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Service Cylinder Sleeve

Type ..... Dry, Can Be Replaced
Material ..... Cast Iron
Machine Cylinder Block Bore to ..... 104.485 to 104.515 mm
Installation ..... Press Fit
Machine Sleeve Bore to:
- Standard Size Piston (Finished Diameter) ..... 102.00 to 102.04 mm
- 0.5 mm Oversize Piston
  - Machine Cylinder Bore to ..... 102.40 to 102.44 mm
  - Hone to (Finished Diameter) ..... 102.50 to 102.54 mm
- 1.0 mm Oversize Piston
  - Machine Cylinder Bore to ..... 102.90 to 102.94 mm
  - Hone to (Finished Diameter) ..... 103.00 to 103.04 mm

Piston

Type ..... Cam Ground
Material ..... Aluminum Alloy
OD at 12 mm From the Bottom, 90 Degrees Piston Pin
- Standard Size Piston ..... 101.873 to 101.887 mm
  - Minimum Service Limit ..... 101.823 mm
- 0.5 mm Oversize Piston ..... 102.373 to 102.387 mm
  - Minimum Service Limit ..... 101.323 mm
- 1.0 mm Oversize Piston ..... 102.873 to 102.887 mm
  - Minimum Service Limit ..... 102.823 mm

ID of Piston Pin Bore ..... 40.006 to 40.012 mm
- Maximum Service Limit ..... 40.025 mm

Width of 1st Ring Groove (Top) ..... 2.465 to 2.485 mm
Width of 2nd Ring Groove (Intermediate) ..... 2.425 to 2.445 mm
Width of 3rd Ring Groove (Oil Ring) ..... 4.040 to 4.060 mm
Protrusion Above Cylinder Block (Maximum) ..... 0.660 mm
Protrusion Above Cylinder Block (Minimum) ..... 0.280 mm

Piston Pin

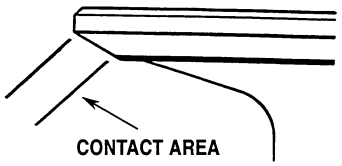
Type ..... Full Float
Pin Length
- Short Style ..... 74.42 to 75.80 mm
- Long Style ..... 82.42 to 82. 94 mm

OD of Pin ..... 39.997 to 40.003 mm
- Minimum Service Limit ..... 39.990 mm

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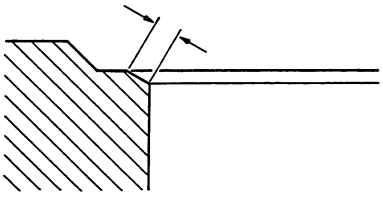
30 Degree Intake Valve

SEAT CONTACT AREA ON THE VALVE TO WIDE



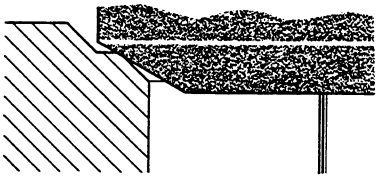
379L94I

IF THE VALVE CONTACT AREA ON THE SEAT LOOKS LIKE THIS.



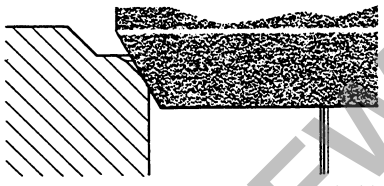
379L94E

USE A 15 DEGREE STONE TO LOWER THE UPPER CONTACT AREA.



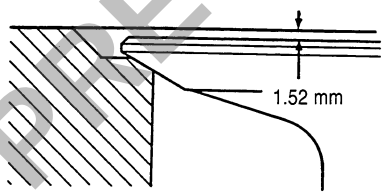
379L94F

USE A 45 DEGREE OR 60 DEGREE STONE TO LIFT THE LOWER CONTACT AREA.



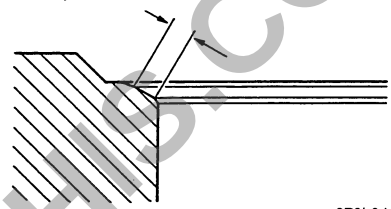
379L94G

CHECK THAT THE VALVE HEAD IS NOT RECESSED MORE THAN 1.52 mm, BELOW THE CYLINDER HEAD SURFACE.



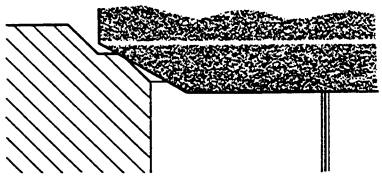
IF THE VALVE HEAD IS RECESSED MORE THAN 1.5 mm, REPLACE THE VALVE AND INSTALL A VALVE SEAT.

IF THE VALVE CONTACT AREA ON THE SEAT LOOKS LIKE THIS (A SEAT THAT HAS BEEN GROUND).



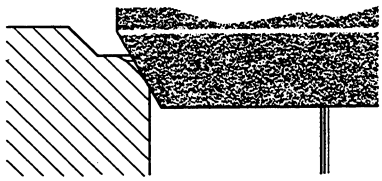
379L94A

USE A 15 DEGREE STONE TO LOWER THE UPPER CONTACT AREA.



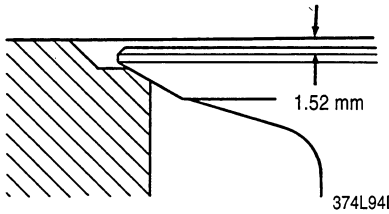
379L94B

USE A 45 DEGREE OR 60 DEGREE STONE TO LIFT THE LOWER CONTACT AREA.



379L94C

CHECK THAT THE VALVE HEAD IS NOT RECESSED MORE THAN 1.52 mm, BELOW THE CYLINDER HEAD SURFACE.



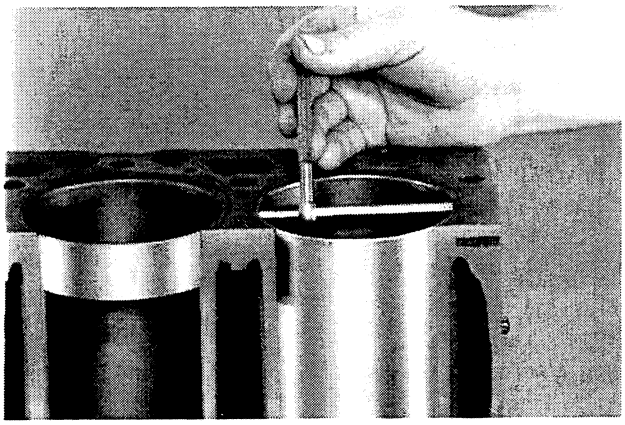
374L94D

IF THE VALVE HEAD IS RECESSED MORE THAN 1.5 mm, REPLACE THE VALVE AND INSTALL A VALVE SEAT.

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STEP 86

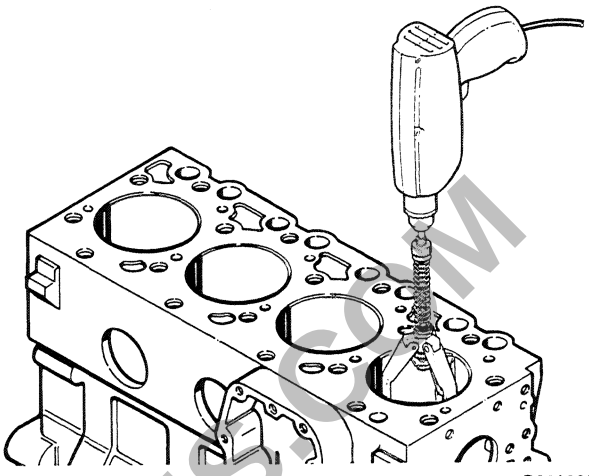


Bore the sleeve to a diameter of 101.90 to 101.94 mm in two steps with the final step taking a maximum of 0.125 mm. Let the sleeve cool between steps to prevent distortion.

STEP 87

Break the top edge of the sleeve with a coarse stone.

STEP 88



B902935J

Use a cylinder hone and hone the cylinder bores to the following specifications. Use a lubricant/coolant with the hone to keep the stones clean and cool.

Rough Honing - Use 80 to 150 grit stones to get a cross-hatch pattern of 45 to 60 degrees from horizontal.

Standard piston - 101.975 to 102.015 mm

Finish Honing - Use 250 to 300 grit stones to get a cross-hatch pattern of 45 to 60 degrees from horizontal.

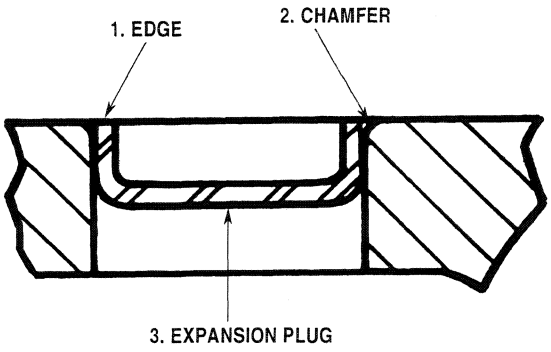
Standard piston - 102.00 to 102.04 mm

Finished cylinder bore must have a surface finish of 0.4 to 0.8 micrometers with a taper of less than 0.025 mm.

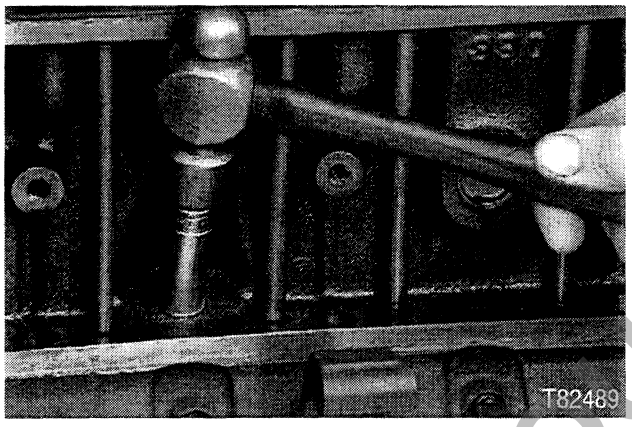
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STEP 305



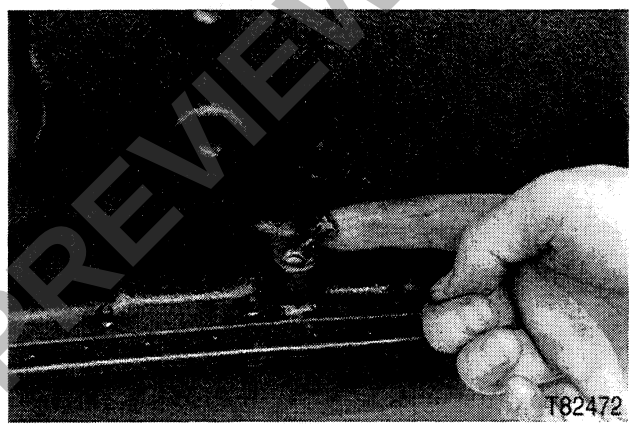
893L0



Install the expansion plug into the cylinder block until the top edge of the expansion plug is even with the bottom edge of the chamfer.

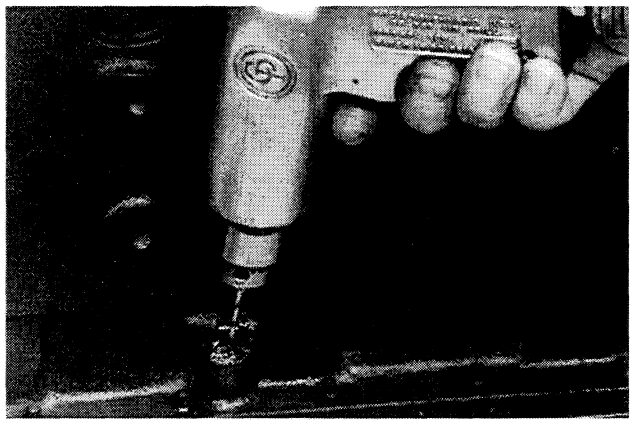
10 mm Expansion Plugs

STEP 306



Put a small amount of grease in the expansion plug.

STEP 307

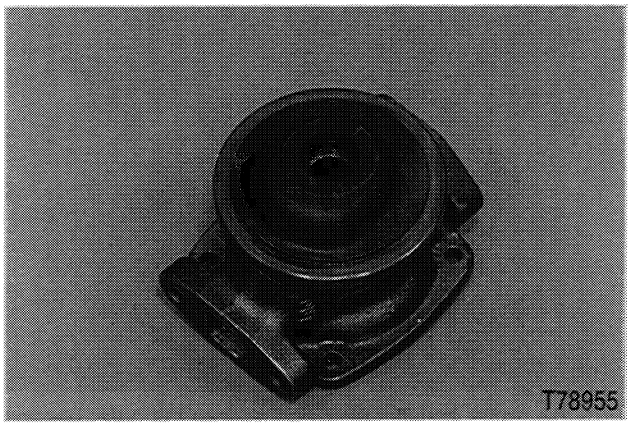


Drill a small hole in the center of the expansion plug.

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STEP 49



Center housing disassembled.

Inspection After Disassembly

STEP 50

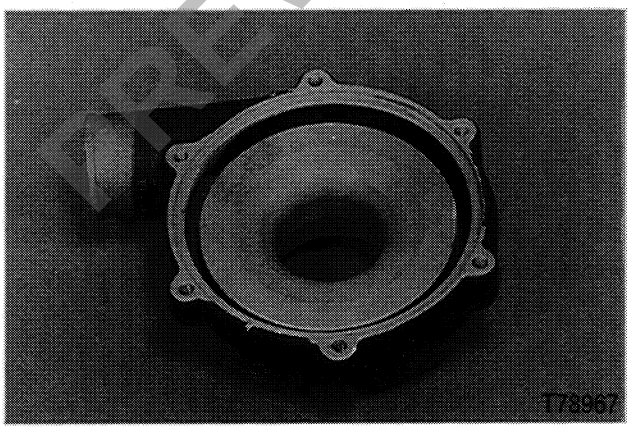
Clean all parts in cleaning solvent.

STEP 51



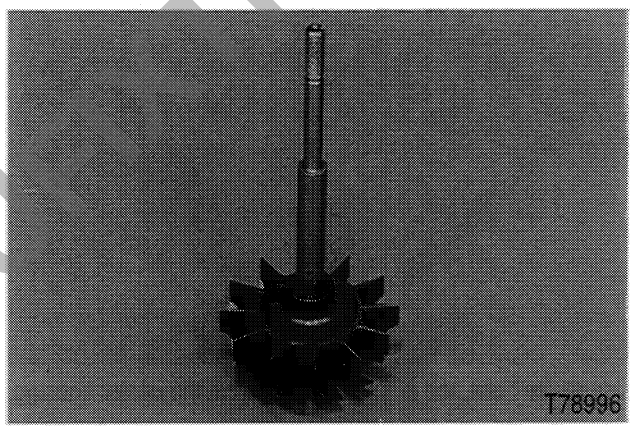
Replace the turbocharger if the outlet openings show warpage or cracks.

STEP 52



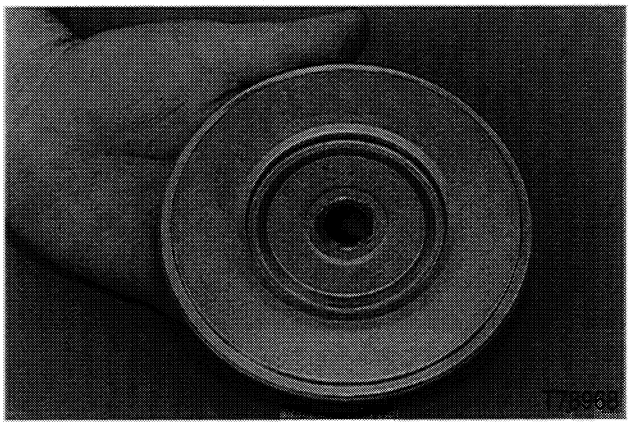
Replace the turbocharger if the compressor housing shows damage caused by wheel friction.

STEP 53



Replace the turbocharger if the turbine wheel is damaged or if the turbine shaft has grooves or scratches.

STEP 54



Replace the turbocharger if the back plate has wheel friction wear.

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TABLE OF CONTENTS

SPECIAL TOOLS 2

SPECIAL TORQUES 2

TROUBLESHOOTING GUIDE 3

FUEL INJECTION PUMP 4
- Removal 4
- Installation 6

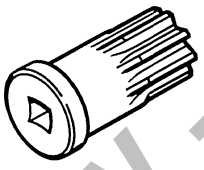
INJECTION PUMP GEAR 8
- Removal 8
- Installation 10

INJECTION PUMP TIMING 11

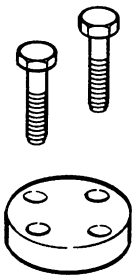
FUEL SHUTOFF SOLENOID 14
- Removal and Disassembly 14
- Assembly and Installation 14

PRIMER PUMP 15
- Removal 15
- Installation 15

SPECIAL TOOLS



CAS -1690 ENGINE TURN OVER TOOL
FIRST USED ON PAGE 5



CAS -1691A GEAR PULLER
FIRST USED ON PAGE 5

SPECIAL TORQUES

Injection Pump Mounting Bolts ..... 21 to 27 Nm

Injection Pump Nut ..... 59 to 71 Nm

Fuel Line Inlet Bolt ..... 22 to 28 Nm

Fuel Shutoff Solenoid ..... 14 Nm

Leak Off Fitting ..... 13 to 17 Nm

Injection Pump Lock Bolt (Lock Position) ..... 7 Nm

Injection Pump Lock Bolt (Unlock Position) ..... 20 Nm

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22 Rear Axle Temperature Switch

Check Points	Reading	Possible Cause of Bad Readings

The rear axle temperature switch is located in the rear axle.

Check Points	Reading	Possible Cause of Bad Readings
Check between the housing of the rear axle temperature switch and the axle housing.	Continuity	Bad ground connection.

NOTE: *Turn the key switch to ON.*

Terminal for wire 33T to ground	12 volts	Check the circuit between the rear axle temperature switch and the instrument cluster (15). Also check the instrument cluster (15).

NOTE: *If the readings are good, replace the rear axle temperature switch.*

23 Parking Brake Switches

The parking brake switches are located in the rear axle just below the levers where the parking brake cable attaches.

Check Points	Reading	Possible Cause of Bad Reading
Terminal for wire 30 to ground	Continuity	Bad ground connection.

NOTE: *Turn the key switch to ON.*

Terminal for wire 36P to ground	12 volts	Check the circuit between the parking brake switch and the instrument cluster (15). Also check the instrument cluster (15).

NOTE: *If the readings are good, replace the parking brake switch.*

24 Warning Alarm

The warning alarm is located in the console.

See the electrical schematic foldout for fuse and relay locations.

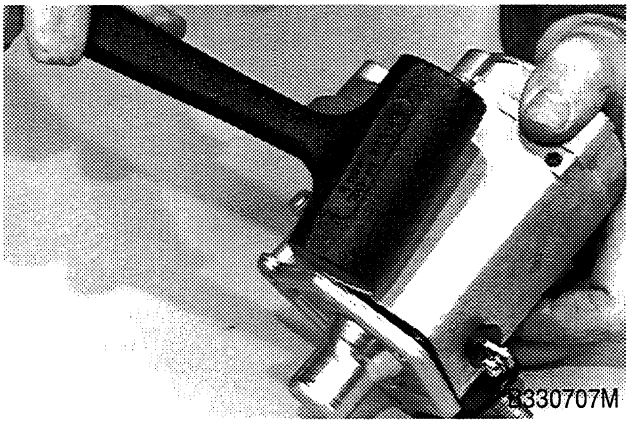
Check Points	Reading	Possible Cause of Bad Reading

NOTE: *Turn the key switch to ON. If the warning buzzer does not sound, do the following checks.*

Terminal for wire 39A to ground	12 volts	Check the circuit between the warning alarm and the key switch (6). Also check the 10 ampere fuse in the fuse block (14) and the key switch (6).
Terminal for wire 39B to ground	Continuity	Check the circuit between the warning alarm and the engine oil pressure switch (18). Also check the engine oil pressure switch (18). Check the diode in wire 31P, see diode check on page 43.

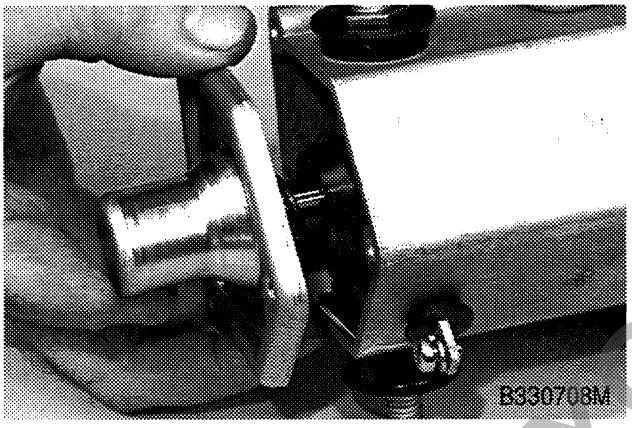
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STEP 19



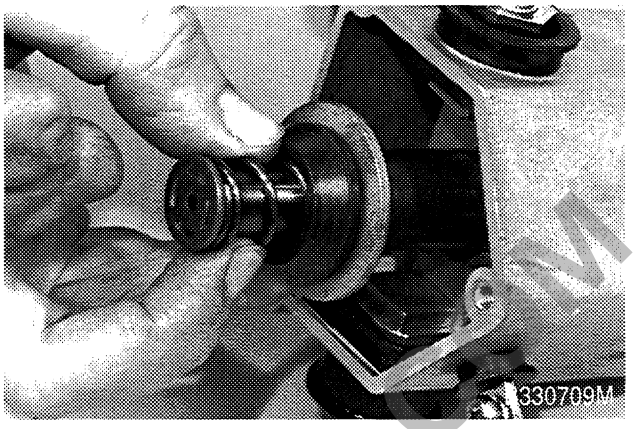
If necessary, use a hammer to loosen the cover.

STEP 20



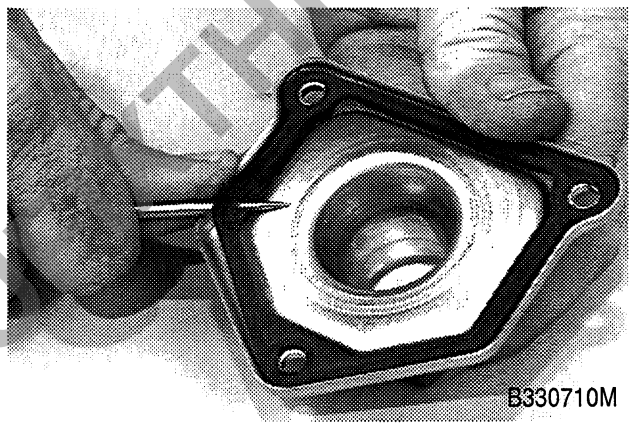
Remove the cover.

STEP 21



Remove the plunger.

STEP 22

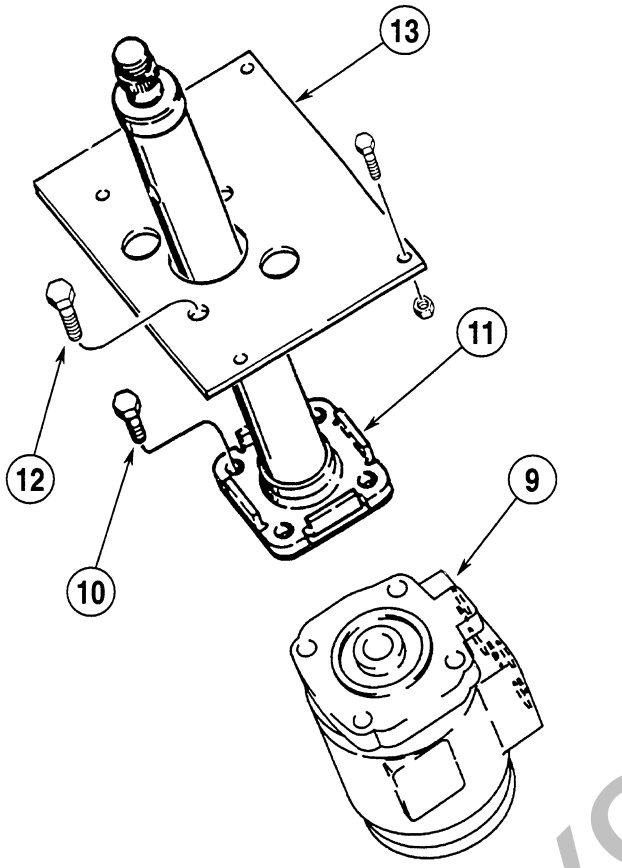


If necessary, remove the gasket from the cover.

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16. Have the other person remove the steering control valve (9) with the three hoses (1, 2, and 5) from the machine.



B9503251

9. Steering Control Valve
10. Cap Screws
11. Steering Column
12. Cap Screws
13. Mounting Plate

Installation

1. Have another person hold the steering control valve (9) in position on the mounting plate (13).

2. Install the cap screws (12) that fasten the steering control valve (9) to the mounting plate (13).

3. Install the cap screws (10) that fasten the steering control valve (9) to the steering column.

4. Put the storage compartment in position in the instrument panel. Install the screws that fasten the storage compartment in the instrument panel.

5. Connect hoses (7 and 8) to the fittings in the steering control valve (9).

6. Connect the hose (5) to the fitting in the hydraulic filter (6).

7. Connect the hoses (1 and 2) to the tubes (3) to the steering cylinder (4).

8. Start and run the engine at low idle.

9. Turn the steering wheel all the way to the right and left several times to remove any air from the steering system.

10. Stop the engine and check for oil leaks.

11. Check the oil level in the hydraulic reservoir. Add oil as required. see Section 1002.

12. Put the engine curtain in position on the mounting bracket and install the cap screws that fasten the engine curtain to the mounting bracket.

13. Remove the cap screws and flat washers that fasten the cover to uprights. Remove the cover and air cleaner as an assembly.

14. Put the cover and air cleaner assembly in position on the uprights. Install the cap screws and flat washers that fasten the cover to uprights.

15. Connect the air cleaner hose to the intake manifold. Tighten the clamp on the air cleaner hose.

16. Connect the electrical connector for the air restriction indicator. Install a new tie strap.

17. Install the exhaust pipe on the muffler. Tighten the clamp that fastens the exhaust pipe to the muffler.

18. Close the hood.

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Section

5003

5003

STEERING CYLINDERS

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CASE CORPORATION
700 STATE STREET
RACINE, WI 53404 U.S.A.

CASE CANADA CORPORATION
3350 SOUTH SERVICE ROAD
BURLINGTON, ON L7N 3M6 CANADA

Bur 7-49470

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Issued May 1995

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DISASSEMBLY OF PLANETARY

NOTE: *The following photos may not look the same as your machine, the procedure is the same.*

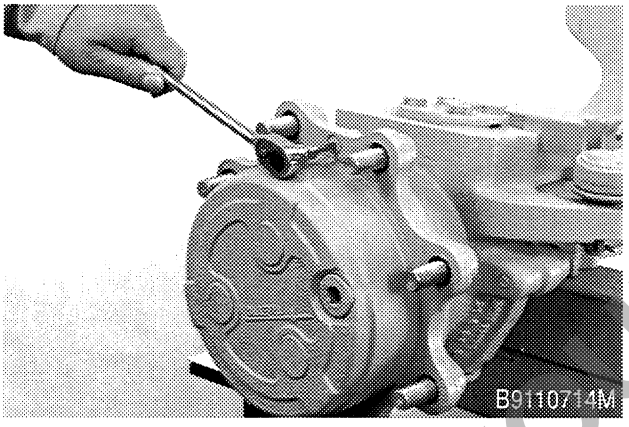
STEP 1

Raise the wheel(s) off the floor and use acceptable supports to hold the machine in position.

STEP 2

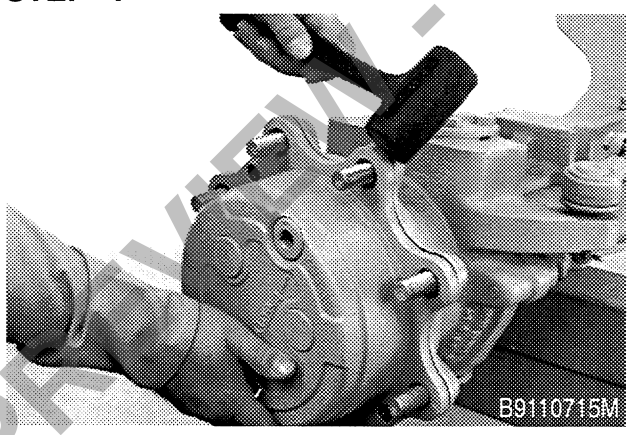
Remove the nuts and hardened washers and remove the wheel(s).

STEP 3



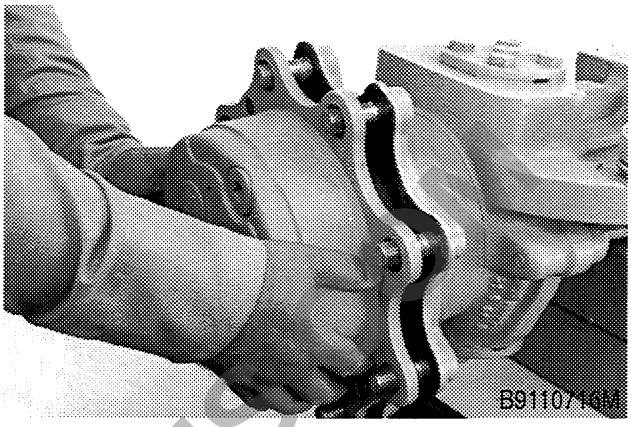
Remove the two Allen head screws that hold the carrier.

STEP 4



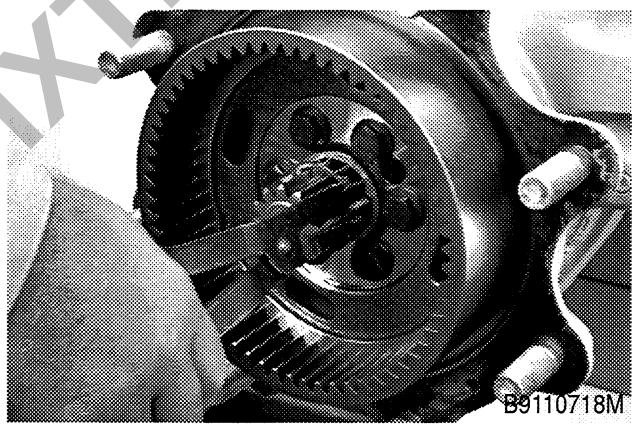
Separate the carrier from the planetary housing.

STEP 5



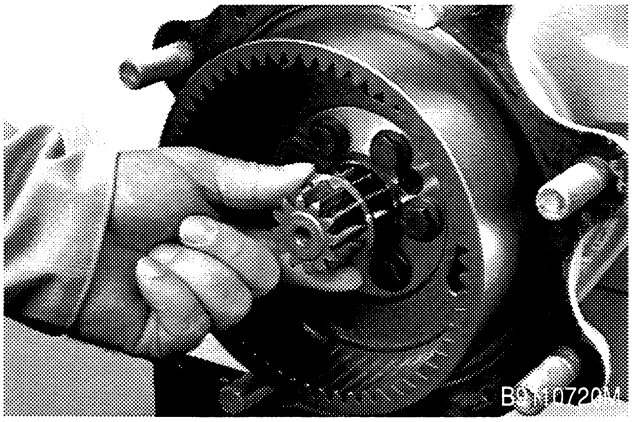
Remove the carrier.

STEP 6



Remove the snap ring.

STEP 7



Remove the thrust washer with the internal tabs.

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REMOVAL OF THE TRANSMISSION

STEP 1

Park the machine on a level surface. Put the backhoe in the transport position with the stabilizers down. Also put the loader bucket on the floor.

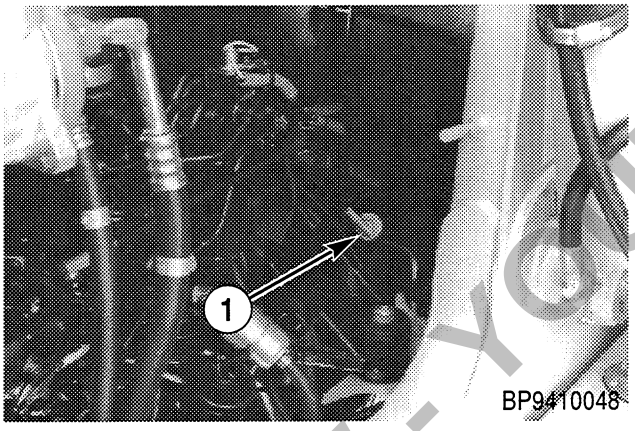
STEP 2

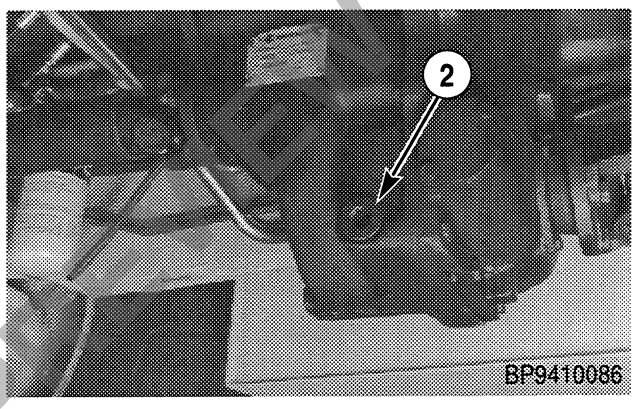
Raise the wheels off the floor high enough to remove the rear axle from under the machine. Put suitable stands under both sides of the machine at the front and rear.

STEP 3

The rear wheels can be removed to ease the transmission removal: however; this step is not a requirement.

STEP 4





Drain the transmission oil using the following procedure:

(1)Loosen the transmission dipstick to relieve any pressure.

(2) Remove the drain plug for the transmission. .

STEP 5

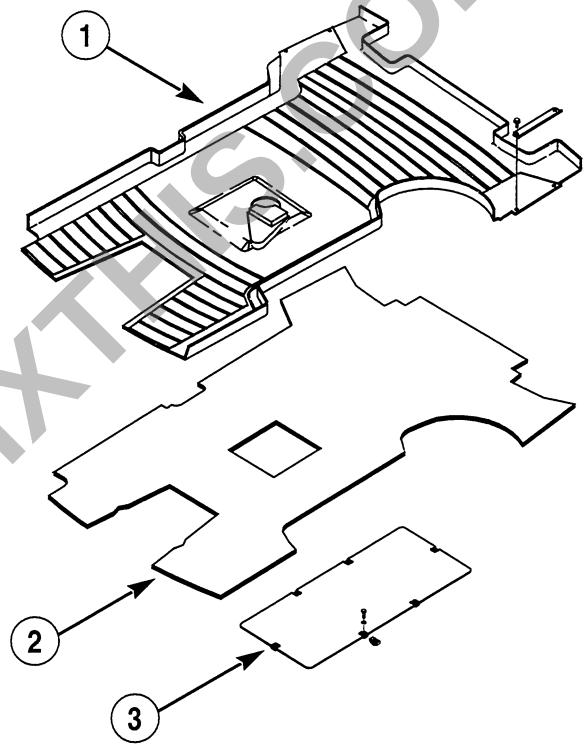
Install the transmission drain plug.

STEP 6

If equipped, remove the cab floor mat.

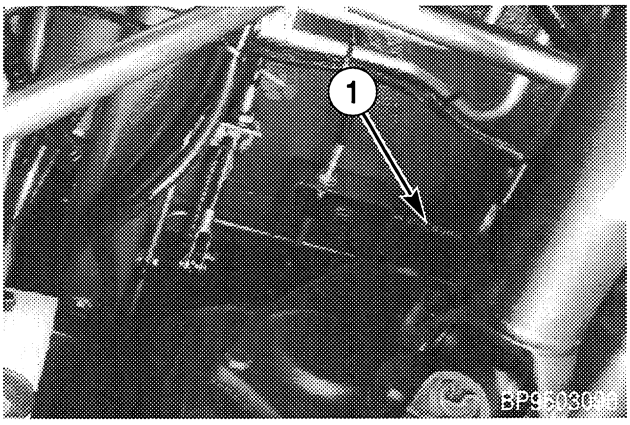
STEP 7

Remove the front cab floor plate.



1. Floormat
2. Foam Floormat Pad
3. Front Floor Plate

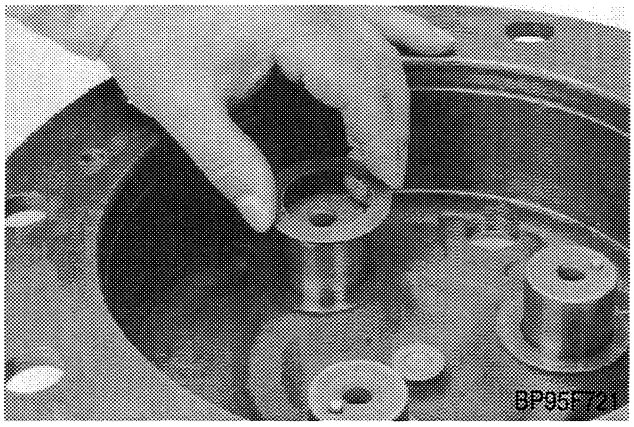
STEP 8



Disconnect the return spring (1) for the shift lever.

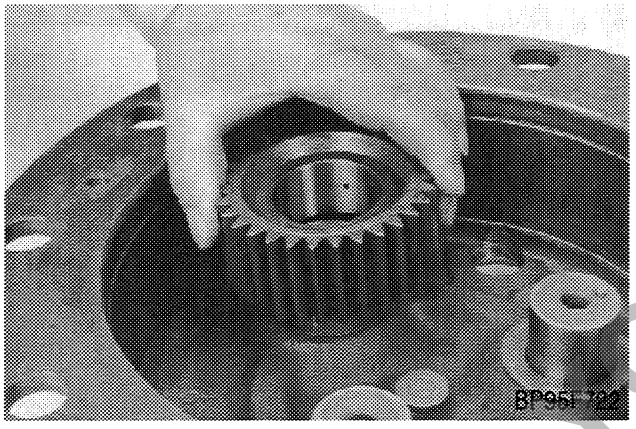
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STEP 41



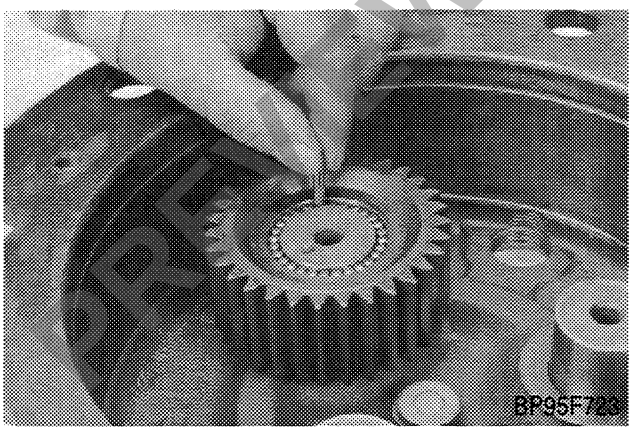
Install the outer thrust washer on one of the pinion shafts.

STEP 42



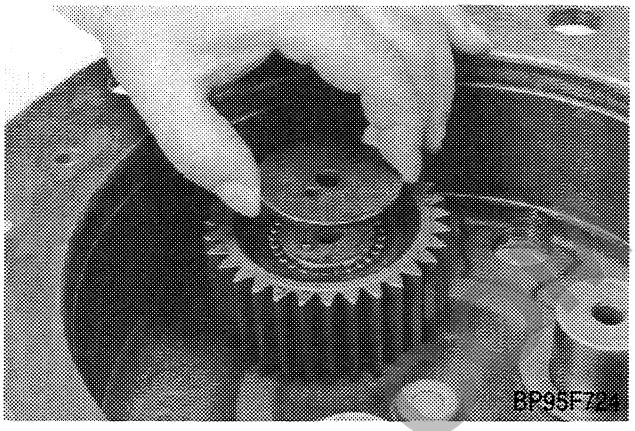
Use clean oil to lubricate the pinion shaft and the bore of the pinion gear. Put the pinion gear on the pinion shaft.

STEP 43



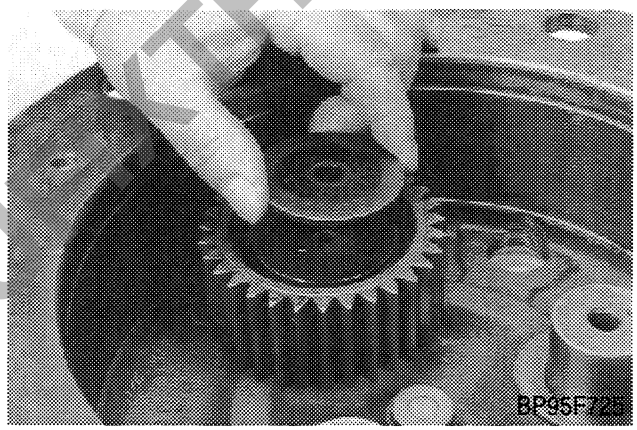
Install the needle bearings (28 per pinion shaft) between the pinion shaft and the pinion gear.

STEP 44



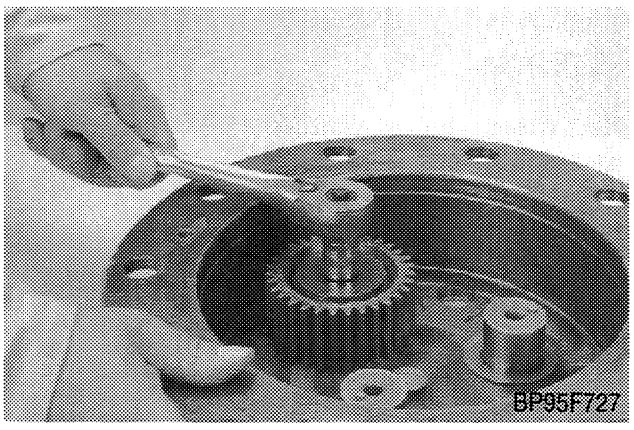
Install the inner thrust washer so that the small hole engages the pin in the top of the pinion shaft.

STEP 45



Install the washer over the inner thrust washer.

STEP 46



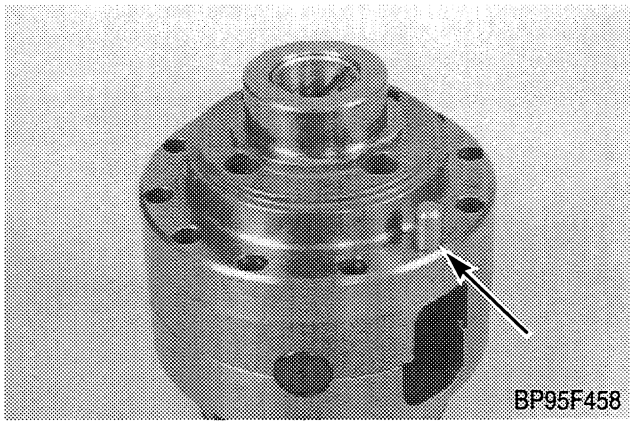
Install the cap screw. Tighten the cap screw to a torque of 59 pound-feet (80 Nm).

STEP 47

Repeat steps 41 through 46 for the other pinion assemblies.

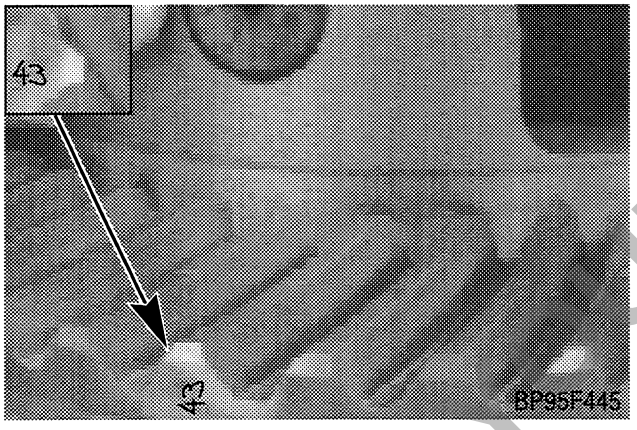
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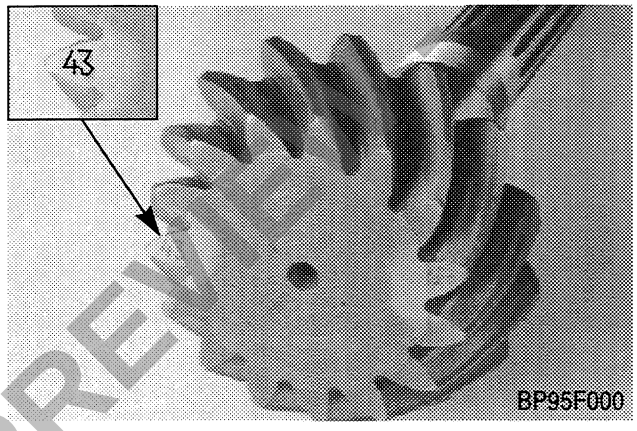
STEP 267



The dowel pin must align with the small hole in the ring gear.

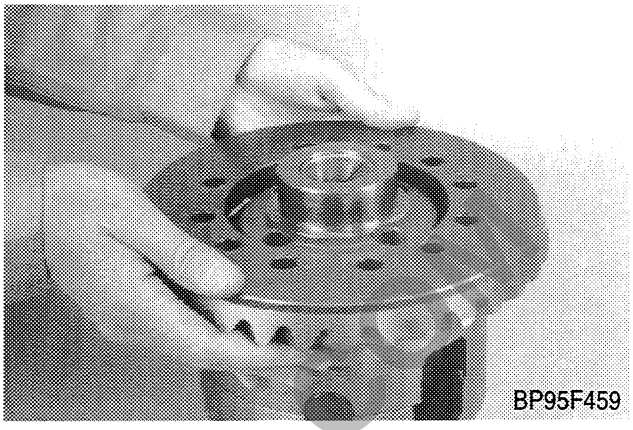
STEP 268





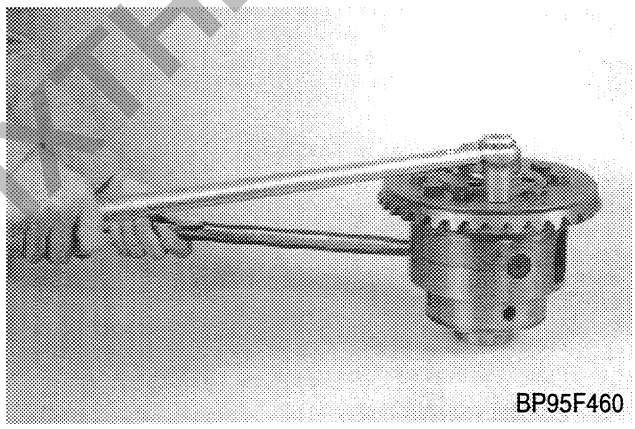
The pinion gear and ring gear are a matched set. Make sure the numbers on the pinion gear and ring gear are the same.

STEP 269



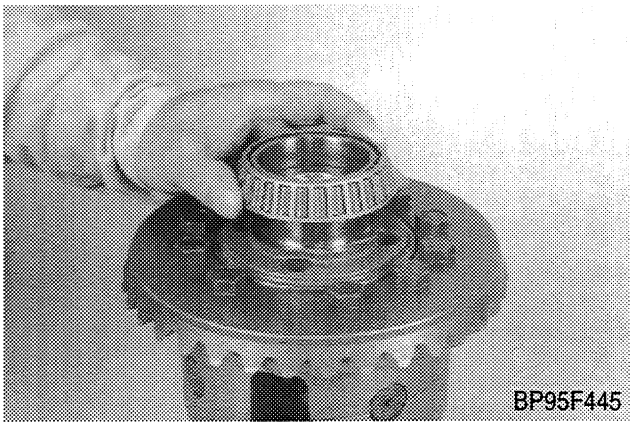
Put the ring gear in position on the differential case.

STEP 270



Apply Loctite 262 to the threads on the cap screws. Install the cap screws. Tighten the cap screws to 95 pound-feet (130 Nm).

STEP 271

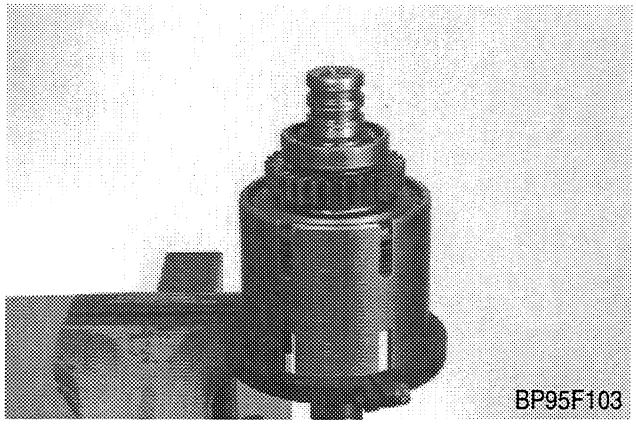


Put the bearing in position on the differential housing.

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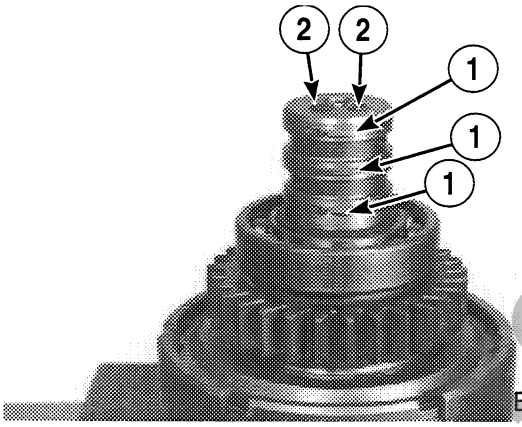
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STEP 108



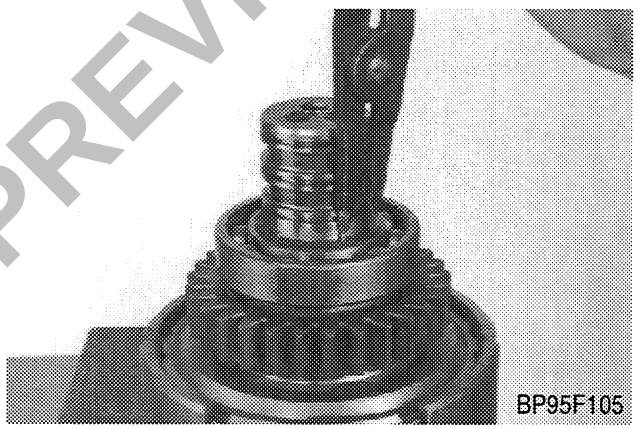
Put the input shaft in the bottom piece of the CAS-2379 special tool as shown so that the forward clutch is up.

STEP 109



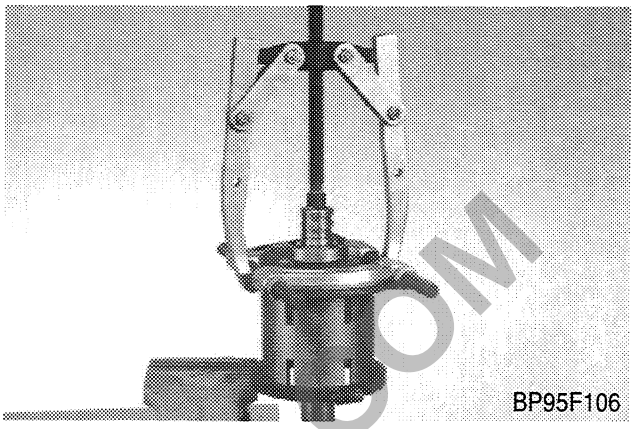
Remove the three sealing rings (1). DO NOT remove the two plugs (2) unless the plugs (2) are leaking. The plugs (2) are sealed with Loctite 262 (red) and are difficult to remove. If removal is necessary, clean all oil from the threads and apply Loctite 262 (red) before installation.

STEP 110



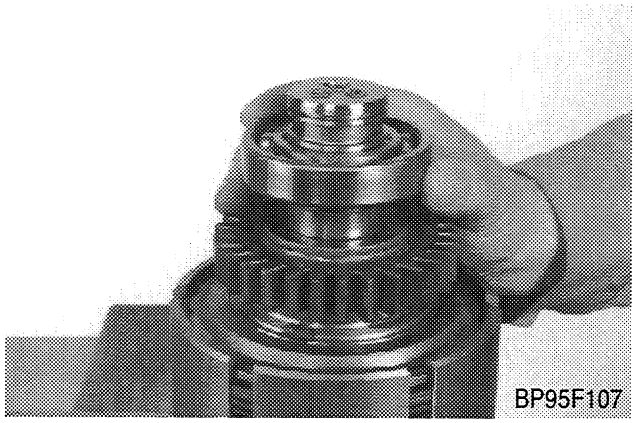
Remove the snap ring.

STEP 111



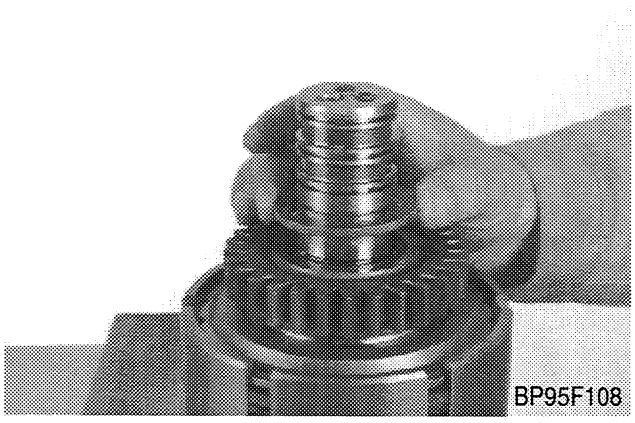
Install a bearing separator under the gear as shown. DO NOT install the bearing separator between the gear and the bearing. Install an acceptable puller on the bearing separator. Use a shaft protector between the puller and the end of the input shaft. Use molydisulfide grease to lubricate the shaft protector and the end of the puller. Make sure that you pull only until the bearing is free. Pulling any farther can damage the parts.

STEP 112



Remove the bearing.

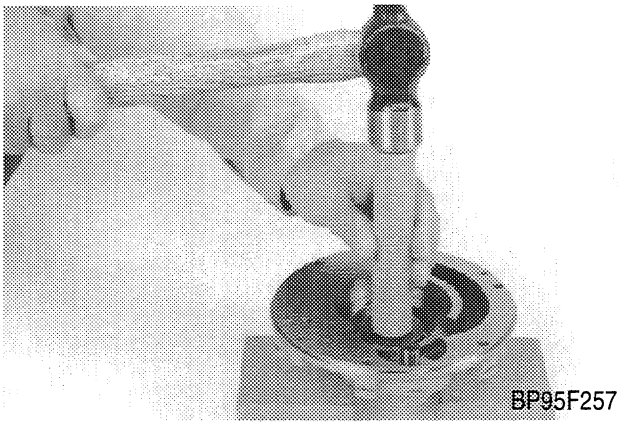
STEP 113



Remove the thrust washer.

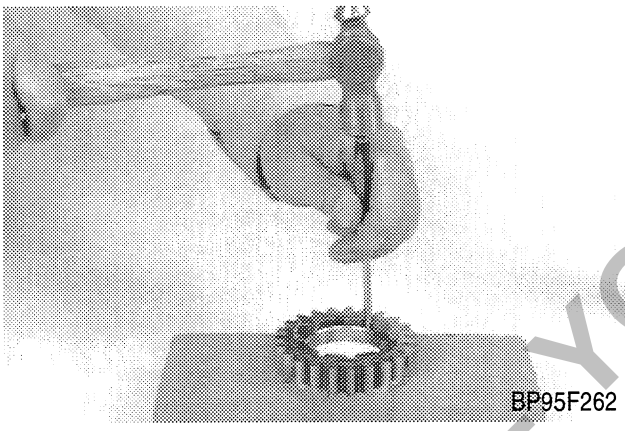
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STEP 307



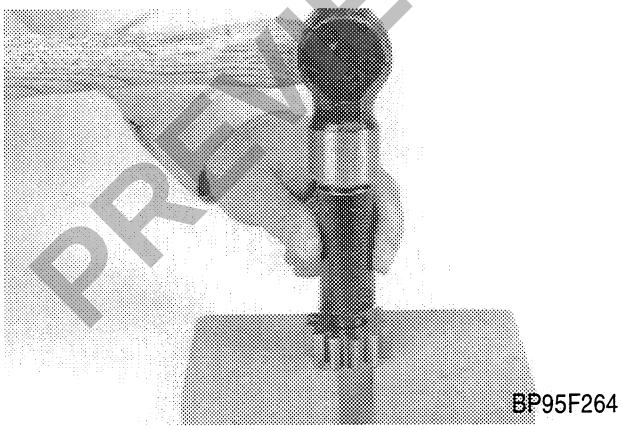
Turn the pump housing over and use blocks to support the pump housing. Use an acceptable driver to drive the bushing from the bore of the pump housing.

STEP 308



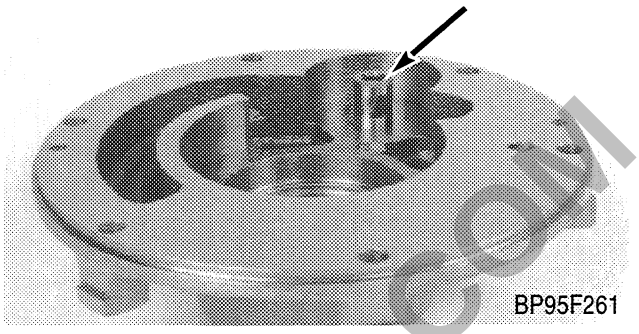
Support the large gear on blocks as shown. Use a punch and a hammer to drive the bushing from the large gear.

STEP 309



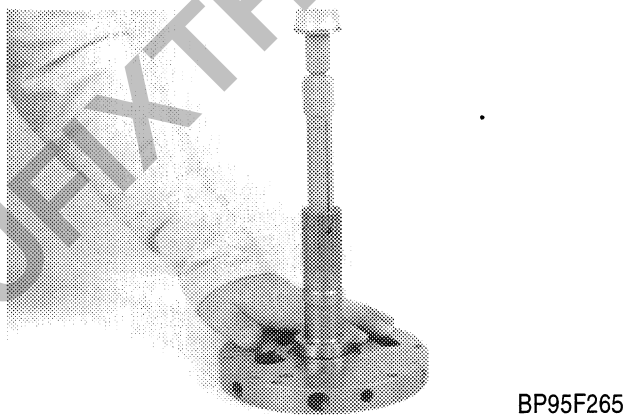
Use an acceptable driver to push the needle bearing out of the small gear.

STEP 310



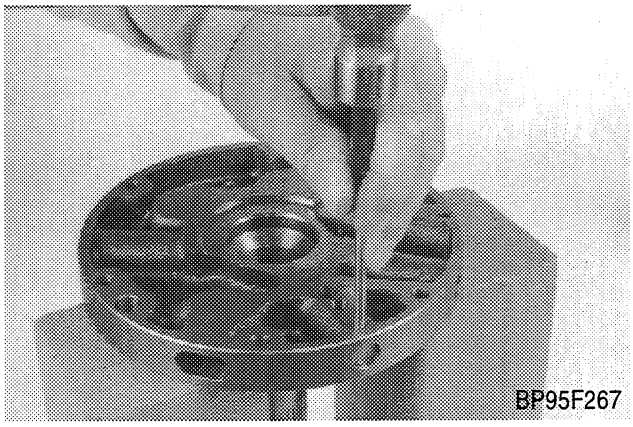
Remove the shaft for the small gear only if the shaft is damaged. The shaft will probably be difficult to remove.

STEP 311



Use a blind hole puller and a slide hammer to pull the bushing from the shaft of the pump support.

STEP 312

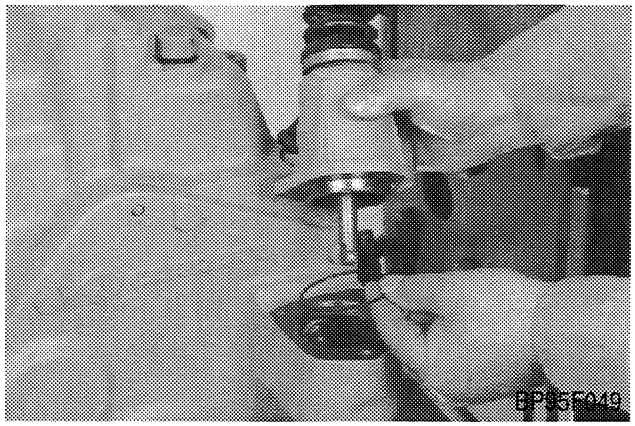


Remove the roll pin for the torque converter relief valve.

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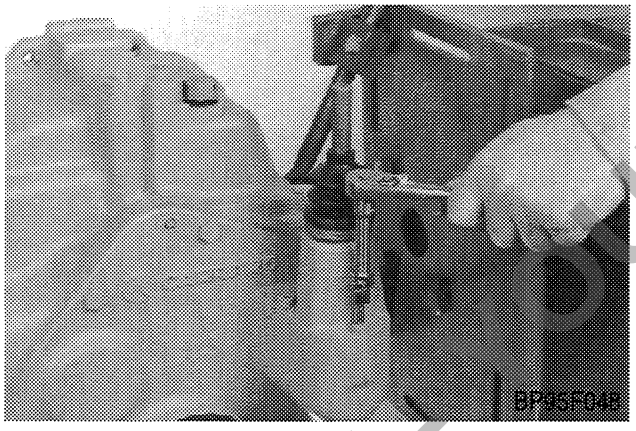
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STEP 493



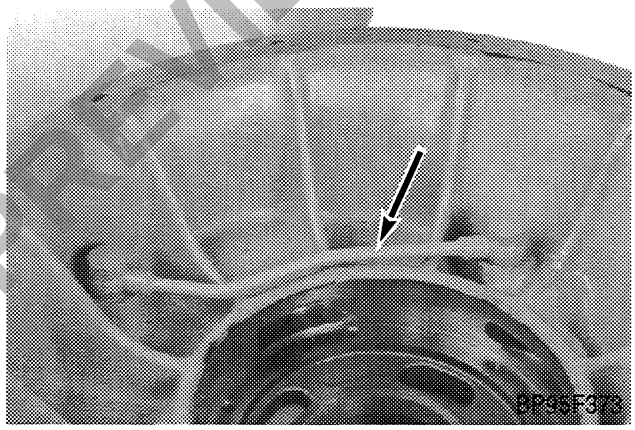
Install a new O-ring on the shifter assembly. Use clean oil to lubricate the 0-ring. Put the shifter assembly into position on the rear cover.

STEP 494



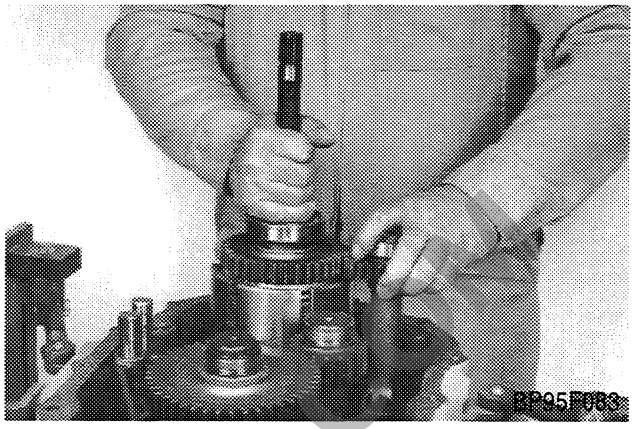
Install the three Allen head screws to fasten the shifter assembly to the rear cover. Tighten the three Allen head screws to a torque of 204 pound-inches (23 Nm).

STEP 495



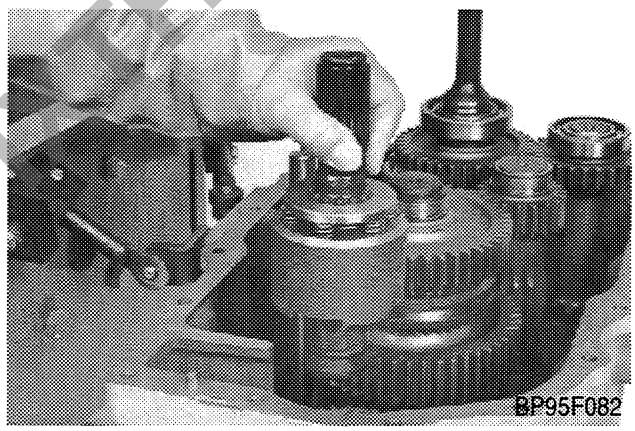
If the tube was removed from the front housing, install the tube now. Tighten the hollow cap screws to a torque of 354 pound-inches (40 Nm).

STEP 496



Install the input shaft and the reverse shaft together as shown.

STEP 497



On machines with four-wheel drive, install the four-wheel drive shaft. Use clean transmission oil to lubricate the bearing surfaces on the four-wheel drive shaft. Make sure that the four-wheel drive shaft goes through the four-wheel drive clutch gear, the thrust washer, and the bearing.

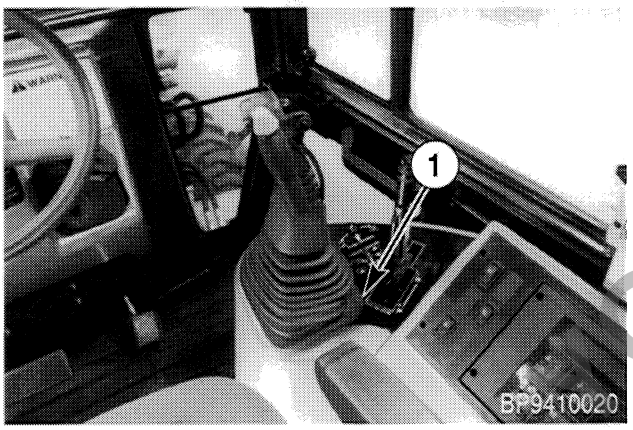
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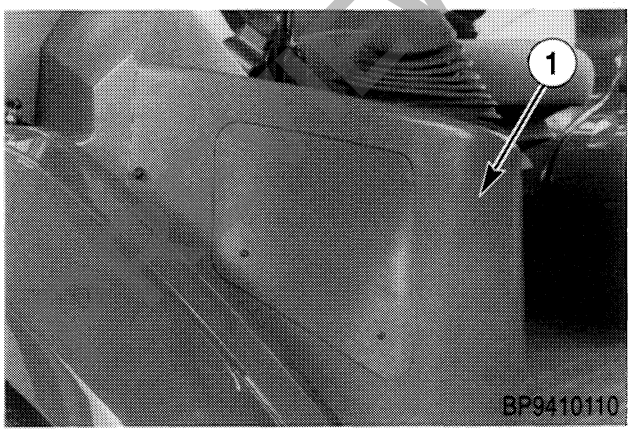
REMOVAL OF THE LOADER CONTROL VALVE

Put identification tags on all disconnected hoses and wires. Close disconnected hoses and fittings with caps and plugs.

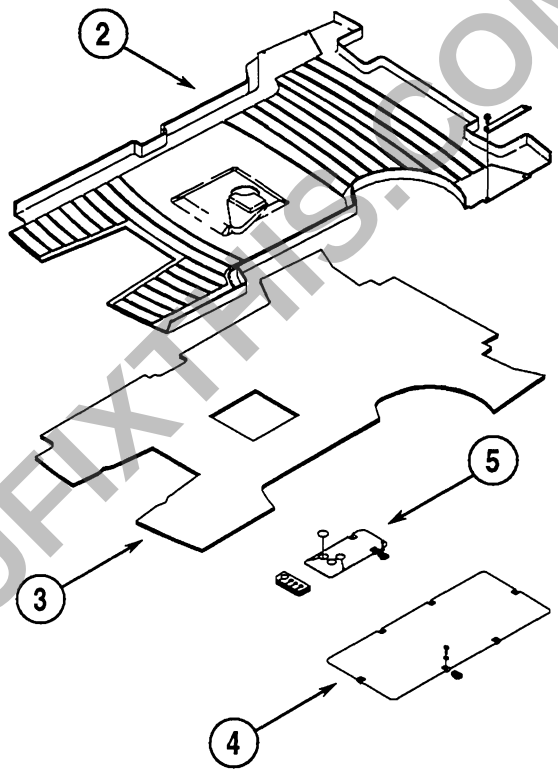
1. Park the machine on a level surface.
2. Apply the parking brake.
3. Lower the loader bucket to the floor and stop the engine.
4. Move the loader control lever in all directions to release the pressure from the loader hydraulic circuits.
5. Remove the boot retaining screw (1). This will allow the boot to slide thought the opening when the cover is removed.



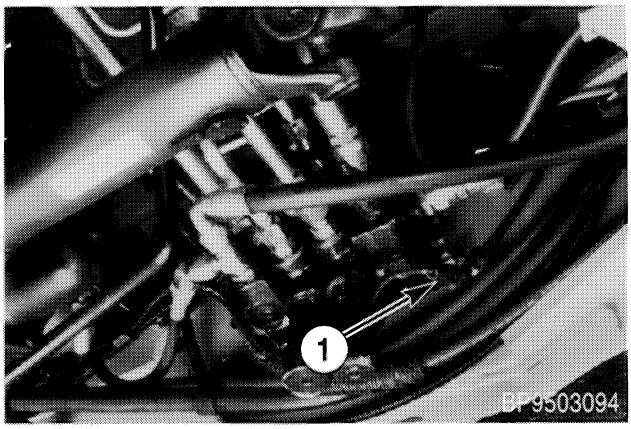
6. Remove the cap screws which fasten the cover (1) to the cab frame. Remove the cover.



7. If equipped, remove the cab floormat (2) and floormat pad (3).
8. Remove the front cab floor plate (4) and the loader control lever split floor plate (5).

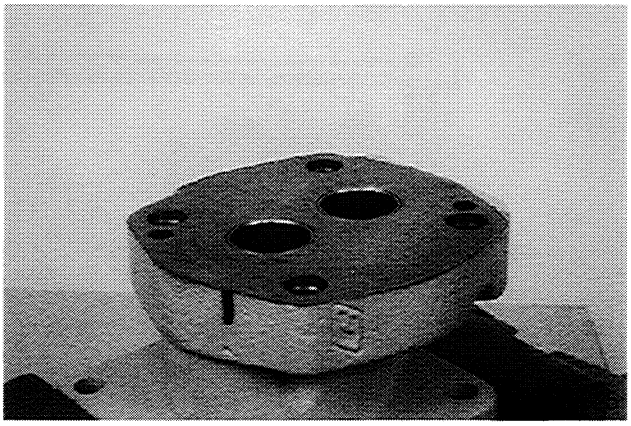


9. Disconnect the wiring (1) for the magnetic detent located on the bucket section of the loader valve.



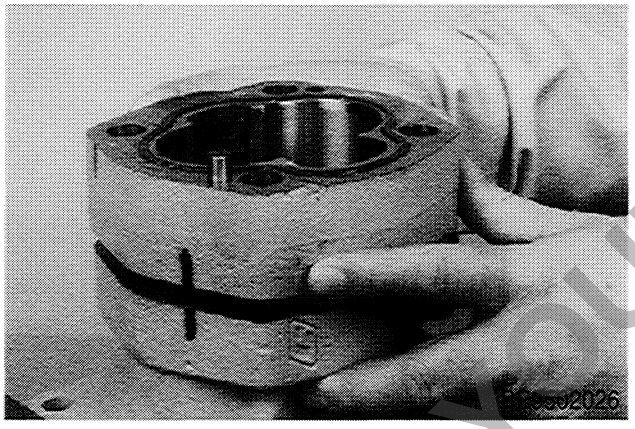
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STEP 24



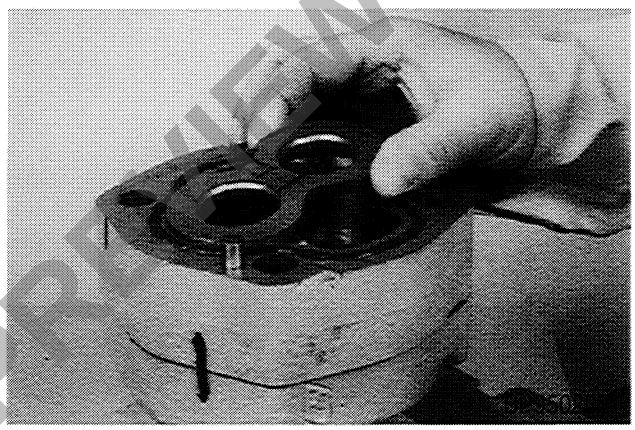
Fasten the shaft end cover in the vise with soft jaws.

STEP 25



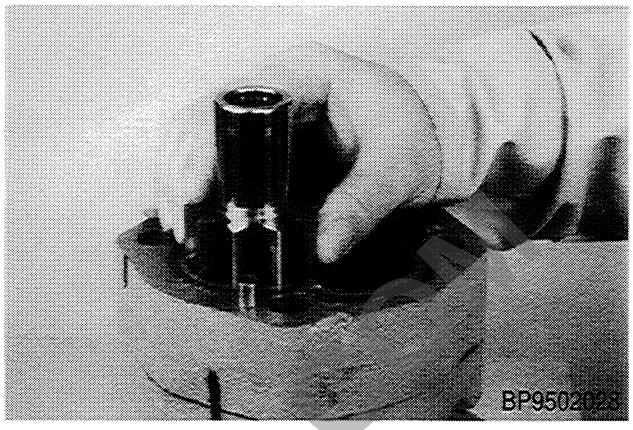
Install the gear housing.

STEP 26



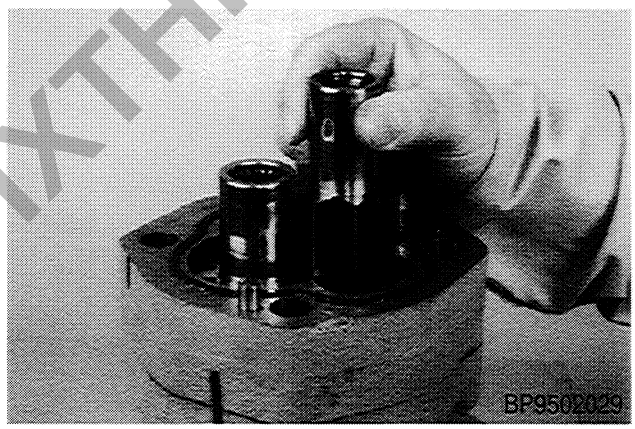
Install the thrust plate so that the seal is down and the open ends of the rectangular relief groove on the face of the thrust plate are toward the outlet side of the hydraulic pump.

STEP 27



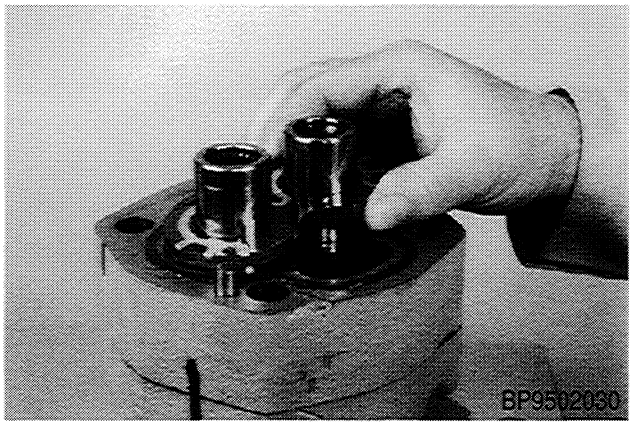
Install the drive gear.

STEP 28



Install the driven gear.

STEP 29



Install the thrust plate so that the seal is up. The seal must be toward the outlet side of the hydraulic pump.

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INSPECTION

STEP 176
Discard all O-rings, backup rings, and wipers.

STEP 177
Use cleaning solvent to clean all parts.

STEP 178
Inspect the spool and the spool bores. If the spool or the spool bore is damaged, use a new section.

STEP 179
Inspect the poppets. Use new parts as necessary.

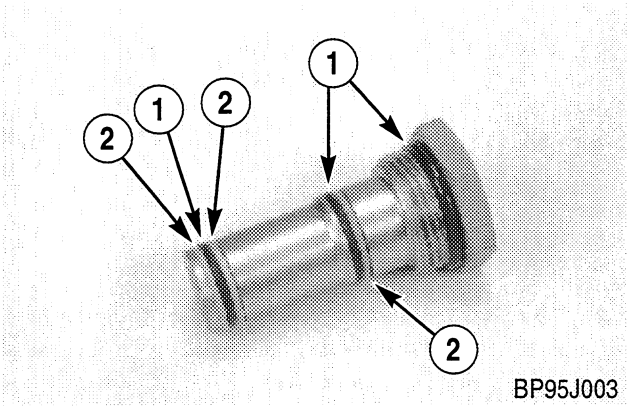
STEP 180
Inspect all machined surfaces.

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Assembly

STEP 111



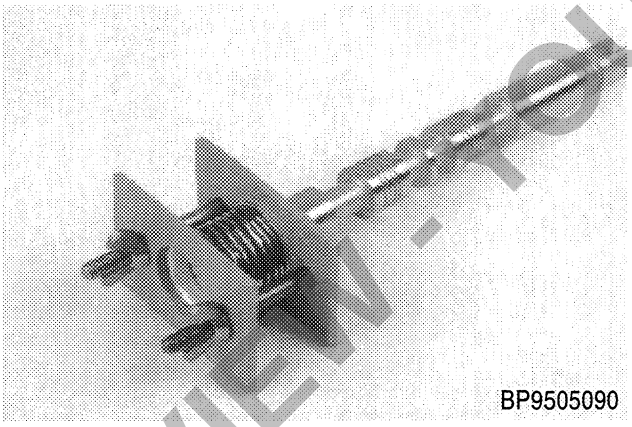
BP95J003

Install new O-rings (1) and backup rings (2) on the plugs.

STEP 112

If necessary, assemble the spring seats and centering spring in the spring compressor and compress the centering spring.

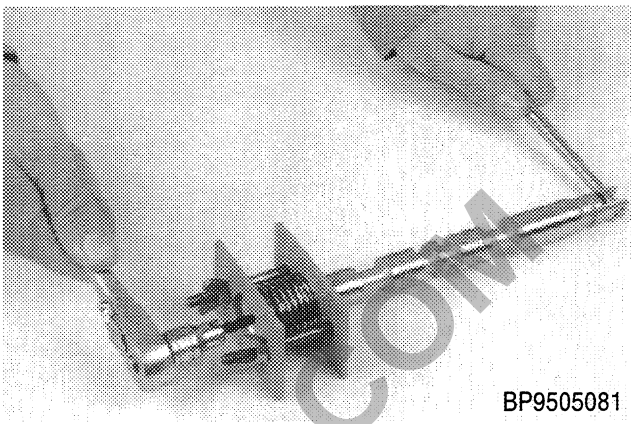
STEP 113



BP9505090

Put the centering spring assembly on the spool.

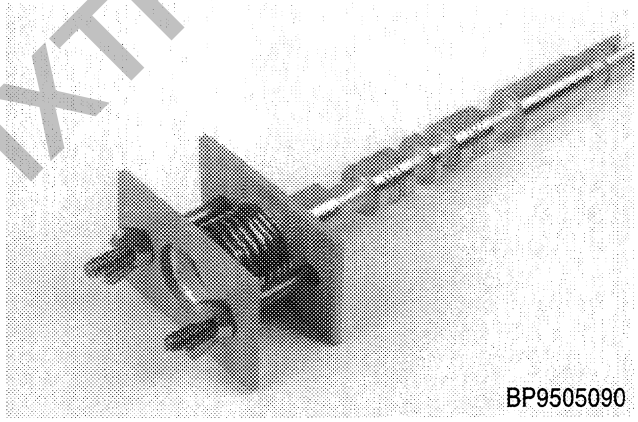
STEP 114



BP9505081

Install the Allen head screw. Tighten the Allen head screw to a torque equal to 120 pound-inches (13.6 Nm).

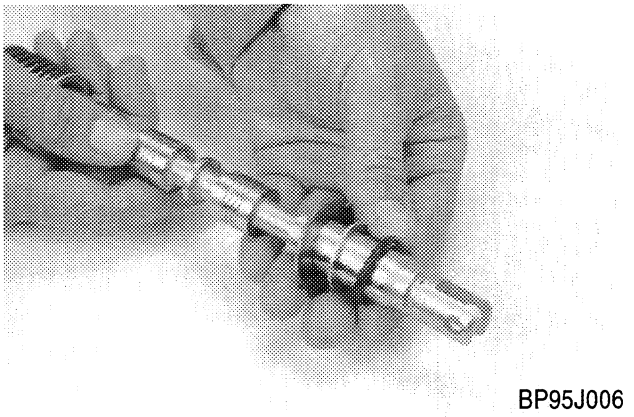
STEP 115



BP9505090

Remove the spring compressor.

STEP 116



BP95J006

Install the flat washer and backup washer on the spool. Install a new O-ring on the spool.

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Section

8010

SOLENOID VALVES
FOR
MACHINES WITH OPTIONAL RIDE CONTROL

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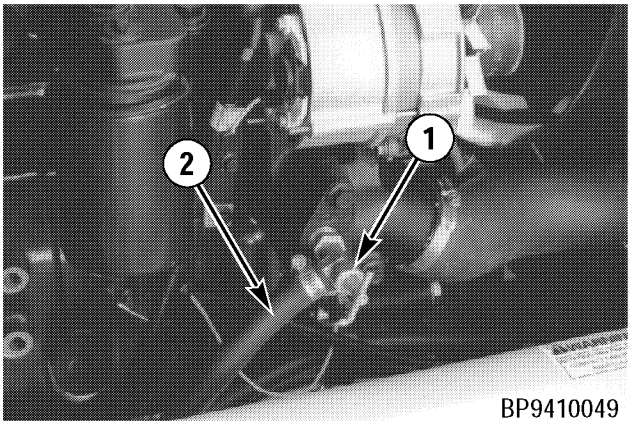
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RACINE, WI 53404 U.S.A.

Bur 7-52460

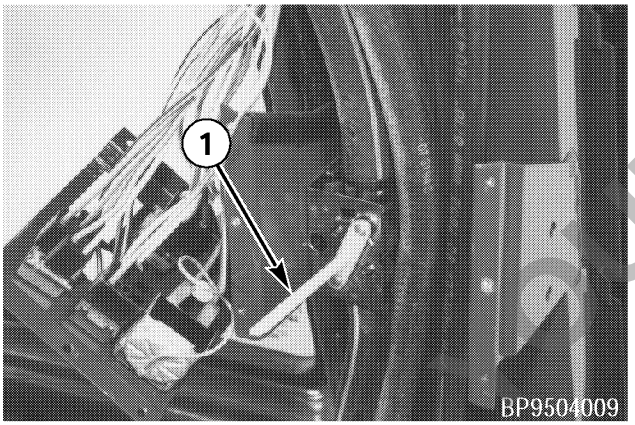
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CAB HEATER CHECK



1. Heater Return Valve *2. Heater Hose*



1. Heater Control Valve

Heater Hoses → Make sure the heater control is in the off position. Feel the heater hoses to see if they are hot. The hoses may be hot due to heat from air flow around the engine.

↓

The heater control valve in the cab is not working if the hoses are hot from engine coolant.

Heater Control Valve → Close the heater return valve at the engine. Turn the valve clockwise to stop the flow of coolant through the heater core.

↓

Check the temperature of the cab heater hoses again.

↓

Check the cab air louver temperature.

↓

If it increases, check the position of the heater control valve. It should be completely closed.

↓

Replace the valve if the control knob is at the OFF stop and leakage is detected through the valve.

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COMPRESSOR OIL LEVEL CHECK

Check the oil level in the compressor when any of the following has occurred:

A. Broken refrigerant hose.

B. Large refrigerant leak.

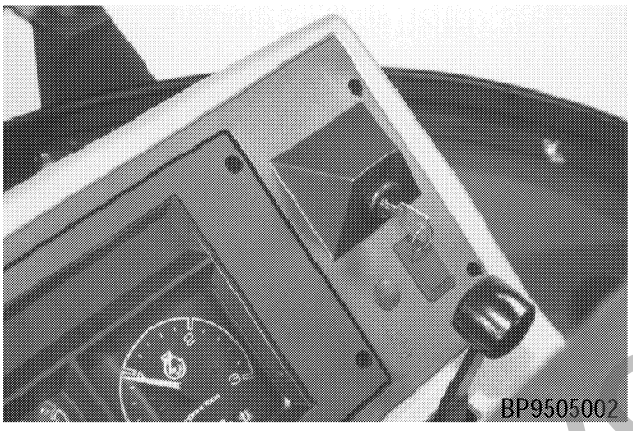
C. Compressor leak.

D. Damage to system components.

E. New compressor installed.

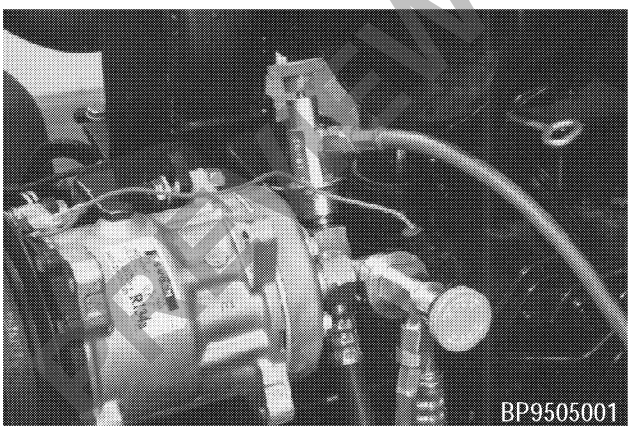
Use the following procedure to check the compressor oil level.

STEP 1



Start the engine and run at 1500 RPM maximum. Operate the air conditioner for 10 to 15 minutes at maximum cooling and high blower speed.

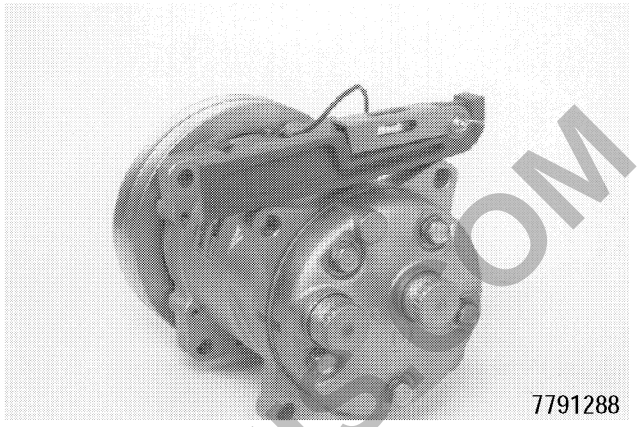
STEP 2



Stop the engine. Connect the compressor to the air conditioner charging, recovery, and recycling station. Discharge the system. See Section 9004 in this service manual for complete instructions.

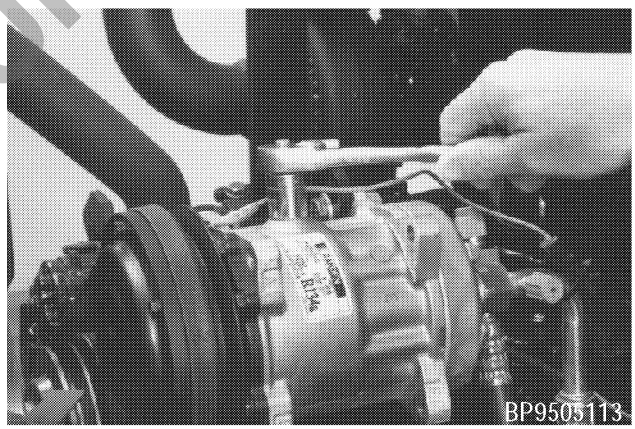
NOTE: *Wear safety goggles when working with refrigerant.*

STEP 3



Check the mounting angle of the compressor. Put the angle gauge from the service tool set across the flat surfaces of the two front mounting ears. Adjust the gauge so that the bubble is between the center marks. Read the mounting angle to the nearest degree mark. Make a note of the degree reading for reference later.

STEP 4



Remove the oil filler plug.

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