19734-0693
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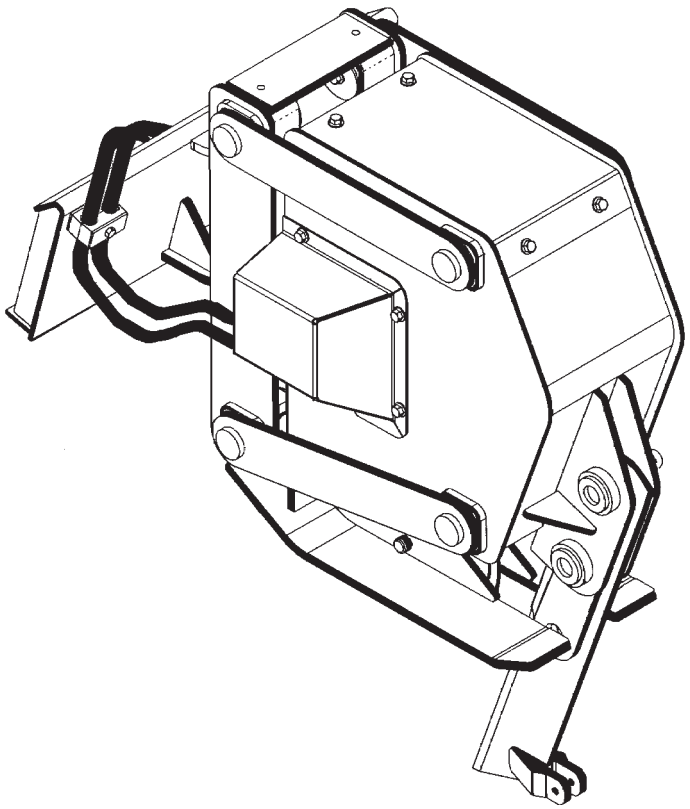
Vibratory Plow

Operator's Manual



Part number OM654 - CNH
1st edition English
July 2025

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PREFACE

GENERAL COMMENTS

Congratulations on the purchase of your new product! This product was carefully designed and manufactured to give you many years of dependable service. Only minor maintenance (such as cleaning and lubricating) is required to keep it in top working condition. Be sure to observe all maintenance procedures and safety precautions in this manual and on any safety decals located on the product and on any equipment on which the attachment is mounted.

This manual has been designed to help you do a better, safer job. Read this manual carefully and become familiar with its contents.

WARNING! Never let anyone operate this unit without reading the "Safety Precautions" and "Operating Instructions" sections of this manual.
Always choose hard, level ground to park the vehicle on and set the brake so the unit cannot roll.

Unless noted otherwise, right and left sides are determined from the operator's control position when facing forward.

NOTE: The illustrations and data used in this manual were current (according to the information available to us) at the time of printing, however, we reserve the right to redesign and change the attachment as may be necessary without notification.

BEFORE OPERATION

The primary responsibility for safety with this equipment falls to the operator. Make sure the equipment is operated only by trained individuals that have read and understand this manual. If there is any portion of this manual or function you do not understand, contact your local authorized dealer or the manufacturer to obtain further assistance. Keep this manual available for reference. Provide the manual to any new owners and/or operators.

SAFETY ALERT SYMBOL

This is the "Safety Alert Symbol" used by this industry. This symbol is used to warn of possible injury. Be sure to read all warnings carefully. They are included for your safety and for the safety of others working with you.

SERVICE

Use only manufacturer replacement parts. Substitute parts may not meet the required standards.

Record the model and serial number of your unit on the cover of this manual. The parts department needs this information to insure that you receive the correct parts.

SOUND AND VIBRATION

Sound pressure levels and vibration data for this attachment are influenced by many different parameters: some items are listed below (not inclusive):

- prime mover type, age, condition, with or without cab enclosure and configuration
- operator training, behavior, stress level
- job site organization, working material condition, environment

Based on the uncertainty of the prime mover, operator, and job site, it is not possible to get precise machine and operator sound pressure levels or vibration levels for this attachment.

NOTE: A list of all Paladin Patents can be found at http://www.paladinattachments.com/patents.asp.

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SAFETY STATEMENTS

THIS SYMBOL BY ITSELF OR WITH A WARNING WORD THROUGHOUT THIS MANUAL IS USED TO CALL YOUR ATTENTION TO INSTRUCTIONS INVOLVING YOUR PERSONAL SAFETY OR THE SAFETY OF OTHERS. FAILURE TO FOLLOW THESE INSTRUCTIONS CAN RESULT IN INJURY OR DEATH.

DANGER — **THIS SIGNAL WORD INDICATES A HAZARDOUS SITUATION WHICH, IF NOT AVOIDED, WILL RESULT IN DEATH OR SERIOUS INJURY.**

WARNING — **THIS SIGNAL WORD INDICATES A HAZARDOUS SITUATION WHICH, IF NOT AVOIDED, COULD RESULT IN DEATH OR SERIOUS INJURY.**

CAUTION — **THIS SIGNAL WORD INDICATES A HAZARDOUS SITUATION WHICH, IF NOT AVOIDED, COULD RESULT IN MINOR OR MODERATE INJURY.**

NOTICE — **NOTICE IS USED TO ADDRESS PRACTICES NOT RELATED TO PHYSICAL INJURY.**

GENERAL SAFETY PRECAUTIONS

WARNING!

READ MANUAL PRIOR TO INSTALLATION

Improper installation, operation, or maintenance of this equipment could result in serious injury or death. Operators and maintenance personnel should read this manual, as well as all manuals related to this equipment and the prime mover thoroughly before beginning installation, operation, or maintenance. **FOLLOW ALL SAFETY INSTRUCTIONS IN THIS MANUAL AND THE PRIME MOVER'S MANUAL(S).**

READ AND UNDERSTAND ALL SAFETY STATEMENTS

Read all safety decals and safety statements in all manuals prior to operating or working on this equipment. Know and obey all OSHA regulations, local laws, and other professional guidelines for your operation. Know and follow good work practices when assembling, maintaining, repairing, mounting, removing, or operating this equipment.

KNOW YOUR EQUIPMENT

Know your equipment's capabilities, dimensions, and operations before operating. Visually inspect your equipment before you start, and never operate equipment that is not in proper working order with all safety devices intact. Check all hardware to ensure it is tight. Make certain that all locking pins, latches, and connection devices are properly installed and secured. Remove and replace any damaged, fatigued, or excessively worn parts. Make certain all safety decals are in place and are legible. Keep decals clean, and replace them if they become worn or hard to read.

GENERAL SAFETY PRECAUTIONS

WARNING!

PROTECT AGAINST FLYING DEBRIS

Always wear proper safety glasses, goggles, or a face shield when driving pins in or out, or when any operation causes dust, flying debris, or any other hazardous material.

WARNING!

LOWER OR SUPPORT RAISED EQUIPMENT

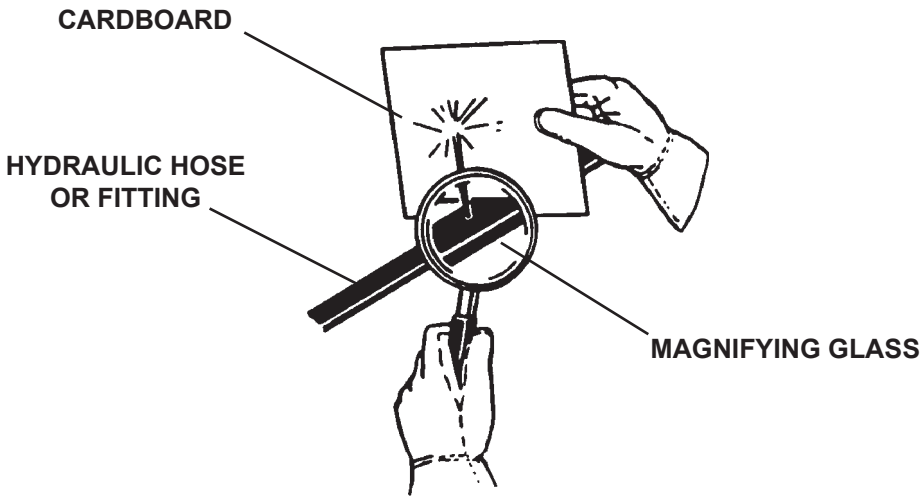
Do not work under raised booms without supporting them. Do not use support material made of concrete blocks, logs, buckets, barrels, or any other material that could suddenly collapse or shift positions. Make sure support material is solid, not decayed, warped, twisted, or tapered. Lower booms to ground level or on blocks. Lower booms and attachments to the ground before leaving the cab or operator's station.

WARNING!

USE CARE WITH HYDRAULIC FLUID PRESSURE

Hydraulic fluid under pressure can penetrate the skin and cause serious injury or death. Hydraulic leaks under pressure may not be visible. Before connecting or disconnecting hydraulic hoses, read your prime mover's operator's manual for detailed instructions on connecting and disconnecting hydraulic hoses or fittings.

- Keep unprotected body parts, such as face, eyes, and arms as far away as possible from a suspected leak. Flesh injected with hydraulic fluid may develop gangrene or other permanent disabilities.
- If injured by injected fluid, see a doctor at once. If your doctor is not familiar with this type of injury, ask him to research it immediately to determine proper treatment.
- Wear safety glasses, protective clothing, and use a piece of cardboard or wood when searching for hydraulic leaks. **DO NOT USE YOUR HANDS! SEE ILLUSTRATION.**



EQUIPMENT SAFETY PRECAUTIONS

WARNING! **KNOW WHERE UTILITIES ARE**

Observe overhead electrical and other utility lines. Be sure equipment will clear them. When digging, call your local utilities for location of buried utility lines, gas, water, and sewer, as well as any other hazard you may encounter.

WARNING! **EXPOSURE TO RESPIRABLE CRYSTALLINE SILICA DUST ALONG WITH OTHER HAZARDOUS DUSTS MAY CAUSE SERIOUS OR FATAL RESPIRATORY DISEASE.**

This attachment is designed to plane (mill) rock, concrete and asphalt, causing high levels of dust. It is recommended to use dust suppression, dust collection and if necessary personal protective equipment during the operation of the planer or of any attachment that may cause high levels of dust.

WARNING! **REMOVE PAINT BEFORE WELDING OR HEATING**

Hazardous fumes/dust can be generated when paint is heated by welding, soldering or using a torch. Do all work outside or in a well ventilated area and dispose of paint and solvent properly. Remove paint before welding or heating.

When sanding or grinding paint, avoid breathing the dust. Wear an approved respirator. If you use solvent or paint stripper, remove stripper with soap and water before welding. Remove solvent or paint stripper containers and other flammable material from area. Allow fumes to disperse at least 15 minutes before welding or heating.

WARNING! **END OF LIFE DISPOSAL**

At the completion of the useful life of the unit, drain all fluids and dismantle by separating the different materials (rubber, steel, plastic, etc.). Follow all federal, state and local regulations for recycling and disposal of the fluid and components.

OPERATING THE ATTACHMENT

- Block off work area from bystanders, livestock, etc.
- Operate only from the operator's station.
- Reduce speed when driving over rough terrain, on a slope, or turning, to avoid overturning the vehicle.
- An operator must not use drugs or alcohol, which can change his or her alertness or coordination. An operator taking prescription or over-the-counter drugs should seek medical advice on whether or not he or she can safely operate equipment.
- Before exiting the prime mover, lower the attachment to the ground, turn off the prime mover's engine, remove the key and apply the brakes.

TRANSPORTING THE ATTACHMENT

- Travel only with the attachment in a safe transport position to prevent uncontrolled movement. Drive slowly over rough ground and on slopes.
- When driving on public roads use safety lights, reflectors, Slow Moving Vehicle signs etc., to prevent accidents. Check local government regulations that may affect you.
- Do not drive close to ditches, excavations, etc., cave in could result.
- Do not smoke when refueling the prime mover. Allow room in the fuel tank for expansion. Wipe up any spilled fuel. Secure cap tightly when done.

EQUIPMENT SAFETY PRECAUTIONS

MAINTAINING THE ATTACHMENT

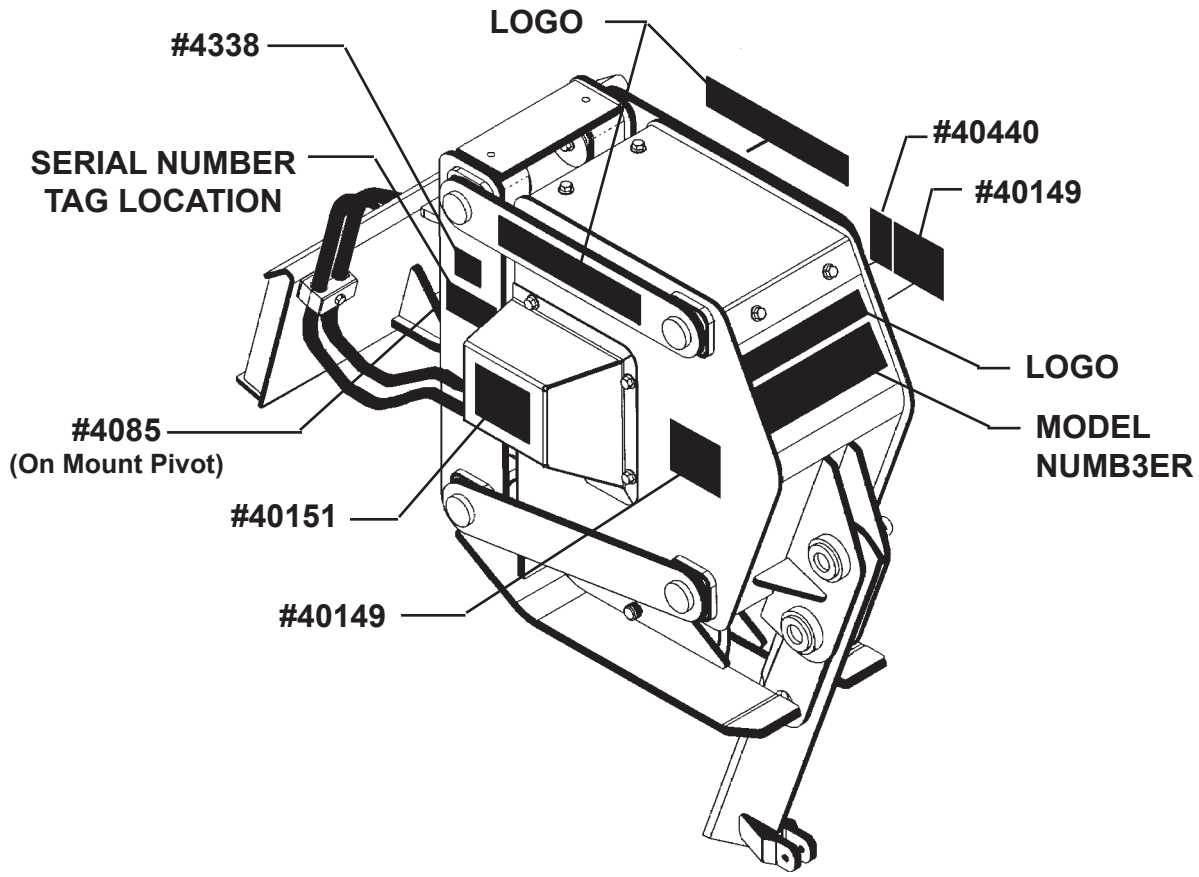
- Before performing maintenance, lower the attachment to the ground, turn off the engine, remove the key and apply the brakes.
- Never perform any work on the attachment unless you are authorized and qualified to do so. Always read the operator service manual's before any repair is made. After completing maintenance or repair, check for correct functioning of the attachment. If not functioning properly, always tag "DO NOT OPERATE" until all problems are corrected.
- Worn, damaged, or illegible safety decals must be replaced. New safety decals can be ordered from BRADCO.
- Never make hydraulic repairs while the system is under pressure. Serious personal injury or death could result.
- Never work under a raised attachment.

DECALS

DECAL PLACEMENT

GENERAL INFORMATION

The diagram on this page shows the location of the decals used on the BRADCO Vibratory Plow. The decals are identified by their part numbers, with reductions of the actual decals located on the following page. Use this information to order replacements for lost or damaged decals. Be sure to read all decals before operating the attachment. They contain information you need to know for both safety and product longevity.



IMPORTANT: Keep all safety decals clean and legible. Replace all missing, illegible, or damaged safety decals. When replacing parts with safety decals attached, the safety decals must also be replaced.

REPLACING SAFETY DECALS: Clean the area of application with nonflammable solvent, then wash the same area with soap and water. Allow the surface to fully dry. Remove the backing from the safety decal, exposing the adhesive surface. Apply the safety decal to the position shown in the diagram above and smooth out any bubbles.

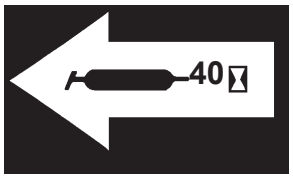
DECALS
DECALS

DANGER! PINCH POINTS
PART #40149

WARNING! CALL BEFORE YOU DIG
PART #40440

WARNING! HIGH PRESSURE FLUID
PART #40151

MADE IN USA
PART #4338



GREASE 40 HOURS
PART #4085

NOTE: CONTACT YOUR LOCAL DEALER FOR MODEL NUMBER AND LOGO DECALS.

INSTALLATION

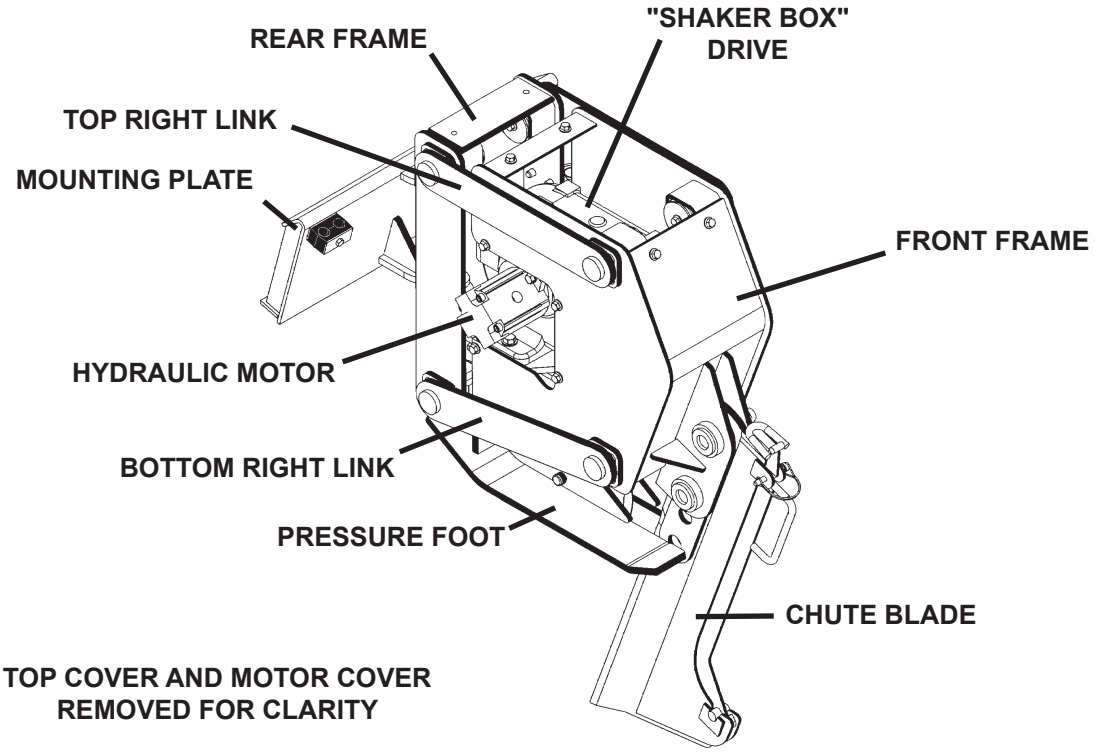
GENERAL INFORMATION

The BRADCO Vibratory Plow was designed to be easy to use and maintain. It is operatored by your loader auxiliary hydraulics and mounts to the toolbar / quick attach mechanism for easy mounting. The Vibratory Plow was shipped complete with the appropriate mounting for your specific prime mover and with the hydraulic hoses and couplers installed.

Remember to read all safety warnings, decals and operating instructions before operating the attachment. If there is any portion of this manual that you do not understand, contact your dealer.

NOMENCLATURE

Throughout this manual, reference is made to various attachment components. The purpose of this section is to acquaint you with the various names of these components. This knowledge will be helpful when reading through the manual or when ordering service parts.



INSTALLATION

1. Remove any attachment from the front of the prime mover.
2. Following all standard safety practices and the instructions for installing an attachment in your prime mover operator's manual, install the attachment onto your loader.

WARNING! To avoid serious personal injury, make sure the attachment is securely latched to the attachment mechanism of your unit. Failure to do so could result in separation of the attachment from the prime mover.

3. Lower the unit to the ground and relieve pressure to the auxiliary hydraulic lines.
4. Following the safety shut down procedure for your prime mover, shut down and exit the prime mover.
5. After making sure that the hydraulic couplers are free from any foreign material or contaminants, connect the couplers to the auxiliary hydraulic system of your prime mover.
6. Following the standard start up procedure for your prime mover, start the loader and run all cylinders on the attachment to purge any air from the system. Check for proper hydraulic connection, hose routing and hose length.
7. Attachment installation is complete.

DETACHING

On firm level ground, remove the coulter wheel and then remove the blade and reinstall it in the transport position. Lower the boom arms completely down on the frame until the attachment is level and approximately 2" off the ground.

Turn off the engine. Move the control levers back and forth to relieve pressure in line. Disconnect couplers.

NOTE: Connect couplers together or install caps to prevent contaminants from entering the hydraulic system.

Follow your prime mover operator's manual for detaching (removing) an attachment. Store hoses off the ground to help prevent damage.

NOTE: Frequent lubrication of grease fittings on the cylinder and pivot tube on the mount with a multi-purpose grease will greatly increase life of the product.

OPERATING INSTRUCTIONS

VIBRATORY PLOW

GENERAL INFORMATION

Simplicity of operation is one of the key features of the Vibratory Plow. The basic vibratory plow itself has no controls, and only one grease fitting. Since the vibratory plow mounts to the toolbar / attachment plate of the loader, it is important to be familiar with, and know the controls on the loader. Such knowledge is crucial for safe, efficient operation of equipment. Read your loader owner's manual for information regarding operation before attempting to use the attachment. Take the time to learn how they operate now.

The Vibratory Plow is relatively simple to use, and with the help of the information in this section and a little practice you should become proficient in its operation in no time. Observe the following points to obtain the best results with the least amount of wear on the machine. Read the "Safety Precautions" section of this manual before you begin. See Section "B".

CAUTION! Operate the vibratory plow only from the operator's station.

Pay attention to the job at hand. Be alert to the possibility of others in the work area.

Always CALL BEFORE YOU DIG. Locate all underground utilities before you begin.

Never let anyone perform maintenance on the machine while it is running.

The Vibratory Plow minimizes turf damage during installation and greatly reduces the time spent on installing pipe for irrigation and lawn sprinkler systems, water and natural gas pipe, telephone and television cable, and wire for "invisible" dog fences.

There are various options available for the vibratory plow. There are four different knife blades which utilize the pull bullet assembly, the cable pull assembly, and/or the pipe bullet assembly. These attach to the clevis on the knife blade with a
3/8" grade 8 bolt (not included). Also available for the vibratory plow is a cable reel mount that mounts two 24" maximum diameter cable spools and utilizes the four optional chute blades that accommodate cable up to 1/2" in diameter.

There are two methods of installation: Direct Vibratory Plowing with the standard knife blade, and Vibratory Plowing with the optional chute blade and cable reel mounting.

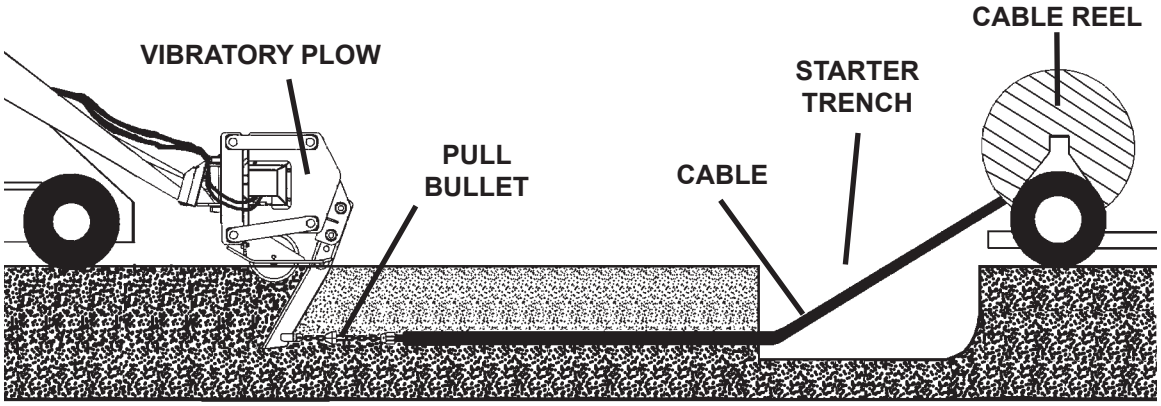
DIRECT VIBRATORY PLOWING (KNIFE BLADE)

Using the direct vibratory plowing method is convenient, fast, and requires a minimum of restoration work after the installation has been completed. This method is usually limited to short runs, where tension on the cable is low enough to prevent damage to the cable. With this method, the cable being pulled is actually pulled through the earth along the entire route. Therefore, this method is best used only for conduit, pipe, or cable-in-conduit unless a bullet assembly (at least twice the size of the cable or pipe) is used in the installation process, which will open up the ground sufficiently to pull the cable through with a minimum of pulling tension.

DIRECT VIBRATORY PLOWING (CONTINUED)

WARNING! Always CALL BEFORE YOU DIG. Locate all underground utilities before you begin.

To begin, dig a starter trench and lower the blade/bullet combination into the trench to the desired depth with the cable attached to the bullet or cable pull. Continue to plow for several feet past the destination pedestal location to allow excess cable for connecting and splicing. At this point, stop the vibratory plow, lift the blade carefully from the ground, and disconnect the cable from the blade. Inspect the cable for any damage that may have occurred during the installation process.



Cable Protection

When the plowing section has been completed, remove any damage from the end of the cable and make sure approximately 40 inches of undamaged cable remain to facilitate connecting and splicing. Install plastic end caps to protect from moisture. A hose clamp should be installed on flooded cable to prevent jacket shinkback.

NOTE: Be sure to observe the minimum bending radius restrictions for the size of cable/ pipe being installed.

VIBRATORY PLOWING (CABLE REEL MOUNT & CHUTE BLADE)

Using the vibratory plowing method of installation is often chosen for its efficiency and lack of required restoration work. But this method is limited in the size of cable or cable-in-conduit by the chute blade, which will accommodate a cable of up to 1/2" in diameter. Cable routes that intersect roads, driveways, or sidewalks should always be avoided. With this method, the cable is not pulled through the earth, so the amount of tension on the cable is minimal.

Unlike the direct plowing method where the payout reel is stationary, with the vibratory plowing method the payout reel is mounted onto the vibratory plow using the optional cable reel mount. The cable is played out over the unit and into the cable guide guide chute attached to the blade.

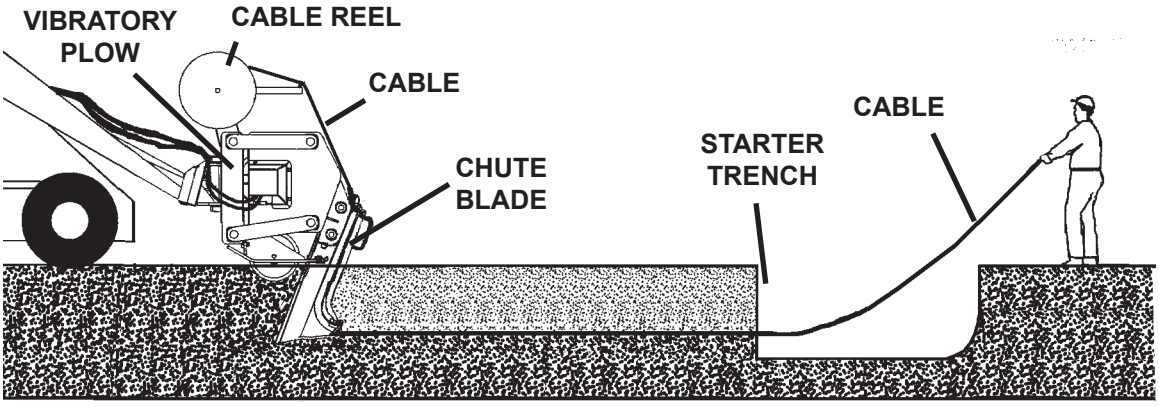
VIBRATORY PLOWING (CONTINUED)

WARNING! Always CALL BEFORE YOU DIG. Locate all underground utilities before you begin.

To begin, dig a starter trench. The cable or cable-in-conduit should play off the top of the reel, through the cable guide and over the unit. Be sure to minimize rubbing or scraping which could cause damage to the cable. Remove the chute from the blade and form and position the cable down along the inside of the blade. Place the chute into position, and lock in place using the safety snap pin. (It is recommended that you apply a lubricant to the inside of the chute to reduce friction and tension.) Pull out a sufficient amount of cable from the reel and through the starter trench. The blade can be lowered into the starter trench while a crew member holds the cable for approximately the first 50 feet of the operation, so the loose end is not inadvertently pulled along. A layer of soil may be applied over the cable in the starter trench to help hold it in place.

NOTE: The cable should never be forcibly pushed into the blade chute.

Continue to plow for several feet past the destination pedestal location to allow excess cable for connecting and splicing. At this point, stop the vibratory plow and remove the chute from the blade and carefully remove the cable. When the cable is free, the blade can be moved forward and lifted out of the ground. Inspect the cable for any damage that may have occurred during the installation process.



Cable Protection

When the plowing section has been completed, remove any damage from the end of the cable and make sure approximately 40 inches of undamaged cable remain to facilitate connecting and splicing. Install plastic end caps to protect from moisture. A hose clamp should be installed on flooded cable to prevent jacket shinkback.

NOTE: Be sure to observe the minimum bending radius restrictions for the size of cable/ pipe being installed.

OPERATING INSTRUCTIONS

VIBRATORY PLOW

STORAGE:

- Clean the unit thoroughly, removing all mud, dirt, and grease.
- Inspect for visible signs of wear, breakage, or damage. Order any parts required and make the necessary repairs to avoid delays upon removal from storage.
- Tighten loose nuts, capscrews and hydraulic connections.
- Coat exposed portions of the cylinder rods with grease.
- Lubricate grease fittings.
- Seal hydraulic system from contaminants and secure all hydraulic hoses off the ground to help prevent damage.
- Replace decals that are damaged or in unreadable condition.
- Store unit in a dry and protected place. Leaving the unit outside will materially shorten its life.

Additional Precautions for Long term Storage:

- Touch up all unpainted surfaces with paint to prevent rust.

REMOVAL FROM STORAGE:

- Remove cover.
- Wash unit and replace any damaged and/or missing parts.
- Lubricate grease fittings.
- Check hydraulic hoses for damage and replace as necessary.

LIFT POINTS

Lifting points are identified by a lifting decals where required. Lifting at other points is unsafe and can damage attachment. Do not attach lifting accessories around cylinders or in any way that may damage hoses or hydraulic components.

- Attach lifting accessories to unit at recommended lifting points.
- Bring lifting accessories together to a central lifting point.
- Lift gradually, maintaining the equilibrium of the unit.

WARNING! Use lifting accessories (chains, slings, ropes, shackles and etc.) that are capable of supporting the size and weight of your attachment. Secure all lifting accessories in such a way to prevent unintended disengagement. Failure to do so could result in the attachment falling and causing serious personal injury or death.

TIE DOWN POINTS

Tie down points are identified by tie down decals where required. Securing to trailer at other points is unsafe and can damage attachment. Do not attach tie down accessories around cylinders or in any way that may damage hoses or hydraulic components.

- Attach tie down accessories to unit as recommended.
- Check unit stability before transporting.

WARNING! Verify that all tie down accessories (chains, slings, ropes, shackles and etc.) are capable of maintaining attachment stability during transporting and are attached in such a way to prevent unintended disengagement or shifting of the unit. Failure to do so could result in serious personal injury or death.

LUBRICATION
VIBRATORY PLOW

GENERAL INFORMATION

Economical and efficient operation of any machine is dependent upon regular and proper lubrication All parts provided with grease fittings should be lubricated every 40 hours as indicated. If any grease fittings are missing, replace them immediately. Clean all fittings thoroughly before using grease gun.

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

GEARBOX (SHAKER BOX)

The oil level in the gear box should be checked after every 40 hours of operation. Proper level of lubricant in the gear box is approximately 1.4 quarts. Fill as necessary with #90 transmission oil. The gear box is a sealed unit. If there is any sign of oil leaks please contact your nearest BRADCO dealer before carrying out any repairs.

The gear box oil should be changed after the first 100 hours of operation and then every 1000 hours thereafter.

TO CHECK OIL LEVEL:

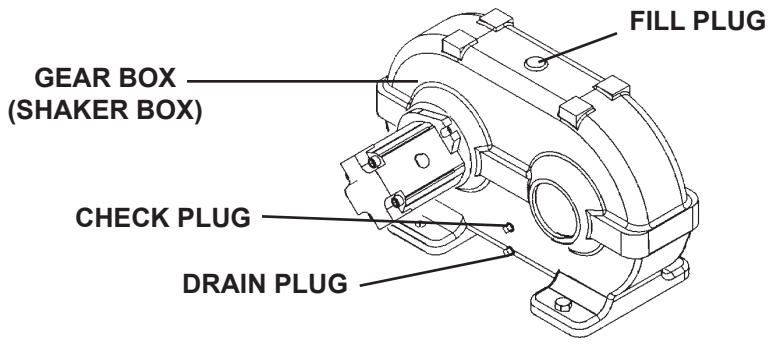
Be sure to park the unit on a level surface and remove the motor cover. Remove the check plug on the gear box (shaker box). Oil should be level with the check plug hole. Add oil as necessary.

TO ADD OIL:

Remove the top cover. Remove the filler plug on the top of the gear box and add up to the full point (check plug).

TO CHANGE OIL:

1. Park the unit on a level surface.
2. Remove the motor cover.
3. Position a drain pan under the unit and remove the drain plug.
4. Once the oil is drained reinstall the drain plug.
5. Remove the top cover to gain access to the filler plug. Add approximately 1.4 quarts of #90 weight transmission oil.
6. Check oil level and add as necessary.



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MAINTENANCE AND SERVICE

GENERAL INFORMATION

Regular maintenance is the key to long equipment life and safe operation. Maintenance requirements have been reduced to an absolute minimum. However, it is very important that these maintenance functions be performed as described.

WARNING! When replacing parts use only factory approved replacement parts. Manufacturer will not claim responsibility for use of unapproved parts or accessories and/or other damages as a result of their use.

PROCEDURE	DAILY	EVERY 40 HOURS	100 HOURS	1000 HOURS
Check all hardware and tighten, if necessary. See Bolt Torque Specifications.	✔			
Check for missing hardware and replace with approved replacement parts.	✔			
Check hydraulic system for hydraulic oil leaks.	✔			
Visually inspect the machine for worn parts or cracked welds and replace as necessary.	✔			
Check for missing or illegible Safety / Warning Decals.	✔			
Lubricate all grease fittings.		✔		
Check oil in gear box (shaker box).		✔		
Change oil in gear box after the first 100 hours break in period.			✔	
Change oil in gear box.				✔

WARNING! Escaping fluid under pressure can have sufficient force to penetrate the skin, causing serious personal injury. Fluid escaping from a very small hole can be almost invisible. Use a piece of cardboard or wood, rather than hands to search for suspected leaks.

Keep unprotected body parts, such as face, eyes, and arms as far away as possible from a suspected leak. Flesh injected with hydraulic fluid may develop gangrene or other permanent disabilities.

If injured by injected fluid, see a doctor at once. If your doctor is not familiar with this type of injury, ask him to research it immediately to determine proper treatment.

MAINTENANCE AND SERVICE

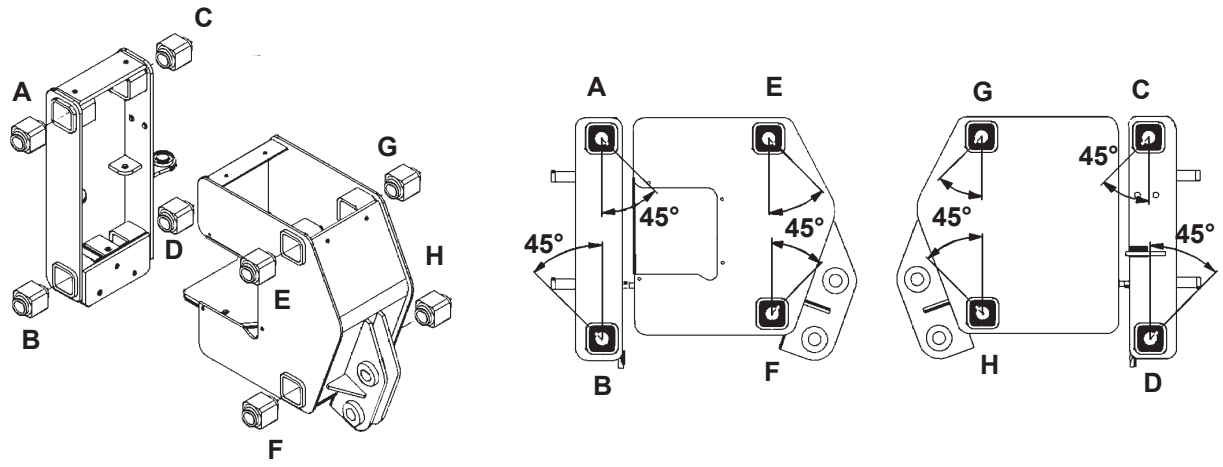
REPLACING BUSHINGS

Due to the constant shaking motion of the vibratory plow the square bonded bushings will eventually become worn and require replacement. An installation kit (#19856) can be purchased from your BRADCO dealer to assist in the installation process.

1. Determine which bushing needs replaced and remove the necessary link by first removing the two .38" UNC X .75" capscrews (#1953) and keepers (#17862) that are securing it to the unit.

2. Locate the bushing (A-H) being replaced in Figure #1 and note the keyway orientation. The correct keyway orientation is critical to the final assembly.

FIGURE #1



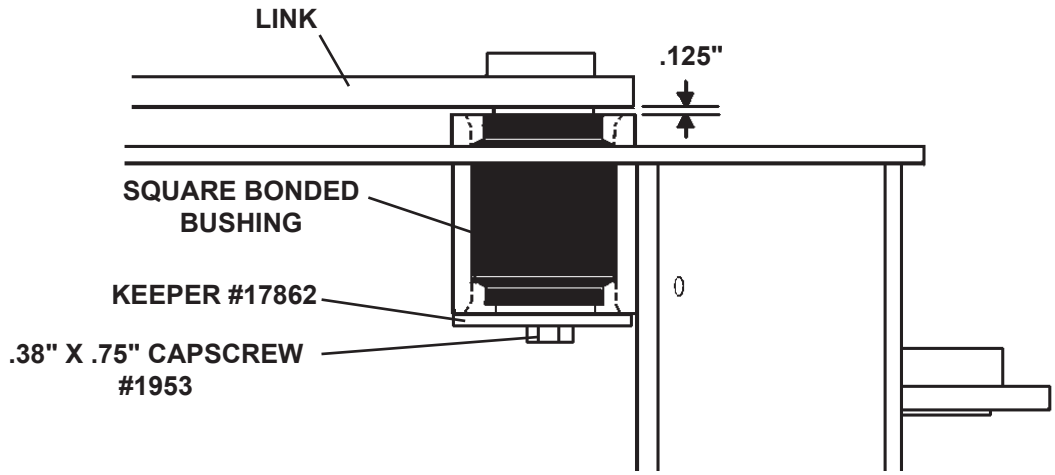
3. Remove the worn bushing.

4. Lubricate the bushing and the bushing socket lightly with P-80 rubber emulsion lubricant or water. Position the bushing on the outside of the bushing socket and press into place.

NOTE: BE SURE TO INSTALL THE BUSHING WITH THE CORRECT KEYWAY ORIENTATION. (SEE FIGURE #1)

NOTE: THE BUSHING SHOULD EXTEND OUT .125" (1/8") FROM THE OUTSIDE OF THE SOCKET ON BOTH SIDES. SEE FIGURE #2

FIGURE #2



NOTE: BE SURE KEYWAY IS IN THE CORRECT ORIENTATION.

5. Once the bushing is centered in the socket position the key and re-install the link using an anti-seize lubricant. (Replace the key #18695 if worn or damaged.)

6. Secure the link in place by reinstalling the keepers and capscrews removed in Step #1.

MAINTENANCE AND SERVICE

CYLINDER SEAL REPLACEMENT

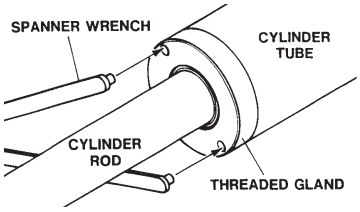
The following information is provided to assist you in the event you should need to repair or rebuild a hydraulic cylinder. When working on hydraulic cylinders, make sure that the work area and tools are clean and free of dirt to prevent contamination of the hydraulic system and damage to the hydraulic cylinders. Always protect the active part of the cylinder rod (the chrome section). Nicks or scratches on the surface of the rod could result in cylinder failure. Clean all parts thoroughly with a cleaning solvent before reassembly.

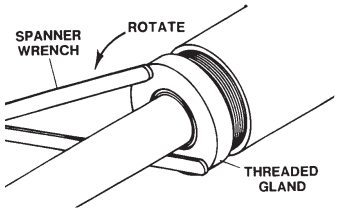
DISASSEMBLY PROCEDURE

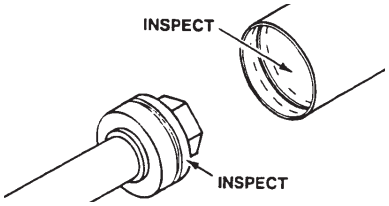
IMPORTANT: Do not contact the active surface of the cylinder rod with the vise. Damage to the rod could result.

THREADED TYPE GLAND

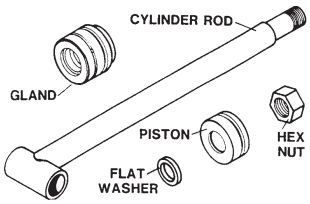
1. Rotate the gland with a spanner wrench counterclockwise until the gland is free of the cylinder tube.
2. Pull the cylinder rod from the cylinder tube and inspect the piston and the bore of the cylinder tube for deep scratches or galling. If damaged, the piston AND the cylinder tube must be replaced.

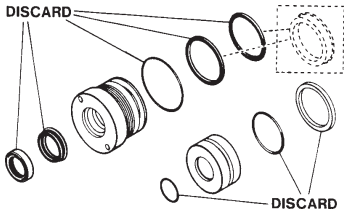






3. Remove the hex nut, piston, flat washer or spacer tube (if so equipped), and gland from the cylinder rod. If the cylinder rod is rusty, scratched, or bent, it must be replaced.
4. Remove and discard all the old seals.



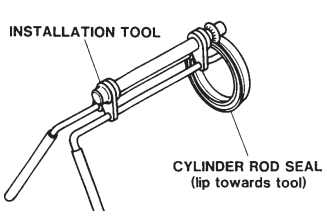


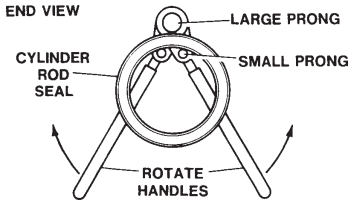
ASSEMBLY PROCEDURE

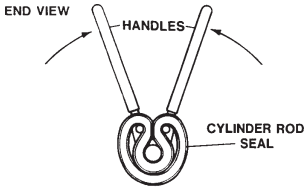
IMPORTANT: Replace all seals even if they do not appear to be damaged. Failure to replace all seals may result in premature cylinder failure. NOTE: Seal kits will service most cylinders of similar bore size and rod diameter.

1. Install the cylinder rod seal in the gland first. Be careful not to damage the seal in the process, as it is somewhat difficult to install.

NOTE: A special installation tool (Part #65349) is available to help with installing the seal. Simply fit the end of the tool over the seal so that the large prong of the tool is on the outside of the seal, and the two smaller prongs on the inside. The lip of the seal should be facing towards the tool. Rotate the handles on the tool around to wrap the seal around the end of the tool.







Rotate the handles on the tool around to wrap the seal around the end of the tool.

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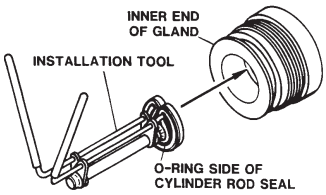
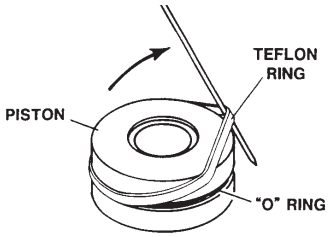
MAINTENANCE AND SERVICE

Now insert the seal into the gland from the inner end. Position the seal in its groove, and release and remove the tool. Press the seal into its seat the rest of the way by hand.



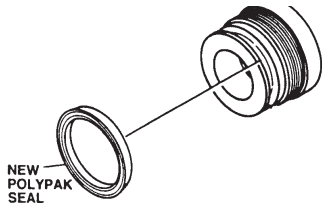
2. Install the new piston ring, rod wiper, O-rings and backup washers, if applicable, on the piston.

   Be careful not to damage the seals. Caution must be used when installing the piston ring. The ring must be stretched carefully over the piston with a smooth, round, pointed tool.



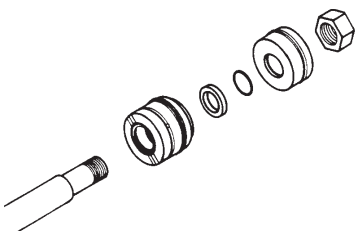
3. After installing the rod seal inside the gland, as shown in step #1, install the external seal.

NOTE: Threaded glands may have been equipped with a separate O-ring and backup washer system or a polypak (all in one) type seal. Current seal kits contain a polypak (all in one) type seal to replace the discarded seal types on ALL THREADED GLANDS.



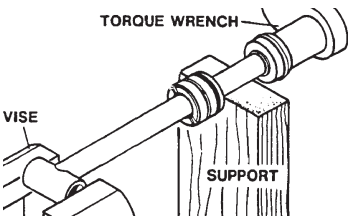
4. Slide the gland onto the cylinder rod, being careful not to damage the rod wiper. Then install the spacer, or flat washer (if so equipped), small o-ring, piston, and hex nut onto the end of the cylinder rod.

5. Secure the cylinder rod (mounting end) in a vise with a support at its center. Torque the nut to the amount shown for the thread diameter of the cylinder rod (see chart).



Thread Diameter	POUNDS - FEET
7/8"	150-200
*1"	230-325
1-1/8"	350-480
1-1/4"	490-670
1-3/8"	670-900

*** 1" Thread Diameter WITH 1.25" Rod Diameter**
Min. 230 ft. lbs. Max. 250 ft. lbs.



IMPORTANT: Do not contact the active surface of the cylinder rod with the vise. Damage to the rod could result.

6. Apply a lubricant (such as Lubriplate #105) to the piston and teflon ring. Insert the cylinder rod assembly into the cylinder tube.

IMPORTANT: Ensure that the piston ring fits squarely into the cylinder tube and piston groove, otherwise the ring may be damaged and a leak will occur.

7. Use a spanner wrench to rotate the gland clockwise into the cylinder. Continue to rotate the gland with the spanner wrench until it is tight.

WARNING! **Cylinders serviced in the field are to be tested for leakage prior to the attachment being placed in work. Failure to test rebuilt cylinders could result in damage to the cylinder and/or the attachment, cause severe personal injury or even death.**

TROUBLESHOOTING

PROBLEM	POSSIBLE CAUSE	POSSIBLE SOLUTION
External leaking.	Cylinder seals damaged. (Hydraulic Steering Option)	Replace cylinder seals.
	Broken or loose hydraulic fittings or line.	Check for leaks and repair or replace.
	Motor gasket damaged.	Replace.
Vibratory Plow not vibrating.	Loader auxiliary hydraulics not engaged.	Refer to loader operator's manual.
	Inadequate hydraulic flow from loader.	Check hydraulic flow to plow.
	Low oil supply.	Add oil.
	Couplers not engaged.	Engage couplers.
	Air in hydraulic lines.	Activate system until air is purged from system.
	Broken hose.	Replace damaged hose.
	Obstructions in hydraulic lines.	Remove obstructions and replace if necessary.
	Loose or damaged hydraulic connection.	Tighten or replace fittings.
	Motor damaged or seal blown.	Call Bradco's service department for instructions.
	Ground speed too fast.	Reduce ground speed.
Vibratory plow fails to maintain angle. (Hydraulic Steering Option)	Broken or leaking hydraulic lines.	Replace broken hose and check for leaks.
	Oil leaking past cylinder packings.	Replace cylinder seals.

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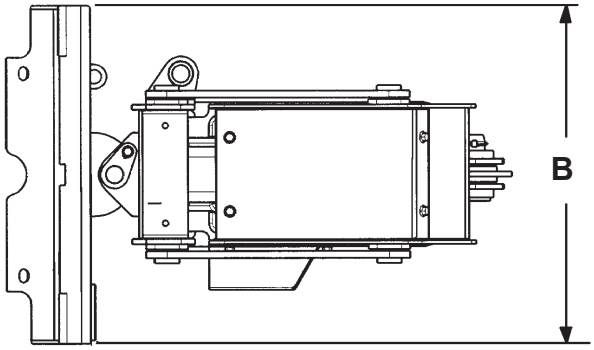
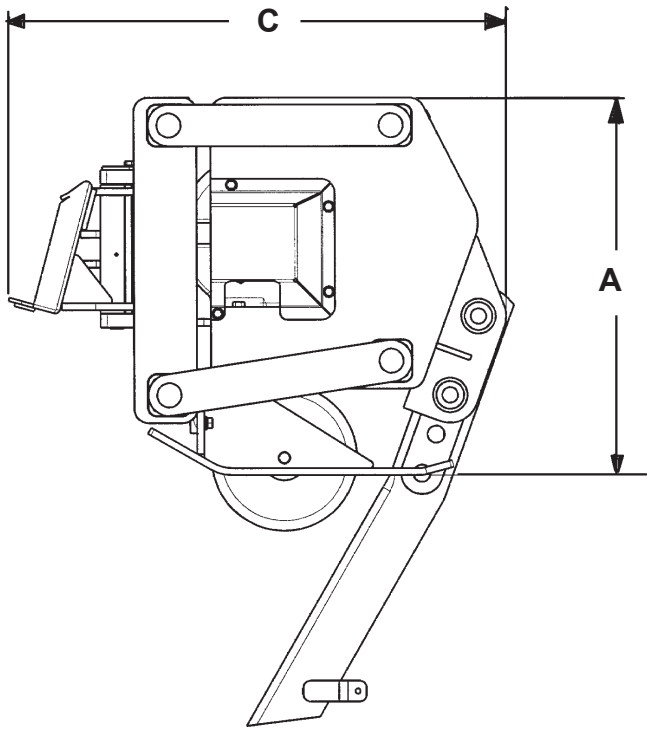
TROUBLESHOOTING

PROBLEM	POSSIBLE CAUSE	POSSIBLE SOLUTION
Vibratory Plow angles too slowly. (Hydraulic Steering Option)	Cold oil.	Warm oil with engine at idle.
	Engine speed too slow.	Open Throttle.
	Oil leaking past cylinder packings.	Replace cylinder seals.
Excessive noise.	Ground speed too slow.	Adjust ground speed.
	Bushing(s) worn or damaged.	Replace as necessary.
	Turning radius too sharp for ground speed.	Adjust the hydraulic angle to increase turning radius and adjust travel speed as required.
Vibratory plow stalls	Ground speed too fast.	Adjust ground speed.
Excessive vibration transferred to loader and mounting bracket.	Ground speed too fast for ground condition.	Adjust ground speed.
	Underground obstruction.	Locate and remove obstruction or reroute cable.

SPECIFICATIONS
VIBRATORY PLOW





SPECIFICATIONS AND DESIGN ARE SUBJECT TO CHANGE WITHOUT NOTICE AND WITHOUT LIABILITY THEREFOR.

SPECIFICATIONS

DESCRIPTION	SPECIFICATION
A. Overall Height	27.1"
B. Overall Width	24.5"
C. Overall Length	35.8"
Flow Requirements (GPM)	8-14
Operating Pressure (PSI)	1500-2500
Weight (LBS)	510#

NOTE: Dimensions DO NOT include blade or coulter wheel.

BOLT TORQUE SPECIFICATIONS

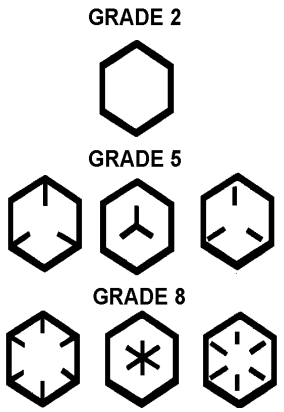
GENERAL TORQUE SPECIFICATION TABLES

Use the following charts when determining bolt torque specifications when special torques are not given. Always use grade 5 or better when replacing bolts.

SAE BOLT TORQUE SPECIFICATIONS

NOTE: The following torque values are for use with extreme pressure lubricants, plating or hard washer applications Increase torque 15% when using hardware that is unplated and either dry or lubricated with engine oil.

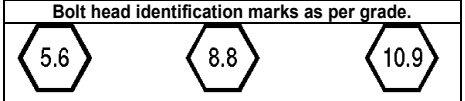
Bolt Size		SAE GRADE 5 TORQUE Pounds Feet		SAE GRADE 5 TORQUE Newton-Meters		SAE GRADE 8 TORQUE Pounds Feet		SAE GRADE 8 TORQUE Newton-Meters		Bolt head identification marks as per grade. NOTE: Manufacturing Marks Will Vary
Inches	Millimeters	UNC	UNF	UNC	UNF	UNC	UNF	UNC	UNF	
1/4	6.35	8	9	11	12	10	13	14	18	
5/16	7.94	14	17	19	23	20	25	27	34	
3/8	9.53	30	36	41	49	38	46	52	62	
7/16	11.11	46	54	62	73	60	71	81	96	
1/2	12.70	68	82	92	111	94	112	127	152	
9/16	14.29	94	112	127	152	136	163	184	221	
5/8	15.88	128	153	174	207	187	224	254	304	
3/4	19.05	230	275	312	373	323	395	438	536	
7/8	22.23	340	408	461	553	510	612	691	830	
1	25.40	493	592	668	803	765	918	1037	1245	
1-1/8	25.58	680	748	922	1014	1088	1224	1475	1660	
1-1/4	31.75	952	1054	1291	1429	1547	1700	2097	2305	
1-3/8	34.93	1241	1428	1683	1936	2023	2312	2743	3135	
1-1/2	38.10	1649	1870	2236	2535	2686	3026	3642	4103	



METRIC BOLT TORQUE SPECIFICATIONS

NOTE: The following torque values are for use with metric hardware that is unplated and either dry or lubricated with engine oil. Reduce torque 15% when using hardware that has extreme pressure lubricants, plating or hard washer applications.

Bolt head identification marks as per grade.



Size of Bolt	Grade No.	Pitch (mm)	Pounds Feet	Newton-Meters	Pitch (mm)	Pounds Feet	Newton-Meters
M6	5.6	1.0	3.6-5.8	4.9-7.9	-	-	-
	8.8		5.8-.4	7.9-12.7		-	-
	10.9		7.2-10	9.8-13.6		-	-
M8	5.6	1.25	7.2-14	9.8-19	1.0	12-17	16.3-23
	8.8		17-22	23-29.8		19-27	25.7-36.6
	10.9		20-26	27.1-35.2		22-31	29.8-42
M10	5.6	1.5	20-25	27.1-33.9	1.25	20-29	27.1-39.3
	8.8		34-40	46.1-54.2		35-47	47.4-63.7
	10.9		38-46	51.5-62.3		40-52	54.2-70.5
M12	5.6	1.75	28-34	37.9-46.1	1.25	31-41	42-55.6
	8.8		51-59	69.1-79.9		56-68	75.9-92.1
	10.9		57-66	77.2-89.4		62-75	84-101.6
M14	5.6	2.0	49-56	66.4-75.9	1.5	52-64	70.5-86.7
	8.8		81-93	109.8-126		90-106	122-143.6
	10.9		96-109	130.1-147.7		107-124	145-168
M16	5.6	2.0	67-77	90.8-104.3	1.5	69-83	93.5-112.5
	8.8		116-130	157.2-176.2		120-138	162.6-187
	10.9		129-145	174.8-196.5		140-158	189.7-214.1
M18	5.6	2.0	88-100	119.2-136	1.5	100-117	136-158.5
	8.8		150-168	203.3-227.6		177-199	239.8-269.6
	10.9		175-194	237.1-262.9		202-231	273.7-313
M20	5.6	2.5	108-130	146.3-176.2	1.5	132-150	178.9-203.3
	8.8		186-205	252-277.8		206-242	279.1-327.9
	10.9		213-249	288.6-337.4		246-289	333.3-391.6

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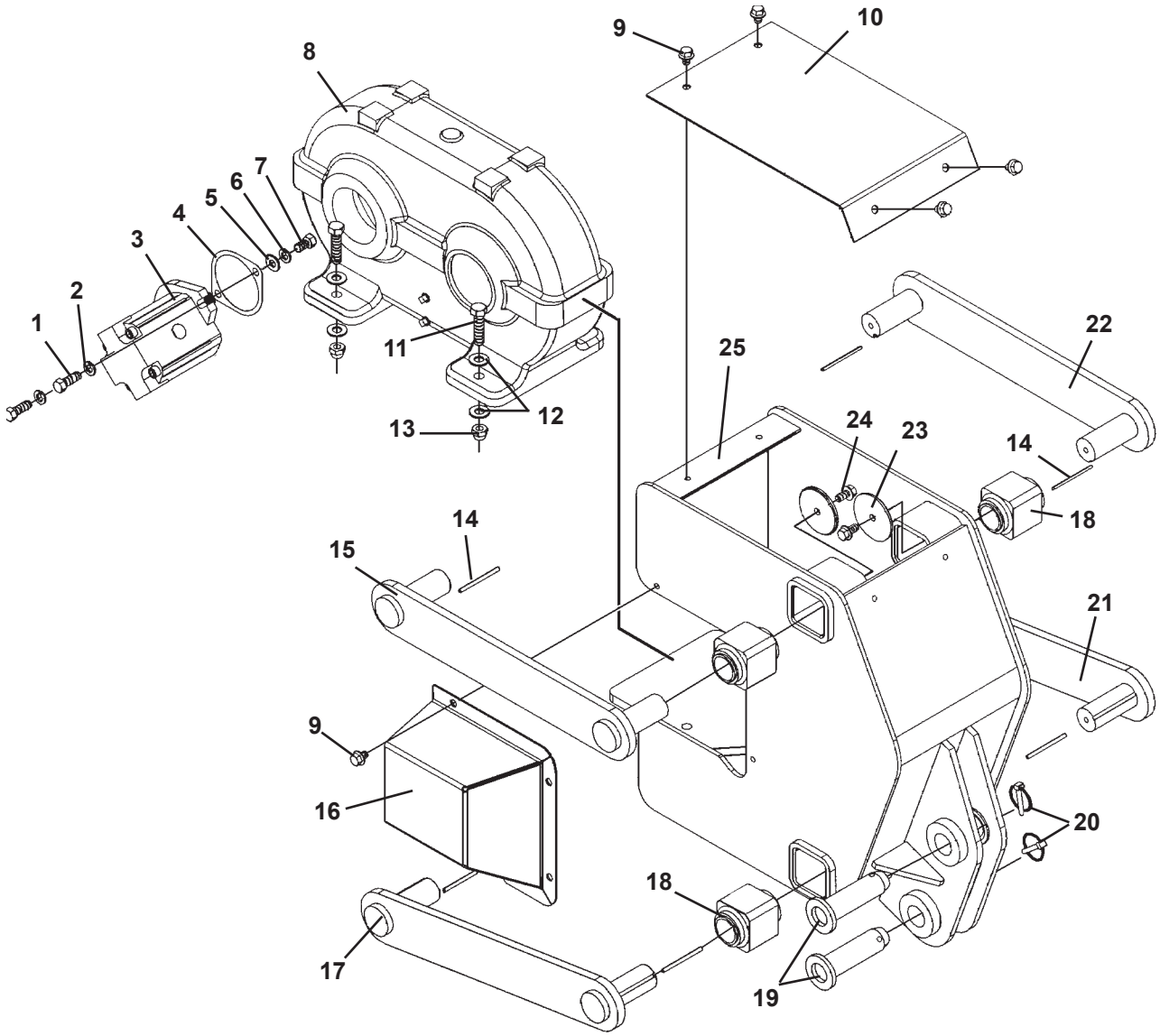
VIBRATORY PLOW ASSEMBLY

ASSEMBLIES #19000 & #19693

DIAGRAM 1 OF 2



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VIBRATORY PLOW ASSEMBLY

ASSEMBLIES #19000 & #19693

LIST 1 OF 2

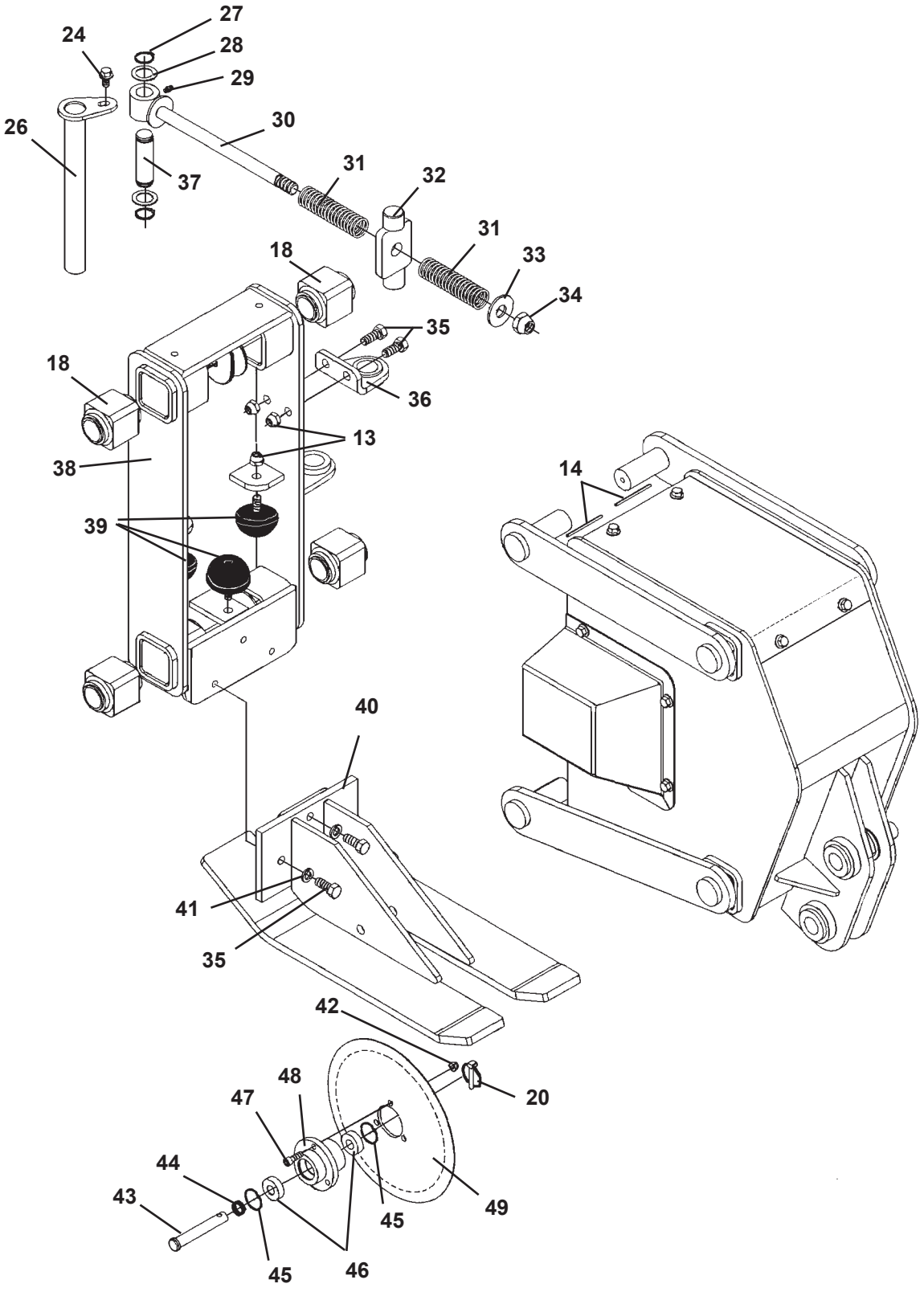
ITEM	REQ'D	PART NO.	DESCRIPTION
1	2	10085	.44" UNC X 1.25" Sockethead Capscrew
2	2	1504	.44" Lock Washer
3	1	19645	Hydraulic Motor 7.5 - 11 GPM (Assembly #19693)
	1	19314	Hydraulic Motor 9.5 - 14 GPM (Assembly #19000)
	**	19814	Replacement Motor Seal Kit
	-	19815	Replacement Motor Shaft Key
4	1	22532	Motor Gasket
5	1	1512	Flat Washer
6	1	1502	Lock Washer
7	1	1020	.31" UNC X .50" Hex Capscrew
8	1	2000515	Drive
9	8	1961	.38" UNC X .50" Flange Head Capscrew
10	1	17864	Top Cover
11	4	10086	.50" UNC X 2.25" Hex Capscrew Grade 8
12	8	1646	.50" Hard Flat Washer
13	9	1841	.50" UNC Deformed Oval Lock Nut
14	8	18695	Key
15	1	18692	Top Right Link
16	1	19285	Motor Cover
17	1	17857	Bottom Right Link
18	8	18805	Square Bonded Bushing
19	2	17866	Blade Pin
20	3	6626	Klik Pin
21	1	17859	Bottom Left Link
22	1	17856	Top Left Link
23	8	17862	Keeper
24	9	1953	.38" UNC X .75" Tapping Screw
25	1	2006901	Front Frame

**** Field replacement of the internal motor seals voids warranty.**

VIBRATORY PLOW ASSEMBLY

ASSEMBLIES #19000 & #19693

DIAGRAM 2 OF 2



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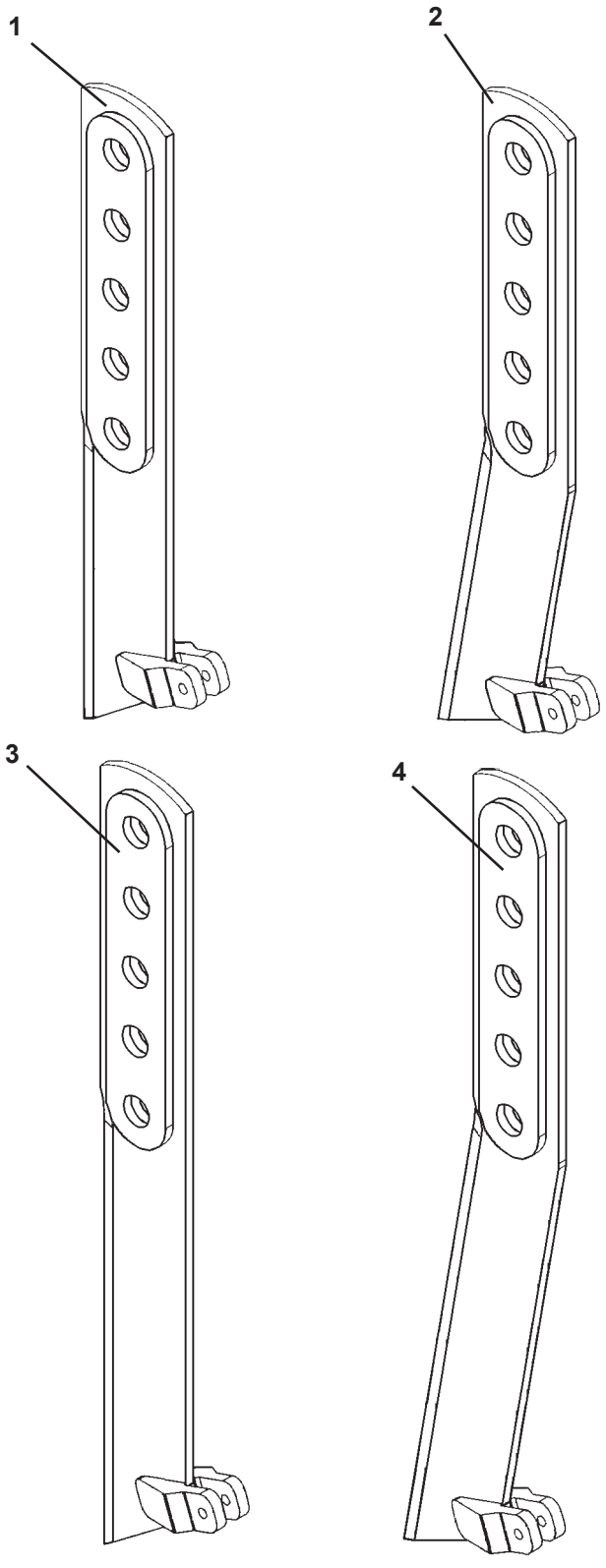
VIBRATORY PLOW ASSEMBLY

ASSEMBLIES #19000 & #19693

LIST 2 OF 2

ITEM	REQ'D	PART NO.	DESCRIPTION
13	*9*	*1841*	*.50" UNC Deformed Oval Lock Nut*
14	*8*	*18695*	*Key*
18	*8*	*18805*	*Square Bonded Bushing*
20	*3*	*6626*	*Klik Pin*
24	*9*	*1953*	*.38" UNC X .75" Tapping Screw*
26	1	18875	Main Pivot Pin
27	2	6612	Snap Ring
28	2	57462	Thrust Washer
29	1	6616	Grease Fitting
30	1	18821	Spring Rod
31	2	100212	Spring
32	1	18818	Pivot Plate
33	1	1518	.75" Flat Washer
34	1	1534	.75" UNC Nylock Nut
35	5	1780	.50" UNC X 1.25" Hex Capscrew - Grade 8
36	1	18748	Pivot Mount
37	1	18747	Pivot Pin
38	1	17852	Rear Frame
39	3	6886	Rubber Bumper
40	1	2007430	Pressure Foot
41	3	1505	.50" Lock Washer
42	3	1753	.31" UNC Nylock Nut
43	1	22261	Coulter Pin
44	1	18467	Coulter Pin Spring
45	2	1596	Spiral Ring
46	2	2002332	Ball Bearing
47	3	10066	.31" x 1.00" Socket Head Shoulder Screw
48	1	2000804	Coulter Hub
49	1	17949	Coulter Wheel

BLADE ASSEMBLIES



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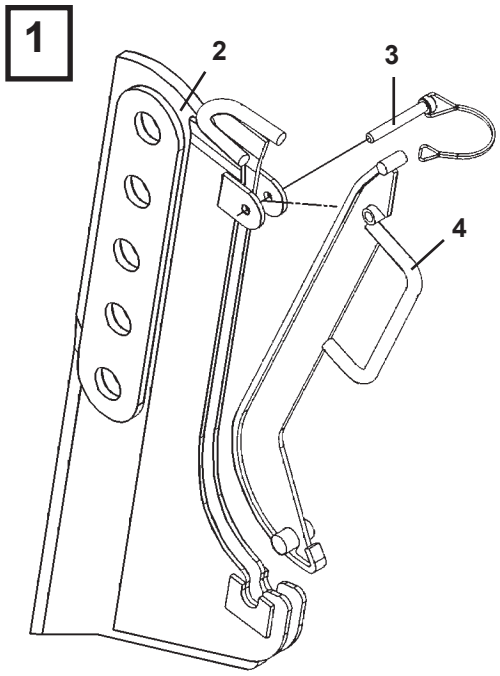
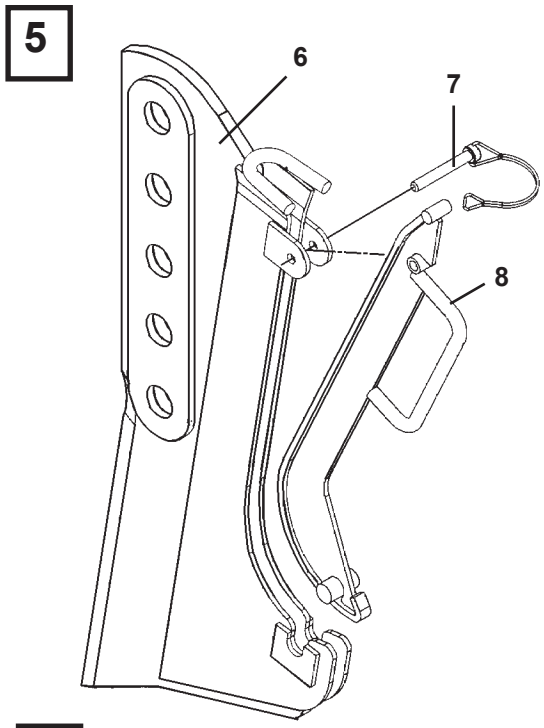
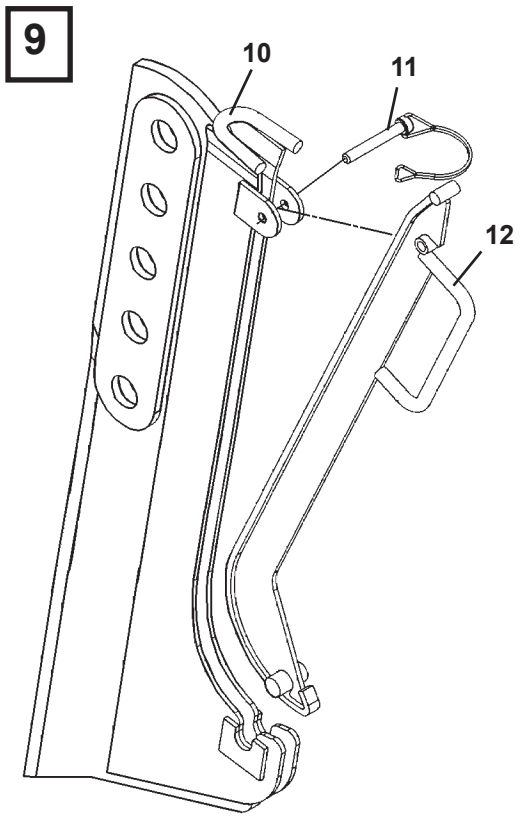
BLADE ASSEMBLIES

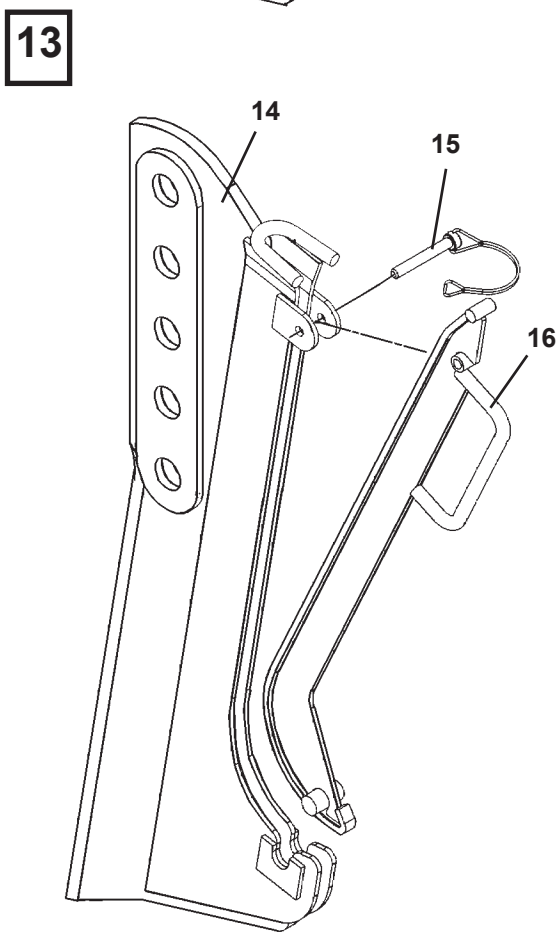
NO	REQ'D	PART NO.	DESCRIPTION
1	--	19325	20° .38" Blade (6"-12" Depth with 1" Clevis)
2	--	19441	30° .38" Blade (6"-12" Depth with 1" Clevis)
3	--	18690	20° .38" Blade (12"-18" Depth with 1" Clevis)
4	--	2007030	30° .38" Blade (12"-18" Depth with 1" Clevis)

CHUTE BLADE ASSEMBLIES









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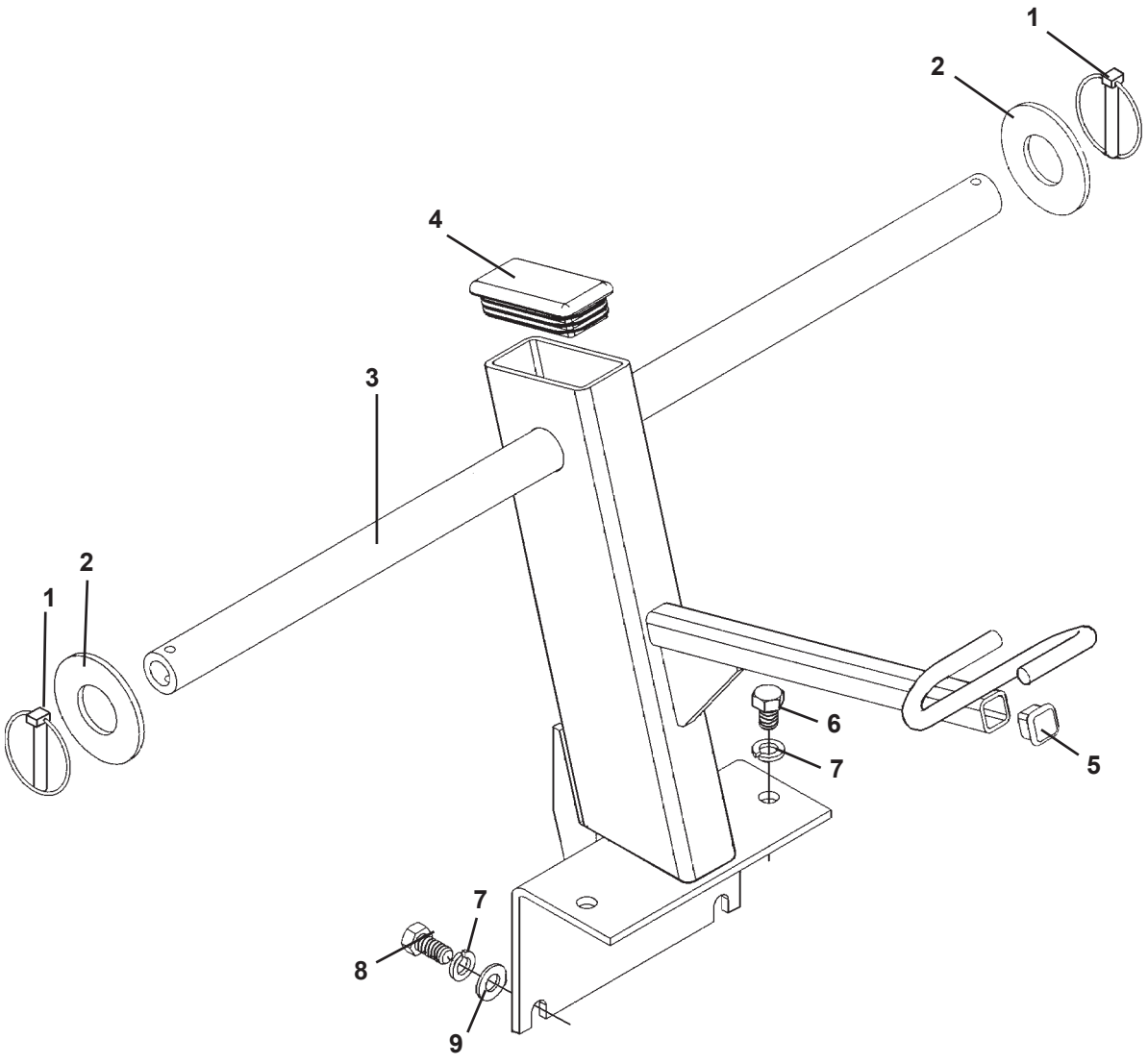
CHUTE BLADE ASSEMBLIES

ITEM	REQ'D	PART NO.	DESCRIPTION
1	--	**19442**	**20° .50" Chute Blade Assembly (6"-12" Depth) (Includes Items 2 thru 4)**
2	1	19447	Blade
3	1	10041	Safety Snap Pin
4	1	19464	Chute
5	--	**19443**	**30° .50" Chute Blade Assembly (6"-12" Depth) (Includes Items 6 thru 8)**
6	1	19448	Blade
7	1	10041	Safety Snap Pin
8	1	19464	Chute
9	--	**19444**	**20° .50" Chute Blade Assembly (12"-18" Depth) (Includes Items 10 thru 12)**
10	1	19449	Blade
11	1	10041	Safety Snap Pin
12	1	19465	Chute
13	--	**19445**	**30° .50" Chute Blade Assembly (12"-18" Depth) (Includes Items 14 thru 16)**
14	1	19450	Blade
15	1	10041	Safety Snap Pin
16	1	19465	Chute

CABLE REEL MOUNTING KIT

ASSEMBLY #19085



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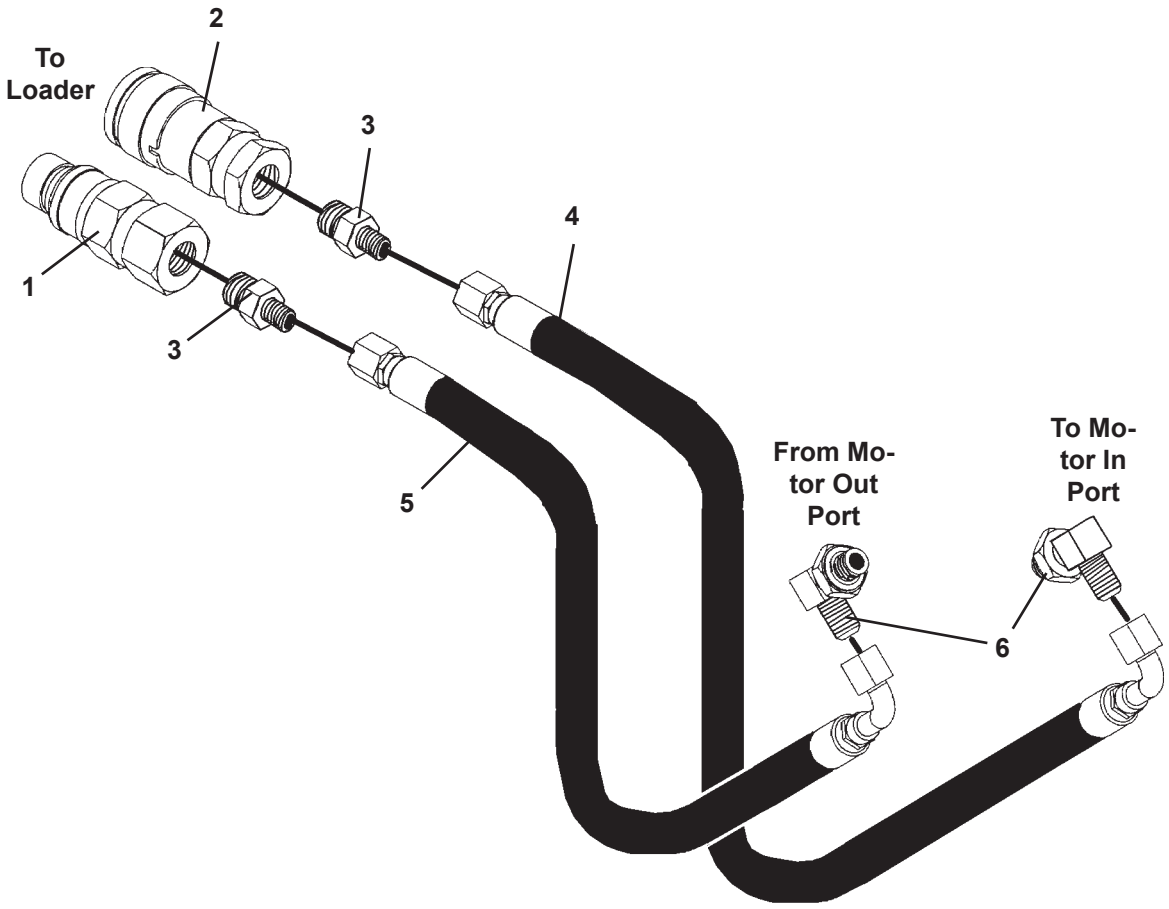
CABLE REEL MOUNTING KIT

ASSEMBLY #19085

ITEM	REQ'D	PART NO.	DESCRIPTION
1	2	6626	Klik Pin
2	2	1521	Washer
3	1	19086	Cable Reel Mount
4	1	88798	Rectangular Plastic Plug
5	1	19093	1.00" Square Plastic Plug
6	2	1087	.50" UNC X .75" Hex Capscrew
7	4	1505	.50" Lock Washer
8	2	1088	.50" UNC X 1.00" Hex Capscrew
9	2	1516	.50 " Flat Washer

HYDRAULIC ASSEMBLY

HYDRAULIC ASSEMBLY



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HYDRAULIC ASSEMBLY

HYDRAULIC ASSEMBLY

ITEM	REQ'D	PART NO.	DESCRIPTION
1	1	**	Quick Coupler - Male
2	1	**	Quick Coupler - Female
3	2	3103	Straight Connector 8MBo-8MJ
4	1	38117	Hose Assembly .50" x 91" 8FJX-8FJX 90°
5	1	37844	Hose Assembly .50" x 84" 8FJX-8FJX 90°
6	2	3283	90° Elbow 10MBo-8MJ

**** Hydraulic couplers are specific to your loader application. Contact Factory or your local BRADCO dealer to order these items.**

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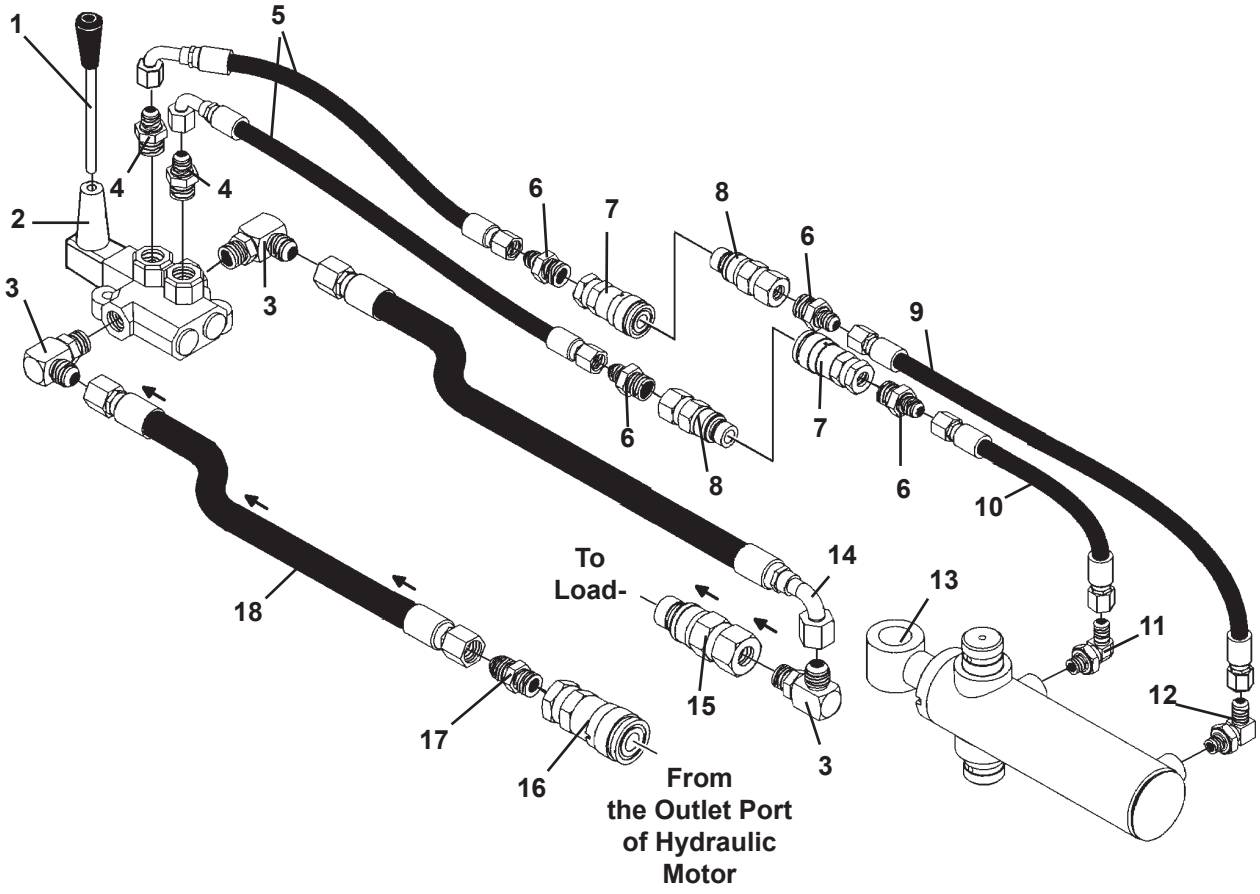
HYDRAULIC ASSEMBLY

HYDRAULIC STEERING ASSEMBLY



9281 8-27-14-2

HYDRAULIC ASSEMBLY

HYDRAULIC STEERING ASSEMBLY

ITEM	REQ'D	PART NO.	DESCRIPTION
1	1	19316	Valve Handle
2	1	19315	3-Position Valve
3	3	3104	90° Elbow 8MBo-6MJ
4	2	3457	Straight Connector 6MBo-6MJ
5	2	38116	Hose Assembly .25" x 57" 6FJX-6FJX 90°
6	4	3269	Straight Connector 8MBo-6MJ
7	2	84928	Quick Coupler - Female
8	2	84923	Quick Coupler - Male
9	1	38114	Hose Assembly .25" x 50" 6FJX-6FJX
10	1	38115	Hose Assembly .25" x 44" 6FJX-6FJX
11	1	30259	90° Elbow with Orifice 6MBo-6MJ
12	1	3434	90° Elbow 6MBo-6MJ
13	1	18727	Cylinder Assembly
14	1	38113	Hose Assembly .50" x 63" 8FJX-8FJX 90°
15	2	**	Quick Coupler - Male
16	2	**	Quick Coupler - Female
17	1	3103	Straight Connector 8MBo-8MJ
18	1	38112	Hose Assembly .50" x 58" 8FJX-8FJX

**** Hydraulic couplers are specific to your loader application. Contact Factory or your local BRADCO dealer to order these items.**

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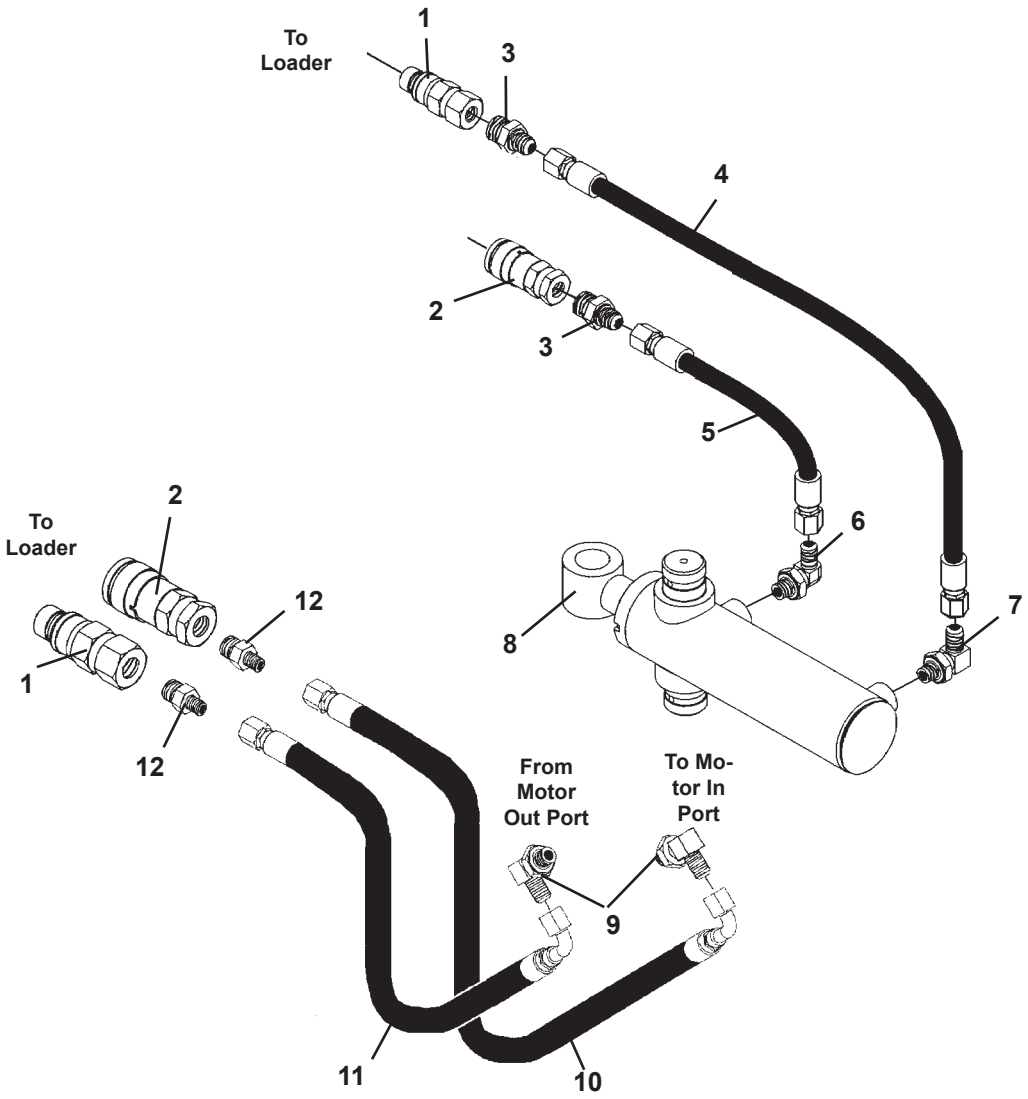
HYDRAULIC ASSEMBLY

HYDRAULIC ASSEMBLY WITH STEERING
(REQUIRES DUAL AUXILIARY HYDRAULICS)



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HYDRAULIC ASSEMBLY

HYDRAULIC ASSEMBLY WITH STEERING
(REQUIRES DUAL AUXILIARY HYDRAULICS)

ITEM	REQ'D	PART NO.	DESCRIPTION
1	2	**	Quick Coupler - Male
2	2	**	Quick Coupler - Female
3	2	3269	Straight Connector 8MBo-6MJ
4	1	38114	Hose Assembly .25" x 50" 6FJX-6FJX
5	1	38115	Hose Assembly .25" x 44" 6FJX-6FJX
6	1	30259	90° Elbow with Orifice 6MBo-6MJ
7	1	3434	90° Elbow 6MBo-6MJ
8	1	18727	Cylinder Assembly
9	2	3283	90° Elbow 10MBo-8MJ
10	1	38117	Hose Assembly .50" x 91" 8FJX-8FJX 90°
11	1	37844	Hose Assembly .50" x 84" 8FJX-8FJX 90°
12	2	3103	Straight Connector 8MBo-8MJ

**** Hydraulic couplers are specific to your loader application. Contact Factory or your local BRADCO dealer to order these items.**

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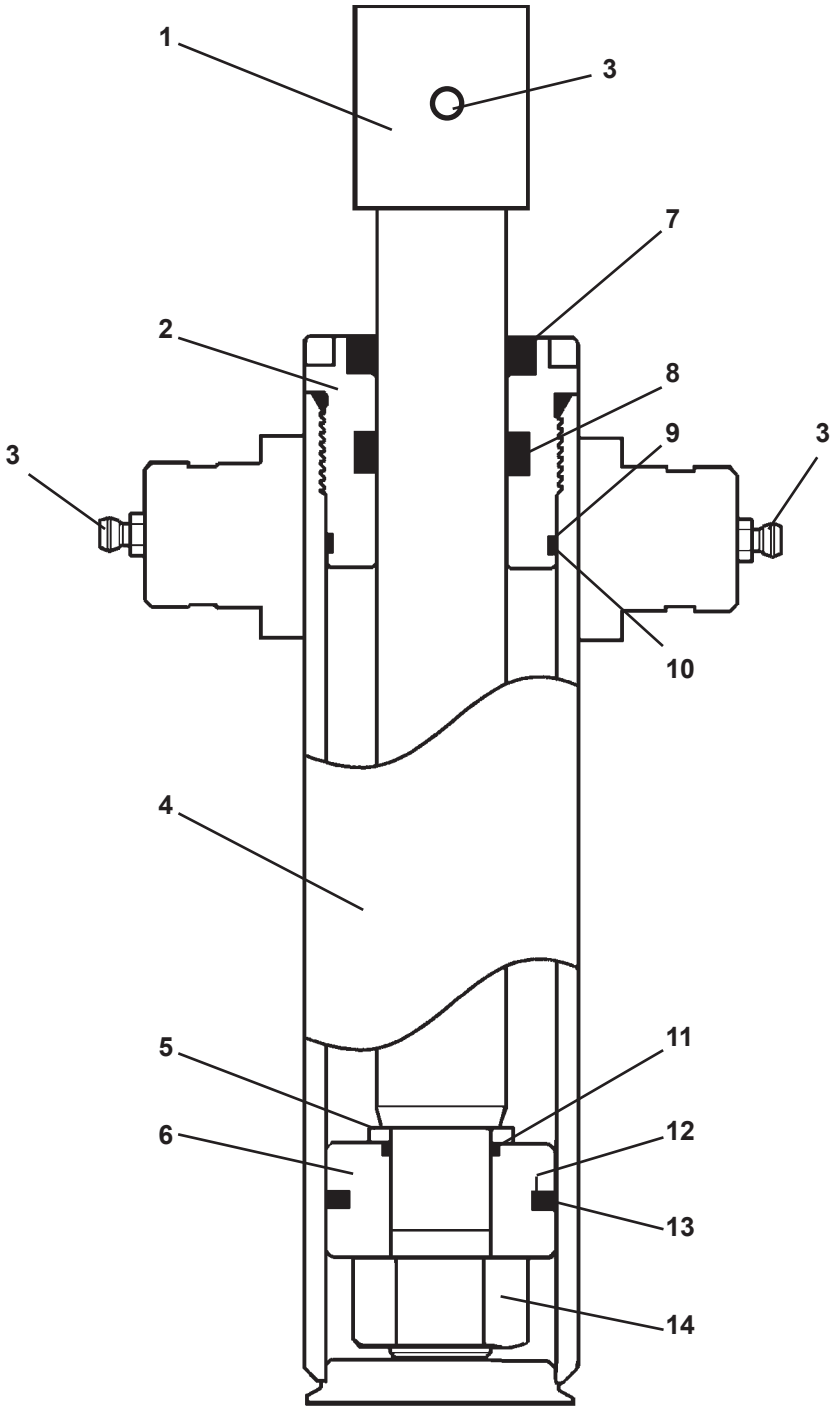
CYLINDER ASSEMBLY

ASSEMBLY #18727



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CYLINDER ASSEMBLY

ASSEMBLY #18727

ITEM	REQ'D	PART NO.	DESCRIPTION
1	1	18729	Cylinder Rod
2	1	89527	Cylinder Gland
3	3	6616	Grease Fitting
4	1	18728	Cylinder Tube
5	1	52644	Special Washer
6	1	6992	Piston
7	1	4981*	Rod Wiper
8	1	45262*	PolyPak Seal
9	1	4634*	Back-Up Washer
10	1	4633*	O'Ring
11	1	4635*	O'Ring
12	1	4637*	O'Ring
13	1	4636*	Piston Ring
14	1	1482	Deformed Lock Nut

NOTE: Seal kit #45581 includes all parts marked with an asterisk (*). Parts are not sold separately.

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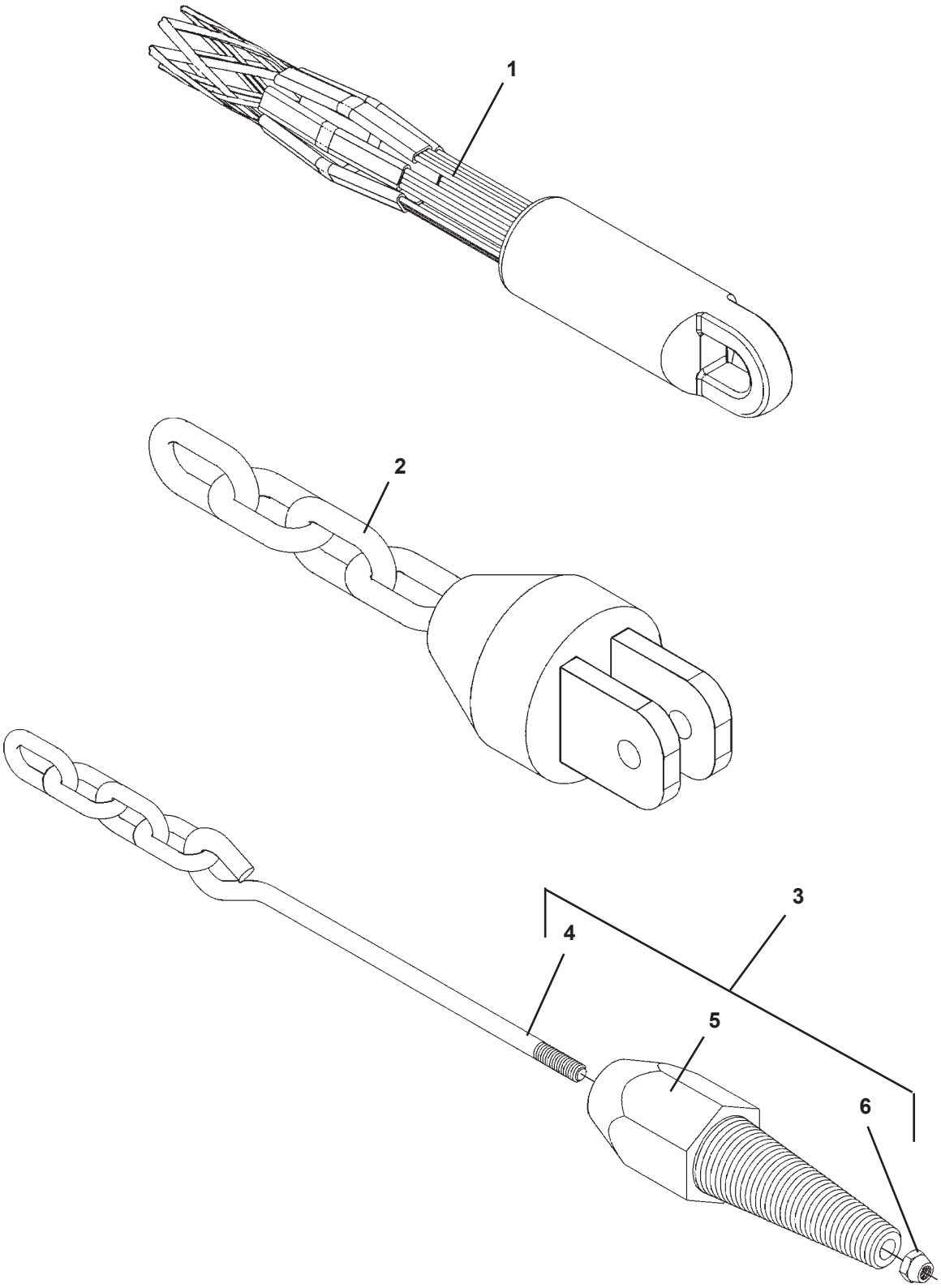
OPTIONS



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OPTIONS

ITEM	REQ'D	PART NO.	DESCRIPTION
1	1	2001171	Cable Pull Grip
2	1	17754	2.5" Pull Bullet
3	--	18740	Pipe Puller Assembly (Includes Items 4 thru 6)
4	1	17861	Chain Assembly
5	1	18746	Pipe Bullet
6	1	1837	.38" UNC Deformed Oval Lock Nut

Dealer’s stamp

CNH Industrial America LLC reserves the right to make improvements in design and changes in specifications at any time without notice and without incurring any obligation to install them on units previously sold. Specifications, descriptions, and illustrative material herein are as accurate as known at time of publication, but are subject to change without notice.

Availability of some models and equipment builds varies according to the country in which the equipment is being used. For exact information about any particular product, please consult your CNH Industrial America dealer.

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