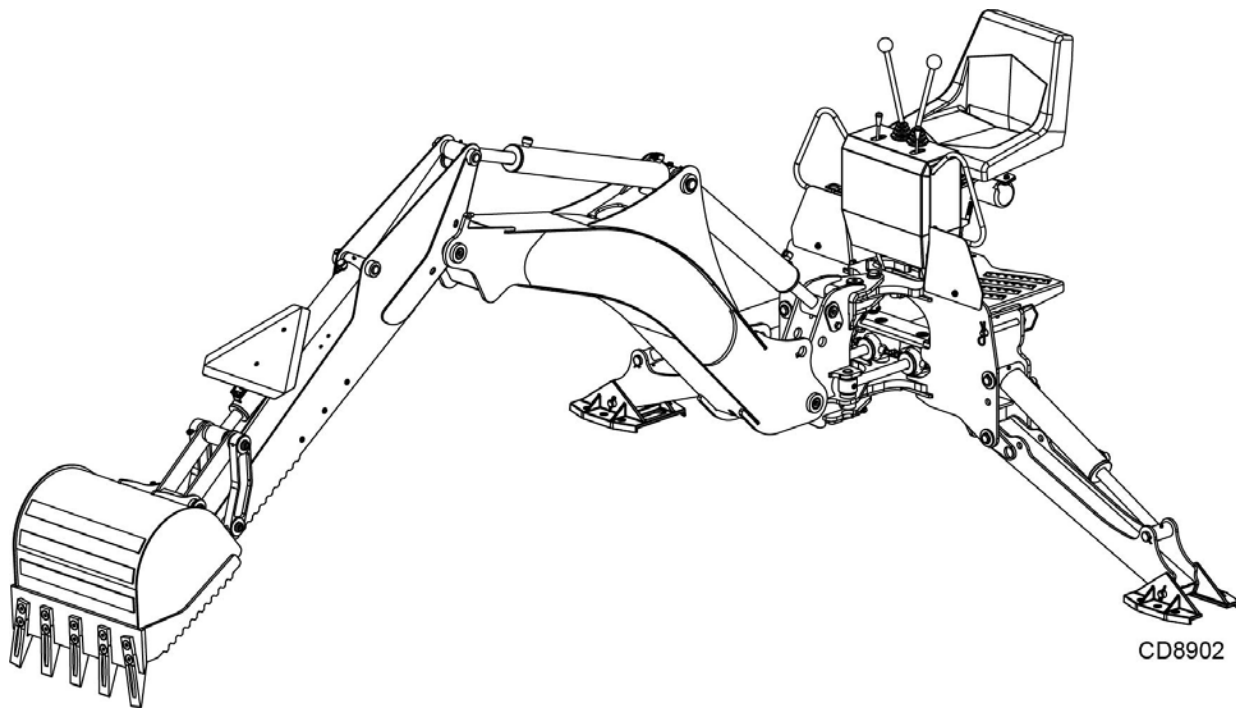


BACKHOE

BH85 & BH100



CD8902

MAN1272

(Rev. 10/22/2019)

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. 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 physical injury hazards. Obey all safety messages that follow this symbol to avoid possible injury or death.



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



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



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

**IMPORTANT
or NOTICE**

Is used to address practices not related to physical injury.

NOTE

Indicates helpful information.

WOODS®
Woods Equipment Company

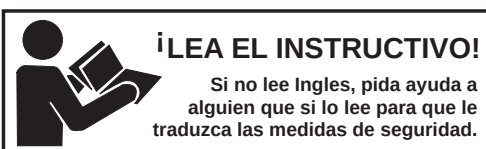
ALITEC™
CENTRAL FABRICATORS®
GANNON®
WAIN-ROY®
WOODS®

2 Introduction

Gen'I (Rev. 2/25/2016)

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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.

BH85 & BH100 SPECIFICATIONS

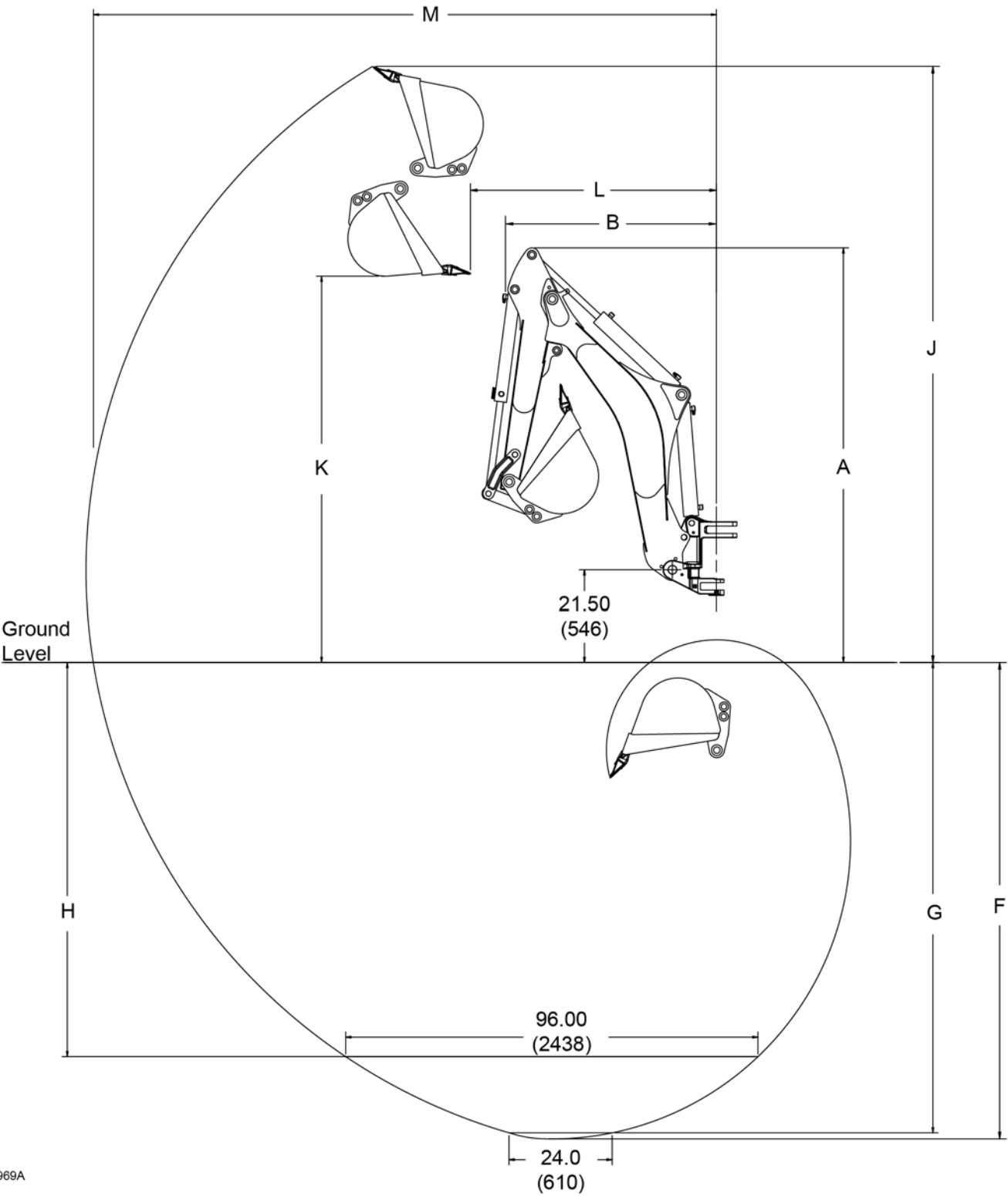
Description	Illustration	English		Metric	
		BH85	BH100	BH85	BH100
Tractor PTO HP		30 - 100 HP	40 - 100 HP	22 - 75 kw	30 - 75 kw
Digging Depth - Maximum	F	103 in.	121 in.	2616 mm	3073 mm
Digging Depth - 2' Flat	G	102 in.	120 in.	2591 mm	3048 mm
Digging Depth - 8' Flat	H	82 in.	102 in.	2083 mm	2591 mm
Reach from Swing Pivot	M	141 in.	161 in.	3581 mm	4089 mm
Loading Height	K	83 in.	100 in.	2108 mm	2540 mm
Loading Reach	L	61 in.	70 in.	1549 mm	1778 mm
Transport Height	A	94 in.	104 in.	2388 mm	2642 mm
Transport Length	B	55 in.	55 in.	1397 mm	1397 mm
Swing Arc		180°	180°	180°	180°
Bucket Rotation		180°	180°	180°	180°
Stabilizer Spread - Up		76 in.	76 in.	1930 mm	1930 mm
Stabilizer Spread - Down		102 in.	102 in.	2591 mm	2591 mm
Leveling Angle*		10°	10°	10°	10°
Relief Pressure		2465 psi	2465 psi	17 Mpa	17 Mpa
Bucket Digging Force		4600 lbs	4600 lbs	20462 N	20462 N
Dipperstick Digging Force		2940 lbs	2720 lbs	13078 N	12099 N

Bucket Capacity (Heaped)		cu.-ft.	cu.-meter
12" (305 mm)		1.37	0.039
15" (381 mm)		1.84	0.052
18" (457 mm)		2.32	0.066
24" (610 mm)		3.27	0.093
36" (914 mm)		3.17	0.090

Per Definitions in Standards - SAE J49 and SAE J1234

* Depends on Tractor Model and Tire Sizes

BH85 & BH100 SPECIFICATIONS



CD6969A

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.

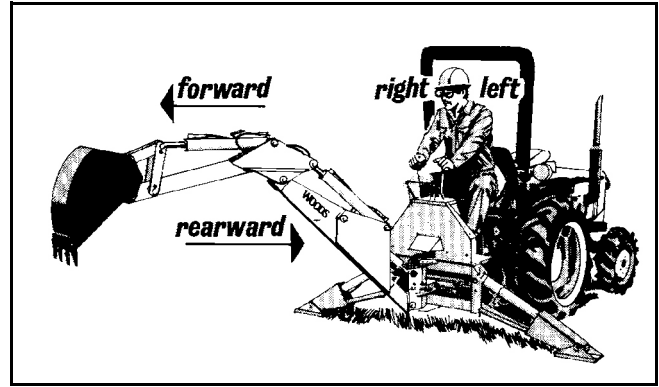


Figure 1. Backhoe Directions

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.

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

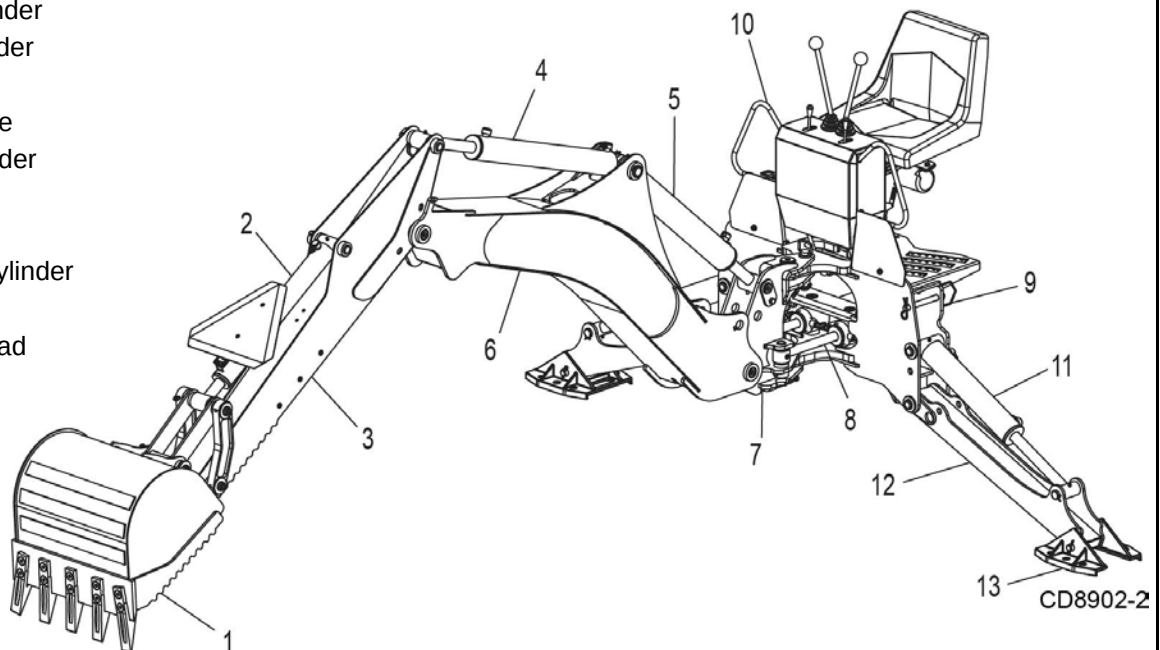


Figure 2. Backhoe Components



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, prudence, 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.**

■ **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.**

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

■ **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.**

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 40 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.**

■ **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.**

■ **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)

■ Connect PTO driveline directly to power unit PTO shaft. Never use adapter sleeves or adapter shafts. Adapters can cause driveline failures due to incorrect spline or incorrect operating length and can result in personal injury or death.

■ Power unit must be equipped with Roll Over Protection System (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, 2, or 3N tractors under 100 hp with 1800 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.

■ Do not use with 3-point quick attaching coupler.

■ Do not use on tractor front 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.

■ 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 25% of tractor and equipment weight must be on tractor front wheels when attachments are in transport position. Without this weight, front tractor wheels could raise up resulting in loss of steering. The weight may be attained with front wheel weights, ballast in tires, front tractor weights or front loader.

■ Weigh the tractor and equipment as shown in Figure 3. The weight on the front tires, divided by the total weight on both front, plus rear tires, must be at least 25%.

■ 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.

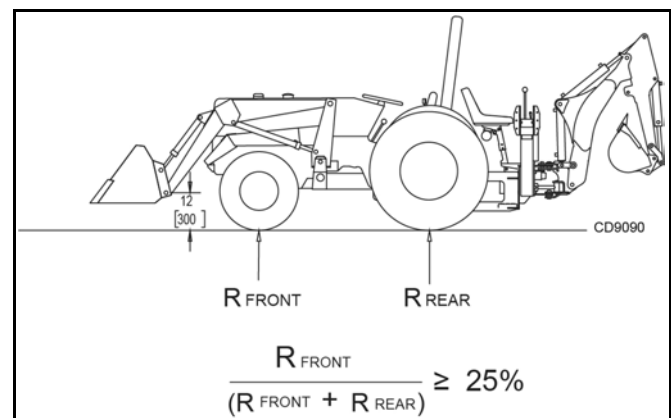


Figure 3. Backhoe Stability Calculation

OPERATION

■ Never allow children or untrained persons to operate equipment.

■ Do not allow bystanders within 25 feet of the area when operating, attaching, removing, assembling, maintaining, 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.

■ Prevent trench cave-in by shoring, sloping, or stepping the sides of the trench.



SAFETY RULES

ATTENTION! BECOME ALERT! YOUR SAFETY IS INVOLVED!



- Keep materials & equipment a minimum of 2 ft. from the edge of excavation.
- Never enter a trench over 4 feet deep without protective shoring and a way to climb out.
- Provide barricades to prevent people from falling into trench.
- 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 Roll Over Protection System (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.
- 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, stabilizer 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, stabilizer and boom transport locks and attach Slow Moving Vehicle (SMV) sign before transporting backhoe.
- Power unit must be equipped with Roll Over Protection System (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 within 25 feet of the area when operating, attaching, removing, assembling, maintaining, 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.

SAFETY RULES



ATTENTION! BECOME ALERT! YOUR SAFETY IS INVOLVED!



- Before working on backhoe, extend boom and dipperstick and place bucket on ground. Shut off the tractor engine. 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.

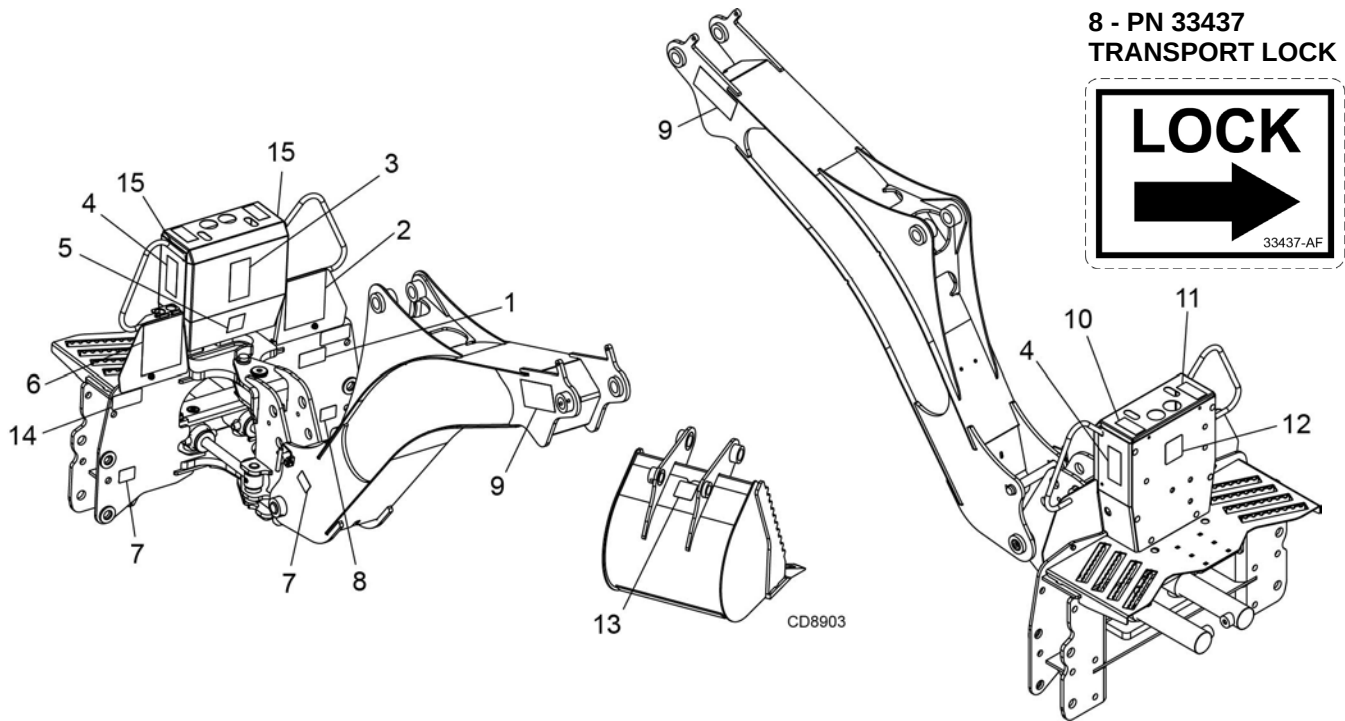
SAFETY & INSTRUCTIONAL DECALS



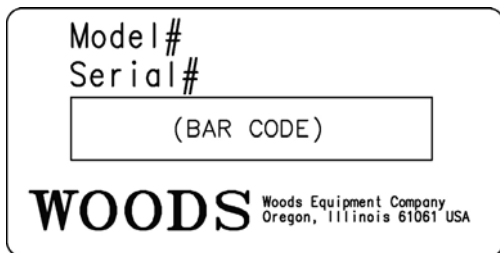
ATTENTION! BECOME ALERT! YOUR SAFETY IS INVOLVED!



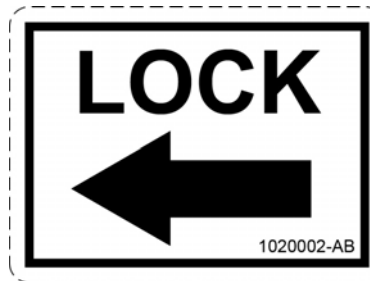
Replace Immediately If Damaged!



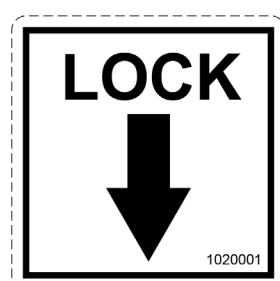
1 - SERIAL NUMBER PLATE



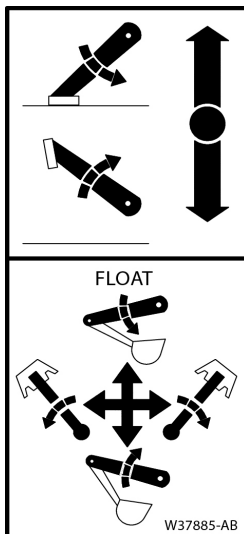
**7 - PN 1020002
(TRANSPORT LOCK)**



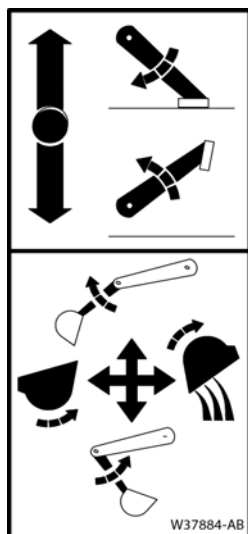
**5 - PN 1020001
(TRANSPORT LOCK)**



10 - PN W37885



11 - PN W37884



BE CAREFUL!

Keep safety decals clean and visible.

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.

Replace safety decals if they are missing or illegible.

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.

SAFETY & INSTRUCTIONAL DECALS



ATTENTION! BECOME ALERT! YOUR SAFETY IS INVOLVED!



Replace Immediately If Damaged!

2 - PN 618131

⚠ WARNING

TO AVOID SERIOUS INJURY OR DEATH,

- Before operating, read and follow all safety precautions in Operator's Manual (available from your dealer, or call 1-800-319-6637).
- Make sure all safety decals are installed and readable.
- Make sure all shields are properly installed.
- Never allow passengers during transport.
- Remove seat and upper support assembly before installing or removing backhoe.
- Only mount on Category 1 or 2 tractors under 100 hp with 1800 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. Watch for overhead electrical wires.
- When operating, always sit in backhoe seat; keep bystanders away from maximum swing area.
- Operate PTO at 540 rpm. Do not exceed.
- 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.

BH85 618131

6 - PN 618130

⚠ 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.
- Only use tractor manufacturer's high-strength top link pin of at least 3/4" diameter and klik pin retainer. See manual for installation instructions.

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

BH85 618130

3 - PN 618133

⚠ DANGER

TO AVOID CRUSHING INJURY OR DEATH

- Operate backhoe controls from backhoe seat, except when installing or removing backhoe
- DO NOT enter or exit from this side

618133

13 - PN 606323

⚠ CAUTION

Heavy object.
Can cause muscle strain or back injury.

Use lifting aids and proper lifting techniques when moving.

606323

14 - PN 20106 (RED REFLECTOR)

9 - PN 618132

⚠ WARNING

TO AVOID PERSONAL INJURY, STAY CLEAR OF BACKHOE OPERATING AREA

618132

15 - PN 18868

⚠ DANGER

SHIELD MISSING

**DO NOT OPERATE
PUT SHIELD ON**

18868-B

4 - 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

12 - PN 1032572

811

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1032572

OPERATION

The operator is responsible for the safe operation of the backhoe within its intended uses. The backhoe is intended for digging trenches, wider holes, moving soil, gravel, rocks, or stumps into a pile, or container and backfilling. The accessory thumb is intended to pick up and move items that do not fit in the bucket. 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 12.

DANGER

- Never operate without 3-point hitch Saf-T-Lok[®] kit or sub-frame kit.
- 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.
- Only use tractor manufacturer's high strength top link pin of at least $\frac{3}{4}$ " diameter and klik pin retainer. See 3 point mounting or sub-frame kit for installation instructions.
- Failure to follow the above instructions may result in serious injury or death from backhoe being thrust upward, forward, or rearward by digging forces.

Figure 3

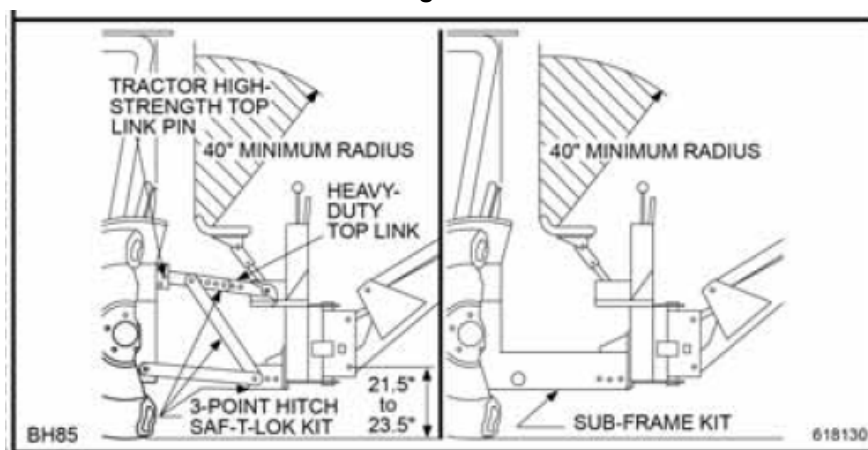


Figure 4. Minimum Clearance Radius

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.
- 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.

- A minimum 25% 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 25% 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.
- Never allow children or untrained persons to operate equipment.

PTO HYDRAULIC PUMP (OPTIONAL)

WARNING

- Instructions for engaging and disengaging the PTO are in your tractor manual. Learn how to disengage PTO quickly should an emergency occur.

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

An optional tractor-driven PTO pump is available. The tractor-driven PTO pump supplies hydraulic pressure for backhoe operation.

When engaging hydraulic PTO mounted pump, engine RPM should always be low. Once engaged, engine RPM may be increased to desirable operation speed.

IMPORTANT: 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.

POSITION THE MACHINE

WARNING

- Place and keep 3-point lift quadrant lever in lowered position at all times.
- If tractor is equipped with draft sensing control, set to "HEAVY" (minimum sensitivity) position.
- Do not dig with backhoe unless stabilizers are down on firm surface.

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.

Disengage transport lock pin and swing lock pin. Place pins in storage position and secure with lock pins provided (see Transportation section for storage location).

Lower stabilizers until they carry the weight of the backhoe (see **Control Handle Operation** section for instructions on operation of stabilizer controls). 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

CAUTION

- When operating controls, always sit in backhoe seat.

It is not difficult to become a successful operator. Your backhoe is equipped with control lever operating decals on both the left and right side of your operator's console as seen in Figure 5. Study these decals; they will assist you in becoming familiar with the controls.

When becoming familiar with backhoe controls, start with a lower tractor engine RPM.

Before operating, perform a functional test by placing the 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. See **Boom and Swing Controls** section

WARNING! Do not operate backhoe if control functions differ from control decals; serious injury or death could occur.

STABILIZER CONTROLS

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

Pushing handle 4 forward will lower right stabilizer; pulling back raises it.

BOOM AND SWING CONTROLS (Handle 2, Figure 5)

Pulling the handle back (towards **A**) raises boom; pushing it forward (toward **C**) lowers it.

Full forward (toward **C**) is the float position. Moving the backhoe's Boom Control into the float position relieves all pressure from the boom hydraulic cylinder. That allows the boom to move up, or down freely as dipper and bucket controls are operated.

WARNING! If the backhoe bucket is not in contact with the ground, moving to float will allow the backhoe to drop quickly to the ground. Only use the float position when the bucket is on the ground.

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

DIPPER AND BUCKET CONTROLS (Handle 3, Figure 5)

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

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

Moving the 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.

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 the cylinders to reach the limit of travel.

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

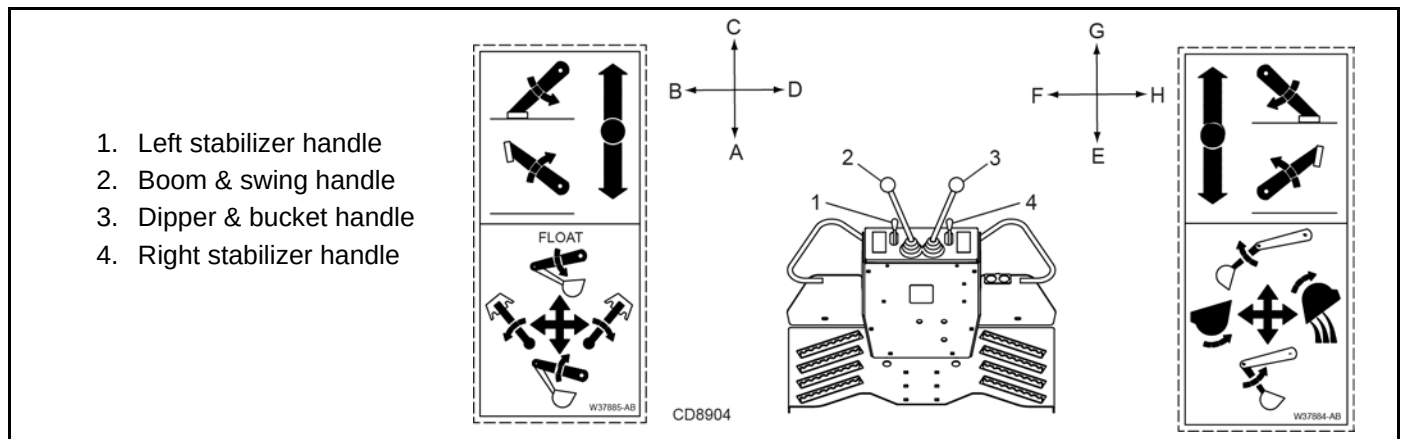


Figure 5. Operator's Controls (Typical View)

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.
- Do not use backhoe for craning; it is primarily designed for digging. Mechanical failures such as rupture which will cause a load to drop suddenly.
- Do not drive tractor with material in backhoe bucket.
- Mechanical failures such as hose ruptures 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 area (maximum reach of bucket) as shown in Figure 6, serious injury or death could occur.

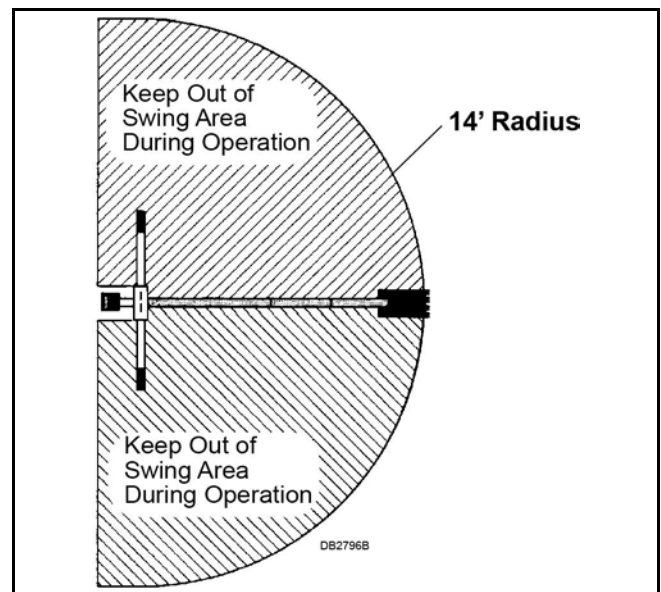


Figure 6. Backhoe Swing Area

- Stay clear of steep areas or excavation banks that are soft or could give away.

Starting Excavation

To start the excavation, position backhoe as shown in Figure 7 for maximum breakout force.

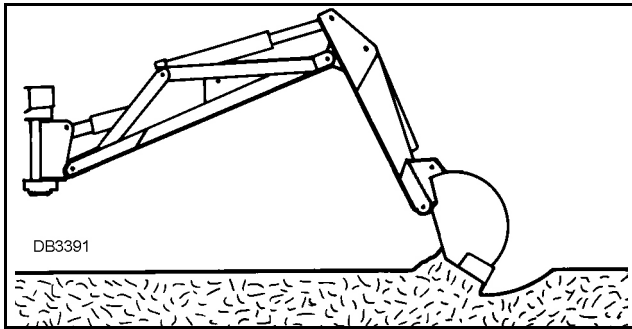


Figure 7. Starting Position

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. See Figure 8.

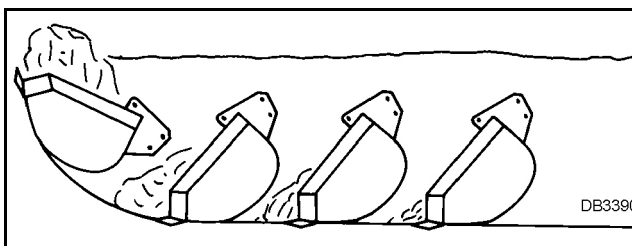


Figure 8. Fill Bucket

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. Move slowly when loading materials into trailer or truck.

Trenching

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. See Figure 9.

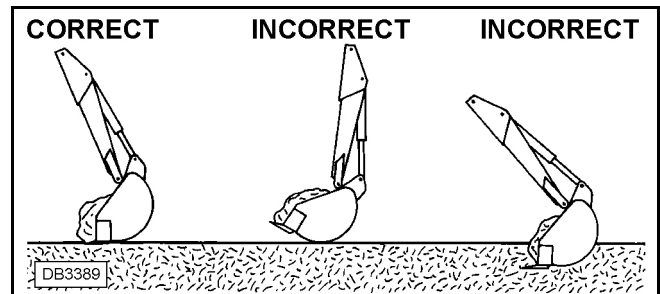


Figure 9. Trenching

NOTE: 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.

Side Slope Trenching



WARNING

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

When operating on a side slope, the backhoe must be positioned using one of these two methods as shown in Figure 10 or Figure 11.

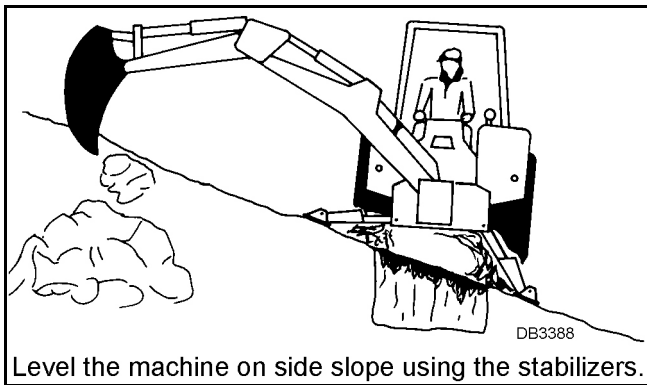


Figure 10. Level with Stabilizers

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 11.

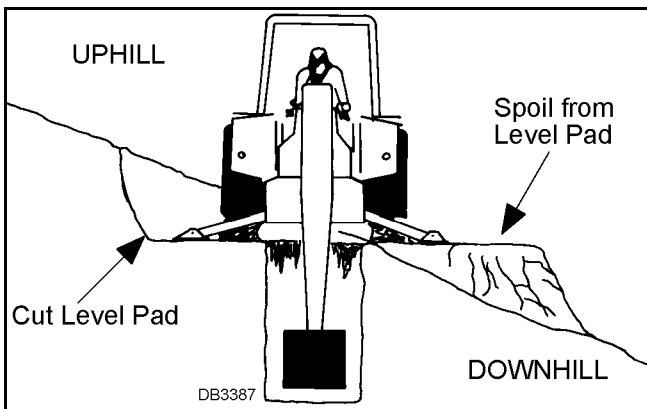


Figure 11. Level with Cut-Out

THUMB OPERATION **(MECHANICAL & HYDRAULIC)**

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.

HYDRAULIC THUMB OPERATION

To activate the thumb, use the foot pedal on the left side of the operator's platform.

- To open thumb, press the left side of the pedal.
- To close thumb, press the right side of the pedal.

Open or close the thumb and curl the bucket to grab and secure objects.

Become familiar with these functions for smooth and easy operation.

When normal backhoe operation is required, retract thumb up against dipper as shown in Figure 13.



Figure 12. Thumb Operation



Figure 13. Thumb Storage Position

TRANSPORTING

⚠ WARNING

- Always engage swing, stabilizer and boom transport locks and attach Slow Moving Vehicle (SMV) sign before transporting backhoe.
- Turn on tractor's flashing lights when transporting.
- Power unit must be equipped with Roll Over Protection System (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, stabilizer and boom transport locks, Relieve system pressure by operating controls, and remove ignition key before leaving equipment.

Transport and Swing Lock Installation

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 14.

3. Install transport lock pin through boom and swing frame and secure with lock pin.
4. Always raise and lock stabilizers before transporting backhoe. See Figure 14.

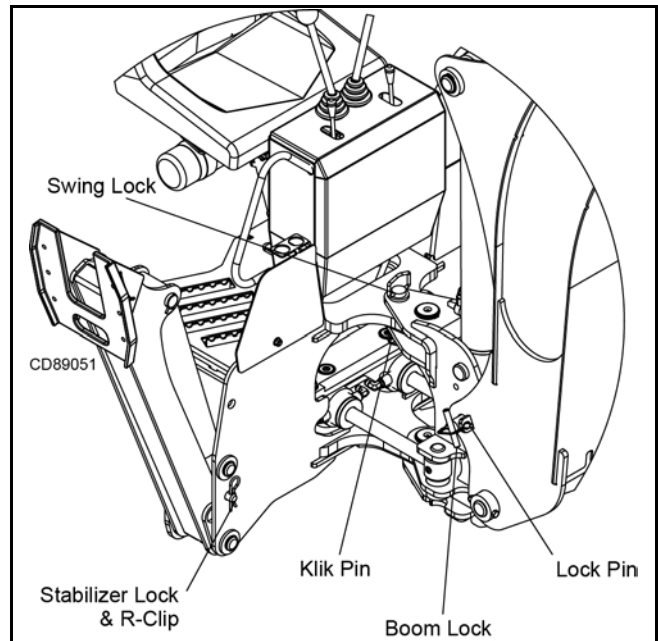


Figure 14. Lock Pins Installed for Transportation

Pin Storage

1. Store swing and boom lock pins in holes on rear of console during operation. Install lock pin and klik pin, Figure 15.
2. Store stabilizer lock pins in main frame. See Figure 15.

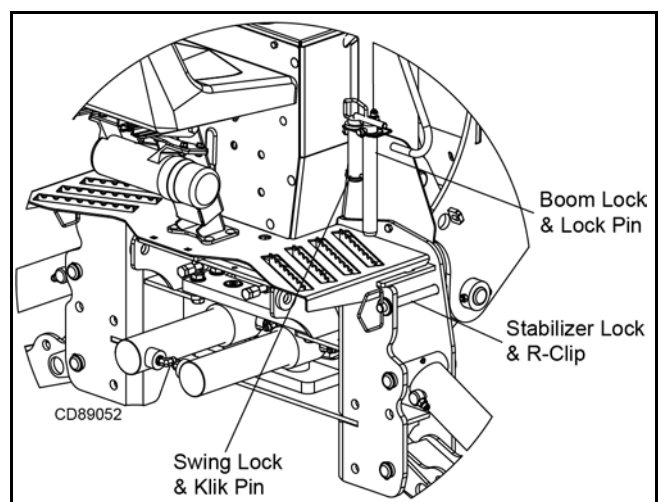


Figure 15. Pin Storage Position

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

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.

■ Keep feet away from under backhoe to prevent crushing should the backhoe suddenly drop.

3-Point Mount Removal

1. Operate tractor at low engine idle.
2. Position tractor on a hard level surface, remove swing lock pin and transport bar, and center the backhoe boom.
3. Lower stabilizers and take weight of backhoe off of rear tractor tires.
4. Lower boom and dipper to form 90-degree angle and rest bucket on the ground. See Figure 16.
5. 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.
6. Shut off tractor engine and disconnect hydraulic system.

4-Point Sub-Frame Mount Removal

1. Locate the sub-frame mounting kit manual that came with your sub-frame kit.

NOTE: Sub-frames are different for each tractor. See sub-frame installation instructions for part location details

2. Operate tractor at low engine idle.

3. Position tractor on a hard level surface, center the backhoe boom and install swing transport lock pin.
4. Raise boom and remove boom transport lock pin
5. Remove stabilizer transport lock pins, lower stabilizers and take weight of backhoe off of rear tractor tires.
6. Lower boom and dipper to form 90-degree angle and rest bucket on the ground.
7. Remove the seat assembly.
8. Remove klik pins from bolt and nut assemblies.
9. Use 1-1/2 inch open end wrench supplied with the mounting kit to remove hex nuts. Return wrench to storage position.
10. Use the boom to relieve excess pressure on 1-inch bolts and remove bolts.
11. Tilt backhoe main frame using boom cylinder to separate slots on the backhoe brackets from the tractor brackets.
12. Raise stabilizers (to lower backhoe) until backhoe brackets slide out of hooks on the sub-frame. Lower backhoe approximately 1-1/2 inch.
13. Move tractor forward to clear backhoe brackets.
14. 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. Install stabilizer and boom lock pins (Figure 16)
15. Disconnect hydraulic system.

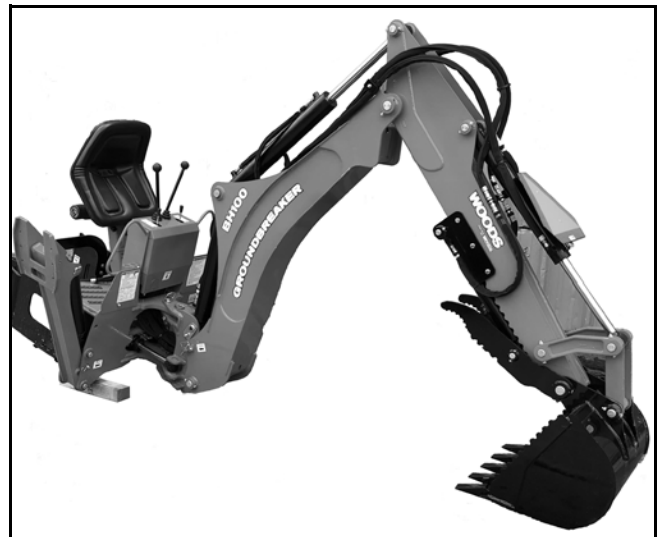


Figure 16. Storage Position

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. See Figure 17.

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

Connect backhoe pressure and return hoses together for storage. See Figure 17.

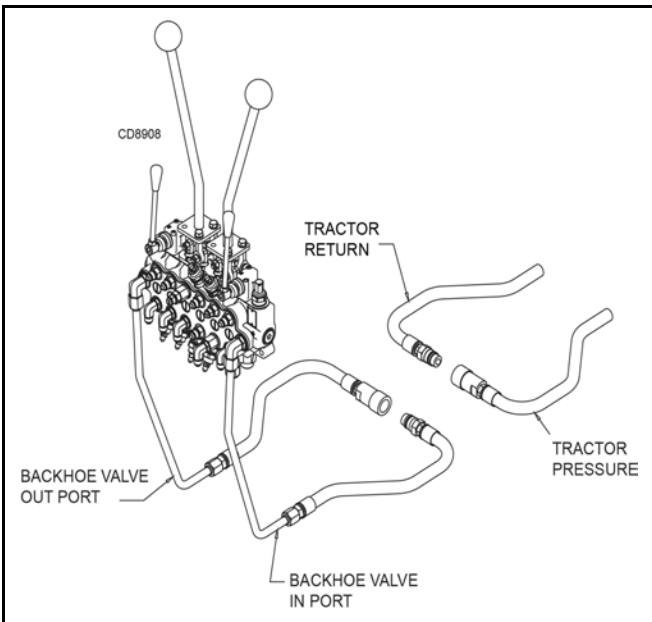


Figure 17. Tractors with Open-Center Valves

PRE-OPERATION CHECK LIST

(OWNER'S RESPONSIBILITY BEFORE EACH USE)

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.

! WARNING

■ Before working on backhoe, extend boom and dipper-stick and place bucket on ground. Shut off tractor engine. Make sure that all system pressure has been relieved by operating controls before maintenance, service, or disconnecting any hydraulic lines.

- ___ 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 tractor.
- ___ 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

■ Before working on backhoe, extend boom and dipperstick and place bucket on ground. Shut off tractor engine. 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.

HYDRAULICS

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.

■ Hydraulic oil and components get hot during operation. Let cool before performing any maintenance.

Hydraulic Hoses and Fittings

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.

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

Relief Valve (Figure 18)

This valve is pre-set at the factory to prevent system pressure from exceeding 2465 psi.

WARNING! 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.

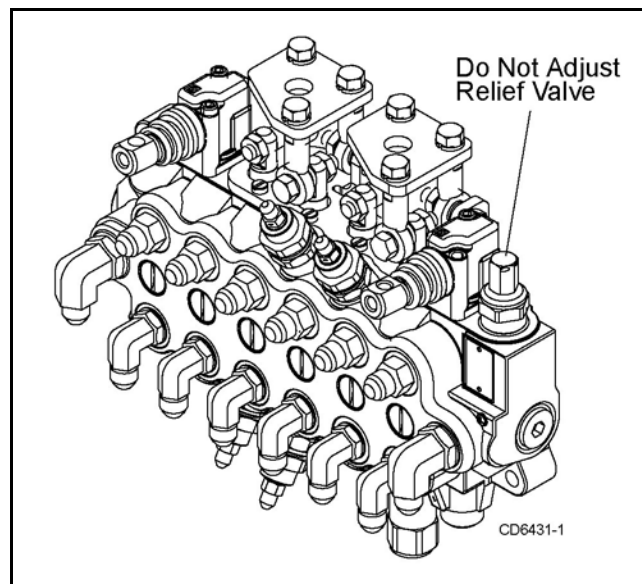


Figure 18. Relief Valve, BH85 & BH100

LUBRICATION

WARNING

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

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. See **Figure 19** and **Lubrication and Maintenance Schedule** on Pg. 22

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 enough.

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

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.

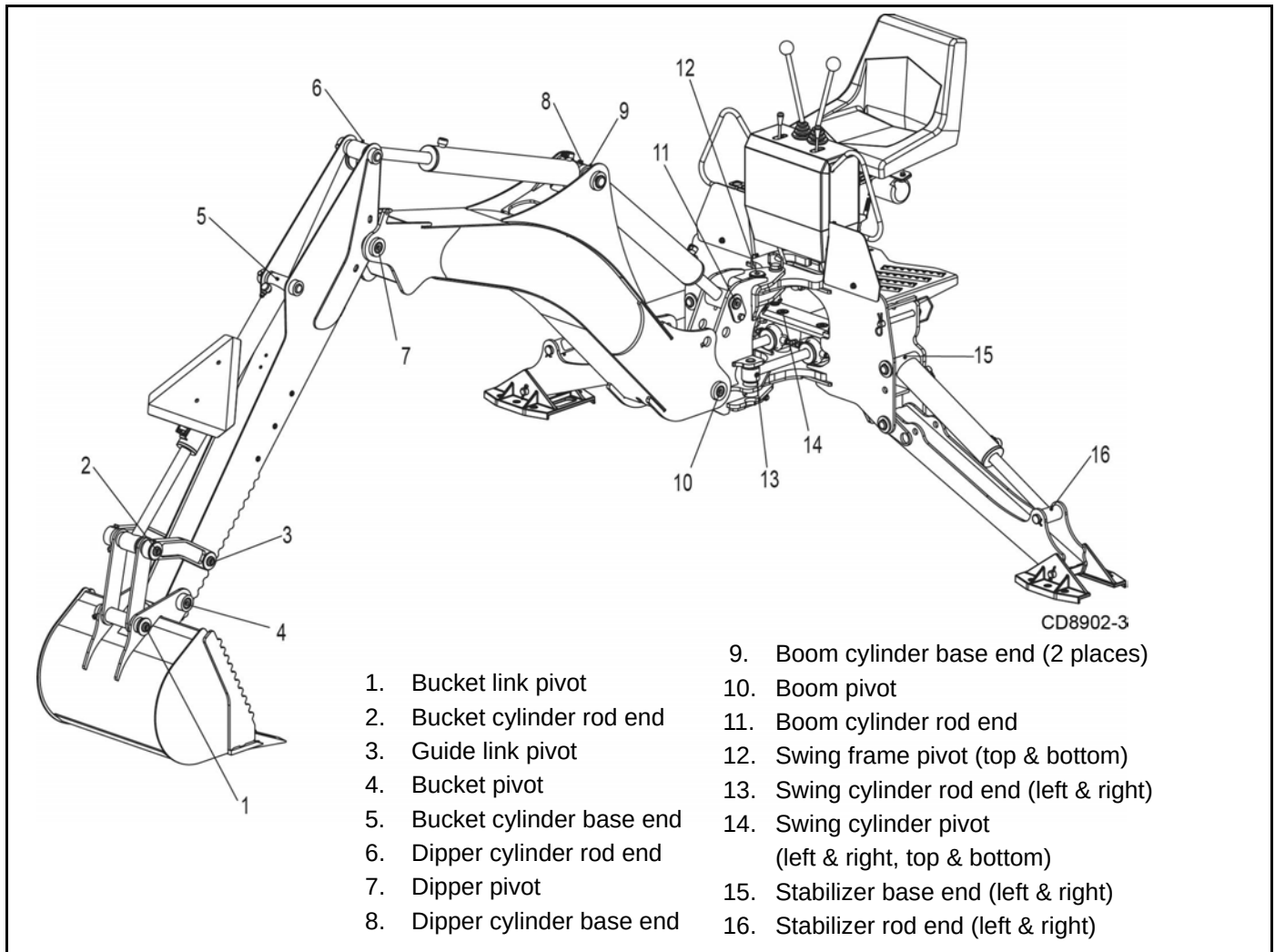


Figure 19. Lubrication Points

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.
- Temperature changes can cause backhoe to move during storage. Store in a clean, dry place. Put waterproof cover over backhoe if stored outside.

DISPOSAL

If the backhoe becomes worn past its usable life, dispose of it according to local ordinances. **DO NOT** use the backhoe and its individual components for anything other than their intended use.

BACKHOE LUBRICATION & MAINTENANCE SCHEDULE

MAINTENANCE REQUIREMENT	SERVICE INTERVAL	NOTES
Lubricate points as shown in Figure 19 with SAE multi-purpose grease.	8 hours, or daily	In very wet or dry conditions, lubricate after every 4 hours of operation.
Inspect hydraulic hoses for damage or leaking.	8 hours, or daily	Replace if hose is kinked or if hose cover is cracked or damaged.
Check hydraulic fluid level in reservoir or tractor sump.	8 hours, or daily	Refer to PTO Pump Kit manual, or tractor manual for fluid specifications.
Remove large debris such as clumps of dirt, grease etc.	8 hours, or daily	
Inspect and replace worn or damaged parts.	8 hours, or daily	
Inspect and replace any safety decals that are missing, or not readable.	8 hours, or daily	Safety decals are available at no charge from your Woods dealer.
Make sure that shields and guards are properly installed and in good condition.	8 hours, or daily	
Make sure that all fasteners are installed and are properly torqued.	8 hours, or daily	Fasteners in plastic materials only need to be snug. Do not overtighten. Do not over-tighten capscrews used to retain pivot pins.
Change oil and filter in backhoe reservoir, (if equipped).	After first 20 hours	Refer to PTO Pump Kit manual for fluid specifications.
Clean and thoroughly inspect painted surfaces of machine.	250 hours, or annually	
Inspect pins and replaceable bearings.	250 hours, or annually	
Inspect all hydraulic components for leaks or damage.	250 hours, or annually	
Inspect and replace any safety decals that are missing, or not readable.	250 hours, or annually	Safety decals are available at no charge from your Woods dealer.
Inspect seat and attaching hardware	250 hours, or annually	
Inspect bucket teeth and replace as needed.	250 hours, or annually	
Make sure that all fasteners are installed and torqued properly.	250 hours, or annually	Or before putting into service after extended storage. Refer to PTO Pump Kit manual for fluid specifications.
Change oil and filter in backhoe reservoir, (if equipped).	250 hours, or annually	
Replace all hydraulic hoses.	500 hours, or 5 years	

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. Shut off tractor engine. 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.

■ Never strike a pivot pin or punch with a nail hammer because the face may chip, possibly resulting in an eye or other serious injury. Use a soft face hammer.

BH85 & BH100

HYDRAULIC VALVE REPAIR (FIGURE 20)

Valve repair should be accomplished in a clean work place. Photograph or 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 2500 psi. If your tractor does not create 2500 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 (6, Figure 20). 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 2465 psi for BH85 & BH100. 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.

IMPORTANT: 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 8	2465 psi
Cartridge 7	2610 psi
Cartridge 9	3045 psi

Load Check Valve Replacement

The load check valves (11) 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 (3, 4). Unscrew the positioner assembly from valve housing. Push spool (1, 2) 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 (15) and O-ring (16) from positioner end of valve housing. Remove O-ring (16) and flange washer (17) 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 (16) and install, along with brass sleeve (15) on spool housing positioner end. Slide spool into valve housing. Torque positioner end cap (3, 4) to 70 ± 15 in-lbs.

Reassemble the O-ring (16) and flanged washer (17) 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.

- A. Valve - 6 Spool MBLK 2465 PSI
- 1. Spool 4 position float
- 2. Spool 3 position
- 3. Spool pos cont asy 4 pos
- 4. Spool pos cont asy 3 pos
- 5. Control asy-stabilizer
- 6. Valve relief 2465 psi
- 7. Valve relief 2610 psi
- 8. Valve relief / anti-cav 2465 psi

- 9. Valve relief / anti-cav 3045 psi
- 10. Plug, 3/4 SAE M w/ o-ring
- 11. Valve load check asy
- 12. Handle control-stabilizer
- 13. Plug - PBY(if required)
- 14. Sleeve w/ o-rings (boom spool only)

- 15. Sleeve, lower
- 16. O-ring
- 17. Flange washer

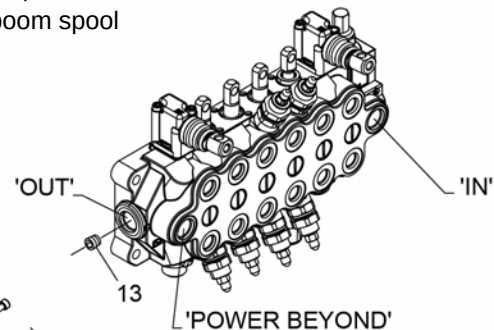
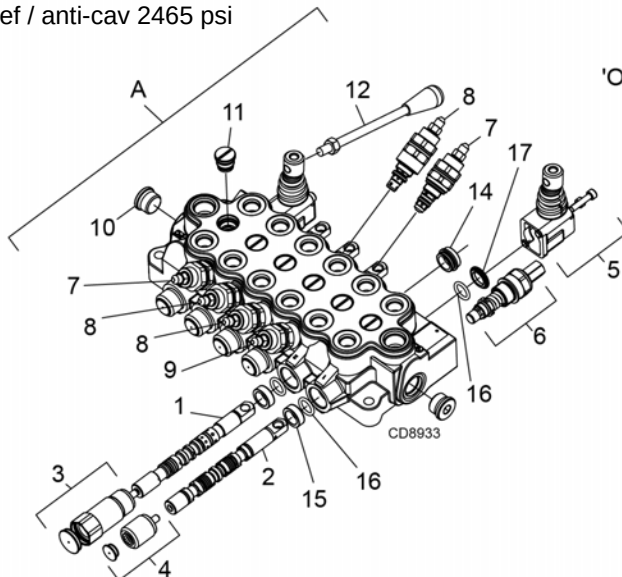


Figure 20. BH85 & BH100 Control Valve Assembly

ADJUST CONTROL VALVE LINKAGE

Reconnect control linkage to valve.

Control handles should be positioned as shown. Refer to parts list on page 40 for details.

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 (See **Control Handle Operation**, page 14).

WARNING! Do not operate backhoe if functions differ from the decal.

Pay specific attention to the float position of the boom.

WARNING! Moving the backhoe's Boom Control into the float position relieves all pressure from the boom hydraulic cylinder. That allows the boom to move up, or down freely as dipper and bucket controls are operated. However, if the backhoe bucket is not in contact with the ground, moving to float will allow the backhoe to drop quickly to the ground. Only use the float position when the bucket is on the ground.

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.

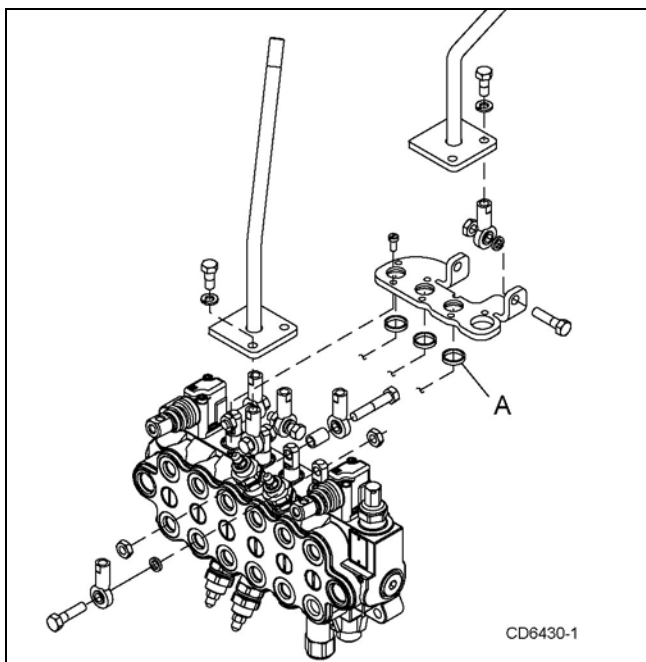


Figure 21. Control Lever Adjustment

HYDRAULIC CYLINDER REPAIR

CAUTION

■ Never strike a pivot pin or punch with a nail hammer because the face may chip, possibly resulting in an eye or other serious injury. Use a soft face hammer.

Cylinder Service

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

NOTE: Repair to cylinders is limited to replacing seals, wear rings, and O-rings. Replacing rod, barrel, or pistons is not cost effective. Purchasing a complete cylinder is more economical.

Check stamping on barrel before ordering repair parts. See Parts page 43 and page 44 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.

NOTE: Spanner wrench 1021841 is available from Woods to help with assembly and disassembly.

Swing Cylinders (Figure 22)

Disassembly

On spanner nut style cylinders, unscrew spanner nut (6) using a spanner wrench, or carefully use a punch and hammer.

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

Clamp cross pin end of rod assembly in a vise with protective jaws. Remove lock nut (4) from rod assembly. Remove piston (5) 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 diameter of barrel. Replace cylinder if damaged.

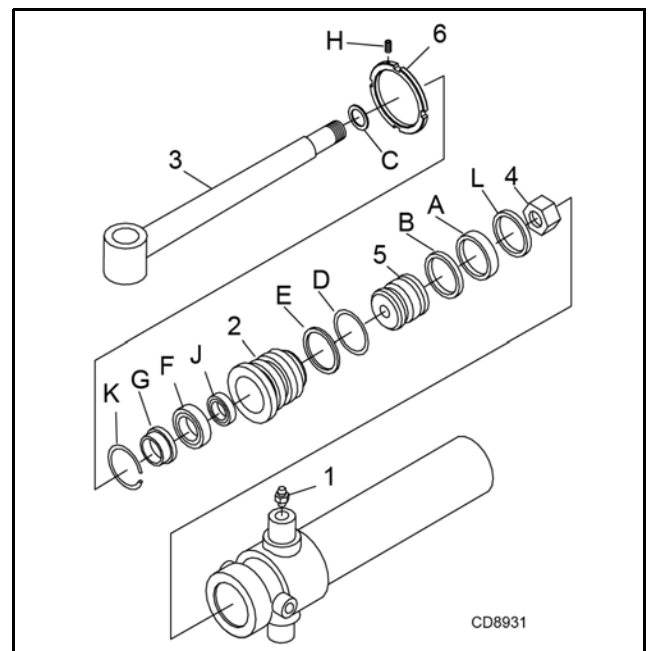


Figure 22. Spanner Nut Cylinder Assembly

Assembly

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 (G) in outer rod guide groove. Slide rod guide assembly (2) onto rod (3). Place wear ring (A) in narrow groove of piston. Place piston seal (B) in wide piston groove. Place piston ring (J) in narrow groove in rod guide.

Lightly coat rod threads with hydraulic oil and slide O-ring (C) over threads and into groove. Install piston (5) onto rod (3) with wear ring on side away from rod guide. Clean threads of rod and apply Loctite® primer 7649 and removable thread locker 243. Install lock nut (4) and torque to 175 lbs-ft for swing cylinder.

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 (2) into barrel just past groove inside barrel. Insert retaining ring (K) into groove and pull rod (1) to seat rod guide (2) against ring. Screw spanner nut (4) into rod guide (2) using a spanner wrench, or carefully use a punch and hammer.

Cylinder Disassembly (except swing)

Remove set screw (H) from outside of rod guide (2). Using a spanner wrench or a hammer and punch, unscrew rod guide from cylinder barrel. Remove rod assembly (3) from barrel.

Clamp cross tube of rod assembly in a vise and remove nut (4) from rod. Remove piston (5) from rod and slide rod guide off of 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. Replace cylinder if damaged.

Assembly

For these assembly instructions the front surface of the threaded rod guide with two holes will be referred to as the "rod guide face."

Lubricate O-rings and seals with clean hydraulic fluid. Install back-up washer (E) on rod guide (2), and then install O-ring (D) in exterior O-ring groove of rod guide. Make sure that the back-up ring is located closest to the rod guide face. Place rod wiper (G) in outer rod guide groove. Install rod seal (F) into the second groove from the rod guide face with the open portion of V-groove toward piston. Install wear ring (J) in remaining groove. With all rod guide seals installed, slide the rod guide assembly onto rod (3).

Coat O-ring (C) with oil and slide over rod threads and install in groove on rod. Slide piston (5) onto rod. Clean threads of rod and apply Loctite®¹ primer 7649 and removable thread locker 243. Install nut (4) and torque to 275lbs-ft. Install wear ring (A) and piston seal (B) into grooves on outside of piston. Note that piston seal consists of two pieces.

Compress wear rings and piston seals and carefully insert piston and rod assembly into barrel. Use care to prevent damage while installing. Carefully screw rod guide (2) into barrel using a spanner wrench, or a punch and hammer. Align drilled hole in guide and barrel and install new set screw (H).

1. Loctite is a registered trademark of the Henkel Loctite Corporation.

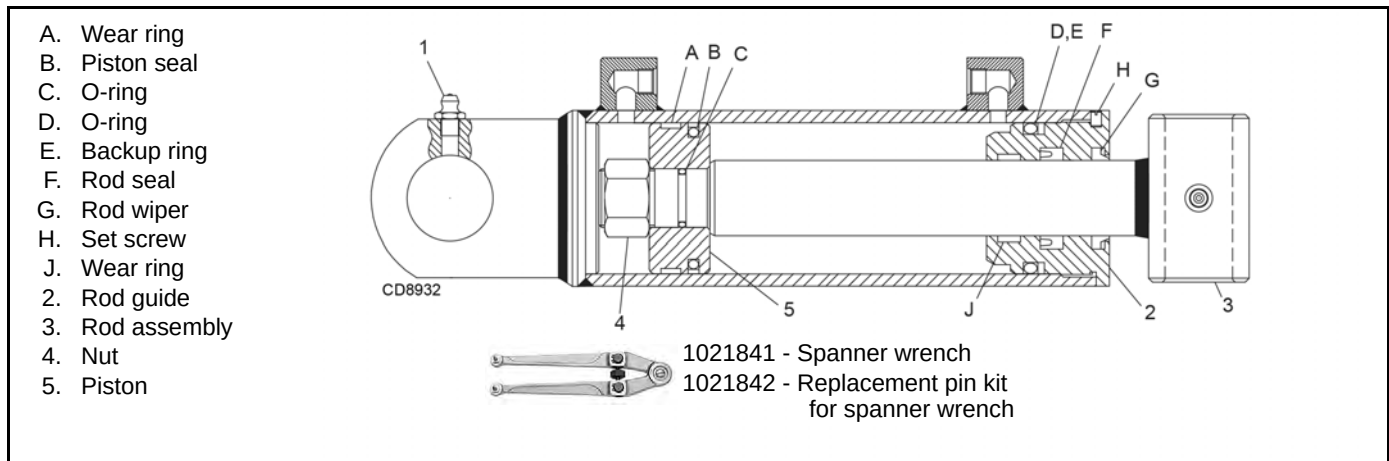


Figure 23. Cylinder Assembly

ASSEMBLY

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.

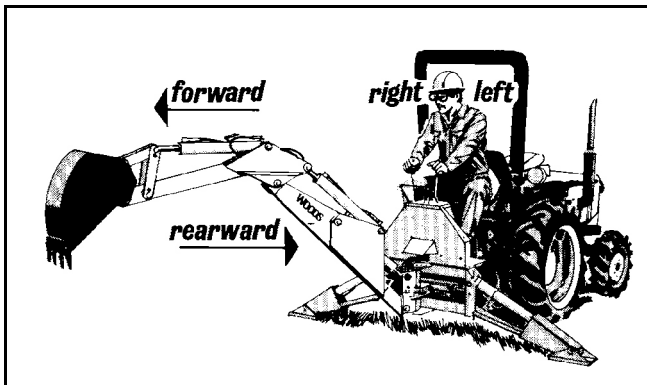


Figure 24. Backhoe Directions

GENERAL ASSEMBLY INSTRUCTIONS

WARNING

- Keep all persons away from operator control area while performing adjustments, service, or maintenance.
- Only mount this backhoe on Category 1, 2, or 3N tractors under 100 hp with 1800 lb. lift capacity at 24" behind 3-point lift arm hitch balls.

Removing Backhoe from Pallet

WARNING

- Lift and move backhoe carefully with adequate equipment and proper training.

The backhoe is shipped partially assembled in a wooden pallet. To remove the backhoe from the pallet use a lifting strap rated for at least 3000 lbs and position it as shown in Figure 25, support backhoe and carefully remove straps and pin and fasten it to the pallet.

WARNING! Use lifting strap certified to ASME B30.9 rated at a minimum capacity of 3000 lbs.

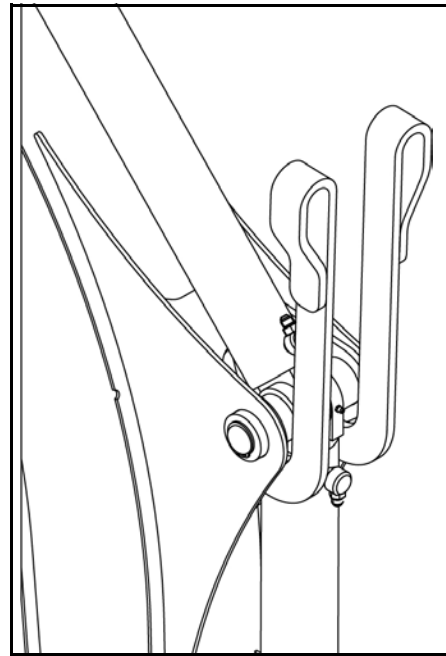


Figure 25. Lifting Backhoe

Stabilizer Installation (Figure 25)

Remove stabilizer arms from pallet.

Remove pivot pins (4) from their shipping position. Attach stabilizer arm (2) to main frame (1) with pivot pin (4) and secure with snap ring (6).

Attach stabilizer cylinder (3) to stabilizer arm with pivot pin (5) and secure with two cotter pins (7).

Insert transport lock pins (8) to hold stabilizers in raised position.

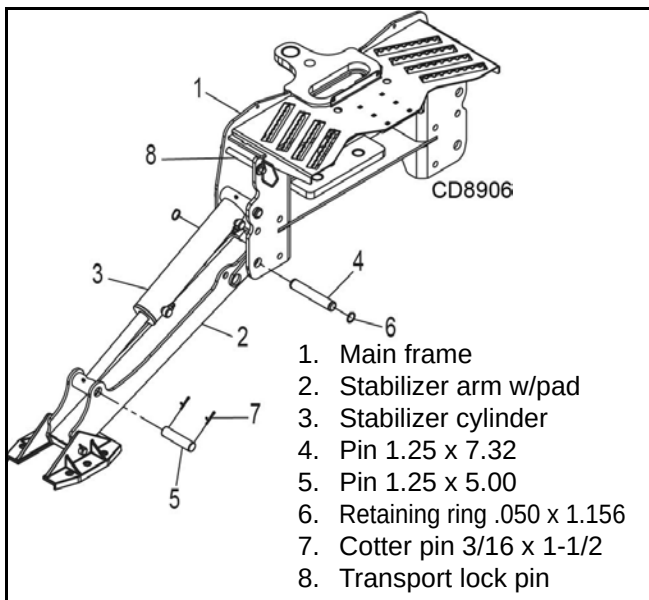


Figure 26. Stabilizer Arm Assembly - Left Side

Bucket Installation (Figure 27)

⚠ WARNING

■ Buckets are heavy and can cause muscle strain or back injury. Use lifting aids and proper lifting techniques when installing.

1. Remove pivot pins (4 & 5) from end of bucket link (3) and dipper (1).
2. Attach bucket (2) to the end of the dipper with pivot pins (5).
3. Attach bucket link (3) to the bucket using pivot pin (4).
4. Secure both pins using bolts (6) and lock nuts (7).

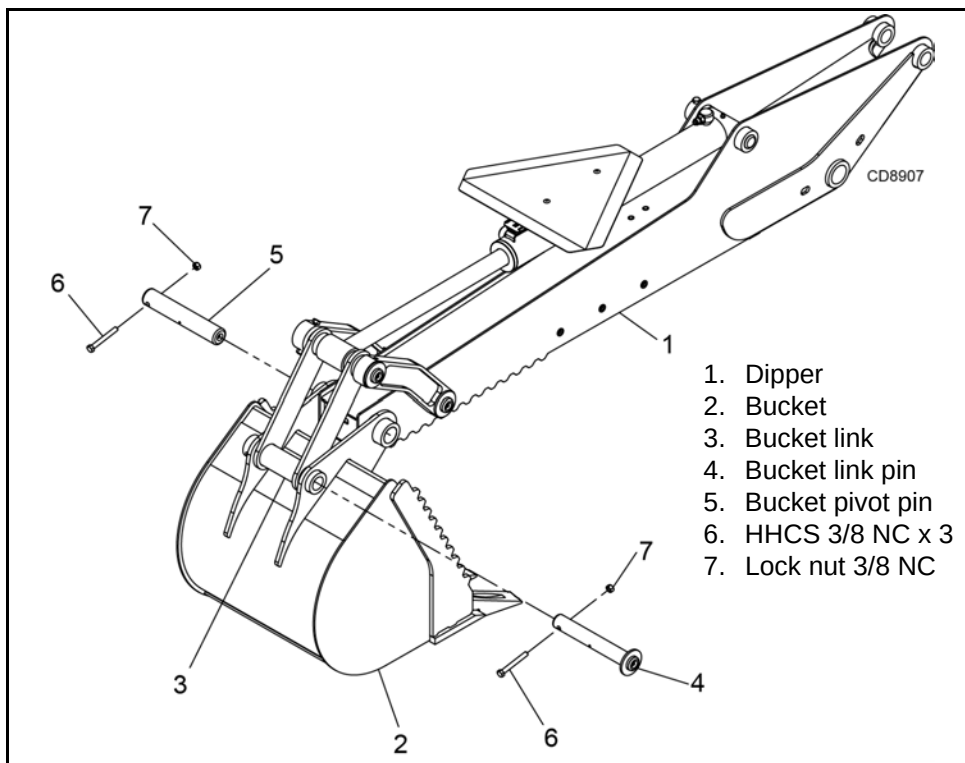


Figure 27. Bucket Installation

NOTE: 12", 15", 18", 24" and 36" buckets are available with this backhoe.

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.

■ 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 10 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

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.

IMPORTANT: 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.

IMPORTANT: Damage to valve will result if oil is routed backwards through the valve.

IMPORTANT: Valve damage will occur if back pressure exceeds 450 psi.

IMPORTANT: 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.

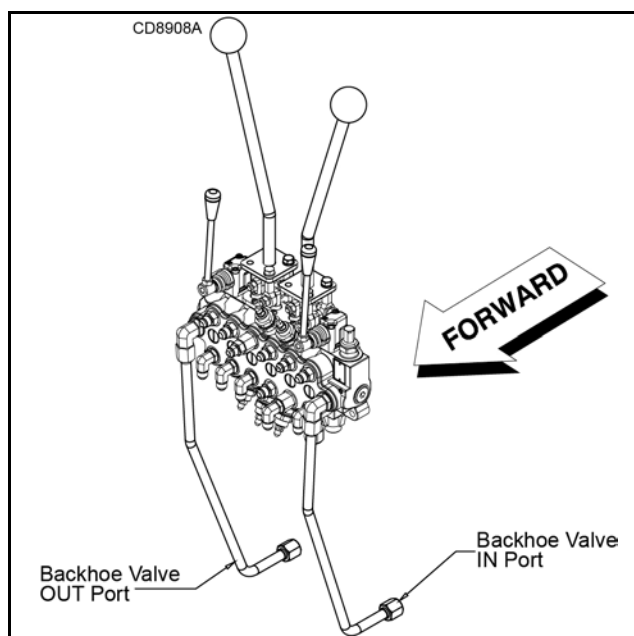


Figure 28. Backhoe Valve Ports

OPTIONAL EQUIPMENT

1006610KT Stabilizer Street Pad Installation (Figure 29)

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

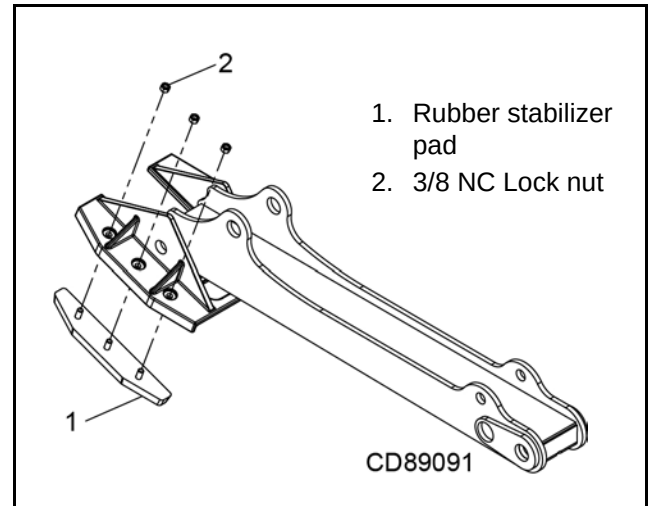


Figure 29. Stabilizer Pad Installation

6045355 3-Point Mount Kit

See 3-Point Mount Kit manual for installation instructions.

604345 PTO Pump Kit

See PTO Pump Kit manual for installation instructions.

602759 Mechanical Thumb Kit (Figure 30)

WARNING

■ **Never strike a pivot pin or punch with a nail hammer because the face may chip, possibly resulting in an eye or other serious injury. Use a soft face hammer.**

1. Disengage boom lock pin, lower boom and place bucket on the ground.
2. Remove hardware and pivot pin that attaches bucket to the end of the dipper. Reuse hardware when installing thumb pivot pin (5).
3. Place thumb (1) over bucket lugs and align holes.
4. Insert pin (5) to secure thumb and bucket to dipper. Reuse previously removed hardware.
5. Align thumb channel (2) with thumb and insert pin (7). Secure pin with hex bolt (15) and lock nut (16).
6. Install thumb bracket (3) using three hex bolts (13) and lock nuts (14).

7. Insert thumb tube (4) into thumb channel and secure together using pin (8) and klik pin (9).
8. Rotate thumb tube up and connect to the thumb bracket using pin (6). Secure pin with hex bolt (15) and lock nut (16).

NOTE: Thumb compatible with 15", 18", and 24" buckets.

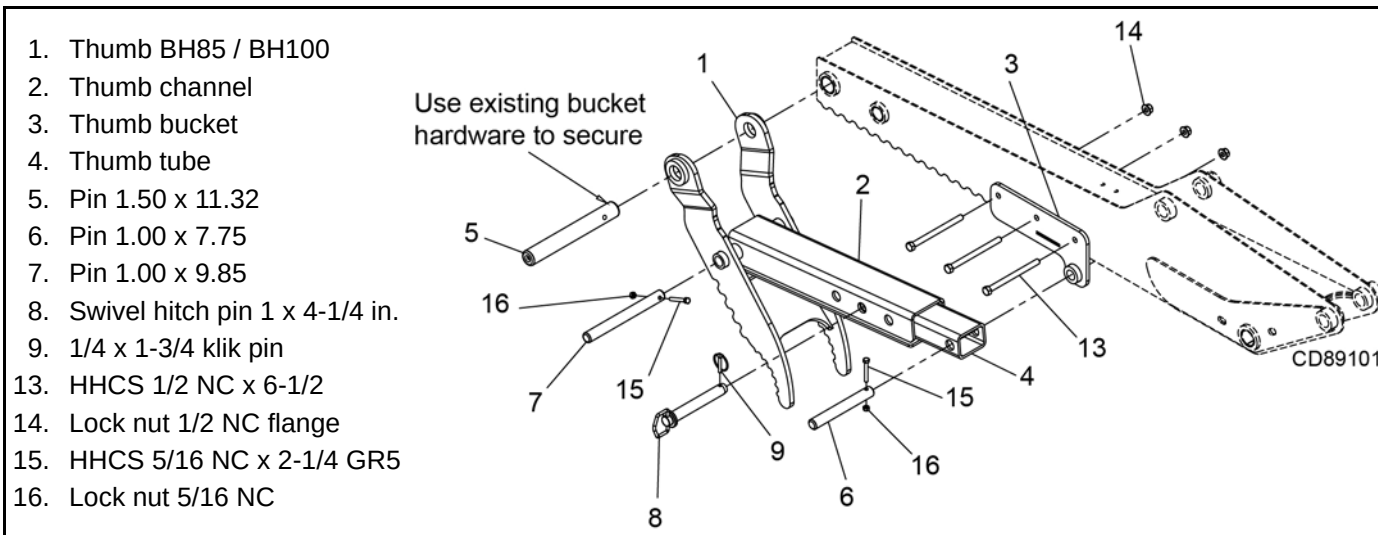


Figure 30. Mechanical Thumb Installation



Figure 31. Mechanical Thumb Installed

Hydraulic Thumb

Hydraulic thumb installed only at factory. See page 51 for parts list.

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. (Refer to torque chart.)
- ___ Check that all lubrication points have been lubricated. (Refer to lubrication diagram.)
- ___ 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. (Refer to sub-frame manual).
- ___ 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)

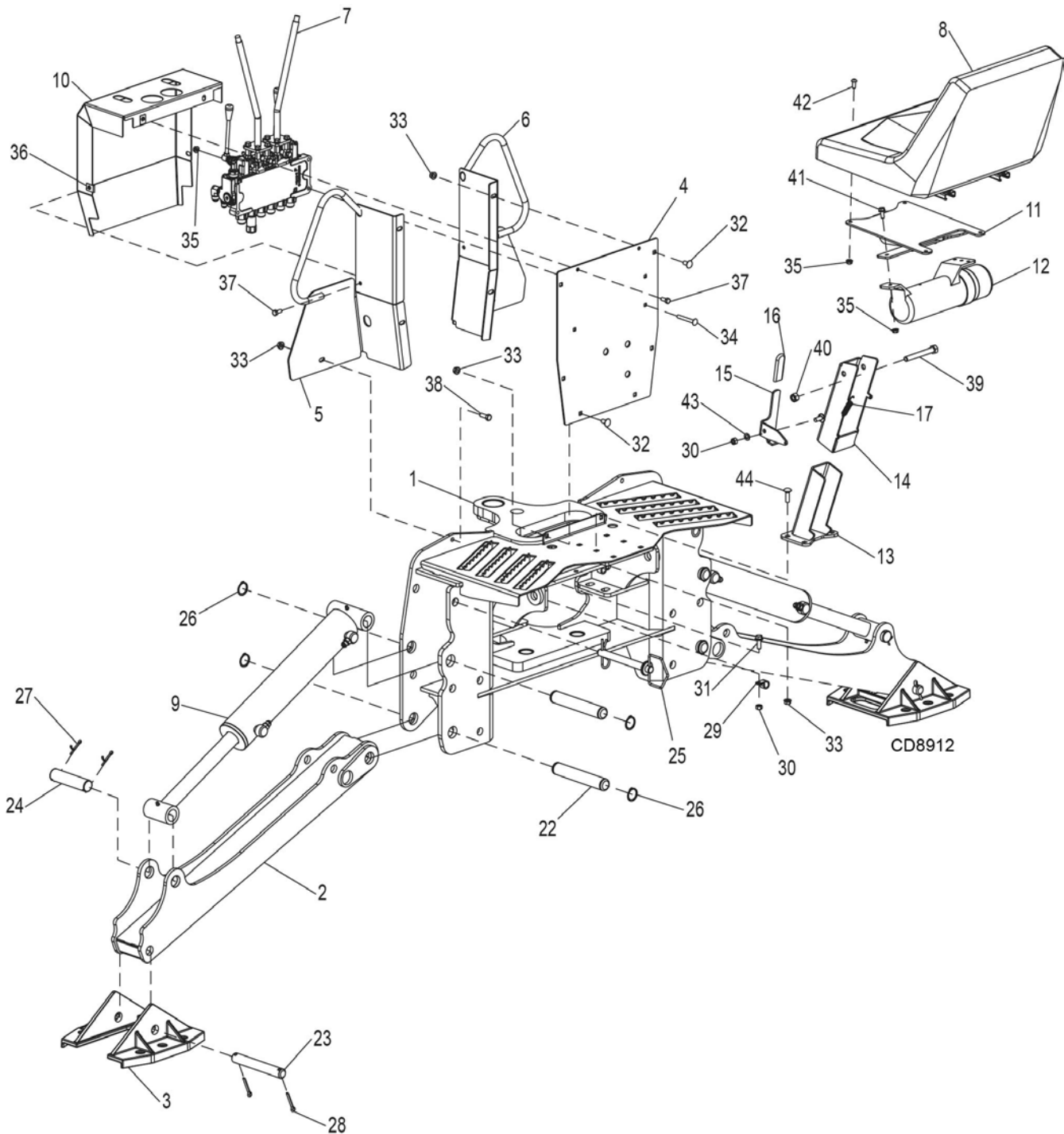
- ___ Present Operator's Manual (and sub-frame manual when applicable) and request that customer and all operators read it before operating equipment.
- ___ Point out all safety features of the equipment. Explain the importance and meaning of all safety decals and emphasize the potential hazards when 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).
- ___ Point out Danger decal #618130 and explain each bullet point.

NOTES

BH85 & BH100

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BH85 & BH100 MAIN FRAME ASSEMBLY



36 *Parts*

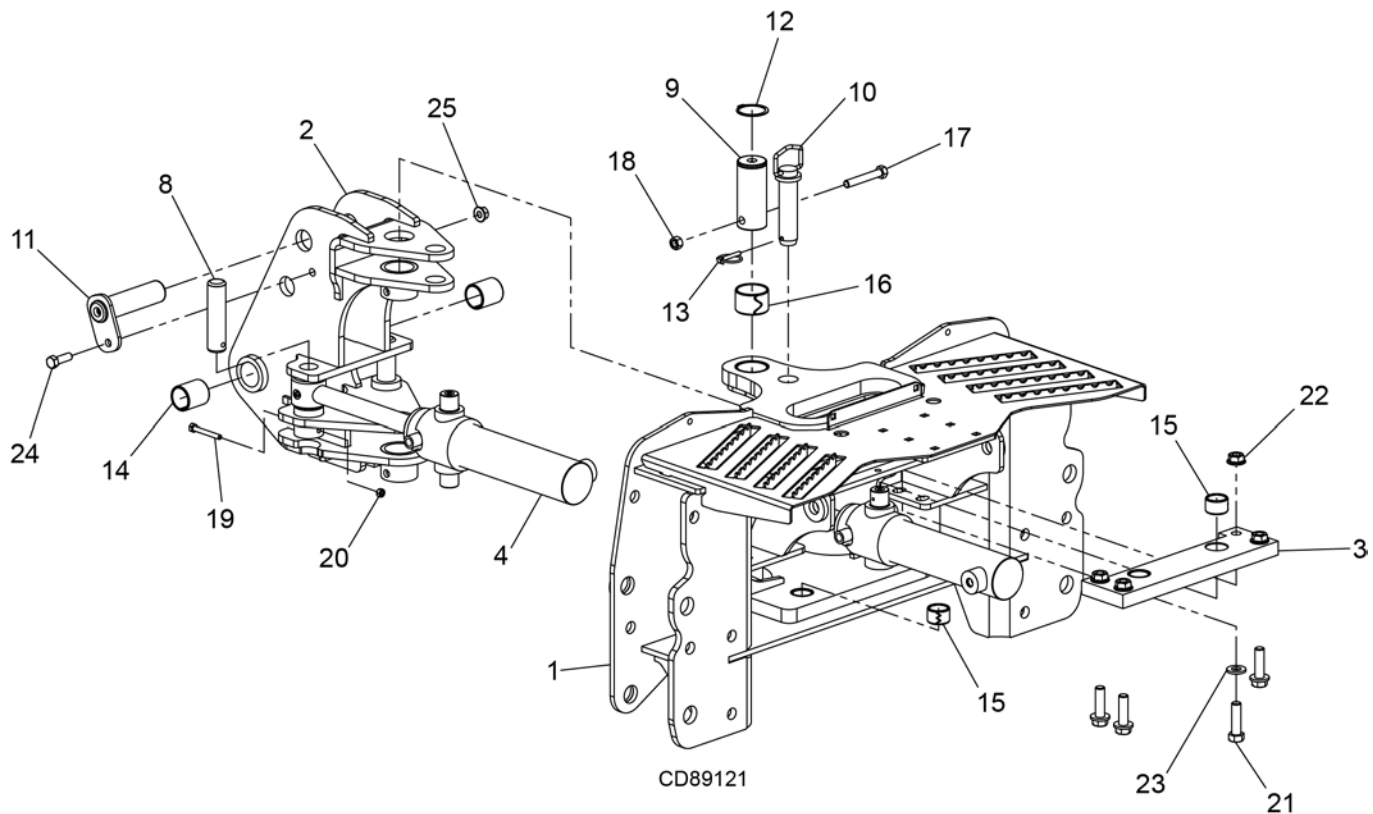
MAN1272 (10/22/2019)

MAIN FRAME ASSEMBLY PARTS LIST

REF	PART	QTY	DESCRIPTION
1	602935RP	1	Main frame BH85 / BH100
2	603735RP	2	Stabilizer arm
3	1017808	2	Stabilizer pad
4	603745RP	1	Console back
5	603758RP	1	Console left
6	603760RP	1	Console right
7	-----	1	Valve w/controls (see page 41)
8	604340	1	Adjustable high back seat
9	602224	2	Cylinder 2.95 x 1.50 x 14.00
10	603748RP	1	Console cover
11	603754RP	1	Seat bracket
12	1003828	1	Manual tube
13	603749RP	1	Lower seat support
14	603764RP	1	Upper seat channel
15	603753RP	1	Seat handle
16	70165	1	Handle grip
17	78705	1	Extension spring
22	1011884	4	Pin, 1.25 x 7.32
23	37431	2	Pin, 1.00 x 6.10
24	602772	2	Pin 1.25 x 5.00
25	55318	2	Hitch pin .75 x 6.25
26	63236	8	Ring, ret .050 x 1.156
27	1266 *	4	3/16 x 1-1/2 cotter pin

REF	PART	QTY	DESCRIPTION
28	923 *	4	1/4 x 1-3/4 cotter pin
29	W74058	2	Clamp .625 DIA steel cushion
30	6698 *	3	Nut lock 3/8 NC ZP
31	62153 *	2	3/8 NC x 1 hex flange
32	24597 *	6	Bolt CRG 3/8 NC x 3/4
33	14350 *	12	Nut lock 3/8 NC flange
34	1008291 *	3	Bolt CRG 5/16 NC x 2.5 GR5
35	W73163 *	10	Nut whiz 5/16 NC flange HD ZP
36	74047	4	Spring nut 5/16 - 18 U-tapered
37	6096 *	4	HHCS 5/16 NC x 3/4 GR5 ZP
38	839 *	2	HHCS 3/8 NC x 1 GR5 ZP
39	10380 *	1	HHCS 1/2 NC x 4 GR5 ZP
40	765 *	1	Nut lock 1/2 NC ZP
41	71851 *	3	HHCS 5/16 NC x 3/4 flange
42	78285	4	Button head screw 5/16 NC x 3/4 ZP
43	21757	1	Washer 3/8 STD SAE flat
44	20973 *	4	Bolt CRG 3/8 NC x 1-1/4 GR5
	618136	NS	Complete Decal Set
	618137	NS	Safety Decal Set
	HHCS		Hex Head Cap Screw
	CRG		Carriage
	*		Standard hardware, obtain locally

BH85 & BH100 SWING FRAME ASSEMBLY



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

1	602935RP	1	Main frame BH85 / BH100
2	602934RP	1	Swing frame BH100
	603604RP	1	Swing frame BH85
3	609665RP	1	Trunnion bar
4	602220	2	Cylinder 2.48 x 1.26 x 11.00
8	1011874	2	Pin, 1.25 x 5.00
9	602774	2	Pin, 2.00 x 4.75
10	1012609	1	Pin, hitch 1.25 x 4.25
11	604339	1	Pin, flag 1.50 x 5.94
12	443029	2	Snap ring
13	62043	1	Klik pin 1/4 x 1-3/4
14	37851	2	Bushing, 1-1/2 ID x 1-3/4 OD x 2
15	1020214	4	Bushing, 1.25 x 1.50 x 1.00
16	603731	2	Bushing, 2.00 x 2.25 x 1.50
17	14069 *	2	HHCS 1/2 NC x 3-1/4

REF	PART	QTY	DESCRIPTION
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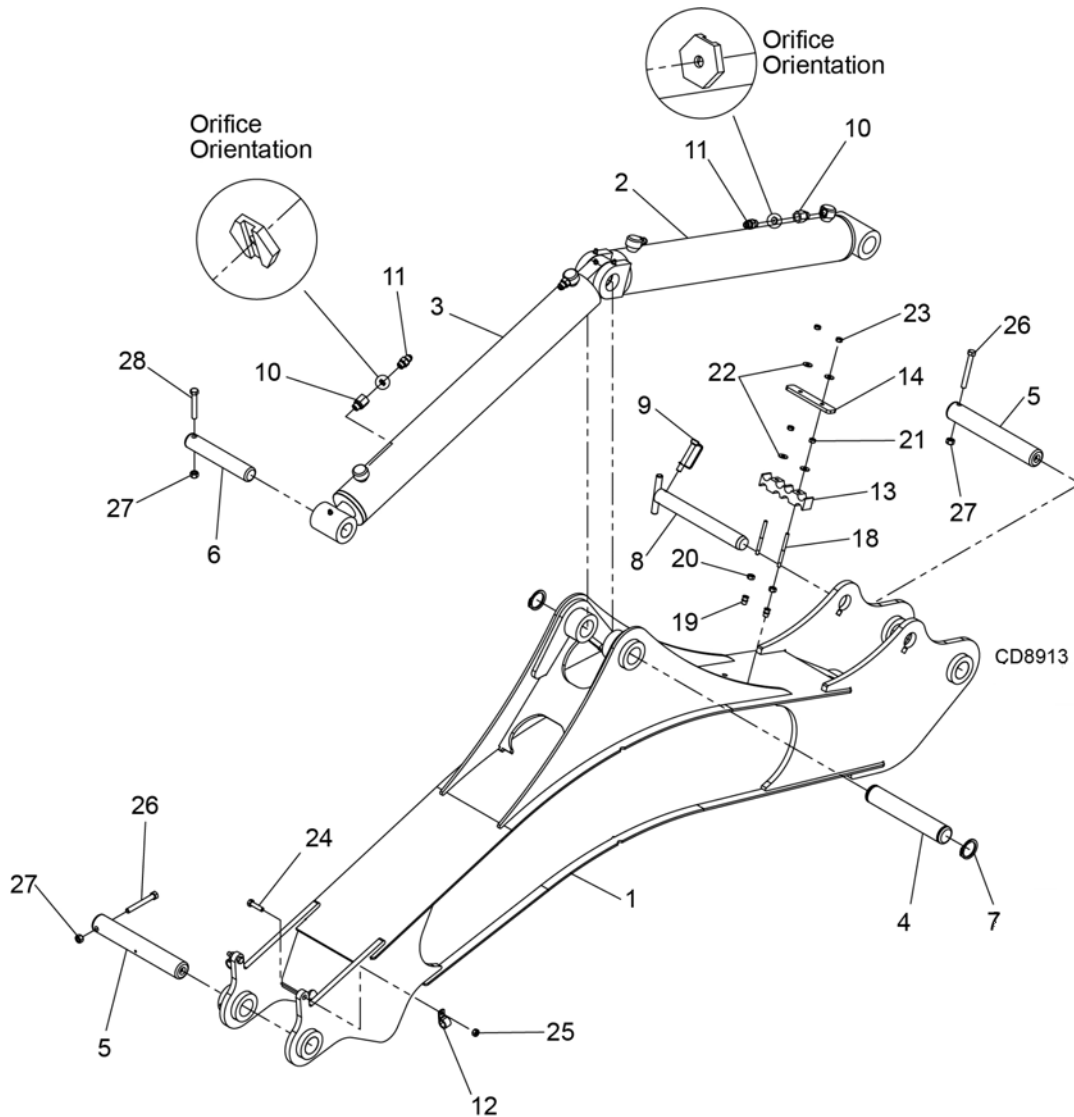
18	765 *	2	Lock nut 1/2 NC ZP
19	10509 *	2	HHCS 5/16 NC x 2-1/2 GR5
20	6778 *	2	Lock nut 5/16 NC
21	12274 *	4	HHCS 5/8 NC x 2-1/4
22	19025	4	Nut, HFN 5/8 DRI-LOC patch
23	57817	4	Washer 5/8 SAE flat hardened
24	3379 *	1	HHCS 1/2 NC x 1-1/2 GR5 ZP
25	11900 *	1	Lock nut 1/2 NC flange

HHCS Hex Head Cap Screw

HFN Hex Flange Nut

* Standard hardware, obtain locally

BH85 & BH100 BOOM ASSEMBLY



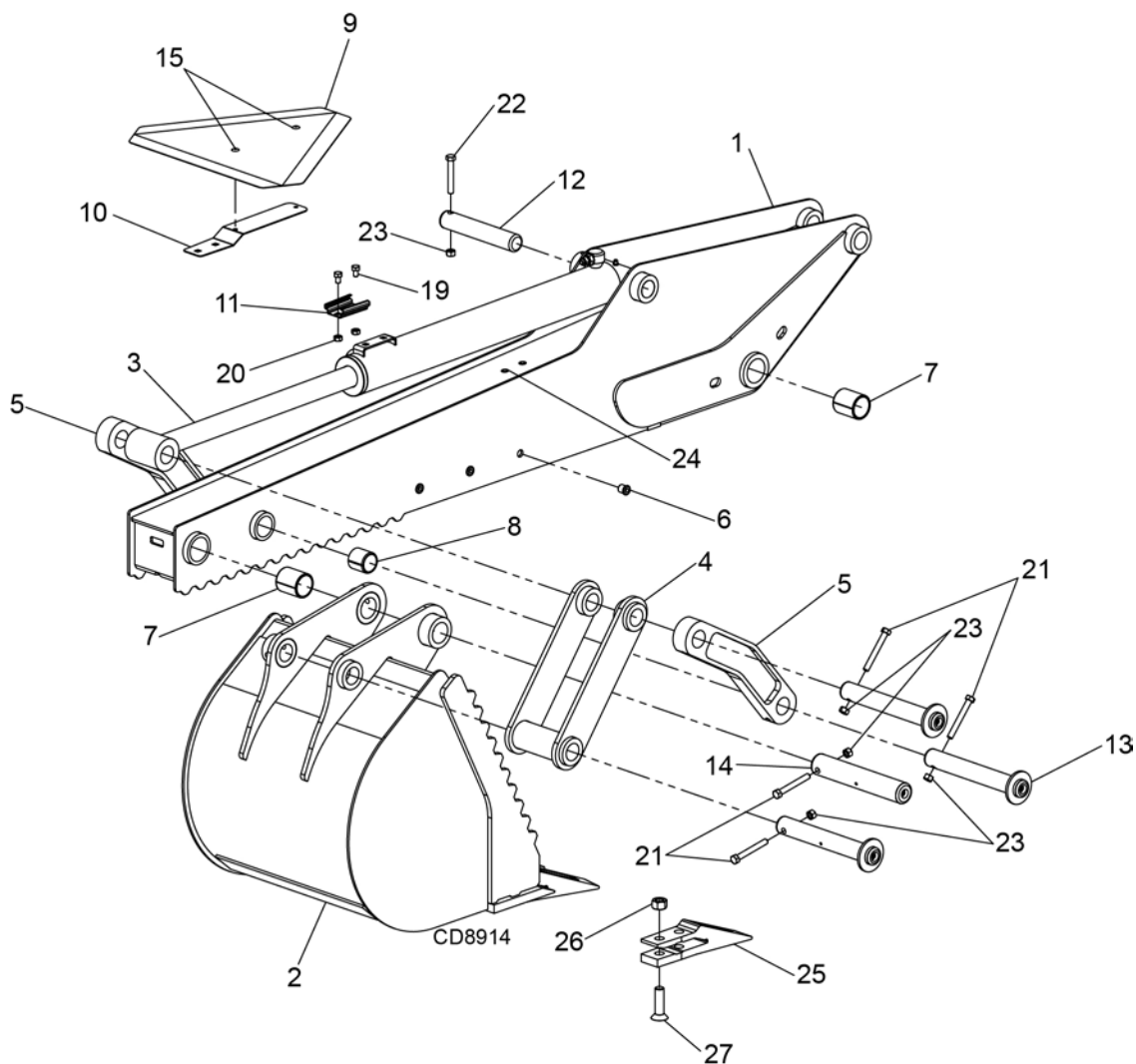
REF	PART	QTY	DESCRIPTION
1	602932RP	1	Boom BH100
	603594RP	1	Boom BH85
2	602219	1	Cylinder 3.15 x 1.57 x 21.38 (BH100)
	602217	1	Cylinder 3.15 x 1.57 x 17.38 (BH85)
3	602222	1	Cylinder 2.95 x 1.57 x 22.25 (BH100)
	602226	1	Cylinder 2.95 x 1.57 x 20.75 (BH85)
4	1017747	1	Pin, 1.50 x 8.62
5	1017748	2	Pin, 1.50 x 9.78
6	602771	1	Pin, 1.25 x 7.08
7	62718	2	Snap ring .109 x 1.50
8	602773	1	Pin, 1.18 x 9.75
9	33000	1	Lynch pin 3/8 x 2-1/4
10	1020005	2	Restrictor, .125 9/16 ORB
11	62367	2	Adapter 9/16 JICM 9/16 ORBM
12	W74058	2	Clamp .625 DIA steel cushion

REF	PART	QTY	DESCRIPTION
13	1011843	1	Hose clamp
14	1011844	1	Clamp
18	1011842	2	Stud 1/4 - 20 UNC x 3.00
19	-----	2	Nut 1/4 - 20 UNC blind hole
20	4529 *	2	Nut hex 5/16 NC ZP
21	5288 *	2	Nut hex 1/4 NC
22	5336 *	4	Washer 1/4 flat ZP
23	FA254	2	Nut 1/4 NC Nylock ZP
24	6250 *	2	HHCS 5/16 NC x 1-1/4 GR5 ZP
25	6778 *	2	Lock nut 5/16 NC
26	7747 *	2	HHCS 3/8 NC x 3 GR5
27	6698 *	3	Lock nut 3/8 NC ZP
28	2290 *	1	HHCS 3/8 NC x 2-1/2 GR5 ZP

HHCS Hex Head Cap Screw

* Standard hardware, obtain locally

BH85 & BH100 DIPPER / BUCKET ASSEMBLY



REF	PART	QTY	DESCRIPTION
1	602933RP	1	Dipper BH100
	602945RP	1	Dipper BH85
2	602753	1	Bucket 12"
	602754	1	Bucket 15"
	602755	1	Bucket 18"
	602756	1	Bucket 24"
	602757	1	Bucket 36"
	602757D	1	Bucket, 36" Ditching (no teeth)
3	602223	1	Cylinder 2.48 x 1.50 x 20.00
4	603582RP	1	Bucket link
5	37835RP	2	Guide link
6	602943	6	Plug, .551 x .492
7	37851	4	Bushing 1-1/2 ID x 1-3/4 OD x 2
8	34014	2	Bushing, 1-1/4 x 1-1/2 x 1-1/2
9	24611	1	SMV sign
10	1004251	1	SMV bracket
11	62484	1	Socket SMV emblem
12	602771	1	Pin, 1.25 x 7.08

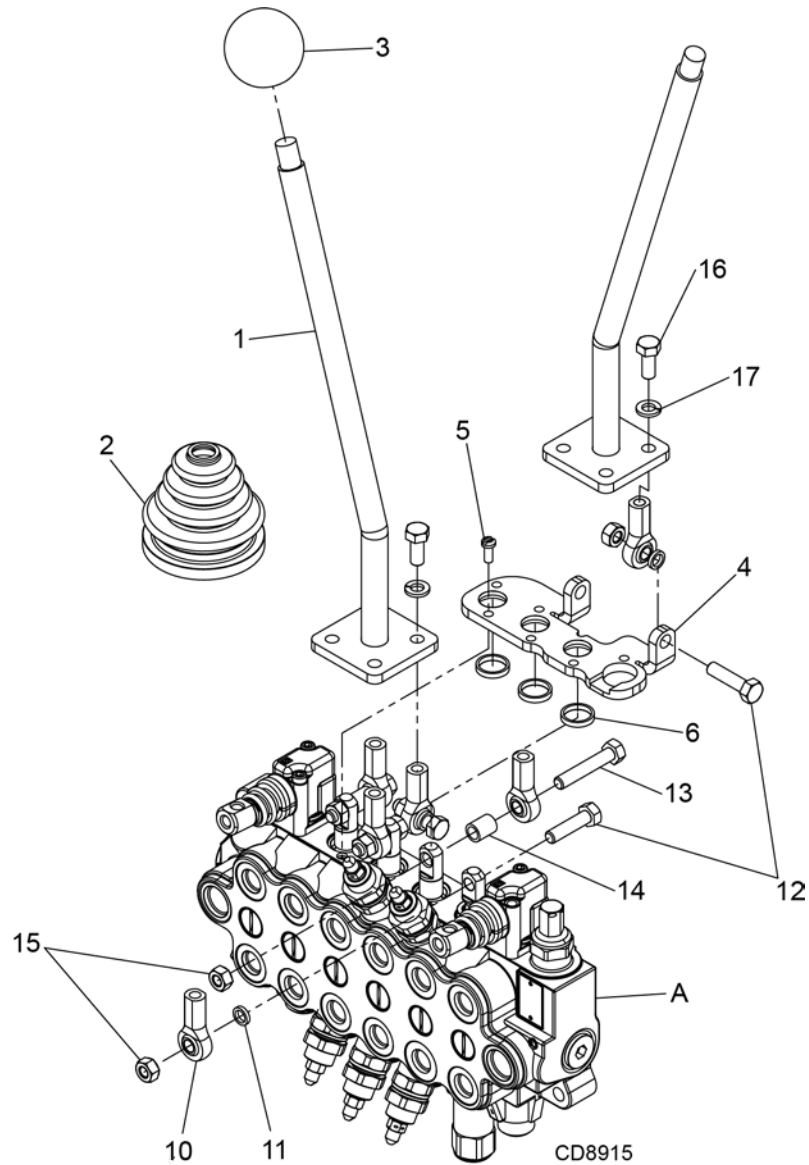
REF	PART	QTY	DESCRIPTION
13	37839	3	Pin, clevis 1.25 x 9.25
14	1020014	1	Pin, 1.50 x 8.61
15	601271	2	Rivet, blind .25 x .53 x .06 - .25
19	5237 *	2	HHCS 5/16 NC x 1/2 GR5
20	6778 *	2	Lock nut 5/16 NC
21	7447 *	4	HHCS 3/8 NC x 3 GR5
22	2290 *	1	HHCS 3/8 NC x 2-1/2 GR5 ZP
23	6698 *	5	Lock nut 3/8 NC ZP
24	-----	2	Nut 1/4 - 20 UNC blind hole
25	1031020	AR	Tooth, bolt on 1.75 x 9.30
26	6239 *	AR	Lock nut 5/8 NC
27	602218	AR	FSHCS 5/8 UNC x 2-1/2

AR As Required
HHCS Hex Head Cap Screw
* Standard hardware, obtain locally

40 Parts

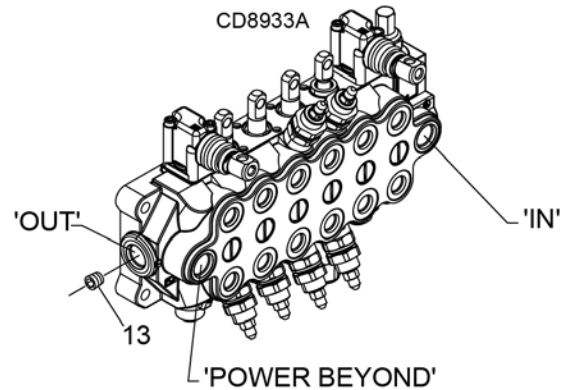
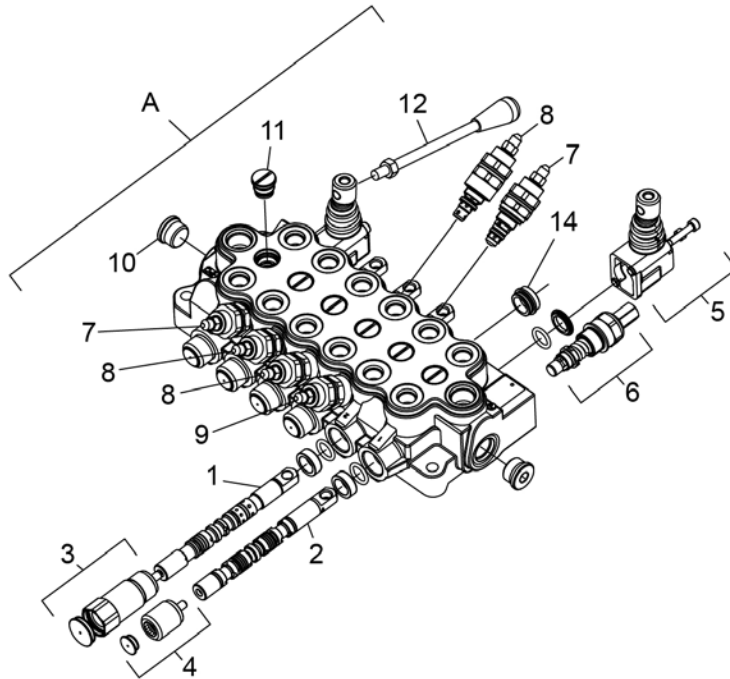
MAN1272 (10/22/2019)

BH85 & BH100 VALVE HARDWARE



REF	PART	QTY	DESCRIPTION	REF	PART	QTY	DESCRIPTION
A	618139	1	6 spool monoblock valve repair (see page 41)	11	37577	4	Washer, .328 x .463 x .093
1	605185RP	2	Control handle	12	6250 *	4	HHCS 5/16 NC x 1-1/4 GR5 ZP
2	37765	2	Boot, rubber control	13	4528 *	2	HHCS 5/16 NC x 1-3/4 GR5
3	1042055	2	Knob - 1.88 DIA x 1/2 - 13 UNC	14	604338	2	Sleeve, .328 x .463 x .575
4	605175RP	1	Plate, control linkage mount	15	6778 *	6	Lock nut 5/16 NC
5	-----	7	Screw, slotted head M5 - 0.8P x 12 mm (included with item 1)	16	24405	6	HHCS 5/16 NF x 3/4 GR5 ZP
6	-----	3	Spool wiper (included with item 1)	17	2472 *	6	Washer 5/16 lock ZP
10	37613	6	Rod end 5/16 NF female				
				HHCS			Hex Head Cap Screw
				*			Standard hardware, obtain locally

BH85 & BH100 CONTROL VALVE ASSEMBLY



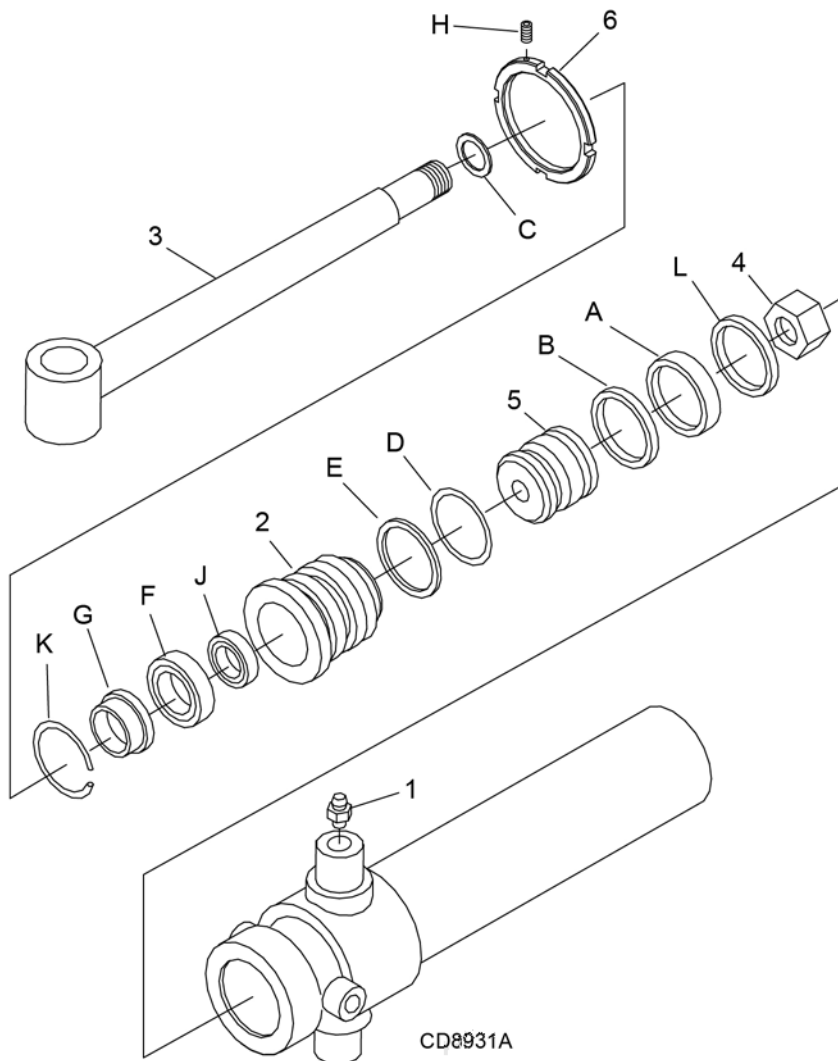
PORT FUNCTION IN
POWER BEYOND CONFIGURATION

REF	PART	QTY	DESCRIPTION
A	618139	1	Valve - 6 Spool MBLK repair
1	1011953	1	Spool 4 position float
2	1011954	5	Spool 3 position
3	33343	1	Spool POS cont ASY 4 POS
4	1011955	5	Spool POS cont ASY 3 POS
5	38628-1	2	Control Ass'y - Stabilizer
6	33342	1	Valve relief 2030 PSI
7	53380	2	Valve relief 2610 PSI

REF	PART	QTY	DESCRIPTION
8	53381	3	Valve relief / anti-cav 2470 PSI
9	602216	1	Valve relief / anti-cav 3045 PSI
10	38632-1	2	Plug, 3/4 SAE M w/ o-ring
11	33339	6	Valve load check asy
12	38629	2	Handle control - stabilizer
13	1020211	1	Plug - PBV (if required)
14	1034169	1	Sleeve w/ o-rings (boom spool only)
NS	33346	6	Spool seal repair kit

HHCS	Hex Head Cap Screw
NS	not shown
*	Standard hardware, obtain locally

SWING CYLINDER ASSEMBLY



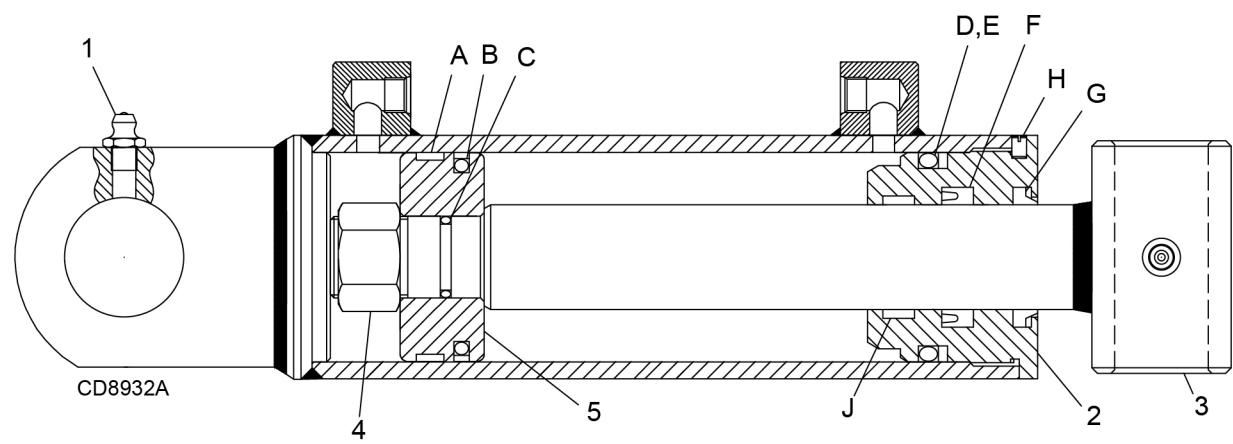
REF	PART	QTY	DESCRIPTION
A	*	1	Wear ring
B	*	1	Piston seal
C	*	1	O-ring
D	*	1	O-ring
E	*	1	Backup ring
F	*	1	Rod seal
G	*	1	Rod wiper
H	*	1	Set screw
J	*	1	Wear ring
K	*	1	Retaining ring
L	*	1	Piston ring

REF	PART	QTY	DESCRIPTION
1	12296	2	Grease fitting 1/4 - 28
2	N/S	1	Rod guide
3	N/S	1	Rod assembly
4	N/S	1	Nut
5	N/S	1	Piston
6	N/S	1	Spanner nut
	602220	2	Complete swing cylinder

N/S Not serviceable

* Items A - L included in seal kit 606315

HYDRAULIC CYLINDER ASSEMBLY

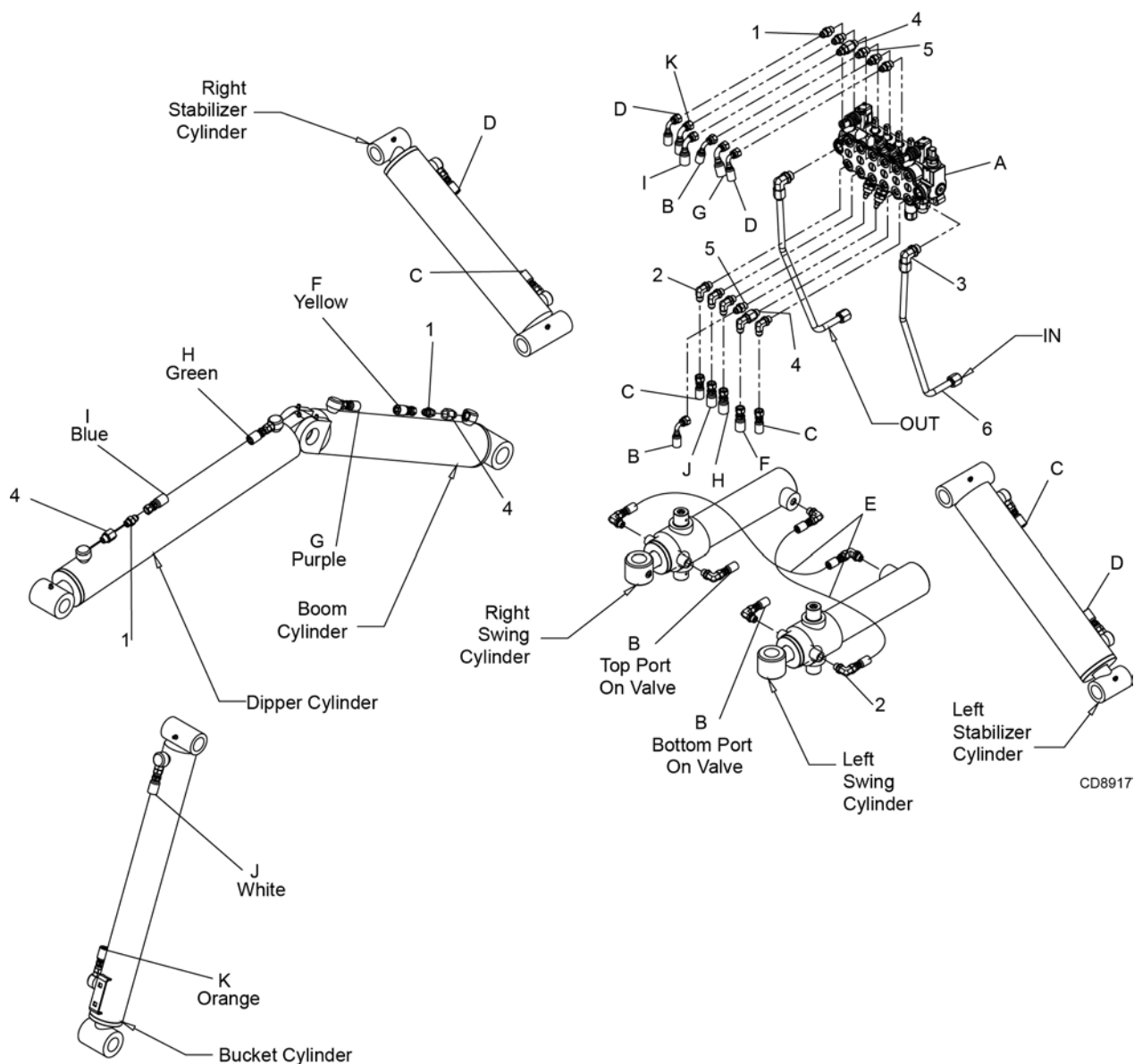


Optional Spanner Wrench —  1021841 - Spanner wrench
1021842 - Replacement Pins

Function	* Complete Assembly	Base End Style	Retracted Length	Bore Dia	Rod Dia	Seal Kit (Includes A - H)
Stabilizer	602224	Tube	21.00	2.95	1.50	606316
Dipper (BH85)	602226	Tang	29.75	2.95	1.57	606317
Dipper (BH100)	602222	Tang	32.12	2.95	1.57	606317
Boom (BH85)	602217	Clevis	25.62	3.15	1.57	606318
Boom (BH100)	602219	Clevis	31.00	3.15	1.57	606318
Bucket	602223	Tube	28.00	2.48	1.50	606319
Thumb	602227	Tube	24.00	2.48	1.50	606319

*** Part Number Is Stamped On Cylinder Barrel Near Base End Port.**
Item 1. - Grease Fitting P/N 195 1/8 NPT (obtain locally)

BH85 HOSES & FITTINGS

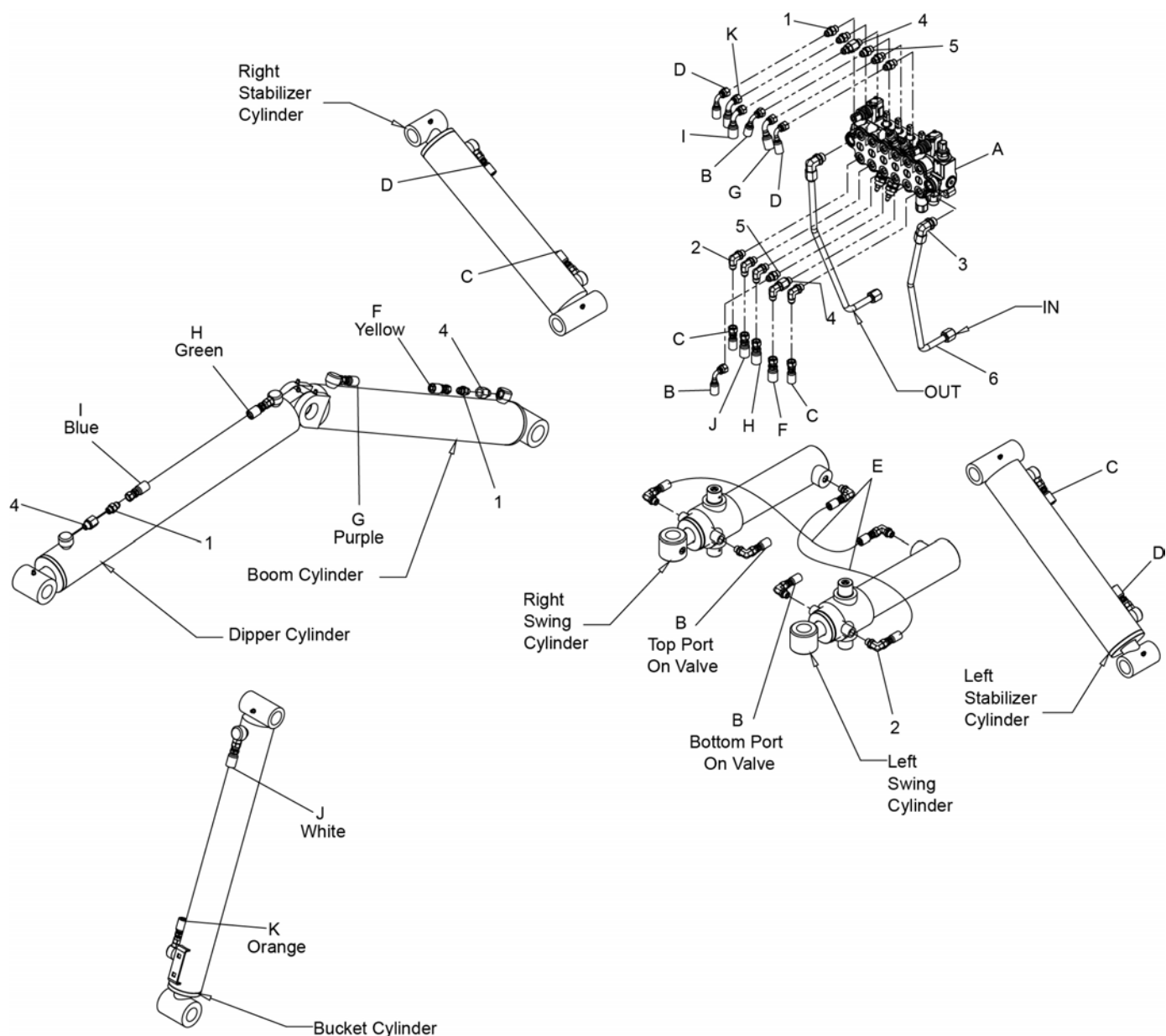


HOSE

REF	PART	QTY	DESCRIPTION
A	-----	1	6 spool monoblock valve (see page 41)
1	62367	15	Adapter 9/16 JICM 9/16 ORBM
2	63558	11	90° adjustable elbow
3	316004	2	Elbow 3/4 ORBM 3/4 JICM
4	1020005	4	Restrictor, .125 9/16 ORB
5	37508	2	Adapter .094 9/16 JICM 9/16 ORBM
6	602776	2	Feedline BH85 & BH100

REF	PART	QTY	DESCRIPTION
B	602212	2	Hose, 1/4 33 9/16 JICF 9/16 JICF
C	602214	2	Hose, 1/4 47 9/16 JICF 9/16 JICF
D	602215	2	Hose, 1/4 50 9/16 JICF 9/16 JICF
E	606327	2	Hose, 1/4 22 9/16 JICF 9/16 JICF
F	606306	1	Hose, 3/8 78 9/16 JICF 9/16 JICF
G	606307	1	Hose, 3/8 79 9/16 JICF 9/16 JICF
H	606308	1	Hose, 3/8 94 9/16 JICF 9/16 JICF
I	606309	1	Hose, 3/8 98 9/16 JICF 9/16 JICF
J	606310	1	Hose, 3/8 144 9/16 JICF 9/16 JICF
K	606311	1	Hose, 3/8 152 9/16 JICF 9/16 JICF

BH100 HOSES & FITTINGS

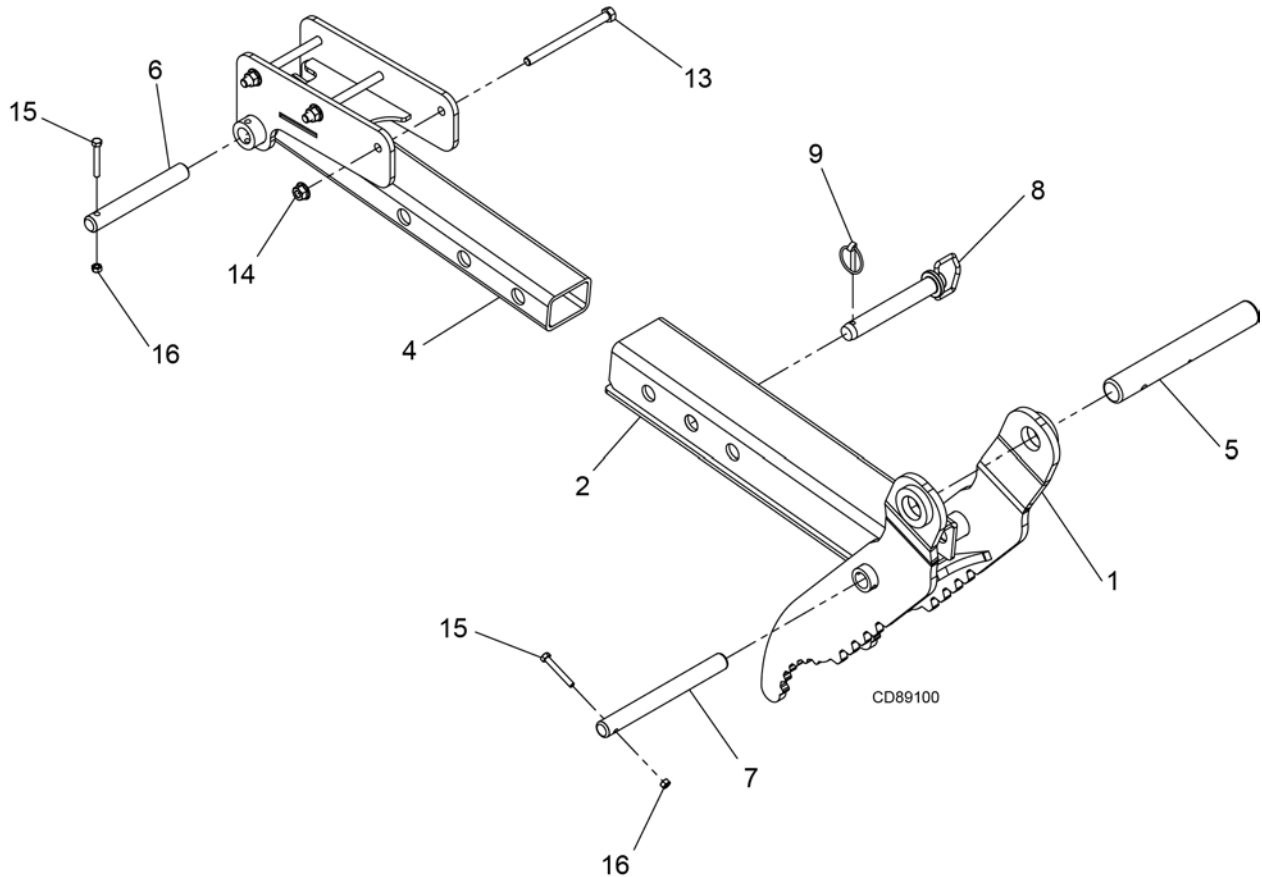


HOSE

REF	PART	QTY	DESCRIPTION
A	-----	1	6 spool monoblock valve (see page 41)
1	62367	15	Adapter 9/16 JICM 9/16 ORBM
2	63558	11	90° adjustable elbow
3	316004	2	Elbow 3/4 ORBM 3/4 JICM
4	1020005	4	Restrictor, .125 x 9/16 ORB
5	37508	2	Adapter .094 9/16 JICM 9/16 ORBM
6	602776	2	Feedline BH85 & BH100

REF	PART	QTY	DESCRIPTION
B	602212	2	Hose, 1/4 33 9/16 JICF 9/16 JICF
C	602214	2	Hose, 1/4 47 9/16 JICF 9/16 JICF
D	602215	2	Hose, 1/4 50 9/16 JICF 9/16 JICF
E	606327	2	Hose, 1/4 22 9/16 JICF 9/16 JICF
F	606306	1	Hose, 3/8 78 9/16 JICF 9/16 JICF
G	606307	1	Hose, 3/8 79 9/16 JICF 9/16 JICF
H	602228	1	Hose, 3/8 101 9/16 JICF 9/16 JICF
I	602229	1	Hose, 3/8 106 9/16 JICF 9/16 JICF
J	602230	1	Hose, 3/8 159 9/16 JICF 9/16 JICF
K	602231	1	Hose, 3/8 168 9/16 JICF 9/16 JICF

602759 MECHANICAL THUMB ASSEMBLY (OPTIONAL)

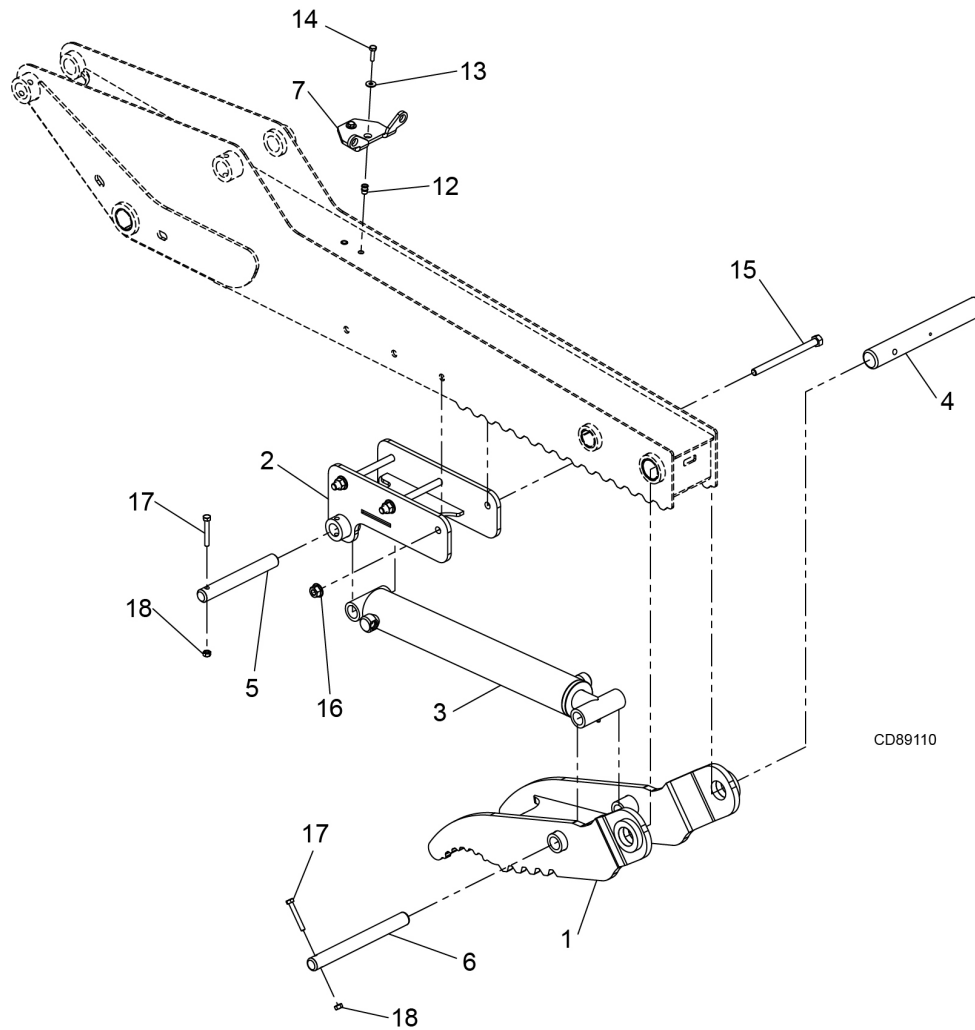


REF	PART	QTY	DESCRIPTION
A	602759		BH85/100 Mechanical thumb kit - 15", 18", 24" bucket
1	602926RP	1	Thumb BH85/100
2	602929RP	1	Thumb channel
3	603588RP	1	Thumb bracket
4	603550RP	1	Thumb tube
5	604336	1	Pin 1.50 x 11.32 (use bolt and nut from backhoe)
6	1045272	1	Pin 1.00 x 7.75
7	604337	1	Pin 1.00 x 9.75
8	S071051C0	1	Swivel hitch pin 1 x 4-1/4 in.
9	62043	1	Klik pin 1/4 x 1-3/4
13	22205 *	3	HHCS 1/2 NC x 6-1/2
14	11900 *	3	Lock nut 1/2 NC flange
15	7164 *	2	HHCS 5/16 NC x 2-1/4 GR5
16	6778 *	2	Lock nut 5/16 NC

* Standard hardware, obtain locally

HHCS Hex head cap screw

HYDRAULIC THUMB ASSEMBLY (OPTIONAL)



REF	PART	QTY	DESCRIPTION
A	-----		BH85/100 Hydraulic thumb kit - 15", 18", 24" bucket
1	602926RP	1	Thumb BH85/100
2	603588RP	1	Thumb bracket
3	602227	1	Cylinder 2.48 x 1.50 x 16.75
4	604336	1	Pin 1.50 x 11.32 (use bolt and nut from backhoe)
5	1045272	1	Pin 1.00 x 7.75
6	604337	1	Pin 1.00 x 9.85
7	605181RP	1	Coupler bracket
12	-----	2	Nut 1/4 - 20 UNC blind hole
13	5336 *	2	Washer 1/4 Flat ZP
14	10378 *	2	HHCS 1/4 NC x 1 GR5
15	22205 *	3	HHCS 1/2 NC x 6-1/2 GR5
16	11900 *	3	Nut lock 1/2 NC flange
17	7164 *	2	HHCS 5/16 NC flange
18	6778 *	2	Nut lock 5/16 NC

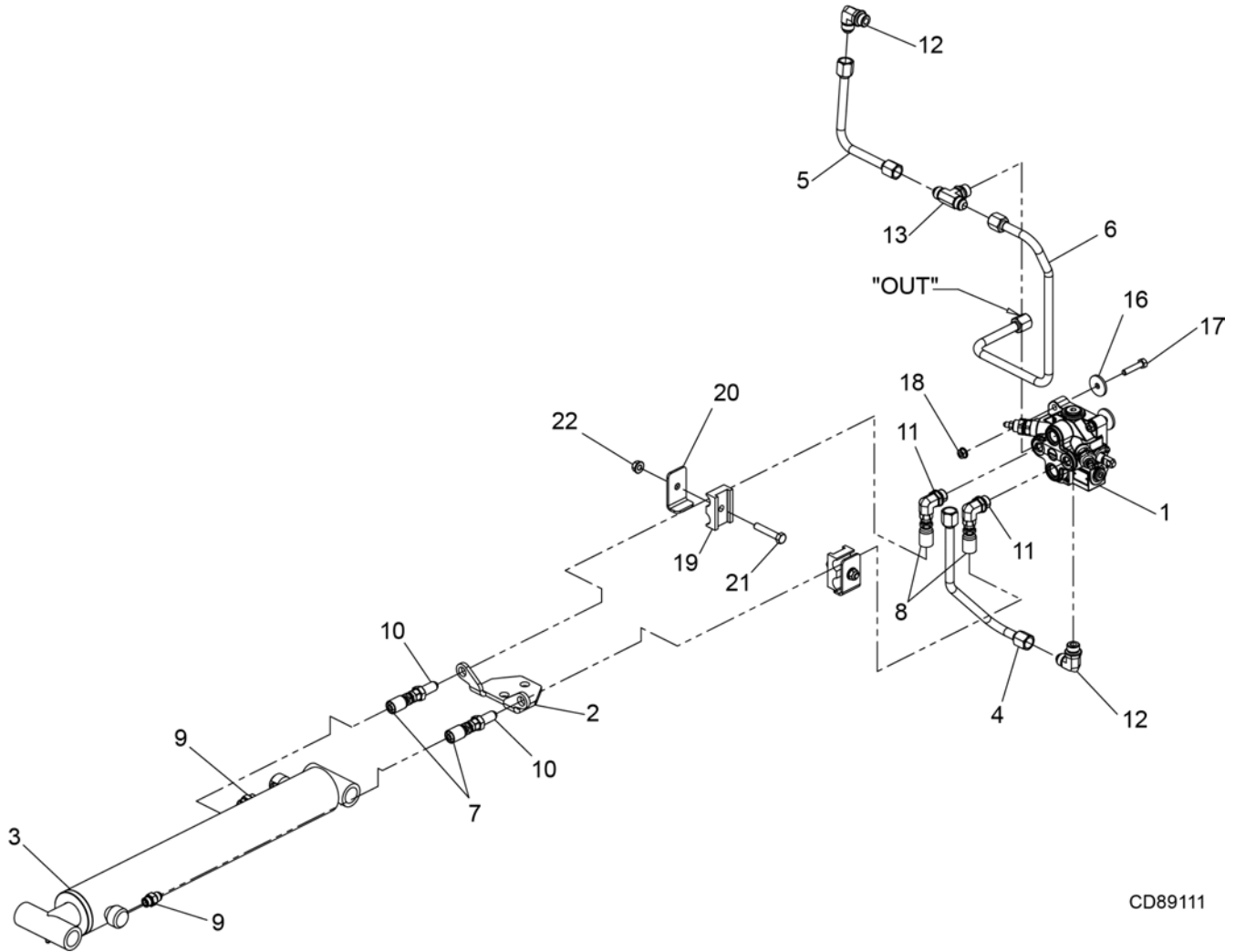
* Standard hardware, obtain locally

Use existing hardware

HHCS Hex head cap screw

HYDRAULIC THUMB ASSEMBLY (OPTIONAL) CONTINUED

HYDRAULIC CONNECTION

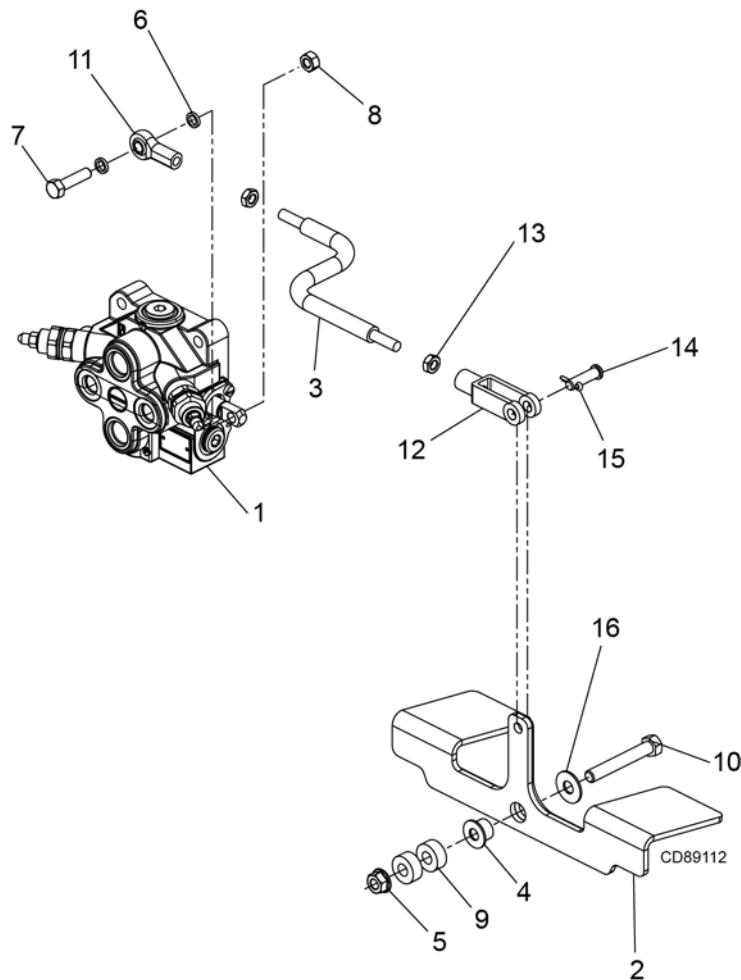


CD89111

REF	PART	QTY	DESCRIPTION	REF	PART	QTY	DESCRIPTION
1	1031145	1	Monoblock valve, 1 spool (see page 51)	11	313038	2	Elbow 3/4 ORBM 9/16 JIC
2	605181RP	1	Coupler bracket	12	316004	2	Elbow 3/4 ORBM 3/4 JICM
3	602227	1	Cylinder 2.48 x 1.50 x 16.75	13	602768	1	Tee, 3/4 JICM 3/4 JICM 3/4 ORBM
4	602775	1	Tube assembly PBY	16	603762RP	3	Washer, 1.31 x .34 x .135
5	602777	1	Tube assembly inlet	17	24408 *	3	HHCS 5/16 NC x 1-1/2 GR5 ZP
6	602769	1	Tube assembly return	18	14139 *	3	Nut lock 5/16 NC flange HD ZP
7	602233	2	Hose, 3/8 30 9/16 JICF 9/16 JICF	19	1020047	2	Hose clamp
8	602232	2	Hose, 3/8 152 9/16 JICF 9/16 JICF (BH100)	20	1020091RP	2	Angle clamp
8	606312	2	Hose, 3/8 131 9/16 JICF 9/16 JICF (BH85)	21	3231 *	2	HHCS 3/8 NC x 2 GR5
9	62367	2	Adapter 9/16 JICM 9/16 ORBM	22	14350 *	2	Nut lock 3/8 NC flange
10	1009496	2	Bulkhead 9/16 JIC 9/16 JIC		1020211 NS	1	Plug - PBY (see page 42)
					NS		Not shown
					*		Standard hardware, obtain locally
					HHCS		Hex head cap screw

HYDRAULIC THUMB ASSEMBLY (OPTIONAL) CONTINUED

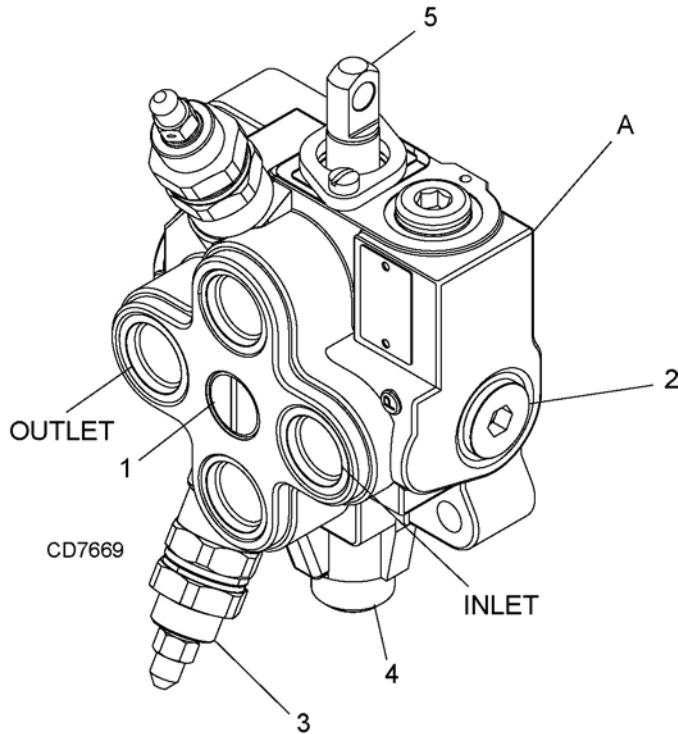
PEDAL & LINKAGE ASSEMBLY



REF	PART	QTY	DESCRIPTION
1	1031145	1	Monoblock valve, 1 spool (see page 51)
2	605440RP	1	Thumb pedal
3	604335	1	Bar linkage
4	604334	1	Flange sleeve .376 x .627 x .500
5	14350 *	1	Nut lock 3/8 NC flange
6	37577	2	Washer, .328 x .463 x .093
7	6250 *	1	HHCS 5/16 NC x 1-1/4 GR5 ZP
8	6778 *	1	Nut lock 5/16 NC
9	605437	1	Washer, .39 x .88 x .38
10	2290 *	1	HHCS 3/8 NC x 2-1/2 GR5 ZP
11	37613	1	Rod end 5/16 NF
12	604359	1	Adjustable yoke 5/16 - 24 UNF x 2.5
13	33654	2	Nut jam 5/16 NF
14	W70024	1	Pin clevis .312 x .781
15	1326 *	1	1/8 x 1/2 cotter pin
16	565 *	1	Washer, 3/8 flat

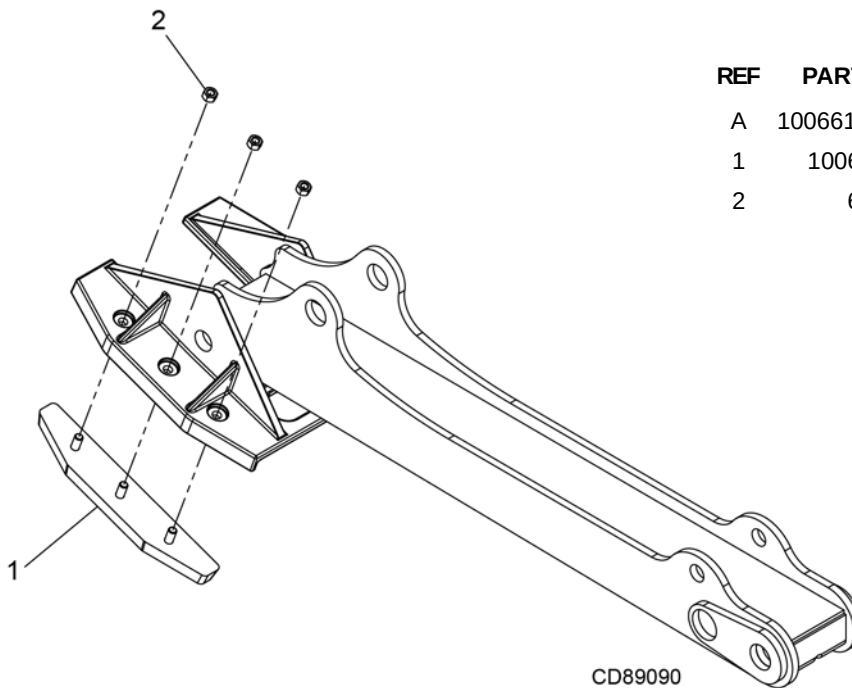
* Standard hardware, obtain locally
 HHCS Hex head cap screw

HYDRAULIC THUMB VALVE (OPTIONAL)



REF	PART	QTY	DESCRIPTION
A	1031145	1	Valve Assembly, 1 Spool
1	33339	1	Check Valve Assembly
2	38632-1	2	Plug, 3/4 SAE with o-ring
3	53381	2	Relief Valve Assembly 2400 psi
4	1011955	1	Spool, Position Control Assy, 3 Position
5	1011954	1	Spool, 3 Position
NS	33346	1	Spool Seal Repair Kit
	NS		Not Shown

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

BOLT TORQUE CHART

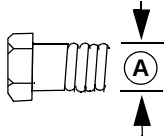
Always tighten hardware to these values unless a different torque value or tightening procedure is listed for a specific application.

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

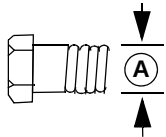


SAE Grade 5
(3 Radial Dashes)



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

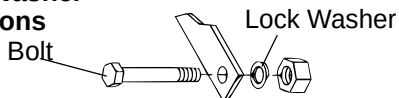
Metric Bolt Head
Identification



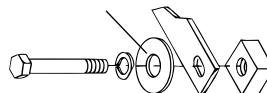
Metric
Grade 10.9

Ⓐ 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



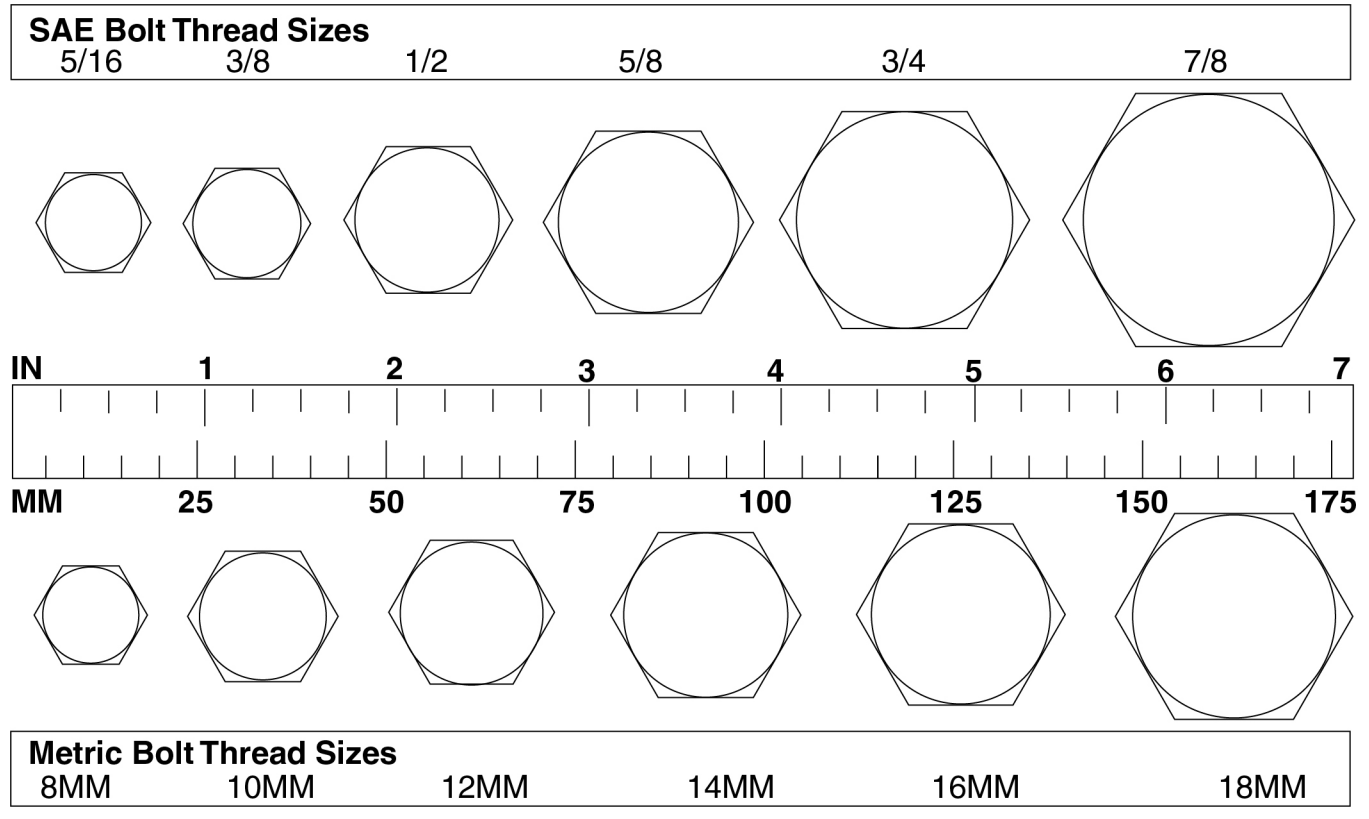
Flat Washer



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

(Replacement Parts For All Models Except Zero-Turn Mowers)

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:

WOODS® | A Blount International Brand

2606 South Illinois Route 2
Post Office Box 1000
Oregon, Illinois 61061 USA
800-319-6637 tel
800-399-6637 fax
woodsequipment.com

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

WARRANTY

All Models Except Zero-Turn Mowers

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 backhoes, loaders and mounts (except 3-pt. SAF-T-LOK® mounts) are warranted for two (2) years from the date of delivery to the original purchaser. The limited warranty covers any defects in the material and/or workmanship. Following the proper, recommended installation by an authorized Woods Dealer and normal use of a Woods mounting and backhoe or loader, if a tractor incurs damage resulting from the attachment, Woods will cover the existing tractor warranty in the event the manufacturer voids its tractor warranty because of the attachment. Warranty does not cover any misuse or abusive conditions that could cause premature wear or damage to attachment or tractor.

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)
	All units invoiced after 4/30/2012	
Gearbox components	BB48.30, BB60.30, BB72.30, BB84.40, BB60.50, BB72.50, BB60.60, BB72.60, BB84.60, BB84.50, DS8.30, DS10.40, DS8.50, DSO8.50, DS10.50, DSO10.50, DBH5.31, DBH6.31	6 years
	BW12, BW10.50, BW10.50Q, BW15.50, BW15.50Q, BW10.60, BW10.60Q, BW13.70, BW13.70Q, BW13.70QREV, BW15.60, BW15.60Q, BW10.70, BW10.70Q, BW15.70, BW15.70Q, BW20.50, BW20.50Q, BW20.60, BW20.60Q, BW20.70, BW20.70Q, BW20.51, BW20.51Q, BW20.61, BW20.61Q, BW20.71, BW20.71Q, BW13.71, BW13.71Q, BW13.71QREV	
	BW240X, BW240XHD, BW1620X, BW2400X	
	RD990X, PRD6000, PRD7200, PRD8400, S15CD, S20CD, S22CD, S25CD, S27CD, S30CD, TC/R74, TC/R68, TC/R60, TBW144, TBW180, TBW204, TSG50, S12ED, S15ED, S18ED, S20ED	
	FM60.20, FM72.20, TBW150C, RT/R42.30, RT/R48.30, RT/R60.40, RT/R72.40, RC3.5, RC4, RC5, RC6	3 years (1 year if used in rental or commercial applications)
Blade spindles	RD990X, PRD6000, PRD7200, PRD8400, TBW144, TBW180, TBW204	3 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.

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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.

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:

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