

Drill Feed Cylinder Bolt-On Replacement Procedure

Function

To provide a general procedure for removing a drill feed cylinder and installing a replacement unit. These instructions are general; your mast may differ slightly from those described in this document. Specifically, screw and tool sizes listed are imperial. Some mast designs may require the use of metric tools and screws. For information on your machine's mast, please refer to your machine's Parts Catalog.

Tools Needed

- Socket Wrench
- 1/4" Hex Driver or Allen Wrench
- 3/8" Hex Driver or Allen Wrench
- 1/2" Hex Driver or Allen Wrench
- 5/8" Hex Driver or Allen Wrench
- 3/4" Socket or Wrench
- 15/16" Socket or Wrench
- 1-11/16" Socket or Wrench
- 1/2" Socket or Wrench
- Loctite 243
- Blocking or Cribbing Materials
- 1-1/8" - 12 Eyebolt
- Select and Use  Before Starting Job

Parts Needed

PART #	DESCRIPTION	QTY
-	Replacement Feed Cylinder	1
-	Hydraulic Hose Caps/Plugs	
-	3/8 - 6" (or greater) Hex Head Cap Screw	1

Machine Setup

1. Prior to performing any work, ensure that the machine is in a safe

- working area with the boom and drill carriage lowered.
2. Have readily available the hydraulic circuit, Parts Catalog, JHF# 573402 Bolt Tightening Torque Recommendations document, and this document for reference during this procedure.

General Safety Advisements to be Followed Throughout Procedure

WARNING

Only approved lifting devices should be used when performing Maintenance activities. Always ensure that Working Load Limits are not exceeded. Failure to adhere to recommended WLL could result in serious injury or death.

WARNING

Keep hands clear of moving machinery or parts, and always wear personal protective equipment when performing maintenance activities.

WARNING

Use only OEM parts (found in Parts Catalog) when replacing parts. Using non-OEM parts could result in serious injury or death and will void any warranties.

Removal Procedure

1. With the mast in the vertical position, using the feed handle or joystick raise the inner mast upwards 9" (228 mm) and place a block or crib between the bottom plate of the outer mast and the bottom of the

inner mast channel to hold in place. If the cylinder is completely disabled, external means of lifting will be required. If the feed cylinder is not operational, the drillguide will need to be removed, as described in Step 6, prior to proceeding with the remaining steps.

2. If possible, lower the drillhead carriage until it is centered between the upper and lower crossheads. Install block or crib under the bottom of the drillhead carriage. Depending upon the condition of the cylinder, it may not be possible to move carriage to described location. In this case, a larger block or crib will be required.
3. Turn off machine and follow your lock-out tagout (LOTO) procedure.
4. Remove hosing from the feed cylinder.



NOTICE

Anytime hydraulic hoses are removed, hydraulic pressure must be removed from the line and all open hydraulic connections should be plugged or capped to prevent contamination. In addition, it is advisable to label hoses during the removal process. This will make reattachment easier and help to ensure accuracy during reattachment.

5. Place a 3/8 - 6" (or greater) hex head cap screw through the crosshead chain, just above the bottom crosshead roller. This will prevent the carriage from moving during mast disassembly.
6. Using a socket wrench, remove the three hex head cap screws from the drillhead motor cover and the four drill head mounting hex head cap screws. Remove hosing from drillhead, and using an appropriate lifting device, remove the drillhead from the carriage.
7. Using a socket wrench, remove the four hex head cap screws mounting the drillguide. Remove hosing, and, using an appropriate lifting device, remove the drillguide.
8. Using a 5/8" hex driver or Allen wrench, remove the two 3/4" socket head cap screws that attach the foot of the feed cylinder to the outer mast.



9. Some masts have a Lock Ring installed at the top of the feed cylinder. This ring can be separated by removing the (2) 1/2" socket head cap screws. Once the screws have been removed, the ring can be removed.
10. Remove 1-1/8" bolt which connects the end of the feed cylinder to the inner mast top plate using a 1-11/16" socket or 1-11/16" wrench.
11. Remove the inner mast top plate by removing the six 1/2" screws. Depending upon the design, these may be socket or hex head cap screws. The socket head can be removed with a 3/8" hex driver or Allen wrench, while the hex head cap screw requires a 3/4" socket or 3/4" wrench.

NOTICE

After removing the inner mast top plate, remove spacers from inside of the 1-1/8"-12 tapped hole in the top of the feed cylinder. These spacers can be re-used during the new cylinder installation.



12. Remove the chain attachment link from the combs on the inner mast by removing two 5/16" socket head cap screws and two 5/16" nylock nuts.
13. Install 1-1/8"-12 Eyebolt in top of the Feed Cylinder. **Note:** If mast has a clevis or pin cap, use other certified lifting devices (chain, shackles, slings, etc.).
14. Pull the feed cylinder, crossheads, chain, and carriage up and out of both the inner and outer mast assemblies.

NOTICE

It will be necessary to rotate feed cylinder foot to front to clear inner mast back plate.

15. Stand feed cylinder up on the ground and block or crib up to the bottom of the carriage.
16. Break the two crosshead chains at the master links and / or remove the crossheads to free the cylinder.

- Remove the feed cylinder.

Installation Procedure

- Install new feed cylinder.
- Reconnect crosshead chains and crossheads to attach feed cylinder to the carriage assembly.
- Reinstall 3/8 - 6" (or greater) hex head cap screw in crosshead chain.
- Install 1-1/8" - 12 Eyebolt in replacement feed cylinder.
- Lift feed cylinder, crossheads, chain, and carriage into the inner mast from the top. Ensure that the 9" block or crib installed during the removal process is under the bottom of the inner mast and that the drill carriage is resting on blocking or cribbing.
- Rotate the feed cylinder foot back to the rear to align with mounting holes in the outer mast. Install two 3/4" socket head cap screws to secure the foot of the cylinder using Loctite 243 on the threads. Screws should bottom out before fully clamping down on the foot; this allows the feed cylinder to float approximately 1/4" (6mm).
- Connect chain attachment link to combs on inner mast using the two 5/16" socket head cap screws and two 5/16" nylock nuts. Tighten just enough to fully engage the complete length of nylon in the nylock nut.



NOTICE

The quantities of spacers that are required can vary. Once tightened, the gap from the retaining hex head cap screw to the top of the inner mast top plate should be 1/8" to 5/32" (3.2 to 8 mm). This gap and the gap at the bottom of the cylinder are critical, allowing the cylinder to float. **Failure to include these gaps could result in premature cylinder failure.**

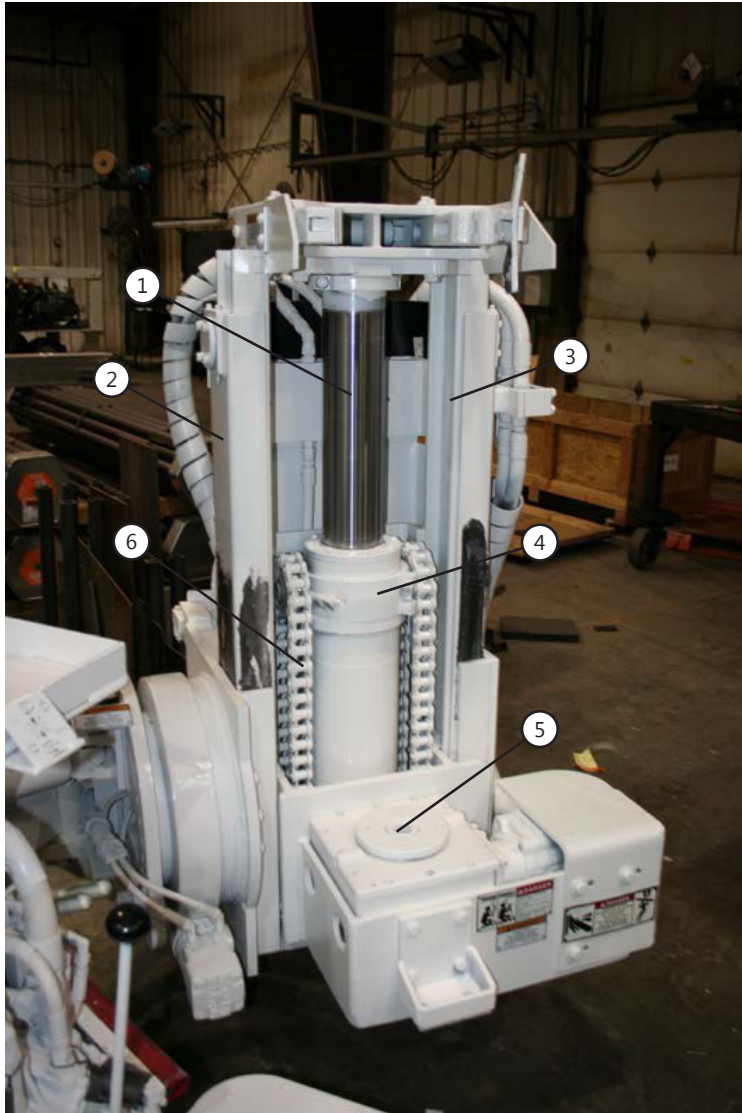
- Remove the 3/8" hex head cap screw from the crosshead chain.
- Reconnect hoses to the feed cylinder, making sure to install them in the correct port.
- Reapply power to the machine.
- Apply hydraulic pressure to move the carriage up and to extend the inner mast. The 9" (228 mm) blocking or cribbing that was installed and the blocking or cribbing supporting the drill carriage can now be removed.
- Reinstall the drillguide using a drill steel to align the drillguide bushings.
- Reinstall drillhead into carriage, using Loctite 243 on screw threads.
- Turn off the machine and follow lock-out tagout procedures.
- Reinstall hoses on drillguide and drillhead, making sure to install them in the correct port.
- Reapply power to machine and run mast, drillguide, and drillhead to ensure everything is working properly.

NOTICE

Ensure that the mounting screws are purposely long enough so they do not clamp the feed cylinder tight to the bottom of the mast. Do not replace the screws with shorter screws or add washers to take up the gap. Use only OEM parts.

- Install spacers, Lock Ring, inner mast top plate, and the 1-1/8" cylinder retaining screw using Loctite 243 on the threads.

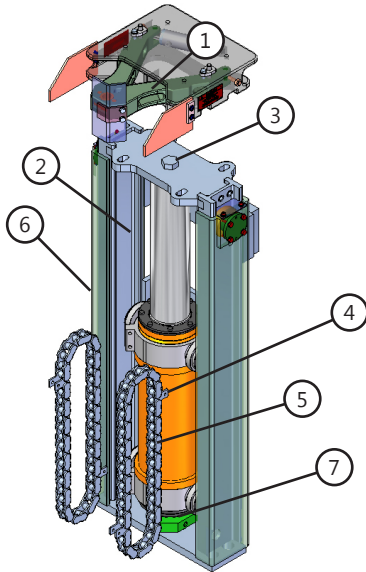
Figure 1



Component Parts (Fig. 1)

ITEM	DESCRIPTION	QTY
1	Feed Cylinder	1
2	Titan Outer Mast Assembly	1
3	Inner Mast Assembly	1
4	Crosshead Assembly	1
5	Typical Drillhead Assembly	1
6	Crosshead Chain	2

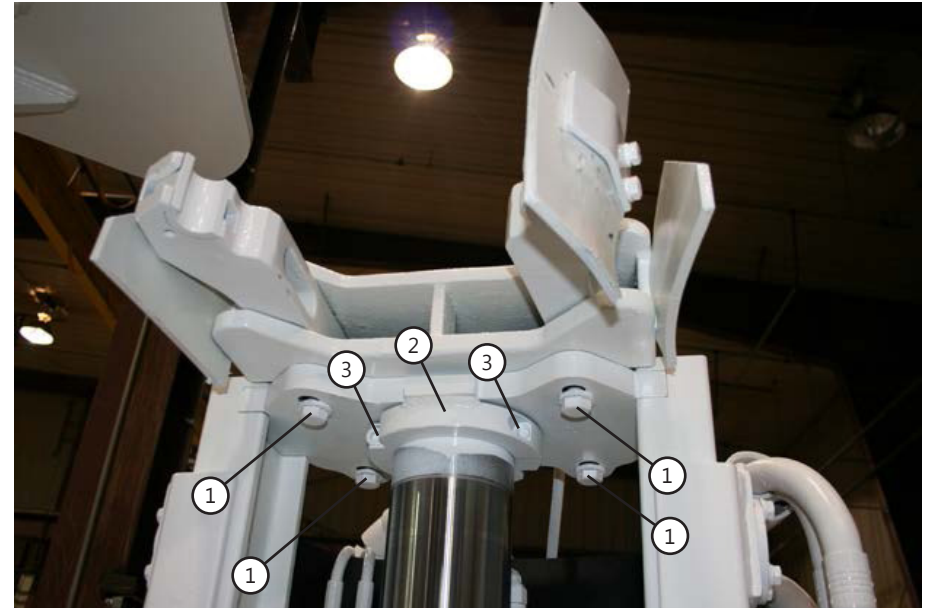
Figure 2



Component Parts (Fig. 8)

ITEM	DESCRIPTION	QTY
1	Drillguide	1
2	Inner Mast	1
3	Drill Feed Cylinder to Inner Mast Mounting Screw	1
4	Crosshead Chains to Inner Mast Mounting Screws	6
5	Crosshead Chains	2
6	Outer Mast	1
7	Drill Feed Cylinder to Outer Mast Mounting Screws	8

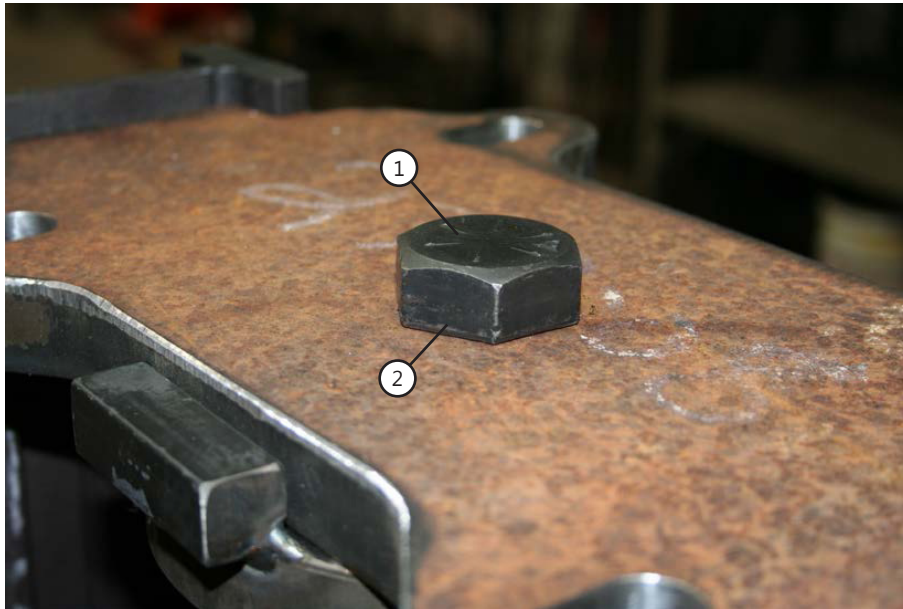
Figure 3



Component Parts (Fig. 3)

ITEM	DESCRIPTION	QTY
1	Hex Head Cap Screw	4
2	Lock Ring	1
3	Retaining Socket Head Cap Screw(s)	1-2

Figure 4



Component Parts (Fig. 4)

ITEM	DESCRIPTION	QTY
1	Top Hex Head Cap Screw	1
2	1/8"-5/32" (3-5mm) Gap	-

NOTICE

Top hex head cap screw should bottom out with a 1/8" to 5/32" gap between the bottom of the screw and the top of the inner mast. Additional or fewer spacers may be required to achieve gap.

Figure 5



Component Parts (Fig. 4)

ITEM	DESCRIPTION	QTY
1	Top Plate Socket Head Cap Screws	6

NOTICE

Torque these screws according to JHF #573402 Bolt Tightening Torque Recommendations Document.

Figure 7



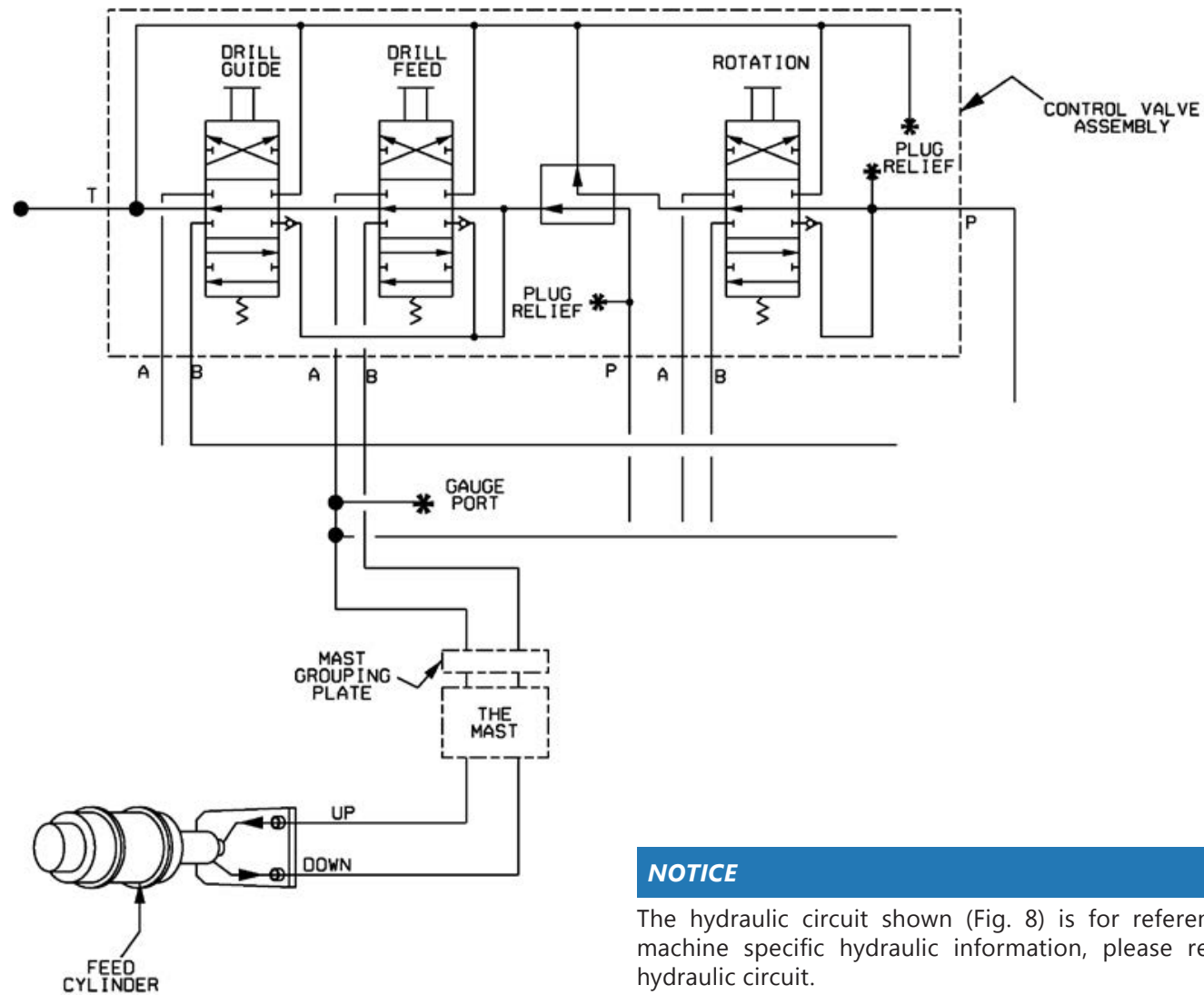
Component Parts (Fig. 7)

ITEM	DESCRIPTION	QTY
1	Socket Head Cap Screws	2
2	Optional Feed Cylinder Foot Guard	1
3	1/4" (6mm) Gap	-

NOTICE

Ensure that the mounting screws are purposely long enough so they do not clamp the feed cylinder tight to the bottom of the mast. Do not replace the screws with shorter screws or add washers to take up the gap.

Figure 8



NOTICE

The hydraulic circuit shown (Fig. 8) is for reference purposes only. For machine specific hydraulic information, please refer to your machine's hydraulic circuit.