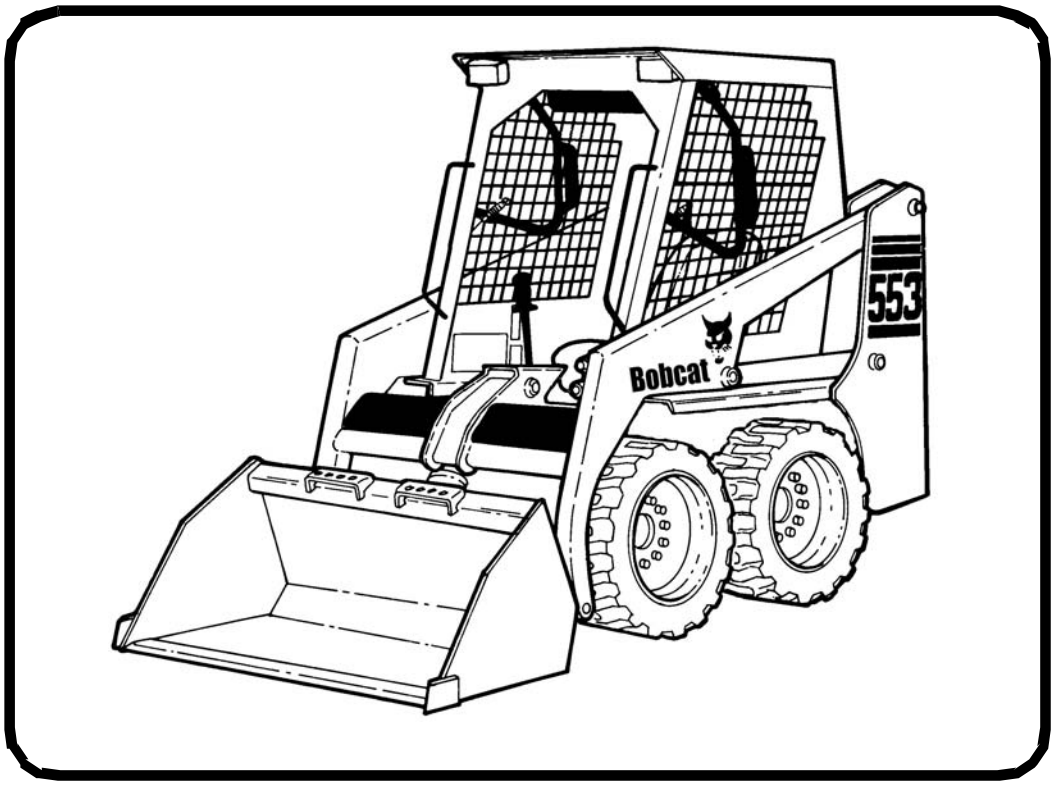
Bobcat®

Service Manual
553 Skid-Steer Loader

S/N 539112001 & Above
S/N 539412001 & Above



EQUIPPED WITH
BOBCAT INTERLOCK
CONTROL SYSTEM (BICS)

Ingersoll Rand
Compact Vehicle Technologies

6904705 (3-06)

Printed in U.S.A.

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SAFETY INSTRUCTIONS

Safety Alert Symbol

This symbol with a warning statement means: "Warning, be alert! Your safety is involved!" Carefully read the message that follows.

WARNING

Instructions are necessary before operating or servicing machine. Read and understand the Operation & Maintenance Manual, Operator's Handbook and signs (decals) on machine. Follow warnings and instructions in the manuals when making repairs, adjustments or servicing. Check for correct function after adjustments, repairs or service. Untrained operators and failure to follow instructions can cause injury or death.

W-2003-0903

WARNING

Warnings on the machine and in the manuals are for your safety. Failure to obey warnings can cause injury or death.

W-2044-1285

IMPORTANT

This notice identifies procedures which must be followed to avoid damage to the machine.

I-2019-0284

The following publications provide information on the safe use and maintenance of the Bobcat machine and attachments:

- The Delivery Report is used to assure that complete instructions have been given to the new owner and that the machine is in safe operating condition.
- The Operation & Maintenance Manual delivered with the machine or attachment contains operating information as well as routine maintenance and service procedures. It is a part of the machine and can be stored in a container provided on the machine. Replacement Operation & Maintenance Manuals can be ordered from your Bobcat dealer.
- Machine signs (decals) instruct on the safe operation and care of your Bobcat machine or attachment. The signs and their locations are shown in the Operation & Maintenance Manual. Replacement signs are available from your Bobcat dealer.
- An Operator's Handbook fastened to the operator cab. It's brief instructions are convenient to the operator. The handbook is available from your dealer in an English edition or one of many other languages. See your Bobcat dealer for more information on translated versions.
- The AEM Safety Manual delivered with the machine gives general safety information.
- The Service Manual and Parts Manual are available from your dealer for use by mechanics to do shop-type service and repair work.
- The Skid-Steer Loader Operator Training Course is available through your local dealer or at **www.training.bobcat.com** or **www.bobcat.com**. This course is intended to provide rules and practices of correct operation of the Skid-Steer Loader. The course is available in English and Spanish versions.
- Service Safety Training Courses are available from your Bobcat dealer or at **www.training.bobcat.com** or **www.bobcat.com**. They provide information for safe and correct service procedures.
- The Skid-Steer Loader Safety Video is available from your Bobcat dealer or at **www.training.bobcat.com** or **www.bobcat.com**.

SI SSL-0206 SM

LIFTING AND BLOCKING THE LOADER

Figure 10-10-1

⚠ WARNING

Instructions are necessary before operating or servicing machine. Read and understand the Operation & Maintenance Manual, Operator's Handbook and signs (decals) on machine. Follow warnings and instructions in the manuals when making repairs, adjustments or servicing. Check for correct function after adjustments, repairs or service. Untrained operators and failure to follow instructions can cause injury or death.

W-2003-0903

Procedure

Always park the loader on a level surface.

⚠ WARNING

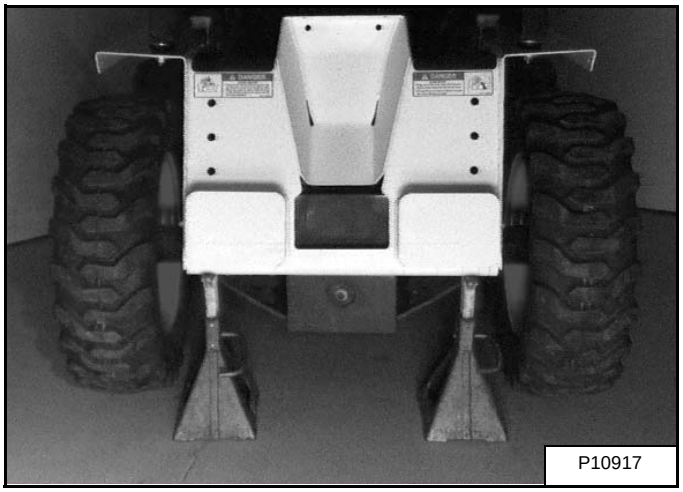
Put jackstands under the front axles and rear corners of the frame before running the engine for service. Failure to use jackstands can allow the machine to fall or move and cause injury or death.

W-2017-0286

Figure 10-10-2

Lift the rear of the loader and install jackstands **[Figure 10-10-2]**.

Figure 10-10-3



Lift the front of the loader and put jackstands under the loader frame **[Figure 10-10-3]**.

NOTE: Make sure the jackstands do not touch the tires.

TOWING THE LOADER

Procedure

IMPORTANT

Never attempt to start the engine by pushing or pulling. Hydrostatic pumps and motors will be damaged.

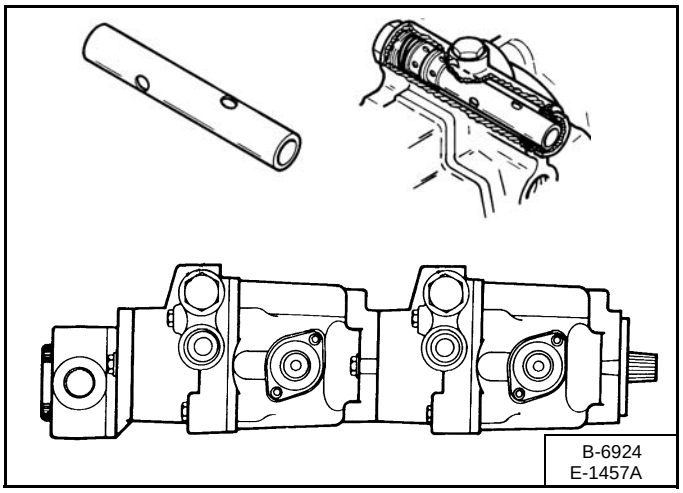
I-2001-1285

IMPORTANT

Do not push or pull the machine at more than 2 MPH (3,2 km/h) or for a distance of more than 25 feet (7,6 meters) with the towing tool in place.

I-2017-0389

Figure 10-50-1



To prevent damage to the loaders hydrostatic system, the loader must be towed only a short distance at slow speed. (Example: Moving the loader onto a transport vehicle.)

Relief valve release tool set MEL1220 is available from your dealer. Tool must be installed before towing.

Raise the operator cab. (See Raising on Page 10-30-1.)

Clean the area around the hydrostatic pumps.

Remove the high pressure relief valve from one side of each hydrostatic pump **[Figure 10-50-1]** and install the relief valve tubes. Install the plugs and tighten.

Lower the operator cab. See Lowering on Page 10-30-2

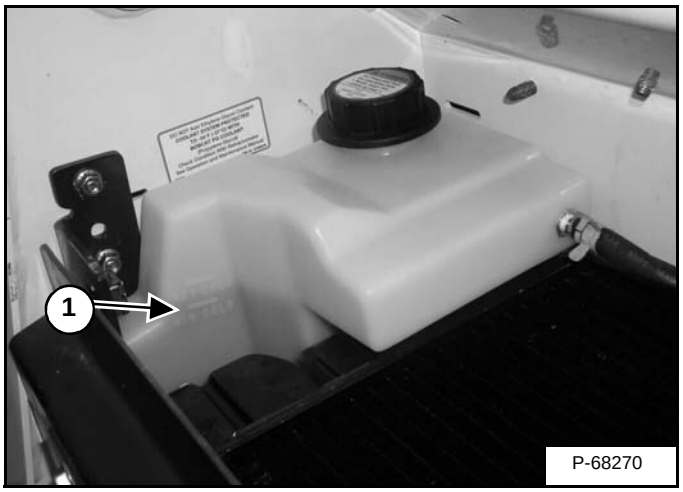
The towing chain (or cable) must be rated at 1 and 1/2 times the weight of the loader. (See Performance on Page SPEC-10-2.)

- Turn the key switch to ON and press the traction lock override button.
- Tow the Bobcat at 2 MPH (3,2 km/hr) or less for not more than 25 feet (7,6 meters).

If the electrical system is not functioning, contact your Bobcat loader dealer. (Part of the brake system must be disassembled to move the loader.)

Removing And Replacing Coolant (Cont'd)

Figure 10-90-5



Fill the coolant recovery tank to the FULL COLD mark with premixed coolant (Item 1) **[Figure 10-90-5]**.

Check the radiator cap for correct pressure rating or overheating can result.

Check for leaks in the cooling system. Check for worn or damaged hoses, clamps or radiator. Check for loose or worn water pump belt.

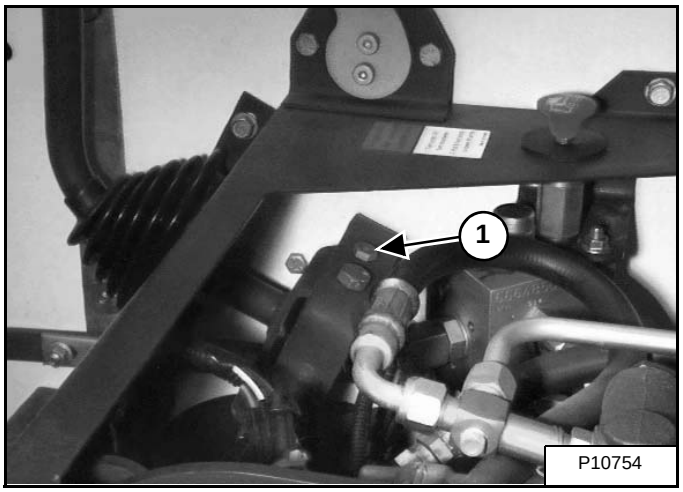
Replace damaged parts immediately to prevent leaks and overheating.

Install the cap on the recovery tank, install the rear grill, and close the rear door.

AUXILIARY CONTROL LOCKBOLT

Procedure

Figure 10-140-1



The auxiliary control has a lockbolt (Item 1) **[Figure 10-140-1]** that must be removed to use the optional auxiliary hydraulics.

Raise the operator cab. (See Raising on Page 10-30-1.)

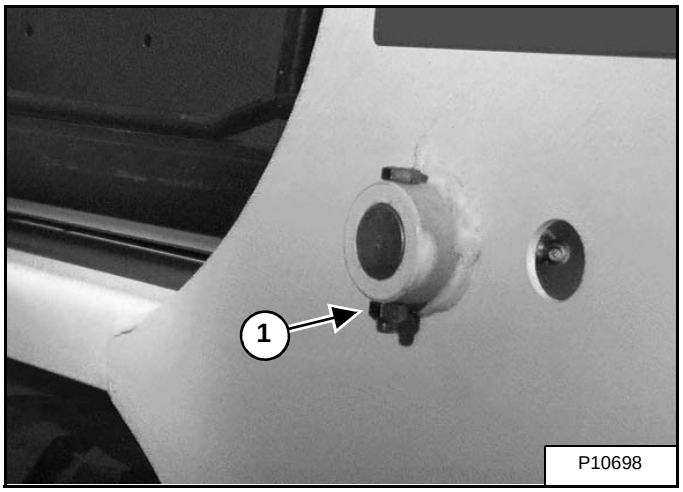
Remove the nut and bolt (Item 1) **[Figure 10-140-1]** at the right hand steering lever.

Lower the operator cab. (See Lowering on Page 10-30-2.)

PIVOT PINS

Inspection And Maintenance

Figure 10-190-1



All lift arm and cylinder pivots have a large pin held in position with a retainer bolt and lock nut (Item 1) **[Figure 10-190-1]**.

Check that the lock nuts are tightened to 18-20 ft.-lb. (24-27 N•m) torque.

HYDRAULIC SYSTEM

CYLINDER (LIFT) 20-20-1
Disassembly And Assembly. 20-20-6
Parts Identification 20-20-5
Removal And Installation 20-20-2
Testing 20-20-1

CYLINDER (TILT) 20-21-1
Disassembly And Assembly. 20-21-4
Parts Identification 20-21-3
Removal And Installation 20-21-1
Testing 20-21-1

HYDRAULIC CONTROL VALVE. 20-40-1
Anti-Cavitation Check Valve Removal And Installation . . . 20-40-7
Auxiliary Spool And Detent Removal And Installation . . . 20-40-15
BICS Valve Removal And Installation 20-40-1
Description. 20-40-1
Disassembly And Assembly. 20-40-5
Identification Chart. 20-40-4
Lift Spool And Detent Removal And Installation 20-40-10
Load Check Valve Removal And Installation. 20-40-5
Main Relief Valve Removal And Installation 20-40-6
One Way Restrictors Removal And Installation. 20-40-18
Port Relief Valve Removal And Installation 20-40-8
Rubber Boot (Auxiliary) Removal And Installation. 20-40-9
Rubber Boot (Lift) Removal And Installation 20-40-9
Rubber Boot (Tilt) Removal And Installation 20-40-9
Tilt Spool Removal And Installation 20-40-14
Spool Seal Installation 20-40-19

HYDRAULIC/HYDROSTATIC FILTER 20-70-1
Description. 20-70-1
Housing Disassembly And Assembly 20-70-2
Housing Removal And Installation. 20-70-1

HYDRAULIC FLUID RESERVOIR 20-80-1
Description. 20-80-1
Hydrauilc Fluid Screen. 20-80-2
Removal And Installation. 20-80-1

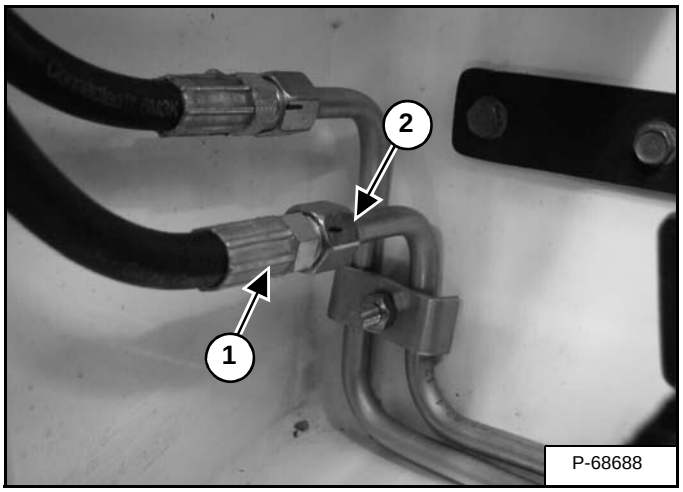
HYDRAULIC PUMP 20-60-1
Description. 20-60-1
Direct Pump Testing. 20-60-1
Disassembly And Assembly. 20-60-5
Parts Identification 20-60-4
Removal And Installation. 20-60-2

Continued On Next Page

CYLINDER (LIFT)

Testing

Figure 20-20-1



Fully lower the lift arms and stop the engine.

Twist and pull the lift arm by-pass control to release the hydraulic pressure.

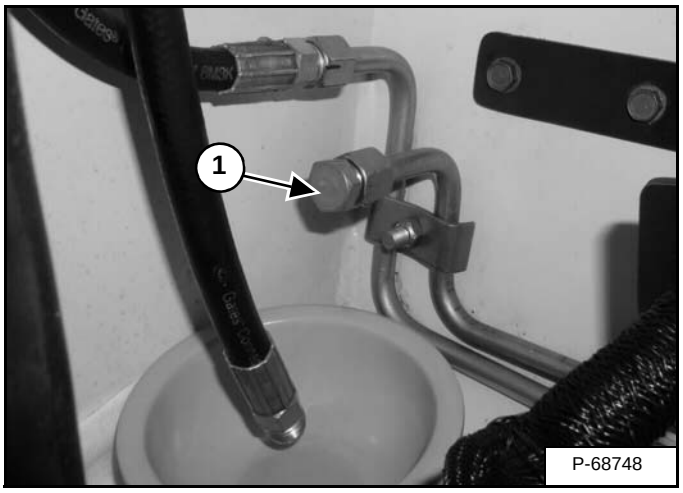
Raise the seat bar.

Check only one cylinder at a time.

Left Lift Cylinder

At the engine compartment, disconnect the lift cylinder base end hose (Item 1) from the hydraulic tubeline (Item 2) **[Figure 20-20-1]**.

Figure 20-20-2



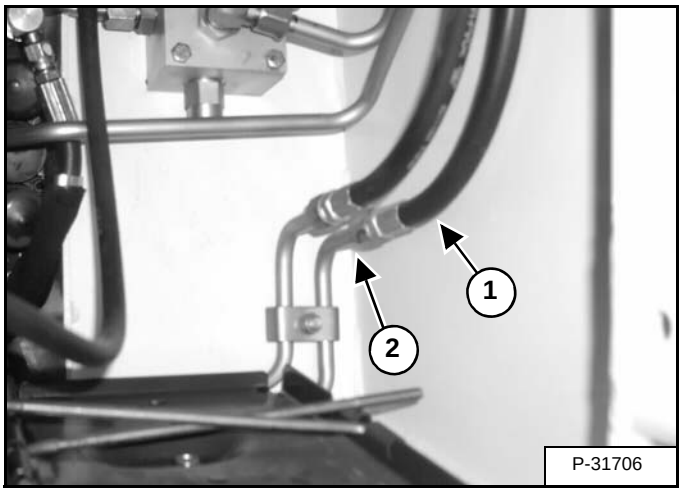
Install a plug in the tubeline (Item 1) **[Figure 20-20-2]** and tighten.

Lower the seat bar and start the engine, be sure the parking brake is engaged.

Push the top (toe) of the lift pedal.

If there is leakage from the lift cylinder base end hose, remove the lift cylinder for repair. (See Removal And Installation on Page 20-20-2.)

Figure 20-20-3



Right Lift Cylinder

Remove the loader battery. (See Removal And Installation on Page 60-20-1.)

Disconnect the lift cylinder base end hose (Item 1) **[Figure 20-20-3]** from the hydraulic tubeline.

Install a plug in the tubeline (Item 2) **[Figure 20-20-3]** and tighten.

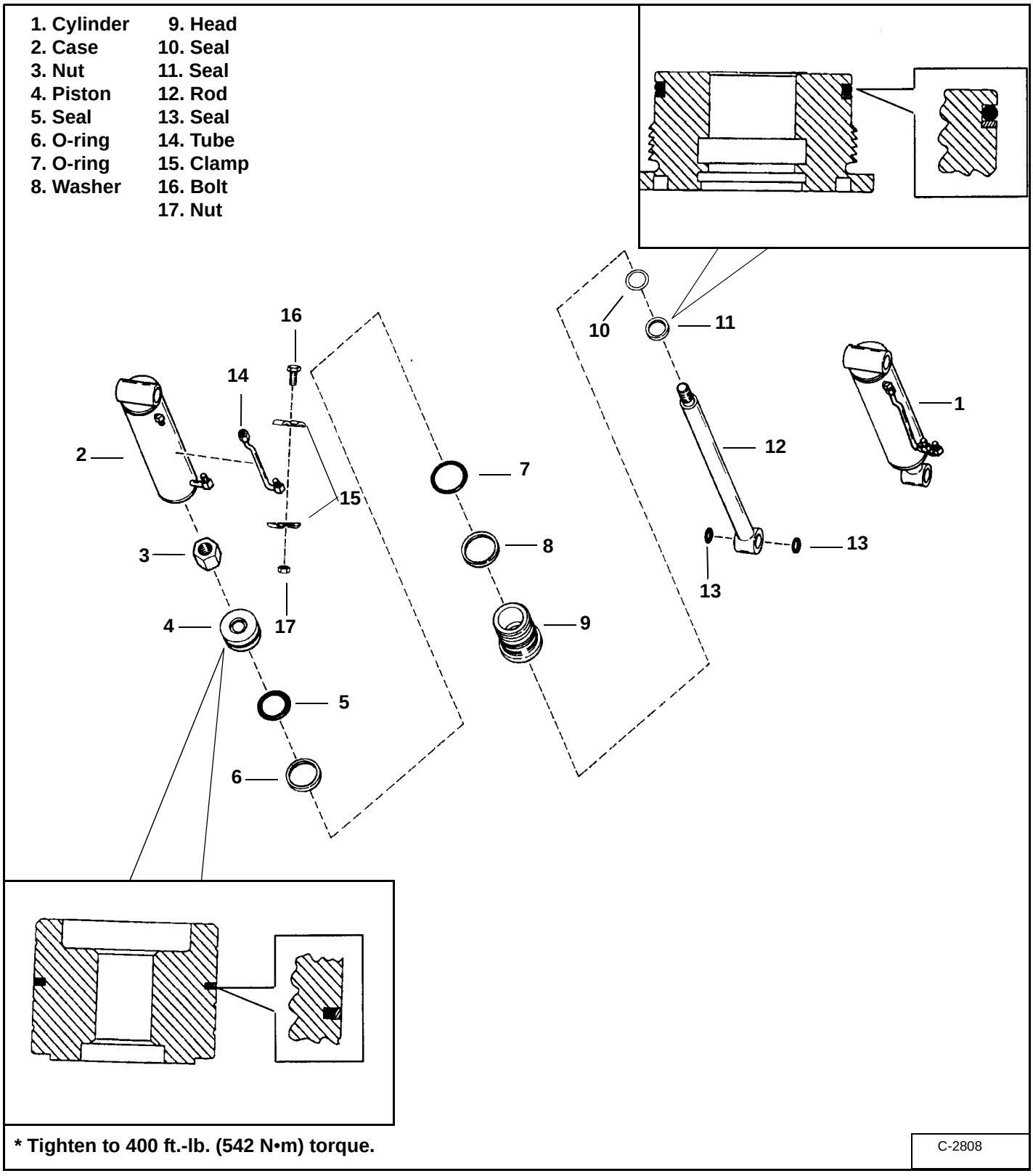
Install the battery and connect the battery cables, negative cable last.

Lower the seat bar and start the engine, be sure the parking brake is engaged.

Push the top (toe) of the lift pedal.

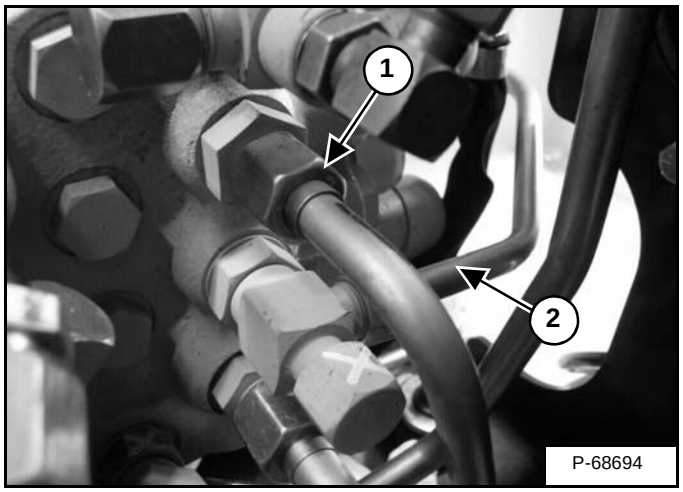
If there is leakage from the lift cylinder base end hose, remove the lift cylinder for repair. (See Removal And Installation on Page 20-20-2.)

Parts Identification



BICS Valve Removal and Installation (Cont'd)

Figure 20-40-6

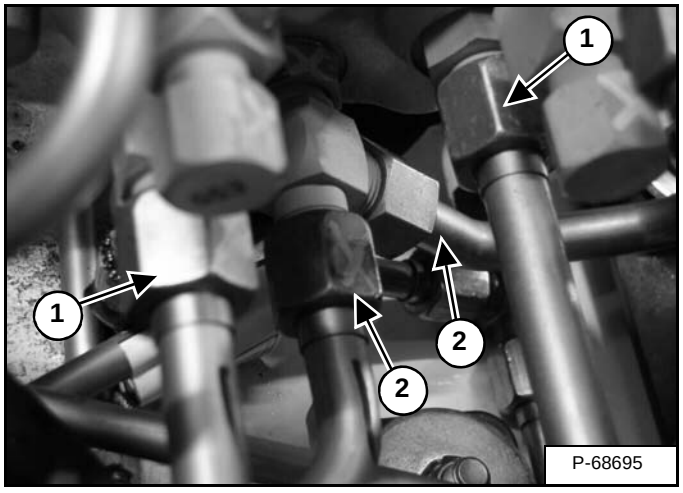


Disconnect the rear (base end) tubeline (Item 1) **[Figure 20-40-6]** from the lift section of the control valve.

Disconnect the rear (base end) tubeline (Item 1) **[Figure 20-40-6]** from the tee fitting of the tilt section of the control valve.

NOTE: The tee fitting located in the lift section base end port is capped because it is not equipped with an optional bucket position valve. If the loader has a bucket position valve, disconnect the tubeline from this fitting.

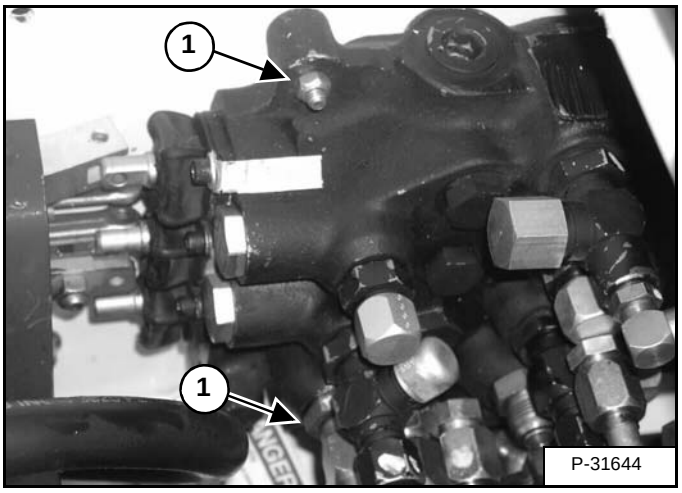
Figure 20-40-7



Disconnect the two tubelines (Item 1) **[Figure 20-40-7]** from the auxiliary section of the control valve.

Disconnect the tubelines (Item 2) **[Figure 20-40-7]** from the outlet port of the control valve.

Figure 20-40-8



Remove the two mounting bolts (Item 1) **[Figure 20-40-8]** from the control valve.

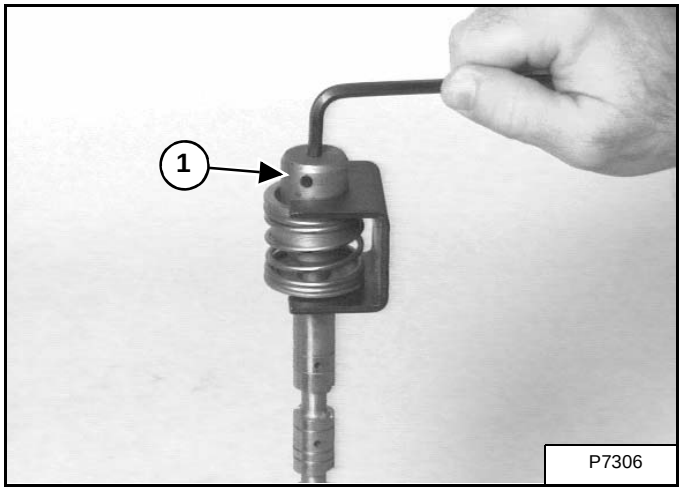
Installation: Tighten the mounting bolts to 17 ft.-lb. (23 N•m) torque.

NOTE: When removing the control valve from the loader, lift the linkage end upward and remove the control valve.

Use the reverse removal procedure to install the hydraulic control valve.

Lift Spool And Detent Disassembly And Assembly (Cont'd)

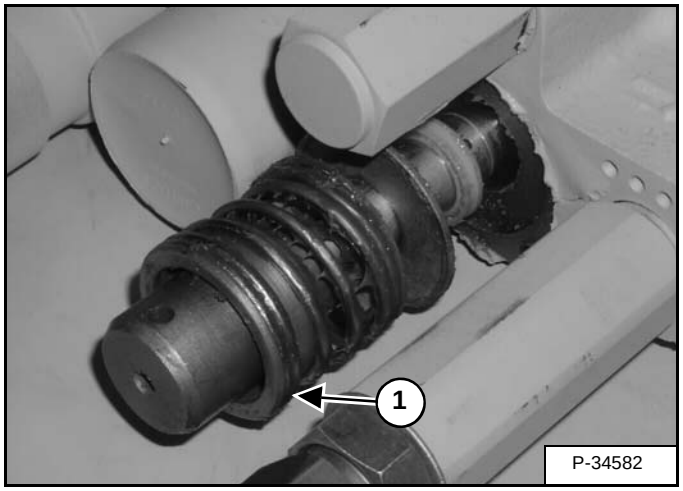
Figure 20-40-36



Use MEL1285 Compression Spring Tool and install the centering spring retainer, centering spring, and detent adapter/end cap assembly on the spool.

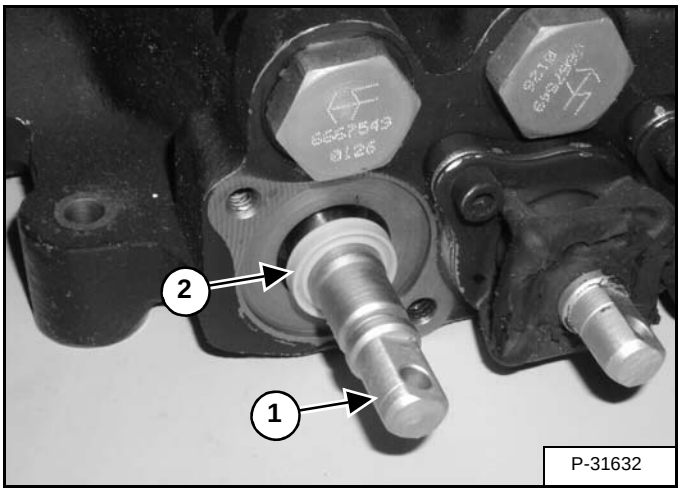
Tighten the detent adapter (Item 1) **[Figure 20-40-36]** to 90-100 in.-lb. (10,2-11,3 N•m) torque.

Figure 20-40-37



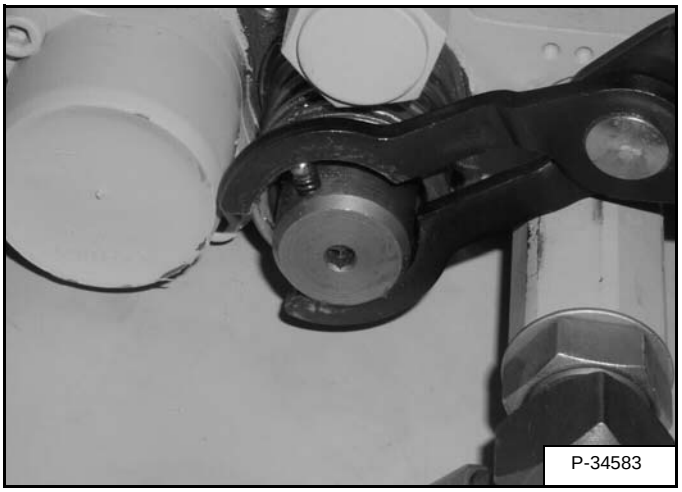
Install the spool assembly (Item 1) **[Figure 20-40-37]** in the control valve.

Figure 20-40-38



Lubricate the spool seal and install the spool seal (Item 2) **[Figure 20-40-38]** on the spool as shown. Push the spool seal into the control valve. Be sure the spool seal is evenly installed against the seat in the spool chamber.

Figure 20-40-39



Hold the detent balls and spring in position with the tool **[Figure 20-40-39]**.

TILT LOCK VALVE

Description

The Tilt lock valve controls the flow of hydraulic fluid for the Bob-Tach cylinder and controls the pilot pressure for the lift lock valve. When engine is running, the seat bar is lowered, and the Press to Operate button is pushed, hydraulic fluid can be directed for Bob-Tach function and for lowering the lift arms.

The Tilt lock valve has a filter screen, a check valve (for tilt lock), a solenoid activated directional control valve (for lift and tilt control), and a pilot activated directional control valve (for tilt control.)

Testing

The Bob-Tach should not move unless the engine is running, the seat bar is lowered, and the Press to Operate button has been pushed.

Start the engine, lower the seat bar, and push the Press to Operate button. Push the toe or the heal of the right foot pedal. The Bob-Tach should move in either direction.

Start the engine, lower the seat bar, and DO NOT push the Press to Operate button. Push the toe or the heal of the right foot pedal. The Bob-Tach should NOT move in either direction.

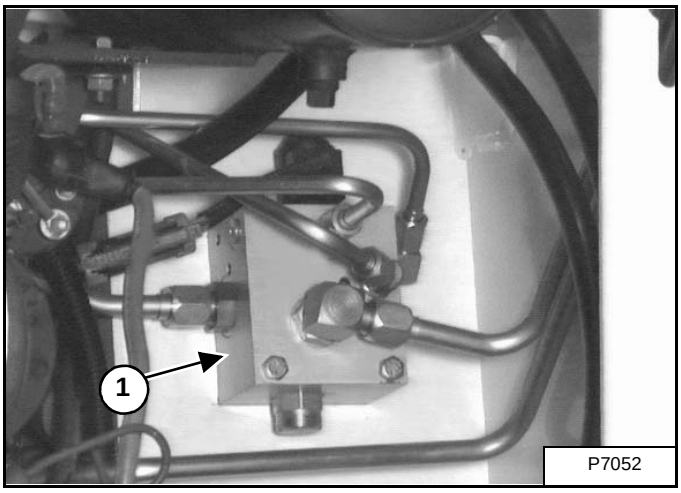
Removal And Installation

WARNING

Never work on a machine with the lift arms up unless the lift arms are secured by an approved lift arm support device. Failure to use an approved lift arm support device can allow the lift arms or attachment to fall and cause injury or death.

W-2059-0598

Figure 20-51-1



Place jackstands under the rear corners of the loader. (See Procedure on Page 10-10-1.)

Raise the loader lift arms and install an approved lift arm support device. (See Installing on Page 10-20-1.)

Raise the operator cab. (See Raising on Page 10-30-1.)

Drain the hydraulic fluid reservoir .(See Removal And Installation on Page 20-80-1.)

Remove the battery from the loader. (See Removal And Installation on Page 60-20-1.)

The tilt lock valve (Item 1) **[Figure 20-51-1]** is located at the engine compartment on the right side of the loader frame.

Disconnect the five tubelines connected to the tilt lock valve **[Figure 20-51-1]** .

HYDRAULIC FLUID RESERVOIR

Description

The hydraulic fluid reservoir is a storage container for the loaders hydraulic/hydrostatic fluid. The reservoir contains a vented fill cap with a fluid screen to prevent contaminants from entering the reservoir while adding fluid.

The hydraulic fluid reservoir is located behind the operators cab on the left side of the loader.

Removal And Installation

⚠ WARNING

Never work on a machine with the lift arms up unless the lift arms are secured by an approved lift arm support device. Failure to use an approved lift arm support device can allow the lift arms or attachment to fall and cause injury or death.

W-2059-0598

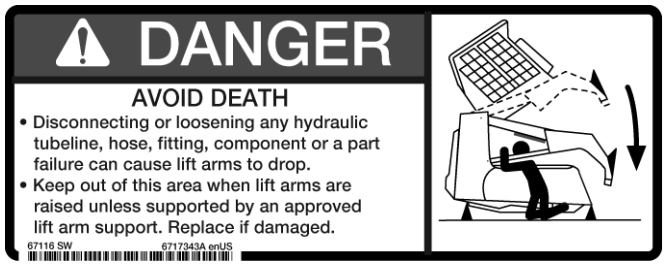
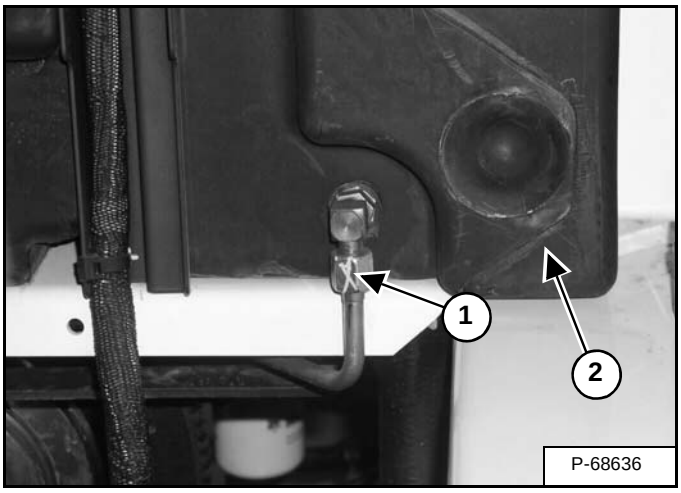


Figure 20-80-1



Place jackstands under the rear corners of the loader. (See Procedure on Page 10-10-1.)

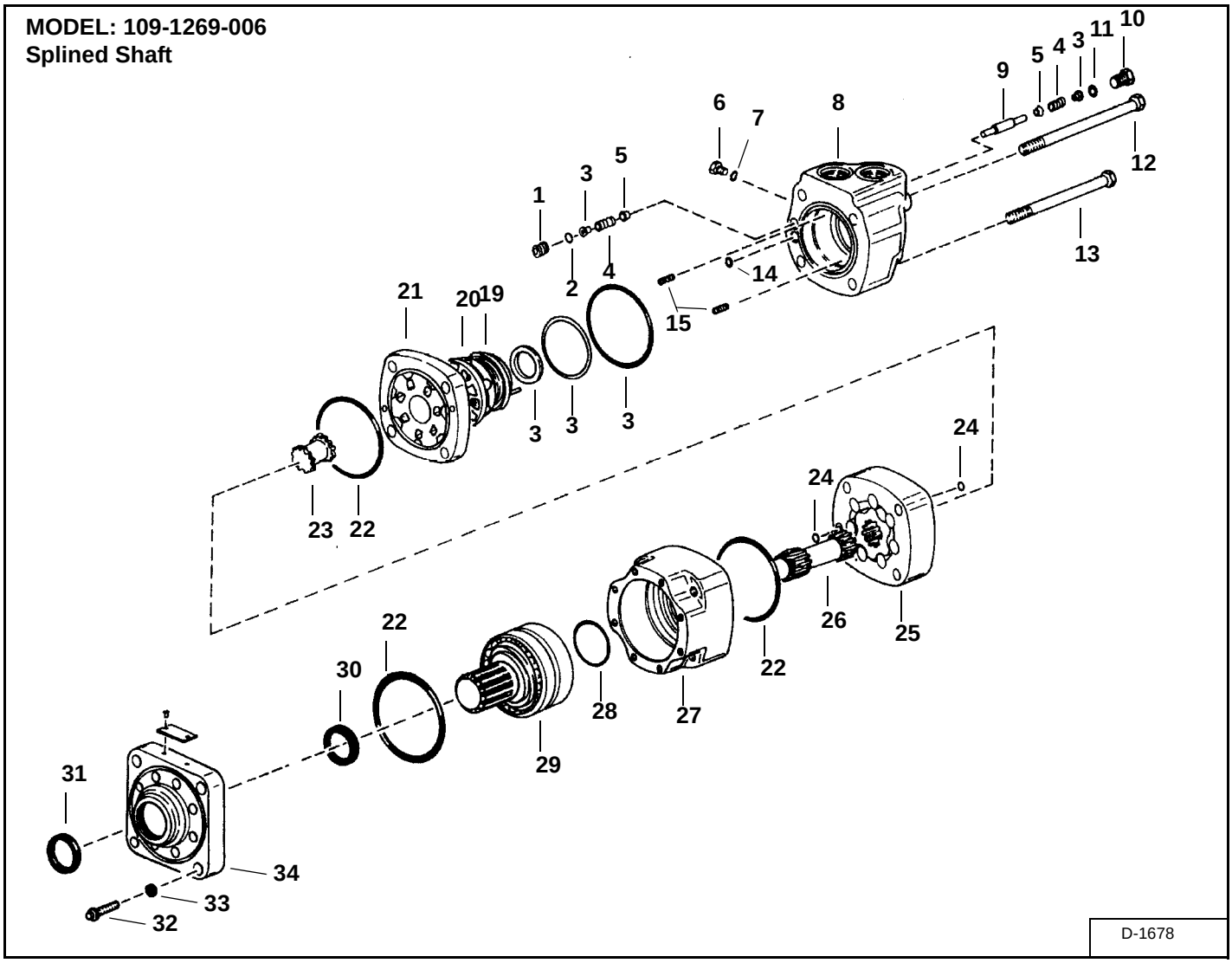
Raise the lift arms and install an approved lift arm support device. (See Installing on Page 10-20-1.)

Raise the operator cab. (See Raising on Page 10-30-1.)

Disconnect the return tubeline (Item 1) from the hydraulic reservoir (Item 2) **[Figure 20-80-1]**.

Attach a hose to the fitting on the bottom of the hydraulic reservoir and drain the fluid into a container.

Parts Identification



MODEL: 553

Ref.	Description
1.	PLUG
2.	O-RING
3.	SHUTTLE
4.	SPRING
5.	POPPET
6.	PLUG
7.	O-RING
8.	HOUSING
9.	PISTON
10.	O-RING
11.	PLUG
12.	BOLT
13.	BOLT
14.	O-RING
15.	SPRING
16.	O-RING
17.	SEAL, outer
18.	SEAL, inner
19.	PLATE
20.	VALVE
21.	PLATE, valve
22.	O-RING
23.	SHAFT
24.	O-RING
25.	GEROLER
26.	SHAFT
27.	HOUSING, bearing
28.	SEAL
29.	SHAFT & BEARING
30.	SEAL, shaft
31.	SEAL, dust
32.	BOLT
33.	WASHER
34.	COVER, front

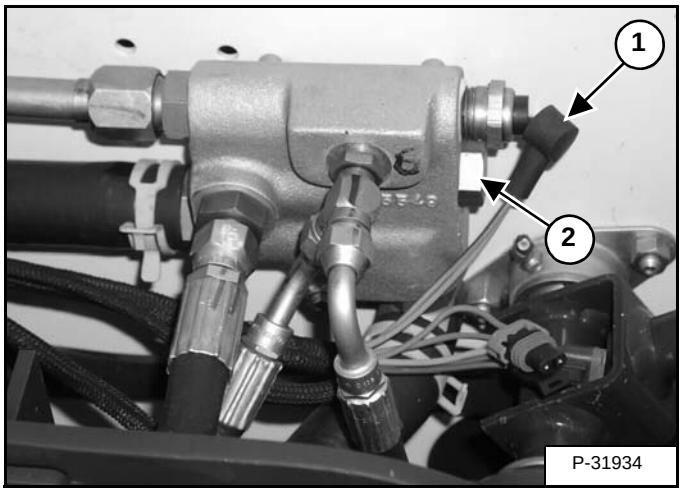
PORT BLOCK

Description

The port block has a charge oil by-pass valve, which together with reservoir fluid, feeds the hydraulic gear pump. The port block has a hydraulic fluid temperature switch. The hydraulic fluid is gravity fed from the hydraulic reservoir to the port block.

Removal And Installation

Figure 30-30-1

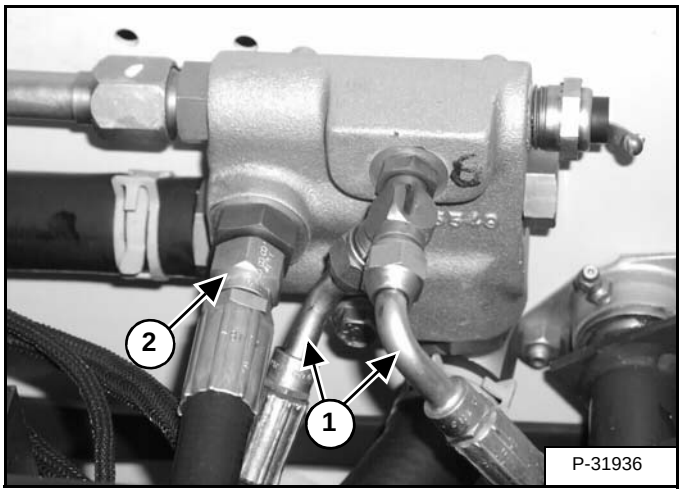


Drain the hydraulic fluid from the reservoir. (See Removing And Replacing The Hydraulic/Hydrostatic Fluid on Page 10-120-2.)

Remove the control panel. (See Removal And Installation on Page 50-100-1.)

Disconnect the wire (Item 1) **[Figure 30-30-1]** from the hydraulic fluid temperature switch.

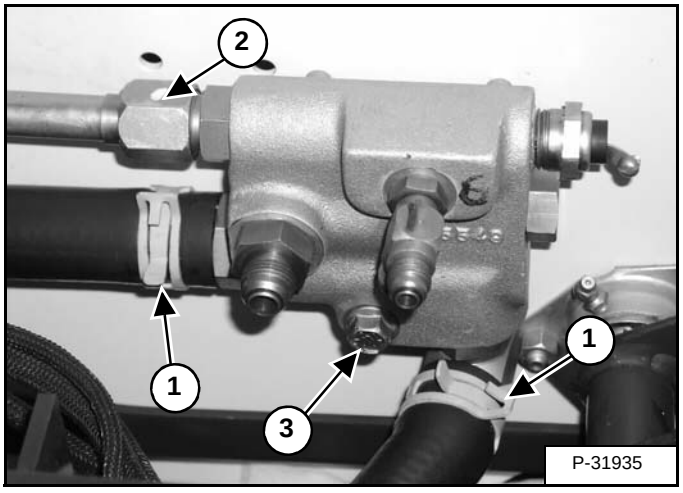
Figure 30-30-2



Disconnect the two hydrostatic motor case drain hoses (Item 1) **[Figure 30-30-2]** from the tee fitting on the port block.

Disconnect the charge inlet hose (Item 2) **[Figure 30-30-2]** from the port block.

Figure 30-30-3



Disconnect the inlet and outlet hoses (Item1) **[Figure 30-30-3]** from the port block.

Disconnect the return tubeline (Item 2) **[Figure 30-30-3]** from the port block.

Remove the mounting bolt (Item 3) **[Figure 30-30-3]** from the port block and remove the port block from the loader.

Reverse the removal procedure to install the port block in the loader.

Oil Cooler By-Pass Valve Removal And Installation

The oil cooler by-pass valve is located in the return tubeline port (Item 2) **[Figure 30-30-3]** of the port block.

Disconnect the tubeline and remove the fitting from the port.

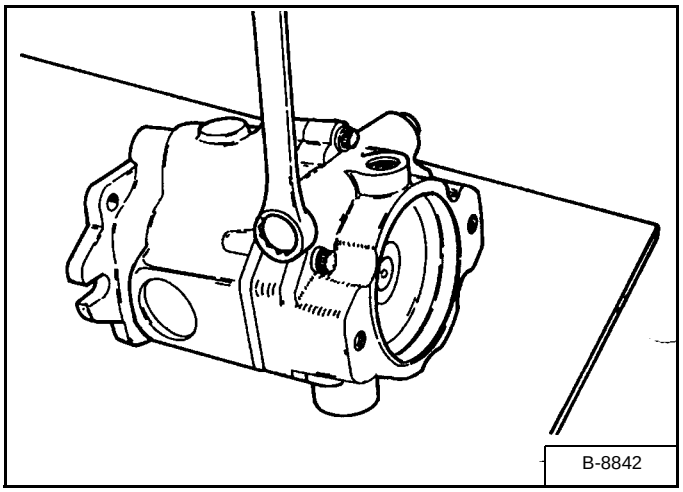
Check the poppet and spring for damage or wear and replace if necessary.

Hydraulic Oil Temperature Switch Removal And Installation

To replace the hydraulic oil temperature switch (Item 1) **[Figure 30-30-1]**, disconnect the wire from the switch and remove the switch from the port block.

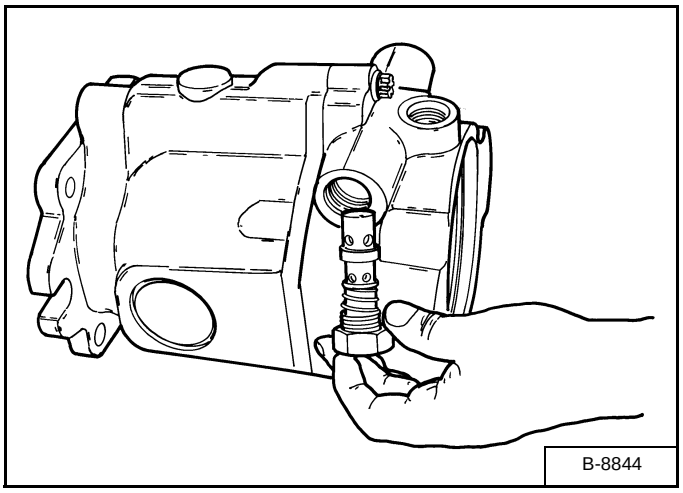
Disassembly And Assembly (Cont'd)

Figure 30-40-22



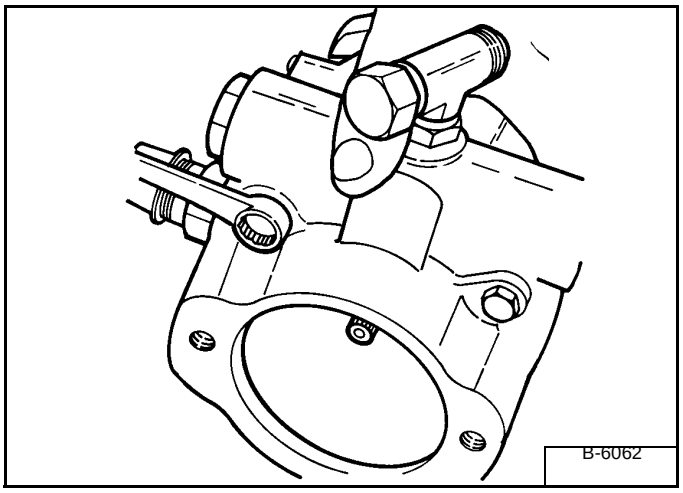
Remove the plugs at the high pressure replenishing valves **[Figure 30-40-22]**.

Figure 30-40-23



Remove the high pressure replenishing valves **[Figure 30-40-23]**.

Figure 30-40-24

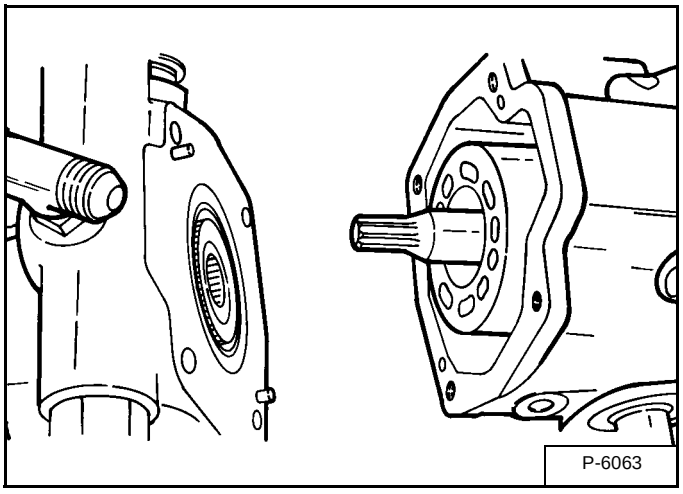


NOTE: The hydrostatic pump front and rear pump internal parts are the same. Keep all the parts for one pump separated from the parts for the other pump.

Remove the four bolts from the center section **[Figure 30-40-24]**.

Assembly: Tighten the bolts to 17-21 ft.-lb. (23-28 N•m) torque.

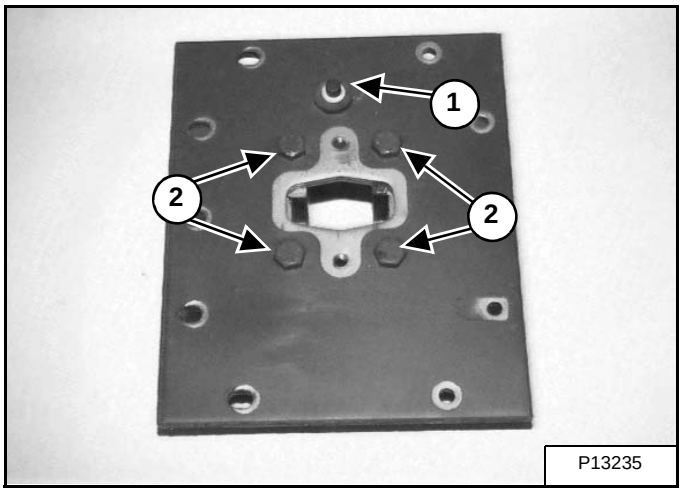
Figure 30-40-25



Remove the center section **[Figure 30-40-25]**.

Traction Lock Guides Removal And Installation (Cont'd)

Figure 40-10-6



NOTE: Before removing the traction lock guides (Items 1 & 2) [Figure 40-10-5], use the vent (Item 1) [Figure 40-10-6] as a reference for the rear of the chaincase cover. Mark the traction lock guides for left and right and also mark the guides for front and rear. This must be done for proper installation of the guides and to allow for the correct positioning of the shaft assembly in the guides.

Remove the four mounting bolts (Item 2) **[Figure 40-10-6]** from the traction lock guides and remove the guides.

Installation: Put a bead of polyurethane caulk around each mounting hole between the chaincase cover and the traction lock guides. Put liquid adhesive (Loctite® #242) on the threads of the traction lock guide bolts. Tighten to 65-70 ft.-lb. (88-95 N•m) torque.

Inspect the traction lock guides for damage or wear and replace if necessary.

Reverse the removal procedure to install the traction lock guides.

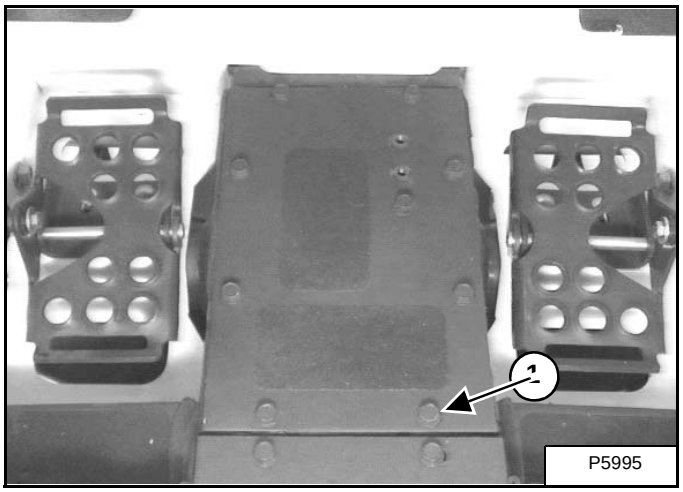
CHAINCASE

Description

The chaincase contains the #60 HS roller chain, sprockets, and lubrication oil. The chaincase has two sealed covers to access the intermal components for adjustment or repair.

Front Cover Removal And Installation

Figure 40-30-1



Remove the control panel. (See Removal And Installation on Page 50-100-1.)

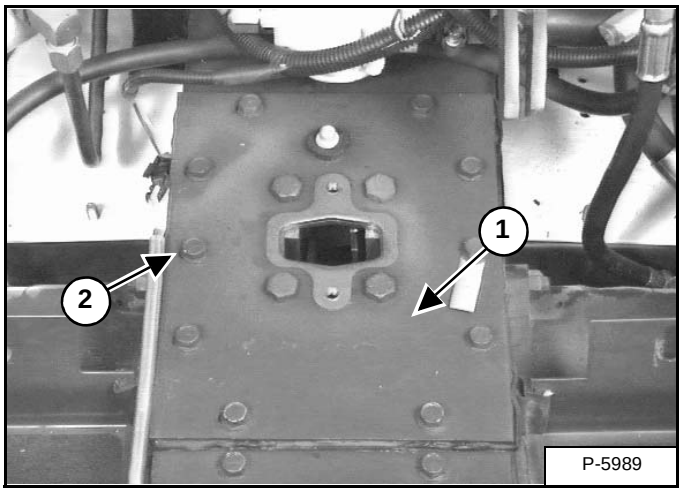
Remove the eight mounting bolts (Item 1) **[Figure 40-30-1]** from the front cover.

Installation: Apply liquid adhesive (Loctite® #242) to each mounting bolt and tighten the bolts to 190-240 in.-lb. (22-27 N•m) torque.

Remove the gasket from the chaincase and inspect for damage. Replace if necessary.

Rear Cover Removal And Installation

Figure 40-30-2



Remove the traction lock. (See Removal And Installation on Page 60-90-2.)

Remove the control panel. (See Removal And Installation on Page 50-100-1.)

Remove the traction lock assembly from the rear cover (Item 1) **[Figure 40-30-2]**. (See Removal And Installation on Page 60-90-2.)

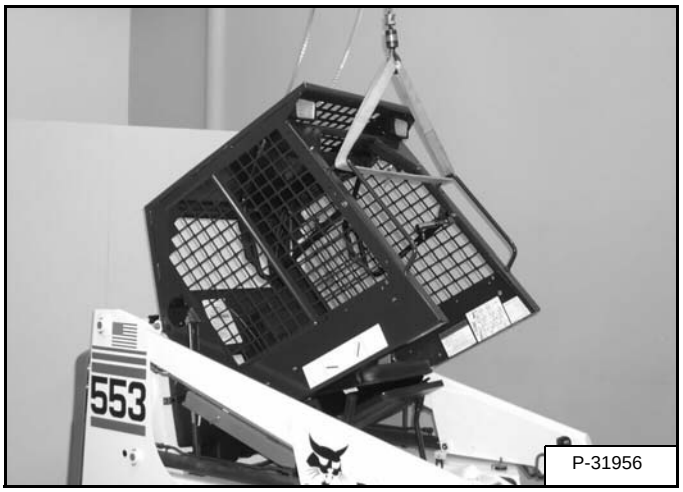
Remove the ten mounting bolts (Item 2) **[Figure 40-30-2]** from the rear cover.

Installation: Apply liquid adhesive (Loctite® #242) to each mounting bolt and tighten the mounting bolts to 190-240 in.-lb. (22-27 N•m) torque.

Remove the gasket from the chaincase and inspect for damage. Replace if necessary.

Removal And Installatin (Cont'd)

Figure 50-20-7



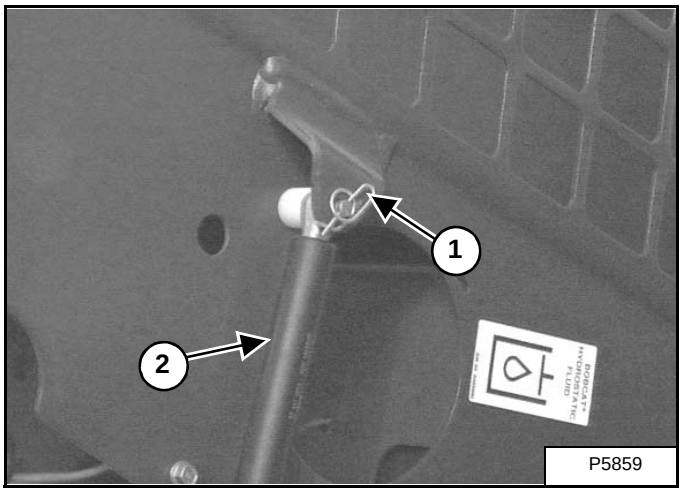
Install a lifting strap on both operator cab lift handles **[Figure 50-20-7]**.

Fasten the lifting strap to a chain hoist .

Raise the operator cab. (See Raising on Page 10-30-1.)

NOTE: Be careful when raising the operator cab. The cab will tilt farther back with the cab stops removed. If the cab is equipped with a rear window, the window could be damaged if not careful.

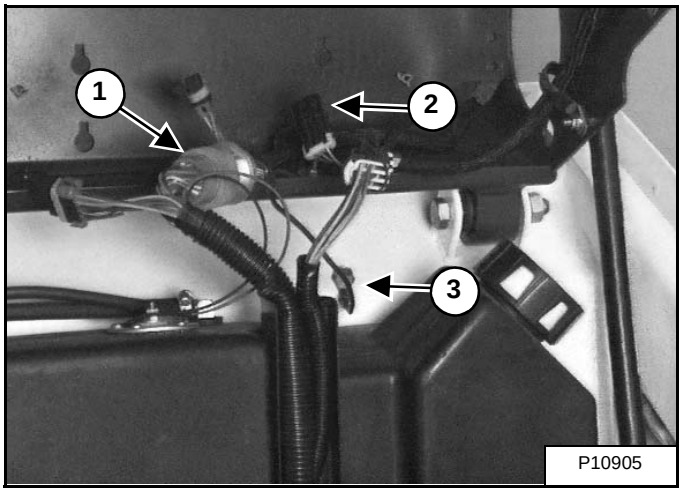
Figure 50-20-8



Remove the retaining pin (Item 1) clevis pin and spacer from the gas cylinder (Item 2) **[Figure 50-20-8]** (both sides).

Keep the other end of the gas cylinder fastened to the loader and put the cylinder on the fender of the loader.

Figure 50-20-9



Disconnect the operator cab harness (Item 1) and BICS harness (Item 2) **[Figure 50-20-9]**.

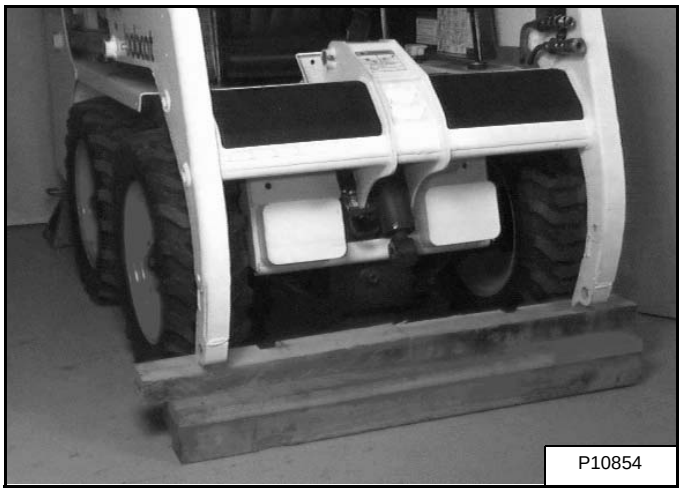
Disconnect the operator cab ground wire (Item 3) **[Figure 50-20-9]** from the loader frame.

Use the chain hoist to lower the operator cab back on the fenders of the loader frame.

LIFT ARM

Removal And Installation

Figure 50-50-1



Remove the attachment from the Bob-Tach.

Remove the Bob-Tach from the loader. (See Removal And Installation on Page 50-40-1.)

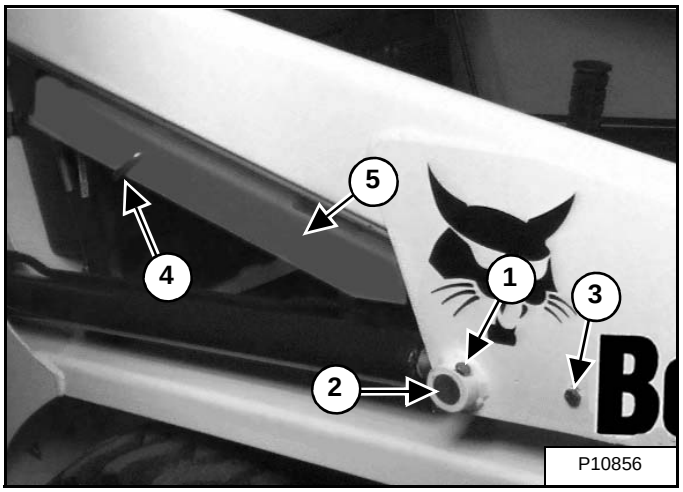
Stop the engine. Pull up on the lift arm by-pass control and move the lift pedal to release the hydraulic pressure, until the boom arms rest on blocks **[Figure 50-50-1]**.

Raise the seat bar.

Install jackstands under the rear of the loader. (See Procedure on Page 10-10-1.)

Raise the operator cab. (See Raising on Page 10-30-1.)

Figure 50-50-2



Remove the retainer bolt (Item 1) **[Figure 50-50-2]** and nut from the rod end pivot pin.

Installation: Tighten the retainer bolt and nut to 18-20 ft.-lb. (24-27 N•m) torque.

Remove the rod end pivot pin (Item 2) **[Figure 50-50-2]** from the cylinder.

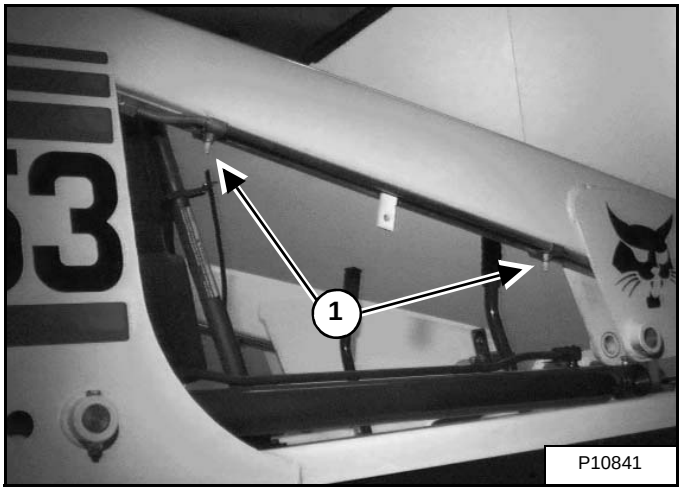
Remove the retainer bolt (Item 3) **[Figure 50-50-2]** nut and spacer from the lift arm support device.

Installation: Tighten the retainer bolt and nut to 18-20 ft.-lb. (24-27 N•m) torque.

Remove the lift arm support device retaining pin (Item 4) **[Figure 50-50-2]**.

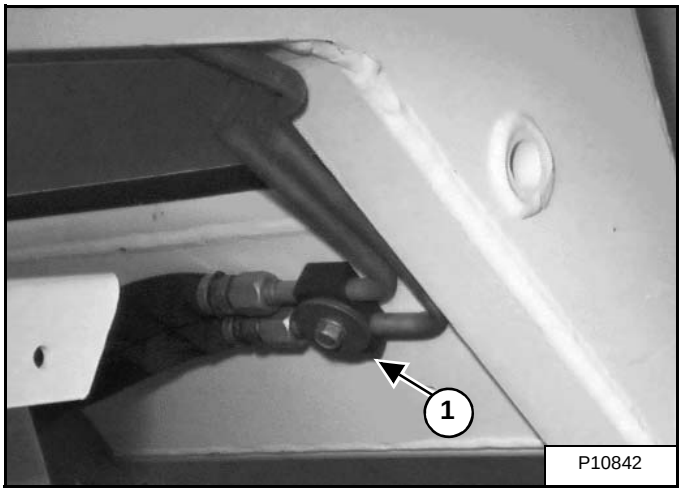
Remove the lift arm support device (Item 5) **[Figure 50-50-2]**.

Figure 50-50-3



Remove the tubeline mounting brackets (Item 1) **[Figure 50-50-3]** from the tilt cylinder tubelines.

Figure 50-50-4



Remove the tilt cylinder tubeline mounting bracket (Item 1) **[Figure 50-50-4]**.

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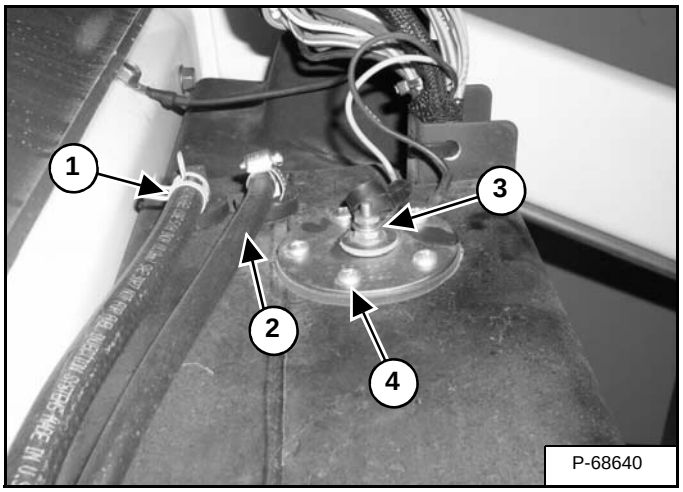
FUEL TANK

Removal And Installation

Figure 50-80-1



Raise the operator cab. (See Raising on Page 10-30-1.)

Disconnect the fuel supply hose (Item 1) **[Figure 50-80-1]** from the fuel tank.

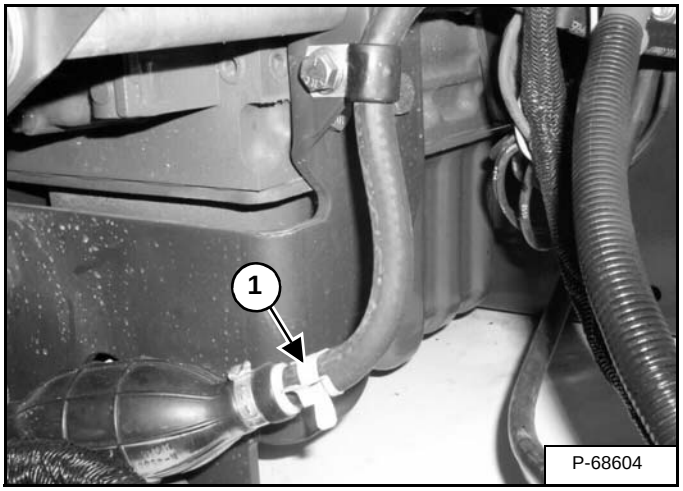
The fuel supply hose (Item 1) **[Figure 50-80-1]** is connected to the fuel primer bulb located at the rear of the engine by the rear engine mounts.

Disconnect the fuel return hose (Item 2) **[Figure 50-80-1]** from the fuel tank.

The fuel return hose is connected to the return tubeline on the fuel injectors.

Remove the rubber boot and disconnect the two wires from the fuel level sender (Item 3) **[Figure 50-80-1]**.

Figure 50-80-2



Drain the fuel from the tank by disconnecting the fuel supply line from the primer bulb (Item 1) **[Figure 50-80-2]**.

Figure 50-80-3

Remove the mounting bolt (Item 1) **[Figure 50-80-3]** from fuel tank retaining strap.

Remove the fuel tank from the loader.

If the fuel tank is being replaced due to damage, remove the remaining fuel from the tank and put into an approved fuel container.

Reverse the removal procedure to install the fuel tank.

Fuel Level Sender Removal And Installation

To replace the fuel level sender, disconnect the two wires (Item 3) **[Figure 50-80-1]** from the fuel sender.

Remove the five mounting screws (Item 4) **[Figure 50-80-1]** from the fuel sender.

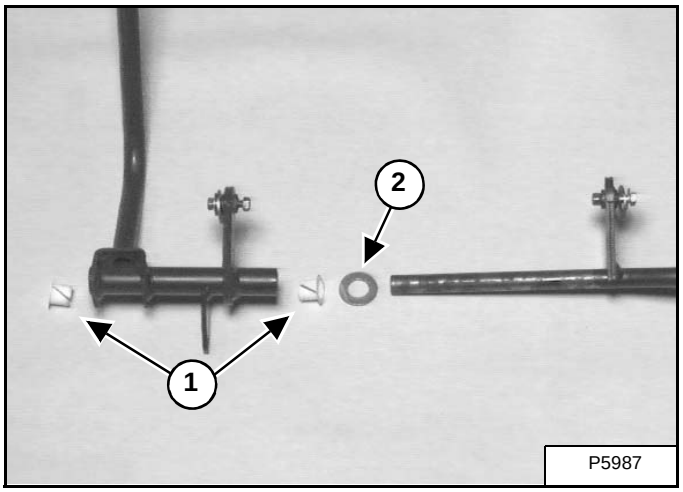
Remove the fuel level sender from the fuel tank.

Inspect the sender and replace if necessary.

Reverse the removal procedure to install the fuel level sender in the fuel tank.

Linkage Removal And Installation

Figure 50-110-5



Slide the left steering lever assembly off the shaft of the right steering lever assembly **[Figure 50-110-5]**.

Check the plastic bushings (Item 1) **[Figure 50-110-5]** for damage or wear and replace if necessary.

Assembly: Lightly lubricate the steering shaft before assembly.

Install the washer (Item 2) **[Figure 50-110-5]** on the shaft.

Install the two plastic bushings (Item 1) **[Figure 50-110-5]** in each end of the left side lever assembly.

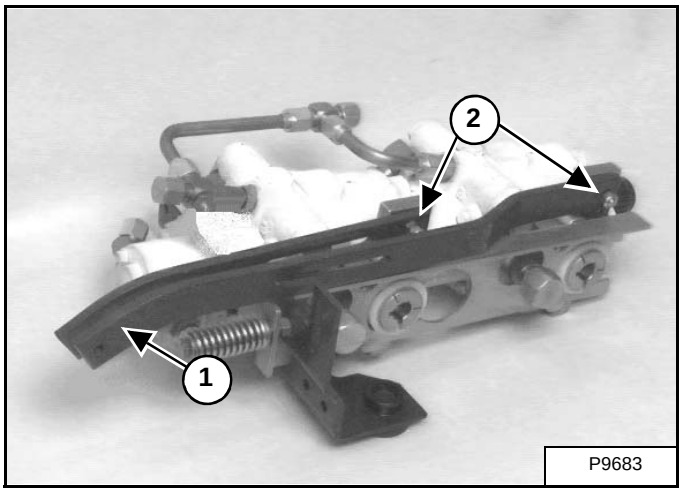
Slide the left side steering lever assembly onto the right side lever assembly.

⚠ WARNING

Never work on a machine with the lift arms up unless the lift arms are secured by an approved lift arm support device. Failure to use an approved lift arm support device can allow the lift arms or attachment to fall and cause injury or death.

W-2059-0598

Figure 50-110-6



Install jackstands under the rear of the loader. (See Procedure on Page 10-10-1.)

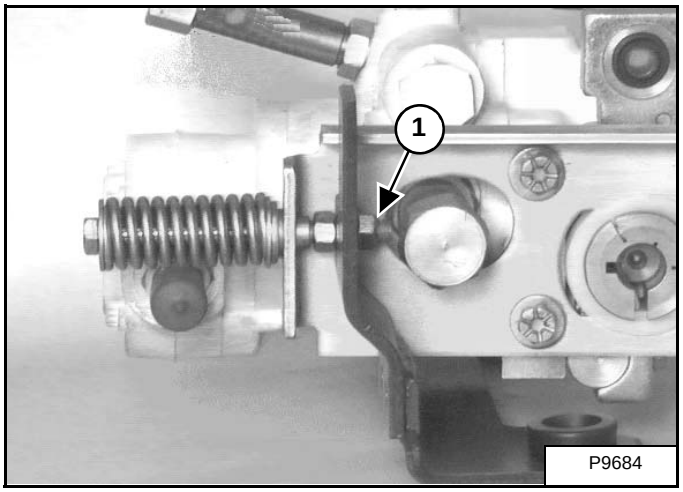
Raise the lift arms and install an approved lift arm support device. (See Installing on Page 10-20-1.)

Raise the operator cab. (See Raising on Page 10-30-1.)

NOTE: The steering linkage/hydrostatic pump assembly has been removed from the loader to show the steering linkage removal and installation more clearly. The steering linkage can be removed from the loader with the assembly installed in the loader.

Remove the right and left steering linkages (Item 1) from the pintle levers (Item 2) **[Figure 50-110-6]**.

Figure 50-110-7

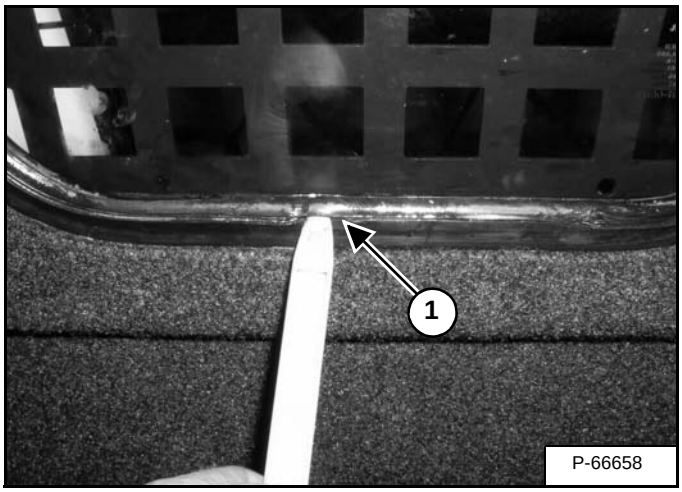


Remove the mounting nut (Item 1) **[Figure 50-110-7]** from the centering spring assembly.

WINDOW (TOP)

Removal

Figure 50-121-1

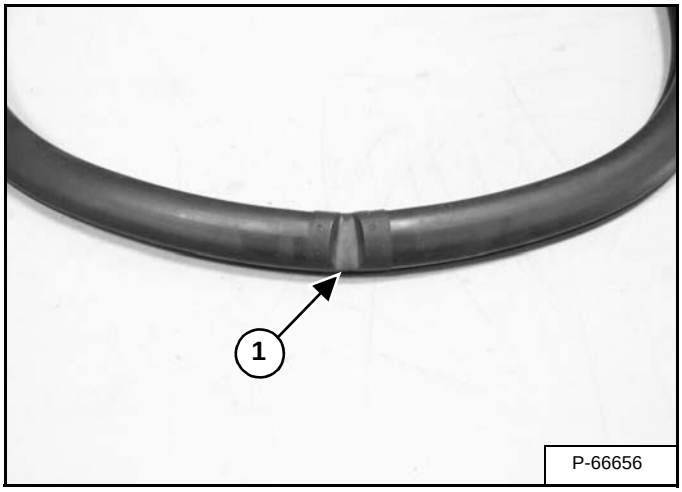


Install the plastic stick to move the locking tab out of the molding (Item 1) **[Figure 50-121-1]**.

Use the plastic stick to help remove the window from the molding.

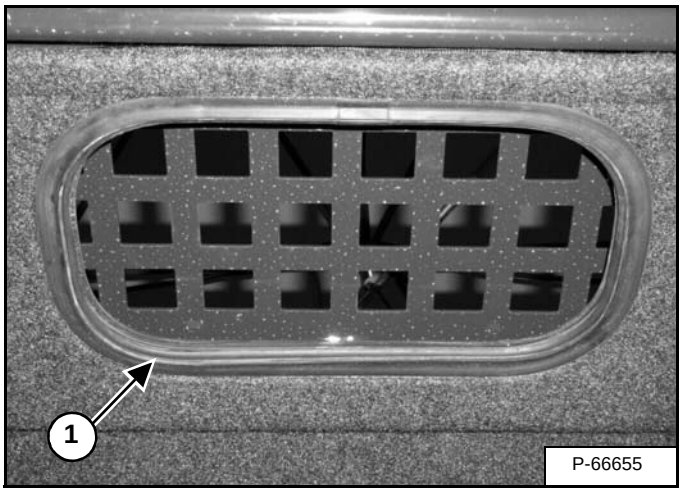
Installation

Figure 50-121-2



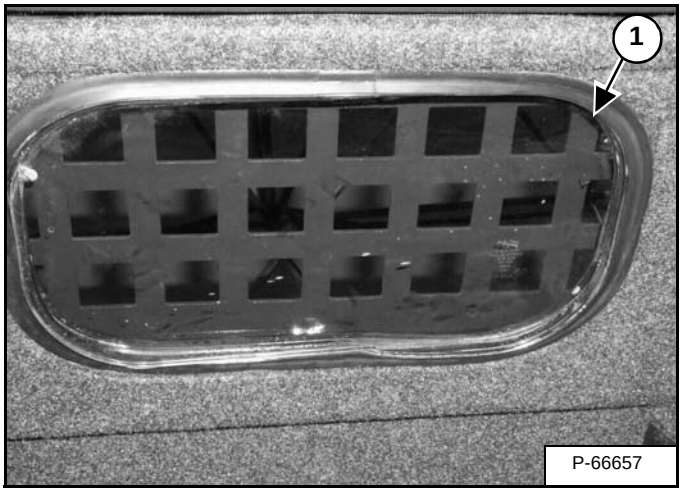
The molding has a V groove (Item 1) **[Figure 50-121-2]** which must be located to the top and front of the loader when the moldng is installed in the opening.

Figure 50-121-3



From inside the operator cab, install the molding (Item 1) **[Figure 50-121-3]** in the opening. Use the plastic stick to move the locking tab out of the groove in the molding.

Figure 50-121-4



Apply liquid soap in the rubber molding to make installation easier.

Install the window from inside the operator cab.

Install the corner of the window into the corner of the molding (Item 1) **[Figure 50-121-4]**. Work the window until the window is fully seated along the front edge of the molding.

Use the plastic stick under the molding to guide the window into the molding groove.

Use the plastic stick to position the locking tab into the groove to secure the window in the molding, as shown in **[Figure 50-121-1]**.

WIRING SCHEMATIC

553 (S/N 539111001 AND ABOVE)
(S/N 539411001 AND ABOVE)
(PRINTED DECEMBER 2005)
V-0800

WIRES CONNECT BY LETTER ACROSS CONNECTORS

SOME CONNECTOR BODIES NOT SHOWN FOR DRAWING CLARITY

BATTERY FEED 1000-1999 RED, RED/WHT, RNG
GROUND 2000-2999 BLK
MONITORING 3000-3999 LBL
HYDRAULIC 4000-4999 LGN
ATTACHMENT CONTROLS 5000-5999 YEL
LIGHTS 6000-6999 PNK
ACCESSORIES 7000-7999 WHT
ENGINE 8000-8999 TAN
COMMUNICATION 9000-9999 PUR

RED = RED
RNG = ORANGE
BLK = BLACK
LBL = LIGHT BLUE
DBL = DARK BLUE
LGN = LIGHT GREEN
DGN = DARK GREEN
YEL = YELLOW
PNK = PINK
WHT = WHITE
BRN = BROWN
TAN = TAN
PUR = PURPLE
GRY = GRAY

ENGINE HARNESS - 7115227

FILTER HARNESS - 6715458

CAB HARNESS - 6711832

BICS CONTROLLER HARNESS - 6731914

STARTER
DIODE
GLOW PLUG
FAN CONTROL
HYDRAULIC FILTER PRESSURE SWITCH
CHARGE PRESSURE SWITCH
HYDRAULIC OIL TEMPERATURE SWITCH
ENGINE OIL PRESSURE SWITCH
ENGINE COOLANT SENDER
FUEL LEVEL SENDER
BUCKET POSITION SOLENOID (IF EQUIPPED)
ACCESSORY FUSE
LIGHT FUSE 25A
FAN FUSE 1 25A
FAN FUSE 2 25A
ALTERNATOR
FAN 1
FAN 2
SWITCHED POWER
ENGINE FUSE 15A
GAUGE/BOSS FUSE 10A
BICS FUSE 10A
BATTERY
FUEL SHUTOFF TIMER
FUEL PULL SOLENOID
BRAKE FUSE 25A
HORN (If Equipped)
BUCKET LEVEL SWITCH (IF EQUIPPED)
GLOW PLUG SWITCH
IGNITION SWITCH
POWER SOCKET (If Equipped)
DOME LIGHT (If Equipped)
LIGHT SWITCH (IF EQUIPPED)
HOURMETER
COOLANT TEMPERATURE GAUGE
VOLTMETER
FUEL GAUGE
ENGINE WARNING LIGHT
TRANSMISSION WARNING LIGHT
AUXILIARY HYDRAULIC SWITCH (IF EQUIPPED)
RIGHT FRONT HEADLIGHT (IF EQUIPPED)
LEFT FRONT HEADLIGHT (IF EQUIPPED)
PARK BRAKE SWITCH
TRAVEL CONTROL LOCKOUT (If Equipped)
SEAT BAR SENSOR
TRACTION LOCK OVERRIDE SWITCH
BICS CONTROLLER

FUSE 5 FUSE 1 FUSE 6 FUSE 2 FUSE 7 FUSE 3 FUSE 8 FUSE 4 FUSE 9 FUSE 10 FUSE 11 FUSE 12
GLOW PLUG
FAN CONTROL
FAN 1
FAN 2
TRACTION PULL (BRAKE)
SWITCH POWER
STARTER


Bobcat®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Specifications

All dimensions are given in inches. Respective metric dimensions are given in millimeters enclosed by parentheses.

Fuel System

Injection Timing	17°-19° before T.D.C. 0.30 to 0.33 rad.
Fuel Injection Pressure	1990-2133 PSI (13721-14707 kPa)
Fuel Tightness of Nozzle Valve Seat	Dry Nozzle at 1849 PSI (12742 kPa)

Valves

Valve Seat Width	0.0835
Valve Seat and Face Angle (Intake)	60° 1.047 rad.
Valve Seat and Face Angle (Exhaust)	45° 0.785 rad.
Valve Stem O.D.	0.2740 to 0.2764 in. (6.960 to 7.021 mm)
Valve Guide I.D.	0.2760 to 0.2765 in. (7.010 to 7.023 mm)
Clearance Between Valve Stem And Valve Guide (Intake and Exhaust)	0.0014 to 0.0025 in. (0.035 to 0.064 mm)
Allowable Limit	0.0039 in. (0.1 mm)
Valve Clearance (Cold)	0.0057 to 0.0073 in. (0.145 to 0.185 mm)
Valve Recessing	0.0020 to 0.0060 in. (0.05 to 0.25 mm)
Allowable Limit	0.0060 in. (0.40 mm)

Valve Springs

Valve Spring	1.457 to 1.476 in. (37 to 37.5 mm)
Allowable Limit	1.437 in. (36.5 mm)
Setting Load/Setting Length (Intake)	26.4 lbs / 1.22 in. (117.4 N / 31 mm) (11.97 kgf / 31 mm)
Allowable Limit	22.5 lbs /1.22 in. (10.2 N / 31 mm) (5.6 kgf / 31 mm)
Tilt - Allowable Limit	0.039 in. (1.0 mm)

Valve Tappets

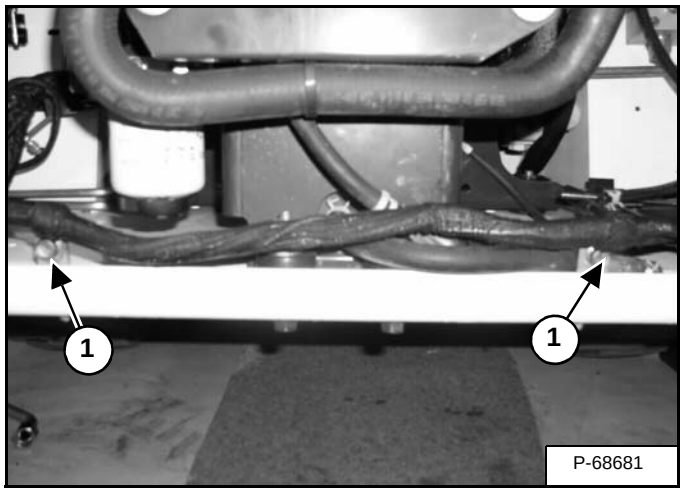
Clearance Between Tappet And Guide	0.0008 to 0.0024 in. (0.020 to 0.062 mm)
Allowable Limit	0.0028 in. (0.07 mm)
Tappet Guide I.D.	0.7874 to 0.7882 in. (20.000 to 20.021 mm)
Tappet O.D.	0.7858 to 0.7866 in. (19.966 to 19.980 mm)

Valve Timing

Intake Valve - Open	14° before T.D.C. 0.24 rad.
Closed	36° after B.D.C. 0.61 rad.
Exhaust Valve - Open	45° before B.D.C. 0.76 rad.
Closed	17° after T.D.C. 0.29 rad.

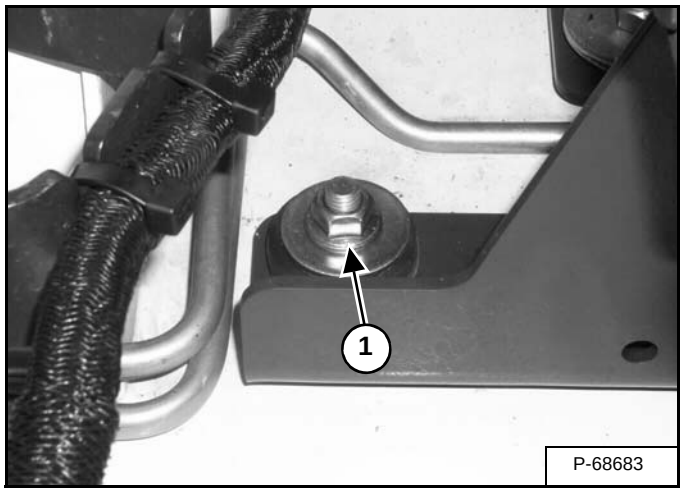
Engine Removal And Installation (Cont'd)

Figure 70-10-11



Remove the bolts (Item 1) **[Figure 70-10-11]** to move the engine harness for engine removal.

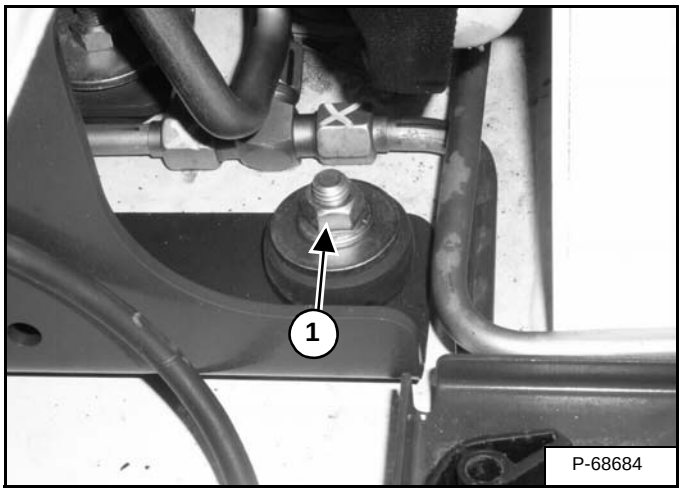
Figure 70-10-12



Remove the nut and washer (Item 1) **[Figure 70-10-12]** from the front left engine mount.

Installation: Tighten the nut to 65-70 ft.-lb. (88-95 N•m) torque.

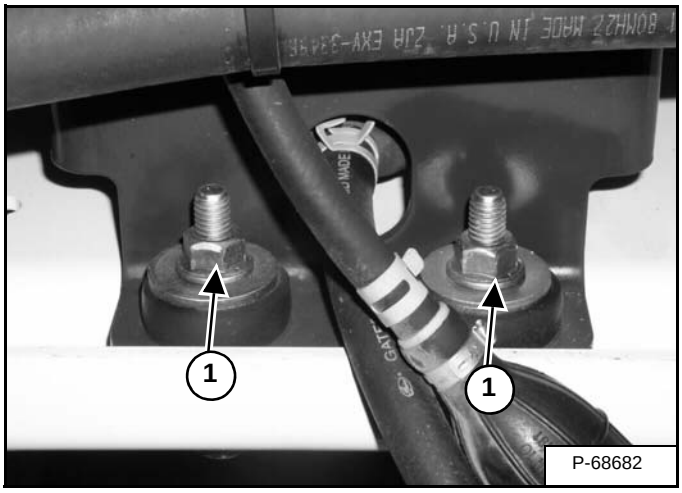
Figure 70-10-13



Remove the nut and washer (Item 1) **[Figure 70-10-13]** from the right front engine mount.

Installation: Tighten the nut to 65-70 ft.-lb. (88-95 N•m) torque.

Figure 70-10-14



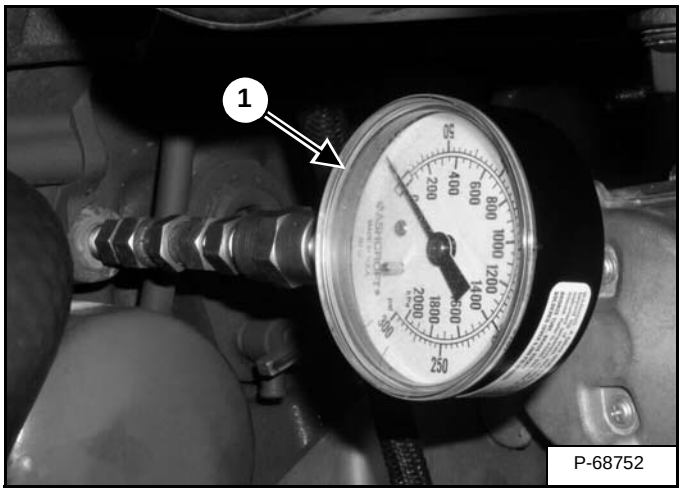
Remove the nuts and washers (Item 1) **[Figure 70-10-14]** from the rear engine mount.

Installation: Tighten the nuts to 65-70 ft.-lb. (88-95 N•m) torque.


Bobcat®

Engine Oil Pressure - Testing

Figure 70-60-5



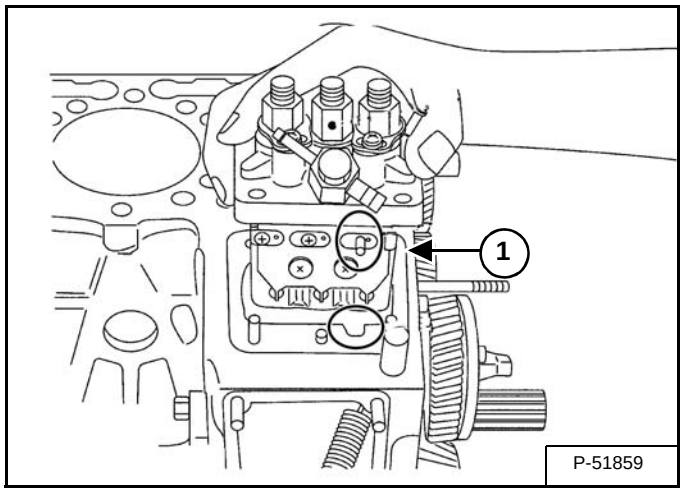
Remove the engine pressure switch and install the pressure tester (Item 1) **[Figure 70-60-5]**.

Start the engine. After engine warms up, check the oil pressure of both idle and full RPM.

Allowable Limit at Idle	7 PSI (.48 bar) 0.5 kgf/cm^2
Engine Oil Pressure - Full RPM	28 -64 PSI (1.9 -4.4 bar) 2.0-4.5 kgf/cm^2
Allowable Limit at Full RPM	21 PSI (1.4 bar) 1.5 kgf/cm^2

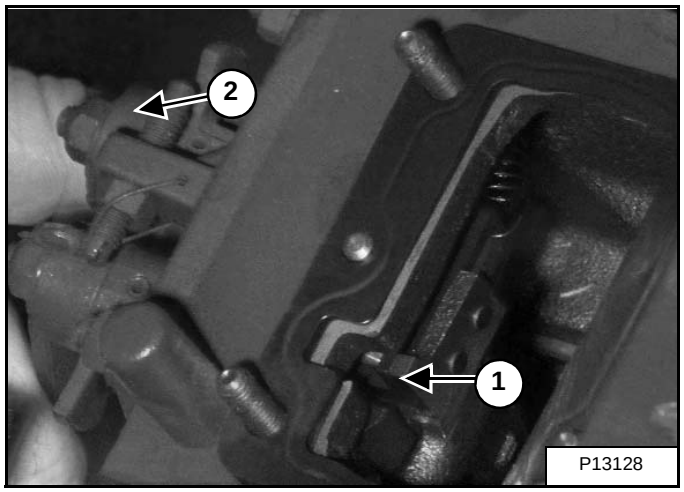
Fuel Injection Pump Removal And Installation (Cont'd)

Figure 70-70-35



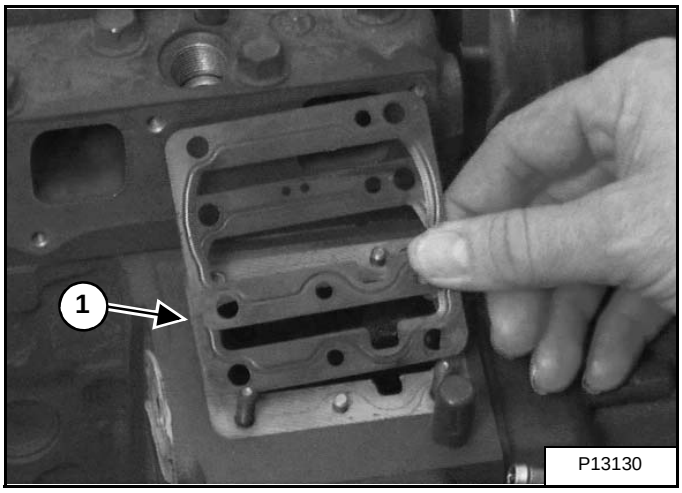
Remove the injection pump from the engine **[Figure 70-70-35]**.

Figure 70-70-36



Installation: The fuel rack pin (Item 1) **[Figure 70-70-35]** on the injection pump must be aligned with the notch (Item 1) located inside the injection pump chamber. Use the throttle lever (Item 2) **[Figure 70-70-36]** on the side of the injection pump chamber to align the notch.

Figure 70-70-37

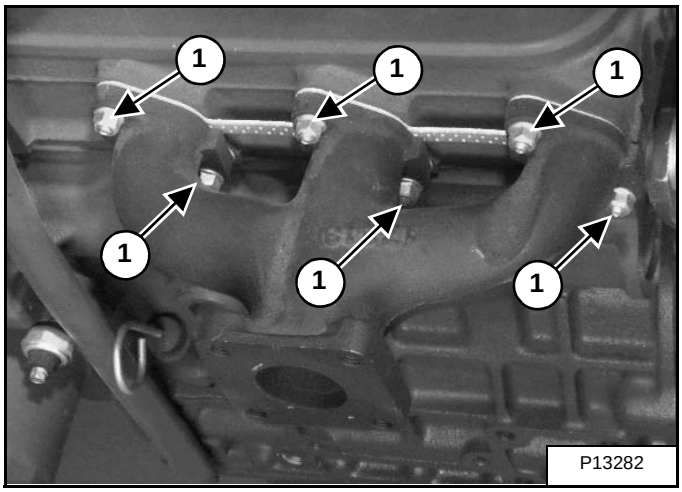


Install the shim(s) (Item 1) **[Figure 70-70-37]** on the injection pump mounting surface. (See Injection Pump - Timing on Page 70-70-11.) for information on number of shims used.

Install the injection pump in the engine.

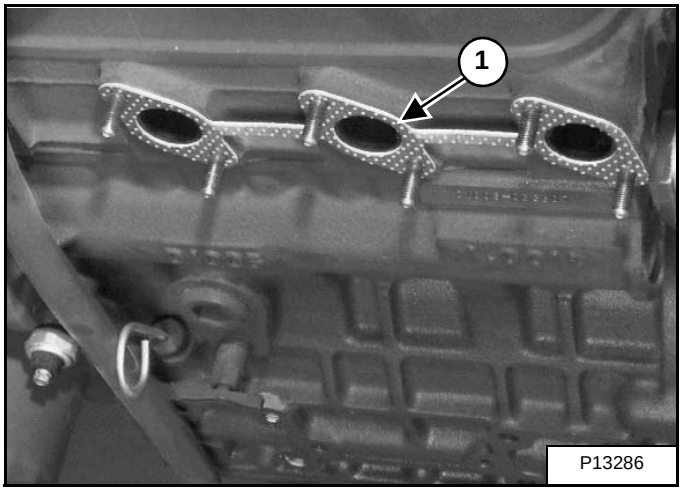
Exhaust Manifold Removal And Installation

Figure 70-80-13



Remove the mounting nuts (Item 1) **[Figure 70-80-13]** from the exhaust manifold.

Figure 70-80-14

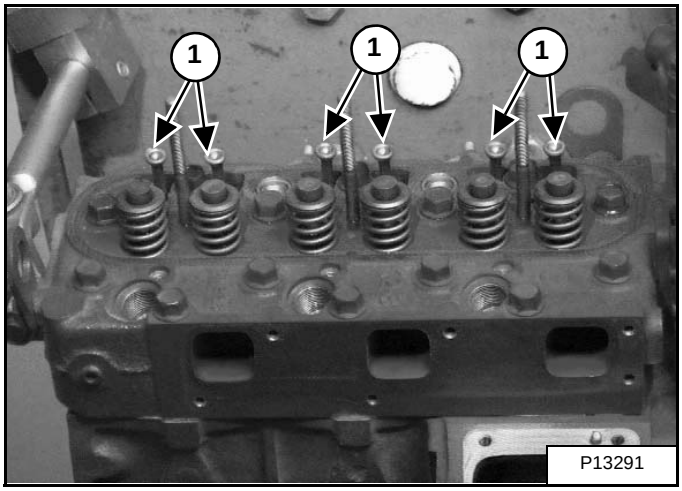


Remove the exhaust manifold from the engine and remove the exhaust manifold gasket (Item 1) **[Figure 70-80-14]** from the engine.

Installation: Replace the exhaust manifold gasket. Tighten the mounting nuts to 12-14 ft.-lb. (16-19 N•m) torque.

Cylinder Head Removal And Installation

Figure 70-80-15



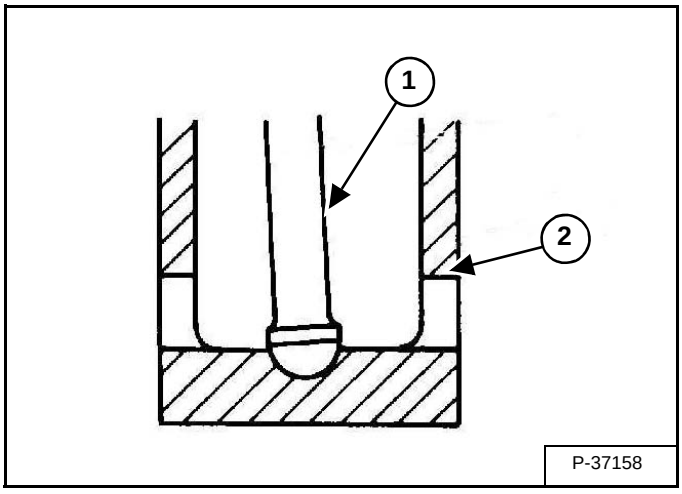
Remove the rocker arm assembly.

Remove the six push rods (Item 1) **[Figure 70-80-15]**.

NOTE: Mark the push rods to prevent interchanging when installing.

Check for wear and replace if needed.

Figure 70-80-16



Put the push rods (Item 1) into the tappets (Item 2) **[Figure 70-80-16]** and check that the ends are properly seated in the grooves.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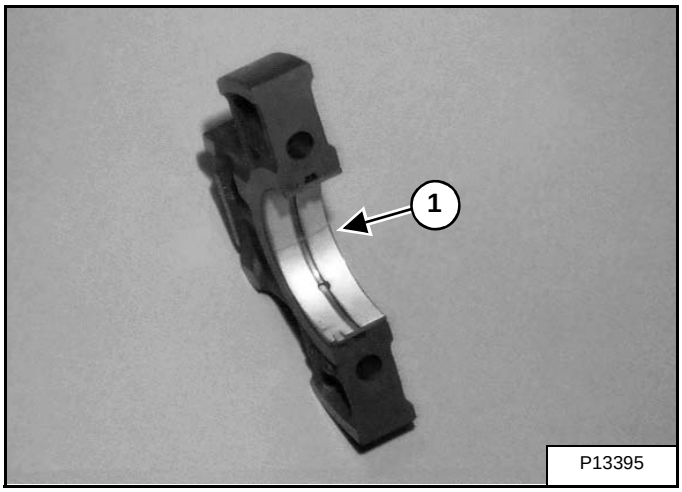
Crankshaft And Bearing - Servicing (Cont'd)

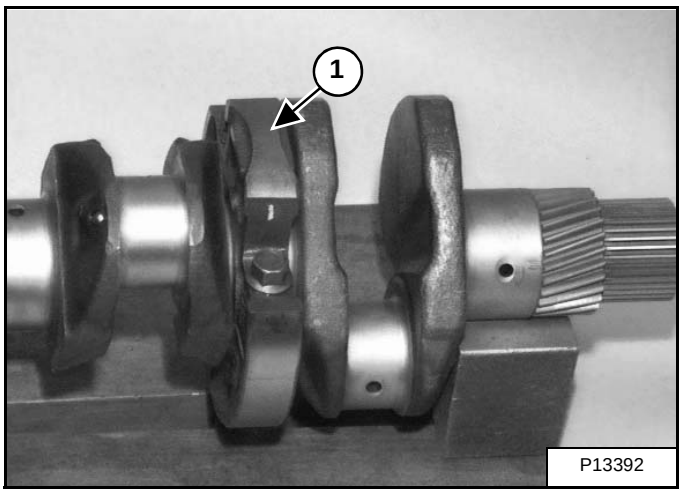
Figure 70-90-31



Clean the crankshaft journal and crankshaft bearing.

Put a strip of plastigauge (Item 1) **[Figure 70-90-31]** on the main bearing.

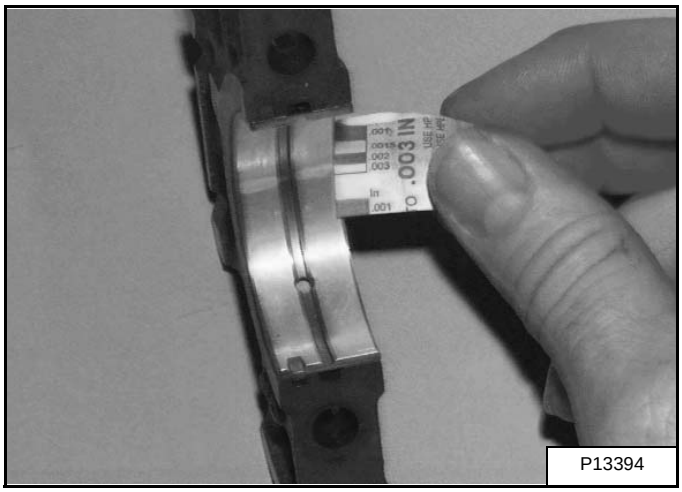
Figure 70-90-32



Install the main bearing case halves (Item 1) **[Figure 70-90-32]** and tighten to 22-25 ft.-lb. (29-34 N•m) torque.

NOTE: DO NOT turn the crankshaft with the press gauge installed. Incorrect measurements will be obtained.

Figure 70-90-33



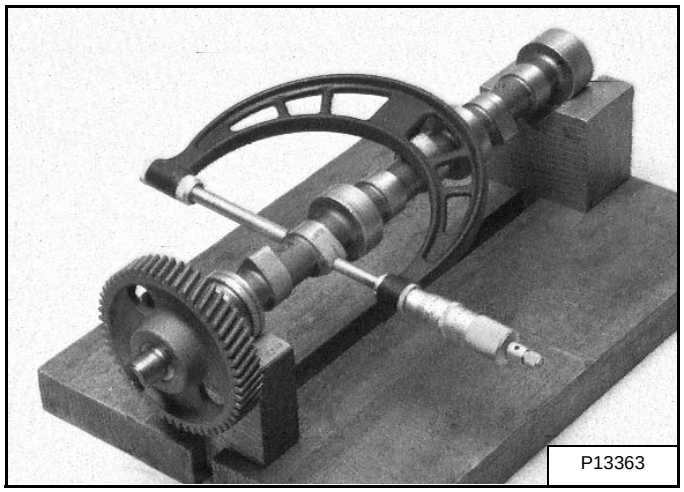
Remove the bolts, remove the main bearing cap, and measure with the plastigauge scale **[Figure 70-90-33]**, to get oil clearance.

Oil Clearance Between Crankshaft and Number 2 & 3 Bearings	0.0013-0.0037 in. (0,034-0,095 mm)
Oil Clearance Between Crankshaft and Number 4 Bearing	0.0013-0.0039 in. (0,034-0,098 mm)
Allowable Limit	0.0079 in. (0,2 mm)

If the clearance exceeds the allowable limits, replace the crankshaft bearings.

Camshaft Servicing

Figure 70-100-18



Support the camshaft with V-blocks **[Figure 70-100-18]**.

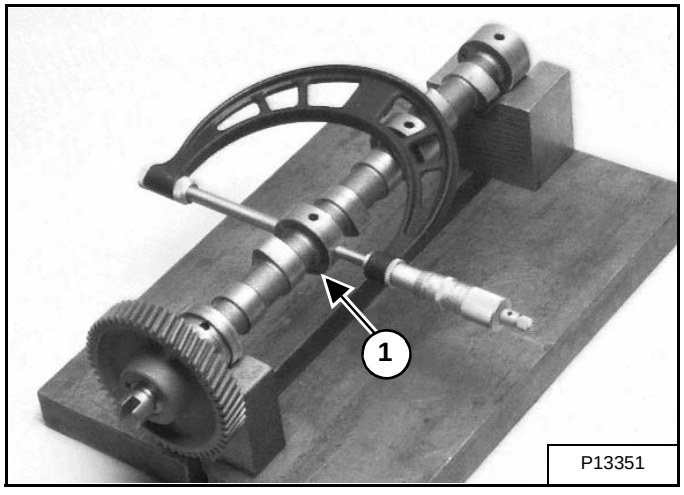
Measure the height of the intake and exhaust cams at their highest point with a micrometer.

The measurement should be:

Intake	1.1339 in. (28,80 mm)
Allowable Limit	1.1319 in. (28,75 mm)
Exhaust	1.1417 in. (29,00 mm)
Allowable Limit	1.1398 in. (28,95 mm)

If the measurement is less than the allowable limit replace the camshaft.

Figure 70-100-19



Measure the camshaft journal outside diameter (Item 1) **[Figure 70-100-19]**.

Camshaft Journal O.D.	1.4147-1.3799 in. (35,934-35,050 mm)

Figure 70-100-20

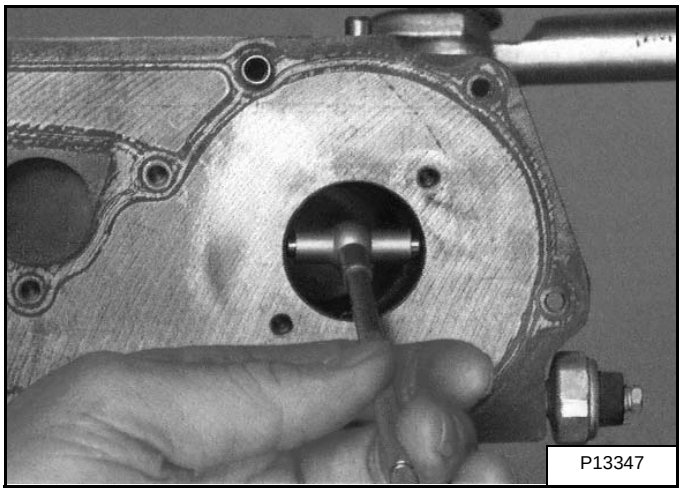
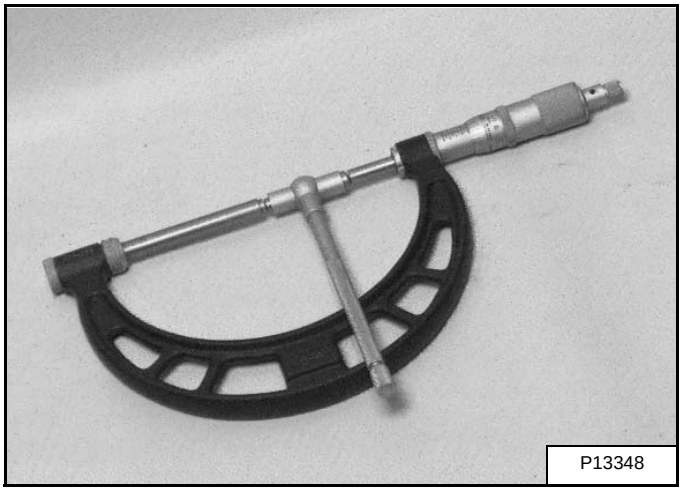


Figure 70-100-21



Measure the camshaft bore in the cylinder block with an inside micrometer **[Figure 70-100-20]** & **[Figure 70-100-21]**.

Camshaft Bearing I.D.	1.4173-1.4183 in. (36,000-36,025 mm)
Oil Clearance of Camshaft Journal	0.0020-0.0036 in. (0,050-0,091 mm)
Allowable Limit	0.059 in. (0,15 mm)

If the oil clearance exceeds the allowable limit, replace the camshaft.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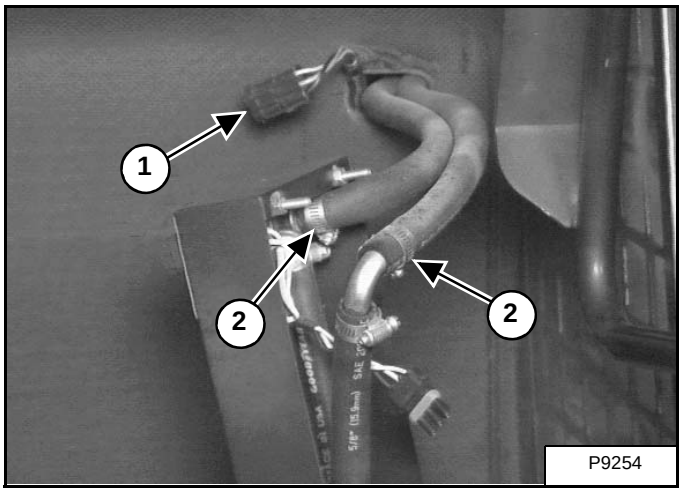
Removal And Installation (Cont'd)

Figure 80-40-4

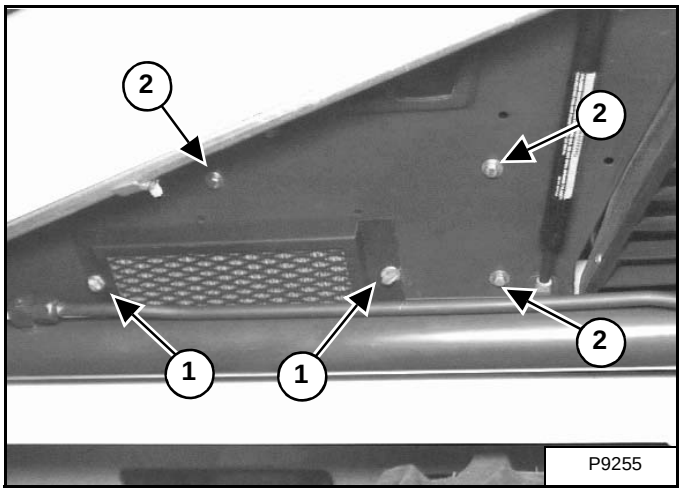


Disconnect the heater wiring harness from the engine harness (Item 1) **[Figure 80-40-4]**.

Remove the hoses (Item 1) **[Figure 80-40-4]** from the heater.

NOTE: Be sure to mark the hoses for the correct location during assembly.

Figure 80-40-5



Remove the thumb screws (Item 1) **[Figure 80-40-5]** and flat washers to remove the filter and screen.

Remove the bolts (Item 2) **[Figure 80-40-5]** from the side of the cab to remove the heater.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TORQUE SPECIFICATIONS FOR BOLTS (CONT'D)

Torque For General Metric Bolts

THREAD SIZE (DIA. X PITCH)	MATERIAL		
	HEAD MARK 4	HEAD MARK 7	HEAD MARK 10
M 5 x 0.8		3-4 ft.-lbs. (4-5 Nm)	
M 6 x 1.0		6-7 ft.-lbs. (8-9 Nm)	6-9 ft.-lbs. (8-12 Nm)
M 8 x 1.25	6-9 ft.-lbs. (8-12 Nm)	11-16 ft.-lbs. (15-22 Nm)	18-25 ft.-lbs. (24-34 Nm)
M 10 x 1.25	13-18 ft.-lbs. (18-24 Nm)	22-30 ft.-lbs. (30-41 Nm)	36-50 ft.-lbs. (49-68 Nm)
M 12 x 1.25	22-30 ft.-lbs. (30-41 Nm)	40-54 ft.-lbs. (54-73 Nm)	69-87 ft.-lbs. (94-118 Nm)
M 14 x 1.25	36-50 ft.-lbs. (49-68 Nm)	58-80 ft.-lbs. (79-108 Nm)	116-137 ft.-lbs. (157-186 Nm)

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