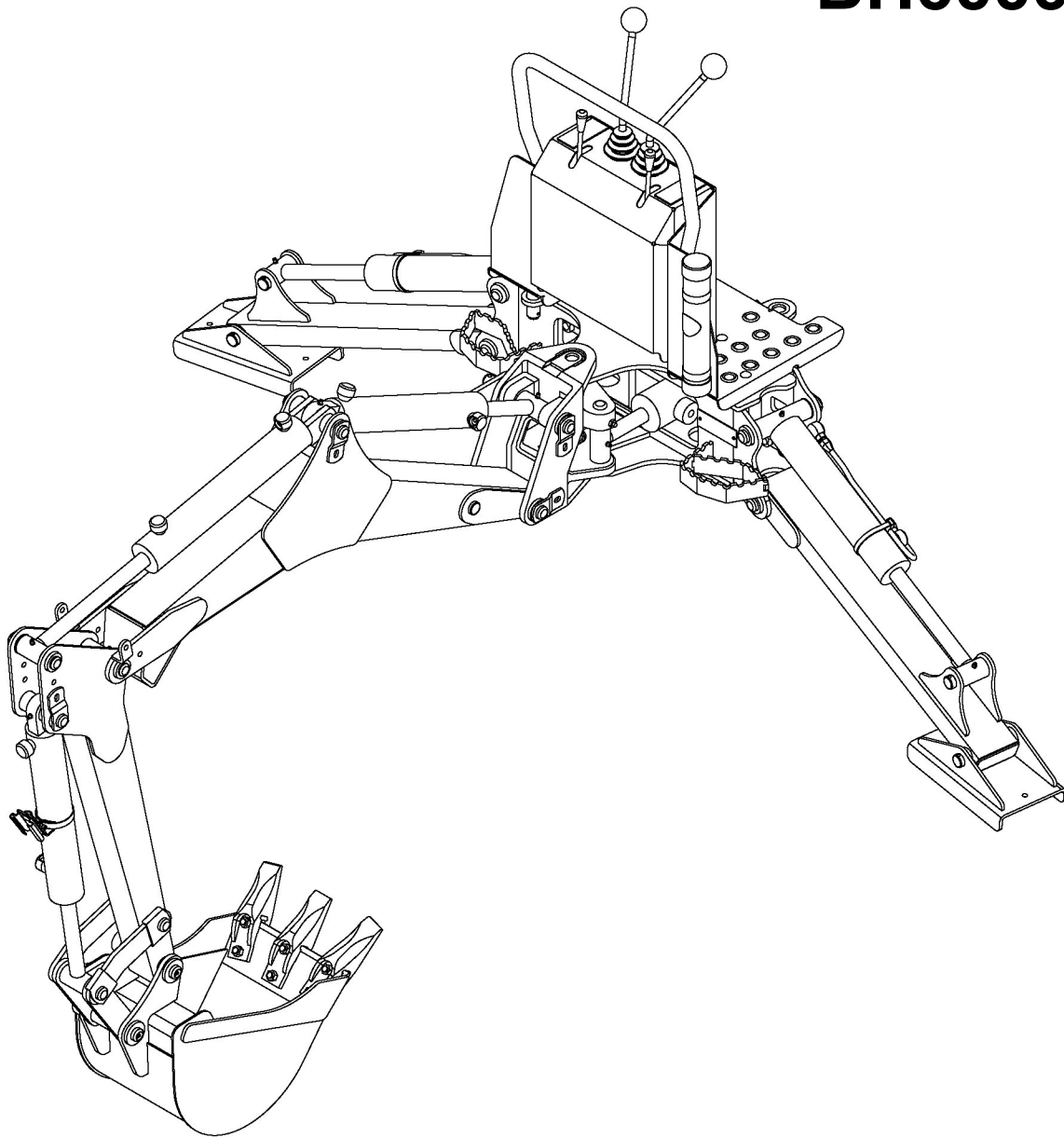


WOODS BACKHOE

BH6000



MAN0306

(Rev. 5/23/2008)

WOODS®
Tested. Proven. Unbeatable.

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 Product Registration online at the Woods Dealer Website or complete the mail-in form included with the Operator's Manual. If using the mail-in form, the dealer is to return the prepaid postage portion to Woods, give one copy to the customer, and retain one copy. **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®

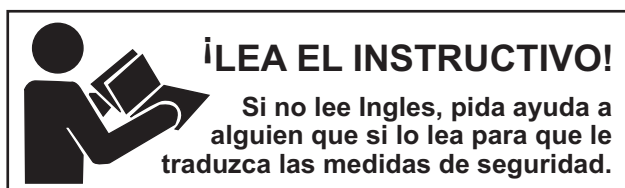
ALITEC™
BMP®
CENTRAL FABRICATORS®
GANNON®
GILL®
WAIN-ROY®
WOODS®

2 Introduction

Gen'l (Rev. 2/19/2008)

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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.

BH6000 SPECIFICATIONS

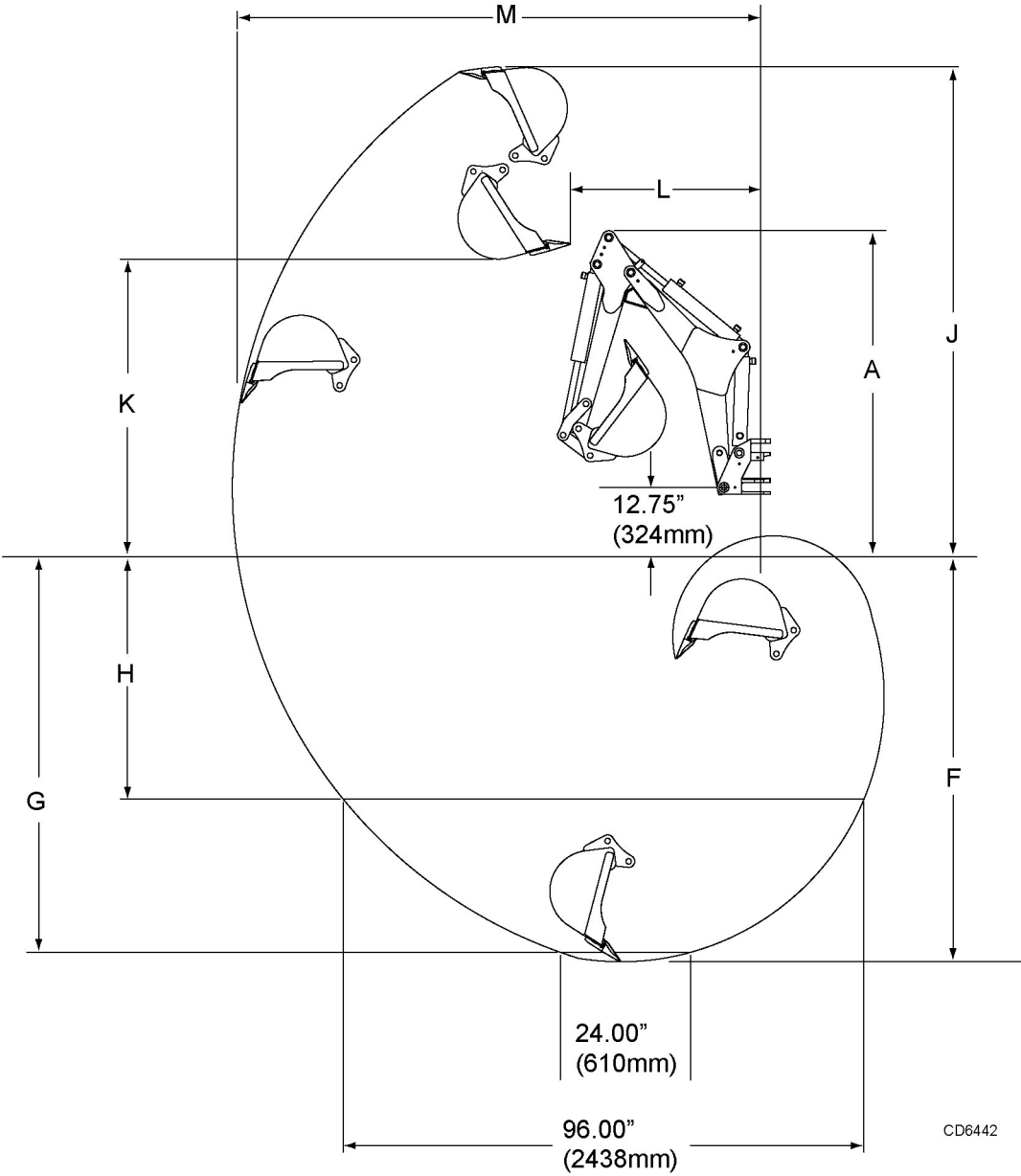
Description	Illustration	English		Metric	
		8" Bucket	12" Bucket 16" Bucket	8" Bucket	12" Bucket 16" Bucket
Transport Height*	A	60.0"	60.0"	1524 mm	1524 mm
Stabilizer Spread (Transport)*		51.0"	51.0"	1295 mm	1295 mm
Angle of Departure**		15°	15°	15°	15°
Digging Depth, Maximum*	F	75.5"	74.0"	1918 mm	1880 mm
Digging Depth, 2 ft. Flat bottom*	G	74.0"	72.5"	1880 mm	1842 mm
Digging Depth, 8 ft. Flat bottom*	H	47.0"	44.0"	1194 mm	1118 mm
Overall Operating Height*	J	91.0"	90.0"	2311 mm	2286 mm
Loading Height*	K	54.0"	54.5"	1372 mm	1384 mm
Loading Reach*	L	33.5"	35.5"	851mm	902mm
Reach from Swing Pivot*	M	98.0"	96.3"	2489 mm	2446 mm
Bucket Rotation*		180°	180°	180°	180°
Swing Arc*		150°	150°	150°	150°
Stabilizer Spread (Operating)*		77.5"	77.5"	1969 mm	1969 mm
Leveling Angle*		12°	12°	12°	12°
Operating Pressure*		1780 psi	1780 psi	12.27 MPa	12.27 MPa
Operating Flow		3.5 - 5.0 gpm	3.5 - 5.0 gpm	13.2 - 18.9 lpm	13.2 - 18.9 lpm
Bucket Digging Force*		2025 lbs	2200 lbs	9008 N	9786 N
Dipperstick Digging Force*		1150 lbs	1180 lbs	5115 N	5249 N

Bucket Capacity (Heaped)		cu.-ft.	cu.-meter
8" (203mm)		0.63	0.018
12" (305mm)		0.90	0.025
16" (406mm)		1.31	0.037

* Per Definitions in SAE J49 Standard

** Per Definitions in SAE J1234 Standard

BH6000 SPECIFICATIONS



GENERAL INFORMATION

WARNING

■ Some illustrations in this manual show the equipment with safety shields removed to provide a better view. This equipment should never be operated with any necessary 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.

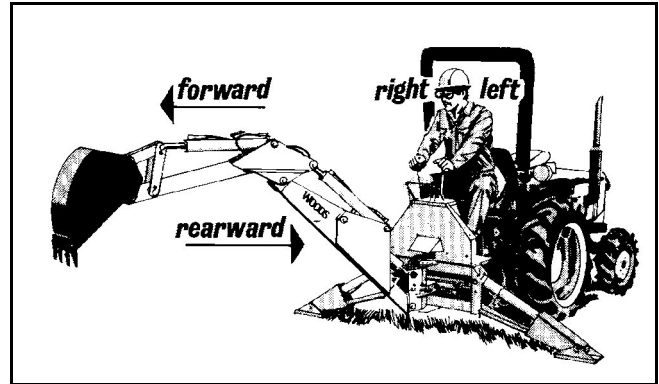


Figure 1. Backhoe Directions

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

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

1. Bucket
2. Bucket cylinder
3. Dipperstick cylinder
4. Boom cylinder
5. Console
6. Stabilizer
7. Swing cylinder
8. Boom
9. Dipperstick
10. Stabilizer cylinder
11. Swing frame
12. Main frame

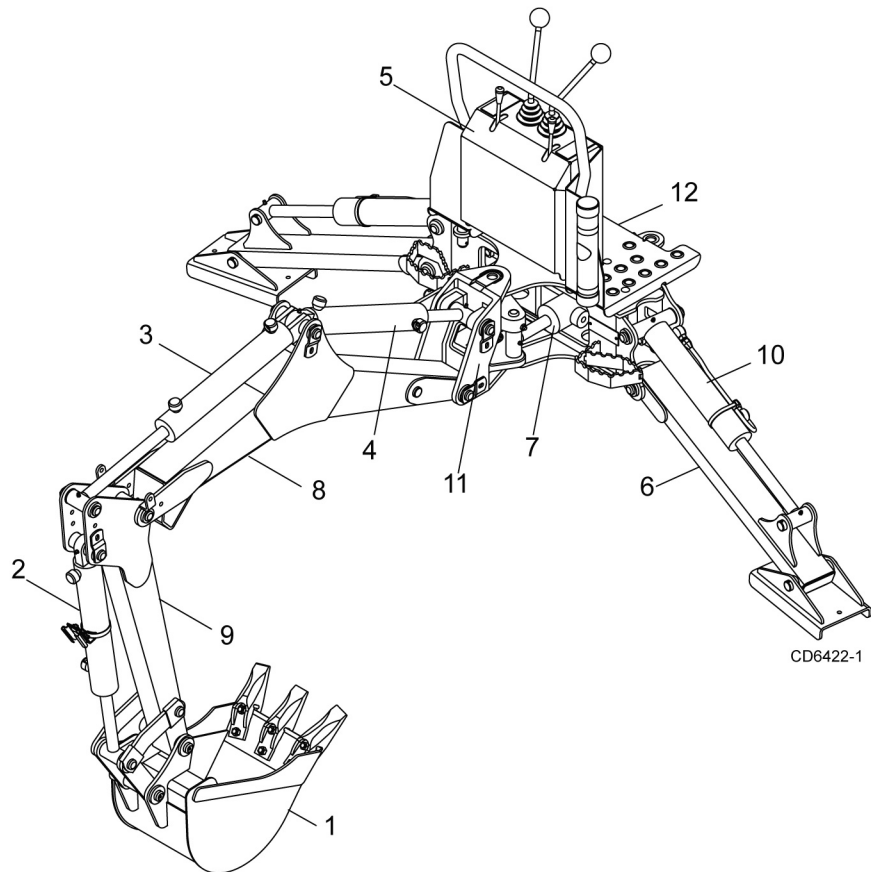


Figure 2. Backhoe Components

6 Introduction

MAN0306 (Rev. 5/23/2008)



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.woodsonline.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 attachment is properly secured, adjusted, and in good operating condition.

■ 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.



SAFETY RULES

ATTENTION! BECOME ALERT! YOUR SAFETY IS INVOLVED!



- Never put backhoe into service unless backhoe manufacturer's sub-frame has been installed and adjusted.
- Be sure that backhoe is properly mounted, adjusted, and in good operating condition.
- 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.
- 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 being trapped should the boom swing control be accidentally activated.

- 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 or transport on steep slopes.
- Do not operate or transport equipment while under the influence of alcohol or drugs.



SAFETY RULES

ATTENTION! BECOME ALERT! YOUR SAFETY IS INVOLVED!



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.



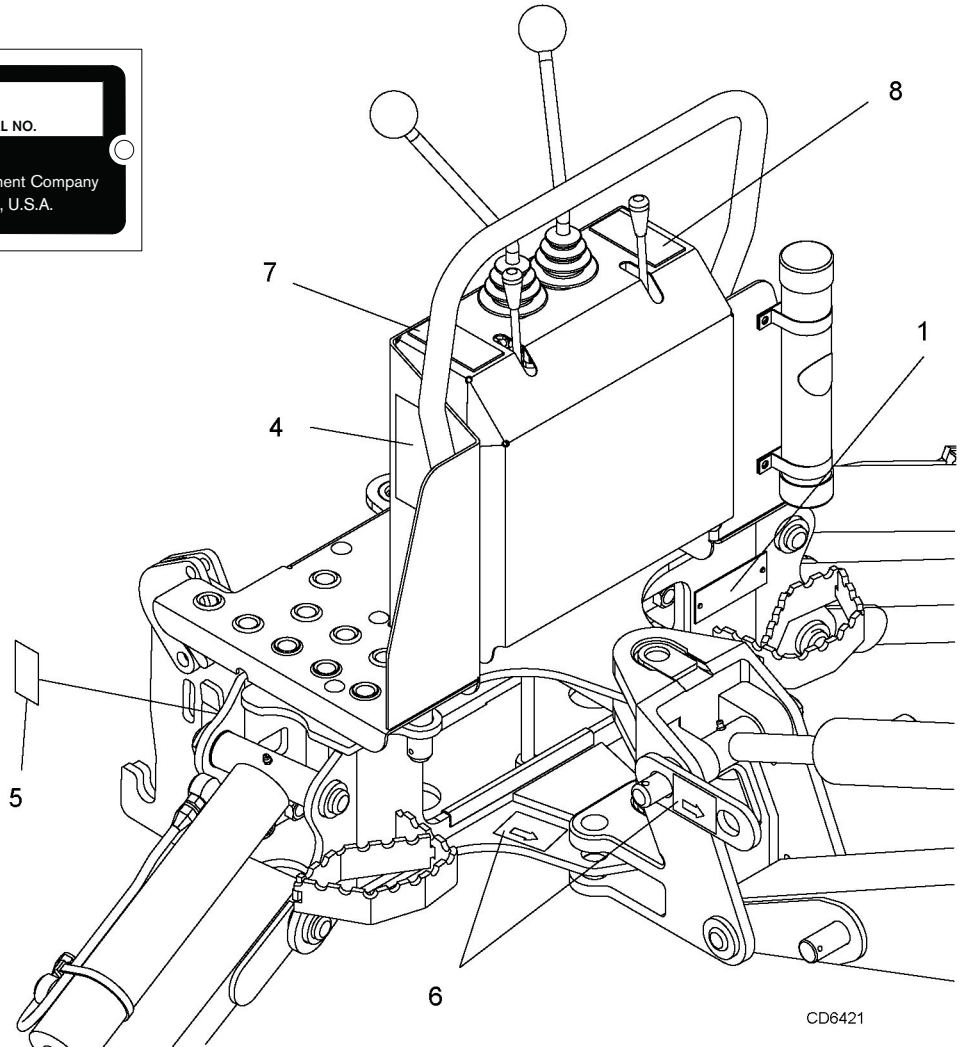
SAFETY & INSTRUCTIONAL DECALS



ATTENTION! BECOME ALERT! YOUR SAFETY IS INVOLVED!
Replace Immediately If Damaged!

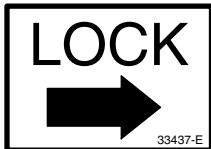


1 - SERIAL NUMBER PLATE

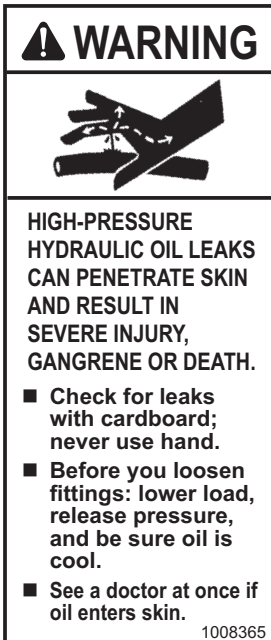


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6 - PN 33437



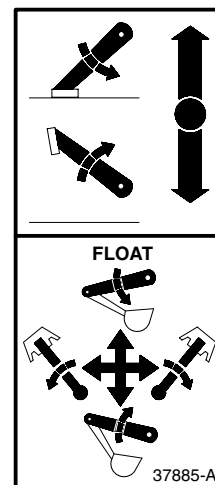
4 - PN 1008365



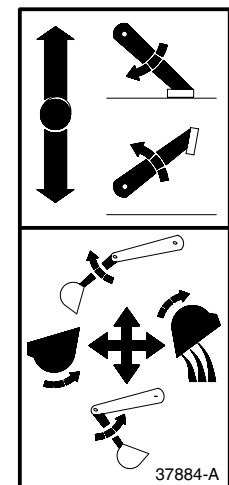
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8 - PN 37885



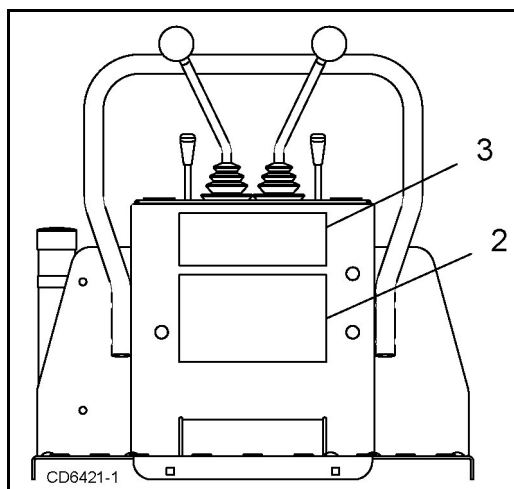
7 - PN 37884





SAFETY & INSTRUCTIONAL DECALS

ATTENTION! BECOME ALERT! YOUR SAFETY IS INVOLVED!
Replace Immediately If Damaged!



2 - PN 1008363



WARNING

TO AVOID SEVERE INJURY OR DEATH,

- Read Operator's Manual (Obtain from dealer or, in the United States and Canada call 1-800-319-6637) and follow all safety rules.
- Make sure all safety decals are installed and readable. Replace if damaged.
- Make sure shields and guards are properly installed. Replace if damaged.
- A minimum 25% of tractor and equipment weight must be on tractor front wheels with backhoe in transport position.
- When using backhoe, always sit in backhoe seat; Keep others out of operator, stabilizer, and maximum bucket swing areas.
- Backhoe digging forces can lift and turn tractor over. Make sure stabilizer pads are on firm ground and avoid soft or steep banks.
- Consult local utilities before digging. Know location of and avoid contact with all underground cables, pipelines, overhead wires and other hazards in digging area.
- Never allow riders on tractor or backhoe.
- Before transport, attach Slow Moving Vehicle (SMV) sign and engage transport locks.
- Before leaving equipment unattended, raise boom and install transport locks, relieve pressure on dipperstick and bucket, shut engine off, and remove key.

1008363

3 - PN 1008364



DANGER

CRUSHING HAZARD

- Never use unless backhoe manufacturer's sub-frame has been installed as instructed in Operator's Manual. (Obtain manuals from dealer or, in the United States and Canada call 1-800-319-6637.)
- Do not modify or substitute any part of mounting kits or backhoe.

Failure to follow these instructions can result in severe injury or death from backhoe being thrust upward, forward, or rearward by digging forces.

1008364

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.

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.**
- 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.
- 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

- 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.

- Never put backhoe into service unless backhoe manufacturer's sub-frame has been installed and adjusted.

OPERATION

WARNING

- Keep bystanders away from operator, stabilizer, and maximum bucket swing areas.
- 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.

CAUTION

- When operating controls, always sit in backhoe seat.

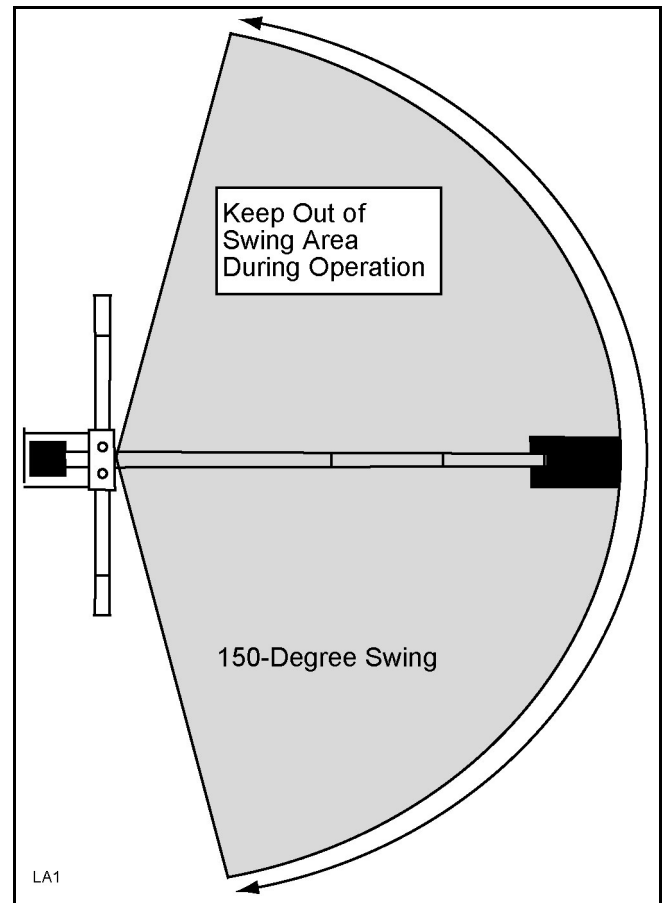


Figure 1. Backhoe Swing Area

Mechanical failures such as a hose rupture will cause a load to drop. Lifting a heavy load with the dipperstick, 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 1, 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.

POSITION THE MACHINE

Before operating in an unfamiliar area, walk around the full length of the proposed site and check for hidden holes, drop-off 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

Refer to Figure 2.

Assume your position in the operator's seat.

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

Set tractor RPM to a speed that moves the backhoe at a rate that you are comfortable with.

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 2) 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 dipperstick 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.

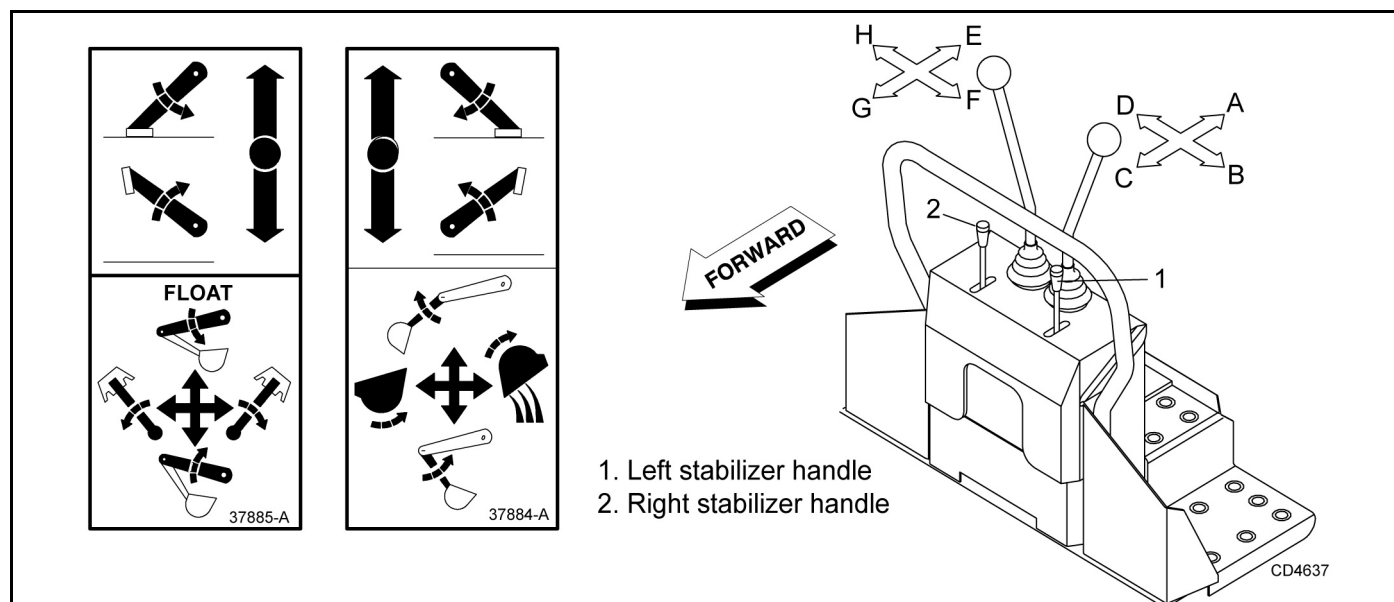


Figure 2. Operator's Controls

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.

START 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.**

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

Actuate the dipperstick cylinder to start digging. Approximately halfway through digging cycle, start bucket curl while continuing to crowd dipperstick 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.

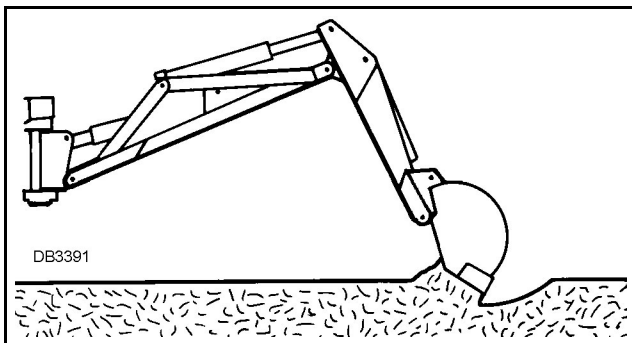


Figure 3. Starting Position

FILL 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 dipperstick and bucket during the digging cycle. As the dipperstick 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 dipperstick and curl bucket completely while starting to lift it out of the excavation. This will allow excess material to fall back into the excavation.

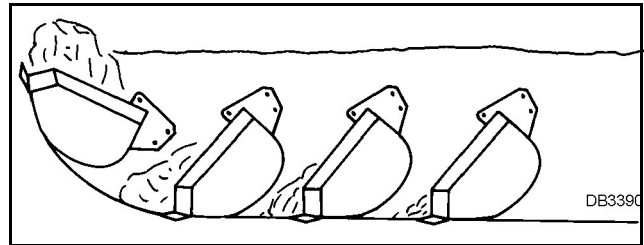


Figure 4. Fill Bucket

DUMP AND RETURN CYCLE

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

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

TRENCHING AND EXCAVATING

Refer to Figure 5.

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 dipperstick 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.

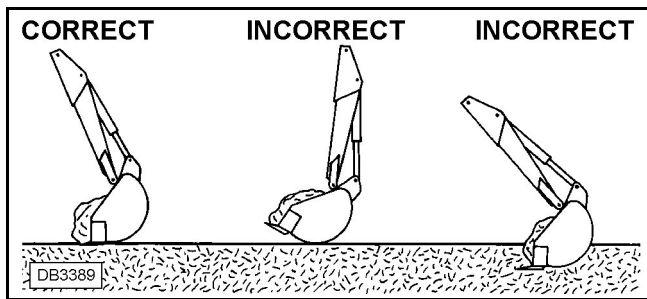


Figure 5. Trenching

SIDE SLOPE TRENCHING OR EXCAVATING

! WARNING

■ **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 6 or Figure 7.

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

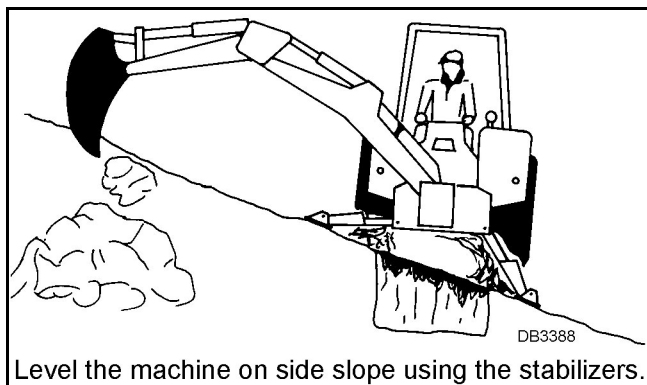


Figure 6. Level with Stabilizers

Cut a level pad for the uphill side of the machine and place spoil on the downhill side as shown in Figure 7.

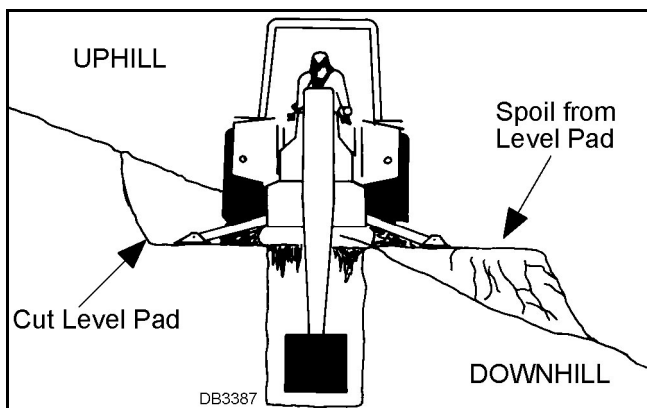


Figure 7. Level with Cut Out

THUMB OPERATION

The mechanical 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.

The thumb has six operating positions. Place lower channel in the hole furthest from the dipper pivot pin and secure with clevis pin (9). Select one of the six operating positions and secure with hitch pin (7). Rotate the bucket to hold material against the thumb.

When normal backhoe operation is required, place thumb in storage position. Remove pin clevis pin (9) from end of thumb, place lower channel in hole closest to the dipper pivot pin and secure with clevis pin. Rotate thumb up against dipper, and insert hitch pin to lock thumb into storage position. See . Thumb in Storage Position, page 16.

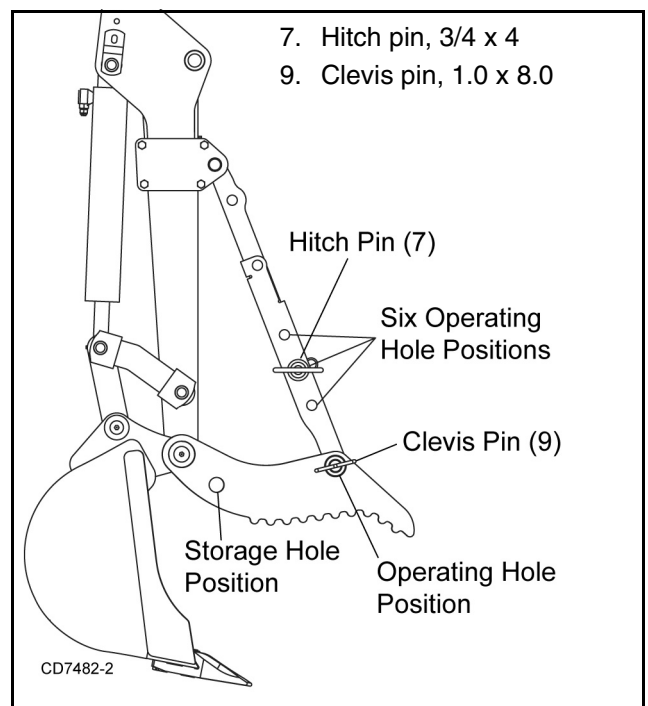


Figure 8. Thumb in Operating Position

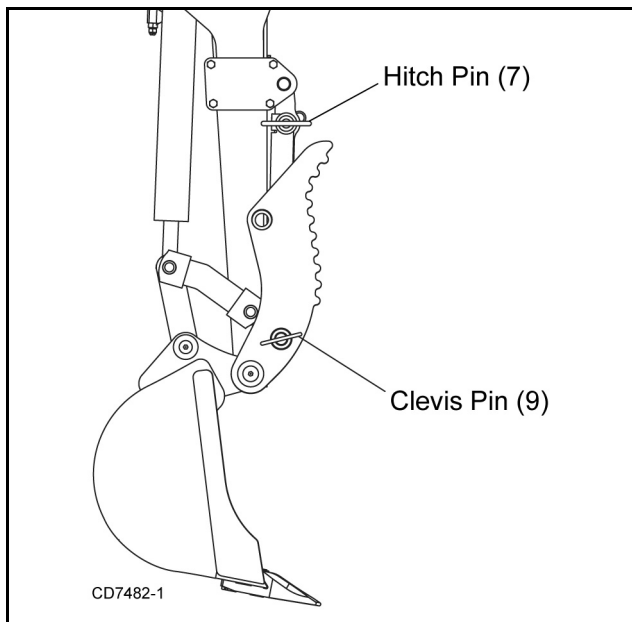


Figure 9. Thumb in Storage Position

NOTE: Do not operate thumb using these hole positions. Damage to thumb will occur.

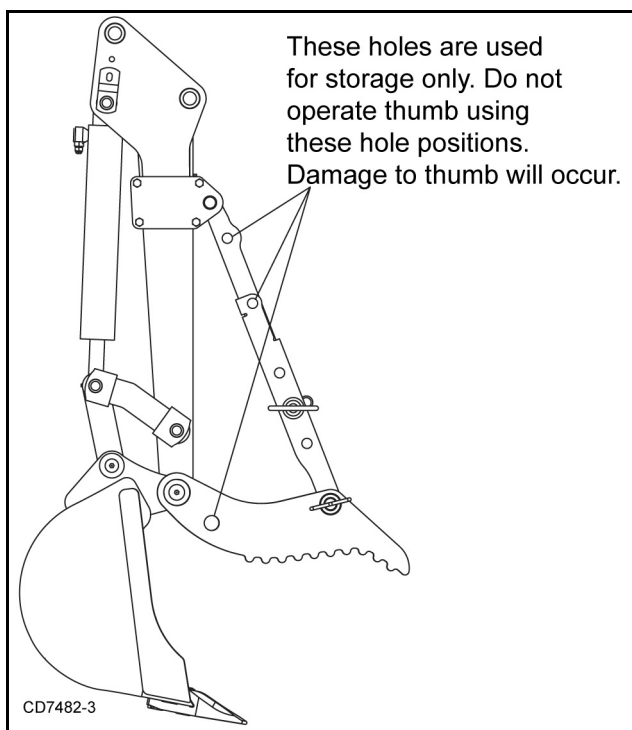


Figure 10.

TRANSPORT

⚠ WARNING

■ 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 bar and store swing lock pin. Push transport lock bar down fully to prevent damage.

Engage transport lock by fully retracting boom and dipperstick. Position transport lock bar (1), located on right side of swing frame, over transport lock pin (2).

Center boom from side to side and install swing lock pin (3) through swing frame plate (4) and main frame. Secure swing lock pin (3) with a safety pin (5) as shown.

Always raise stabilizers before transporting backhoe.

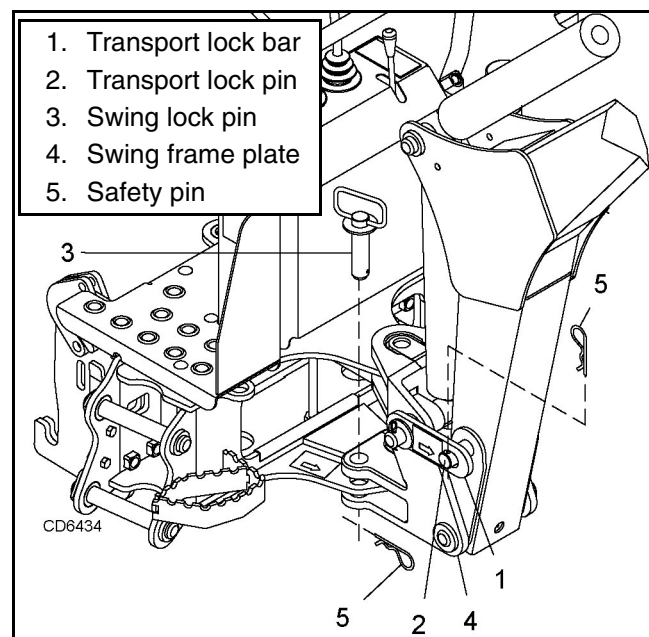


Figure 11. Transport and Swing Lock Installation

Transport Backhoe and Tractor on a Trailer

The backhoe sub-frame provides tie down point for securing backhoe and tractor on a trailer.

Insert chain through holes provided and secure to trailer. See Figure 12.



Figure 12. Backhoe Tie Down Location

REMOVE AND STORE BACKHOE

⚠ 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.

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

1. Position tractor on a hard level surface and center the backhoe boom.
2. Lower stabilizers and take weight off of rear tractor tires.
3. Lower boom and dipper to form 90-degree angle and rest bucket on the ground.
4. Remove klik pins from lock pins. Remove lock pins and rotate latches into the open position. Install lock pins to secure.

5. Lower stabilizers until backhoe mounts clear the tractor brackets.
6. Lower backhoe until backhoe mounts are firmly on the ground. Raise stabilizers all the way up. Retract boom cylinder and engage lock bar.
7. Turn off engine, set brakes, and remove key.
8. Disconnect backhoe hydraulic hoses from tractor.

NOTICE

■ Failure to connect tractor hoses together will result in damage to tractor hydraulic system.

9. Connect male quick coupler on the end of the RETURN hose to the female quick coupler on the bulkhead support bracket when backhoe is removed (Figure 13).



Figure 13. Hose Connection - Backhoe Removed

10. Connect IN and OUT quick couplers on backhoe together to prevent dirt and debris from accumulating in quick couplers.

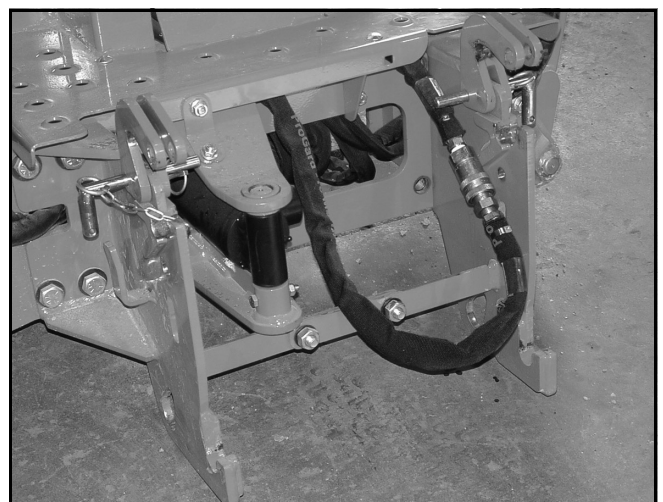


Figure 14. Backhoe Hose Connection

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.
- ___ Check that there are no leaks in the hydraulic system. Before operating, all hydraulic hoses must be routed properly and are not 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.
- ___ Place all backhoe controls in neutral position before starting tractor engine.
- ___ Check tractor transmission oil 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.

RELIEF VALVE

This valve is pre-set at the factory to prevent system pressure from exceeding 2000 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.

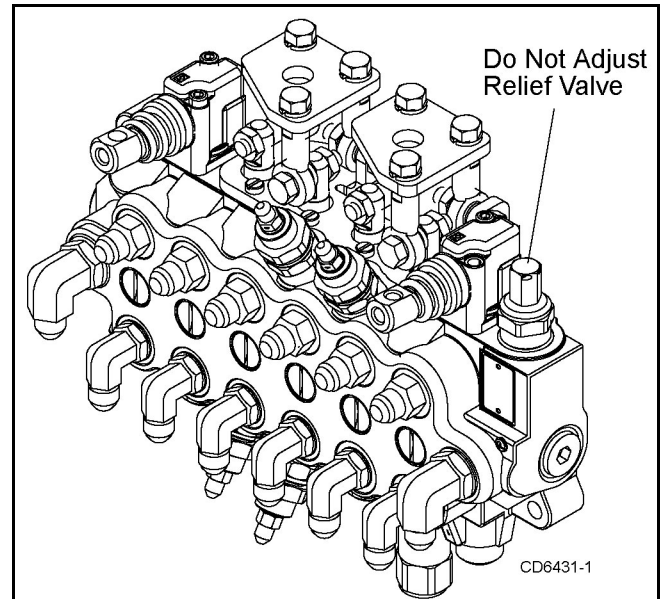


Figure 15. Relief Valve

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

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 16 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 dipperstick at 90° to each other with bucket cutting edge vertical and teeth resting on ground. Lower stabilizers to lubricate cylinders.

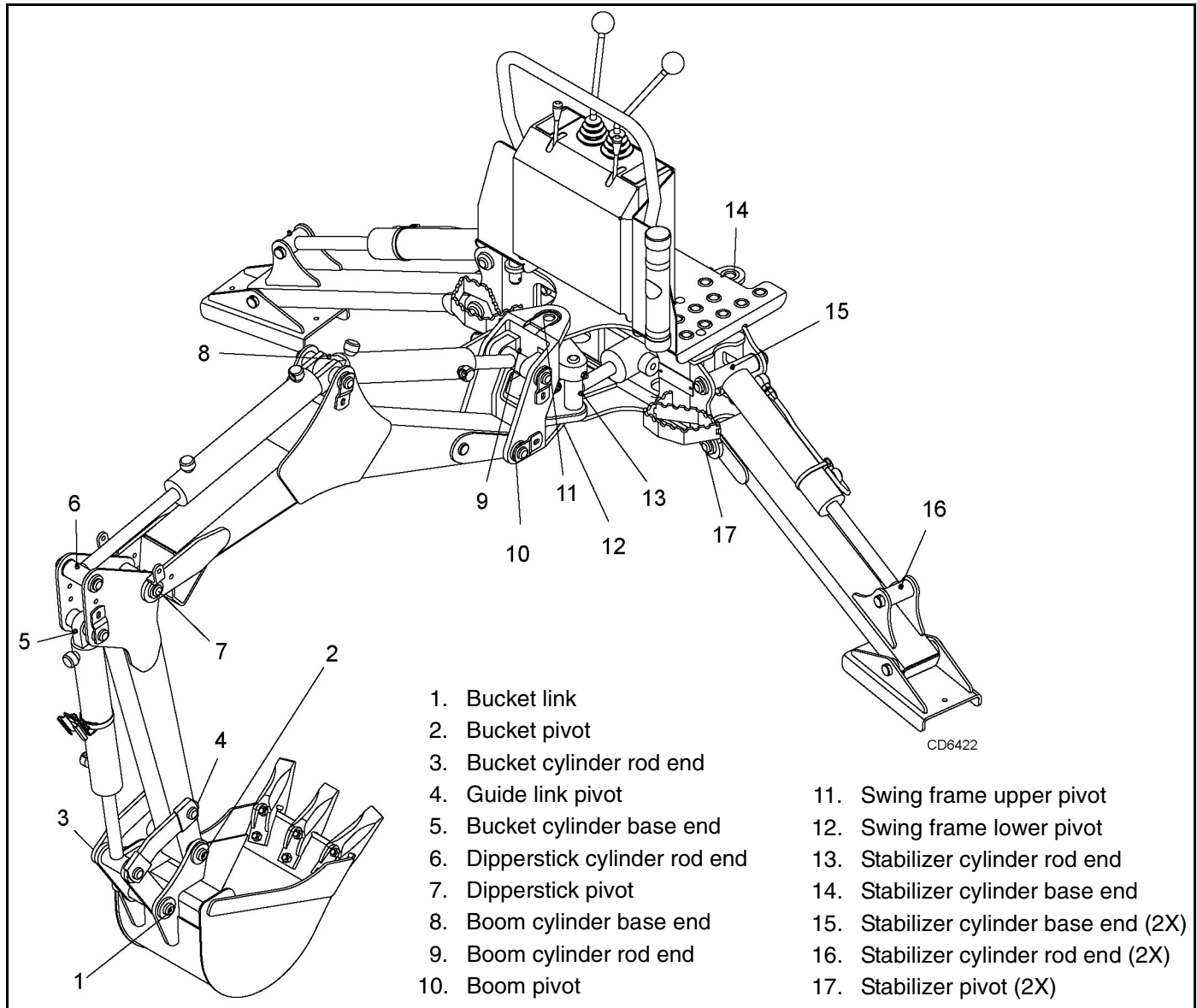


Figure 16. Lubrication Points

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
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 dipperstick or bucket cylinder lever is activated while boom control is in raised position	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.**

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 VALVE REPAIR

Refer to Figure 17.

Valve repair should be accomplished in a clean work place. Note the configuration of the parts before disassembling valve and control linkage. This will make reassembly easier.

System Relief Valve

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.**

No individual parts are available for relief valve. Replace entire assembly if required.

Pressure Setting Adjustment

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

To adjust relief valve setting, place a 3000 psi pressure gauge in the line attached to the valve inlet (IN) port. Remove cap from top of main relief (1, Figure 17). Turn adjusting screw clockwise to increase pressure and counter clockwise to decrease pressure. Start tractor and set throttle for full engine speed. Move right stabilizer control lever to raise stabilizer to transport position and hold the lever so full pressure builds. Adjust screw to attain 2000 psi. Shut off tractor and replace cap.

Port Relief Valves

Pressure settings on port relief valves are preset at the factory. Although they are adjustable, they must not be reset in the field using backhoe hydraulic system. An incorrect setting could cause hydraulic pump to fail or backhoe cylinder rods to buckle.

Replace Port Relief Valves

It is not necessary to remove the entire valve assembly from the console to replace individual port relief valves. Be sure to install valve cartridges set at the correct pressure. Valves are similar and can be easily mixed up.

NOTE: Valve cartridges have small sealing washers attached to them. When replacing valve, check cavity in valve housing for any loose washers.

Port Relief Valve	Pressure Setting
Cartridge 2	2000 psi
Cartridge 3	2500 psi

Load Check Valve Replacement

The load check valves (4) are located between the valve work ports. Remove load check assembly using a large screwdriver. Inspect seat in valve housing for any dirt or damage. Replace load check if required.

Spool Repair

Whenever repairing spools or positioner, replace valve spool seals which are included in the spool seal repair kit.

Disassemble

Remove the joystick assembly and/or single lever control from valve. Remove the plastic dust cap from positioner (5, 6). Unscrew the positioner assembly from valve housing. Push spool (7, 8) out of housing.

Secure spool in vise taking care not to scratch or nick the outer surface. Unscrew the positioner from spool. Remove brass sleeve (9) and O-ring (10) from positioner end of valve housing. Remove O-ring (10) and flange washer (11) from control lever end of valve housing. The boom spool has a special sleeve with two O-rings.

Check spools, replace if nicked and scratched.

Carefully inspect spool bore in valve housing. If deep scratches or scouring is present, entire valve should be replaced.

Assemble

Clean threads on positioner and spool. Apply a removable-type thread locking compound to male threads and assemble positioner to spool. Torque to 85 ± 15 in-lbs.

Apply clean oil to O-ring (10) and install, along with brass sleeve (9) on spool housing positioner end. Slide spool into valve housing. Torque positioner end cap (5, 6) to 70 ± 15 in-lbs.

Reassemble the O-ring (10) and flanged washer (11) on control lever end of spool. Boom spool does not use a flange washer.

Position spool wipers (A) (Figure 18) on swing, dipper, and bucket spools in linkage plate. Reinstall control linkage. Note the screws installed in the boom and dipper spools should be tightened until snug, then backed off approximately $\frac{1}{2}$ turn to allow free movement of the joystick.

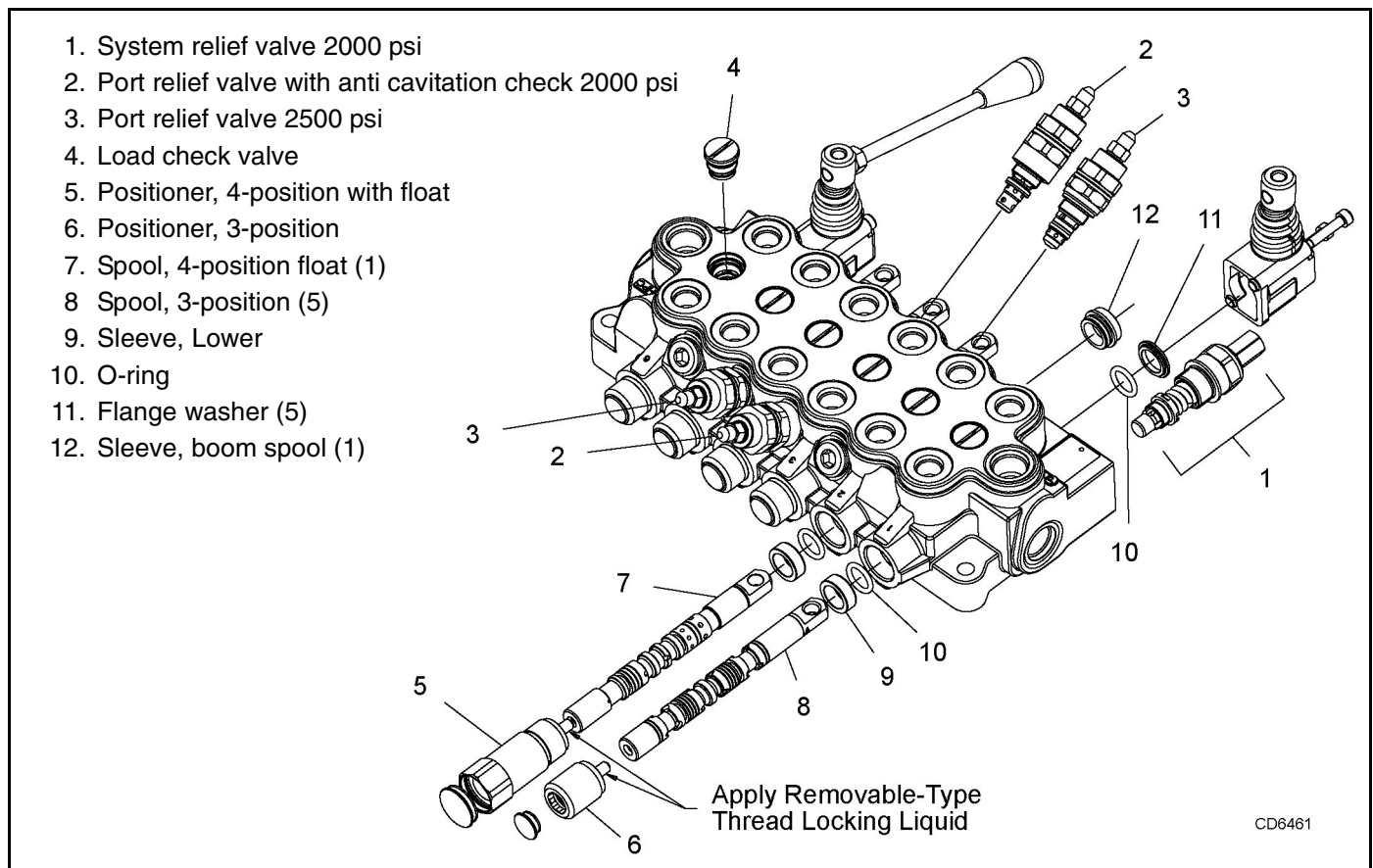


Figure 17. Control Valve Assembly

ADJUST CONTROL VALVE LINKAGE

Reconnect control linkage to valve.

Control handles should be positioned as shown.

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.

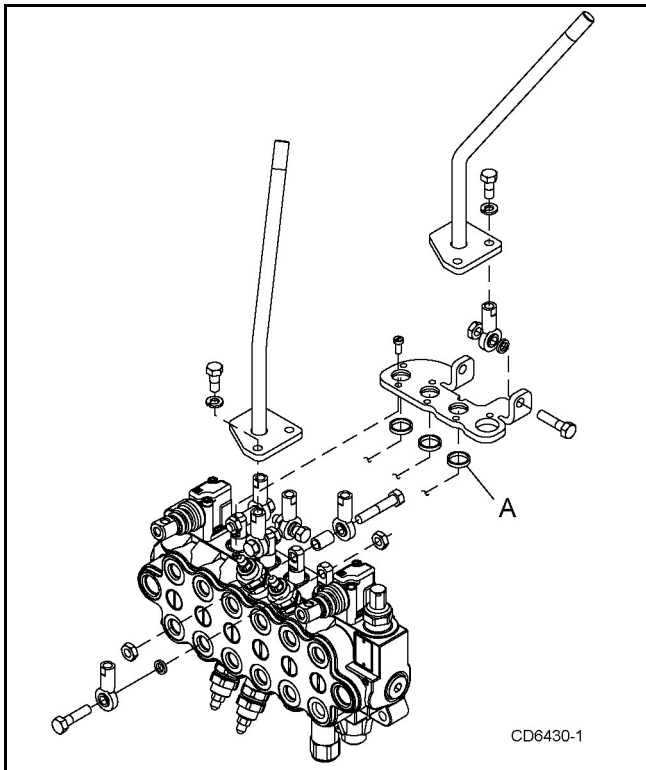


Figure 18. Control Lever Adjustment

HYDRAULIC CYLINDER REPAIR

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.

Boom, Dipperstick, Bucket & Stabilizer Cylinders

The only repair parts available for these cylinders are seal kits. If damage occurs to one of the cylinder components, replace the cylinder.

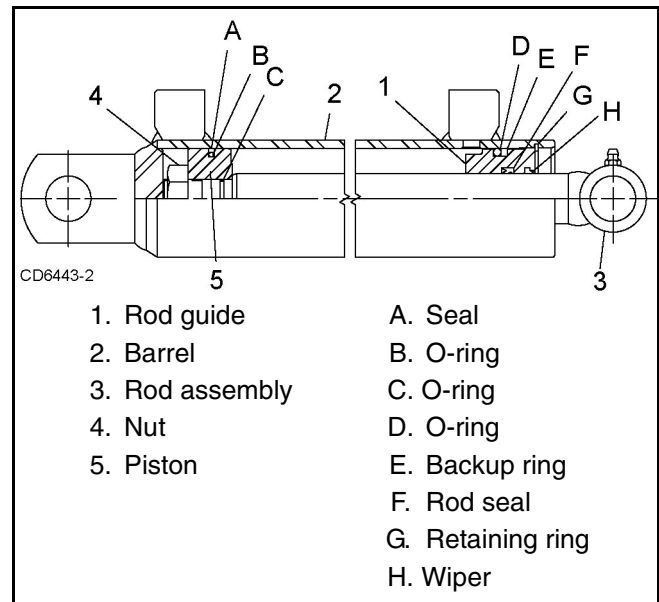


Figure 19. Boom, Dipper, Bucket, Stabilizer Cylinder

Disassemble

Remove retaining ring (G) from barrel (2). Slide rod assembly (3) out of barrel. Inspect inside of cylinder barrel and rod surface for any scratches or scouring. Small scratches can be removed with fine crocus cloth. If scratches cannot be repaired, replace entire cylinder.

Clamp tube end of rod assembly in vise. Use a small torch to heat nut (4) and break down the thread-locking compound. Remove nut. Remove piston (5) and rod guide (1) from rod assembly. Clean threads on rod assembly and nut. Discard all seals.

Assemble

Lubricate new seals with clean oil. Install O-ring (D) and back up ring (E) in the outer groove of guide (1). Note the position of the backup ring. Install rod seal (F) in inner groove of rod guide. Note that the lips of the seal should be toward the piston side of the guide. Install wiper (H) with lip pointed outward from guide. Slide rod guide onto rod assembly.

Install O-ring (B) and seal (A) on piston (5). Apply oil to threads on rod assembly. Slide O-ring (C) over threads. Install piston. Apply permanent type thread-locking compound to rod threads and install nut. Torque nut to 125-135 lbs-ft.

Lubricate seals, slide rod assembly into tube and install snap ring (G) to complete assembly.

Swing Cylinder

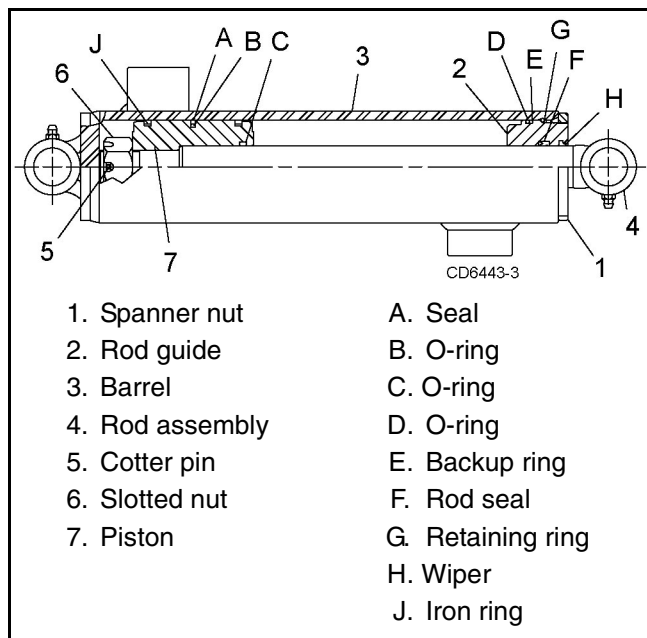


Figure 20. Swing Cylinder

Disassemble

On the 2-1/2" spanner nut type cylinders, Figure 20, unscrew spanner nut (1) using a spanner wrench, or carefully use a punch and hammer.

Tap rod guide (2) into barrel (3) about 1/2". Remove round retaining ring (G). Pull on rod (4) to remove parts from barrel.

Clamp cross pin end of rod assembly (4) in a vise with protective jaws. Remove cotter pin (5) and nut (6) from rod assembly. Remove piston (7) and rod guide (2) 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 of cylinder barrel and rod surface for any scratches or scouring. Small scratches can be removed with fine crocus cloth. If scratches cannot be repaired, replace entire cylinder.

Assemble

Lubricate O-rings and seals with clean hydraulic fluid. Install back-up washer (E) on rod guide (2), then install O-ring (D) in exterior O-ring groove of rod guide. Install rod seal (F) into inner groove of rod guide with open portion of V-groove toward piston.

Place rod wiper (H) in outer rod guide groove. Slide rod guide assembly (5) onto rod (1). Place iron rings (J) in outer grooves of piston. Place piston seal (A) and O-ring (B) in center piston groove. Install O-ring (C) on lip of piston.

Install piston (7) onto rod (4). Install nut (6) and torque to 150-180 lbs-ft. Install cotter pin (5).

Compress iron 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 (2) into barrel (3) just past groove inside barrel. Insert retaining ring (G) into groove and pull rod (4) to seat rod guide (2) against ring. Apply thread-locking compound (removable) to spanner nut (1). Screw spanner nut (1) onto rod guide (2) using a spanner wrench, or carefully use a punch and hammer.



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 Woods sub-frame kit.

When mounting this backhoe on a tractor using a sub-frame mounting, 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.

Recommended torque values for hardware are given on page 41.

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

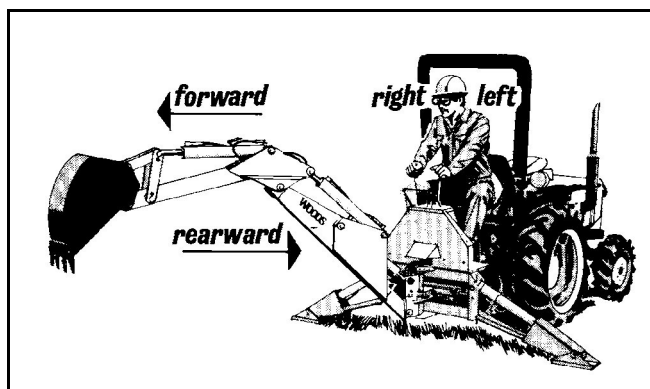


Figure 18. Backhoe Directions

WARNING

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

■ 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.**

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.

INSTALL STABILIZER

Remove stabilizer arms from pallet.

Remove pivot pins (3 & 4) from their shipping position. Attach stabilizer arm (1) to main frame (8) using pivot pin (4) and secure with bolt (7) and locknut (6).

Attach stabilizer cylinder (2) to stabilizer arm with pivot pin (3) and secure with cotter pins (5).

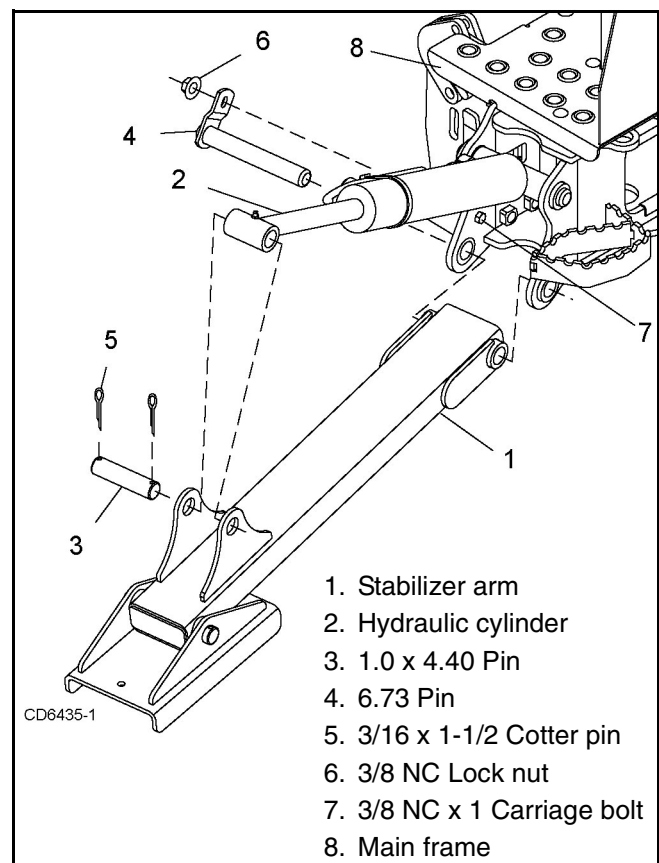


Figure 19. Stabilizer Arm Assembly

INSTALL DIPPERSTICK CYLINDER

Remove pivot pin (6) from end of dipperstick (1). Attach dipperstick cylinder (4) to dipperstick with pivot pin (6) and secure with bolt (12) and flange locknut (13). Make sure hydraulic hoses are not twisted after boom and dipperstick are assembled.

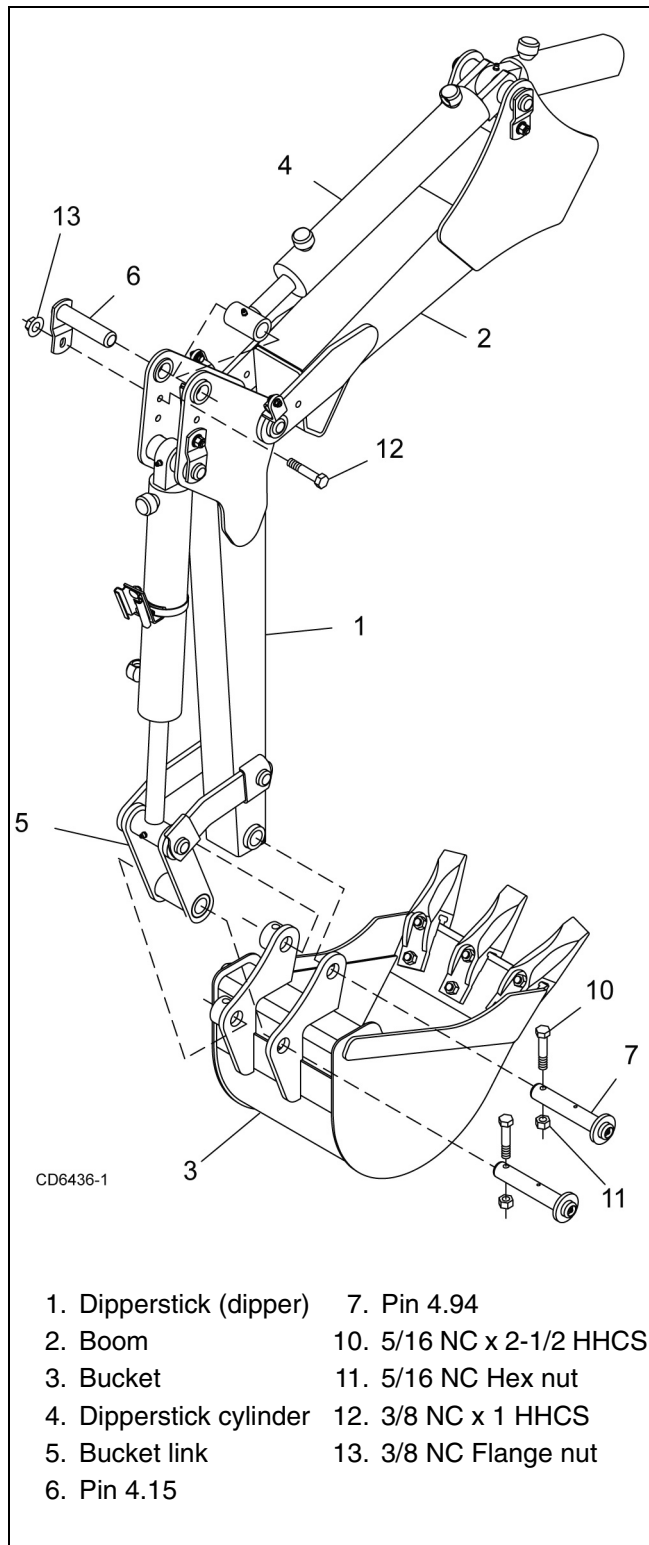


Figure 20. Dipperstick and Bucket Installation

INSTALL BUCKET

8", 12", and 16" buckets are available with this backhoe. Remove pivot pins (7) from end of bucket link (5) and dipperstick (1). Attach bucket (3) to bucket link and dipperstick with pivot pins (7) and secure with bolts (10) and lock nuts (11).

INSTALL HYDRAULIC HOSES

⚠ 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.**

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

Power to the backhoe is supplied directly from the tractor hydraulic system. A hydraulic requirement of 3.5 gallons per minute and 1780 psi is necessary to operate the backhoe efficiently. 3/8" 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.

Refer to the sub-frame mounting kit manual for specific installation instructions.

INSTALL BACKHOE BRACKETS

Remove backhoe from pallet and position on level surface. Install backhoe brackets found in the sub-frame mounting kit.

ATTACH BACKHOE TO TRACTOR

Back tractor as near as possible and center on backhoe. Refer to the sub-frame mounting kit manual for instructions on connecting hydraulic hoses and attaching the backhoe to the tractor.

After cycling backhoe through its operating range, stop tractor and check the oil level in the tractor transmission.

INSTALL OPTIONAL STABILIZER STREET PAD

1. Remove cotter pins, headless pin, and stabilizer pad from the end of each stabilizer arm.

NOTE: On earlier stabilizer arms the mounting holes are not available, holes will have to be drilled. See Figure 21 to locate and drill two 25/64" (.391") holes on the back side (tractor side) of the stabilizer arms.

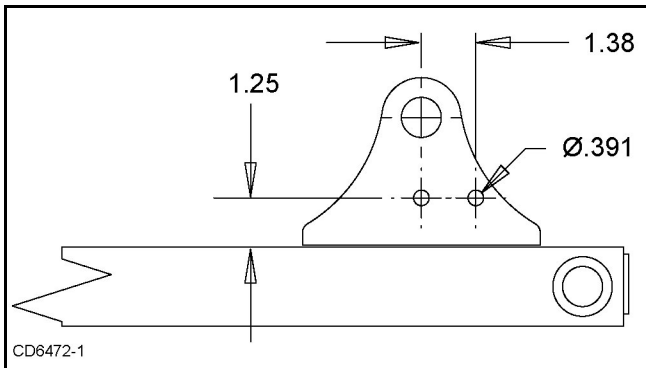


Figure 21. Mounting Hole Location

2. Attach rubber strap (3) to the back side (tractor side) of the stabilizer arm using two carriage bolts (11), reinforcement strap (4) and flange whiz nut (13). See Figure 22.
3. Attach stabilizer pad (1) to the end of stabilizer arm using headless pin (5) and two cotter pins (10).

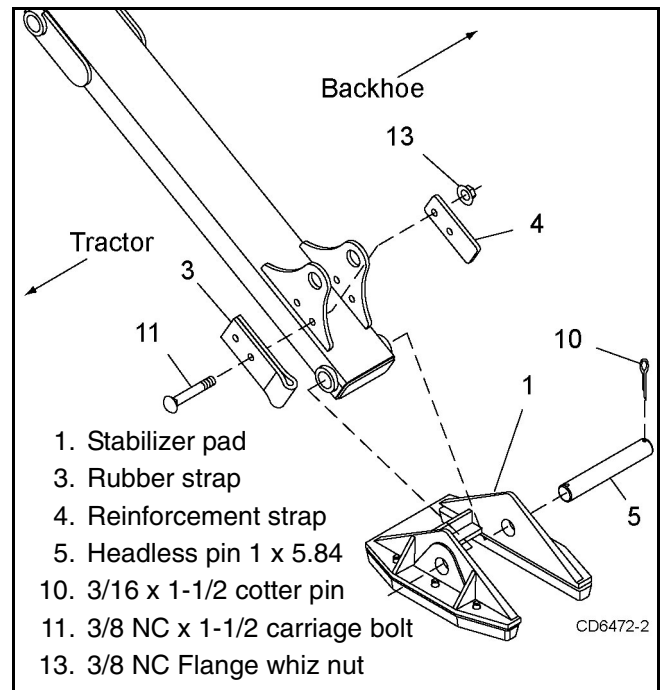


Figure 22. Stabilizer Street Pad Installation

4. Rotate stabilizer pad over and past rubber strap with the points down for use in soil conditions. See Figure 23.
5. Rotate stabilizer pad with rubber pads down for use on hard surfaces.

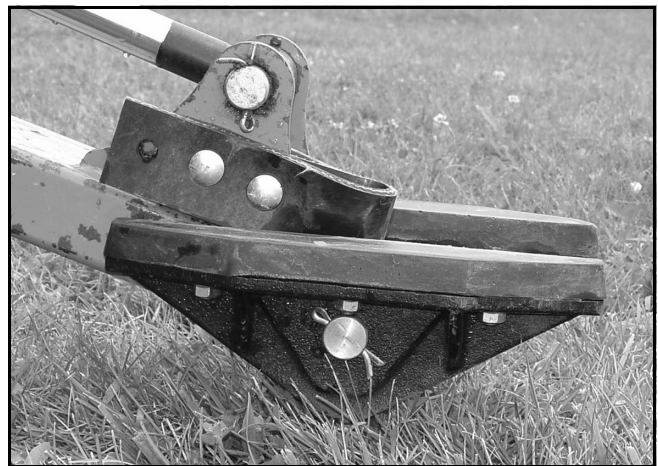


Figure 23. Stabilizer Pad - Point Down

DEALER CHECK LIST

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.
- ___ 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).



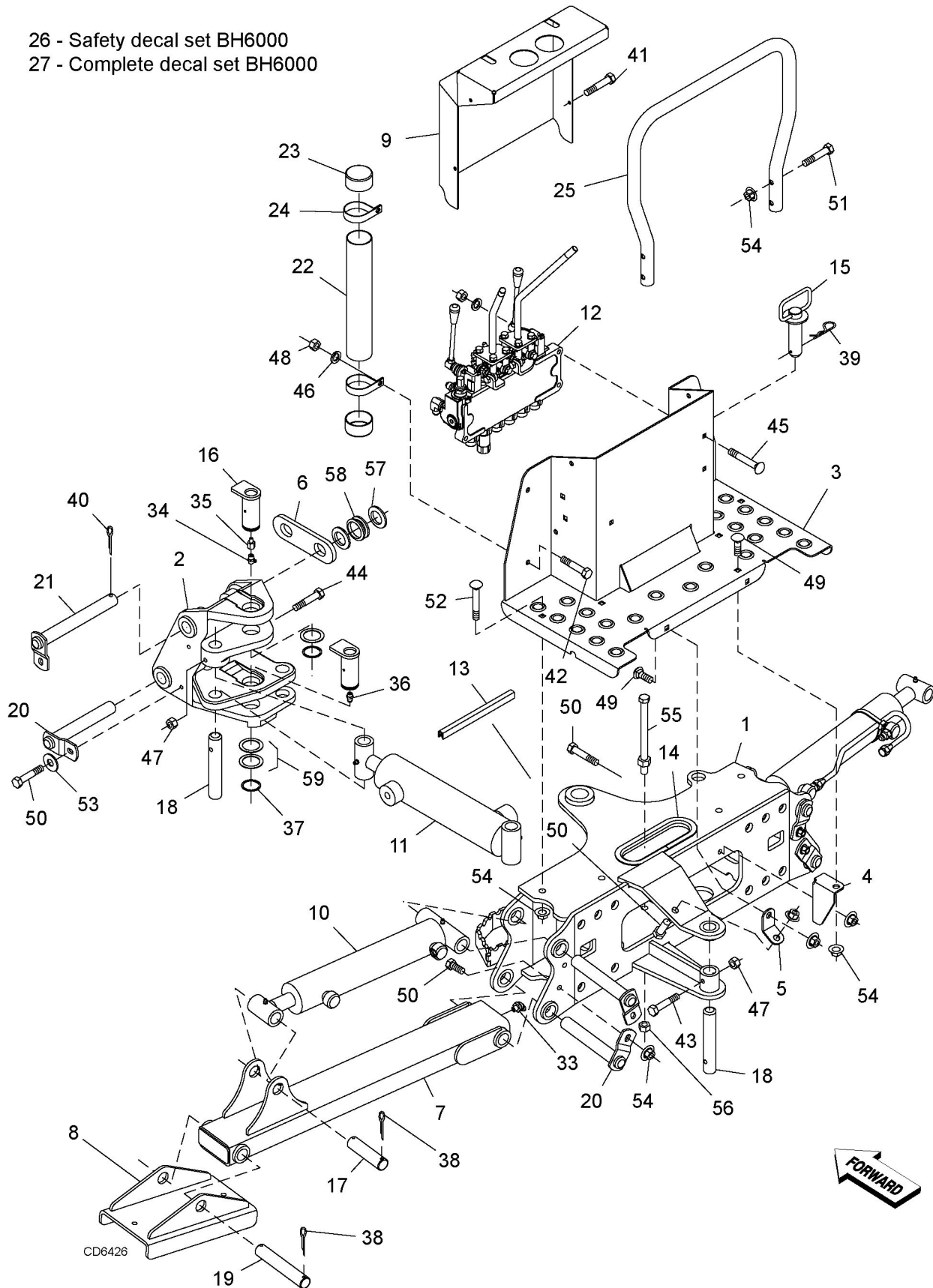
NOTES

BH6000

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BH6000 Optional Stabilizer Street Pad.	39
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BH6000 MAIN FRAME ASSEMBLY

- 26 - Safety decal set BH6000
27 - Complete decal set BH6000

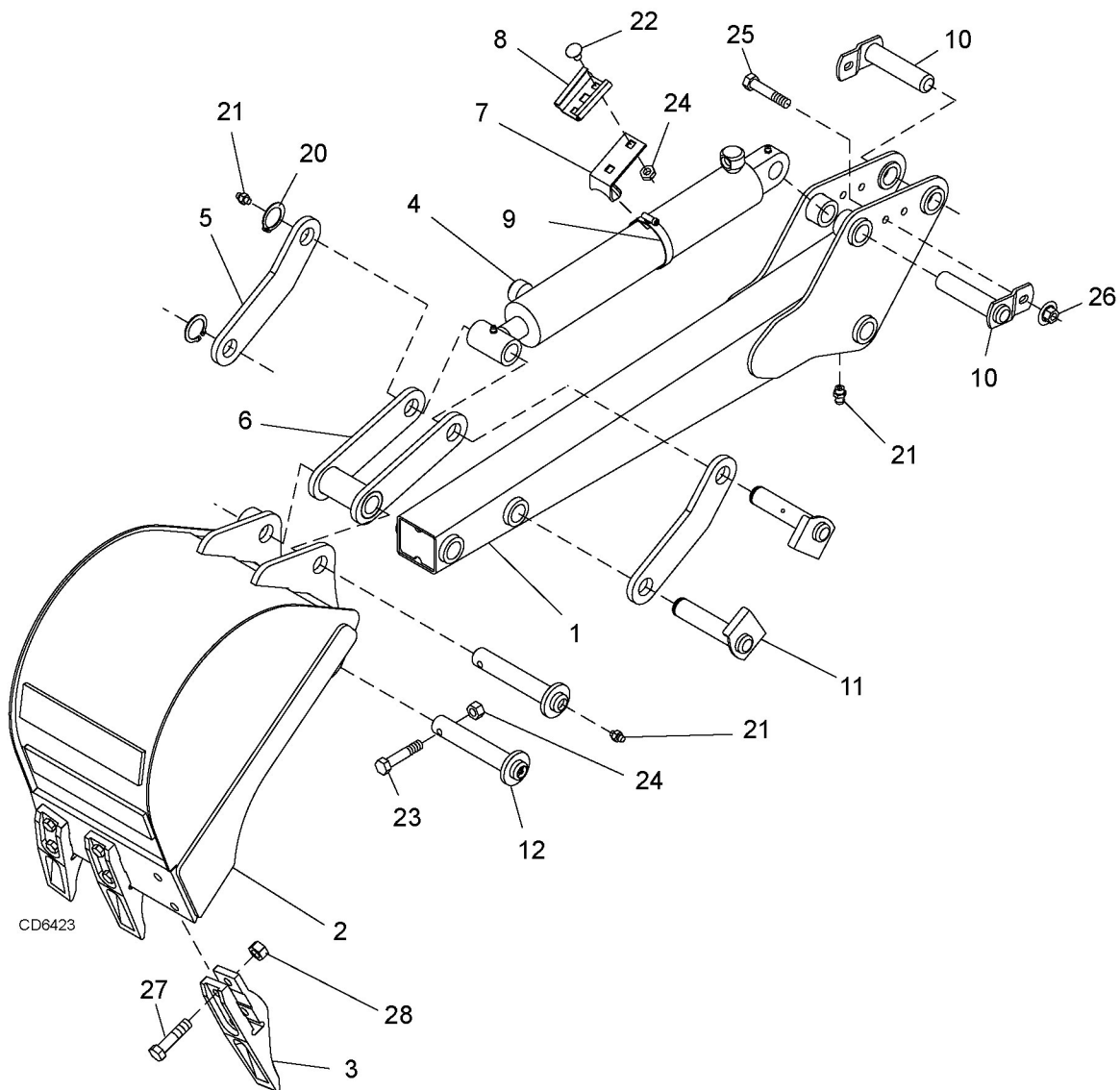


BH6000 MAIN FRAME ASSEMBLY

REF	PART	QTY	DESCRIPTION	REF	PART	QTY	DESCRIPTION
1	1008270	1	Main frame	26	1008397	1	Decal set, safety BH6000
2	1008376	1	Swing frame machined BH6000	27	1008398	1	Decal set, complete BH6000
3	1008396	1	Console BH6000 w/decals	33	3584	2	Grease fitting 1/4 tapered thread 45°
4	1008284	1	Bracket, console	34	158 *	1	Grease fitting 1/8 NPT x 65°
5	1008285	1	Link bent, console	35	20786	1	Adapter, grease 1/4-28m x 1-8 NPTF
6	1008335	1	Link, lockup w/decal	36	12296 *	1	Grease fitting 1/4-28 x 15/32 straight
7	1008260	2	Arm, stabilizer	37	1008366	2	Ring, retaining external .05 x 1.375
8	1008265	2	Pad, stabilizer	38	1266 *	8	3/16 x 1-1/2 Cotter pin
9	1008393	1	Cover, console w/decals	39	15036 *	1	3/16 Safety pin
10	1008203	2	Hydraulic cylinder 2.25 x 1.125 x 10.05	40	1285 *	1	1/4 x 1-1/2 Cotter pin
11	1008204	1	Hydraulic cylinder 2.50 x 1.125 x 6.82	41	30036	4	5/16 NC x 3/4 Self tap screw
12	-----	1	Valve, w/control asy BH6000 (See page 36)	42	6096 *	2	5/16 NC x 3/4 Cap screw GR5
13	1008361	1	Trim strip .38 x 8.0	43	300105 *	1	5/16 NC x 2 Cap screw GR5
14	1008360	1	Trim strip .38 x 16.0	44	62155 *	1	5/16 NC x 2-3/4 Cap screw GR5
15	1008359	1	Pin, swivel handle 1.00 x 3.0	45	1008291 *	3	Bolt, carriage 5/16NC x 2.5 GR5
16	1008356	2	Pin, 3.12	46	2472 *	3	Lock washer 5/16
17	1008325	2	Pin, headless 1.00 x 4.40	47	6778 *	2	Nut, lock 5/16 NC
18	1008327	2	Pin, headless 1.00 x 5.94	48	4529 *	3	Nut, hex 5/16 NC
19	1008326	2	Pin, headless 1.00 x 5.86	49	24597 *	2	Bolt, carriage 3/8 NC x 3/4
20	1008268	5	Pin, 6.73	50	839 *	7	3/8 NC x 1 Bolt, carriage
21	1008333	1	Pin, 7.89	51	976 *	4	3/8 NC x 1-1/2 Cap screw GR5
22	1004656	1	Manual tube PVC 2.0 ID x 11.25	52	35735 *	4	Bolt, carriage 3/8 NC x 2.5
23	1004657	2	Caplug, 2.00 ID x 1.00 (glue bottom cap)	53	565 *	2	Washer, 3/8 flat
24	1004695	2	Clamp, 1.94 dia pipe	54	14350	12	Nut, lock 3/8 NC flange
25	37600	1	Handle, 1.05 x 13.3 x 15.5	55	55193	1	1/2 NC x 7 Cap screw GR5
				56	1093 *	2	Nut, 1/2 NC hex
				57	62075	2	Bushing, 1.01 ID x 1.51 OD x 10 ga
				58	62072	1	Spring/compression 1.19 .07 0.6 27
				59	29130	3	Washer, 1-3/8 ID x 1-7/8 OD x 18 ga

* Standard hardware, obtain locally

BH6000 DIPPERSTICK ASSEMBLY



REF	PART	QTY	DESCRIPTION
-----	------	-----	-------------

1	1008240	1	Dipperstick BH6000
2	1008368	1	Bucket, 8" - or -
2	1008312	1	Bucket, 12" - or -
2	1008316	1	Bucket, 16"
3	1014202	A/R	Tooth, bucket 1.95 x 7.5
4	1008201	1	Hydraulic cylinder 2.25 x 1.125 x 12.50
5	1008208	2	Link, guide
6	1008210	1	Bucket, link
7	62263	1	Bracket, socket SMV
8	62484	1	Socket, SMV emblem
9	34181	1	Hose clamp, 2-1/2-3-1/2"
10	1008215	2	Pin, 4.15

REF	PART	QTY	DESCRIPTION
-----	------	-----	-------------

11	1008216	2	Pin, 4.35 (includes #21)
12	1008218	2	Pin, 4.94 (includes #21)
20	62102	2	Ring, retainer .042 x .925 ext
21	12296 *	1	1/4 28 Straight grease fitting 15/32
22	62532 *	2	Bolt, carriage 5/16 NC x 1/2 GR5
23	10509 *	2	5/16 NC x 2-1/2 Cap screw GR5
24	6778 *	4	Nut, lock 5/16 NC
25	839 *	2	3/8 NC x 1 Cap screw GR5
26	14350	2	Nut, lock 3/8 NC flange
27	24576 *	A/R	1/2 NC x 1-3/4 Cap screw GR5
28	765 *	A/R	1/2 NC Lock nut

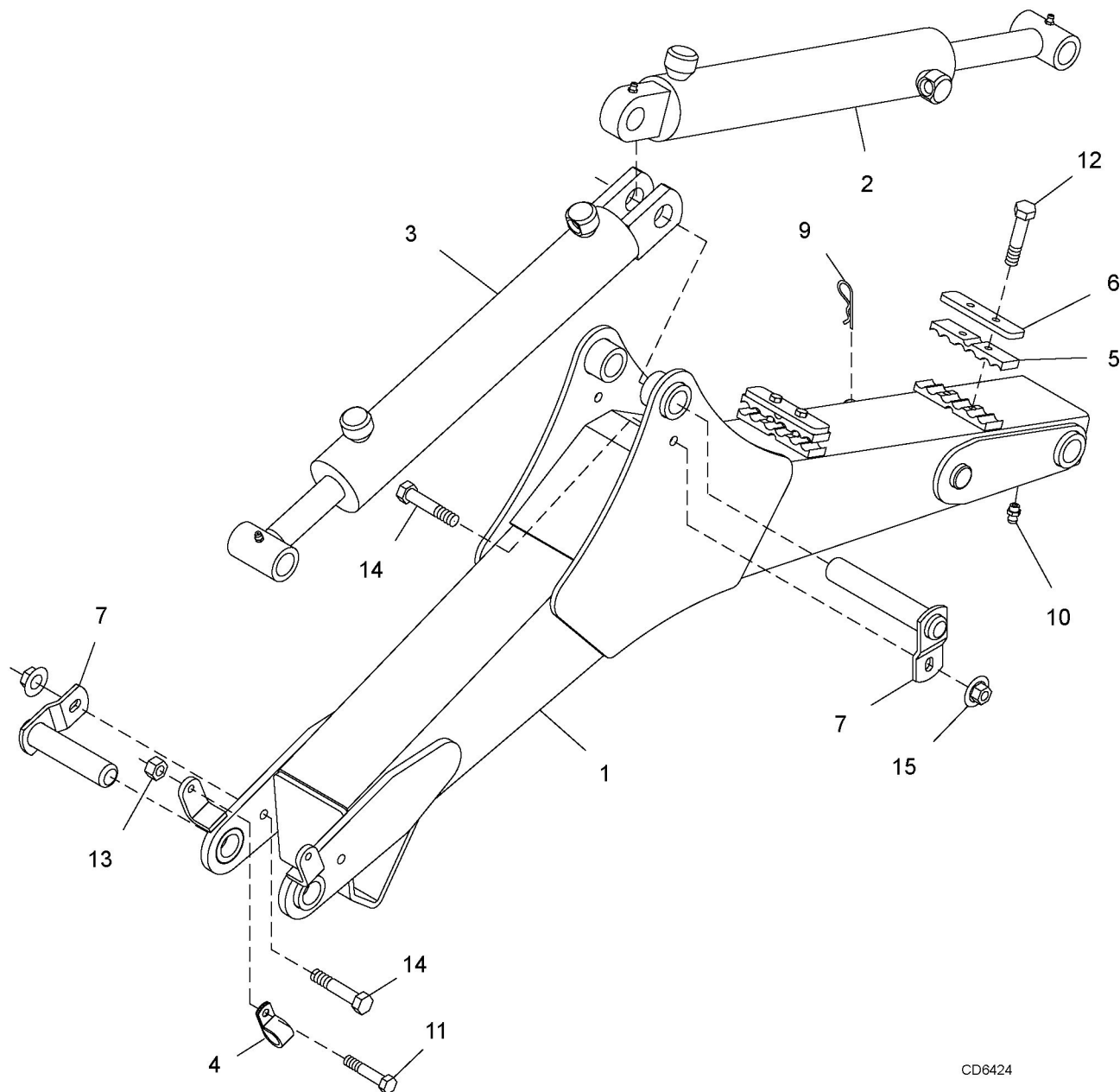
A/S As required

* Standard hardware, obtain locally

34 Parts

MAN0306 (Rev.5/23/2008)

BH6000 BOOM ASSEMBLY



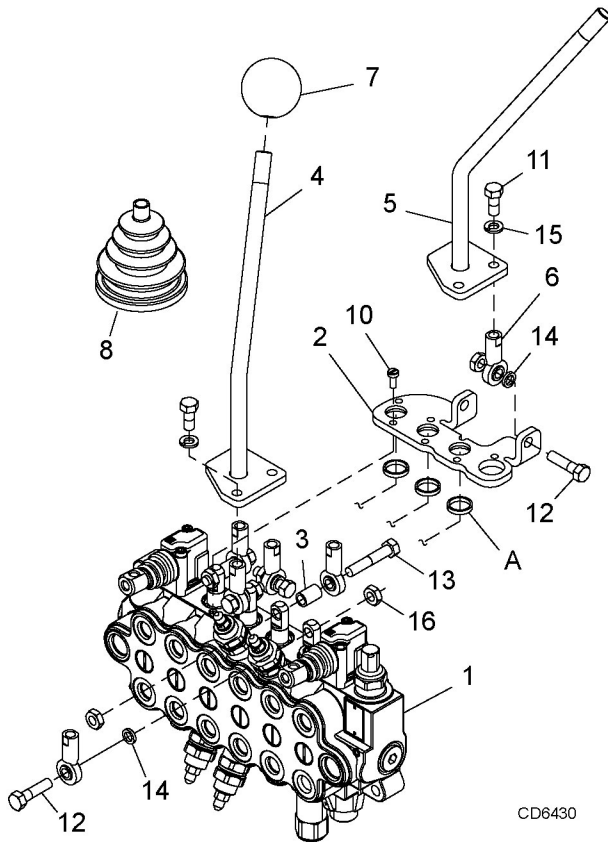
CD6424

REF	PART	QTY	DESCRIPTION
1	1008220	1	Boom BH6000
2	1008201	1	Hydraulic cylinder 2.25 x 1.125 x 12.5 (tang, see page 36)
3	1008202	1	Hydraulic cylinder 2.25 x 1.125 x 12.5 (clevis, see page 36)
4	1008290	2	Clamp, hose 9/16
5	1008336	4	Clamp, 6 hose
6	1008337	2	Link, clamp
7	1008213	2	Pin, 5.05

REF	PART	QTY	DESCRIPTION
9	15036 *	1	3/16 Safety pin
10	12296 *	1	1/4 28 straight grease fitting 15/32
11	2457 *	2	1/4 NC x 3/4 Cap screw GR5
12	22348 *	4	1/4 NC x 2 Cap screw GR5
13	6128 *	2	Nut, lock 1/4 NC
14	839 *	2	3/8 NC x 1 Cap screw GR5
15	14350 *	2	Nut, lock 3/8 NC flange

* Standard hardware, obtain locally

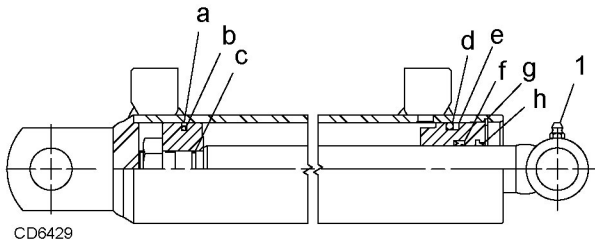
BH6000 VALVE CONTROLS & HARDWARE



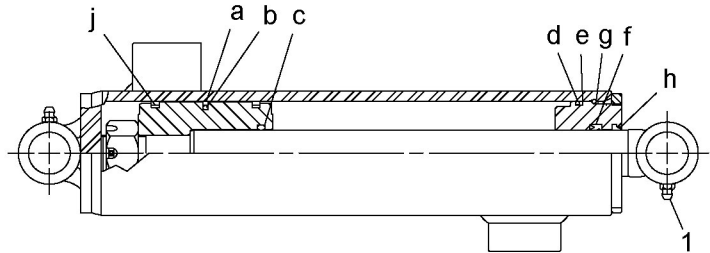
REF	PART	QTY	DESCRIPTION
1	1008206	1	Valve, 6 spool monoblock 2000 psi
2	1008321	1	Plate, control linkage mounting
3	1008322	2	Sleeve .325 x .463 x .680
4	1008369	1	Control handle, right
5	1008370	1	Control handle, left
6	37613	6	Rod end, 5/16 NF female
7	37672	2	Knob, 1.88 OD x 1/2 NC
8	37765	2	Boot, rubber control
10	----	7	Screw, slot head M5 x .8 x 12 (included w/item 1)
11	24405	6	5/16 NF x 3/4 Cap screw GR5
12	6250 *	4	5/16 NC x 1-1/4 Cap screw GR5
13	4528 *	2	5/16 NC x 1.75 Cap screw GR5
14	37577	4	Washer, .328 x .50 x .093
15	2472 *	6	Washer, lock 5/16
16	6778 *	6	Nut, lock 5/16 NC
A	----	3	Spool wiper (included w/item1)

* Standard hardware, obtain locally

BH6000 CYLINDERS



BOOM, DIPPER, BUCKET
STABILIZER CYLINDERS

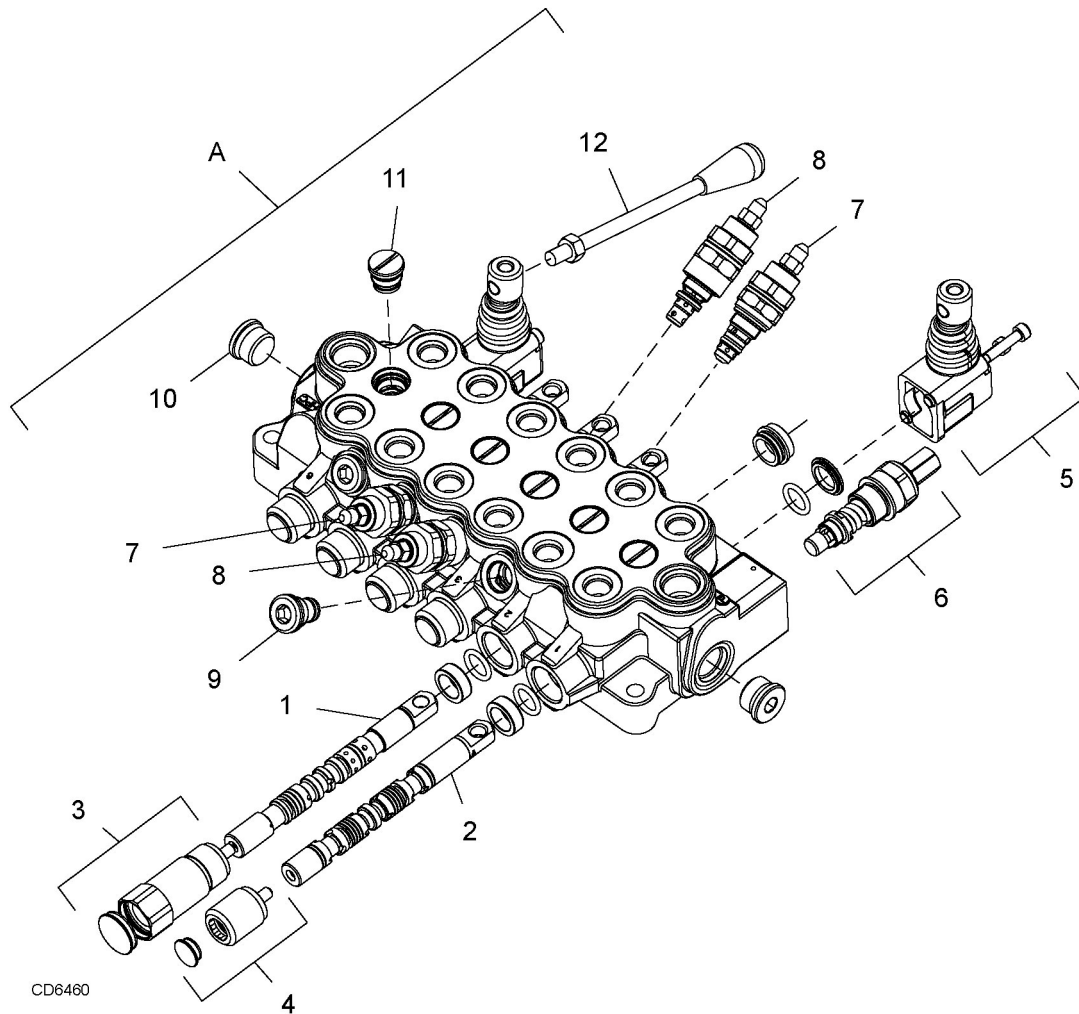


SWING CYLINDER

Function	Complete Assembly	Base End Style	Retracted Length	Extended Length	Bore Dia	Rod Dia	Seal Kit (a - j)
Swing	1008204	Tube	14.94	21.76	2.50	1.12	1008411
Stabilizer	1008203	Tube	16.95	27.00	2.25	1.12	1008410
Dipper	1008202	Clevis	19.50	32.00	2.25	1.12	1008410
Boom	1008201	Tang	19.50	32.00	2.25	1.12	1008410
Bucket	1008201	Tang	19.50	32.00	2.25	1.12	1008410

1. - 12296 1/4 28 straight grease fitting 15/32

BH6000 CONTROL VALVE

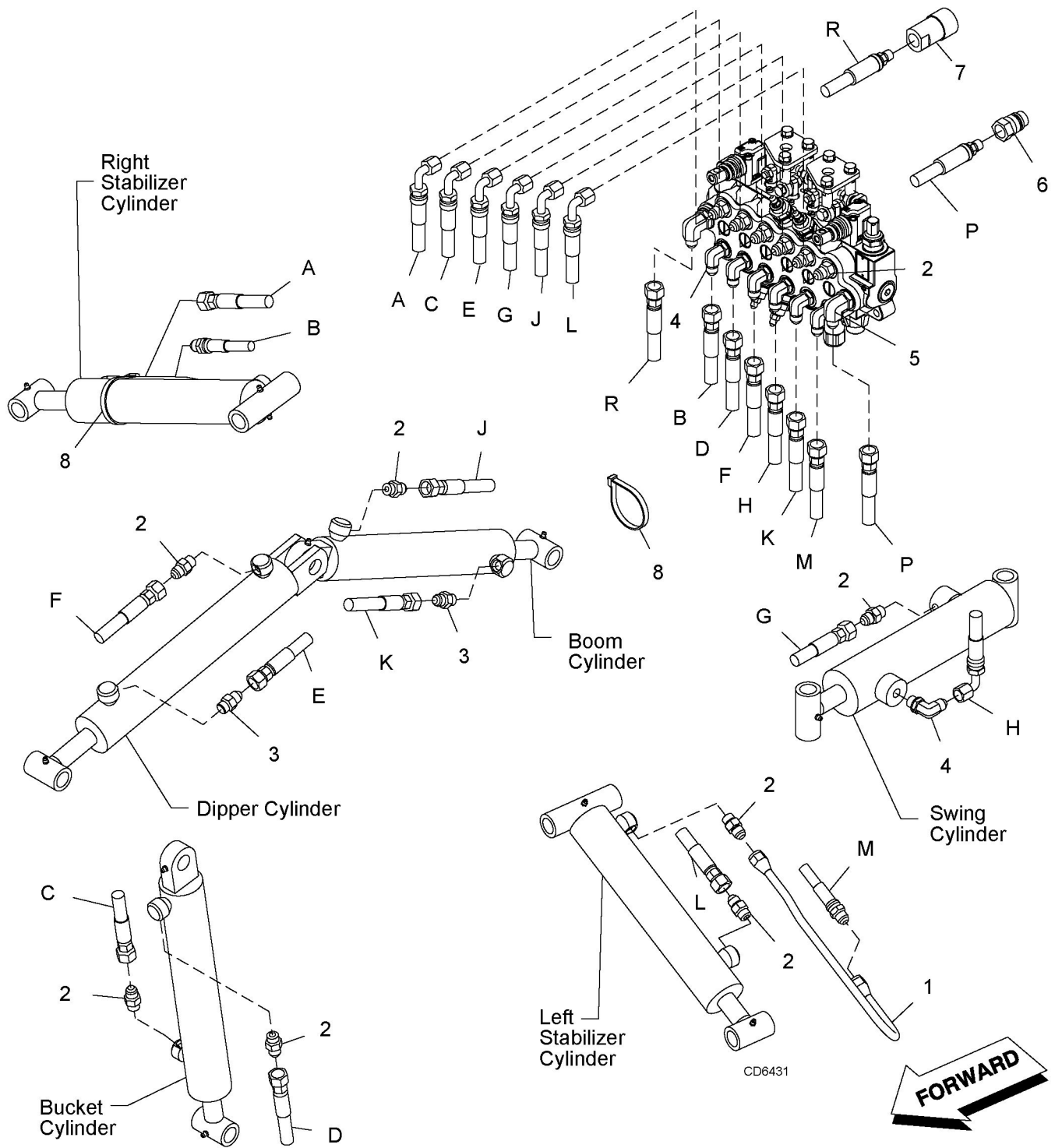


REF	PART	QTY	DESCRIPTION
A	1008206	1	Valve - 6 spool MBLK 2000 psi
1	1008384	1	Spool, 4-position float
2	1008385	5	Spool, 3-position
3	33343	1	Spool, position cont asy 4-position
4	33345	5	Spool, pos cont asy 3-position
5	38628-1	2	Control assembly stabilizer
6	33342	1	Valve relief 2000 psi

REF	PART	QTY	DESCRIPTION
7	33341	2	Valve relief 2500psi
8	33340	2	Valve relief w/anti-cavitation check 2000 psi
9	38631-1	2	Plug port relief cavity
10	38632-1	2	Plug, 3/4 SAE male w/O-ring
11	33339	6	Valve, load check assembly
12	38629	2	Handle control-stabilizer
NS	33346	6	Spool, seal repair kit

NS Not shown

BH6000 HOSES & FITTINGS



38 Parts

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BH6000 HOSES & FITTINGS PARTS LIST

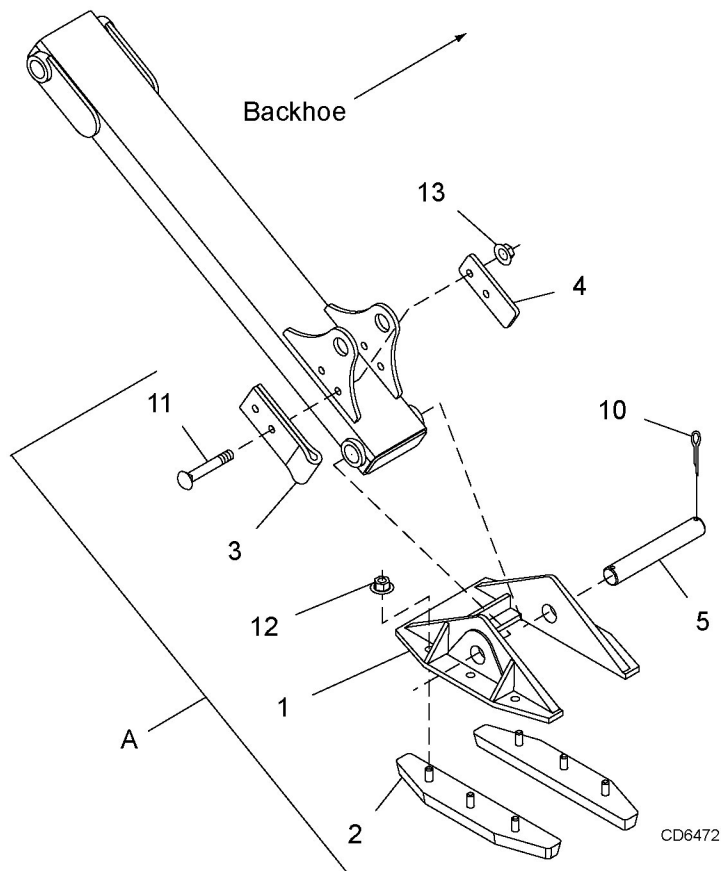
HOSES

REF	PART	QTY	DESCRIPTION
1	1008254	2	Tube assembly - bent, hydraulic
2	62367	15	Adapter, 9/16 JICM x 9/16 O-ring
3	37508	2	Adapter, 9/16 JICM x 9/16 O-ring (restricted)
4	63558	7	Elbow, 9/16 JICM x 9/16 O-ring 90°
5	313038	2	Elbow, 9/16 JICM x 3/4 O-ring 90°
6	64300	1	Quick coupler 3/8, male
7	64299	1	Quick coupler 3/8, female
8	65766 *	3	.34 x 34.0 Plastic cable tie

* Standard hardware, obtain locally

REF	PART	QTY	DESCRIPTION
A	1008342	1	Hose, 43" x 9/16 JICF x 9/16 JICF
B	1008348	1	Hose, 39" x 9/16 JICM x 9/16 JICF
C	1008345	1	Hose, 103" x 9/16 JICF x 9/16 JICF
D	1008351	1	Hose, 102" x 9/16 JICF x 9/16 JICF
E	1008344	1	Hose, 75" x 9/16 JICF x 9/16 JICF
F	1008350	1	Hose, 80" x 9/16 JICF x 9/16 JICF
G	1008341	1	Hose, 24" x 9/16 JICF x 9/16 JICF
H	1008340	1	Hose, 21" x 9/16 JICF x 9/16 JICF
J	1008343	1	Hose, 56" x 9/16 JICF x 9/16 JICF
K	1008349	1	Hose, 62" x 9/16 JICF x 9/16 JICF
L	1008342	1	Hose, 43" x 9/16 JICF x 9/16 JICF
M	1008348	1	Hose, 39" x 9/16 JICM x 9/16 JICF
P	1009493	1	Hose, 40" x 3/8 NPTM x 9/16 JICF
R	1009490	1	Hose, 21" x 3/8 NPTM x 9/16 JICF

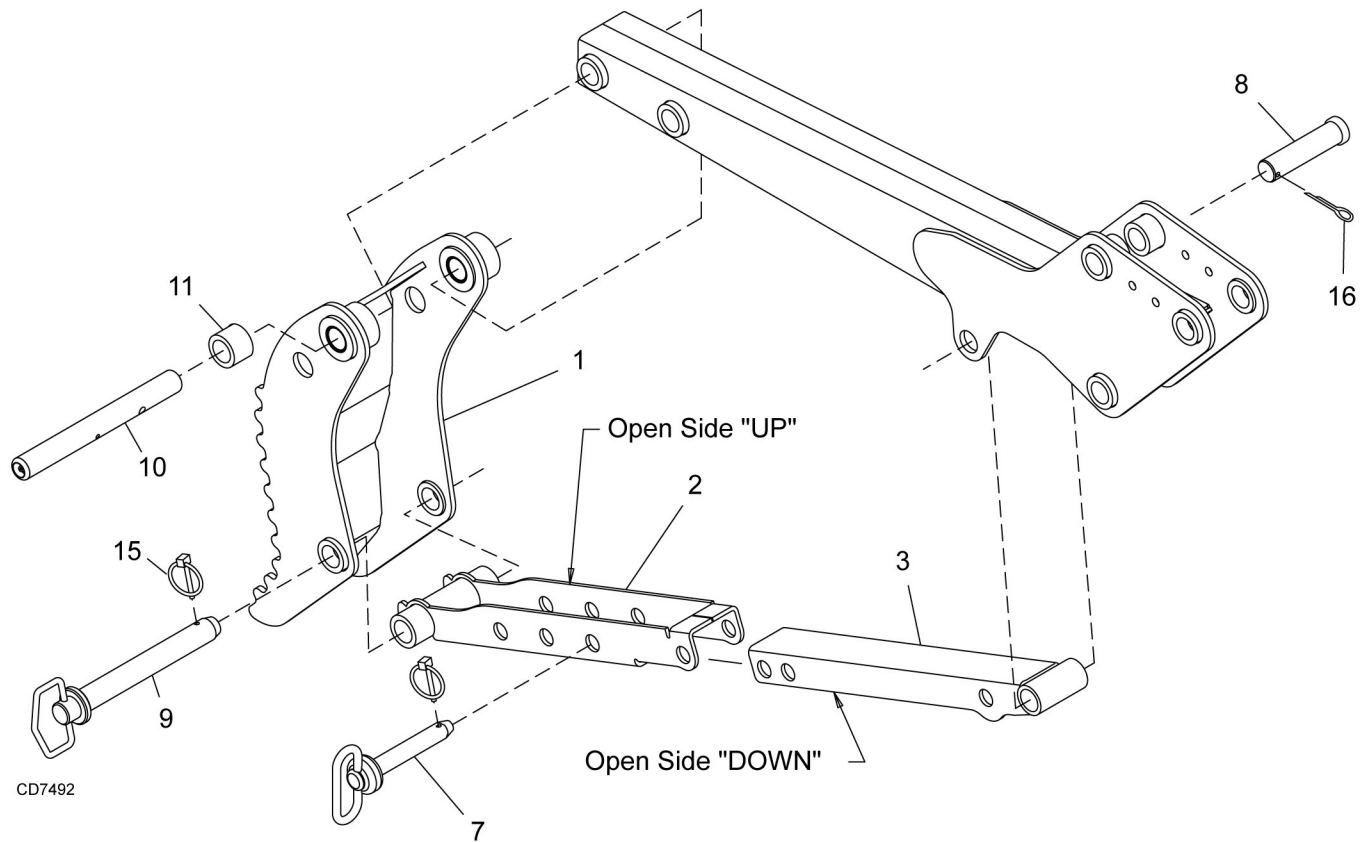
OPTIONAL STABILIZER STREET PAD



REF	PART	QTY	DESCRIPTION
A	1008408		Stabilizer street pad kit (includes all items listed below)
1	37766	2	Stabilizer pad, machined
2	1006610	4	Stabilizer pad, urethane
3	1008287	2	Strap, rubber
4	1008367	2	Reinforcement strap, link stabilizer
5	53920	2	Pin, headless 1.00 x 5.84
10	1266 *	4	3/16 x 1-1/2 Cotter pin
11	301104 *	4	3/8 NC x 1-1/2 Carriage bolt
12	14350 *	12	3/8 NC Flange lock nut
13	70069	4	3/8 NC Flange whiz nut

* Standard hardware, obtain locally

BH6000 MECHANICAL THUMB



REF	PART	QTY	DESCRIPTION
1	1023220	1	Thumb
2	1023308	1	Lower channel
3	1023312	1	Upper channel
7	1012579	1	Hitch pin, 3/4 x 4
8	304056	1	Clevis pin

REF	PART	QTY	DESCRIPTION
9	1023224	1	Clevis pin, 1 x 8
10	1023223	1	Pin, 1.0 x 9.19
11	1011867	2	Bushing, 1.0 x 1.13 x 1.5 (included in item 1)
15	1027868	2	Lynch pin, 3/16 x 1-5/8
16	1266 *	2	Cotter pin, 3/16 x 1-1/2

* Standard hardware, obtain locally

BOLT TORQUE CHART

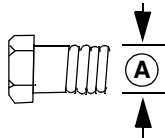
Always tighten hardware to these values unless a different torque value or tightening procedure is listed for a specific application.

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

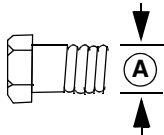


**SAE Grade 5
(3 Radial Dashes)**



**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



**Metric
Grade 8.8**

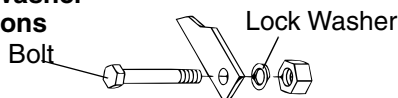
Metric Bolt Head
Identification



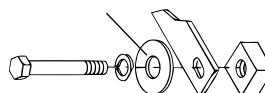
**Metric
Grade 10.9**

Ⓐ Diameter & Thread Pitch (Millimeters)	Wrench Size	COARSE THREAD				FINE THREAD				Ⓐ Diameter & Thread Pitch (Millimeters)
		MARKING ON HEAD				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



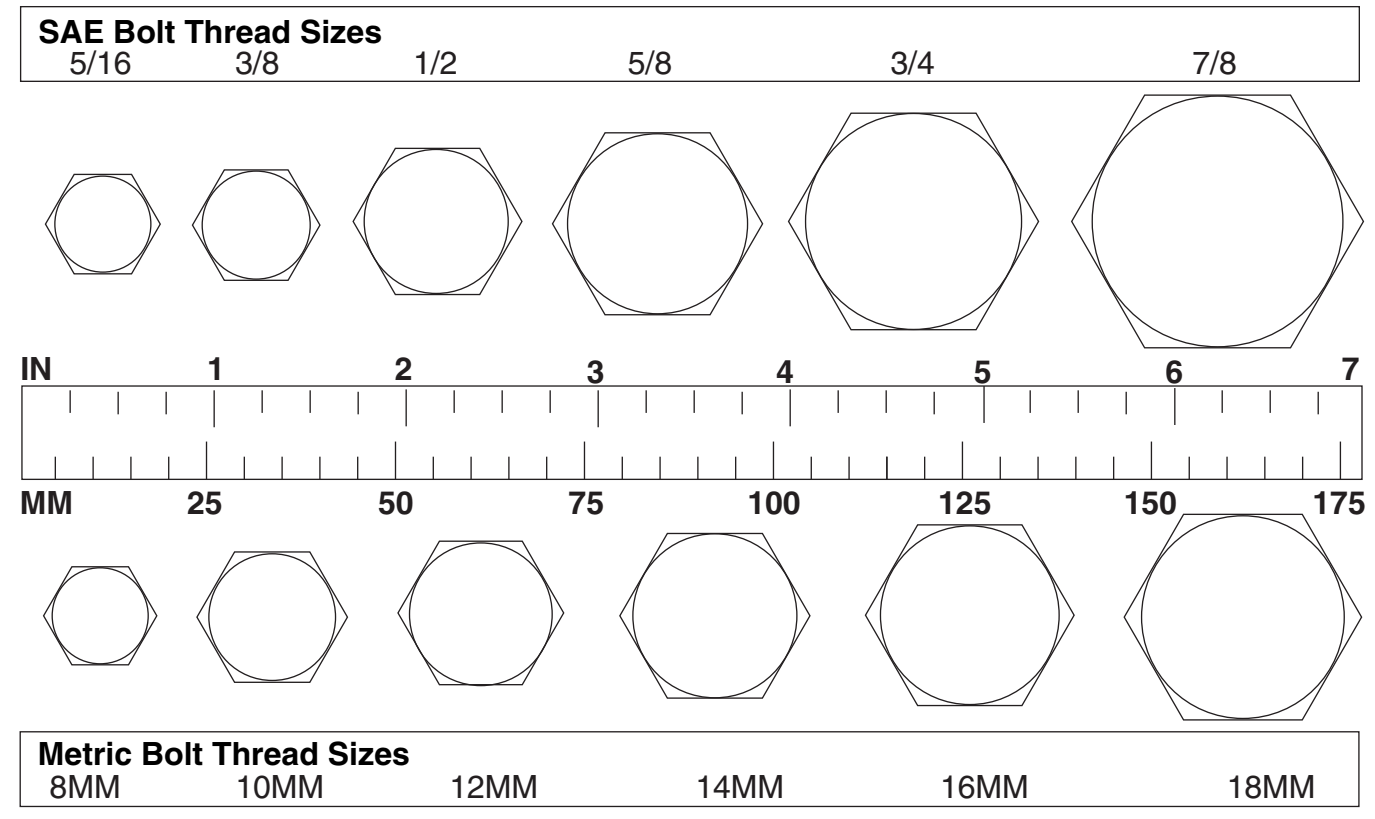
Flat Washer



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

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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.

Woods backhoe models BH70-X, BH80-X, and BH90-X 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, BW1800	8 years
	BB48X, BB60X, BB72X, BB84X, BB600X, BB720X, BB840X, BB6000X, BB7200X, BB8400X, DS1260, DSO1260, DS1440, TS1680, BW126-3, BW180-3	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	5 years
	RDC54, RD60, RD72	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, BW180-3, BW1260, BW1800, 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 by contacting:

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

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CENTRAL FABRICATORS®

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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.

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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.

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