FIRE PREVENTION

Maintenance

The machine and some attachments have components that are at high temperatures under normal operating conditions. The primary source of high temperatures is the engine and exhaust system. The electrical system, if damaged or incorrectly maintained, can be a source of arcs or sparks.

Flammable debris (leaves, straw, etc.) must be removed regularly. If flammable debris is allowed to accumulate, it can cause a fire hazard. Clean often to avoid this accumulation. Flammable debris in the engine compartment is a potential fire hazard.

The operator's area, engine compartment and engine cooling system must be inspected every day and cleaned if necessary to prevent fire hazards and overheating.

All fuels, most lubricants and some coolants mixtures are flammable. Flammable fluids that are leaking or spilled onto hot surfaces or onto electrical components can cause a fire.

Operation

Do not use the machine where exhaust, arcs, sparks or hot components can contact flammable material, explosive dust or gases.

Electrical

Check all electrical wiring and connections for damage. Keep the battery terminals clean and tight. Repair or replace any damaged part or wires that are loose or frayed.

Battery gas can explode and cause serious injury. Use the procedure in the Operation & Maintenance Manual for connecting the battery and for jump starting. Do not jump start or charge a frozen or damaged battery. Keep any open flames or sparks away from batteries. Do not smoke in battery charging area.

Hydraulic System

Check hydraulic tubes, hoses and fittings for damage and leakage. Never use open flame or bare skin to check for leaks. Hydraulic tubes and hoses must be properly routed and have adequate support and secure clamps. Tighten or replace any parts that show leakage.

Always clean fluid spills. Do not use gasoline or diesel fuel for cleaning parts. Use commercial nonflammable solvents.

Fueling

Stop the engine and let it cool before adding fuel. No smoking! Do not refuel a machine near open flames or sparks. Fill the fuel tank outdoors.

Starting

Do not use ether or starting fluids on any engine that has glow plugs. These starting aids can cause explosion and injure you or bystanders.

Use the procedure in the Operation & Maintenance Manual for connecting the battery and for jump starting.

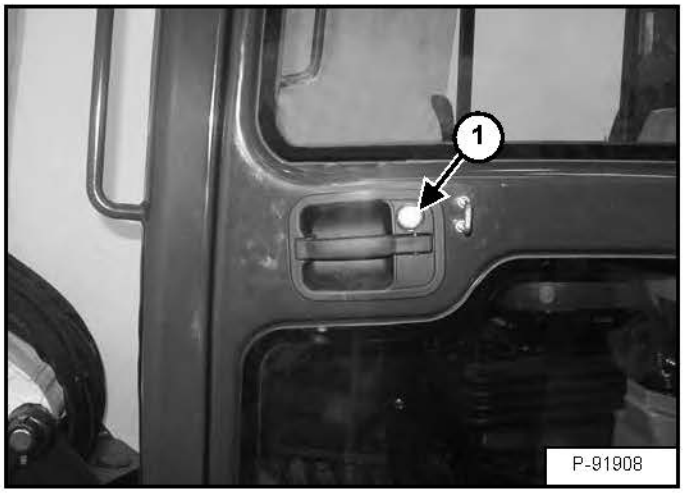
Spark Arrester Exhaust System

The spark arrester exhaust system is designed to control the emission of hot particles from the engine and exhaust system, but the muffler and the exhaust gases are still hot.

Check the spark arrester exhaust system regularly to make sure it is maintained and working properly. Use the procedure in the Operation & Maintenance Manual for cleaning the spark arrester muffler (if equipped).

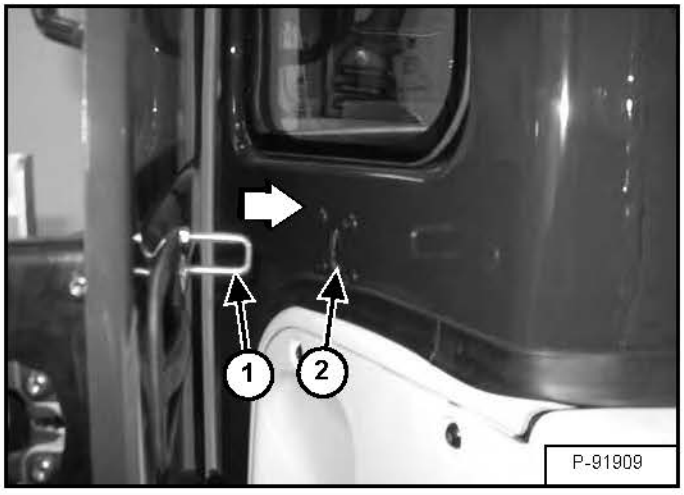
Cab Door

Figure 10-30-1



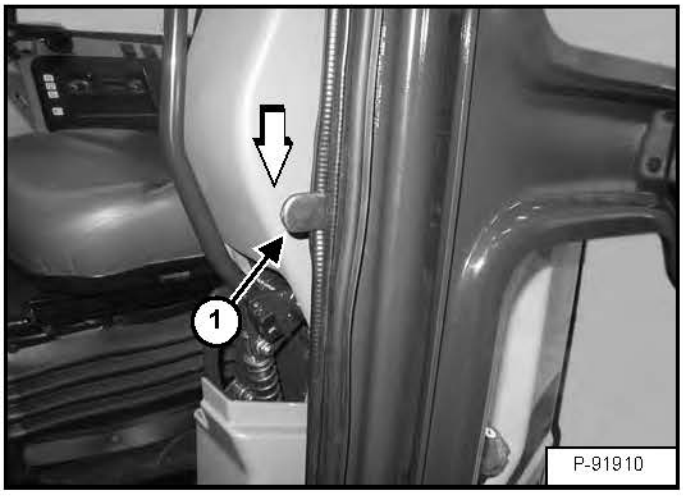
The cab door can be locked (Item 1) **[Figure 10-30-1]** with the same key as the starter switch.

Figure 10-30-2



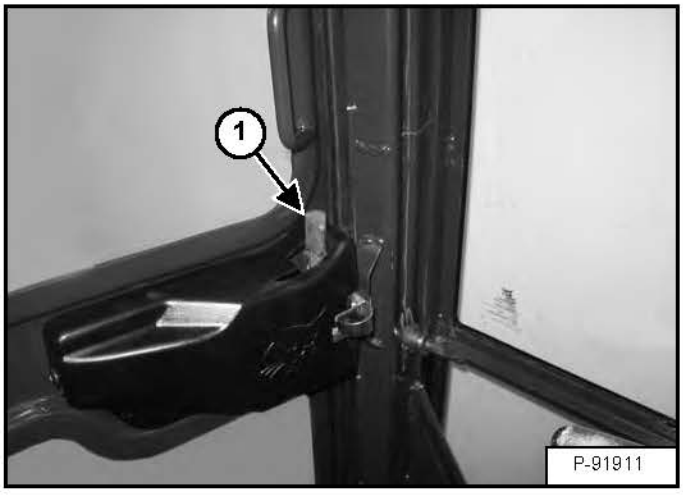
Push the door all the way open until the latch post (Item 1) engages in the latch (Item 2) **[Figure 10-30-2]** to hold the door in the open position.

Figure 10-30-3



When the door is in the open position, push down on the latch (Item 1) **[Figure 10-30-3]** and close the door.

Figure 10-30-4



From inside the cab, open the door using handle (Item 1) **[Figure 10-30-4]**.

SEAT BELT

Inspection And Maintenance

⚠ WARNING

Failure to properly inspect and maintain the seat belt can cause lack of operator restraint resulting in serious injury or death.

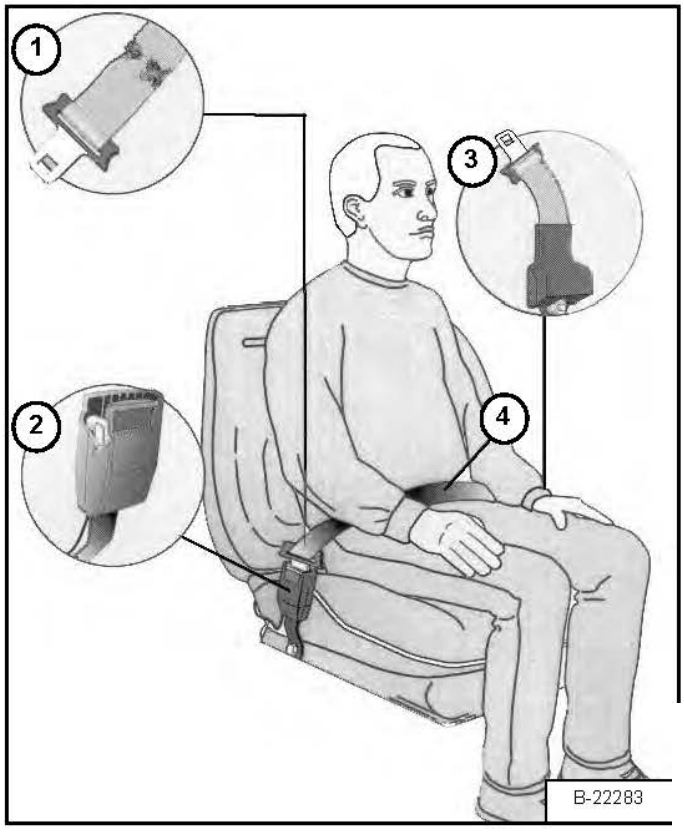
W-2466-0703

Check the seat belt daily for correct function.

Inspect the seat belt system thoroughly at least once each year or more often if the machine is exposed to severe environmental conditions or applications.

Any seat belt system that shows cuts, fraying, extreme or unusual wear, significant discolorations due to ultraviolet UV exposure, dusty / dirty conditions, abrasion to the seat belt webbing, or damage to the buckle, latch plate, retractor (if equipped), hardware or any other obvious problem should be replaced immediately.

Figure 10-190-1



The items below are referenced in **[Figure 10-190-1]**.

1. Check the webbing. If the system is equipped with a retractor, pull the webbing completely out and inspect the full length of the webbing. Look for cuts, wear, fraying, dirt and stiffness.

2. Check the buckle and latch for correct operation. Make sure latch plate is not excessively worn, deformed or buckle is not damaged or casing broken.

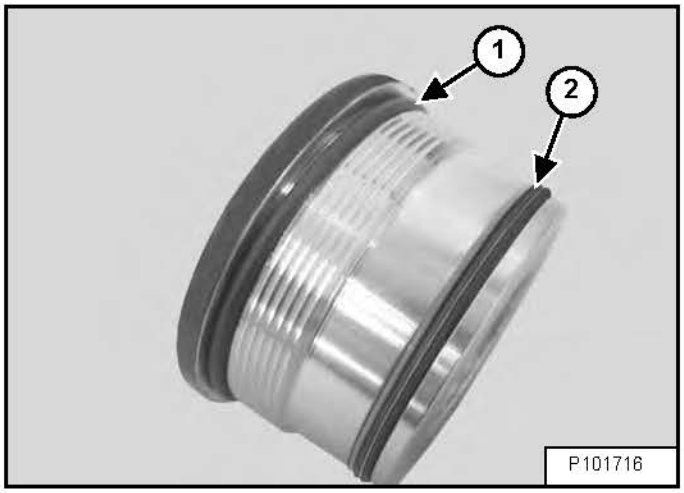
3. Check the retractor web storage device (if equipped) by extending webbing to determine if it looks correct and that it spools out and retracts webbing correctly.

4. Check webbing in areas exposed to ultraviolet (UV) rays from the sun or extreme dust or dirt. If the original color of the webbing in these areas is extremely faded and / or the webbing is packed with dirt, the webbing strength may have deteriorated.

See your Bobcat dealer for seat belt system replacement parts for your machine.

Assembly (Cont'd)

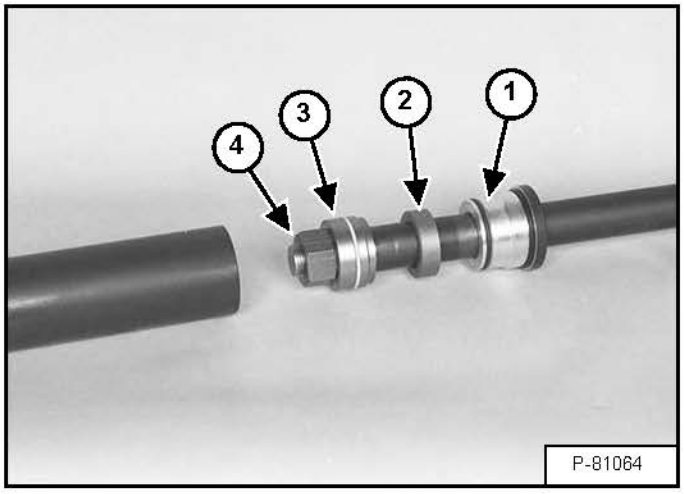
Figure 20-22-28



Install the O-ring (Item 1) **[Figure 20-22-28]**.

Install the seal (Item 2) **[Figure 20-22-28]**.

Figure 20-22-29



Install the head (Item 1), spacer (Item 2) and the piston (Item 3) **[Figure 20-22-29]** on the rod.

Grease the piston where the nut contacts the piston. Do not get grease on the threads.

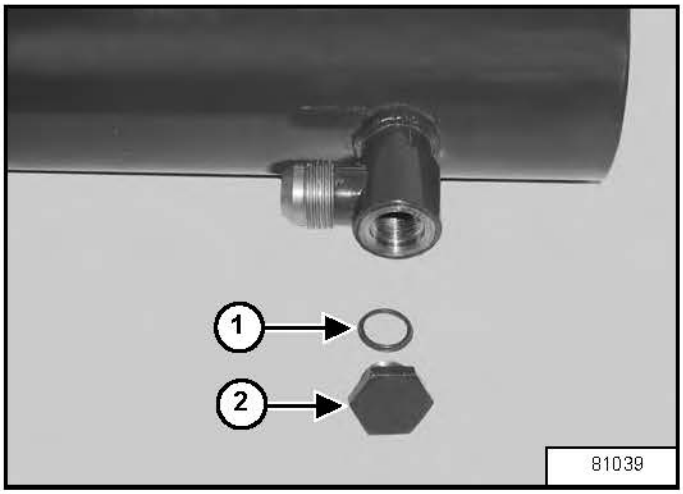
Provide an adequate support for the cylinder before tightening.

NOTE: Clean and dry the rod threads. Install a NEW NUT with pre-applied Loctite®.

Install the nut (Item 4) **[Figure 20-22-29]**.

Tighten the nut to 1491 N•m (1100 ft-lb) torque.

Figure 20-22-30

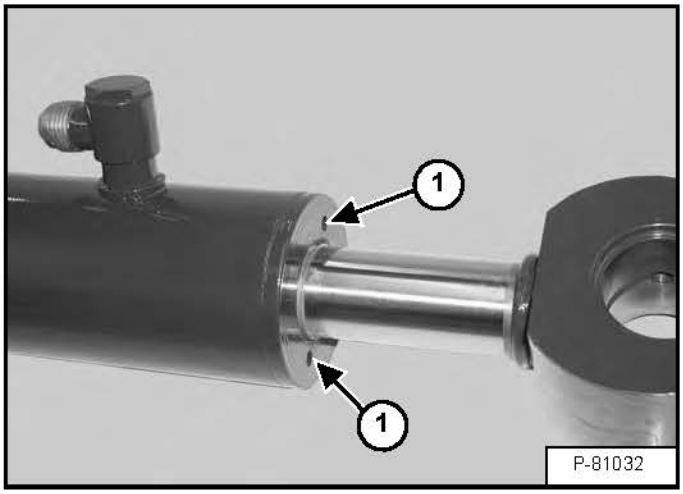


Install the O-ring (Item 1) and plug (Item 2) **[Figure 20-22-30]**.

Tighten the plug to 50 N•m (37 ft-lb) torque.

Put the base end of the cylinder in a vise.

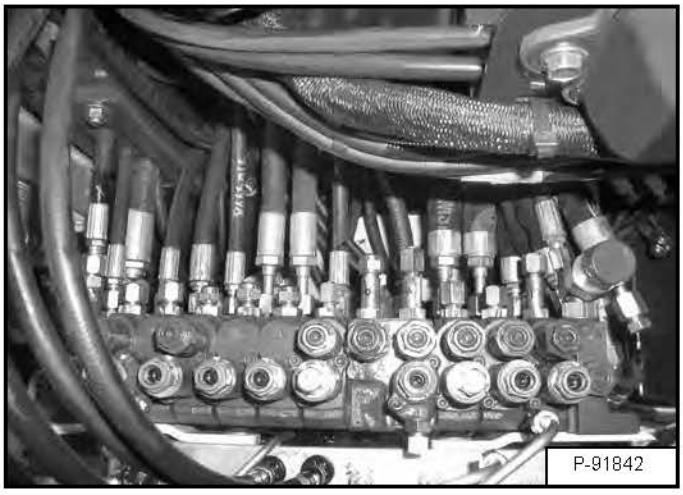
Figure 20-22-31



Insert the adjustable gland nut wrench into the holes (Item 1) **[Figure 20-22-31]** to tighten the head. Tighten the head until it is flush with the end of the housing.

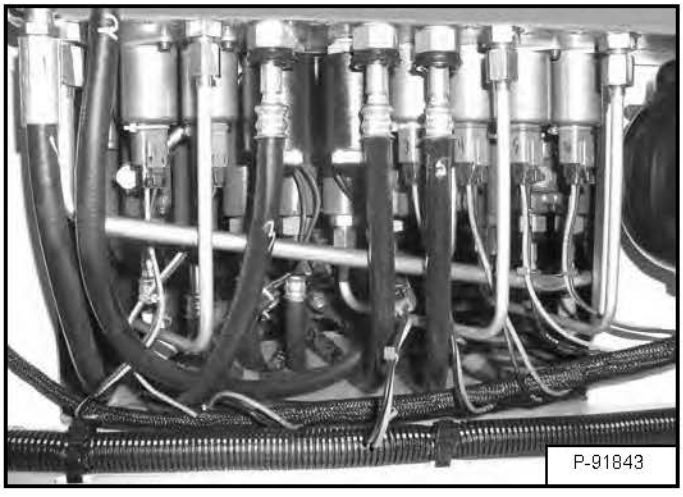
Removal And Installation (Cont'd)

Figure 20-40-7



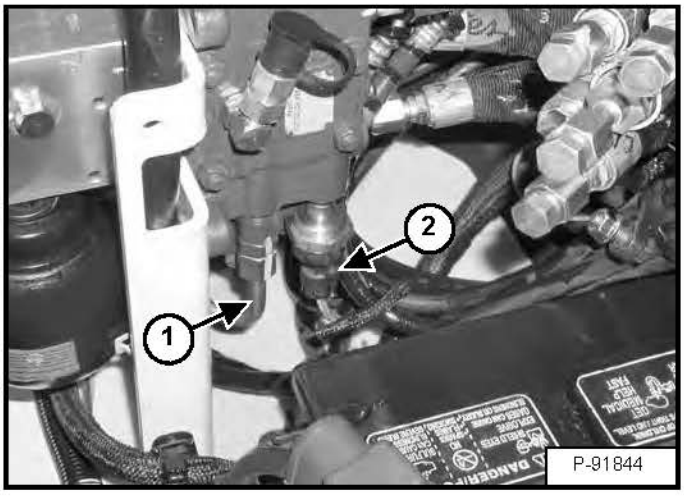
Continue to remove the high pressure hoses **[Figure 20-40-7]**.

Figure 20-40-8



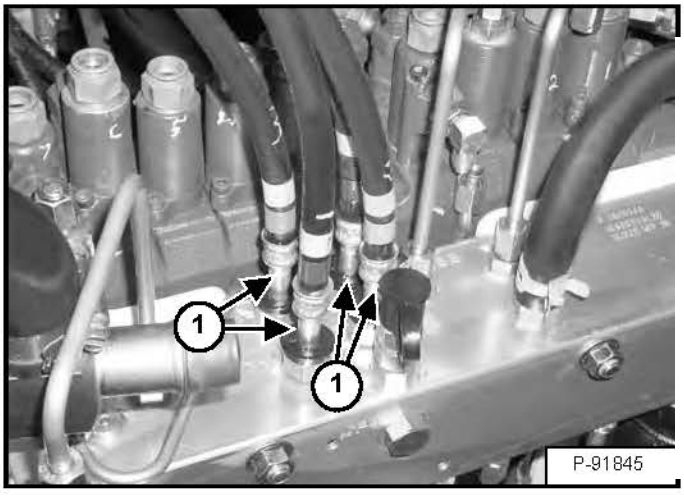
Remove the pilot pressure hoses and tubelines from the valve **[Figure 20-40-8]**.

Figure 20-40-9



Remove the tubeline (Item 1). Disconnect the wire harness (Item 2) **[Figure 20-40-9]**.

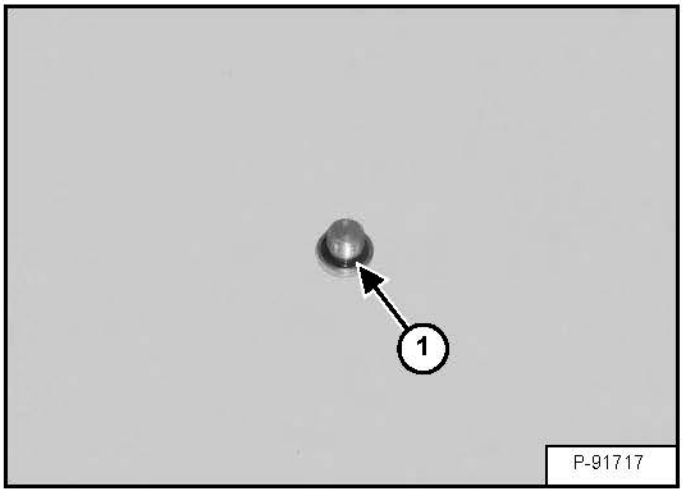
Figure 20-40-10



Remove the four hoses (Item 1) **[Figure 20-40-10]** from the top of the manifold. Reposition the hoses to provide clearance to remove the valve.

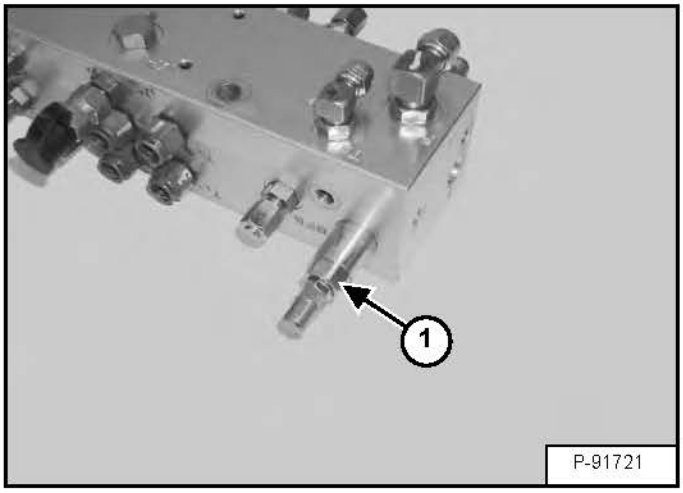
Disassembly And Assembly (Cont'd)

Figure 20-60-25



Remove the O-ring (Item 1) **[Figure 20-60-25]** from the plug.

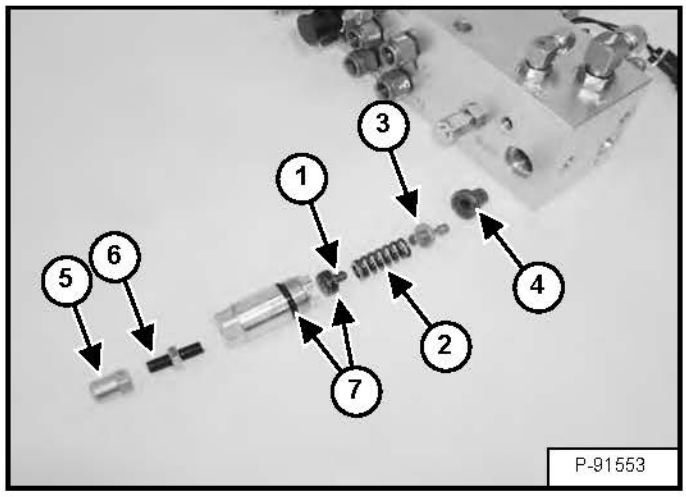
Figure 20-60-26



Remove the pilot relief valve (Item 1) **[Figure 20-60-26]**.

Installation: Tighten the pilot relief valve to 30 N•m (22 ft-lb) torque.

Figure 20-60-27



Remove the spring seat (Item 1), spring (Item 2), spring seat (Item 3) and seat (Item 4). Remove the cap (Item 5) and remove the adjustment screw (Item 6). Remove the O-rings (Item 7) **[Figure 20-60-27]**.

Clean all parts in solvent and dry with compressed air.

Always install new seals and O-rings. Lubricate all seals and O-rings with clean hydraulic fluid before installation.

Inspect all parts for wear or damage. Replace any worn or damaged parts.

LEFT CONTROL LEVER (JOYSTICK)

Testing

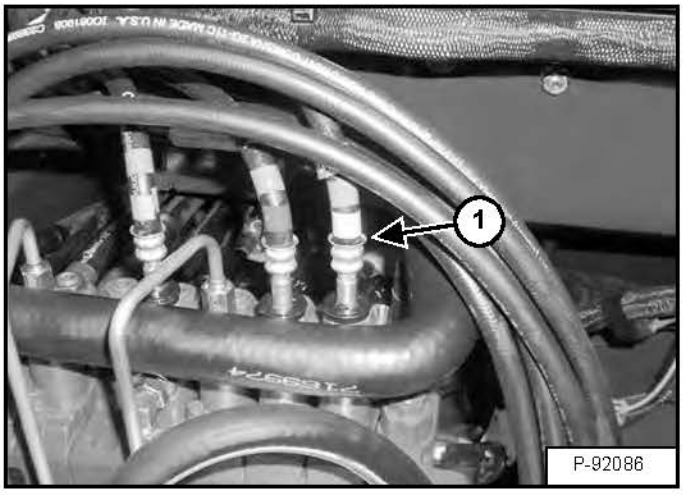
The following tools will be needed to do the procedure:

MEL1355 - Hydraulic Test Kit

Stop the engine.

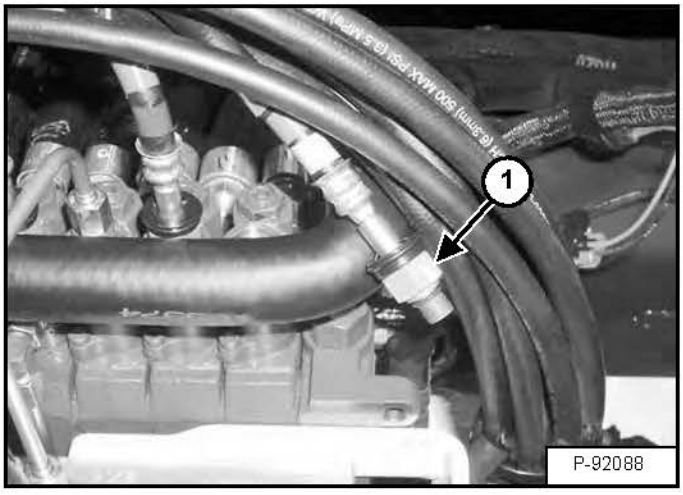
Open the right side cover.

Figure 20-120-1



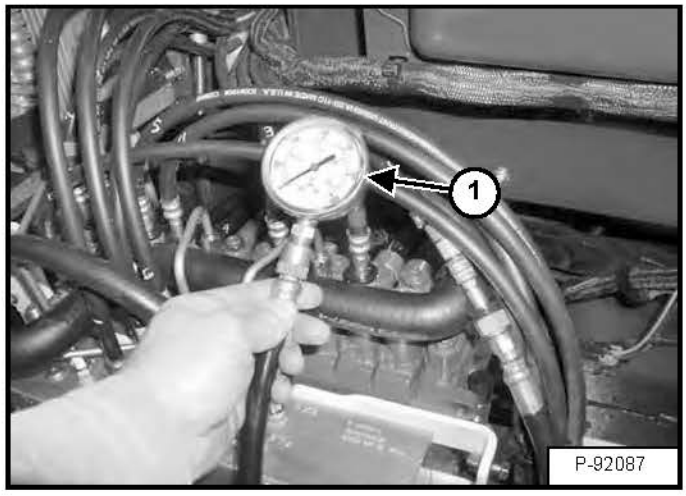
At the control valve assembly (Item 1) **[Figure 20-120-1]**, find the pilot line of the control lever (joystick) that is to be checked. (Boom, Arm, Slew, Bucket)

Figure 20-120-2



Disconnect the hydraulic fitting (Item 1) **[Figure 20-120-2]** from the control valve.

Figure 20-120-3



From the test kit install a 3447 kPa (35 bar) (500 psi) gauge (Item 1) **[Figure 20-120-3]** on the pilot line. Start the excavator, and warm the hydraulic oil to operating temperature.

Engage the circuit to be tested. Record the operating pressure.

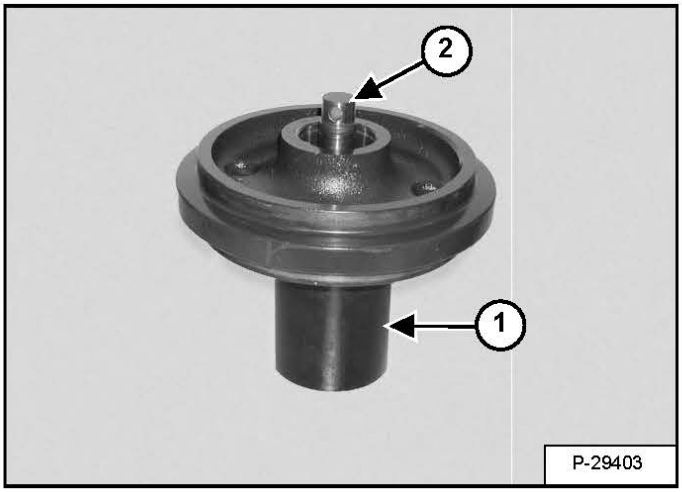
The operating pressure should be approximately 2799 - 3103 kPa (28 - 31 bar) (406 - 450 psi).

If the operating pressure is correct, check the valve section spool for proper operation. If the operating pressure is incorrect, remove the pilot pressure relief valve, clean, install and retest. (See Testing And Adjusting The Pilot Pressure Relief Valve on Page 20-33-1.)

If the pressure is still incorrect replace the pilot pressure relief valve. (See Testing And Adjusting The Pilot Pressure Relief Valve on Page 20-33-1.)

Track Idler Assembly (Cont'd)

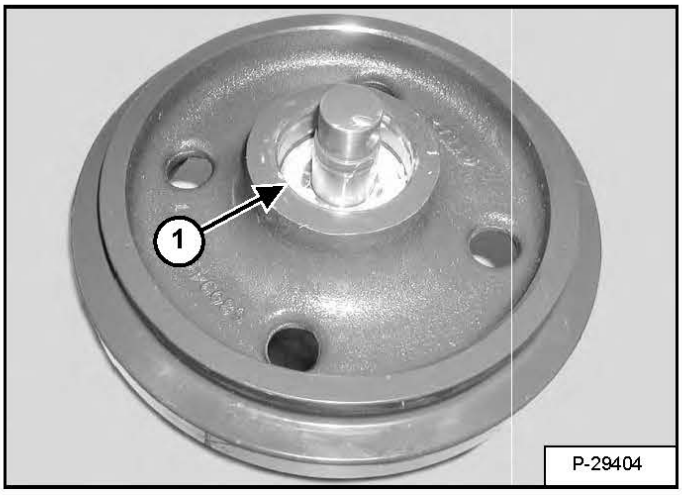
Figure 30-20-25



Turn the idler over and place the idler on the support fixture (Item 1) **[Figure 30-20-25]**.

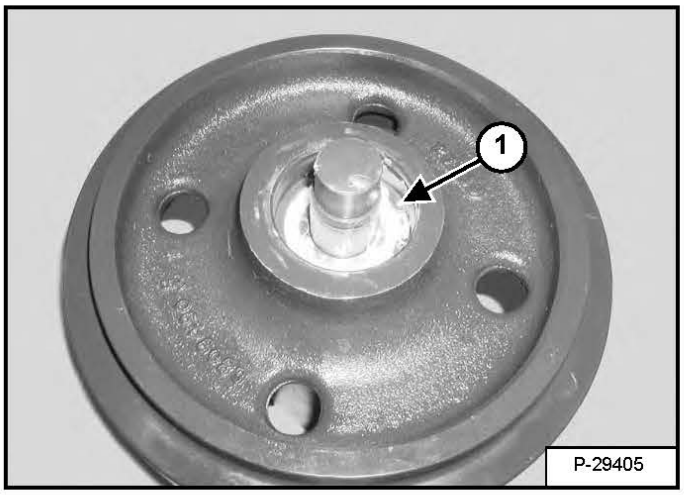
Install the shaft (Item 2) **[Figure 30-20-25]**.

Figure 30-20-26



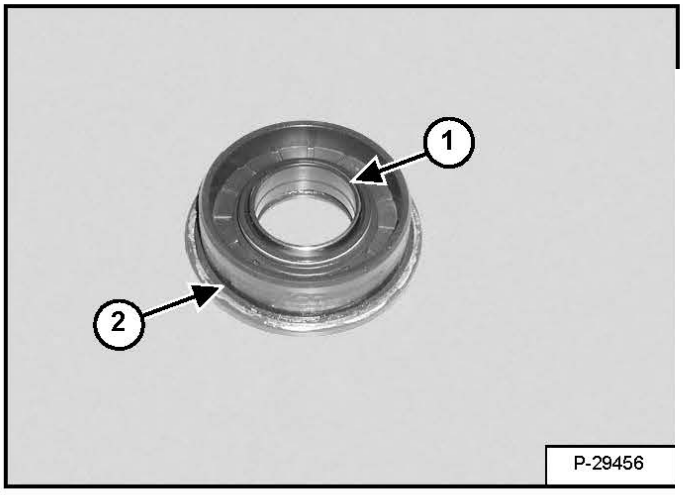
Install the bearing (Item 1) **[Figure 30-20-26]**. Use a brass drift to seat the bearing.

Figure 30-20-27



Install the snap ring (Item 1) **[Figure 30-20-27]**.

Figure 30-20-28



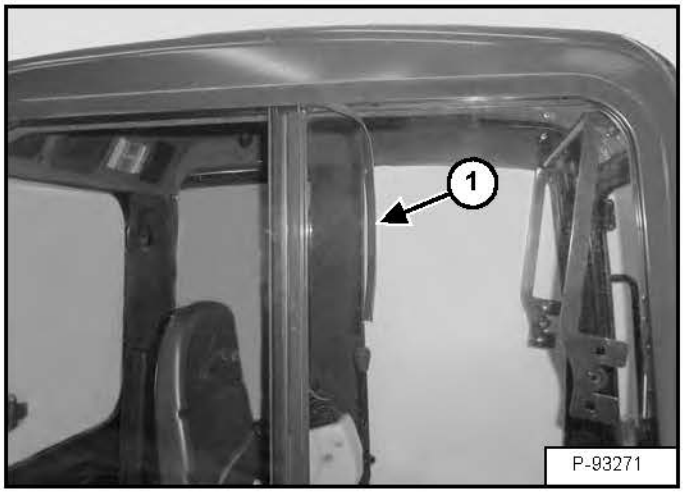
Apply assembly lube to the inside diameter (Item 1) **[Figure 30-20-28]** of the seal.

Apply a small bead of high temperature silicone sealant around the flange surface (Item 2) **[Figure 30-20-28]** of the seal.

Right Side Rear Sliding Window Removal And Installation

Close and latch the front and rear sliding windows.

Figure 40-30-15



Use a pick to pull the felt (Item 1) **[Figure 40-30-15]** from the top window channel.

Unlatch the rear sliding window and slide the window open until it stops.

Figure 40-30-16

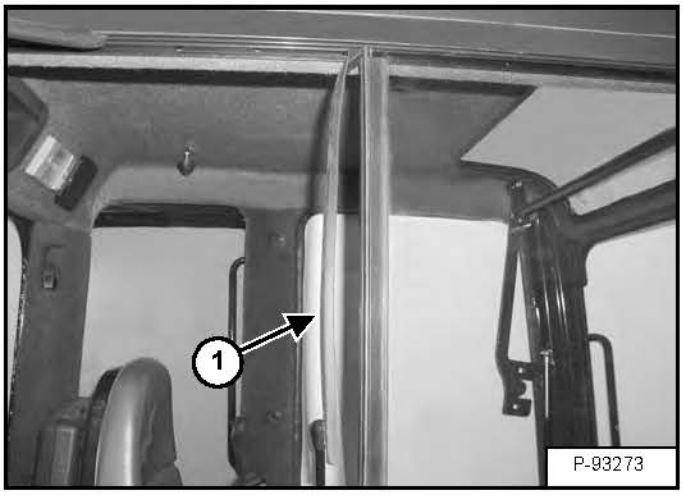
Lift the window up into the top channel and tilt the bottom edge out **[Figure 40-30-16]**. Remove the window from the cab.

Right Side Front Sliding Window Removal And Installation

NOTE: The rear sliding window must be removed before the front sliding window can be removed.

Unlatch the front sliding window and slide the window open until it stops.

Figure 40-30-17



Use a pick to pull the felt (Item 1) **[Figure 40-30-17]** from the inside top window channel.

Figure 40-30-18

Lift the window up into the top channel and tilt the bottom edge out **[Figure 40-30-18]**. Remove the window from the cab.

SWING FRAME

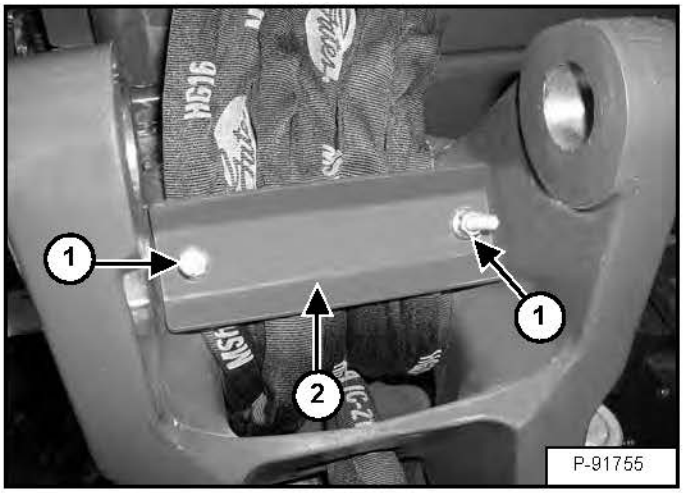
Removal And Installation

Rotate the upperstructure so the blade is to the rear of the excavator.

Remove the arm. (See Removal And Installation on Page 40-160-1.)

Remove the boom. (See Removal And Installation on Page 40-150-1.)

Figure 40-140-1

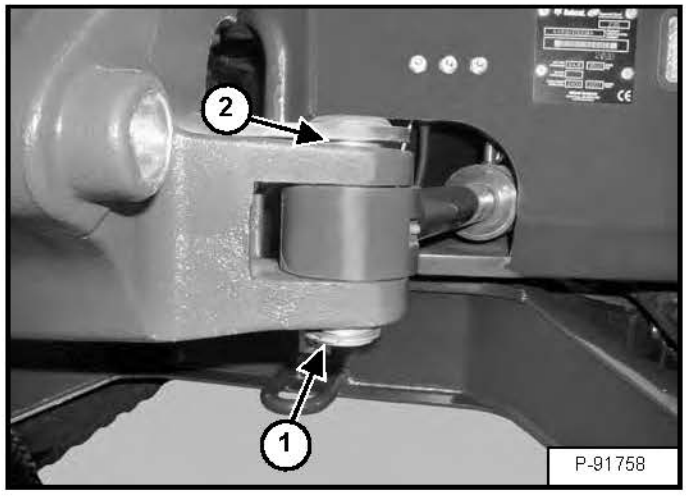


Remove the nuts (Item 1) and the clamp (Item 2) **[Figure 40-140-1]**.

NOTE: Before the hoses are removed from the clamped position, the hoses must be measured for correct clamped length and position. (See Boom Swing Frame Hose Routing on Page 40-140-5.)

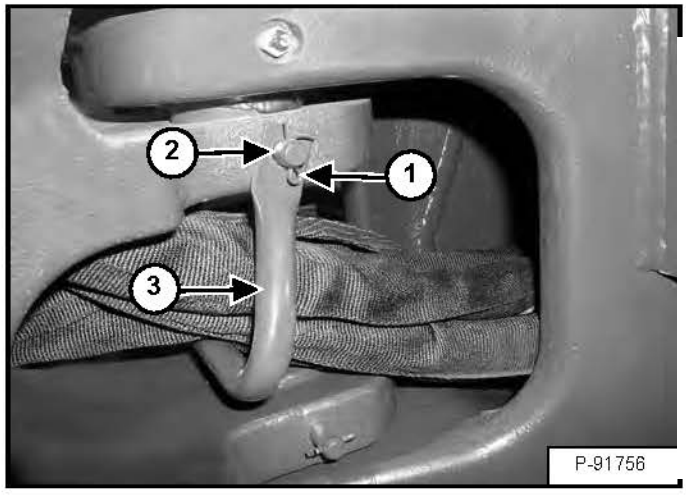
NOTE: Later model excavators are not equipped with the clamp (Item 2) [Figure 40-140-1].

Figure 40-140-2



Remove the snap ring (Item 1), washer, and pin (Item 2) **[Figure 40-140-2]** from the rod end of the swing cylinder.

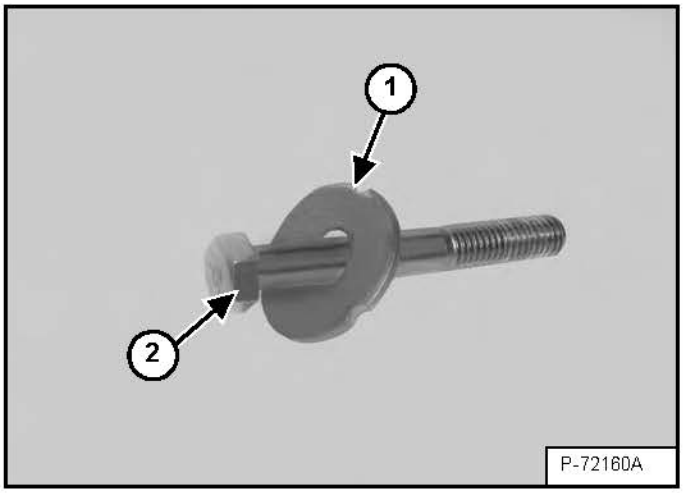
Figure 40-140-3



Remove the cotter pin (Item 1), retaining pin (Item 2) and hose bracket (Item 3) **[Figure 40-140-3]**.

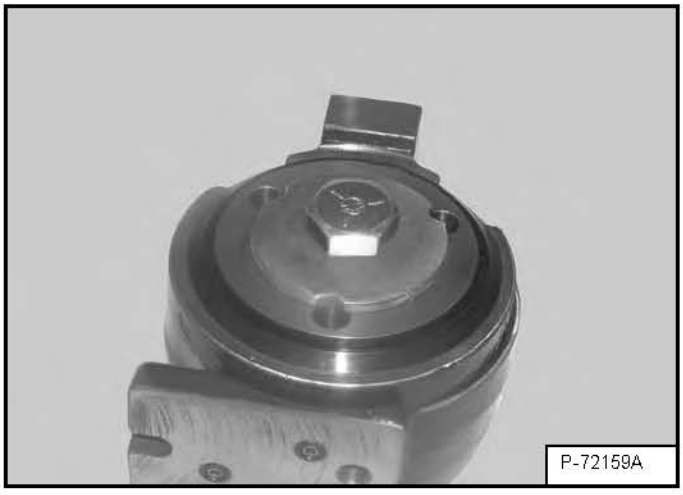
Assembly (Cont'd)

Figure 40-201-45



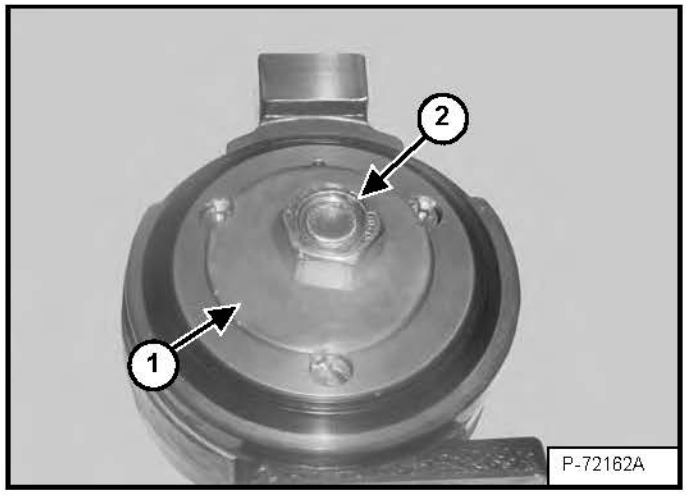
Install a 50,8 mm (2 in) flat washer (Item 1) onto the bolt (Item 2) **[Figure 40-201-45]**.

Figure 40-201-46



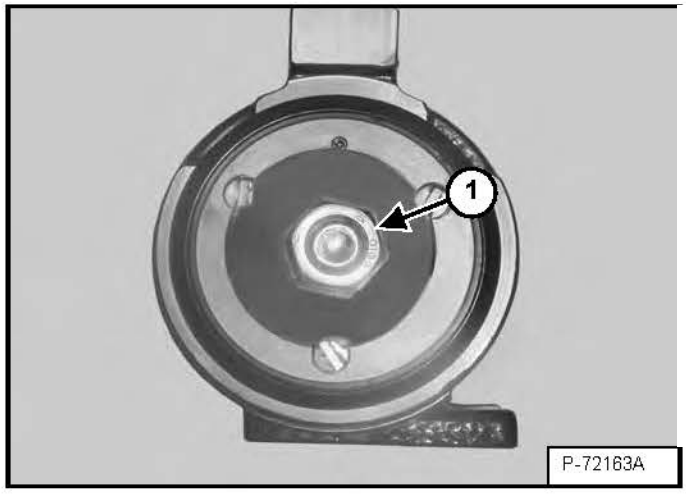
Insert the bolt through the center of the swivel assembly aligning the notches in the flat washer with the screw holes **[Figure 40-201-46]**.

Figure 40-201-47



Turn the swivel assembly over and install the remaining 50,8 mm (2 in) flat washer (Item 1) and nut (Item 2) **[Figure 40-201-47]**.

Figure 40-201-48

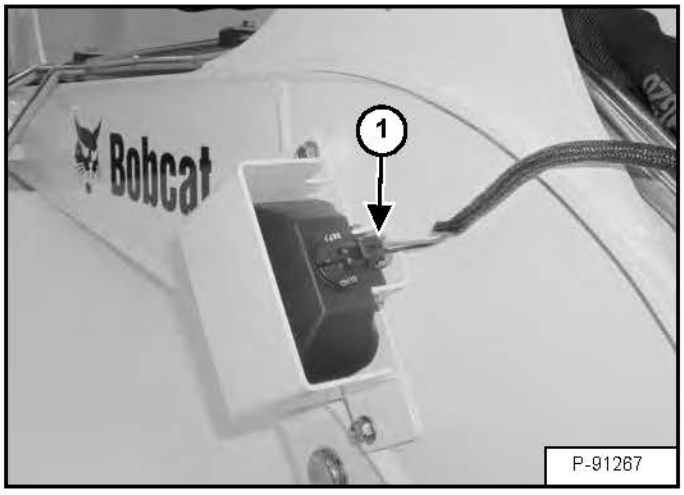


NOTE: The notches in both washers must be aligned with the screw holes on the swivel assembly [Figure 40-201-48].

Tighten the preload tool nut (Item 1) **[Figure 40-201-48]** to 112,5 N•m (83 ft-lb) torque.

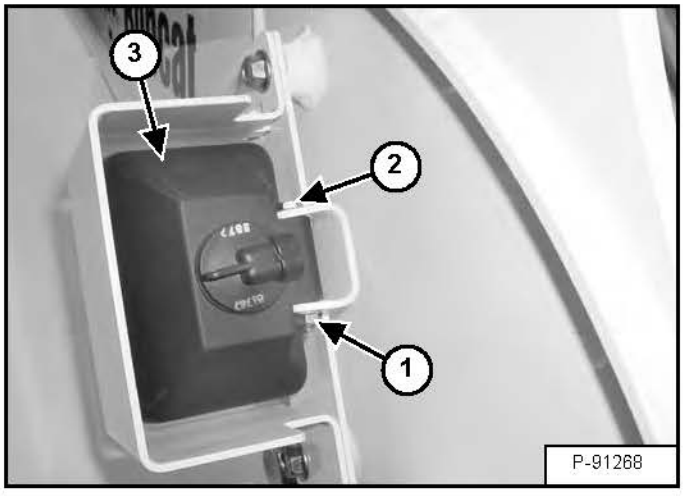
Boom Light Removal And Installation

Figure 50-50-4



Disconnect the wire harness (Item 1) **[Figure 50-50-4]**.

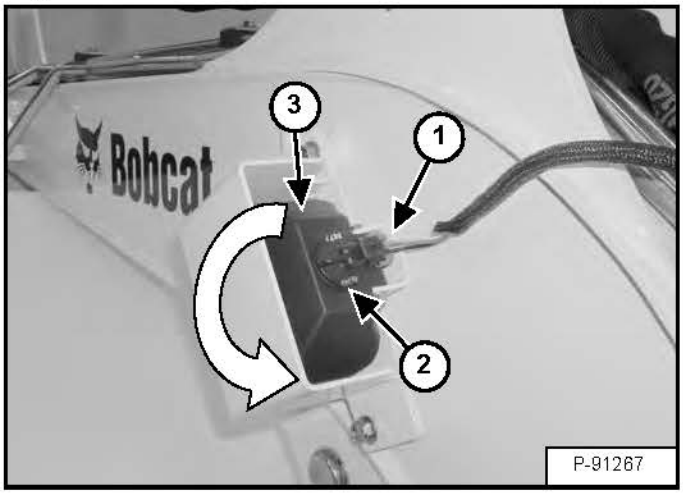
Figure 50-50-5



Remove the nut (Item 1) and bolt (Item 2). Remove the boom light (Item 3) **[Figure 50-50-5]** from the boom light guard.

Boom Light Bulb Replacement

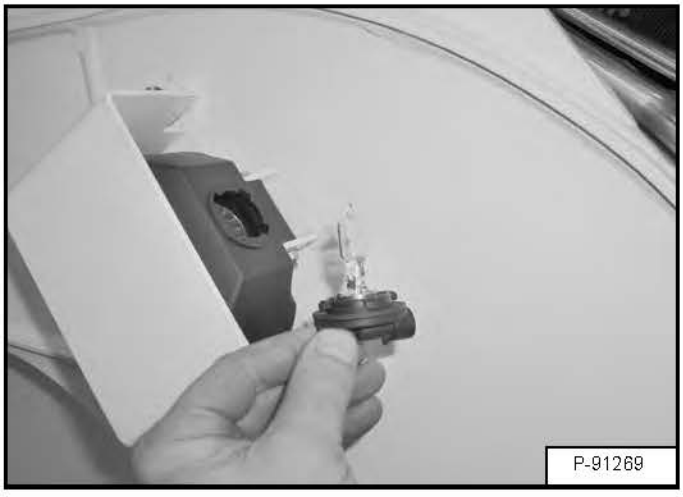
Figure 50-50-6



Disconnect the wire harness (Item 1) **[Figure 50-50-6]**.

Rotate light bulb assembly (Item 2) counterclockwise and pull straight out from the boom light (Item 3) **[Figure 50-50-6]**.

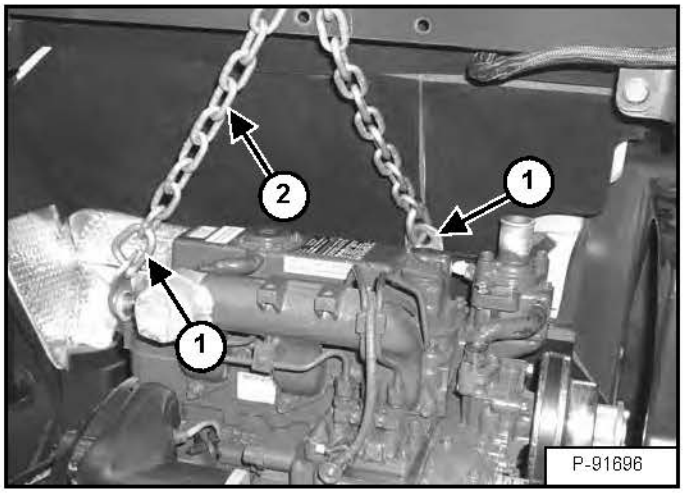
Figure 50-50-7



NOTE: Do not touch glass of halogen bulb with your fingers or allow bulb to come in contact with oils. If contaminated, the bulb should be cleaned with mild alcohol and a clean cloth [Figure 50-50-7].

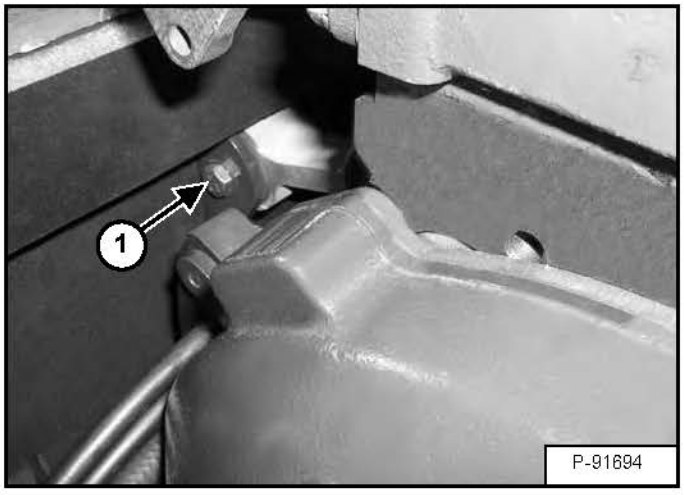
Engine Removal And Installation (Cont'd)

Figure 60-10-21



Attach lifting brackets (Item 1) and chain (Item 2) **[Figure 60-10-21]** to a hoist.

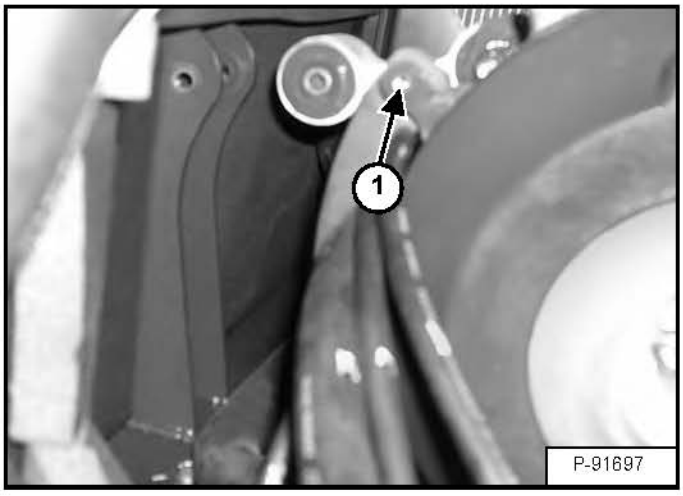
Figure 60-10-22



Remove the bolt (Item 1) **[Figure 60-10-22]** from the front motor mount.

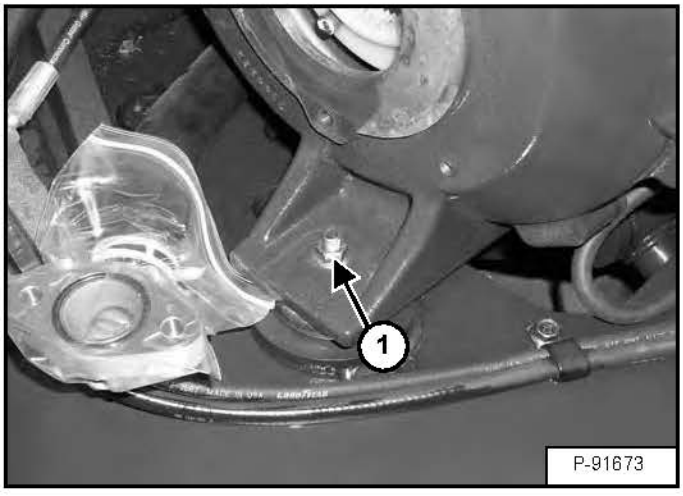
Installation: Tighten the bolt to 105 - 115 N•m (78 - 85 ft-lb) torque.

Figure 60-10-23



Remove the bolts (Item 1) **[Figure 60-10-23]** from the hose guide.

Figure 60-10-24



Remove the bolt (Item 1) **[Figure 60-10-24]** from the left motor mount.

Installation: Tighten the bolt to 105 - 115 N•m (78 - 85 ft-lb) torque.

Connecting Rod Alignment

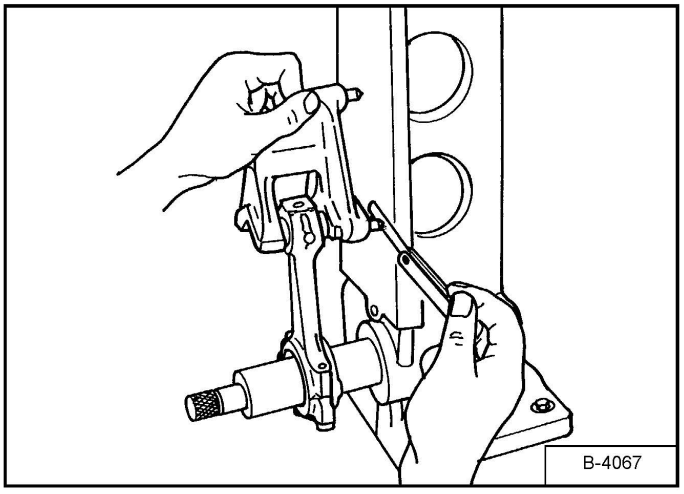
NOTE: The small end bushing is the basis of this check, check the bushing for wear before doing this check.

Install the piston pin into the connecting rod.

Install the connecting rod on an alignment tool.

Put the gauge over the piston pin and move it against the face plate.

Figure 60-90-14

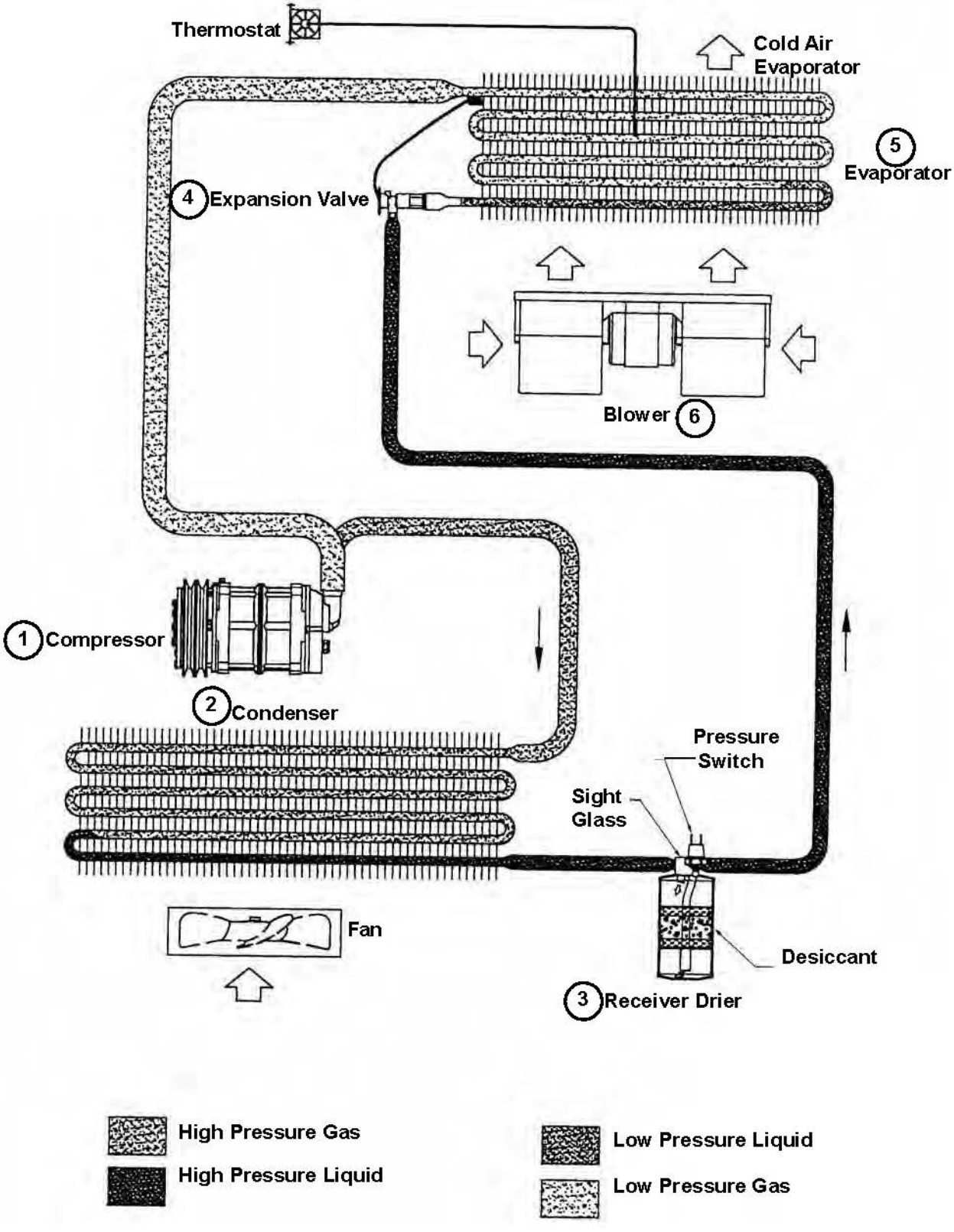


If the gauge does not fit squarely against the face plate, measure the space between the gauge and face plate **[Figure 60-90-14]**.

If the measurement exceeds the allowable limit, replace the connecting rod.

Rod Alignment	0,05 mm (0.002 in)

Chart


Thermostat
Cold Air
Evaporator
5
Evaporator
4
Expansion Valve
Blower
6
1
Compressor
2
Condenser
Pressure
Switch
Sight
Glass
Fan
Desiccant
3
Receiver Drier
High Pressure Gas
High Pressure Liquid
Low Pressure Liquid
Low Pressure Gas