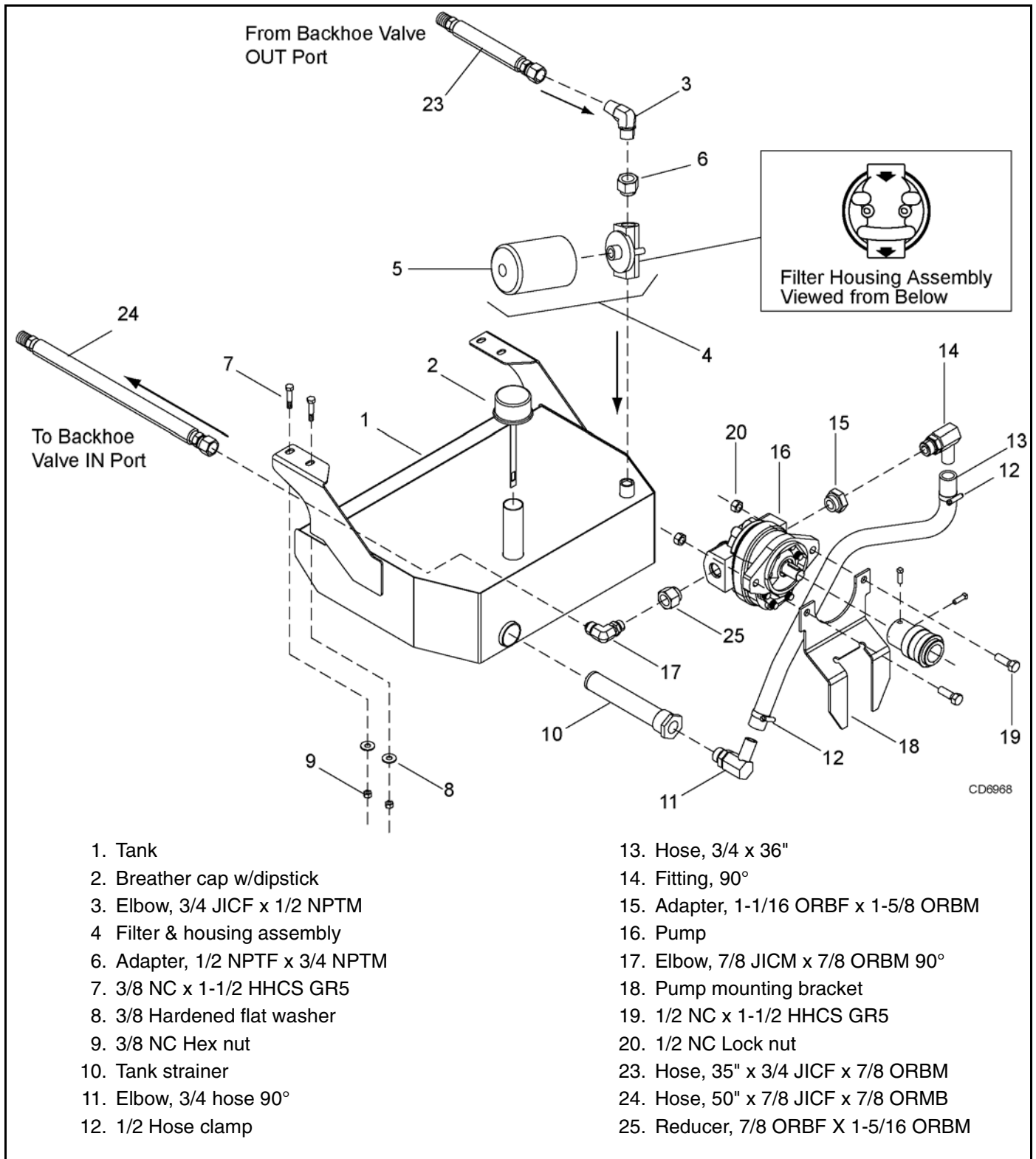


Figure 23. Pump & Reservoir Installation

PUMP MOUNTING BRACKET INSTALLATION

! DANGER

■ The only time the backhoe may be operated from a position other than the operator seat is during backhoe attachment and removal. Operator must:

- Read Mounting Kit Manual instructions on attaching and removing backhoe and use extreme care.
- Always stand between rear tire and backhoe stabilizer arms or along side of tractor to avoid being trapped should the boom swing control be accidentally activated.

! WARNING

■ Make sure spring-activated locking pin or collar slides freely and is seated firmly in tractor PTO spline groove.

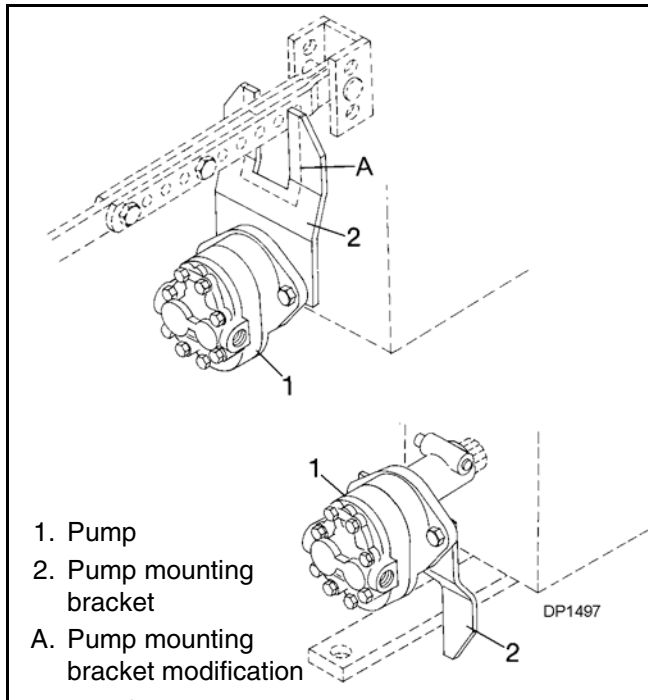


Figure 24. Pump Mounting Bracket Installation

If you are using a sub-frame mounting, refer to the pump mounting instructions provided with the sub-frame.

The pump mounting bracket is designed to slip over tractor drawbar. The best installation is to place bracket offset toward tractor and pump offset down; however, offset may be reversed if interference occurs, Figure 24.

On tractors with non-standard drawbars, it may be necessary to modify pump bracket by enlarging the opening. Bracket may also be inverted and retained on the top link bar. Whatever mounting is used, it is important that pump be restrained from rotating.

Attach pump mounting plate (18) to pump with bolts (19) and nuts (20), Figure 23.

Check all hydraulic fittings and lines to be sure they are tight and free of kinks and twists.

BACKHOE TO TRACTOR ATTACHMENT

Remove backhoe from pallet and position on level surface. Back tractor as near as possible and center on backhoe.

Remove seat and upper support before attaching backhoe to tractor.

Service optional hydraulic reservoir by filling to full mark on dipstick (approximately 6-1/2 to 7 US gallons). When backhoe is mounted and operated, it will be necessary to add more fluid to reservoir. Install cap (2).

NOTICE

■ Fill with clean oil. Do not mix oil types or grades.

Use type "A" or "F" Automatic Transmission Fluid, SAE Motor Oil or #303 Hydraulic Fluid.

Recommended Oils and Temperature Ranges (Do not mix oil grades or types)

SAE Hydraulic Transmission Fluid	All Temperatures
Type "A" or "F" ATF	All Temperatures
SAE 30-30W	90° F and above
SAE 20-20W	35° - 90° F
ASAE 10-10W	35° F and below

SEAT INSTALLATION AND ADJUSTMENT

The seat may be adjusted fore, aft, up and down for operator comfort. It is necessary to use the two adjustments together. Moving the seat down also moves it forward, moving it up also moves it rearward. The fore and aft adjustment may be used with the up and down adjustment to obtain desired position. Never operate the backhoe unless manufacturer's 3-point hitch Saf-T-Lok Limiter or sub-frame has been installed, adjusted and operator's area (shown in decal 1020003, on page 11) is free from obstructions.

OPTIONAL EQUIPMENT

Stabilizer Street Pad Installation

1. Attach two rubber stabilizer pads (7) to the bottom stabilizer pad (2) using three lock nuts (6).
2. Repeat step for opposite side stabilizer.

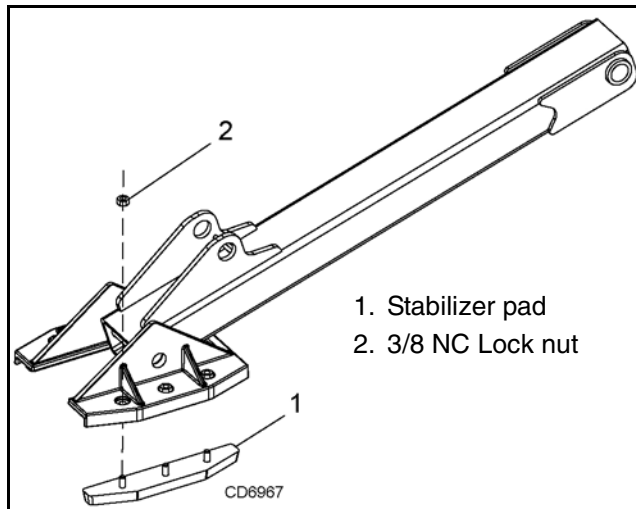


Figure 25. Stabilizer Pad Installation

1012606 3-Point Mount Kit

See 3-Point Mount Kit manual for installation instructions.

1020000 Mechanical Thumb

1. Disconnect lock-up bar, lower boom and place bucket on the ground.
2. Remove hardware and pivot pin that attaches bucket to the end of the dipper.
3. Place thumb (1) over bucket lugs and align holes.

NOTE: Grease pivot bushings (11) on the thumb before installing clevis pin.

4. Insert clevis pin (5) to secure thumb and bucket to the dipper. Secure clevis pin using retaining bolt previously removed.
5. Attach inner tube (3) to the thumb (1) and secure using pin (9), cap screw (9), and lock nut (10). Do not tighten; cap screw should slide freely in the pin and bushing. See Figure 26.
6. Attach outer tube (2) to pivot lugs on dipper and secure using pin (6), cap screw (9), and lock nut (10).
7. Place thumb in the storage position (rotate up against dipper), insert hitch pin (4), and secure with klik pin (8).

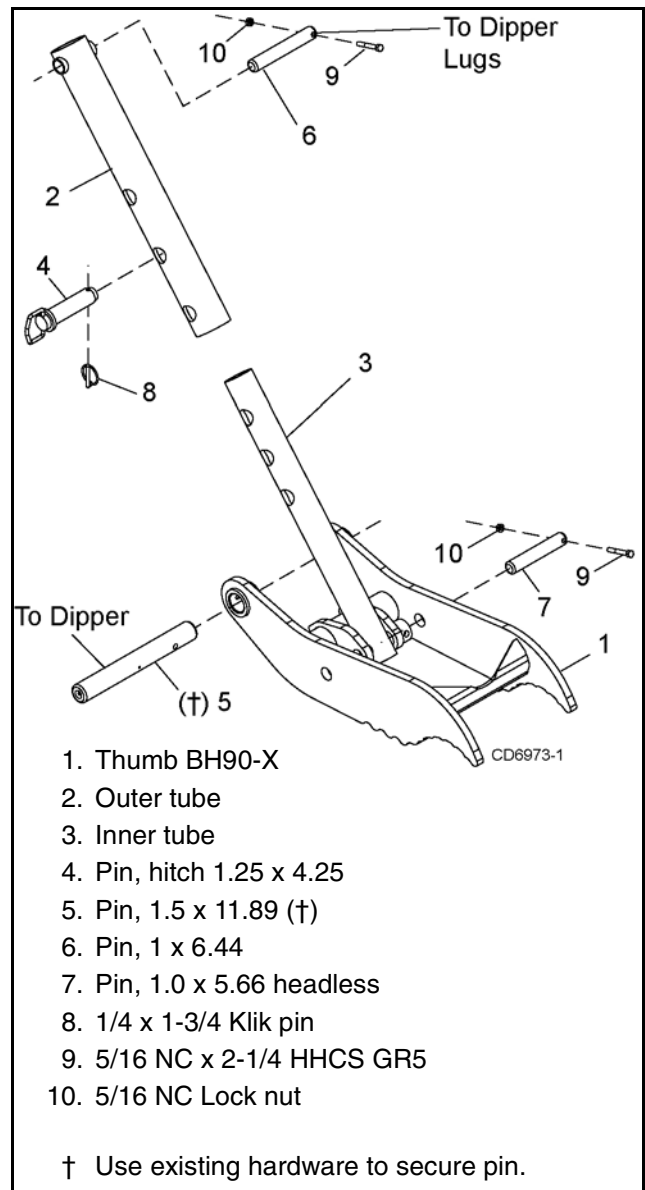


Figure 26. Mechanical Thumb Assembly



Figure 27. Mechanical Thumb Installed

DEALER CHECK LISTS

PRE-DELIVERY CHECK LIST

(DEALER'S RESPONSIBILITY)

Inspect the backhoe (and sub-frame when applicable) thoroughly after assembly to be certain it is set up properly before delivering it to the customer. The check lists are a reminder of points to inspect. Check off each item as it is found satisfactory or after proper adjustments are made.

- ___ Check all bolts to be sure they are tight.
- ___ Check that all lubrication points have been lubricated.
- ___ Check that all cotter pins and safety pins are properly installed.
- ___ Properly attach backhoe (and sub-frame when applicable) to tractor and make all necessary adjustments.
- ___ Check that optional hydraulic reservoir has been serviced and that hydraulic system and all functions have been operated through full cylinder stroke to purge air from system.
- ___ Make sure all hydraulic fittings are tight and hoses are properly routed and not twisted, bent sharply, kinked or pulled tight.
- ___ After pressurizing and operating all backhoe functions, stop tractor and make sure there are no leaks in the hydraulic system. Follow all safety rules when checking for leaks.

DELIVERY CHECK LIST

(DEALER'S RESPONSIBILITY)

- ___ Present Operator's Manual (and sub-frame manual when applicable) and request that customer and all operators read it before operating equipment.
- ___ Point out all safety features of the equipment. Explain the importance and meaning of all safety decals and emphasize the potential hazards when not followed.
- ___ Show customer how to make adjustments.
- ___ Explain importance of lubrication and show lubrication points to customer.
- ___ Show customer the safe and proper procedures to be used when mounting, dismounting and storing backhoe (and sub-frame when applicable).
- ___ If backhoe is mounted to tractor 3-point hitch, explain the importance of the Saf-T-Lok limiter. Point out (as shown in Operator's Manual) the correct attachment and adjustment of the limiter.
- ___ Point out the correct mounting of the hydraulic pump and routing of the hoses. Explain that during operation, mounting, dismounting and storage, care must be taken to prevent hose damage from pulling, twisting and kinking.
- ___ Show customer the safe and proper procedures to be used when mounting, dismounting and storing backhoe (and sub-frame when applicable).

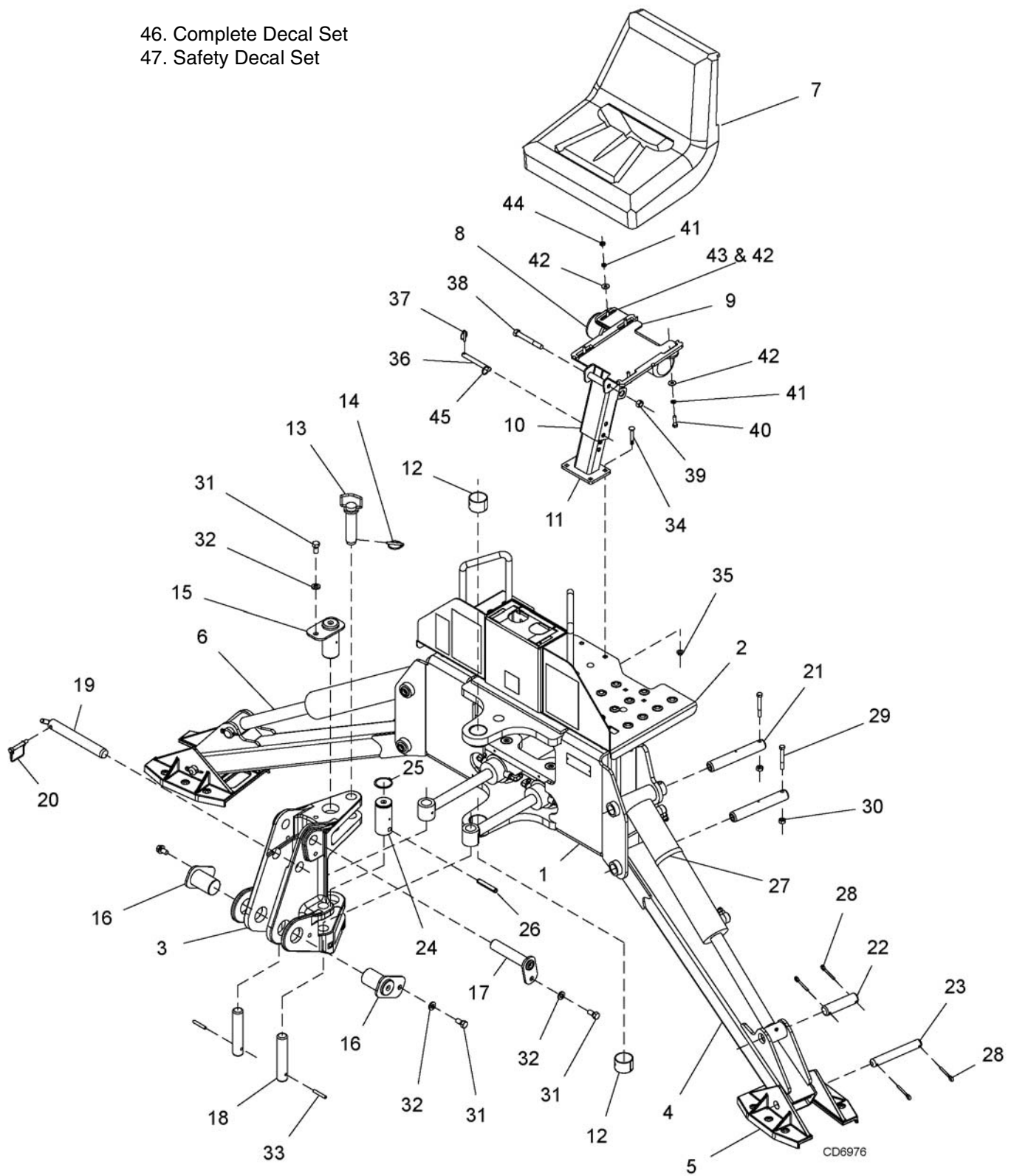


BH90-X

MAIN FRAME ASSEMBLY.....	34 - 37
BOOM ASSEMBLY	38
DIPPER/BUCKET ASSEMBLY	39
CONTROL VALVE LINKAGE ASSEMBLY	40
CONTROL VALVE ASSEMBLY.....	41
BUCKET CYLINDER	42
BOOM & DIPPER CYLINDER	42
STABILIZER CYLINDER	43
SWING CYLINDER	43
HOSES & FITTINGS	44
THUMB ASSEMBLY (OPTIONAL).....	45
STABILIZER STREET PAD KIT (OPTIONAL)	45
PUMP & TANK ASSEMBLY (OPTIONAL)	46

MAIN FRAME ASSEMBLY

- 46. Complete Decal Set
- 47. Safety Decal Set



34 Parts

(Rev. 6/1/2007)
MAN0451 (6/2/2006)

MAIN FRAME ASSEMBLY PARTS LIST

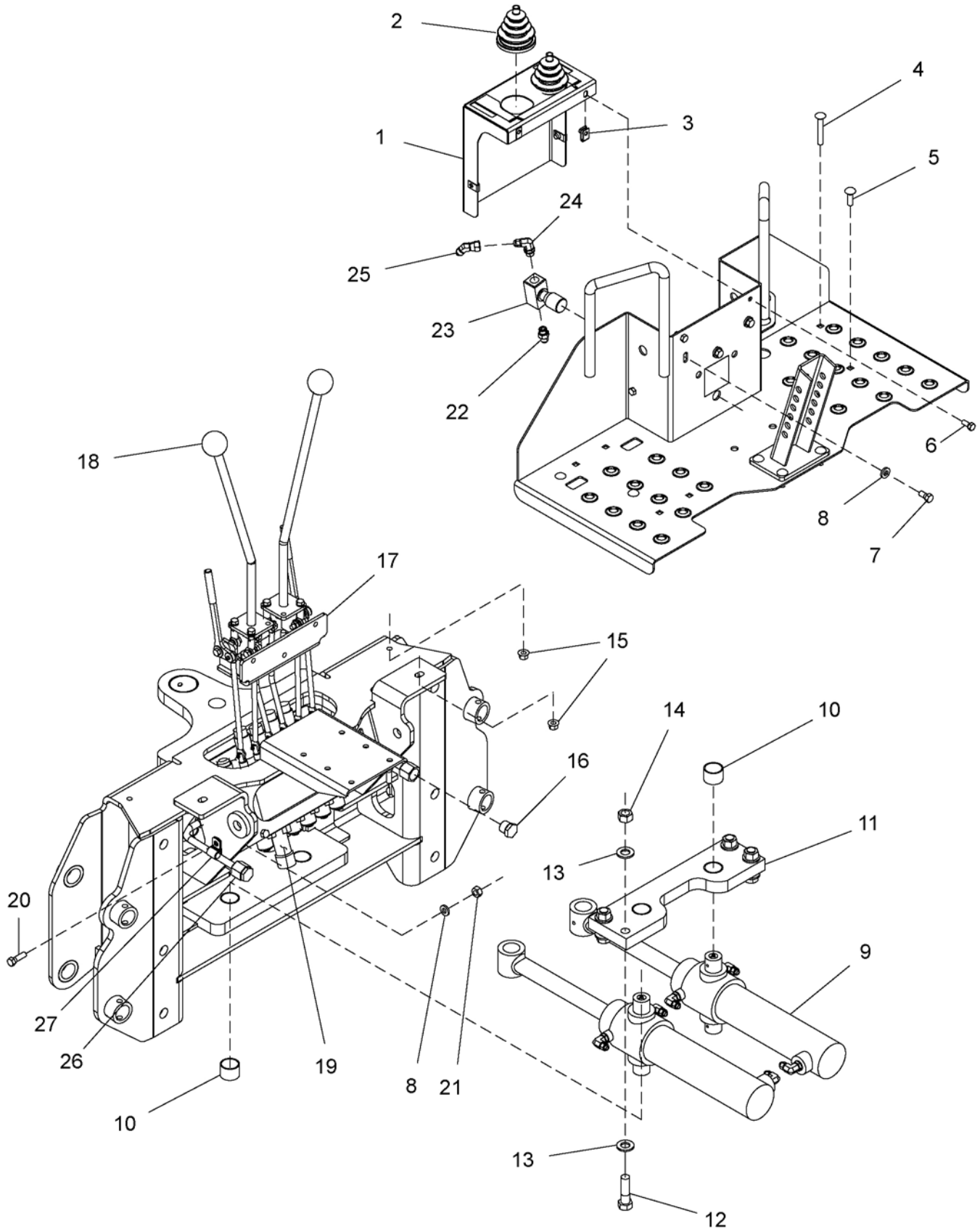
REF	PART	QTY	DESCRIPTION	REF	PART	QTY	DESCRIPTION
1	1017825	1	Main frame	25	443029	1	Snap ring
2	1022051	1	Console w/decals	26	21142	1	Pin, 1/2 x 3 slotted spring
3	1017891	1	Swing frame	27	8641	2	14-1/2 Binding strap
4	1017801	2	Stabilizer	28	923 *	8	1/4 x 1-3/4 Cotter pin
5	1017808	2	Stabilizer pad	29	7747 *	4	3/8 NC x 3 HHCS GR5
6	1017728	2	Hydraulic cylinder 3.0 x 1.5 x 14	30	6698 *	4	3/8 NC Lock nut
7	1012560	1	High back seat	31	25475 †*	4	1/2 NC x 1 HHCS full thread GR5
8	1003828	1	Manual tube	32	1012568	4	1/2 Nord lock washer
9	1012563	1	Seat bracket	33	7251	2	5/16 x 2 Spring pin
10	1012554	1	Seat mount	34	20973 *	4	3/8 NC x 1-1/4 Carriage bolt GR5
11	1008475	1	Lower seat support	35	14350 *	4	3/8 NC Flange lock nut
12	1017922	2	Bushing, 2.0 x 2.19 x 1.5	36	13817	1	Pin, .50 x 3.78
13	1012609	1	Pin, hitch 1.25 x 4.25	37	22411	1	Klik pin, 3/16 x 1
14	62043	1	Klik pin, 1/4 x 1-3/4	38	10380 *	1	1/2 NC x 4 HHCS GR5
15	1017853	1	Pin, 2.0 x 4.0	39	765 *	1	1/2 NC Lock nut
16	1017816	2	Pin, 2.0 x 3.05	40	24408 *	4	5/16 NC x 1-1/2 HHCS GR5
17	1017854	1	Pin assembly	41	2472 *	5	5/16 Lock washer
18	1017822	2	Pin	42	4378 *	6	5/16 Flat washer
19	1012608	1	Pin, 1.18 x 9.0	43	14562 *	1	5/16 NC x 1 HHCS GR5
20	33000	1	Pin, lynch 3/8 x 2-1/4	44	6778 *	1	5/16 NC Lock nut
21	1017974	4	Pin, 1.25 x 7.49	45	62992	1	.11 x 1.1 OD Split ring
22	1017742	2	Pin	46	1022053	1	Complete decal set
23	37431	2	Pin, 1.0 x 6.1	47	1022052	1	Safety decal set
24	1012601	1	Pin, 2.0 x 3.38				

† Apply permanent type thread locking compound such as Loctite® 2760.

HHCS Hex Head Cap Screw

* Standard hardware, obtain locally

MAIN FRAME ASSEMBLY



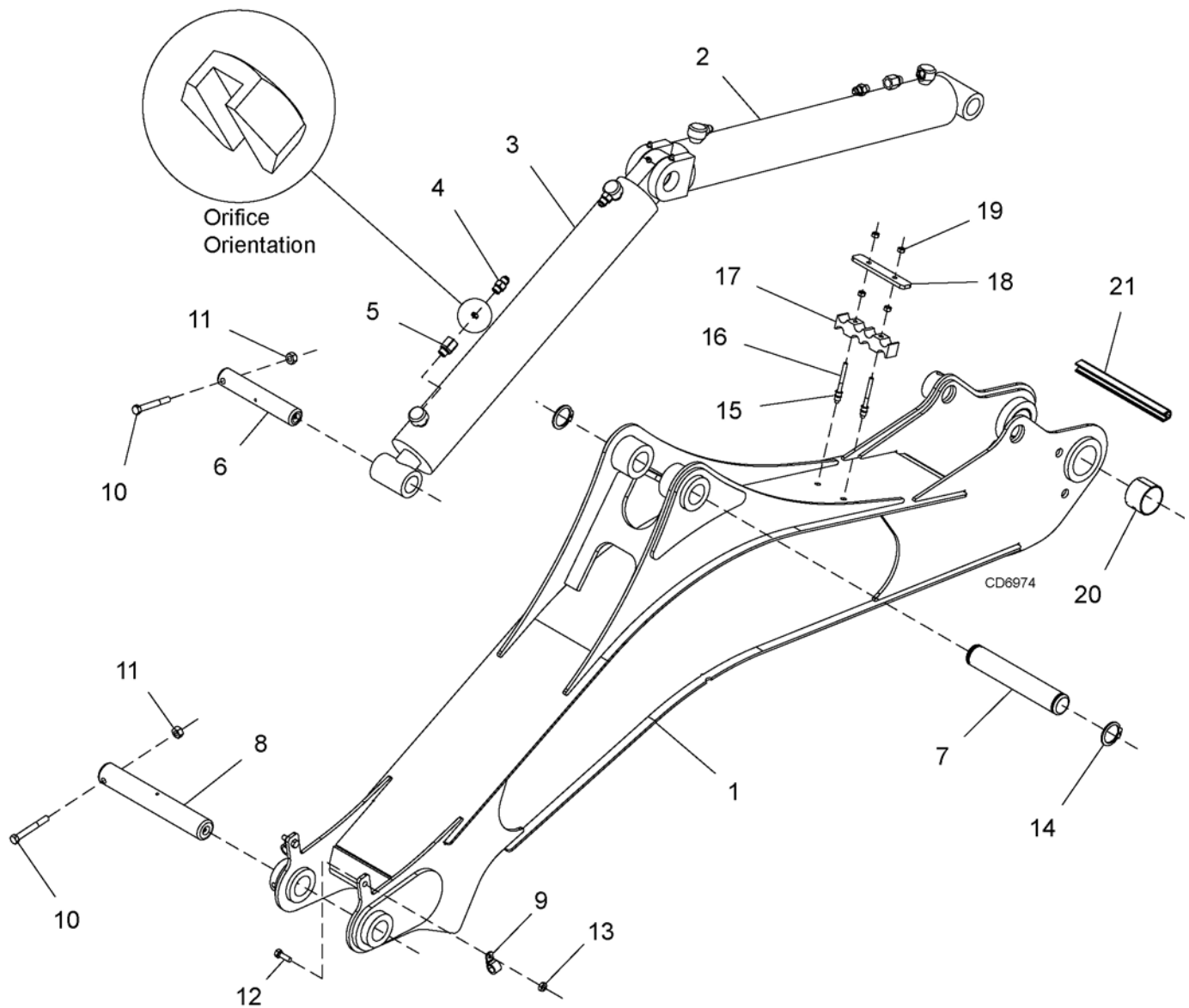
36 Parts

MAN0451 (6/2/2006)

MAIN FRAME ASSEMBLY PARTS LIST

REF	PART	QTY	DESCRIPTION	REF	PART	QTY	DESCRIPTION
1	1022050	1	Cover-console with decals	16	1005736	2	Plug, 7/8-14 O-ring hex head
2	37765	2	Boot, rubber control	17	-----	1	Control valve assembly, see page 41
3	74047	4	Spring nut 5/16-18 u-tapered	18	37672	2	Knob 1.88 dia x 1/2 NC
4	35735 *	2	3/8 NC x 2-1/2 Carriage bolt	19	-----	1	Valve assembly w/fittings, see page 44
5	20973 *	2	3/8 NC x 1-1/4 Carriage bolt GR5	20	12169 *	4	3/8 NC x 1-1/4 HHCS GR5
6	78205 *	4	5/16 NC x 3/4 HHCS GR5	21	6698 *	4	3/8 NC Lock nut
7	1270 *	3	3/8 NF x 3/4 HHCS	22	62367	1	Adapter, 9/16 JICM x 9/16 ORBM
8	44546	7	3/8 Hardened flat washer	23	1012510	1	Valve flow control
9	1017818	2	Hydraulic cylinder 2.50 x 1.25 x 11.00	24	63558	1	Elbow, 9/16 JICM x 9/16 ORBM 90°
10	37429	4	Bushing 1.25 x 1.41 x 1.00	25	62866	1	Elbow, 9/16 JICM x 9/16 JICF 45°
11	1017847	1	Trunnion mount	26	1012614	2	Feedline - BH90-X
12	12274 *	4	5/8 NC x 2-1/4 HHCS	27	35249	2	Clip, fuel line
13	57817	8	5/8 Hardened flat washer				
14	230 *	4	5/8 NC Hex nut		HHCS		Hex Head Cap Screw
15	14350 *	4	3/8 NC Flange lock nut		*		Standard hardware, obtain locally

BOOM ASSEMBLY



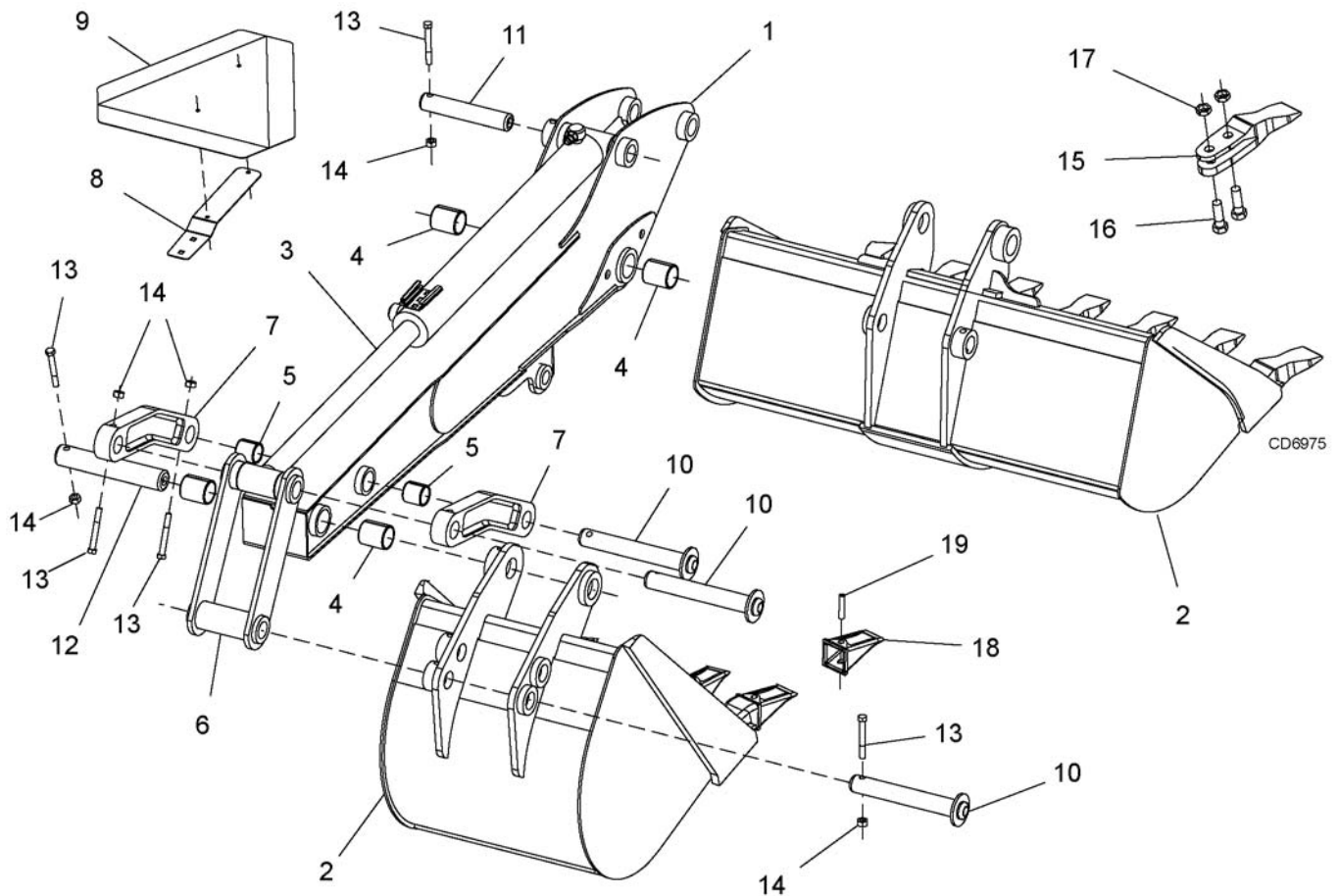
REF	PART	QTY	DESCRIPTION	REF	PART	QTY	DESCRIPTION
1	1017900	1	Boom BH90-X	12	14562 *	2	5/16 NC x 1 HHCS GR5
2	1017725	1	Cylinder 3.00 x 1.50 x 21.50	13	6778 *	2	5/16 NC Lock nut
3	1017726	1	Cylinder 3.00 x 1.50 x 19.63	14	62718	2	Ring, snap .109 x 1.5 OD
4	62367	2	Adapter, 9/16 JICM x 9/16 ORBM	15	-----	2	1/4-20 UNC Blind hole nut
5	1020005	2	Restrictor, .094 9/16 ORB	16	1011842	2	1/4-20 UNC x 3.00 Stud
6	1020013	1	Pin - 1.25 x 7.08	17	1011843	1	Clamp, 8" hose
7	1017747	1	Pin - 1.5 x 8.62	18	1011844	1	Clamp bar .25 x 5.00
8	1017748	1	Pin - 1.5 x 9.78	19	5288 *	4	1/4 NC Hex nut
9	74058	2	Clamp, .625 dia steel cushion	20	1017922	2	Bushing, 2.00 x 2.19 x 1.50
10	7747 *	2	3/8 NC x 3 HHCS GR5	21	1012624	1	Trim strip, .38 x 6.8
11	6698 *	2	3/8 NC Lock nut				

* Standard hardware, obtain locally

38 Parts

MAN0451 (6/2/2006)

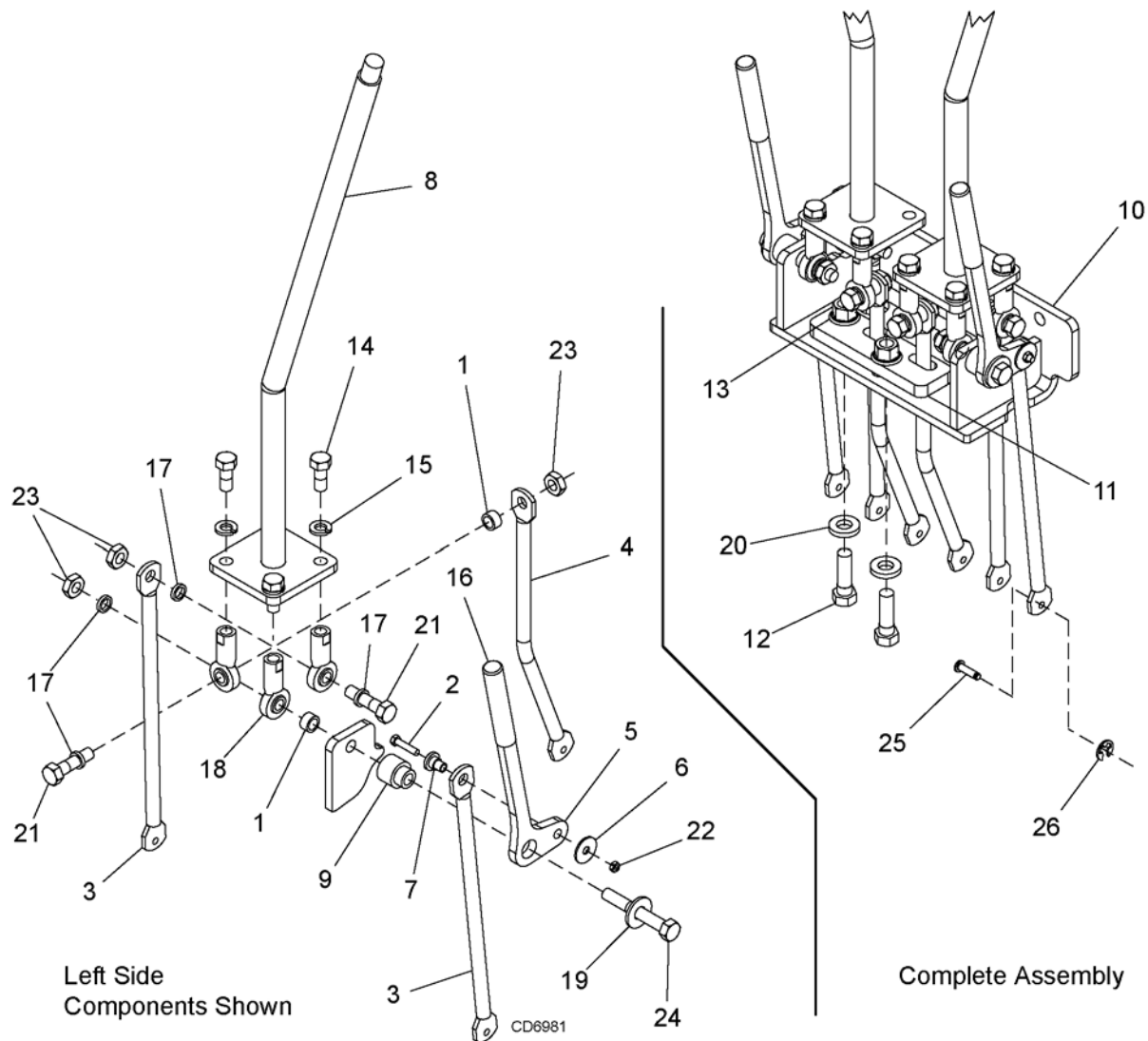
DIPPER/BUCKET ASSEMBLY



REF	PART	QTY	DESCRIPTION	REF	PART	QTY	DESCRIPTION
1	1017950	1	Dipper BH90-X	8	1004251	1	SMV bracket
2	1020212	1	Bucket 12 - or -	9	24611	1	Sign SMV
	1020216	1	Bucket 16 - or -	10	37839	3	Pin, clevis 1.25 x 7.68
	1020218	1	Bucket 18 - or -	11	1020013	1	Pin, 1.25 x 7.08
	1020224	1	Bucket 24 - or -	12	1020014	1	Pin, 1.50 x 8.61
	1020236	1	Bucket 36 w/teeth	13	7747 *	5	3/8 NC x 3 HHCS GR5
	1020236D	1	Bucket 36 (ditching bucket, no teeth)	14	6698 *	5	3/8 NC Lock nut
3	1017727	1	Cylinder 2.50 x 1.50 x 20.00	15	1013499	AR	Tooth
4	37851	4	Bushing 1-1/2 ID x 1-3/4 OD x 2	16	902 *	2	5/8 NC x 2 HHCS GR5
5	34014	2	Bushing 1-1/4 x 1-1/2 x 1-1/2	17	6239 *	2	5/8 NC Lock nut
6	37830	1	Bucket link	18	HEX156	AR	Tooth, standard
7	37835	2	Guide link	19	HEP156	AR	Pin (HA201, HA203)

AR as required
 HHCS Hex Head Cap Screw
 * Standard hardware, obtain locally

CONTROL VALVE LINKAGE ASSEMBLY

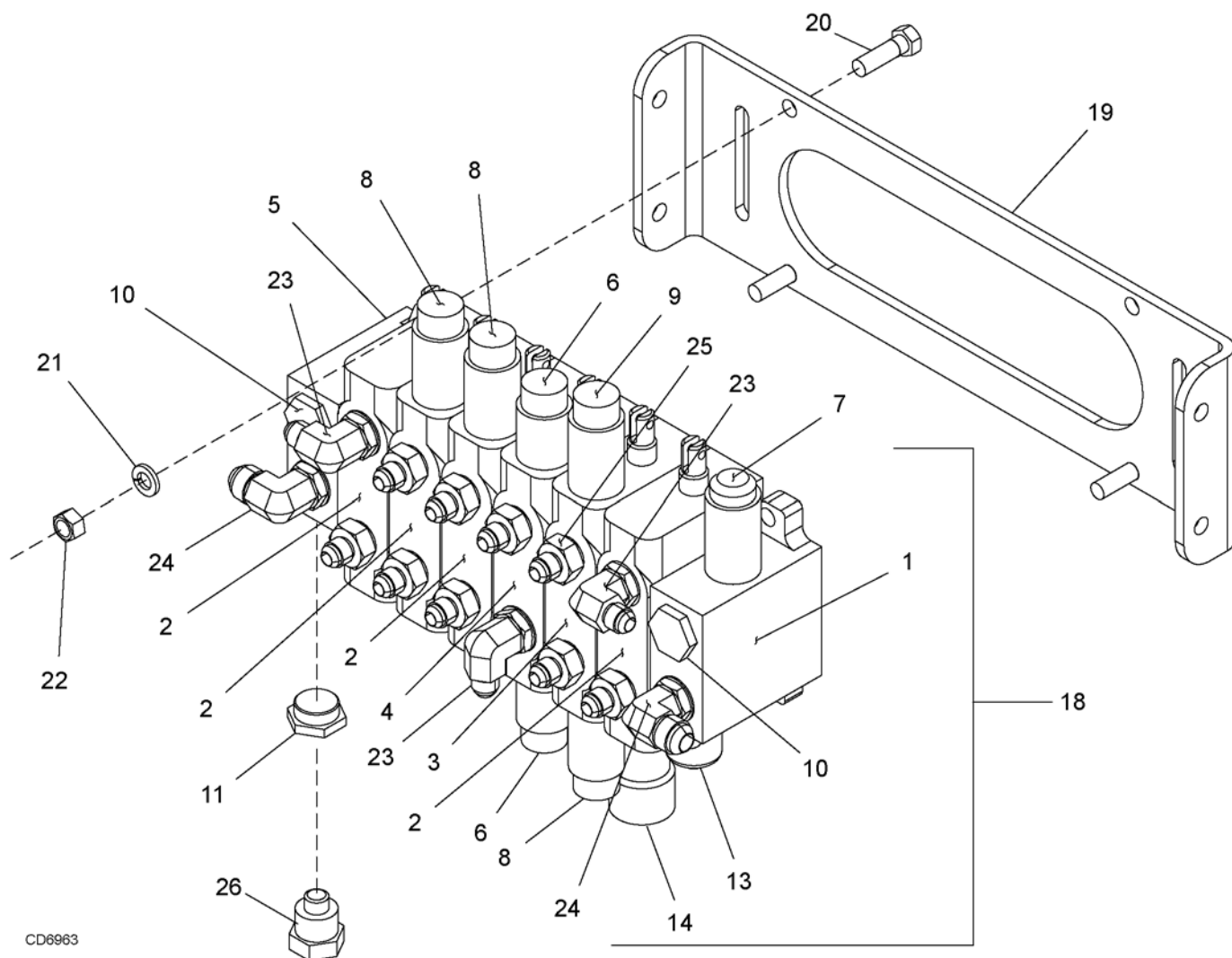


REF	PART	QTY	DESCRIPTION	REF	PART	QTY	DESCRIPTION
1	1017767	4	Sleeve, .328 x .463 x .250	15	2472 *	6	5/16 Lock washer
2	1017779 *	2	#8-32 x 3/4 HHCS	16	31416	2	Rubber handle
3	1017988	4	Control link	17	37577	8	Washer, .328 x .463 x .093
4	1017990	2	Control handle	18	37613	6	Rod end, 5/16 NF female
5	1017991	2	Stabilizer handle	19	4378 *	2	5/16 Flat washer
6	----- *	2	Washer, #8 flat	20	44546	2	3/8 Hardened flat washer
7	1020021	2	Sleeve, pivot stabilizer	21	6250 *	4	5/16 NC x 1-1/4 HHCS GR5
8	1020023	2	Handle	22	62529 *	2	#8 NC Lock nut
9	1020024	2	Sleeve, pivot joystick	23	6778 *	6	5/16 NC Lock nut
10	1020040	1	Valve control bracket	24	7164 *	2	5/16 NC x 2-1/4 HHCS GR5
11	1020046	1	Guide, valve linkage	25	1006133	6	Pin, grooved clevis .19
12	12169 *	2	3/8 NC x 1-1/4 HHCS GR5	26	34303	6	Ring ret .025 x .156 ext
13	14350 *	2	3/8 NC Flange lock nut				HHCS Hex Head Cap Screw
14	24405 *	6	5/16 NF x 3/4 HHCS GR5				* Standard hardware, obtain locally

40 Parts

MAN0451 (6/2/2006)

CONTROL VALVE ASSEMBLY



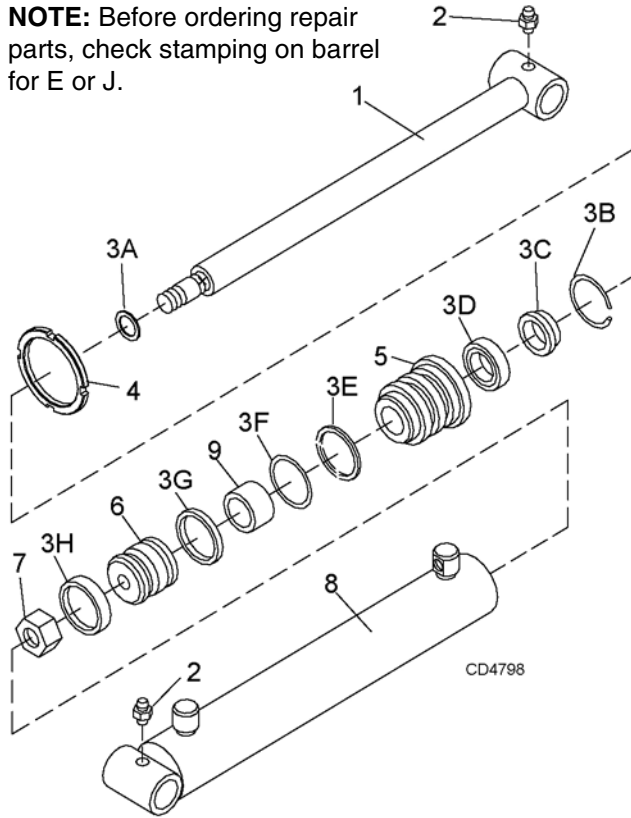
CD6963

REF	PART	QTY	DESCRIPTION	REF	PART	QTY	DESCRIPTION
1	1020055	1	Inlet section assembly	16	1020081	6	Seal kit - spool (NS)
2	1020059	4	Spool section assembly	17	1020082	1	Seal kit - section (NS)
3	1020056	1	Spool section assembly	18	1017880	1	Valve-6 spool section 2500 psi (no fittings)
4	1020057	1	Spool section assembly	19	1017881	1	Bracket, valve
5	1020058	1	Outlet section assembly	20	12169 *	3	3/8 NC x 1-1/4 HHCS GR5
6	1020077	2	Relief valve assembly PO 2650 psi	21	838 *	3	3/8 Lock washer
7	1020078	1	Relief valve assembly PO 2500 psi	22	835 *	3	3/8 NC Hex nut
8	1020076	3	Relief valve assembly DA 2650 psi	23	313038	3	Elbow, 9/16 JICM x 3/4 ORBM 90°
9	1020060	1	Relief valve DA 3500 psi	24	316004	2	Elbow, 3/4 JICM x 3/4 ORBM 90°
10	43683	2	Plug assembly - SAE (-8)	25	69	9	Adapter, 9/16 JICM x 3/4 ORBM
11	16715-1	1	Plug assembly - SAE (-10)	26	X102202	1	PBY Plug (if required)
12	1020079	1	Tie rod kit, 6 section (NS)				
13	16712-1	5	Standard positioner kit				
14	1020080	1	Repair kit, spool end float		HHCS		Hex Head Cap Screw
15	1020083	6	Load check poppet w/spring (NS)		NS		not shown
					*		Standard hardware, obtain locally

HYDRAULIC CYLINDER ASSEMBLIES

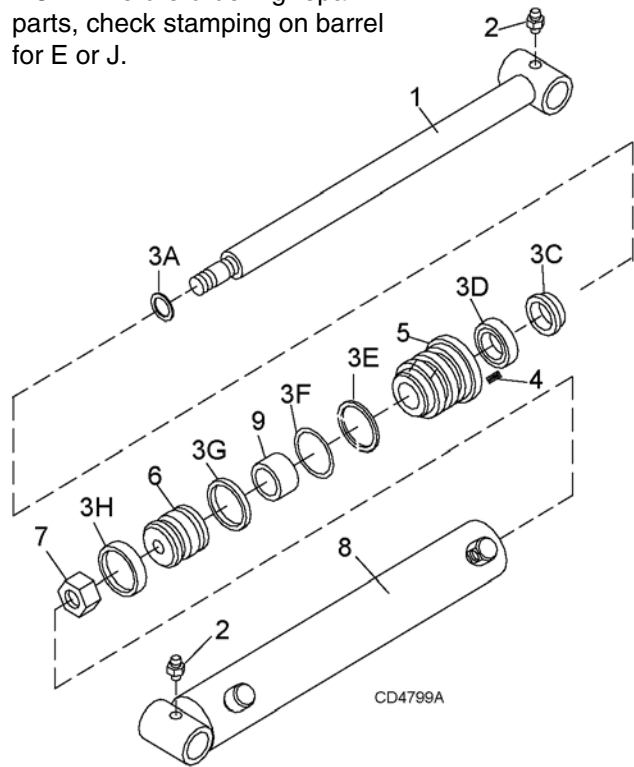
Bucket Cylinder

NOTE: Before ordering repair parts, check stamping on barrel for E or J.



Boom & Dipper Cylinder

NOTE: Before ordering repair parts, check stamping on barrel for E or J.



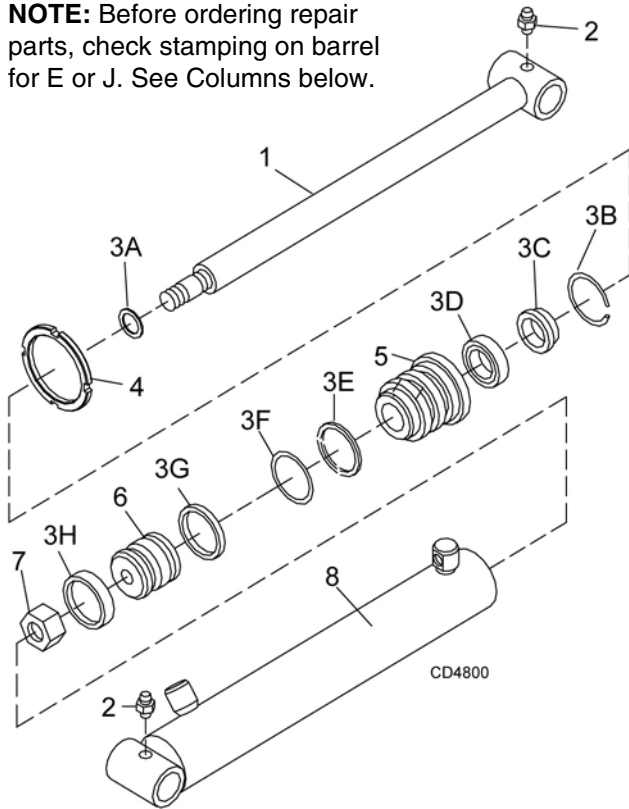
REF	PART "E"	PART "J"	QTY	DESCRIPTION
A	1017727	1017727	1	Complete cylinder assembly
1	1020067	N/S	1	Piston rod
2	N/S	N/S	2	Grease fitting
3	1020026	1029011	1	Seal Kit (includes 3A - 3H)
3A	----	----	1	O-Ring
3B	----	----	1	Internal retaining ring
3C	----	----	1	Wiper ring
3D	----	----	1	Seal
3E	----	----	1	Backup ring
3F	----	----	1	O-Ring
3G	----	----	1	Piston seal
3H	----	----	1	Wear ring
4	----	----	1	Spanner nut
5	----	----	1	Guide
6	----	----	1	Piston
7	----	----	1	Lock nut
8	----	----	1	Cylinder body
9	----	----	1	Tube
		N/S		Not serviceable

REF	PART "E"	PART "J"	QTY	DESCRIPTION
A	1017725	1017725	1	Complete cylinder asy - Boom
B	1017726	1017726	1	Complete cylinder asy - Dipper
1	1020061	N/S	1	Piston rod - Boom
1	1020064	N/S	1	Piston rod - Dipper
2	N/S	N/S	2	Grease fitting
3	1020025	1030038	1	Seal kit (includes 3A-3H)
3A	----	----	1	O-Ring
3C	----	----	1	Wiper ring
3D	----	----	1	Seal
3E	----	----	1	Backup ring
3F	----	----	1	O-Ring
3G	----	----	1	Piston seal
3H	----	----	1	Wear ring
4	----	----	1	Socket set screw
5	----	----	1	Guide
6	----	----	1	Piston
7	----	----	1	Lock nut
8	----	----	1	Cylinder body
9	----	----	1	Tube
		N/S		Not serviceable

HYDRAULIC CYLINDER ASSEMBLIES

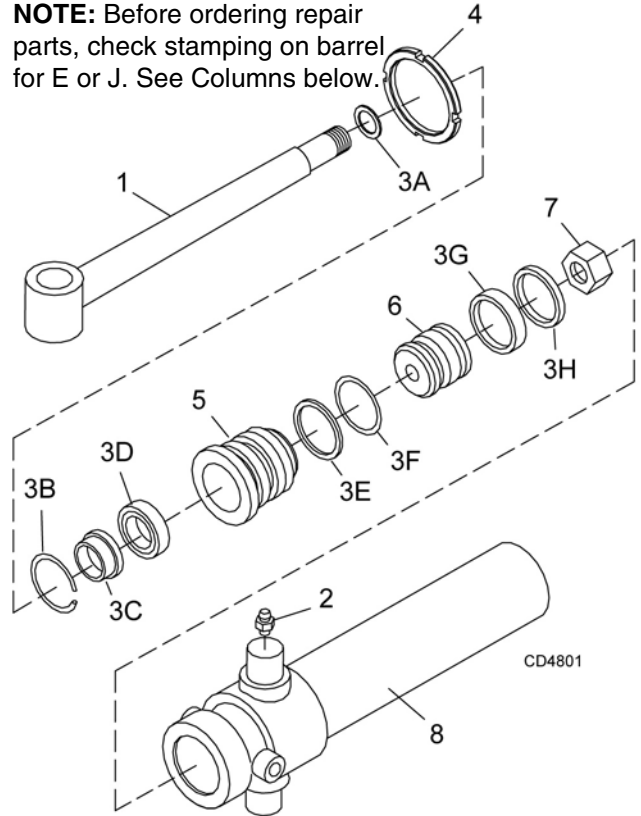
Stabilizer Cylinder

NOTE: Before ordering repair parts, check stamping on barrel for E or J. See Columns below.



Swing Cylinder

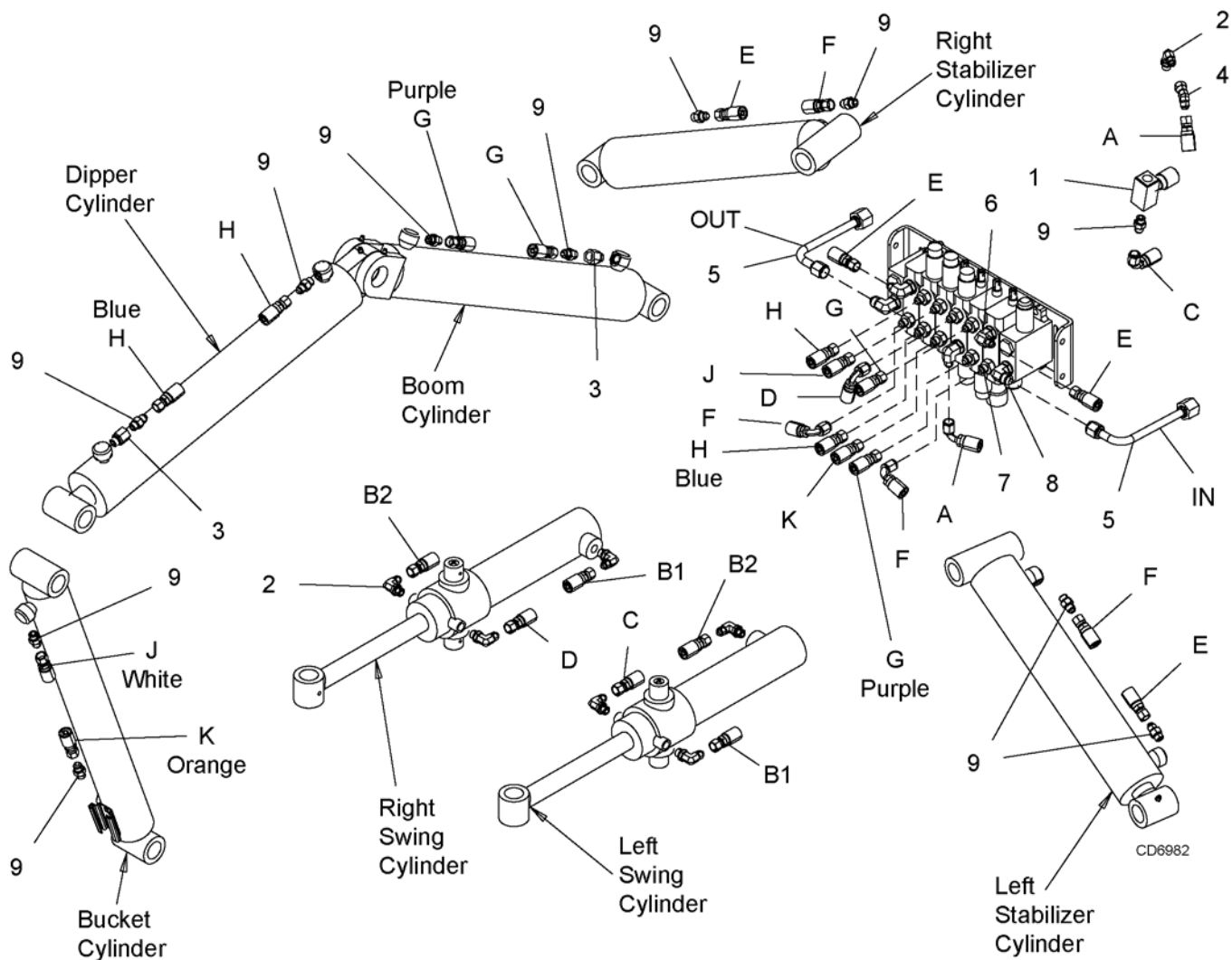
NOTE: Before ordering repair parts, check stamping on barrel for E or J. See Columns below.



REF	PART "E"	PART "J"	QTY	DESCRIPTION
A	1017728	1017728	1	Complete cylinder assembly
1	----	----	1	Piston rod
2	N/S	N/S	2	Grease fitting
3	1020027	1030039	1	Seal kit (Includes 3A-3H)
3A	----	----	1	O-Ring
3B	----	----	1	Internal retaining ring
3C	----	----	1	Wiper ring
3D	----	----	1	Seal
3E	----	----	1	Backup ring
3F	----	----	1	O-Ring
3G	----	----	1	Piston seal
3H	----	----	1	Wear ring
4	----	----	1	Spanner nut
5	----	----	1	Guide
6	----	----	1	Piston
7	----	----	1	Lock nut
8	----	----	1	Cylinder body
			N/S	Not serviceable

REF	PART "E"	PART "J"	QTY	DESCRIPTION
A	1017818	1017818	1	Complete cylinder assembly
1	1020073	1020073	1	Piston rod
2	----	----	1	Grease fitting
3	1020028	1029013	1	Seal kit (Includes 3A - 3H)
3A	----	----	1	O-Ring
3B	----	----	1	Internal retaining ring
3C	----	----	1	Wiper ring
3D	----	----	1	Seal
3E	----	----	1	Backup ring
3F	----	----	1	O-Ring
3G	----	----	1	Piston seal
3H	----	----	1	Piston ring
4	----	----	1	Spanner nut
5	----	----	1	Guide
6	----	----	1	Piston
7	----	----	1	Lock nut
8	----	----	1	Cylinder body
			N/S	Not serviceable

HOSES & FITTINGS



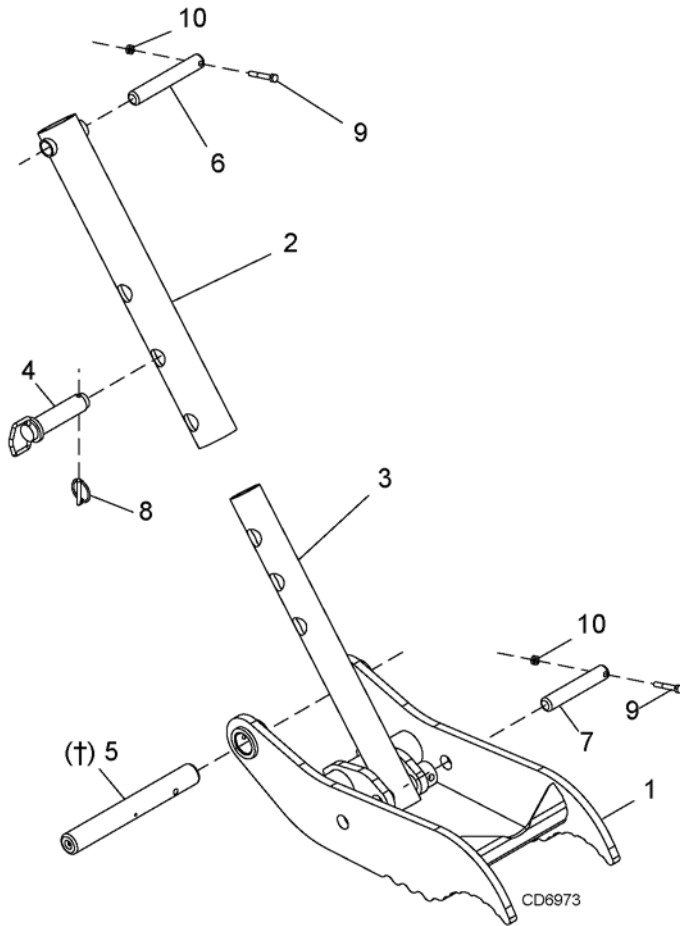
HOSE

REF	PART	QTY	DESCRIPTION	REF	PART	QTY	DESCRIPTION
1	1012510	1	Valve flow control	A	1008340	1	Hose, 1/4 21" 9/16 JICF 9/16 JICF
2	63558	7	Elbow, 9/16 ORBM x 9/16 JICM	B	1014237	2	Hose, 1/4 22" 9/16 JICF 9/16 JICF
3	1020005	2	Restrictor, .094 9/16 ORB	C	37959	1	Hose, 1/4 27" 9/16 JICF 9/16 JICF
4	62866	1	Elbow, 9/16 JICM x 9/16 JICF 45°	D	1020054	1	Hose, 1/4 30" 9/16 JICF 9/16 JICF
5	1012614	2	Feedline - BH90-X	E	1014240	2	Hose, 1/4 42" 9/16 JICF 9/16 JICF
6	313038	3	Elbow, 9/16 JICM x 3/4 ORBM 90°	F	1014241	2	Hose, 1/4 42" 9/16 JICF 9/16 JICF
7	69	9	Adapter, 9/16 JICM x 3/4 ORBM	G	1014242	2	Hose, 3/8 65" 9/16 JICF 9/16 JICF
8	316004	2	Elbow, 3/4 JICM x 3/4 ORBM 90°	H	1014244	2	Hose, 3/8 80" 9/16 JICF 9/16 JICF
9	62367	11	Adapter, 9/16 JICM x 9/16 ORBM	J	1020052	1	Hose, 3/8 127" 9/16 JICF 9/16 JICF
				K	1020053	1	Hose, 3/8 141" 9/16 JICF 9/16 JICF

44 Parts

MAN0451 (6/2/2006)

1020000 THUMB ASSEMBLY (OPTIONAL)

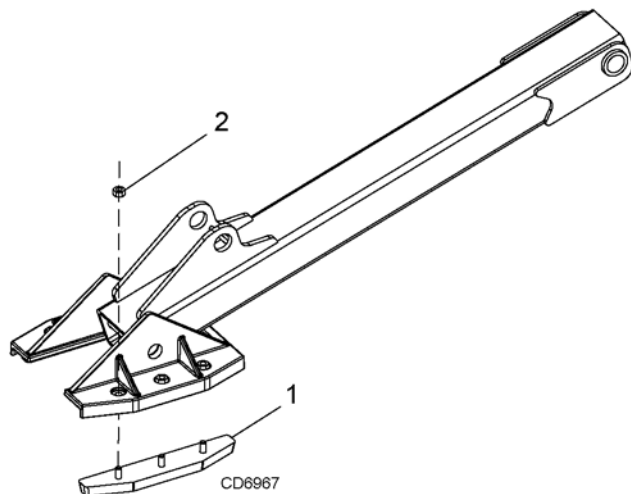


REF	PART	QTY	DESCRIPTION
1	1020030	1	Thumb, BH90-X
2	1009689	1	Outer tube
3	1009690	1	Inner tube
4	1012609	1	Pin, hitch 1.25 x 4.25
5	1020029 †	1	Pin, 1.5 x 8.61
6	55238	1	Pin, 1. x 6.44
7	55242	1	Pin, 1.0 x 5.66 headless
8	62043	1	1/4 x 1-3/4 Kilk pin
9	7164 *	2	5/16 NC x 2-1/4 HHCS GR5
10	6778 *	2	5/16 NC Lock nut

† (use existing hardware)

* Standard hardware, obtain locally

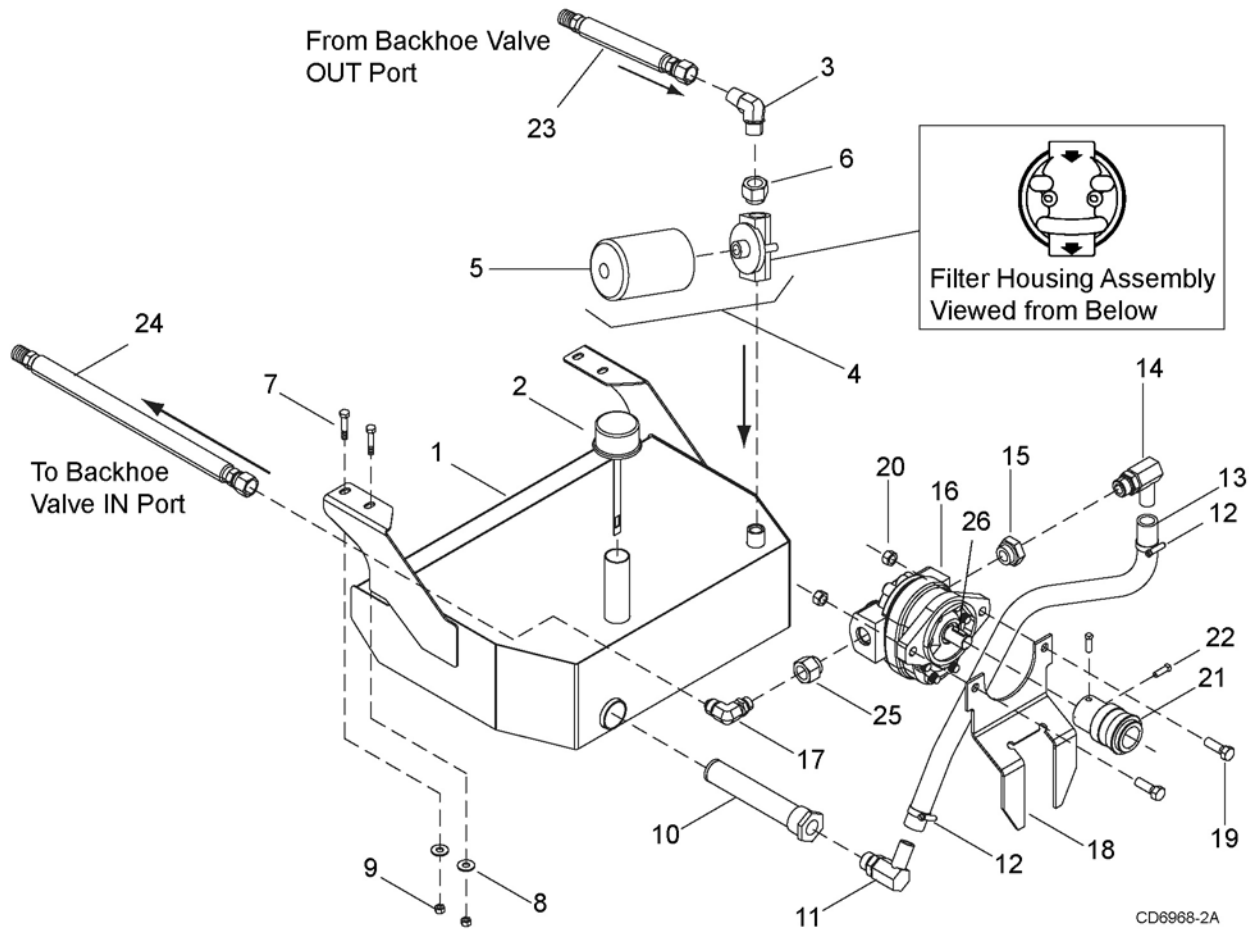
STABILIZER STREET PAD KIT (OPTIONAL)



REF	PART	QTY	DESCRIPTION
A	1006610KT	1	Street pad kit (includes item 1 & 2)
1	1006610	4	Rubber stabilizer pad
2	6698 *	12	3/8 NC Lock nut

* Standard hardware, obtain locally

1012617 PUMP & TANK ASSEMBLY (OPTIONAL)



REF	PART	QTY	DESCRIPTION	REF	PART	QTY	DESCRIPTION
1	1012605	1	Tank, 13.31 x 15.0 x 21.25	14	62429	1	Elbow, 90°
2	31414	1	Breather cap with dipstick	15	62428	1	Adapter, 1-1/16 ORBF x 1-5/8 ORBM
3	38647	1	Elbow, 7/8 JICM x 1/2 NPTM 45° (prior to Oct 2007)	16	37910	1	Pump, 3.80 CIR CCW
3	1020204	1	Elbow, 3/4 JICF x 1/2 NPTM	16A	340069		Pump seal kit (not shown)
4	62420	1	Filter & housing assembly	17	313040	1	Elbow, 7/8 JICM x 7/8 ORBM 90°
5	62421	1	Filter element	18	34285	1	Pump mounting bracket
6	11815	1	Adapter, 1/2 NPTF x 3/4 NPTM	19	3379 *	2	1/2 NC x 1-1/2 Cap screw GR5
7	976 *	4	3/8 NC x 1-1/2 HHCS GR5	20	765 *	2	1/2 NC Lock nut
8	44546	4	3/8 Hardened flat washer	21	38621	1	Pump adapter, .875 ID 540 RPM
9	835 *	4	3/8 NC Hex nut	22	62147 *	2	5/16 NC x 1 Set screw
10	43660	1	Tank strainer	23	38642	1	Hose, 12" x 7/8 JICF x 7/8 ORBM (prior to Oct 2007)
11	62431	1	Elbow, 3/4 NPTM x 3/4 hose	23	1020208	1	Hose, 35" x 3/4 JICF x 7/8 ORBM
12	62412 *	2	1/2 Hose clamp, screw	24	38641	1	Hose, 50" x 7/8 JICF x 7/8 ORBM
13	31210	1	Hose, 3/4 x 36"	25	62432	1	Reducer, 7/8 ORBF x 1-5/16 ORBM
				26	63014	1	Key, 1/4 x 1.0 Woodruff

* Standard hardware, obtain locally

46 Parts

(Rev. 03/09/2010)
MAN0451 (6/2/2006)

BOLT TORQUE CHART

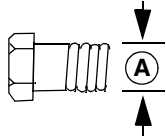
Always tighten hardware to these values unless a different torque value or tightening procedure is listed for a specific application.

Fasteners must always be replaced with the same grade as specified in the manual parts list.

Always use the proper tool for tightening hardware: SAE for SAE hardware and Metric for metric hardware.

Make sure fastener threads are clean and you start thread engagement properly.

All torque values are given to specifications used on hardware defined by SAE J1701 MAR 99 & J1701M JUL 96.



SAE SERIES TORQUE CHART



SAE Grade 2
(No Dashes)

SAE Bolt Head Identification

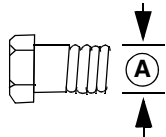


SAE Grade 5
(3 Radial Dashes)



SAE Grade 8
(6 Radial Dashes)

Ⓐ Diameter (Inches)	Wrench Size	MARKING ON HEAD					
		SAE 2		SAE 5		SAE 8	
		lbs-ft	N-m	lbs-ft	N-m	lbs-ft	N-m
1/4"	7/16"	6	8	10	13	14	18
5/16"	1/2"	12	17	19	26	27	37
3/8"	9/16"	23	31	35	47	49	67
7/16"	5/8"	36	48	55	75	78	106
1/2"	3/4"	55	75	85	115	120	163
9/16"	13/16"	78	106	121	164	171	232
5/8"	15/16"	110	149	170	230	240	325
3/4"	1-1/8"	192	261	297	403	420	569
7/8"	1-5/16"	306	416	474	642	669	907
1"	1-1/2"	467	634	722	979	1020	1383



METRIC SERIES TORQUE CHART



8.8
Metric
Grade 8.8

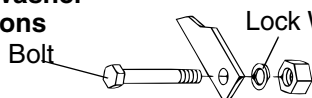
Metric Bolt Head Identification



10.9
Metric
Grade 10.9

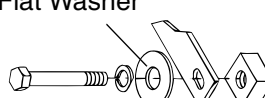
Ⓐ Diameter & Thread Pitch (Millimeters)	Wrench Size	COARSE THREAD				FINE THREAD				Ⓐ Diameter & Thread Pitch (Millimeters)
		MARKING ON HEAD								
		Metric 8.8		Metric 10.9		Metric 8.8		Metric 10.9		
		N-m	lbs-ft	N-m	lbs-ft	N-m	lbs-ft	N-m	lbs-ft	
6 x 1.0	10 mm	8	6	11	8	8	6	11	8	6 x 1.0
8 x 1.25	13 mm	20	15	27	20	21	16	29	22	8 x 1.0
10 x 1.5	16 mm	39	29	54	40	41	30	57	42	10 x 1.25
12 x 1.75	18 mm	68	50	94	70	75	55	103	76	12 x 1.25
14 x 2.0	21 mm	109	80	151	111	118	87	163	120	14 x 1.5
16 x 2.0	24 mm	169	125	234	173	181	133	250	184	16 x 1.5
18 x 2.5	27 mm	234	172	323	239	263	194	363	268	18 x 1.5
20 x 2.5	30 mm	330	244	457	337	367	270	507	374	20 x 1.5
22 x 2.5	34 mm	451	332	623	460	495	365	684	505	22 x 1.5
24 x 3.0	36 mm	571	421	790	583	623	459	861	635	24 x 2.0
30 x 3.0	46 mm	1175	867	1626	1199	1258	928	1740	1283	30 x 2.0

Typical Washer Installations



Lock Washer

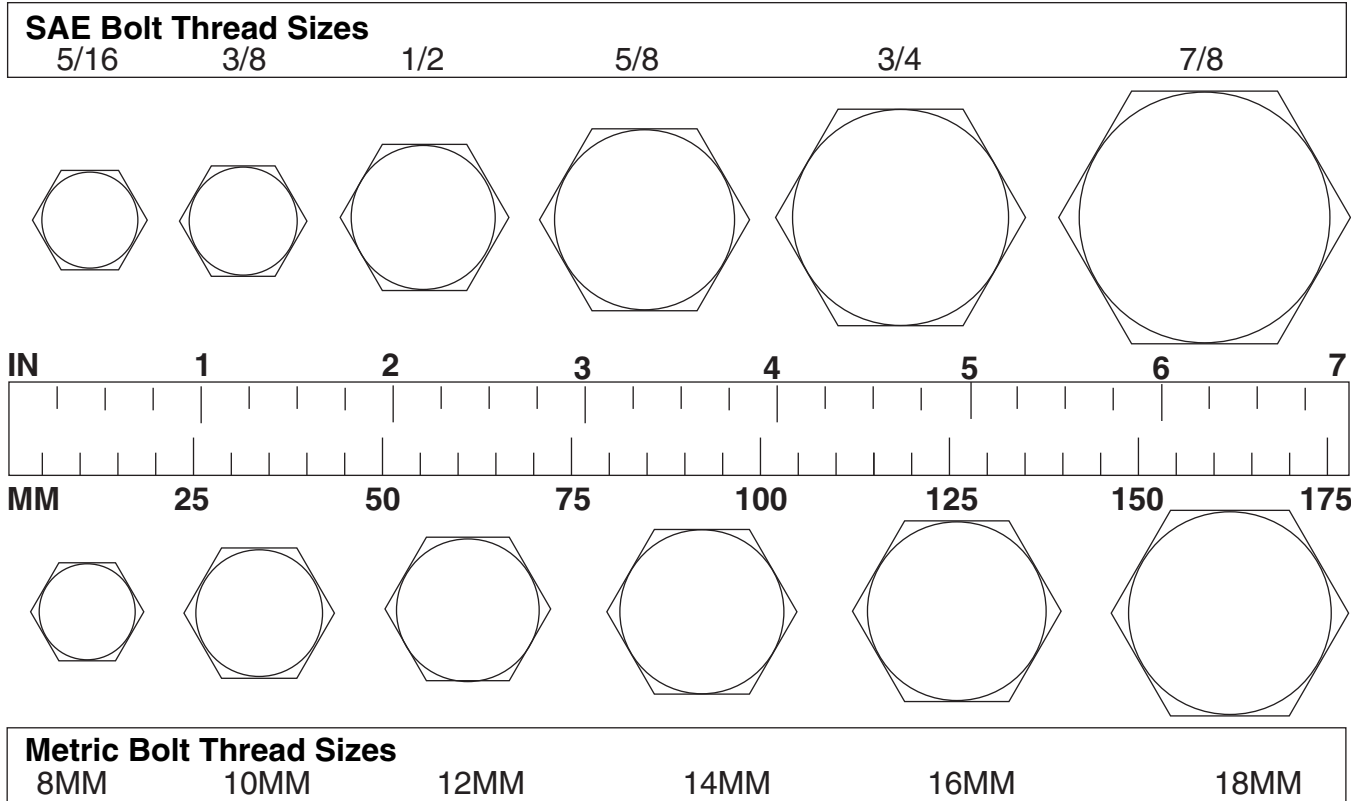
Flat Washer



8/9/00

BOLT SIZE CHART

NOTE: Chart shows bolt thread sizes and corresponding head (wrench) sizes for standard SAE and metric bolts.



ABBREVIATIONS

AG Agriculture
 ASABE American Society of Agricultural & Biological Engineers (formerly ASAE)
 ASAE..... American Society of Agricultural Engineers
 ATF.....Automatic Transmission Fluid
 BSPP..... British Standard Pipe Parallel
 BSPTM..... British Standard Pipe Tapered Male
 CV Constant Velocity
 CCW..... Counter-Clockwise
 CW Clockwise
 F Female
 FT..... Full Thread
 GA Gauge
 GR (5, etc.)..... Grade (5, etc.)
 HHCS Hex Head Cap Screw
 HT Heat-Treated
 JIC..... Joint Industry Council 37° Degree Flare
 LH..... Left Hand
 LT Left
 m Meter
 mm Millimeter
 M Male

MPa Mega Pascal
 N Newton
 NC..... National Coarse
 NF National Fine
 NPSM National Pipe Straight Mechanical
 NPT.....National Pipe Tapered
 NPT SWF..... National Pipe Tapered Swivel Female
 ORBM O-Ring Boss - Male
 P Pitch
 PBY.....Power-Beyond
 psi Pounds per Square Inch
 PTO.....Power Take Off
 QD Quick Disconnect
 RH..... Right Hand
 ROPS..... Roll-Over Protective Structure
 RPM.....Revolutions Per Minute
 RT Right
 SAE..... Society of Automotive Engineers
 UNC Unified Coarse
 UNF Unified Fine
 UNS Unified Special

INDEX

ASSEMBLY

- Backhoe to Tractor Attachment 30
- General Assembly Instructions 26
 - Bucket Installation 27
 - Dipper Cylinder Installation 27
 - Seat Installation and Adjustment 30
 - Stabilizer Installation 26
- Hydraulic Installation 27
 - Open-Center Valve 28
 - Pump Installation 28
 - Pump Mounting Bracket Installation 30
- Optional Equipment
 - 3-Point Mount Kit 31
 - Mechanical Thumb 31
 - Stabilizer Street Pad Installation 31

DEALER CHECK LISTS

- Delivery Check List (Dealer's Responsibility) 32
- Pre-Delivery Check List (Dealer's Responsibility) 32

DEALER SERVICE

- Control Valve Linkage Adjustment 25
- Hydraulic Cylinder Repair
 - Boom and Dipperstick Cylinder (Threaded Gland Cylinders)
 - Assembly 23
 - Disassembly 23
 - Bucket, Swing, & Stabilizer Cylinders (Spanner Nut Cylinders)
 - Assembly 22
 - Disassembly 22
 - General Hydraulic Repair Information 22
- Hydraulic Valve Repair
 - Adjust System Relief Valve Pressure 24
 - Pressure Settings on Port Relief Valves 24
 - Replacing Port Relief Valves 24
 - Segment Replacement 24

GENERAL

- Abbreviations 48
- Bolt Size Chart 48
- Bolt Torque Chart 47
- General Information 6
- Introduction 2
- Obtaining Replacement Manuals 2
- Specifications 4
- Table of Contents 3
- Warranty
 - Product 50
 - Replacement Parts 51

OPERATION

- Backhoe Removal and Storage
 - 3-Point Mount Removal 16
 - 4-Point Sub-Frame Mount Removal 16
 - Disconnect Tractor Hydraulics 17
- Control Handle Operation 13
- Excavation
 - Dump and Return Cycle 14
 - Filling Bucket 14
 - Side Slope Trenching 15
 - Starting Excavation 14
 - Trenching 14
- General Operation 12
- Position the Machine 13
- Pre-Operation Check List (Owner's Responsibility) 17
- Start and Stop Operation 12
- Swing Speed Control 14
- Thumb Operation 17
- Transporting
 - Transport and Swing Lock Installation 15

OWNER SERVICE

- Cleaning
 - After Each Use 20
 - Periodically or Before Extended Storage 20
- Hydraulic Hoses and Fittings 18
- Hydraulic Pump System 20
- Lubrication 19
- Relief Valve 18

PARTS

- Index to Parts Lists 33

SAFETY

- Delivery Check List (Dealer's Responsibility) 32
- Pre-Delivery Check List (Dealer's Responsibility) 32
- Pre-Operation Check List (Owner's Responsibility) 17
- Safety & Instructional Decals 10
- Safety Rules 7
- Safety Symbols Explained 2

TROUBLESHOOTING

- Troubleshooting 21



WARRANTY

(Replacement Parts For All Models Except Mow'n Machine™
Zero-Turn Mowers and Woods Boundary™ Utility Vehicles)

Woods Equipment Company ("WOODS") warrants this product to be free from defect in material and workmanship for a period of ninety (90) days from the date of delivery of the product to the original purchaser with the exception of V-belts, which will be free of defect in material and workmanship for a period of 12 months.

Under no circumstances will this Warranty apply in the event that the product, in the good faith opinion of WOODS, has been subjected to improper operation, improper maintenance, misuse, or an accident. This Warranty does not cover normal wear or tear, or normal maintenance items.

This Warranty is extended solely to the original purchaser of the product. Should the original purchaser sell or otherwise transfer this product to a third party, this Warranty does not transfer to the third party purchaser in any way. There are no third party beneficiaries of this Warranty.

WOODS' obligation under this Warranty is limited to, at WOODS' option, the repair or replacement, free of charge, of the product if WOODS, in its sole discretion, deems it to be defective or in noncompliance with this Warranty. **The product must be returned to WOODS with proof of purchase within thirty (30) days after such defect or noncompliance is discovered or should have been discovered, routed through the dealer and distributor from whom the purchase was made, transportation charges prepaid.** WOODS shall complete such repair or replacement within a reasonable time after WOODS receives the product. THERE ARE NO OTHER REMEDIES UNDER THIS WARRANTY. THE REMEDY OF REPAIR OR REPLACEMENT IS THE SOLE AND EXCLUSIVE REMEDY UNDER THIS WARRANTY.

THERE ARE NO WARRANTIES WHICH EXTEND BEYOND THE DESCRIPTION ON THE FACE OF THIS WARRANTY. WOODS MAKES NO OTHER WARRANTY, EXPRESS OR IMPLIED, AND WOODS SPECIFICALLY DISCLAIMS ANY IMPLIED WARRANTY OF MERCHANTABILITY AND/OR ANY IMPLIED WARRANTY OF FITNESS FOR A PARTICULAR PURPOSE.

WOODS shall not be liable for any incidental or consequential losses, damages or expenses, arising directly or indirectly from the product, whether such claim is based upon breach of contract, breach of warranty, negligence, strict liability in tort or any other legal theory. Without limiting the generality of the foregoing, Woods specifically disclaims any damages relating to (i) lost profits, business, revenues or goodwill; (ii) loss of crops; (iii) loss because of delay in harvesting; (iv) any expense or loss incurred for labor, supplies, substitute machinery or rental; or (v) any other type of damage to property or economic loss.

This Warranty is subject to any existing conditions of supply which may directly affect WOODS' ability to obtain materials or manufacture replacement parts.

No agent, representative, dealer, distributor, service person, salesperson, or employee of any company, including without limitation, WOODS, its authorized dealers, distributors, and service centers, is authorized to alter, modify, or enlarge this Warranty.

Answers to any questions regarding warranty service and locations may be obtained by contacting:

ALITEC™
BMP®
CENTRAL FABRICATORS®
GANNON®
GILL®
WAIN-ROY®
WOODS®

WOODS®

**Woods Equipment
Company**

2606 South Illinois Route 2
Post Office Box 1000
Oregon IL 61061

800-319-6637 tel
800-399-6637 fax
www.WoodsEquipment.com



WARRANTY

(All Models Except Mow'n Machine™ Zero-Turn Mowers and Woods Boundary™ Utility Vehicles)

Please Enter Information Below and Save for Future Reference.

Date Purchased: _____ From (Dealer): _____

Model Number: _____ Serial Number: _____

Woods Equipment Company ("WOODS") warrants this product to be free from defect in material and workmanship. Except as otherwise set forth below, the duration of this Warranty shall be for TWELVE (12) MONTHS COMMENCING ON THE DATE OF DELIVERY OF THE PRODUCT TO THE ORIGINAL PURCHASER.

All current model loaders and backhoes are warranted for two (2) years from the date of delivery to the original purchaser.

The warranty periods for specific parts or conditions are listed below:

Part or Condition Warranted	Model Number	Duration (from date of delivery to the original purchaser)
Gearbox components	BW1260, BW1620, BW1800, BW2400	8 years
	BW240HD, BW180HD, BW180HB, BW126HB	7 years
	BB48X, BB60X, BB72X, BB84X, BB600X, BB720X, BB840X, BB6000X, BB7200X, BB8400X, DS1260, DSO1260, DS1440, TS1680, BW126-3, BW180-3, BW240	6 years
	PHD25, PHD35, PHD65, PHD95, 2162, 3240, DS96, DS120, RCC42, RM550-2, RM660-2, RM990-3, PRD6000, PRD7200, PRD8400, 7144RD-2, 9180RD-2, 9204RD-2, S15CD, S20CD, S22CD, S25CD, S27CD, BW180LH	5 years
	RDC54, RD60, RD72, TBW150C	3 years (1 year if used in rental or commercial applications)
Blade spindles	RM550-2, RM660-2, RM990-3, PRD6000, PRD7200, PRD8400, 7144RD-2, 9180RD-2, 9204RD-2	3 years
Rust-through	BB600, BB720, BB840, BB6000, BB7200, BB8400, BW126-3, BW126HB, BW180-3, BW180HB, BW180HD, BW1260, BW1800, BW240, BW240HD, 2162, 3240, DS1260, DSO1260, DS1440, TS1680	10 years

Under no circumstances will this Warranty apply in the event that the product, in the good faith opinion of WOODS, has been subjected to improper operation, improper maintenance, misuse, or an accident. This Warranty does not apply in the event that the product has been materially modified or repaired by someone other than WOODS, a WOODS authorized dealer or distributor, and/or a WOODS authorized service center. This Warranty does not cover normal wear or tear, or normal maintenance items. This Warranty also does not cover repairs made with parts other than those obtainable through WOODS.

This Warranty is extended solely to the original purchaser of the product. Should the original purchaser sell or otherwise transfer this product to a third party, this Warranty does not transfer to the third party purchaser in any way. There are no third party beneficiaries of this Warranty.

WOODS makes no warranty, express or implied, with respect to engines, batteries, tires or other parts or accessories not manufactured by WOODS. Warranties for these items, if any, are provided separately by their respective manufacturers.

WOODS' obligation under this Warranty is limited to, at WOODS' option, the repair or replacement, free of charge, of the product if WOODS, in its sole discretion, deems it to be defective or in noncompliance with this Warranty. **The product must be returned to WOODS with proof of purchase within thirty (30) days after such defect or noncompliance is discovered or should have been discovered, routed through the dealer and distributor from whom the purchase was made, transportation charges prepaid.** WOODS shall complete such repair or replacement within a reasonable time after WOODS receives the product. THERE ARE NO OTHER REMEDIES UNDER THIS WARRANTY. THE REMEDY OF REPAIR OR REPLACEMENT IS THE SOLE AND EXCLUSIVE REMEDY UNDER THIS WARRANTY.

THERE ARE NO WARRANTIES WHICH EXTEND BEYOND THE DESCRIPTION ON THE FACE OF THIS WARRANTY. WOODS MAKES NO OTHER WARRANTY, EXPRESS OR IMPLIED, AND WOODS SPECIFICALLY DISCLAIMS ANY IMPLIED WARRANTY OF MERCHANTABILITY AND/OR ANY IMPLIED WARRANTY OF FITNESS FOR A PARTICULAR PURPOSE.

WOODS shall not be liable for any incidental or consequential losses, damages or expenses, arising directly or indirectly from the product, whether such claim is based upon breach of contract, breach of warranty, negligence, strict liability in tort or any other legal theory. Without limiting the generality of the foregoing, Woods specifically disclaims any damages relating to (i) lost profits, business, revenues or goodwill; (ii) loss of crops; (iii) loss because of delay in harvesting; (iv) any expense or loss incurred for labor, supplies, substitute machinery or rental; or (v) any other type of damage to property or economic loss.

This Warranty is subject to any existing conditions of supply which may directly affect WOODS' ability to obtain materials or manufacture replacement parts.

No agent, representative, dealer, distributor, serviceperson, salesperson, or employee of any company, including without limitation, WOODS, its authorized dealers, distributors, and service centers, is authorized to alter, modify, or enlarge this Warranty. Answers to any questions regarding warranty service and locations may be obtained

Woods Equipment Company
 2606 South Illinois Route 2
 Post Office Box 1000
 Oregon, Illinois 61061 USA
 800-319-6637 tel
 800-399-6637 fax
 www.WoodsEquipment.com



ALITEC™
BMP®
CENTRAL FABRICATORS®
GANNON®
GILL®
WAIN-ROY®
WOODS®

PART NO.
MAN0451

WOODS®