OPERATOR'S MANUAL

Powered Reaming Head Series II

Supplement for the
240A-308A-339A Operator's Manual
4812A Operator's Manual

Publication No. 050087A

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SERVICE • RELIABILITY • INNOVATION

Introduction

This supplement to the 240A/308A/339A Operator's Manual and 4812A Operator's Manual contains important safety, operation, and maintenance information for your Akkerman Powered Reaming Head Attachment. You must read and understand this manual AND your GBM Operator's Manual before you operate and maintain this equipment. Keep this manual with your Guided Boring Machine at all times. Additional copies of this manual may be purchased from the Akkerman Aftermarket Support Department, or downloaded from the Akkerman web site at www.akkerman.com.

The contractor is responsible for the overall safety program on the job site. Use this manual as a part of the safety program.

The use of second rate parts could affect the efficient performance of this equipment. ALWAYS use genuine Akkerman parts.

Understand safety signal words, DANGER, WARNING, CAUTION, SAFETY INSTRUCTIONS, and NOTICE. When you see these words in this manual or on safety decals mounted on your equipment, follow the safety message to avoid personal injury and/or property damage.

⚠DANGER Indicates an extremely hazardous situation which, if not avoided, WILL result in death or serious injury.

⚠WARNING Indicates a potentially hazardous situation which, if not avoided, COULD result in death or serious injury.

⚠CAUTION Indicates a potentially hazardous situation, which, if not avoided, MAY result in minor or moderate injury. It may also be used to alert against unsafe practices.

SAFETY INSTRUCTIONS Usually consists of individual messages stating procedures or actions that must be followed for the safe operation of a product.

NOTICE Identifies potential property damage and important installation, operator, or maintenance information.

Powered Reaming Head Series II

The Powered Reaming Head is the upsizing tool for displaceable ground installed between the pipeline of 11" OD temporary casings and augers and the final product pipe. The spoils are moved to the reception shaft for removal.

If you find any errors with this manual or know of ways to improve procedures, please let us know. Mail your suggestions to: Akkerman Inc, ATTN: Technical Publications, 58256 266th Street, Brownsdale, MN 55918.

Akkerman Inc. reserves the right to improve its product without notice or obligation.

Contents

Safety

BE ALERT FOR SAFETY INFORMATION

When you see this safety alert symbol on your equipment or in this manual, be alert to the possibility of personal injury or property damage.

Read all safety information.

Keep safety decals clean and in good condition. Replace missing or damaged safety decals.

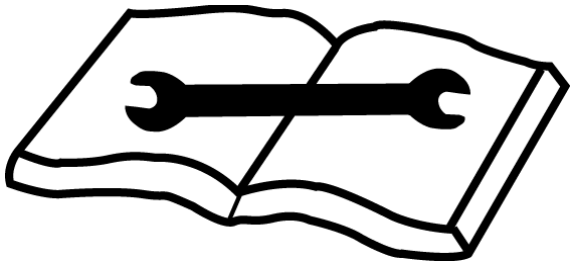
ATTENTION!
BECOME ALERT!
YOUR SAFETY IS INVOLVED!

READ OPERATOR'S MANUAL

⚠WARNING Unsafe operation or maintenance can cause severe injury or death.

Read and understand the Operator's Manual before operating or servicing this equipment.

Any unauthorized modifications will void the warranty.



WEAR PROTECTIVE CLOTHING

Wear OSHA approved protective clothing, such as hard hat, gloves, safety goggles, earmuffs or ear plugs, face shield, and steel-toed boots, when operating and servicing this equipment.

Wear reasonably close fitting clothing and remove jewelry before working on or near this equipment. This will help prevent the danger of catching them in moving parts or controls.

LOCKOUT POWER BEFORE SERVICING

⚠WARNING Failure to lockout power before servicing can cause severe personal injury or death.

LOCKOUT main power supply before servicing. Electrical repairs must be performed only by a certified electrician.

HYDRAULIC OIL/FLUIDS UNDER PRESSURE

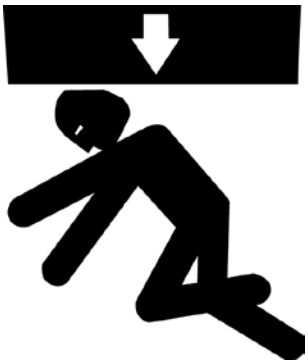
⚠WARNING Escaping oil or other fluids under pressure can penetrate your skin causing serious injury.

Release all pressure before performing maintenance or repairs. Never weld near pressurized fluid lines.

DO NOT use your hands to check for leaks. When searching for leaks, use a piece of wood or cardboard.

Contact medical help immediately if any oil or fluid is injected into your skin. A serious infection or reaction can emerge without proper medical treatment.

BEWARE OF SUSPENDED LOADS



⚠WARNING Suspended loads may fall and cause severe personal injury or death.

If a hydraulic hose breaks from the boom of a crane/excavator, or the lifting support fails, the boom and/or load can fall instantly.

Do not enter area under or around a suspended load.

KEEP PERSONNEL AWAY FROM MOVING PARTS

⚠WARNING Crushing hazard.
Keep personnel away from inside of GBM when jacking or moving GBM. Failure to do so could result in serious personal injury or death.

UNAUTHORIZED WELDING

⚠WARNING Unauthorized welding can cause structural failure resulting in possible injury or death.

Do not weld on any structural member. Unauthorized welding or repair will void the warranty.

HANDLING AUGER CASINGS

⚠WARNING Auger may fall out of casing and cause severe injury or death if casing tips or hits an obstruction.

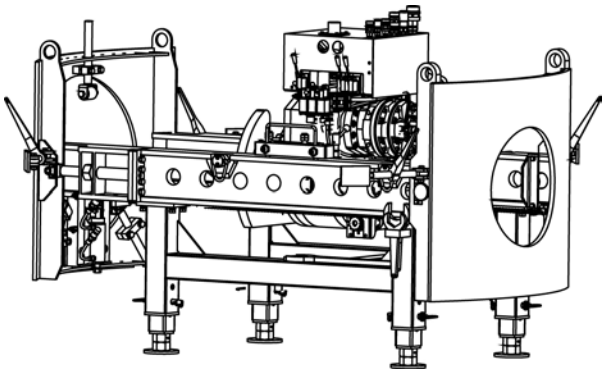
Properly install safety chain assembly to augers and casings before lowering into or lifting out of shaft.

Do not stand or walk under a load.

REGULARLY CLEAN AND INSPECT EQUIPMENT

Remove any grease, oil, or debris buildup to avoid potential injury or equipment damage.

Inspect equipment for damage. If damaged, repair or replace immediately.



PRACTICE SAFE MAINTENANCE

⚠WARNING Unexpected Jacking System movement may cause serious personal injury.

LOCKOUT power before performing any maintenance.

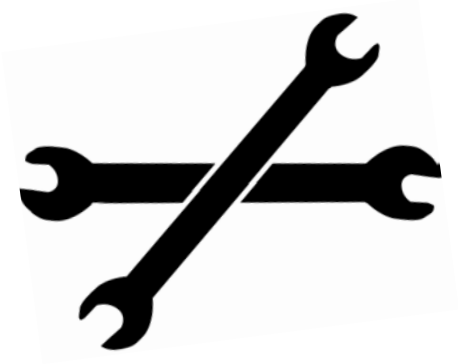
Shut down GBM before making repairs, adjustments, or removing obstructions.

Only trained and qualified personnel should perform maintenance or repairs.

Keep the area around the equipment clean and dry when performing maintenance.

Do not service the machine while it is in motion.

Replace worn or damaged parts. Remove grease, oil, or debris buildup.



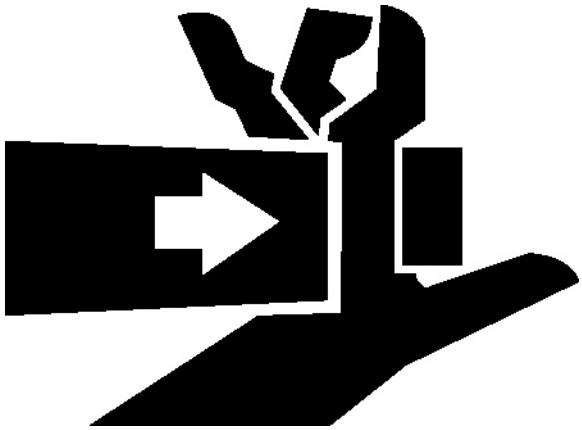
AVOID PINCH POINTS

⚠WARNING Moving parts or the mishandling of parts can cause severe personal injury.

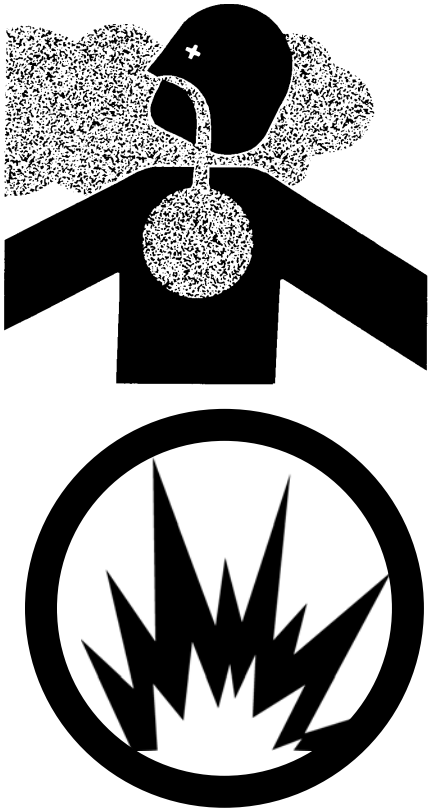
Keep hands away from moving parts.

Watch your fingers, hands, and legs while equipment is in operation.

Handle parts carefully to avoid crushing and pinch point hazards.



TEST SHAFT & TUNNEL VENTILATION



⚠WARNING Keep shafts and tunnel well ventilated at all times.

Use an approved air analyzer to detect hazardous gases and oxygen content.

Before and during the shaft operation, test for combustible and toxic gases and oxygen deficiency.

If the levels exceed OSHA prescribed levels, leave tunnel and shaft immediately! Do not activate or deactivate any electrical or hydraulic devices, since any sparks could cause an explosion.

Once ALL personnel are out of tunnel/shaft, cut power from power source.

Gases must be removed before reentering tunnel/shaft.

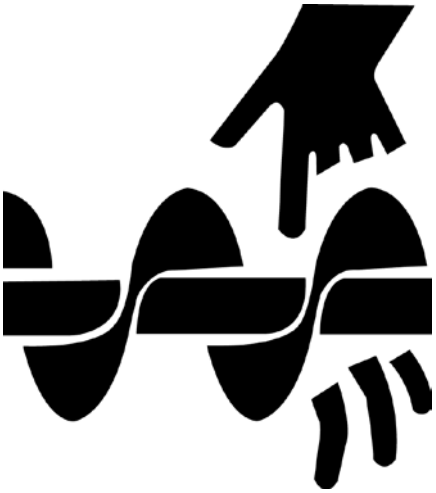
FIRE PREVENTION

⚠CAUTION Fires can cause injury or property damage.

Keep equipment clean. Remove all debris from equipment.

Have a fire extinguisher available at all times. Keep the fire extinguisher fully charged.

KEEP AWAY FROM AUGER



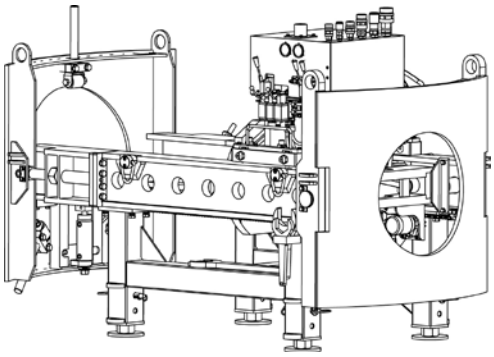
⚠DANGER Contact with rotating auger will cause severe injury or death.

Keep hands, body, and objects clear of operating auger.

Do not operate without covers and guards in place.

Lockout power before servicing.

HIGH PRESSURE HYDRAULICS



⚠WARNING The GBM and Powered Reaming Head use high pressure hydraulics.

Keep all guards in place.

KEEP JOB SITE CLEAN AND ORGANIZED

⚠WARNING Tripping can cause serious personal injury.

Be sure to keep job site clean and organized.

SLIPPERY WHEN WET

⚠WARNING Slips and falls can cause serious personal injury.

Ensure firm footing in wet or slippery conditions.

Replace skid-resistant material if it is damaged or missing to prevent slips and falls.

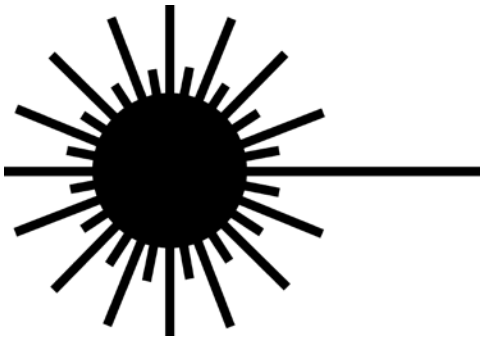
Remove any buildup of grease, oil, or debris.

NO SMOKING IN TUNNEL

⚠WARNING Smoking in tunnel could cause an explosion if combustible gases are present.

Do not smoke in tunnel.

AVOID LASER LIGHT EXPOSURE

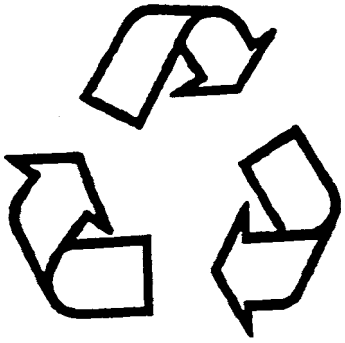


⚠DANGER Staring into laser light will cause severe injury.

Do not stare into laser guidance system light beam. Avoid direct eye exposure.

To avoid possible exposure to radiation in excess of acceptable emission limits, all repairs to laser must be performed by the original manufacturer or an authorized service technician.

RECYCLE WASTE



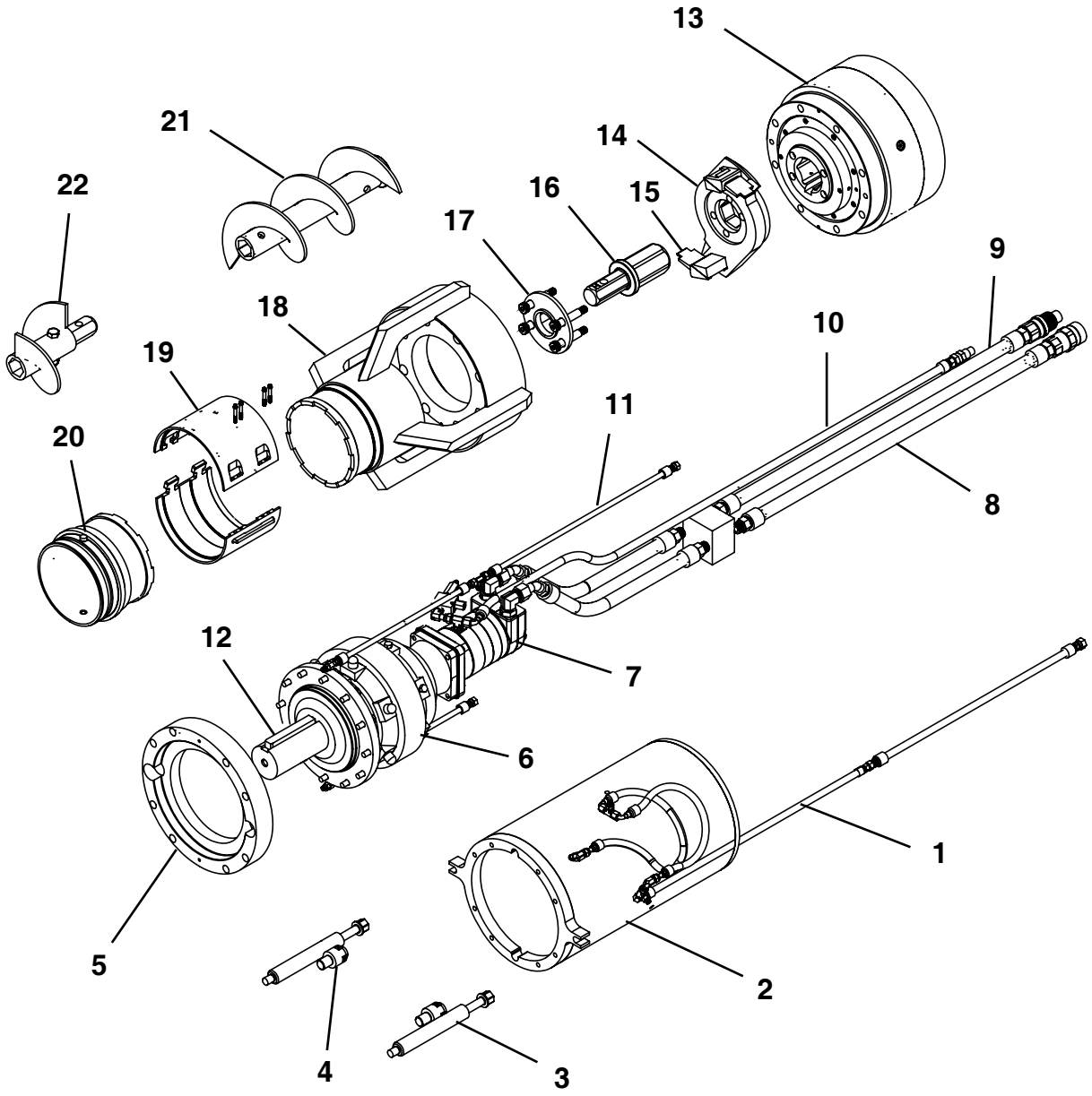
Follow local, state, federal, and international regulations when recycling or disposing of waste. Waste includes fluids/oil, fuel, filters, coolant, and batteries.

Use leakproof containers when draining fluids/oil. Do not pour waste on the ground, down a drain, or into any water source.

NOTES

Terminology

POWERED REAMING HEAD SERIES II



1. Lubrication Circuit
2. PRH Skin Housing Assembly
3. Tensioning Rod
4. Alignment Pin
5. Gear Box Mount
6. Gear Box
7. Hydraulic Auger Drive Motor
8. Pressure Hose
9. Return Hose
10. Case Drain Hose
11. Jetting Circuit
12. Key
13. Bearing Assembly
14. PRH Cutter Bit Assembly
15. Replaceable Teeth
16. Hex Coupler
17. Retainer Plate
18. Reaming Assembly
19. Notched Casing Collar
20. Transition Casing*
21. Lead Auger
22. Single Pitch Auger*

* Used to connect reaming head to non-notched casings.

NOTES

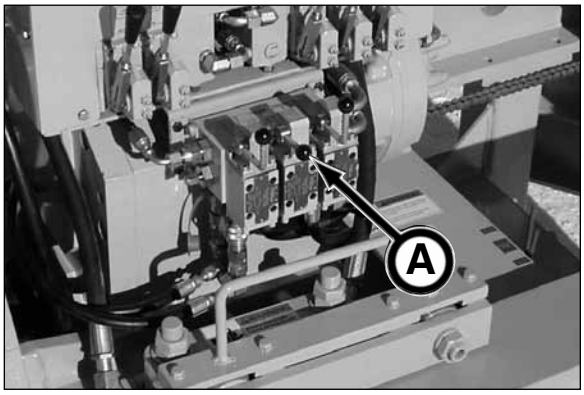
Controls & Instruments

DRIVE SPEED ROTATION SELECTOR (GBM 240A/308A/339A)

The drive speed selector (A) controls the rotational drive motor speed.

When using auger casings, use the HSLT or High Speed Low Torque position.

The LSHT or Low Speed High Torque position is typically used for pushing pilot tubes.



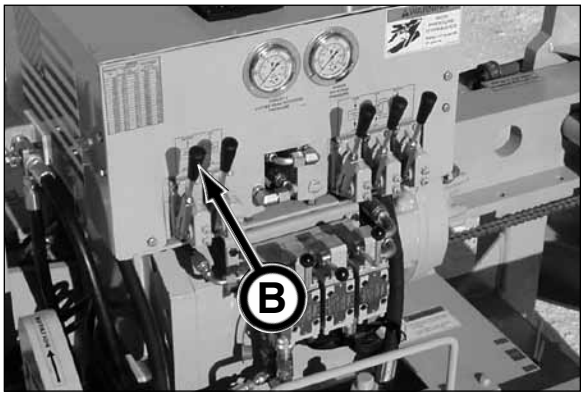
NOTICE Depending on soil conditions and length of drive, for better augering performance you may want to change the speed selector from HSLT position to the LSHT position.

LSHT - Push lever Up
HSLT - Pull lever Down

THRUST CYLINDER CONTROL (GBM 240A/308A/339A)

Use the thrust cylinder control (B) to extend and retract the frame travel cylinders.

Extend Cylinders - Push lever Up
Retract Cylinders - Pull lever Down

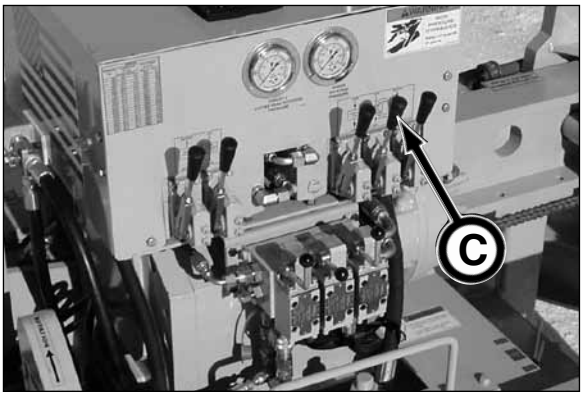


PRH - AUGER CONTROL (GBM 240A/308A/339A)

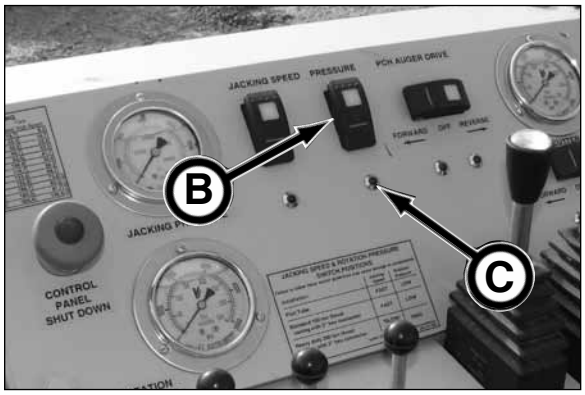
The auger control (C) is used to rotate the powered reaming head auger.

Always rotate the PRH auger in the counter- clockwise (CCW) direction. This will move the spoils to the reception shaft.

Clockwise (CW) Rotation - Push lever Up
Counter-Clockwise (CCW) Rotation - Pull lever Down



ROTATION PRESSURE SWITCH (GBM 4812A)



The rotation pressure switch (B) is used to control the pressure of the GBM frame auger drive rotation.

Select Low or High on the rotation pressure switch as follows:

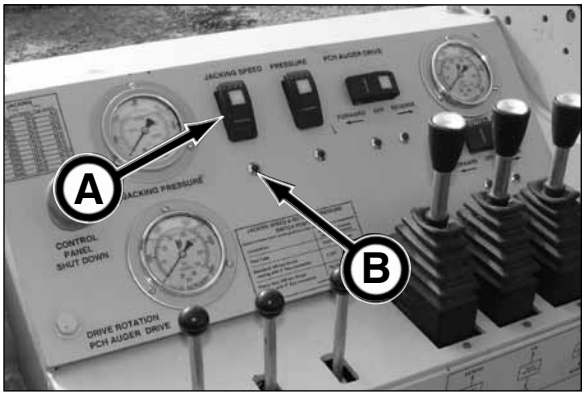
Low - 10,500 ft/lb torque (2,500 psi max)
Use for PRH with 2” hex connector, up to 100 ton maximum rated pipe, and soft ground conditions.

High - 20,000 ft/lb torque (5,000 psi max)
Do not use this switch with the Powered Reaming Head. Doing so will cause damage.

IMPORTANT: ***When using the Powered Reaming Head with the 4812A and Power Pack, the power pack engine speed must be reduced to 1,500 rpm to limit the hydraulic flow. Using the PRH with a higher power pack engine speed will cause the augers to rotate too fast and possibly result in over excavation.***

NOTICE The LED light (C) below the switch will illuminate indicating the function is in operation.

JACKING SPEED SWITCH (GBM 4812A)



The jacking speed switch (A) controls the advance speed of the thrust cylinders.

Select Slow or Fast on the jacking speed control as follows:

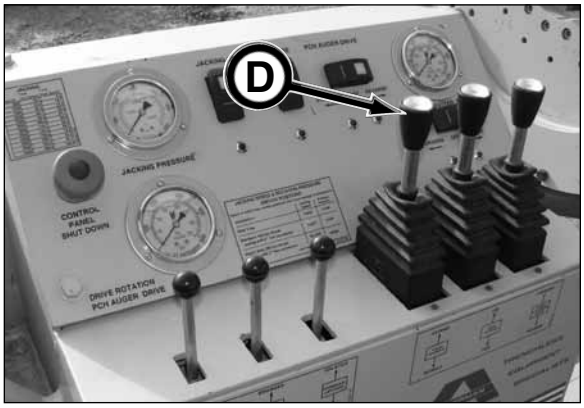
Fast - 100 ton
Use for PRH with 2” hex connector, up to 100 ton maximum rated pipe, and soft ground conditions.

Slow - 200 ton
Do not use this switch with the Powered Reaming Head. Doing so will cause damage.

NOTICE The thrust cylinder retraction speed is not affected by the Slow/Fast switch. The Slow/Fast switch controls the advance speed.

NOTICE The LED light (B) below the switch will illuminate indicating the function is in operation.

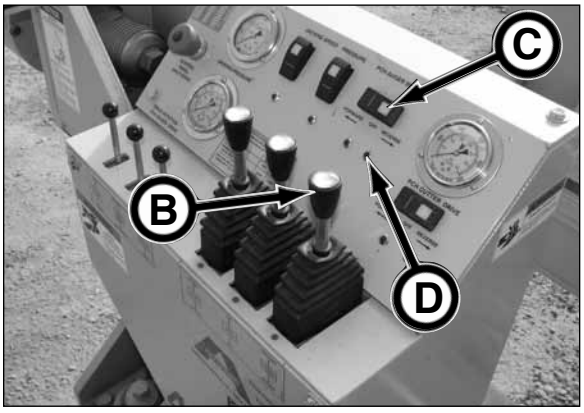
THRUST CYLINDER CONTROL (GBM 4812A)



Use the thrust cylinder control (D) to extend and retract the frame thrust cylinders.

Extend Cylinders - Push lever Forward
Retract Cylinders - Pull lever Back

PRH - AUGER CONTROL (GBM 4812A)



The auger control (B) is used to rotate the powered reaming head auger.

Always rotate the PRH auger in the reverse or counter- clockwise (CCW) direction. This will move the spoils to the reception shaft.

NOTICE Rotating the PRH auger in the wrong direction may damage equipment from spoils building up in the mixing chamber.

Forward (counterclockwise rotation) - Push lever Forward

Reverse (clockwise rotation) - Pull lever Back

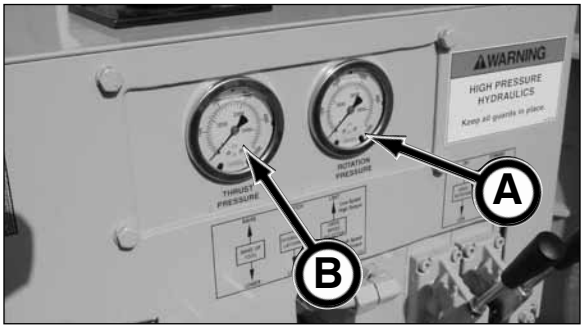
There is also an electric/hydraulic rotation switch (C) to control the rotation of the PRH auger. Selecting Forward or Reverse will rotate the PRH auger at full speed without the need to operate the manually-operated hydraulic control (B).

NOTICE The LED light (D) below the switch will illuminate indicating the function is in operation.

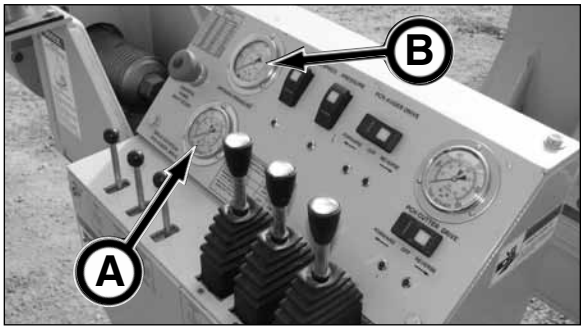
HYDRAULIC PRESSURE GAUGES

Use the pressure gauges to monitor the PRH auger rotation (A) and jacking thrust (B) pressure.

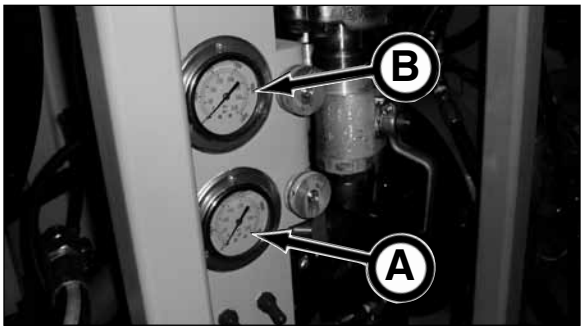
Operating range is up to 4,000 psi (27.579 mPa). Maximum pressure is 5,000 psi (34.474 mPa).



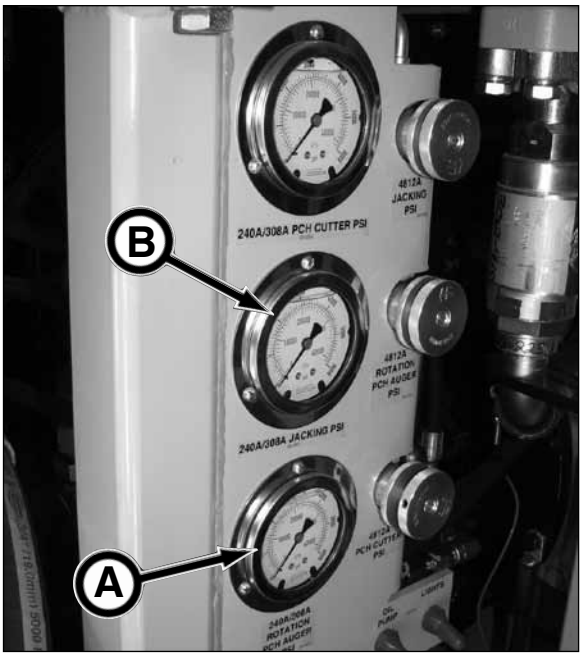
GBM 240A/308A/339A Frames



GBM 4812A Frame



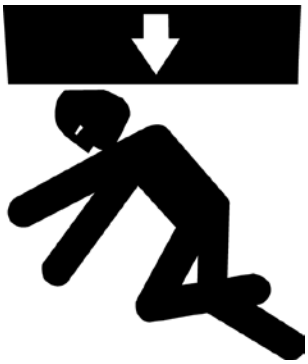
P100Q Power Pack



P150Q Power Pack

Assembly

Use this section to properly assemble the Powered Reaming Head Series II drive assembly to the PRH skin housing assemblies.



⚠WARNING Suspended loads may fall and cause severe personal injury or death. DO NOT enter area under or around a suspended load.

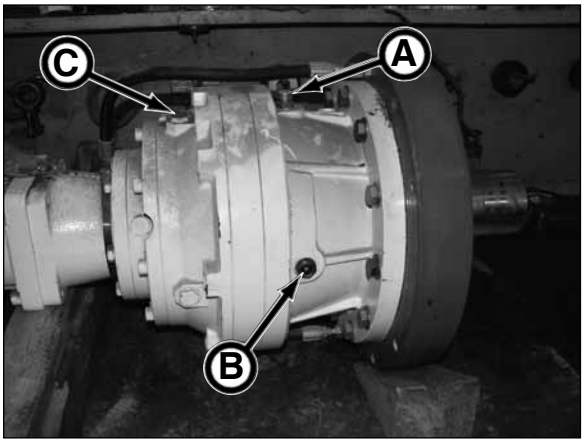
⚠WARNING Assemblies are heavy! Use proper lifting devices and equipment including personal protective equipment while handling assemblies.

1. Before assembling the drive assembly and the bearing assembly to the PRH skin housing assembly, maintenance must be performed on the assemblies as follows:

A. Check gear box oil level:

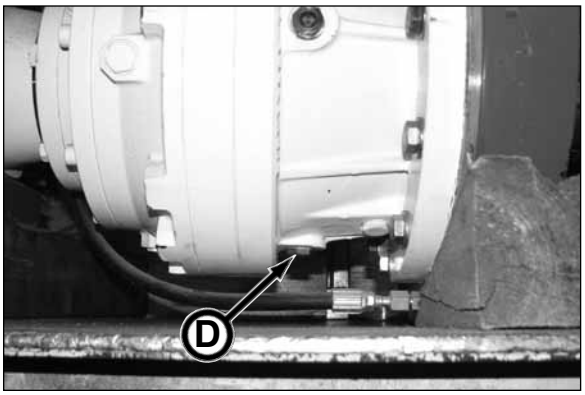
• With the breather (A) in the 12 o'clock position, check so oil level is visible on sight gauges (B) (located in 3 o'clock and 9 o'clock positions). Be sure to allow a few minutes for the oil to settle before checking oil level. If oil is not visible in sight gauge, clean area around fill plug (C). Remove fill plug and add Mobil SHC™ 630 Synthetic Bearing and Gear oil or equivalent until oil is visible in sight gauge. Replace fill plug.

Replace gear box oil every 2,000 feet (610 m).



B. Check gear box for water:

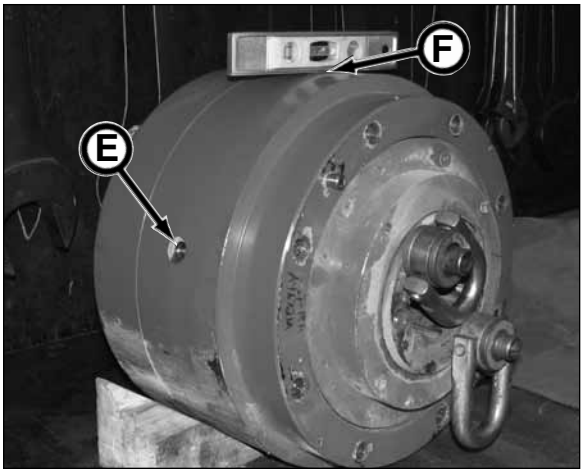
• Clean area around drain plug (D). Loosen drain plug to check for water. If water is visible, the gear box seals have failed. In this case the gear box must be drained and flushed, seals replaced and the gear box filled with fresh, clean Mobil SHC™ 630 Synthetic Bearing and Gear oil.



C. Check bearing assembly oil level:

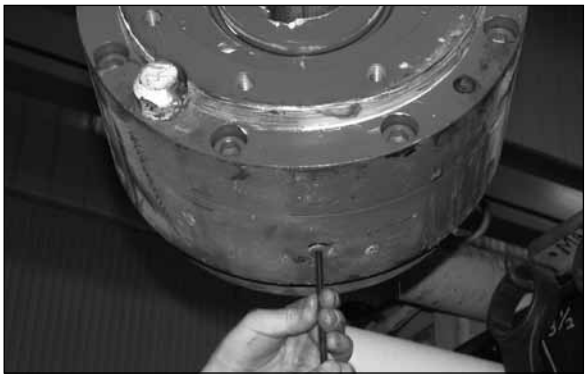
• Orient bearing assembly so the two ports that are located 180° are positioned at the 12 o'clock (fill) and 6 o'clock (drain), and the third port (check port) (E) should then be located slightly higher than the 9 o'clock position or slightly above center line position. Allow a few minutes for the oil to settle before checking oil level. Remove check port plug. Oil level needs to be at check port level. If oil is not at check port level, clean area around fill port (F). Remove fill plug and add Mobil SHC™ 630 Synthetic Bearing and Gear oil or equivalent until oil is at check plug level. Replace fill and check port plugs.

Replace bearing oil every 2,000 feet (610 m).



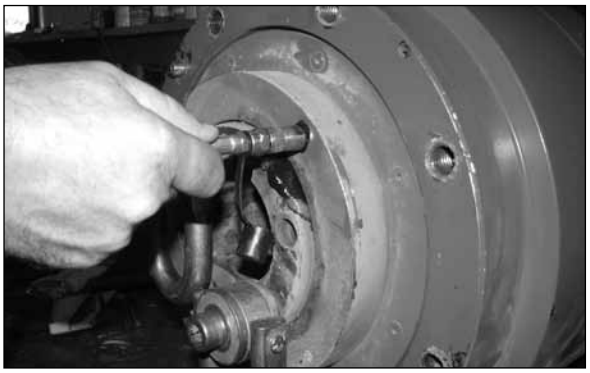
D. Check bearing assembly for water:

• Gain access to drain plug. Clean area around drain plug and loosen drain plug to check for water. If water is visible, the bearing assembly must be drained and flushed, seals replaced and the bearing assembly filled with fresh, clean Mobil SHC™ 630 Synthetic Bearing and Gear oil. Replace drain plug.



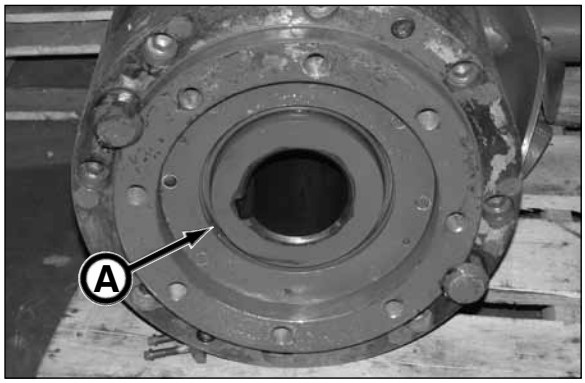
E. Purge bearing assembly lip seals:

• Remove one of the bearing grease plugs (retain plug) and install grease fitting. Mount a grease gun equipped with Mobilgrease® XHP222 grease or equivalent to grease fitting. Lubricate until clean grease is visible on front face of bearing assembly. Rotate bearing and lubricate again until clean grease is visible on front face. Remove grease fitting. Install teflon tape on grease plug and replace plug into port. Repeat purging procedure with the other grease port. Once complete be sure both grease fittings are removed and replaced with plugs.



F. Visually check bearing housing for oil leakage and dirt buildup:

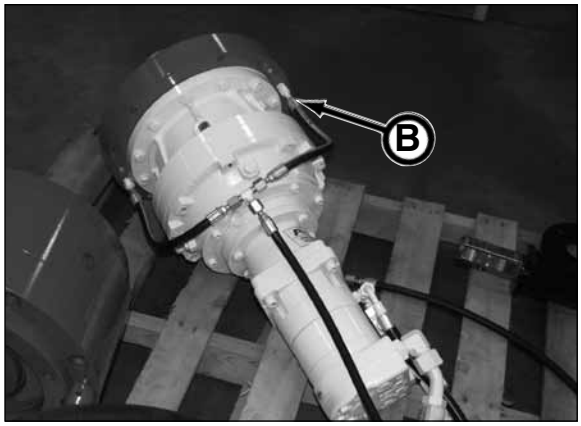
• Visually check rear of bearing housing (A) for oil leakage or excessive dirt. Clean any dirt from housing. If oil leakage is visible, the dirt and oil bearing seals must be replaced. Contact your Akkerman Aftermarket Support representative for more information. If seal replacement is required, keep in mind that the seal orientation is critical. Therefore be sure to replace seals in the exact orientation of the seals being removed.



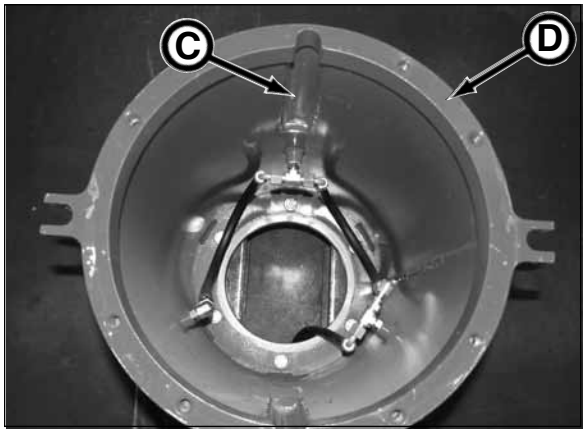
2. Before installing the PRH drive assembly into the skin housing assembly, it is important to note the orientation of the assemblies.

• Drive Assembly
12 o'clock (top) (B)

Note: The breather is also in the 12 o'clock position.

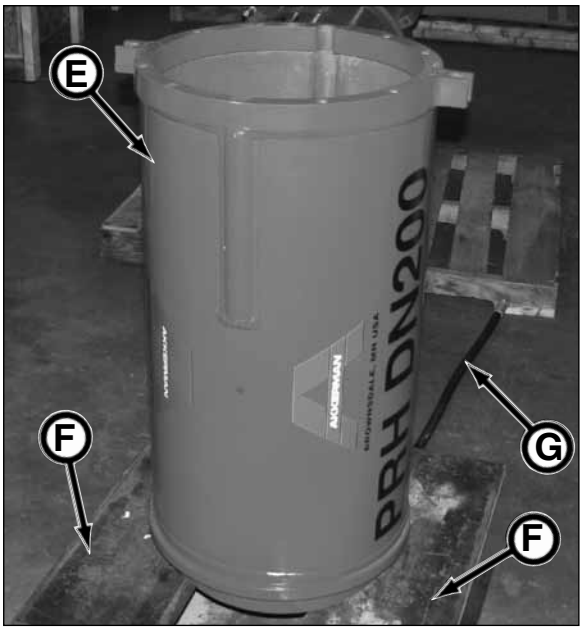


• Skin Housing Assembly
12 o'clock (top) (C)
Front (D)

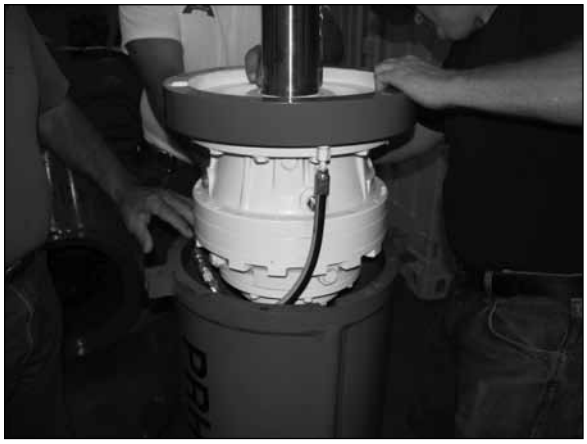


3. Carefully place PRH skin housing assembly (E) on blocks (F) so the middle of the skin assembly can be accessed and the front of skin is on top.

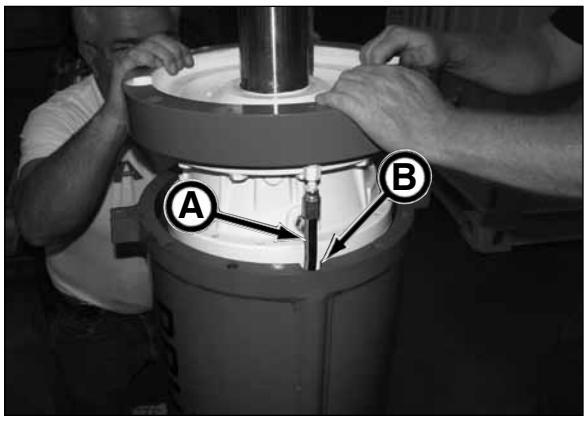
4. During assembly, route hoses (G) through the middle of the skin housing assembly to prevent damage.



5. With a M16-2.0 lift eye, carefully lower drive assembly into skin housing assembly, aligning top positions of assemblies while being careful not to damage hydraulic hoses, jetting hoses and fittings. Route hoses out through back of skin housing assembly opening.



NOTICE (PRH 14 or DN200 [shown]) Jetting hoses (A) must be carefully routed in the grooves (B) of the skin housing assembly.

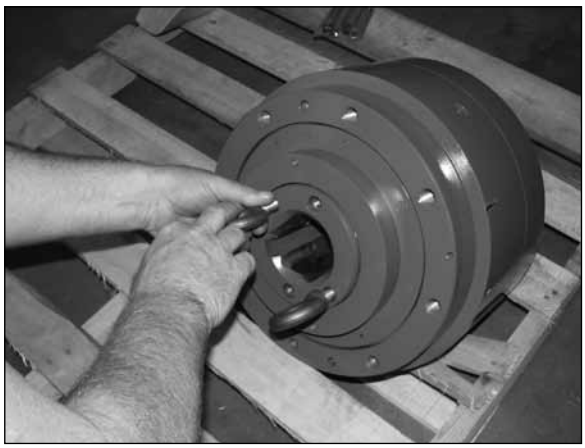


NOTICE (On larger diameter PRH) The breather and check ports must be positioned correctly. The breather must be located in the top, 12 o'clock position. The check ports must be located in the 3 o'clock and 9 o'clock positions.

6. Attach drive assembly to skin housing assembly with eight lubricated (anti-sieze) 1/2 UNC x 2.25 socket head cap screws and tighten to 95 ft-lb (129 N·m) torque.

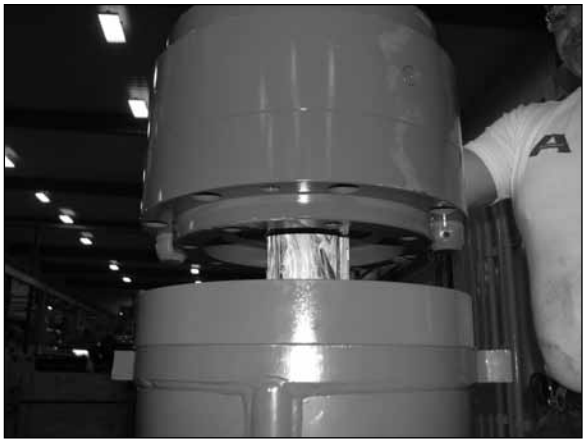
7. Apply anti-seize to drive shaft.

8. Thread two 5/8 in. lift eyes into bearing assembly.



9. Check to be sure orings in the two bearing jetting port holes are in place.

10. Carefully lower bearing on drive assembly by aligning key way and alignment pins.

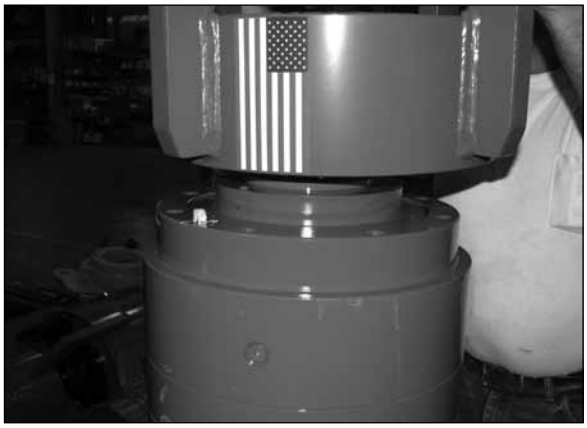


NOTICE After aligning bearing onto drive shaft, the bearing may have to be rotated to align with alignment pins.

11. Remove lift eyes.

12. Check to be sure two dowel pins are in place on bearing assembly. Lubricate dowel pins with anti-seize lubricant.

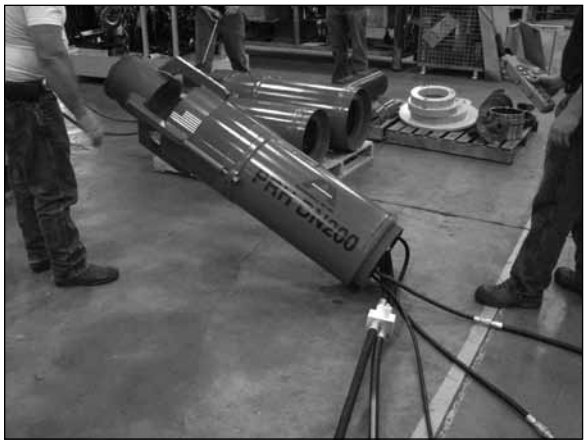
13. Lower reaming assembly onto bearing assembly by aligning bearing assembly dowel pins to holes in reaming assembly.



14. Install two tensioning rods to secure front and rear assembly sections. Be sure tensioning rod threads are lubricated with an anti-seize compound.

15. Tighten tensioning rods to 110 ft-lb (149 N·m) torque.

16. Lower complete assembly to floor being careful not to damage hoses.



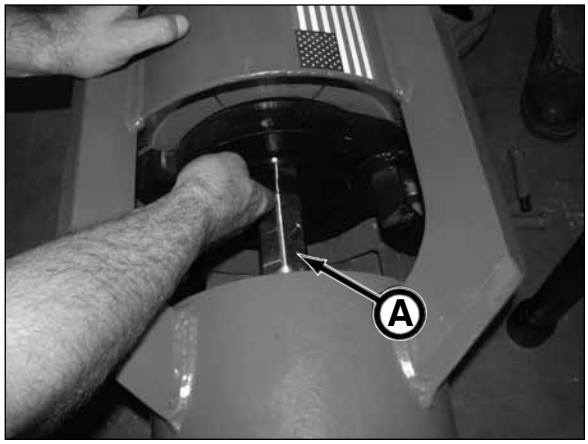
17. Secure reaming assembly to bearing assembly with eight lubricated (anti-seize) 3/4 UNC x 2.5 in. socket head cap screws and tighten to 330 ft-lb (447 N·m) torque.

18. Install cutter bit.

19. Install hex coupler (A) into cutter bit and bearing assembly.

20. Install retainer plate over coupler and into cutter bit.

NOTICE Shoulder on retainer plate should stick out towards auger.



21. Secure cutter bit/coupler/retainer plate to bearing assembly with four lubricated (anti-seize) 3/4 shoulder bolts with 5/8 threads and tighten to 186 ft-lb. (252 N·m) torque.

22. Install leading auger onto coupler.

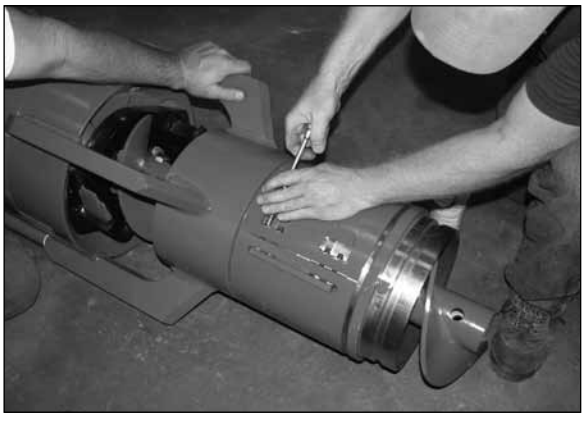
23. Secure auger to coupler with one 3/4 UNC x 4 in. bolt and 3/4 nylock nut. Be sure head of bolt is located on the leading end of the auger.

24. If using notched casings with the powered reaming head, the powered reaming head is ready for use.

    If using non-notched casings with the powered reaming head, proceed to step 25.

25. Install single pitch auger assembly to lead auger with one 3/4 UNC x 4 in. bolt and 3/4 nylock nut.

26. Install notched casing/casing adapter to reaming assembly, making sure alignment guides on adapter are located in the 12 o'clock and 6 o'clock positions.



27. Install casing collar over reaming assembly and notched casing/casing adapter and secure with four 5/16 x 2 in 12 pt cap screws.

28. The powered reaming head is now ready for use.

Operation

OPERATING GUIDELINES

⚠WARNING Do not operate this equipment until you read, study, and understand this manual AND your GBM Operator's Manual. Failure to do so, could result in severe personal injury or death.

1. Before operating, read and understand the Safety, Pre-Start Inspection, and Operation sections.

2. Do not operate this equipment while under the influence of alcohol, drugs, or medication.

3. Follow all Federal, State, and Local safety regulations and procedures.

4. Be sure OSHA prescribed safety personal protective equipment is being worn by all personnel.

5. Be sure the area is safe for operation. Keep work site clean and organized.

6. NEVER operate equipment if it has been engulfed with water. Contact your Akkerman Aftermarket Support representative for proper procedures on how to restore equipment for operation.

7. Have a fully charged fire extinguisher on the job site at all times.

8. Before operating, repair all equipment problems.

9. Be sure the excavated launch and reception pits or shafts are properly shored or braced to prevent slides or cave-ins.

10. Test air monitoring and ventilation detectors for proper operation. Never enter a tunnel without gas detectors.

11. A fully trained and qualified signal person must direct the excavator or crane operator when lifting and lowering equipment into the launch or reception pits.

12. Never walk or work under any part of the excavator or crane and suspended loads.

13. Operate jacking system at lowest pressure possible to prevent excessive heat build up.

14. Test all controls to make sure they work properly.

15. Pressure peaks cause hoses to jump without notice. Keep all personnel away from hoses during operation of equipment.

16. Lock out electrical power at the source (generator) before performing any maintenance.

17. Beware of pinch points.

18. If this manual is lost, contact your Akkerman Aftermarket Support Representative for a new manual or download this manual from the Akkerman web site at www.akkerman.com.

19. High pressure hydraulics are used on the GBM. Be sure all covers and guards are in place before operating.

20. Do not make any modifications to any Akkerman products. Doing so could cause structural failure and will void the warranty.

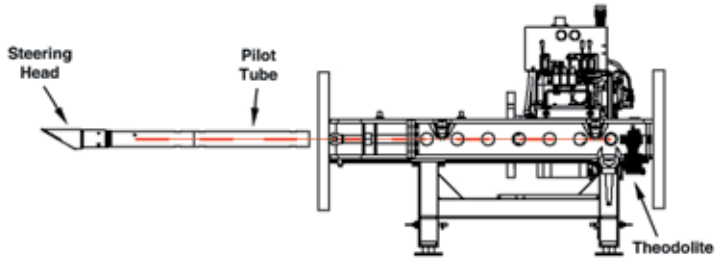
21. Do not make adjustments or repairs to the hydraulic system components while in operation or until all pressure is released and power pack is locked out, tagged out.

22. Be sure all suction valves are open and valve handles tie strapped to prevent accidental closure.

POWERED REAMING HEAD INSTALLATION PROCESS

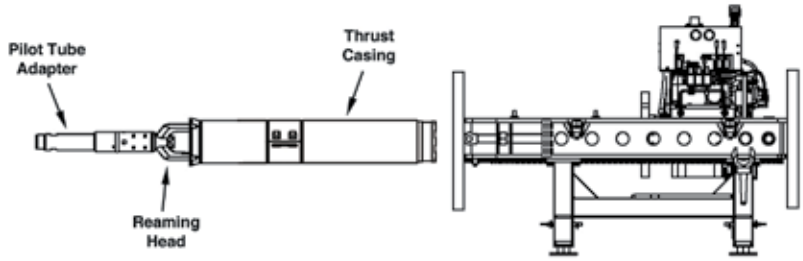
Step 1: PRECISE INSTALLATION OF PILOT TUBES

The first step is the installation of the pilot tube on line and grade.



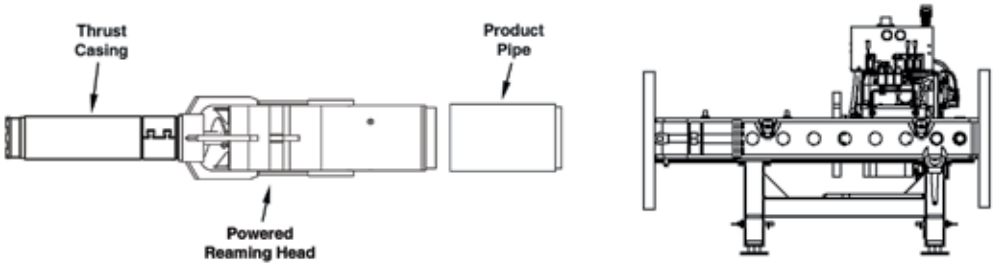
Step 2: ADVANCING THRUST CASINGS ALONG PILOT TUBE PATH

The second step is to follow the pilot tube with a reaming head or other upsizing tool and standard 11” OD thrust casings.



Step 3: INSTALLATION OF PRODUCT PIPE WITH POWERED REAMING HEAD

In the third step, the powered reaming head follows the thrust casings to increase the bore to match the product pipe diameter.



USING THE POWERED REAMING HEAD

Contractors installing pipe in diameters larger than 11 in. (279 mm) outside diameter now have a more productive choice in their pipeline installation when using the Guided Boring Method; the powered reaming head (PRH).

The powered reaming head proceeds as a three step method; first the pilot tubes are installed by using the Akkerman Guided Boring Machine frame and guidance system. Second, the bore diameter is increased to approximately 11 in. (279 mm) by installing temporary casings and augers. The third step is accomplished by installing the powered reaming head behind the temporary casings and reversing the auger flow direction toward the reception shaft.

After the powered reaming head is connected to the hydraulic supply of the power unit, it is thrust into the soils and its rotating auger excavates the soil to the final diameter needed for the product pipe. The spoils are then transported through the temporary casings to the reception shaft and new pipe sections are added in the launch shaft as needed. When the powered cutter head reaches the reception shaft the hydraulic supply hoses are disconnected and removed from within the pipeline. The head is then lifted from the reception shaft signaling the completion of the bore.

To install the powered reaming head refer to the following detailed information:

USE JETTING & PIPE LUBRICATION WITH POWERED REAMING HEAD

When using the Akkerman Powered Reaming Head (PRH), the contractor must plan for jetting, whether or not it is needed for the project. If a “change of conditions” occurs, and the PRH is not plumbed for jetting or is not being used, in many instances, the PRH will become plugged. In addition to using jetting with the PRH, lubricating the product pipe should also be used to reduce jacking pressure.

What is Jetting?

• Jetting consists of water or a water / polymer mixture. Baroid’s EZ MUD®, a water soluble polymer or equivalent can be used. Ask your polymer supplier for the proper jetting mixture based on the Geotech report for your project.

Two Jetting Ports

Why use Jetting?

• The two jetting nozzles (A) on the PRH reduces head torque requirements by lubricating the metal parts along with the spoils to reduce or eliminate the clogging of the head.

• Torque of the auger drive is also reduced since the material flows more freely due to less friction on the metal parts.

Jetting Supply Requirements

The jetting supply should pump a minimum of 5 gpm @ 1,000 psi (19 lpm @ 6,895 kPa) and a maximum of 7 gpm @ 1,500 psi (26.5 lpm @ 10.342 mPa). The maximum operating pressure is 2,500 psi (17.24 mPa).

Jetting Hookup

Install PRH jetting hose to jetting supply source. Install additional supply hoses as needed.

(continued on next page)

Using Jetting

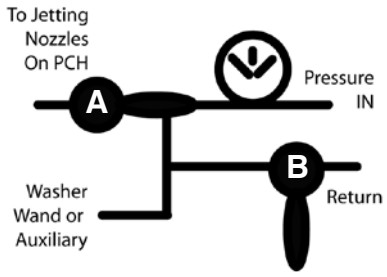
• With jetting properly installed on PRH and jetting supply pump, turn valve (A) to ON position for jetting and turn return valve (B) to OFF position.

• The amount of jetting depends on ground conditions. If your spoils consist of a slurry substance, the amount of jetting should be reduced.

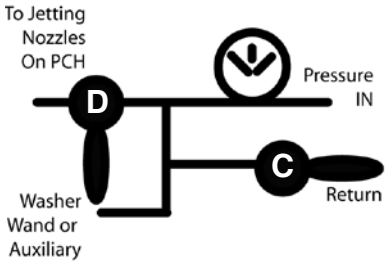
• Only use jetting when advancing pipe to prevent over excavating.

• When shutting down the jetting, be sure to turn return valve (C) to ON position, and then turn jetting valve (D) to OFF position to prevent pressure buildup in jetting hose.

JETTING OR WASHER MODE



BYPASS MODE



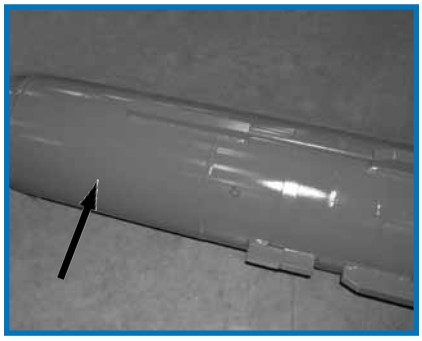
Lubricating Product Pipe

• Lubricating the product pipe around the outside of the pipe has proven to be very effective in reducing the friction between the product pipe and the soil that surrounds it. This lubrication results in a significant decrease in thrust. There are three lubrication ports on the PRH.

• Lubrication type or mixture is based on soil conditions, consistency, clay, sand, etc. Your polymer supplier can help you with the proper lubrication mixture based on your Geotech report for the project.

• Install supply source to lubrication hose on PRH.

• Refer to your Lubrication Pump specifications for the maximum operating pressure rating.



Three Lubrication Ports

Using Pipe Lubrication

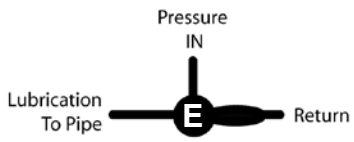
• With lubrication hose properly installed to PRH and lubrication supply pump, turn valve (E) to ON position for lubrication.

• Only lubricate while advancing pipe to prevent the lubricant from flowing into launch shaft or into the cutter face causing plugging, resulting in decreased productivity.

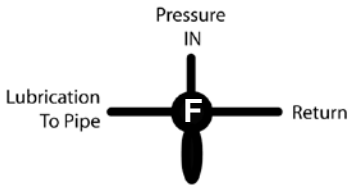
• When shutting down the lubrication, be sure to turn valve (F) to OFF position to prevent pressure buildup in lubrication hose.

• The amount of lubrication depends on ground conditions. Contact your polymer supplier.

LUBRICATION MODE



BYPASS MODE



INSTALLING POWERED REAMING HEAD SERIES II

NOTICE When using the Powered Reaming Head (PRH), the contractor MUST plan for jetting and lubrication, whether or not it is needed for the project. If a “change of conditions” occurs, and the PRH is not plumbed for jetting/lubrication or is not being used, in many instances, the PRH will become plugged. The use of jetting and lubrication helps reduce jacking pressures. For more information, refer to Using Powered Reaming Head Jetting & Lubrication in this section. Akkerman highly recommends to always use jetting and lubrication on a PRH drive.

NOTICE As the reaming head and casings are advanced into the reception shaft, the reaming head assembly and casings must be supported to maintain alignment. Failure to do so will deteriorate the bottom of the bore hole resulting in poor grade alignment.

1. Once the reaming head assembly is in the reception shaft, remove the reaming head auger by removing the casing clips (not shown) and then the auger bolt and nut that was installed in the launch shaft (back bolt as shown). Replace auger into the reaming head assembly casing.

⚠WARNING Suspended loads may fall and cause severe personal injury or death. Do not stand or walk under a load.

⚠WARNING Auger may fall out of casing and cause severe injury or death if reaming head assembly tips or hits an obstruction.

2. Install safety chain assembly or auger pin to auger to secure auger into reaming head assembly. For proper installation of safety chain, refer to Installing Safety Chain Assembly/ Casing Auger Pin To Auger & Casing in this section.

3. Remove the reaming head assembly from reception shaft.

(continued on next page)

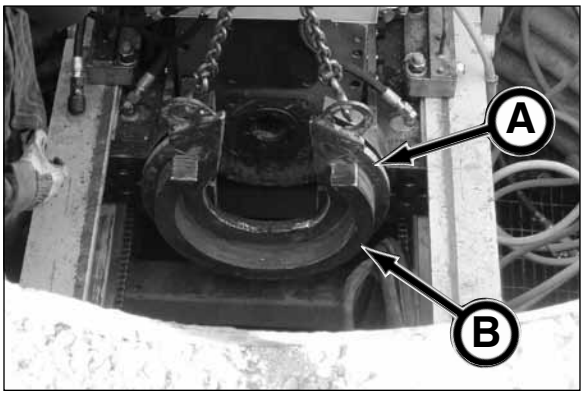
4. Move gear box assembly to the back of the GBM frame. Remove casing thrust adapter from the GBM frame.

5. Remove dirt bucket.

6. Remove auger drive adapter.

7. Install thrust plate (A) to GBM thrust plate with two 3/4 UNC x 1.5 in. bolts and flat washers.

8. Install a properly sized thrust ring (B) to thrust plate with three 1/2 UNC x1 in. bolts.



9. Installing PRH into launch shaft:

   • If installing PRH into a launch shaft smaller than 10 ft., proceed to step 10.

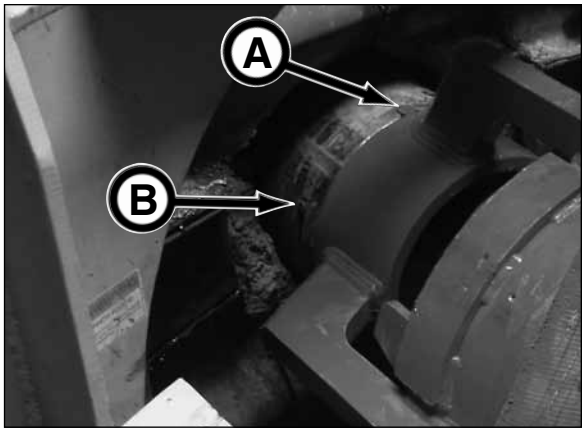
   • If installing PRH into launch shaft 10 ft. or larger, proceed to step 11.

10. **INSTALLING PRH INTO LAUNCH SHAFT SMALLER THAN 10 FT:**

    When installing the PRH into a launch shaft smaller than 10 ft., the PRH must be installed in two sections. The complete PRH is too long for this size of shaft.

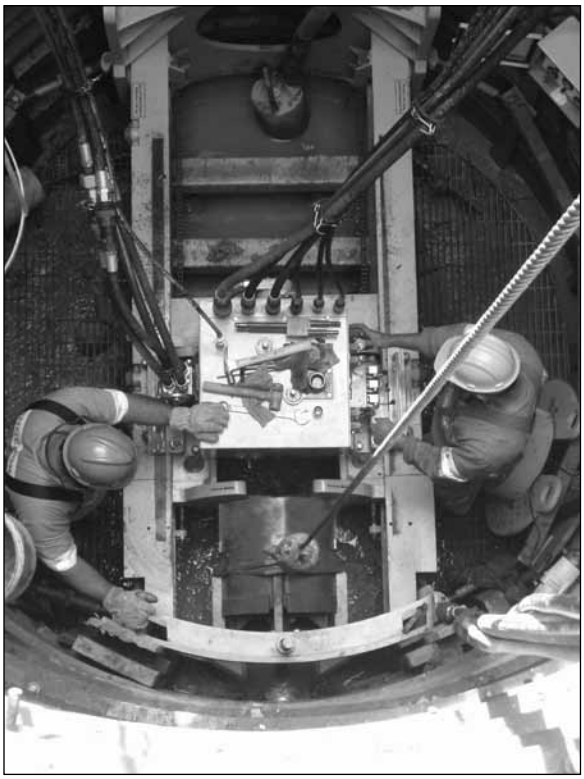
    A. Lower the bearing/reaming assembly into launch shaft.

    B. Align and install PRH lead auger to last casing auger with one 3/4 x 4 in. bolt and nylock lock nut. Tighten the nut so the end of the nut is flush with the end of the bolt. Do not overtighten.



C. Advance the PRH to the last casing and align with alignment guides (A) in the 12 o'clock and 6 o'clock positions.

D. Install four casing joint keepers (B) at 2 o'clock, 4 o'clock, 8 o'clock and 10 o'clock positions to lock front casing to PRH.

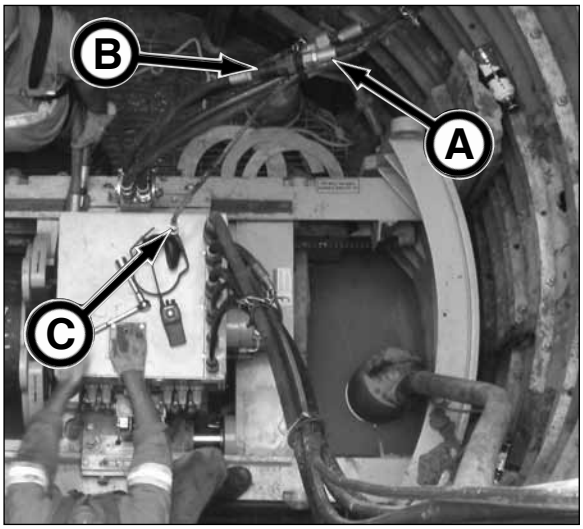


E. Advance bearing/reaming assembly so there is enough room to lower the drive/skin housing assembly into the shaft.

F. Check to be sure the two bearing jetting port hole orings are in place on bearing assembly.

G. Install PRH auger drive, case drain, jetting and lubrication hoses:

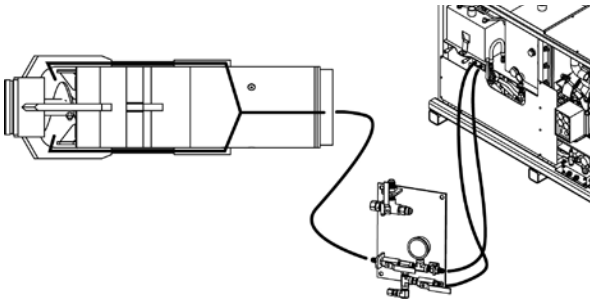
Route all hoses through several pipe (5-8 depending on room as follows:



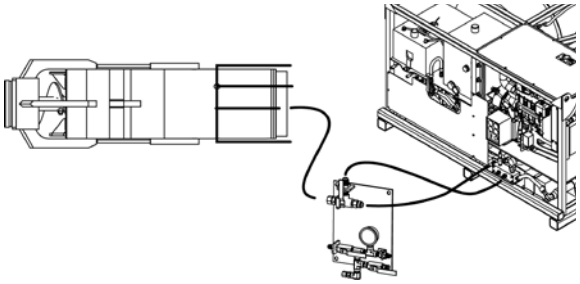
a. connect two 100’ 3/4 hoses (A) from PRH through pipe to the two 1” multi-port quick disconnect hoses (B) on the GBM.

b. one 3/8” case drain hose from PRH through pipe to the case drain connection (C) on GBM.

c. one 100’ 3/8” jetting hose from PRH through pipe to the jetting connection on jetting and lubrication pump shaft control.



d. one 100’ 3/8” lubrication hose from PRH through pipe to the lubrication connection on jetting and lubrication pump shaft control.



H. Lower the drive/skin housing assembly into the shaft. Be careful not to damage or pinch PRH hoses. Route hoses through opening in thrust plate.

I. Carefully align drive/skin housing assembly with the bearing assembly key way and alignment pins (dowels).

J. Secure drive/skin housing assembly to bearing/ reaming assembly with two tensioning rods. Be sure tensioning rod threads are lubricated with an anti-seize compound.

K. Tighten tensioning rods to 110 ft-lb (149 N·m) torque.

L. Proceed to step 12 to advance the PRH.

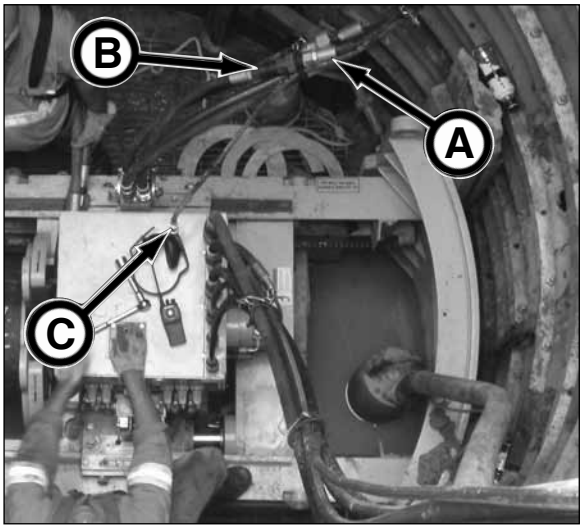
11. **INSTALLING PRH INTO LAUNCH SHAFT 10 FT OR LARGER:**

A. Install PRH auger drive, case drain, jetting and lubrication hoses:

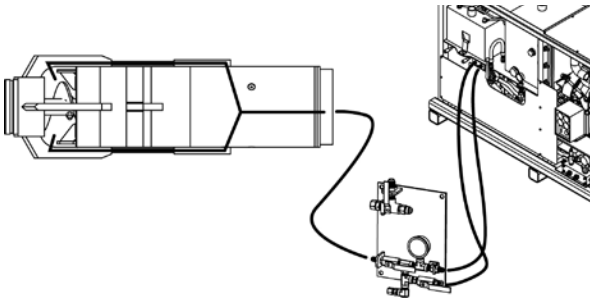
Route all hoses through several pipe (5-8 depending on room as follows:

a. connect two 100’ 3/4 hoses (A) from PRH through pipe to the two 1” multi-port quick disconnect hoses (B) on the GBM.

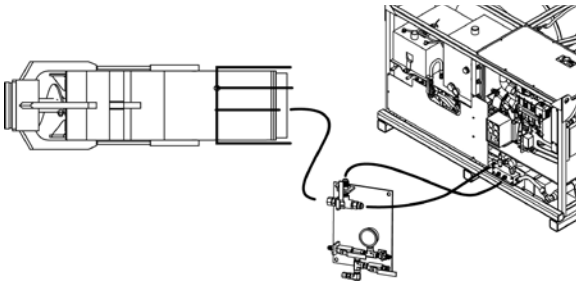
b. one 3/8” case drain hose from PRH through pipe to the case drain connection (C) on GBM.



c. four 25’ 3/8” jetting hoses (to match length of PRH hoses) from PRH through pipe to the jetting connection on jetting and lubrication pump shaft control.



d. four 25’ 3/8” lubrication hoses (to match length of PRH hoses) from PRH through pipe to the lubrication connection on jetting and lubrication pump shaft control.



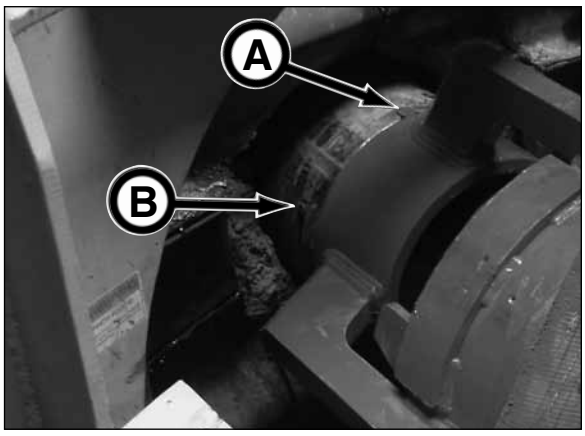
B. Lower complete PRH into launch shaft. Be careful not to damage or pinch PRH hoses. Route hoses through opening in thrust plate.

C. Align and install PRH lead auger to last casing auger with one 3/4 x 4 in. bolt and nylock lock nut. Tighten the nut so the end of the nut is flush with the end of the bolt. Do not overtighten.

D. Advance the PRH to the last casing and align with alignment guides (A) in the 12 o'clock and 6 o'clock positions.

E. Install four casing joint keepers (B) at 2 o'clock, 4 o'clock, 8 o'clock and 10 o'clock positions to lock front casing to PRH.

F. Proceed to step 12 to advance the PRH.



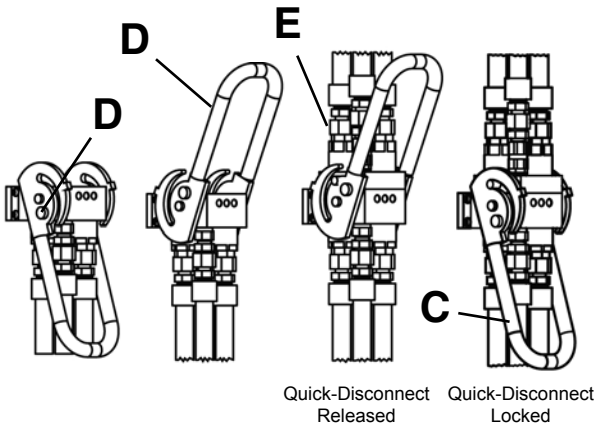
12. Advance gear box so the bell end of the PRH is aligned and flush with PRH thrust plate on GBM frame.

13. Disconnect nylon strap from PRH and remove from launch shaft.

14. When the reception shaft personnel state it is clear to proceed with advancement, move multi-port quick disconnect handle DOWN (C) until release button (D) pops out. Multi-port quick disconnect is now locked into place.

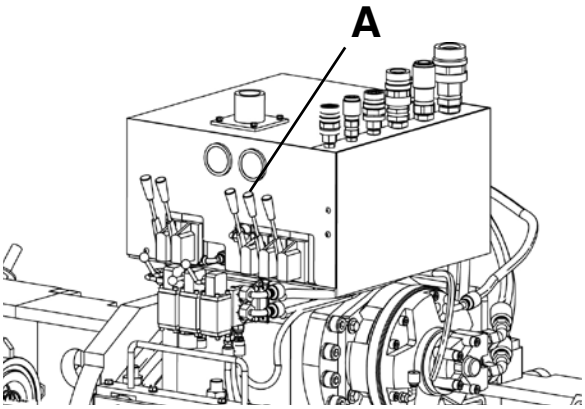
⚠WARNING Contact with rotating auger can result in serious injury. When installing next pipe or when removing casing and auger in reception shaft, release multi disconnect to disable the auger function. Lock multi-port quick disconnect ONLY after it has been communicated from the reception shaft that advancement can proceed.

NOTICE The multi-port quick-disconnect MUST be locked into place before augers will operate.



NOTICE Before operating the auger, be sure the personnel in the launch and reception shafts are clear of any moving parts.

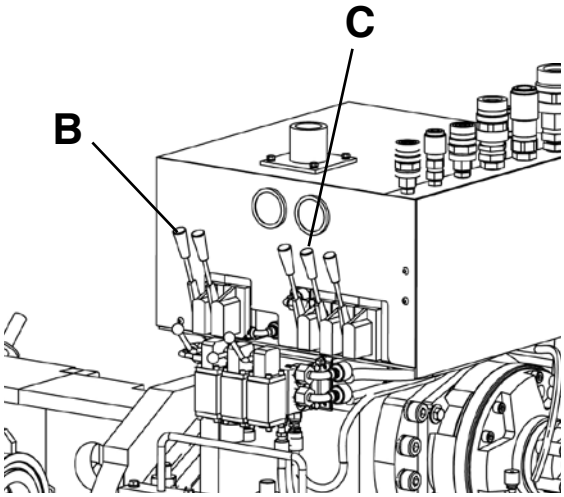
15. Rotate the auger counterclockwise with the auger drive rotation control (A) so the spoils are removed to reception shaft, and turn on jetting at supply source.



Using a communication device between the launch and reception shafts, contact the personnel in reception shaft to confirm that the auger is rotating in the counterclockwise direction and that the spoils are going into the reception shaft.

16. Start jacking the PRH by extending the GBM thrust cylinders using the thrust cylinder control (B) while rotating the PRH auger drive (C).

(Latching Frame Only) Relatch latching pins as needed. Be sure latching pins are completely engaged into frame holes before jacking.



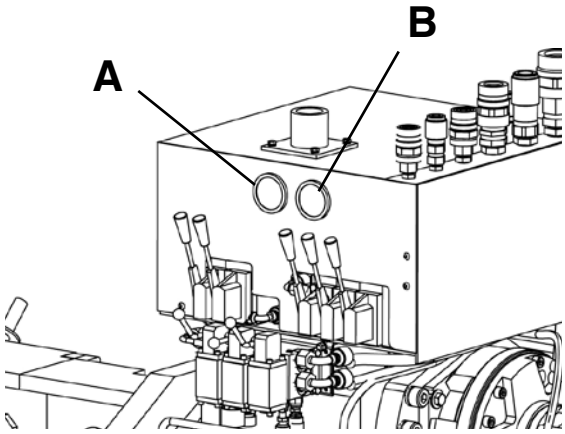
17. While jacking the PRH, monitor the jacking thrust pressure with gauge (A) and the auger drive rotation pressure with gauge (B) to determine advance rate.

    Normal operating pressure:

    jacking - Up to 4,000 psi (Up to 27.579 mPa)

    auger - 2,000 - 4,000 psi (13.790 mPa - 27.579 mPa)

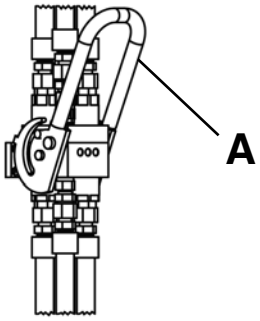
    NOTICE The maximum system operating pressure is 5,000 psi (34.474 mPa). Your operation will stall when operating at 5,000 psi (34.474 mPa).



18. Advance PRH as far forward as possible so the PRH is supported by the bottom roller brackets. Turn off all power.

19. Release disconnect to disable the auger function by moving multi-port quick disconnect handle UP (A).

    ⚠WARNING When installing next pipe or when removing casing and auger in reception shaft, release multi-port quick disconnect to disable the auger function. Failure to do so could result in serious injury from contact with rotating auger. Lock or reconnect multi-port quick disconnect ONLY after it has been communicated from the reception shaft personnel that advancement can proceed.



Quick-Disconnect Released

20. With the addition of the PRH in the pipe line, a section of casing/auger must be removed in the reception shaft.

21. Using a hoist to keep the casing/auger in line with the pipeline, remove keepers from the casings.

    NOTICE Remove bottom keepers first, otherwise the weight of the casing and auger will make it difficult to remove the bottom keepers once the top keepers are removed.

22. Slide the casing out to gain access to the auger joint.

23. Disconnect the augers by removing the auger bolt and nut that was installed in the launch shaft (back bolt as shown).

⚠WARNING Auger may fall out of casing and cause severe injury or death if casing tips or hits an obstruction. Properly install safety chain assembly or auger pin to augers and casings before lowering into or lifting out of shaft. Do not stand or walk under a load.

24. Slide the front auger into the lead casing. Secure auger to casing with safety chain assembly or auger pin.

25. Remove auger casing from reception shaft.

26. Continue removing auger casings until the powered reaming head reaches the reception shaft.

NOTICE To protect your product pipe, the product pipe rating must be checked so if can withstand the thrust pressure of the GBM. The factory setting is 5,000 psi (34.5 MPa) or 100 ton. If your product pipe is rated lower than 100 ton, you MUST readjust the thrust pressure in the P100Q or P150Q Power Pack. Failure to do so will break the pipe. Refer to section 6, Operation section, subsection Power Pack Operation, Adjusting Thrust Pressure in your GBM Operator's Manual.

27. Retract GBM gear box to provide enough room for the installation of the final product pipe.

⚠WARNING Suspended loads may fall and cause severe personal injury or death.

If a hydraulic hose breaks from the boom of a crane/excavator, or the lifting support fails, the boom and/or load can fall instantly.

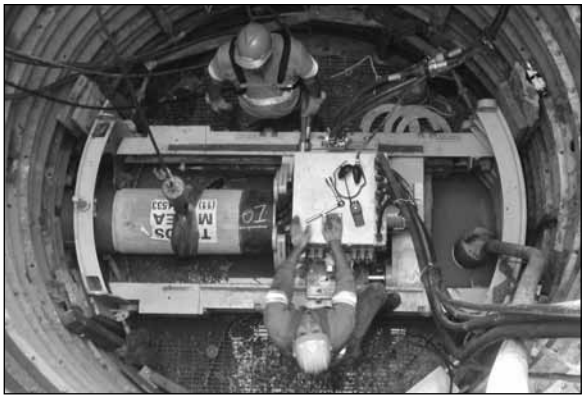
Do not stand or walk under a suspended load.

28. Lower pipe into shaft. Pull hoses through pipe as pipe is being positioned on jacking frame.

NOTICE Be sure to position hoses through pipe so spigot end of pipe goes into the pipeline first.

29. Route hoses through thrust plate. Be sure hoses will not be pinched.

30. Advance thrust plate to bell end of pipe. Be sure fiber ring is in pipe prior to jacking. Use caution during advancement so hydraulic hoses will not be pinched.



31. Push product pipe into pipeline by rotating PRH auger (CCW) drive and extending the thrust cylinders. Be sure to use jetting and lube during advancement of pipe.

NOTICE To properly support the product pipe:
Clay or Hobas: snugly tighten the two lower roller brackets against pipe, and raise up or remove the top roller bracket. Point loading could damage pipe.
Steel Casing: readjust the three roller brackets and tighten snugly against product pipe.

⚠WARNING When installing next pipe or when removing casing and auger in reception shaft, release multi-port quick disconnect to disable the auger functions. Failure to do so could result in serious injury from contact with rotating auger. Lock or reconnect multi-port quick disconnect ONLY after it has been communicated from the reception shaft personnel that advancement can proceed.

32. Continue adding pipe and hoses as needed until the powered reaming head reaches the reception shaft. Be sure to connect the lube hose starting with pipe number three or four.

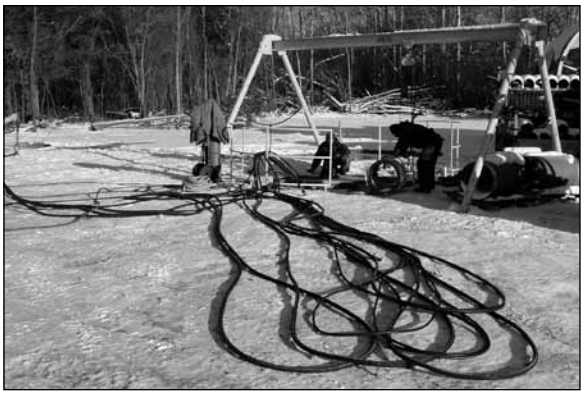
33. With the addition of each section of product pipe, a section of casing/auger must be removed from the reception shaft. Refer to steps 21 - 26 for removing casing/auger from reception shaft.

34. Once the powered reaming head is removed from the reception shaft (refer to Removing Powered Reaming Head From Reception Shaft, in this section), add product pipe as needed until the product pipe reaches the reception shaft per job requirement.

35. Proceed to Removing Powered Reaming Head From Reception Shaft in this section.

REMOVING POWERED REAMING HEAD FROM RECEPTION SHAFT

1. Communicate with the launch shaft personnel to advance PRH until product pipe is exposed.
2. Once the powered reaming head is supported disconnect the PRH from the product pipe and remove the hydraulic hoses, jetting hose and lube hose.



3. Pull hoses back to launch shaft.

4. Remove PRH assembly from reception shaft.

5. Clean PRH to remove all dirt from cutter area and housing while the dirt is soft and flexible and before the dirt hardens to PRH.

NOTES

Lubricants

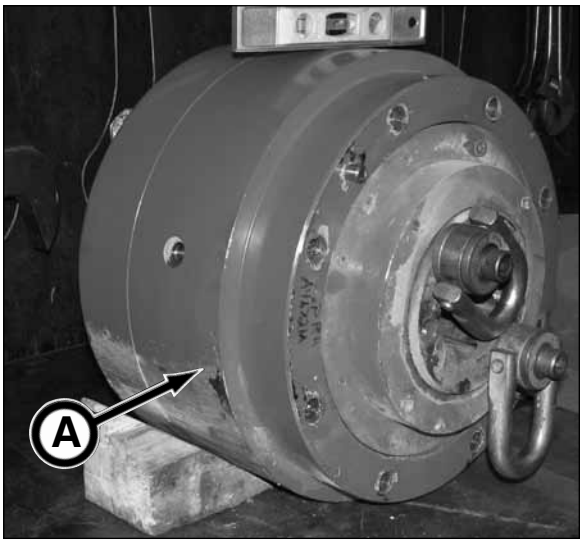
NOTICE Use of inferior lubricants can affect the efficient performance of your Akkerman equipment. Always use high quality lubricants as specified in this section.

BEARING ASSEMBLY & GEAR BOX LUBRICANT

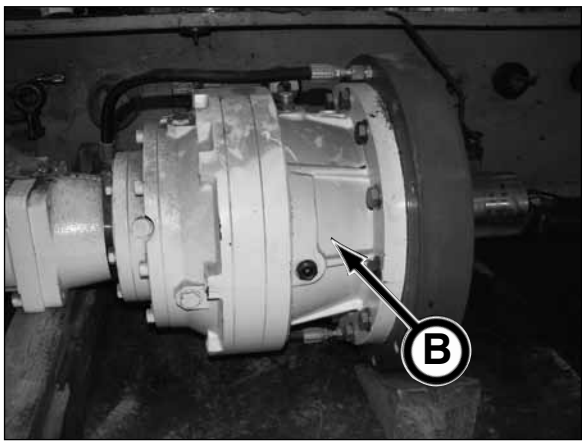
The powered reaming head bearing assembly (A) and auger drive gear box (B) are filled with Mobil SHC 630 Synthetic Bearing and Gear Oil.

Use Mobil SHC 630 or equivalent when adding or changing lubricant.

NOTICE The Mobil SHC 630 Synthetic Bearing and Gear oil is a synthetic oil specifically designed for this application. If you change to a different oil, use a reputable oil supplier to meet or exceed the Mobil SHC 630 oil specification. Do not mix oil manufacturers or grades.



Bearing Cavity



Auger Drive Gear Box

BEARING ASSEMBLY LIP SEAL LUBRICANT

The bearing assembly lip seals are greased with Mobilgrease® XHP222 Premium Lubricating Grease.

The XHP222 grease is a multi-purpose, high performance, high temperature, lithium grease.

Use Mobilgrease® XHP222 Premium Lubricating Grease or equivalent when purging the lip seal grease.

STORING LUBRICANTS

Your equipment can operate at maximum performance only if clean lubricants are used. Use clean containers to handle all lubricants.

Lubricants should be stored in an area protected from dust, moisture, and other contaminates.

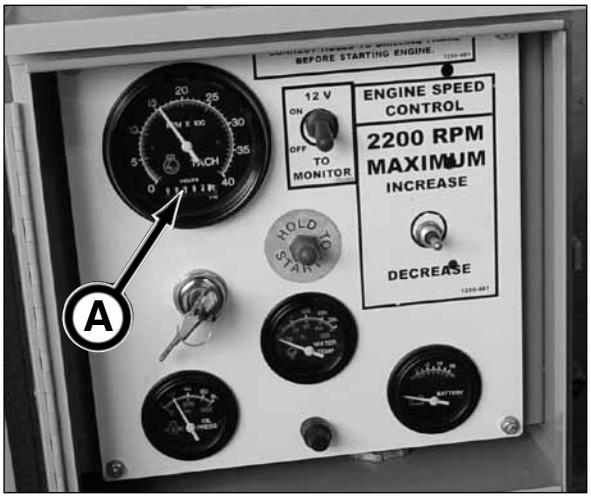
Periodic Maintenance

⚠WARNING Review the Safety section in this manual AND your GBM Operator's Manual before performing maintenance. Failure to do so, could cause severe injury or death.

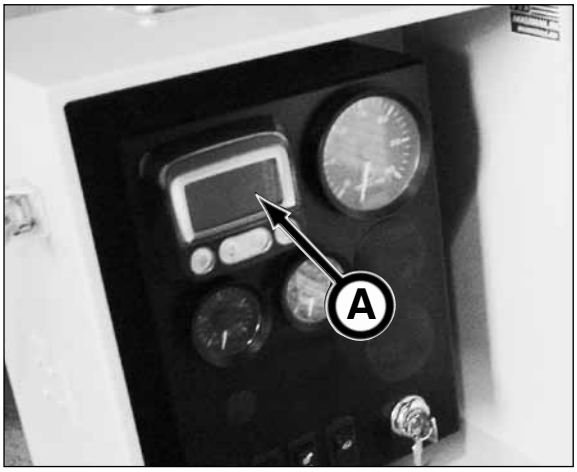
LUBRICATION & MAINTENANCE INTERVALS

The requirements for lubrication and maintenance are shown on the maintenance charts in this section. Intervals of maintenance are based on normal operating conditions. If operating under more difficult conditions, use a shorter time interval between maintenance.

Use the hour meter (A) on the control pendant to determine the proper lubrication and maintenance intervals.



P100Q Pendant (Earlier Models)



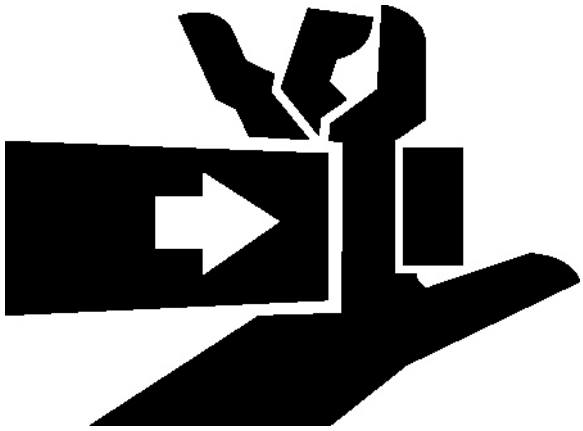
P100Q/P150Q Pendant

LOCKOUT POWER BEFORE SERVICING

⚠WARNING Severe personal injury or death can result from unexpected power unit start-up or machine movement.

LOCKOUT power before attempting to make repairs or adjustments to this equipment, unless otherwise indicated. Proper lockout will prevent accidents and save lives. Performing the lockout will also prevent the equipment from moving or operating unexpectedly.

AVOID PINCH POINTS



⚠WARNING Moving parts or the mishandling of parts can cause severe personal injury.

Keep hands away from moving parts.

Watch your fingers, hands, and legs while equipment is in operation.

Handle parts carefully to avoid crushing and pinch point hazards.

HYDRAULIC OIL/FLUIDS UNDER PRESSURE

⚠WARNING Escaping oil or other fluids under pressure can penetrate your skin causing serious injury.

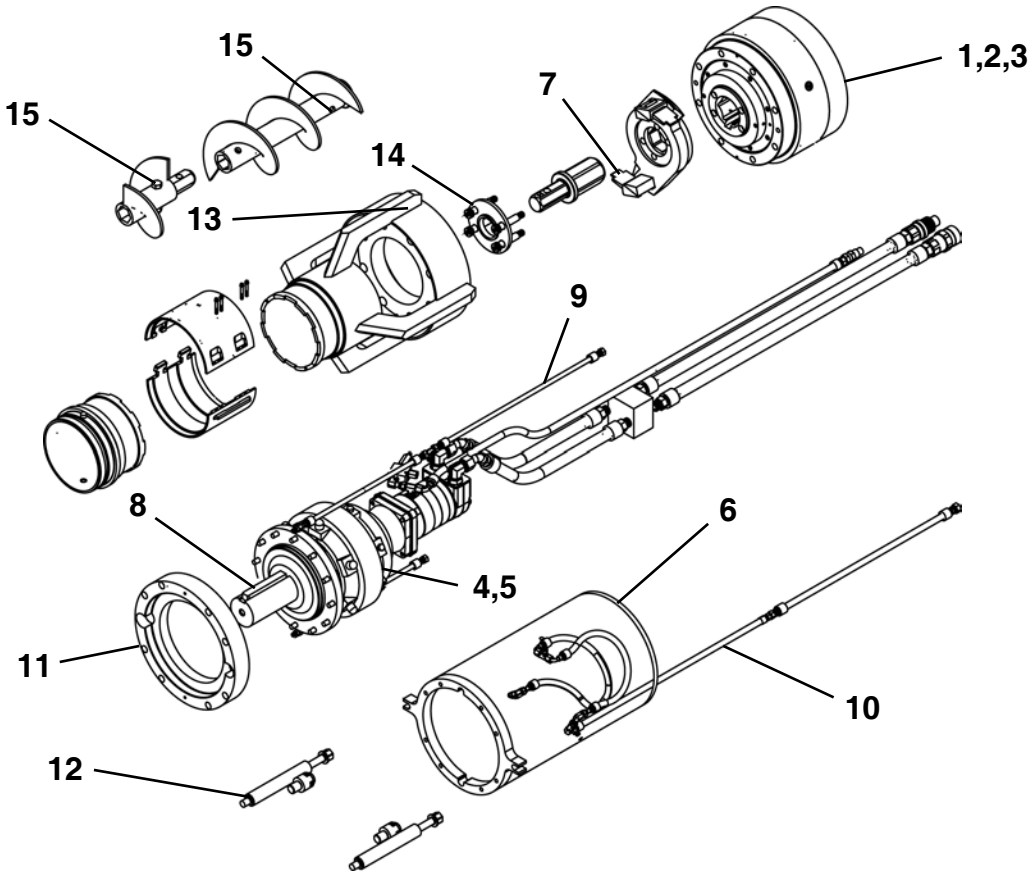
Release all pressure before performing maintenance or repairs. Never weld near pressurized fluid lines.

DO NOT use your hands to check for leaks. When searching for leaks, use a piece of wood or cardboard.

Contact medical help immediately if any oil or fluid is injected into your skin. A serious infection or reaction can emerge without proper medical treatment.

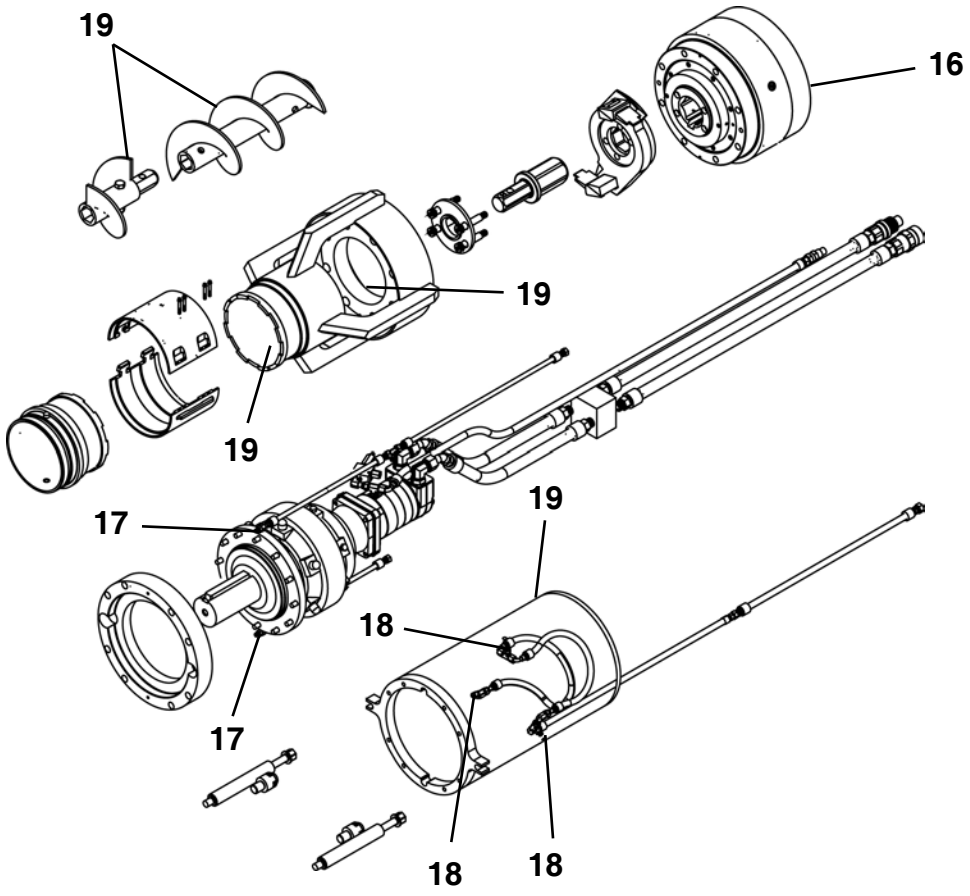
MAINTENANCE CHARTS - POWERED REAMING HEAD

Use the item number in the chart to refer to the detailed maintenance procedures later in this section.



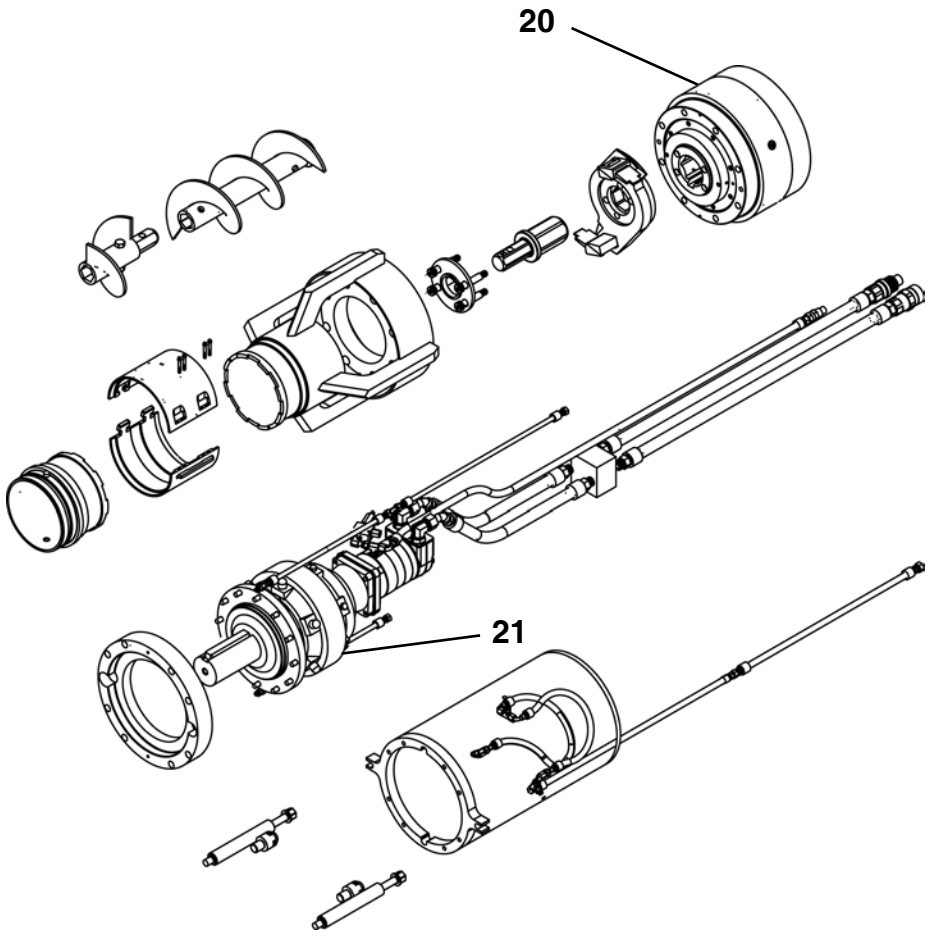
PRIOR TO EACH JOB LAUNCH

ITEM	COMPONENT	SERVICE	REQUIREMENT	MATERIAL
1.	Bearing Assembly	Check Oil Quality & Level	If oil milky or discolored, bearing must be drained, flushed, seals replaced & add new oil.	Mobil® SHC 630
			Oil must be at check port level.	Mobil® SHC 630
2.	Bearing Assembly	Purge Lip Seals	Lubricate until clean grease is visible on face.	Mobil® XHP222
3.	Bearing Housing	Visually Check For Oil/Dirt	Visually check housing for oil.	
4.	Gear Box	Check Oil Level	Oil must be visible in sight gauge.	Mobil® SHC 630
5.	Gear Box	Check For Water	If water is visible, gear box must be drained, flushed, seals replaced, & add new oil.	Mobil® SHC 630
6.	Bell End	Inspect	If damaged, contact Akkerman Aftermarket Support.	
7.	Cutter Teeth	Inspect	If damaged, replace with new.	
8.	Auger Drive Shaft Key	Inspect	If damaged or missing, replace with new.	PN: P0097-026
9.	Jetting Circuit	Check Lines & Ports	Flush if necessary.	2,500 psi Water
10.	Lubrication Circuit	Check Lines & Ports	Flush if necessary.	500 psi Water
11.	Drive Assy To Skin	Check Bolt Tightness	95 ft-lb (129 N·m) Torque	Torque Wrench
12.	Tensioning Rods	Check Bolt Tightness	110 ft-lb (149 N·m) Torque	Torque Wrench
13.	Reaming Assy To Bearing Assembly	Check Bolt Tightness	330 ft-lb (447 N·m) Torque	Torque Wrench
14.	Retainer Plate To Bearing Assy	Check Bolt Tightness	186 ft-lb (252 N·m) Torque	Torque Wrench
15.	Auger Bolt	Check Bolt Tightness	Bolt end flush with nut.	Torque Wrench



AFTER EACH DRIVE

ITEM	COMPONENT	SERVICE	REQUIREMENT	MATERIAL
16.	Bearing Assembly	Purge Lip Seals	Lubricate until clean grease is visible on face.	Mobil® XHP222
17.	Jetting Ports	Flush Ports & Lines	Maximum of 2,500 psi water.	Water
18.	Lubrication Ports	Flush Ports & Lines	Maximum of 500 psi water.	Water
19.	PRH Housing, Auger Chamber & Augers	Clean		Water



EVERY 2000 FEET

ITEM	COMPONENT	SERVICE	REQUIREMENT	MATERIAL
20.	Bearing Assembly	Drain & Fill	Drain and fill with new oil.	Mobil® SHC 630
21.	Gear Box	Drain & Fill	Drain and fill with new oil.	Mobil® SHC 630

PRIOR TO EACH JOB LAUNCH

1. CHECK BEARING ASSEMBLY OIL

A. Test the quality of the bearing assembly oil:

1. Orient bearing assembly so the two ports that are located 180° are positioned at 12 o'clock (fill) and 6 o'clock (drain), and the third port (check port) should then be located slightly higher than the 9 o'clock position or slightly above center line position.

2. Loosen drain plug (A).

3. Obtain an oil sample and retighten drain plug.

• If the oil is milky or discolored (new oil looks similar to new 10W-30 motor oil), there is water in the bearing assembly. The bearing assembly must be drained and flushed, seals replaced and the bearing assembly filled with fresh, clean Mobil SHC™ 630 Synthetic Bearing and Gear oil. Failure to do so WILL cause severe damage to powered reaming head.

B. Check bearing assembly oil level.

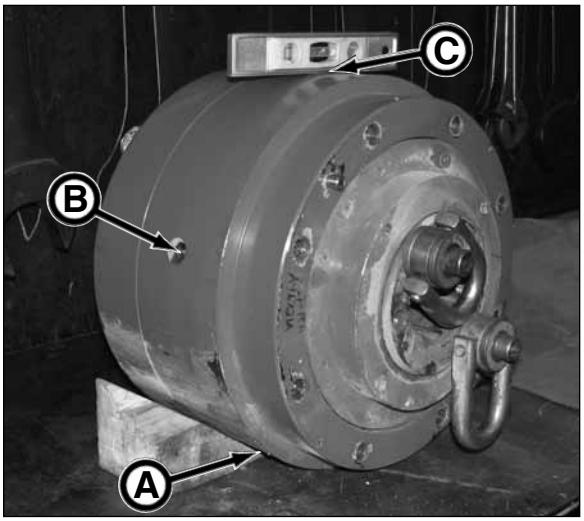
1. Orient bearing assembly so the two ports that are located 180° are positioned at 12 o'clock (fill) and 6 o'clock (drain), and the third port (check port) should then be located slightly higher than the 9 o'clock position or slightly above center line position.

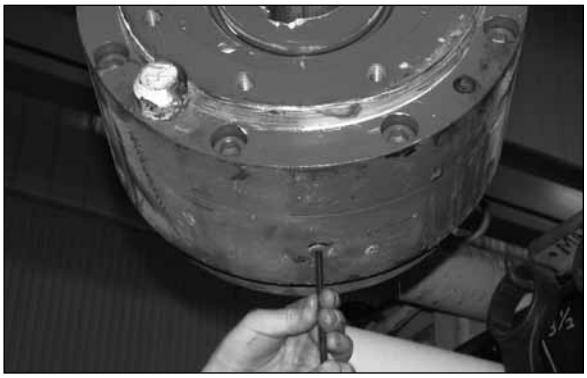
2. Allow a few minutes for the oil to settle before checking oil level.

3. Remove check plug (B).

4. Oil level needs to be at check port level. If oil is not at check port level, clean area around fill port (C). Remove fill plug and add Mobil SHC™ 630 Synthetic Bearing and Gear oil or equivalent until oil is at check plug level.

5. Replace fill and check port plugs.





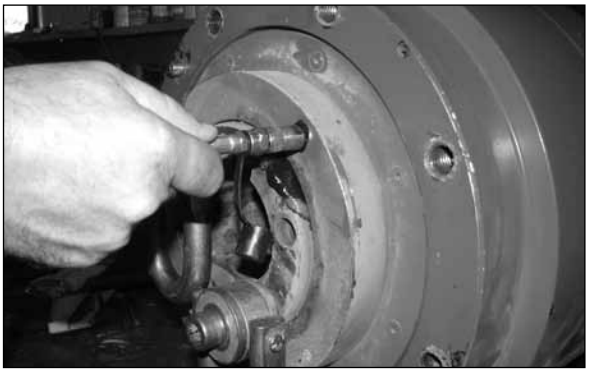
Accessing Drain Plug

Loosening Drain Plug For Sample

2. PURGE BEARING ASSEMBLY LIP SEALS

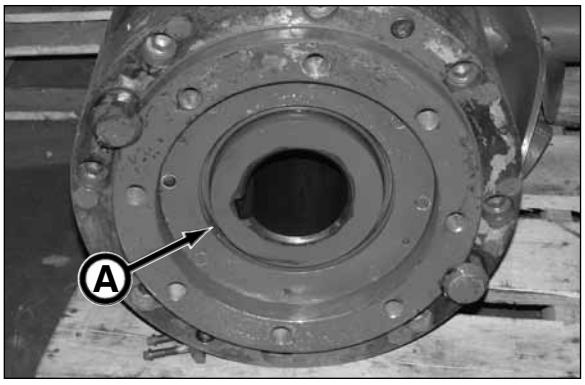
NOTICE Lubricate seals at initial launch, then immediately after each drive while dirt is soft and flexible thereafter.

1. Remove one of the bearing grease plugs (retain plug) and install grease fitting.
2. Mount a grease gun equipped with Mobilgrease® XHP222 grease or equivalent to grease fitting.
3. Lubricate until clean grease is visible on front face of bearing assembly.
4. Rotate bearing and lubricate again until clean grease is visible on front face.
5. Remove grease fitting. Install teflon tape on grease plug and replace plug into port.
6. Repeat purging procedure with the other grease port. Once complete be sure both grease fittings are removed and replaced with teflon taped plugs.



3. VISUALLY CHECK BEARING HOUSING FOR OIL LEAKAGE AND DIRT BUILDUP

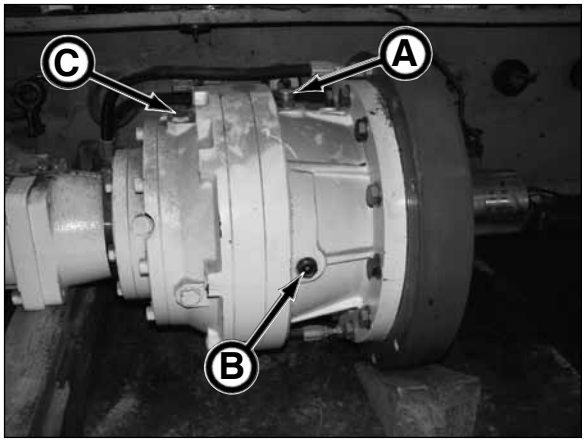
1. Clean all dirt from bearing housing (A).
2. If oil leakage is visible, the dirt and oil bearing seals must be replaced. Contact your Akkerman Aftermarket Support representative for more information. If seal replacement is required, keep in mind that the seal orientation is critical. Therefore be sure to replace seals in the exact orientation of the seals being removed.



4. CHECK GEAR BOX OIL LEVEL

1. With the breather (A) in the 12 o'clock position, check so oil level is visible on sight gauges (B) (located in 3 o'clock and 9 o'clock positions). Be sure to allow a few minutes for the oil to settle before checking oil level.

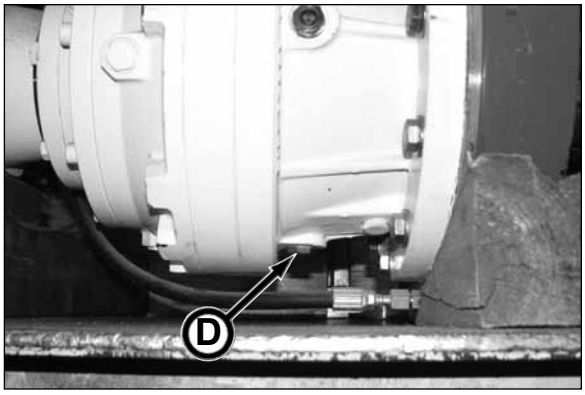
2. If oil is not visible in sight gauge, clean area around fill plug (C). Remove fill plug and add Mobil SHC™ 630 Synthetic Bearing and Gear oil or equivalent until oil is visible in sight gauge. Replace fill plug.



5. CHECK GEAR BOX OIL QUALITY

1. Clean area around drain plug (D). Loosen drain plug to check for water.

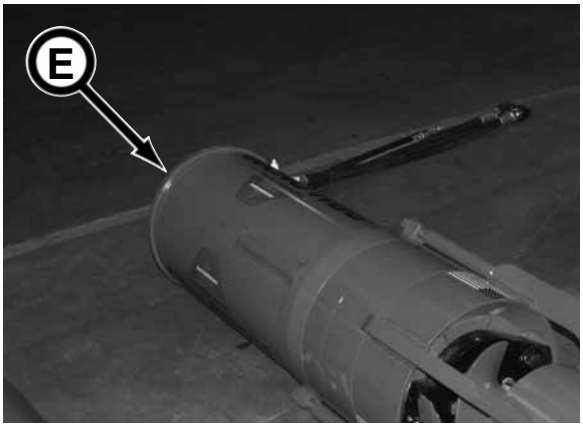
2. If water is visible, the gear box seals have failed. In this case the gear box must be drained and flushed, seals replaced and the gear box filled with fresh, clean Mobil SHC™ 630 Synthetic Bearing and Gear oil.



6. INSPECT HOUSING BELL END

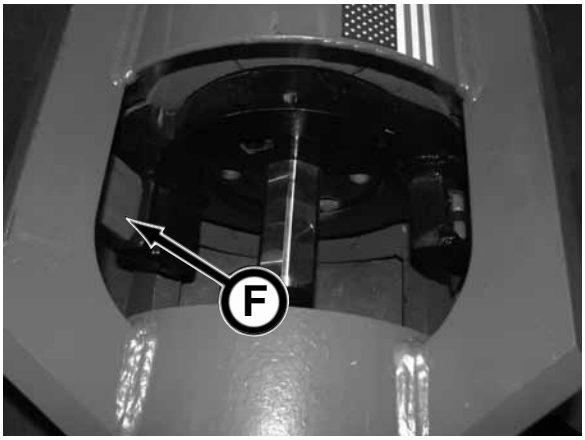
Inspect bell end (E) of housing for damage or excessive wear which may cause the final pipe to be improperly sealed.

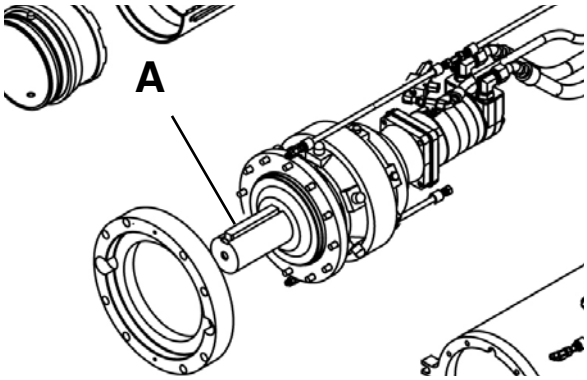
Contact your Akkerman Aftermarket Support representative should bell end damage occur.



7. INSPECT CUTTER BIT TEETH

Inspect cutter teeth (F) for wear or damage. Repair or replace as necessary.





8. CHECK AUGER DRIVE SHAFT KEY

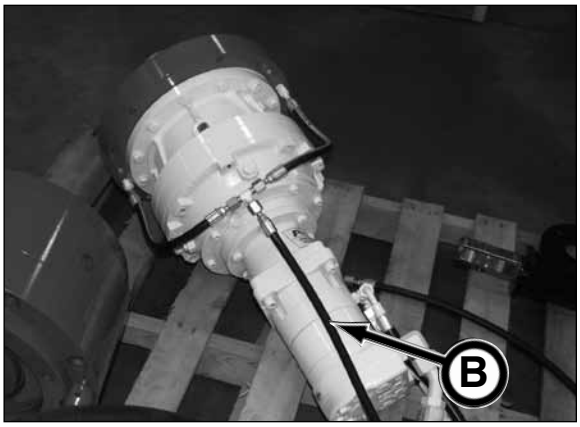
The auger drive shaft key must be retained after drive is complete and available for the next drive. If key (A) is missing, order Akkerman part number P0097-026 for replacement.

9. CLEAN JETTING LINES & PORTS

Flush jetting ports with clean water by installing supply source to the jetting inlet hose (B).

Use a maximum of 2,500 psi (17,237 kPa) water pressure. In freezing weather, use compressed air to remove water from lines after flushing to prevent machine damage.

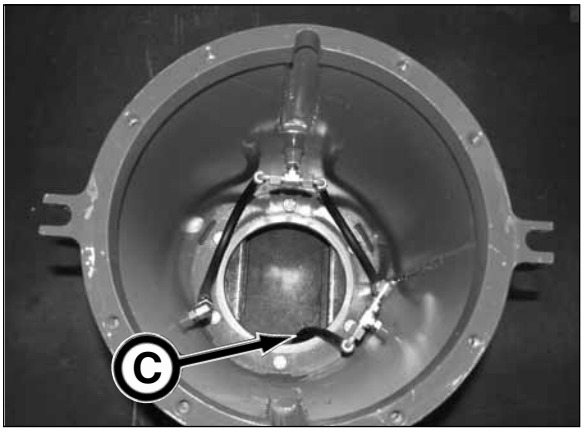
Be sure nozzles are clean. If plugged, remove nozzles for cleaning.



10. CLEAN LUBRICATION LINES & PORTS

Flush pipe lubrication ports with clean water by installing supply source to the lubrication inlet hose (C) on back of rear section.

Use a maximum of 500 psi (3,447 kPa) water pressure. In freezing weather, use compressed air to remove water from lines after flushing to prevent machine damage.



11. CHECK DRIVE ASSEMBLY TO SKIN HOUSING ASSEMBLY BOLT TIGHTNESS

1. Visually check bolts for damage. Replace if damaged.
2. Check drive assembly to skin housing assembly bolt tightness with calibrated torque wrench to 95 ft-lb (129 N·m) torque.
3. If bolts do not hold torque, the bolt(s) must be replaced with new.

12. CHECK TENSIONING ROD BOLT TIGHTNESS

1. Visually check bolts for damage. Replace if damaged.

2. Check tensioning rod bolt tightness with calibrated torque wrench to 110 ft-lb (149 N·m) torque.

3. If bolts do not hold torque, the bolt(s) must be replaced with new.

13. CHECK REAMING ASSEMBLY TO BEARING ASSEMBLY BOLT TIGHTNESS

1. Visually check bolts for damage. Replace if damaged.

2. Check reaming assembly to bearing assembly bolt tightness with calibrated torque wrench to 330 ft-lb (447 N·m) torque.

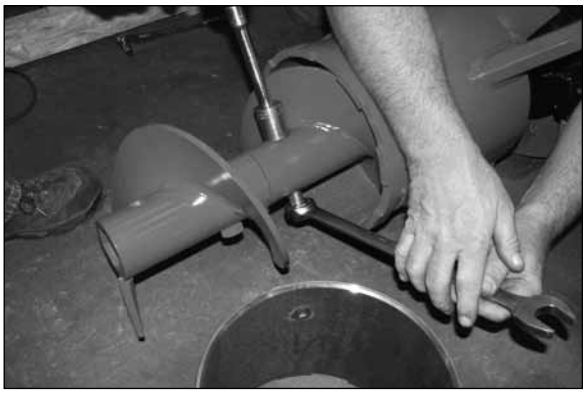
3. If bolts do not hold torque, the bolt(s) must be replaced with new.

14. CHECK RETAINER PLATE TO BEARING ASSEMBLY BOLT TIGHTNESS

1. Visually check bolts for damage. Replace if damaged.

2. Check retainer plate to bearing assembly bolt tightness with calibrated torque wrench to 186 ft-lb. (252 N·m) torque.

3. If bolts do not hold torque, the bolt(s) must be replaced with new.

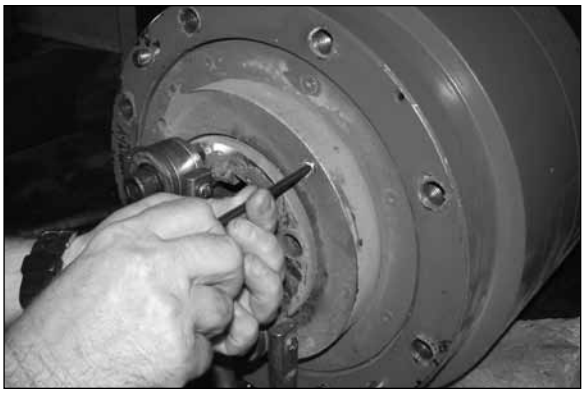


15. CHECK AUGER BOLT TIGHTNESS

1. Visually check bolts for damage. Replace if damaged.

2. Check auger bolts so bolt end is flush with nut.

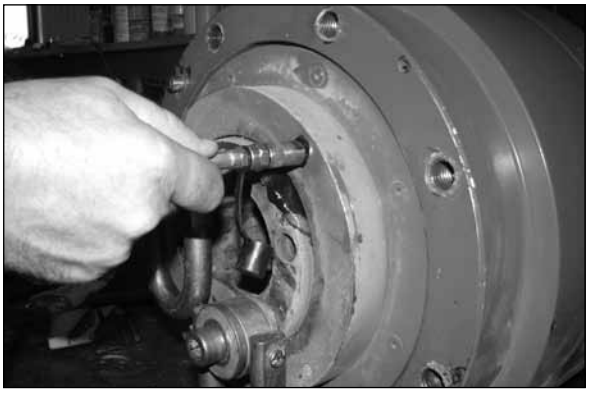
AFTER EACH DRIVE



16. PURGE BEARING ASSEMBLY LIP SEALS

NOTICE Lubricate seals at initial launch, then immediately after each drive while dirt is soft and flexible thereafter.

1. Remove one of the bearing grease plugs (retain plug) and install grease fitting.
2. Mount a grease gun equipped with Mobilgrease® XHP222 grease or equivalent to grease fitting.
3. Lubricate until clean grease is visible on front face of bearing assembly.
4. Rotate bearing and lubricate again until clean grease is visible on front face.
5. Remove grease fitting. Install teflon tape on grease plug and replace plug into port.
6. Repeat purging procedure with the other grease port. Once complete be sure both grease fittings are removed and replaced with teflon taped plugs.

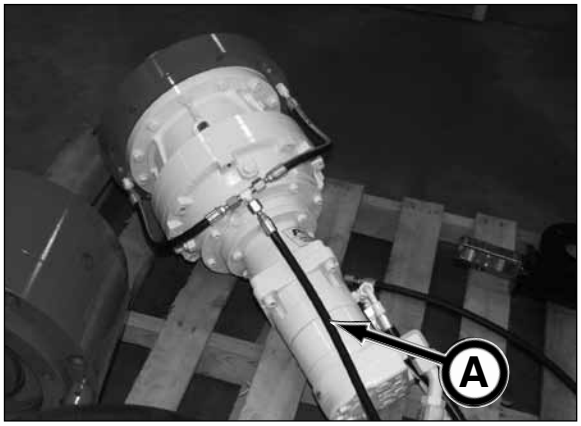


17. FLUSH JETTING LINES & PORTS

Flush jetting ports with clean water by installing supply source to the jetting inlet hose (A).

Use a maximum of 2,500 psi (17,237 kPa) water pressure. In freezing weather, use compressed air to remove water from lines after flushing to prevent machine damage.

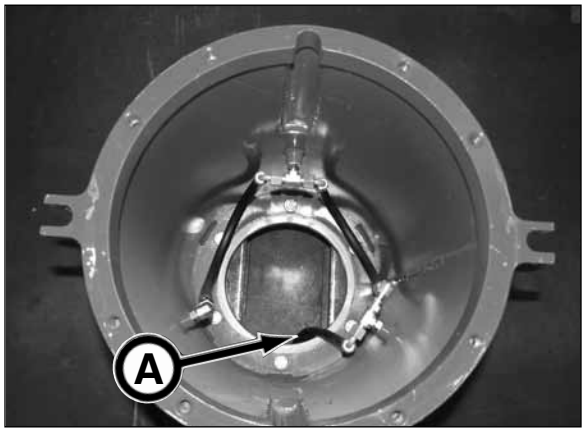
Be sure nozzles are clean. If plugged, remove nozzles for cleaning.



18. FLUSH LUBRICATION LINES & PORTS

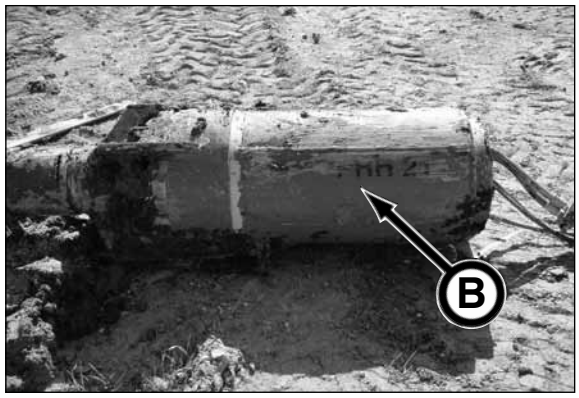
Flush pipe lubrication ports with clean water by installing supply source to the lubrication inlet hose (A) on back of rear section.

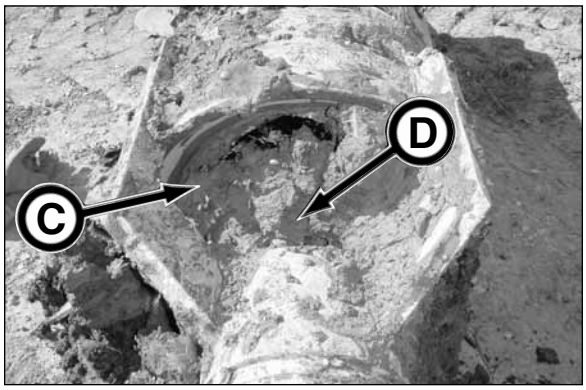
Use a maximum of 500 psi (3,447 kPa) water pressure. In freezing weather, use compressed air to remove water from lines after flushing to prevent machine damage.



19. CLEAN PRH HOUSING, AUGER CHAMBER & AUGERS

Clean PRH to remove all dirt from housing (B), cutting area (C), auger chamber (D), and augers while the dirt is soft and flexible and before the dirt hardens to PRH.





EVERY 2000 FEET

20. DRAIN & FILL BEARING ASSEMBLY

1. Orient bearing assembly so the two ports that are located 180° are positioned at 12 o'clock (fill) and 6 o'clock (drain), and the third port (check port) should then be located slightly higher than the 9 o'clock position or slightly above center line position.

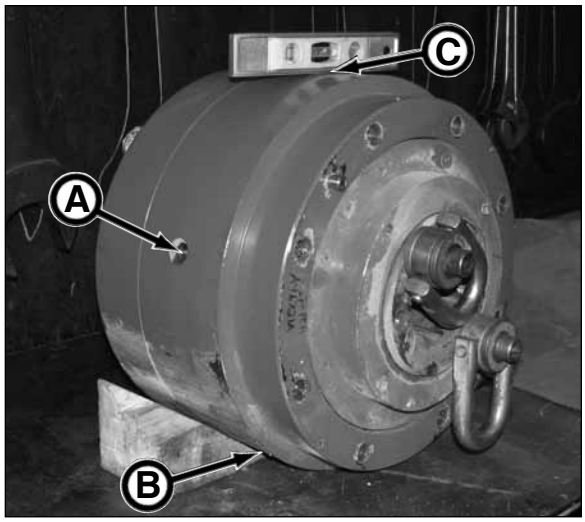
2. Clean areas around the check (A), drain (B), and fill (C) ports.

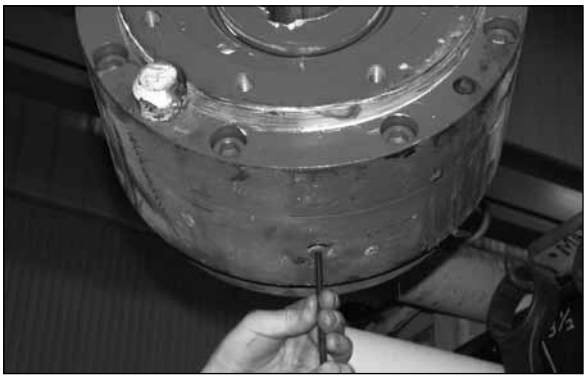
3. Drain oil from bearing assembly by removing drain plug (A) into a properly sized catch pan. Be sure to recycle the drained oil properly.

4. Replace drain plug.

5. Add fresh, clean Mobil SHC™ 630 Synthetic Bearing and Gear oil through the fill port until the oil is level with the check port.

6. Replace check and fill plugs.





Drain Plug Access

21. DRAIN & FILL GEAR BOX

1. Orient gear box so the breather (D) is in the 12 o'clock position (the two sight gauges will be located in 3 o'clock and 9 o'clock positions).

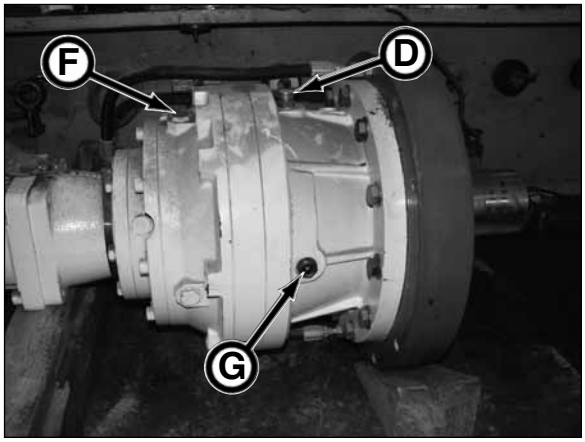
2. Clean area around the drain (E) and fill (F) ports.

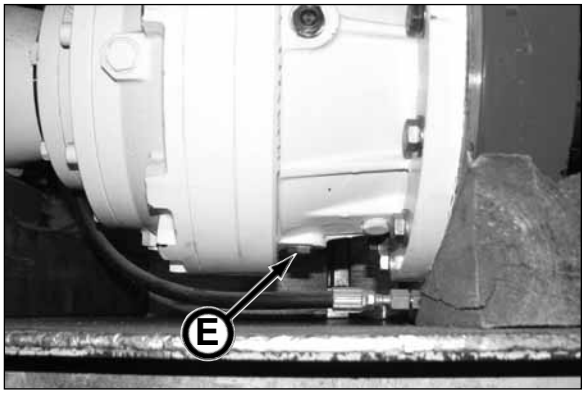
3. Drain oil from gear box by removing drain plug (E) into a properly sized catch pan. Be sure to recycle the drained oil properly.

4. Replace drain plug.

5. Add fresh, clean Mobil SHC™ 630 Synthetic Bearing and Gear oil through the fill port until the oil level is visible on the sight gauges (G).

6. Replace fill plug.





NOTES

Troubleshooting

Powered Reaming Head

Problem	Cause	Solution
High auger torque.	Too many spoils.	Reduce advance rate of PCH.
	Sticky spoils.	Add polymer to spoils.
	Long drive length.	Add polymer to reduce load.
	Improper connections on quick disconnects.	Check to be sure all connections on quick disconnects are fully engaged.
Operating pressure too high.	Advance rate too fast.	Slow advance rate.
	No polymer in water at jetting.	Add polymer to water jetting.
	Spoils are sticky/dry.	Increase jetting psi.
	Improper connections on quick disconnects.	Check to be sure all connections on quick disconnects are fully engaged.
Must stop mid way in product pipe installation to remove casing.	Temporary casing not timed with product pipe.	Add 1’ or 2’ section of product pipe behind PRH.
Hydraulic oil leaking in PRH assembly.	Case drain reliefs dumping out due to high return pressure.	Operate at slower speed, reduced volume.
	Oil too cold.	Operate at lower gpm until oil is warm.
	Pinched case drain hose.	Remove hose from pipe joint or replace hose.

NOTES

Specifications

POWERED REAMING HEAD SERIES II

Assembly Length

Notched Casing (from notched casing end to rear of PRH housing)

PRH 14	60 in. (1,524 mm)
PRH 16	60 in. (1,524 mm)
PRH 20	60 in. (1,524 mm)

Notched Casing (from auger end to rear of PRH housing)

PRH 14	64 in. (1,626 mm)
PRH 16	64 in. (1,626 mm)
PRH 20	64 in. (1,626 mm)

Non-Notched Casing (from transition casing end to rear of PRH housing)

PRH 14	68 in. (1,727 mm)
PRH 16	68 in. (1,727 mm)
PRH 20	68 in. (1,727 mm)

Non-Notched Casing (from transition casing end to rear of PRH housing)

PRH 14	72 in. (1,829 mm)
PRH 16	72 in. (1,829 mm)
PRH 20	72 in. (1,829 mm)

The reaming assembly and the rear housing with drive assembly may be launched separately.

Diameter

Powered Reaming Head Body

PRH 14	15 in. (381 mm)
PRH 16	16 in. (406 mm)
PRH 20	20 in. (508 mm)

Drive System

Auger Drive

Max. Torque	10,500 ft-lbs (14,238 N·m)
Max. Speed	40 rpm

Akkerman Inc. reserves the right to improve its product without notice or obligation.

TORQUE CHART

Use these torque values as a guideline when tightening hardware unless otherwise specified in this manual.

Lubricated Coarse UNC Threads Grade 8 Fasteners			**Lubricated Fine UNF Threads Grade 8 Fasteners**		
Bolt Size	**Torque ft. lbs.**	**(N·m)**	**Bolt Size**	**Torque ft. lbs.**	**(N·m)**
1/4 - 20	10	(14)	1/4 - 28	11	(15)
5/16 - 18	20	(27)	5/16 - 24	22	(30)
3/8 - 16	35	(47)	3/8 - 24	39	(53)
7/16 - 14	56	(76)	7/16 - 20	62	(84)
1/2 - 13	85	(115)	1/2 - 20	96	(130)
9/16 - 12	123	(167)	9/16 - 18	137	(186)
5/8 - 11	170	(231)	5/8 - 18	192	(260)
3/4 - 10	301	(408)	3/4 - 16	336	(456)
7/8 - 9	450	(610)	7/8 - 14	500	(678)
1 - 8	680	(922)	1 - 12	740	(1003)
1-1/8 - 7	960	(1302)	1-1/8 - 12	1030	(1397)
1-1/4 - 7	1360	(1844)	1-1/4 - 12	1500	(2034)
1-1/2 - 6	2360	(3200)	1-1/2 - 12	2660	(3607)

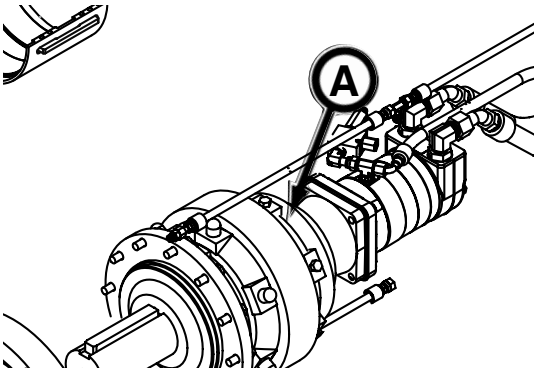
Identification Numbers

Model and serial numbers are required when ordering parts or requesting service information. Record your model and serial numbers below.

POWERED REAMING HEAD (A)

Model Number _____

Serial Number _____



NOTES

Safety Data Sheets

The Federal Occupational, Safety, and Health Administration (OSHA) Standard 29 CFR 1910.1200, require that specific safety data sheets (SDS) be available to employees before operating this equipment. This may include information on substances contained in this equipment such as hydraulic fluid and gear lubricant.

Akkerman Inc. will provide, at no cost, SDS which apply to its product line. Simply contact your Akkerman Aftermarket Support representative for a copy.

To ensure a prompt response to your SDS request, include your return address (including zip or postal code) and the equipment's model numbers and serial numbers with your request.

NOTES

Warranty

Akkerman Inc. warrants that all equipment manufactured by it be free from defects due to workmanship or material under normal use and service for a period of 90 days. This warranty does not apply to normal wear items such as cutter teeth, filters, etc. Akkerman Inc. does not warrant the fitness of its equipment for a particular purpose or application.

NOTES

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