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MAINTENANCE INTERVALS

Operation and Maintenance
Manual Excerpt

CATERPILLAR®

CATERPILLAR®

SEBU7662-04
May 2007

Operation and Maintenance Manual

H140D S, H160D S and H180D S Hydraulic Hammers

BXB1-Up (H140D S)
BXF1-Up (H160D S)
BXP1-Up (H180D S)

i02767095

Maintenance Interval Schedule

SMCS Code: 6700-041; 7519

Ensure that all safety information, warnings, and instructions are read and understood before any operation or any maintenance procedures are performed.

The user is responsible for the performance of maintenance, including all adjustments, the use of proper lubricants, fluids, filters, and the replacement of components due to normal wear and aging. Failure to adhere to proper maintenance intervals and procedures may result in diminished performance of the product and/or accelerated wear of components.

Use mileage, fuel consumption, service hours, or calendar time, WHICH EVER OCCURS FIRST, in order to determine the maintenance intervals. Products that operate in severe operating conditions may require more frequent maintenance.

Note: Before each consecutive interval is performed, all maintenance from the previous interval must be performed.

Every 2 Service Hours or 4 Times Daily

Initial 50 Service Hours

Every 50 Service Hours or Weekly

Every 1000 Service Hours or 1 Year

i01862214

Work Tool - Inspect/ Recondition

SMCS Code: 6333-020; 6333-040; 6700-020; 6700-040

The hammer must be resealed and the membrane for the hydraulic accumulator must be replaced on an annual schedule.

Inspect all of the wear parts. You must replace all of the damaged parts or the parts that are worn. Refer to the Service Manual, “Specifications, Disassembly and Assembly, and the Systems Operation, Testing and Adjusting” Sections for information on the hammer.

You must make sure that the accumulator for the hammer is charged properly. Refer to the Service Manual, “Hydraulic Accumulator - Test and Charge” for procedures on servicing the accumulator.

Refer to Guideline For Reusable Parts and Salvage Operations, SEBF8474, “Hydraulic Hammer Reuse and Salvage Guide” in order to determine the reusability of the components.

i02396713

Work Tool - Lubricate

SMCS Code: 6700-086

NOTICE
Failure to apply down pressure on the hammer tool during lubrication could result in piston seal failure. This seal failure will allow oil to leak from the hammer tool. To avoid seal damage, always apply down pressure on the hammer tool during lubrication.

Note: Before you lubricate the hammer, refer to Special Instruction, REHS1368, “Procedure to Properly Grease Hydraulic Hammers”.

Note: Before you install the hammer tool, the tool shank must be well lubricated.

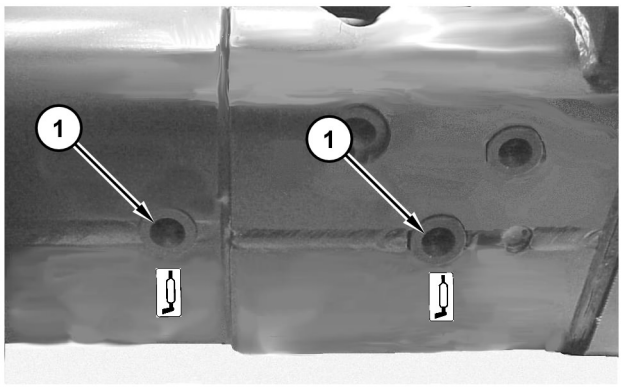

Illustration 36 g01197156

There are two locations (1) on the hammer for lubrication.

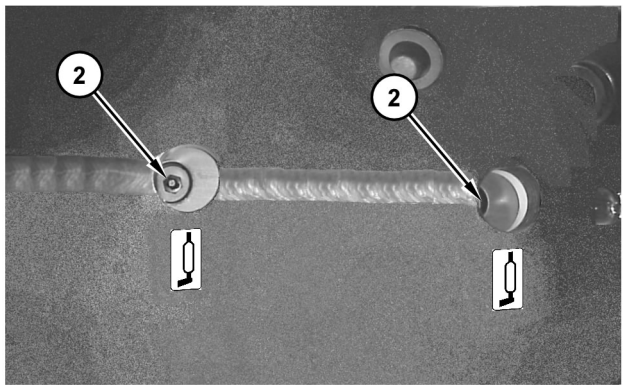

Illustration 37 g01197159

Fittings (2) are located near the bottom of the hammer. In order to access the grease fittings, remove the protective plugs.

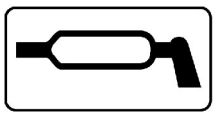

Illustration 38 g01161963

The grease points have been marked with a grease decal.

Apply 10 strokes to 15 strokes from the grease gun to the tool bushings and the hammer tool.

Note: The letter (G) is stamped into the valve body near the port for the autolube system. The port for the autolube system is near the inlet port or the outlet port.

Adjust the intervals and the amount of grease to the wear rate of hammer tool (4) and the working conditions.

Lack of grease or improper grease will cause the following problems:

- Abnormal wear of the tool bushing and hammer tool (4)
- Broken hammer tool (4)

Hammers with Automatic Lubrication

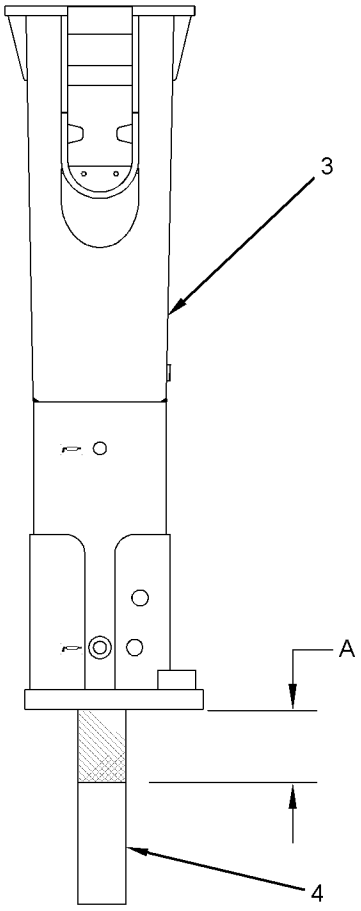

Illustration 39 g01197169

(3) Hammer
(4) Tool
(A) 50 - 100 mm (2 - 4 inch)

Check the Reservoir

Note: To ensure that the autolube system will work properly, make sure that the grease reservoir for the autolube system is full of grease.

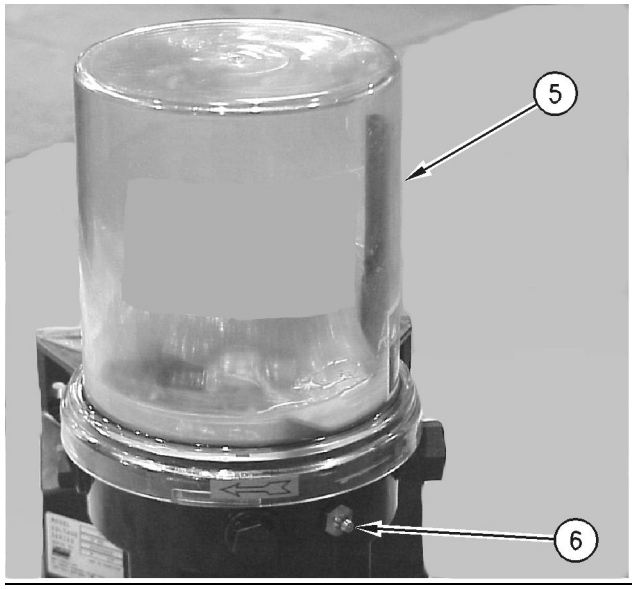

Illustration 40 g00868081

Typical example of reservoir and nipple for refilling the reservoir

Fill the reservoir (5) of the automatic lubrication system. Refill the reservoir when the grease reaches MIN mark on the reservoir. Fill the reservoir up to the MAX mark on the reservoir.

Check the Operation of the Pump

Visually verify the amount of grease around tool (4) below the lower tool bushing. An adequate amount of grease is indicated if there is a collar of grease around the tool for a distance of 50 - 100 mm (2 - 4 inch) (A). This should be checked with no down pressure on the tool. The tool must be off the ground and pointing downward.

Note: When hammer (3) is removed from the stick, the grease line should be disconnected at the same location as the hydraulic pressure and return lines will be disconnected. The grease lines and the return lines must be capped or plugged. The electrical circuit should be deactivated by removing the fuse from the fuse holder in the red wire.

Adjust the Operation of the Pump

If the collar of grease is not 50 - 100 mm (2 - 4 inch) in length (A) the output of the pump is not correct. Refer to Special Instruction, REHS1286, “Installation Procedure for the 24 Volt Automatic Lubrication System for the Hydraulic Hammers” or Special Instruction, GESR0531, “Hydraulic Autolube Kit” for instructions on resetting the pump.

Note: The volume of grease is not adjustable on the pump for the 148-8098 Automatic Lubrication Group. This group is only available in Europe.

i01326826

Hydraulic Fittings - Inspect

SMCS Code: 5057-040-X6

⚠ WARNING

Personal injury or death can result from improperly checking for a leak.

Always use a board or cardboard when checking for a leak. Escaping air or fluid under pressure, even a pin-hole size leak, can penetrate body tissue causing serious injury, and possible death.

If fluid is injected into your skin, it must be treated immediately by a doctor familiar with this type of injury.

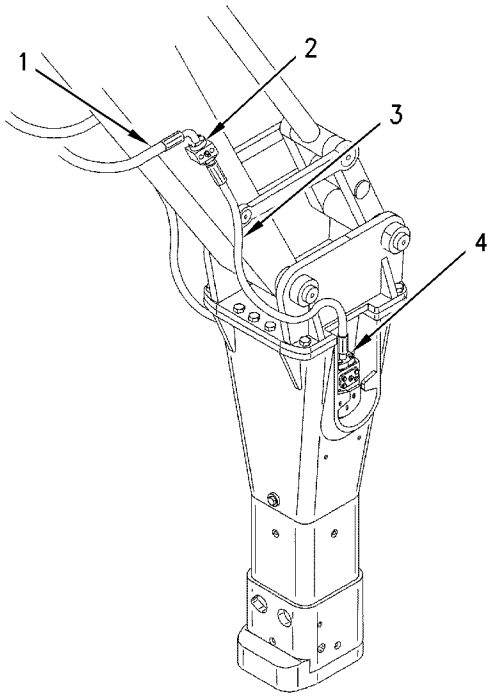

Illustration 41 g00675272

1. In order to perform the following inspection, remove the covers at the top of the hammer housing.
2. Check supply lines and return lines (1) for damage or wear.
3. Check hydraulic fittings (2) and (4) for damage or leaks.
4. Check connector hoses (3) for damage or for wear.
5. Check all of the clamps on the boom and all of the clamps on the stick of the host machine.

Repair any damaged parts or worn parts before you operate the hammer. Replace any damaged parts or worn parts before you operate the hammer. Repair any leaks before you operate the hammer. Replace any covers that were removed before you operate the hydraulic hammer.

i02775997

Mounting Bracket Bolts - Tighten

SMCS Code: 7079-527-BC; 7079-527-BK

Tighten the bolts for the mounting bracket to the following torque value:

Table 7

Torque Values for the Bolts for the Mounting Bracket			
Sales Model	**Part Number and Part Name**	**Quantity**	**Torque Value**
H140D S	7X-2454 Bolt	10	900 ± 100 N·m (664 ± 74 lb ft)
H160D S	7Y-5265 Bolt	10	3100 ± 350 N·m (2286 ± 258 lb ft)
H180D S	7Y-5265 Bolt	10	3100 ± 350 N·m (2286 ± 258 lb ft)

i01958469

Tool - Inspect

SMCS Code: 6826-040

S/N: BXB1-Up

Note: Use caution when you touch the hammer tool. The hammer tool can be very hot after the tool has been in operation.

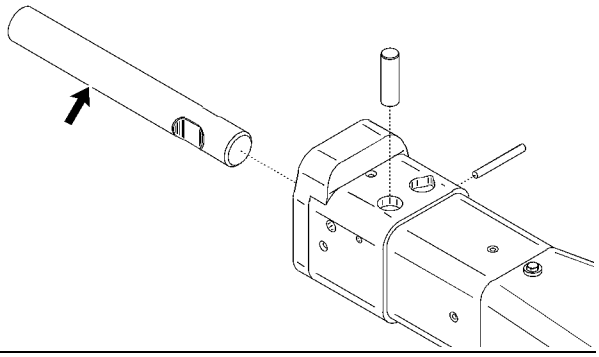

Illustration 42 g00675483

1. Remove the tool from the hammer. Refer to the Operation and Maintenance Manual, “Tool - Remove and Install”.

2. Check the hammer tool for wear. If necessary, grind the burrs off the hammer tool. Inspect the notch for the retaining pins. Remove any burrs.

3. Inspect the retaining pins for the hammer tool. Remove any burrs from the retaining pins. Replace the pins if the pins have excessive wear.

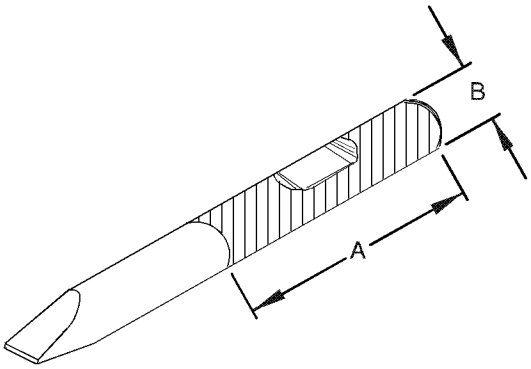

Illustration 43 g01018196

4. Check the hammer tool for wear. When you measure the wear of the tool, you must measure the part of the tool (A) that is in the tool bushings.

5. Measure dimension (B) of the tool.

6. Replace the tool if dimension (B) is less than 138 mm (5.43 inch).

7. Inspect the tool for cracks. If the tool is cracked, replace the tool.

Note: Do not weld a tool to repair. Welding causes cracks on the surface of the tool. Welding can cause failure due to metal fatigue.

i02402705

Tool - Inspect

SMCS Code: 6826-040

S/N: BXF1-Up

Note: Use caution when you touch the hammer tool. The hammer tool can be very hot after the tool has been in operation.

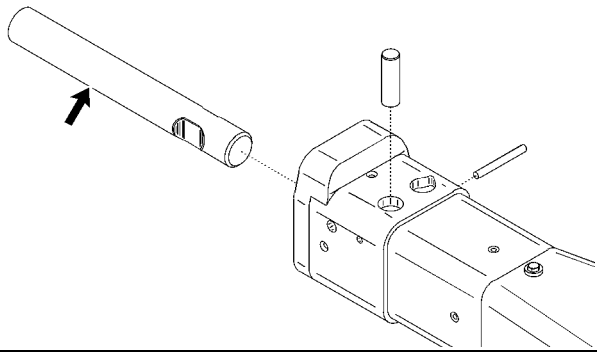

Illustration 44 g00675483

1. Remove the tool from the hammer. Refer to the Operation and Maintenance Manual, “Tool - Remove and Install”.

2. Inspect the retaining pins for the hammer tool. Remove any burrs from the retaining pins. Replace the pins if the pins have excessive wear.

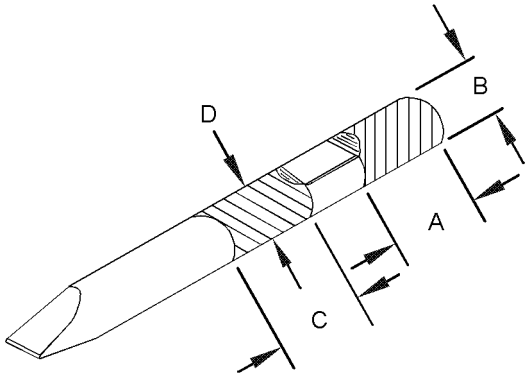

Illustration 45 g01200031

3. Check the hammer tool for wear. If necessary, grind the burrs off the hammer tool. Inspect the notch for the retaining pins. Remove any burrs.

4. When you measure the wear of the tool, you must measure the part of the tool (A) that is in the upper tool bushing and the part of the tool (C) that is in the lower tool bushing.

5. Measure dimension (B) of the tool.

6. Replace the tool if dimension (B) is less than 156 mm (6.14 inch).

7. Measure dimension (D) of the tool.

8. Replace the tool if dimension (D) is less than 158 mm (6.22 inch).

9. Inspect the tool for cracks. If the tool is cracked, replace the tool.

Note: Do not weld a tool to repair. Welding causes cracks on the surface of the tool. Welding can cause failure due to metal fatigue.

i02397357

Tool - Inspect

SMCS Code: 6826-040

S/N: BXP1-Up

Note: Use caution when you touch the hammer tool. The hammer tool can be very hot after the tool has been in operation.

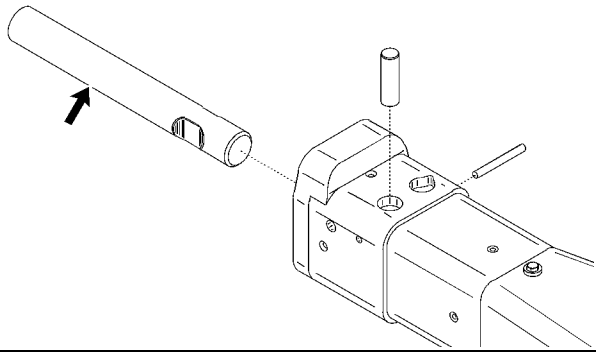

Illustration 46 g00675483

1. Remove the tool from the hammer. Refer to the Operation and Maintenance Manual, “Tool - Remove and Install”.

2. Inspect the retaining pins for the hammer tool. Remove any burrs from the retaining pins. Replace the pins if the pins have excessive wear.

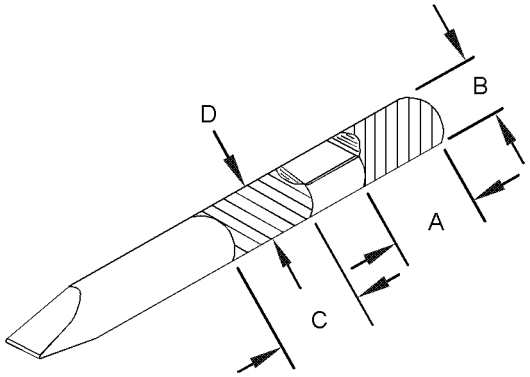

Illustration 47 g01200031

3. Check the hammer tool for wear. If necessary, grind the burrs off the hammer tool. Inspect the notch for the retaining pins. Remove any burrs.

4. When you measure the wear of the tool, you must measure the part of the tool (A) that is in the upper tool bushing and the part of the tool (C) that is in the lower tool bushing.

5. Measure dimension (B) of the tool.

6. Replace the tool if dimension (B) is less than 167 mm (6.58 inch).

7. Measure dimension (D) of the tool.

8. Replace the tool if dimension (D) is less than 172 mm (6.77 inch).

9. Inspect the tool for cracks. If the tool is cracked, replace the tool.

Note: Do not weld a tool to repair. Welding causes cracks on the surface of the tool. Welding can cause failure due to metal fatigue.

i02776014

Tool - Remove and Install

SMCS Code: 6826-010

Removal of Tool

Note: Use caution when you touch the hammer tool. The hammer tool is very hot after the hammer has been used.

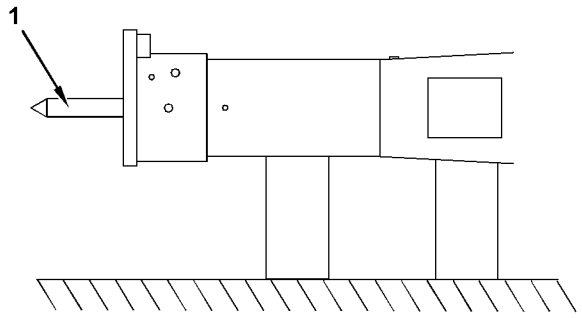

Illustration 48 g01197485

1. Lay the hammer on blocks in order to remove hammer tool (1). Position the hammer in order to remove the retaining pins from the top of the housing. The blocks should be high enough to allow the retaining pins to be removed.

2. Put the host machine's transmission in neutral. The parking brake should be engaged.

3. Stop the engine.

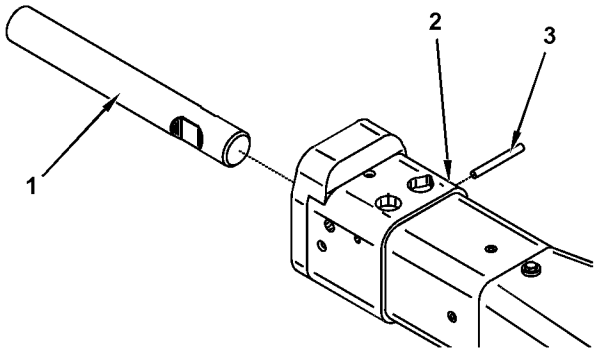

Illustration 49 g01197488

4. The locking pin (2) is spring loaded. Fully depress locking pin (2) with a screwdriver in order to remove pin (3).

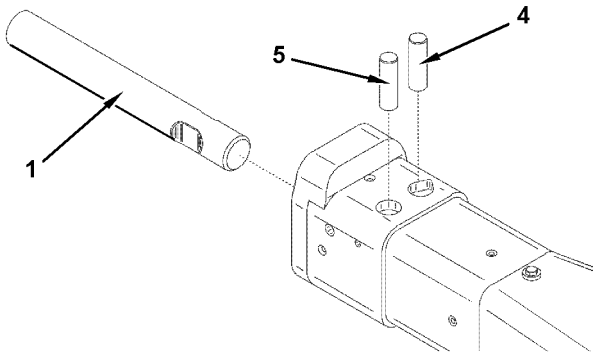

Illustration 50 g01197489

5. Remove retaining pin (4) and retaining pin (5) in order to remove hammer tool (1).

6. Use a suitable lifting device in order to remove hammer tool (1). Refer to the Table 8 for the weight of the hammer tools. Remove hammer tool (1).

Table 8

Approximate Weights of Large Hammer Tools			
	H140D S	**H160D S**	**H180D S**
Blunt Tool	123 kg (271.2 lb)	187 kg (412.3 lb)	225 kg (496 lb)
Super Blunt Tool	134 kg (295.4 lb)	214 kg (471.8 lb)	248 kg (546.7 lb)
Chisel Tool	130 kg (286.6 lb)	206 kg (454.2 lb)	230 kg (507.1 lb)
Soft Rock Chisel Tool	140 kg (308.6 lb)	197 kg (434.3 lb)	240 kg (529.1 lb)
Hard Rock Chisel Tool	132 kg (291.0 lb)	197 kg (434.3 lb)	225 kg (496 lb)
Long Chisel Tool	156 kg (343.9 lb)	222 kg (489.4 lb)	**Not Available**
Moil Tool	127 kg (280.0 lb)	197 kg (434.3 lb)	225 kg (496 lb)
Long Moil Tool	152 kg (335.1 lb)	221 kg (487.2 lb)	**Not Available**
Pyramid Point Tool	132 kg (291.0 lb)	197 kg (434.3 lb)	215 kg (474 lb)

7. After you remove the hammer tool , inspect the lower tool bushing for wear. Refer to the Operation and Maintenance Manual, “Tool Bushing (Lower) - Inspect/Replace” for information on inspecting the bushing.

8. After you have removed the hammer tool, inspect the hammer tool for wear. Refer to the Operation and Maintenance Manual, “Tool - Inspect” for information on inspecting the hammer tool.

9. After you have removed the hammer tool, inspect the seal for the bushings for wear. You must replace the seal if the seal is worn or if the seal is damaged.

Alternate Removal Procedure For Tool Retaining Pins on H180D S

Note: The H180D S tool retaining pins can also be removed with a threaded rod.

Note: Use caution when you touch the hammer tool. The hammer tool is very hot after the hammer has been used.

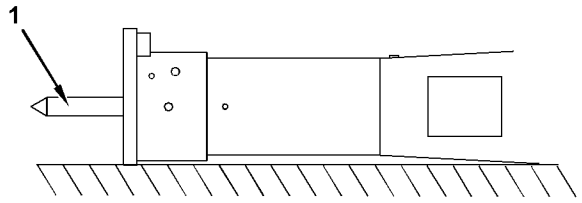

Illustration 51 g01384091

1. Lay the hammer on the ground in order to remove hammer tool (1). Position the hammer in order to remove the retaining pins from the top of the housing.

2. Put the host machine’s transmission in neutral. The parking brake should be engaged.

3. Stop the engine.

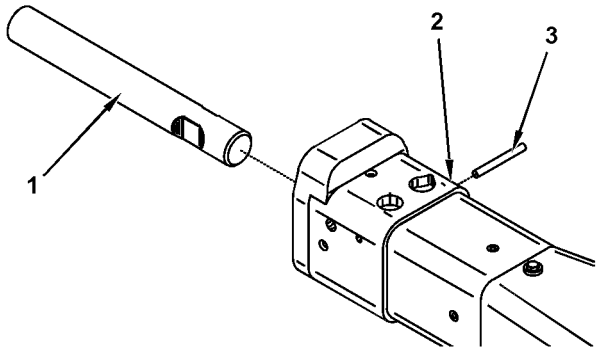

Illustration 52 g01197488

4. The locking pin (2) is spring loaded. Fully depress locking pin (2) with a screwdriver in order to remove pin (3).

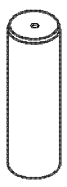

Illustration 53 g01197688

5. A 16 mm (0.6299 inch) threaded hole is located in the end of the pin.

6. Insert a 16 mm (0.6299 inch) threaded rod into the tool retaining pin.

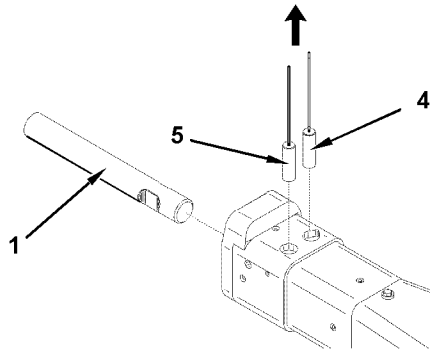

Illustration 54 g01197752

7. Pull the threaded rod outward in order to remove the retaining pin (4) and retaining pin (5).

8. Use a suitable lifting device in order to remove hammer tool (1). Refer to the Table 8 for the weight of the hammer tools. Remove hammer tool (1).

Installation of Tool

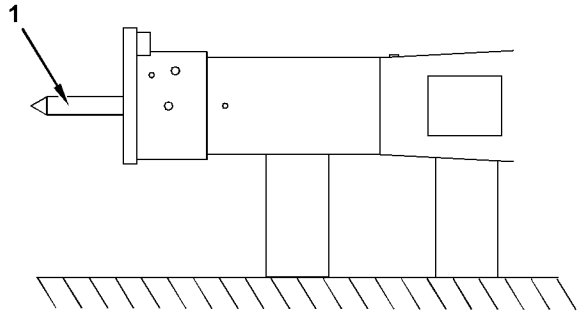

Illustration 55 g01197485

1. Position the hammer in order to install the retaining pins from the top of the housing.

2. Clean hammer tool (1) and lubricate hammer tool (1) with grease.

3. Clean pins (3), (4), and (5). Lubricate pins (3), (4), and (5) with grease.

4. Install hammer tool (1) and align the grooves of the tool with the pin bores.

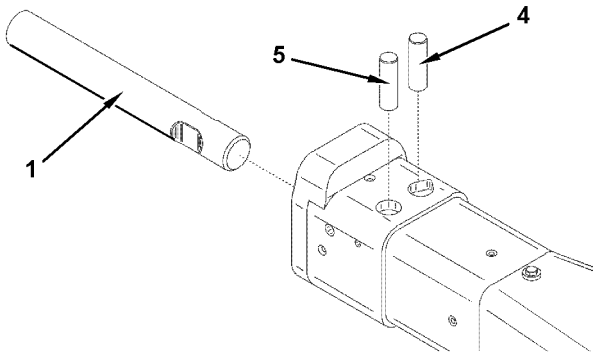

Illustration 56 g01197489

5. Install retaining pin (4) and install retaining pin (5).

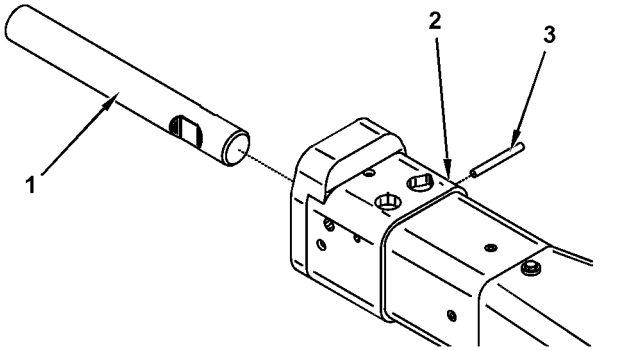

Illustration 57 g01197488

6. The locking pin is spring loaded. Fully depress locking pin (2). Install pin (3) that locks the retaining pins.

7. Check that retaining pin (4) and retaining pin (5) are secured by locking pin (3).

i01570377

Tool Retaining Pins - Inspect/Replace

SMCS Code: 6826-040; 6826-510

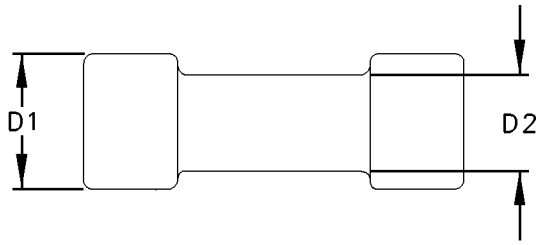

Illustration 58 g00815523

1. Remove the pin from the hammer.
2. Inspect the pin for wear or for cracks.
3. Measure the amount of wear. Compare Dimension (D1) to Dimension (D2). The difference between Dimension (D1) and Dimension (D2) must be less than 1.0 mm (0.04 inch). If the difference is greater than 1.0 mm (0.04 inch), you must replace the pin.
4. If the pin is cracked, you must replace the pin.

i02776016

Tool Bushing (Lower) - Inspect/Replace

SMCS Code: 6826-040-GY; 6826-528

S/N: BXB1-Up

S/N: BXF1-Up

1. Remove the tool. Refer to Operation and Maintenance Manual, “Tool - Remove and Install” for information on the procedure to remove the tool from your hammer.
2. If you need to remove the lower tool bushing, refer to the Service Manual, “Tool Bushing (Lower) - Remove and Install” for more information. Refer to Table 9 for the weight of the lower tool bushing.

Table 9

Approximate Weight of Lower Tool Bushing	
H140D S	34 kg (75 lb)
H160D S	36 kg (79 lb)

3. Completely clean the inside of the bushing. Inspect the inside bore of the bushing for wear.

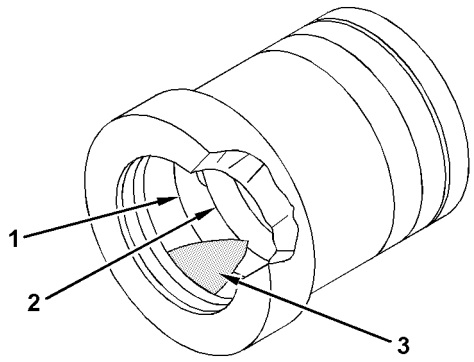

Illustration 59 g01200224

(1) First groove for grease
(2) Second groove for grease
(3) Wear pattern

4. Inspect the wear pattern (3) in the tool bushing. If first groove (1) is worn away and second groove (2) is visible, you can reuse the bushing.

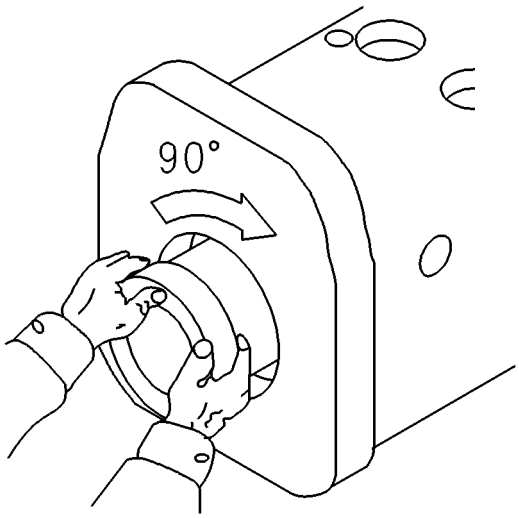

Illustration 60 g00701610

   a. In order to reuse the tool bushing, you can rotate the tool bushing by 90 degrees.

5. If grooves (1) and (2) are worn away, you must replace the tool bushing.

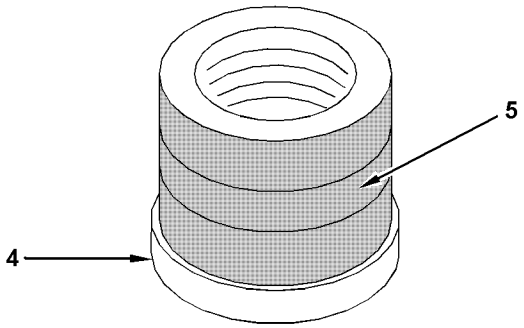

Illustration 61 g01200105

(4) Lower tool bushing
(5) Area on the lower tool bushing for applying grease

6. If the lower tool bushing has been removed from the front head, you must perform the following steps before you install the lower tool bushing.

   a. Apply grease to the entire surface (5) on the lower tool bushing (4). Grease will prevent corrosion and seizures. The removal of the lower tool bushing will be made easier by applying grease.

   b. Install the lower tool bushing. Install the retaining pins.

i02776017

Tool Bushing (Lower) - Inspect/Replace

SMCS Code: 6826-040-GY; 6826-528

S/N: BXP1-Up

1. Remove the tool. Refer to Operation and Maintenance Manual, “Tool - Remove and Install” for information on the procedure to remove the tool from your hammer.

2. If you need to remove the lower tool bushing, refer to the Service Manual, “Tool Bushing (Lower) - Remove and Install” for more information. Refer to Table 10 for the weight of the lower tool bushing.

Table 10

Approximate Weight of Lower Tool Bushing	
H180D S	71 kg (157 lb)

3. Completely clean the inside of the bushing.

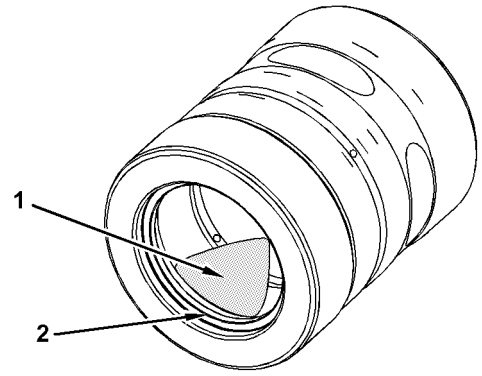

Illustration 62 g01197387

(1) Wear pattern
(2) Seal

4. Inspect the inside bore of the bushing for wear.

5. You can reuse the bushing if the wear (1) is only located on two sides of the bushing and if the bushing has never been rotated due to wear.

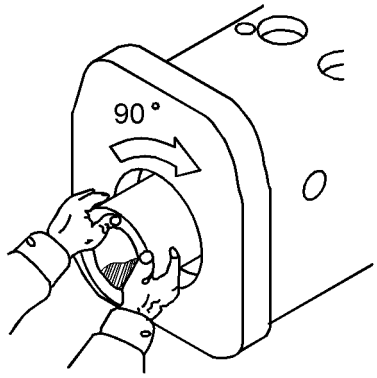

Illustration 63 g01197406

   a. In order to reuse the tool bushing, you can rotate the tool bushing by 90 degrees.

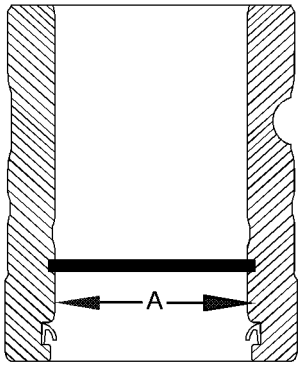

Illustration 64 g01384101

6. You must replace the tool bushing if the tool bushing has too much wear. Refer to Illustration 64 and Table 11 for the dimensions.

Table 11

Wear Limit For Tool Bushing	
Sales Model	Maximum Dimension (A)
H180D S	178 mm (7.0 inch)

7. Inspect the seal (2) in the tool bushing. Replace the seal in the tool bushing if the seal is worn or if the seal is damaged.

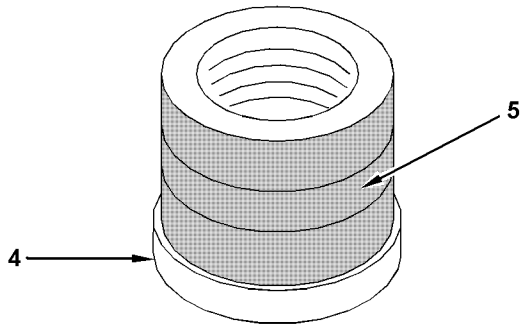

Illustration 65 g01200105

(4) Lower tool bushing
(5) Area on the lower tool bushing for applying grease

8. If the lower tool bushing has been removed from the front head, you must perform the following steps before you install the lower tool bushing.

a. Apply grease to the entire surface (5) on the lower tool bushing (4). Grease will prevent corrosion and seizures. The removal of the lower tool bushing will be made easier by applying grease.

b. Install the lower tool bushing.

9. Install the tool. Refer to Operation and Maintenance Manual, “Tool - Remove and Install” for information on the installation procedure.