1085B AND 1086B CRUZ-AIR
TABLE OF CONTENTS

Reprinted

8-44630

CASE CORPORATION

Printed in U.S.A.
Issued October 1985

1002

MAINTENANCE AND LUBRICATION

TABLE OF CONTENTS

Written In *Clear And Simple English*

CASE CORPORATION

8-44630

Printed in U.S.A.
Issued October 1985

Section

1010

GENERAL ENGINE SPECIFICATIONS

Written In *Clear And Simple English*

IMPORTANT: *This engine was made using the metric measurement system. All measurements and checks must be made with metric tools to make sure of an accurate reading when inspecting parts.*

CASE CORPORATION

Rac 8-27130

Printed in U.S.A.
May, 1985

SPECIAL TORQUES

	U.S. Value	Metric Value
Aftercooler Bolts	18 lb ft	24 Nm (2.4 kgm)
Air Crossover Elbow to Intake Aftercooler	18 lb ft	24 Nm (2.4 kgm)
Alternator Bracket Bolts (Lower)	18 lb ft	24 Nm (2.4 kgm)
Alternator Bracket Bolts (Upper)	18 lb ft	24 Nm (2.4 kgm)
Alternator Retaining Bolt	18 lb ft	24 Nm (2.4 kgm)
Belt Tensioner Bracket Bolts	18 lb ft	24 Nm (2.4 kgm)
Belt Tensioner Retaining Bolt	32 lb ft	43 Nm (4.3 kgm)
Camshaft Retaining Bolts	18 lb ft	24 Nm (2.4 kgm)
Connecting Rod Bolts (Lubricate Threads With Engine Oil)	74 lb ft	100 Nm (10.0 kgm)
Exhaust Manifold Bolts	32 lb ft	43 Nm (4.3 kgm)
Fan Pulley Bracket Bolts	18 lb ft	24 Nm (2.4 kgm)
Fan Pulley Bolts (Grade 8.8)	18 lb ft	24 Nm (2.4 kgm)
Fan Pulley Bolts (Grade 10.9)	25 lb ft	34 Nm (3.4 kgm)
Flywheel Housing Bolts	45 lb ft	60 Nm (6.0 kgm)
Flywheel Retaining Bolts	101 lb ft	137 Nm (13.7 kgm)
Flywheel Housing Cover Bolts	18 lb ft	24 Nm (2.4 kgm)
Fuel Filter Inlet Bolt	24 lb ft	32 Nm (3.2 kgm)
Fuel Air Removal Bolt	4 lb ft	6 Nm (0.6 kgm)
Fuel Filter Inlet Nut	24 lb ft	32 Nm (3.2 kgm)
Fuel Line Fitting (High Pressure)	18 lb ft	24 Nm (2.4 kgm)
Fuel Line Fitting (Low Pressure)	18 lb ft	24 Nm (2.4 kgm)
Fuel Pump Plug with Bronze Washer	17 lb ft	23 Nm (2.3 kgm)
Front Cover Bolts	18 lb ft	24 Nm (2.4 kgm)
Front Housing Bolts	18 lb ft	24 Nm (2.4 kgm)

18. Tighten the nuts to 70 to 84 pound-feet (95 to 114 N m, 9.7 to 11.6 kg/m).

19. Install the cap screw and clamp that fasten the wiring harness to the top of the torque converter. Tighten the cap screw.

20. Connect the ground wire to the manifold at the LH side of the flywheel housing.

21. Connect the wiring harness to the three oil pressure switches in the manifold.

22. Install a new tie strap to fasten the wiring harness to the fuel line.

23. Connect the wire for the engine temperature sender.

24. Connect the hose to the fuel return line on the engine.

25. Connect the fuel supply line to the hand primer pump on the engine.

26. Connect the ground cable to the engine.

27. Install a new tie strap to hold the ether injection hose, if equipped, the throttle cable, and the wiring harness to the compressor hose.

28. Connect the throttle cable to the accelerator cylinder on the engine.

29. Connect the hoses for the air compressor.

30. Connect the wiring harness to the wire for the fuel injection solenoid on the fuel injection pump.

31. If the machine is equipped with ether injection:

    a. Connect the ether injection hose to the intake manifold.

    b. Connect the wiring harness to the wire for the thermostat at the intake manifold.

32. Connect the wire for the water temperature sender at the top of the engine.

33. Connect the wiring harness to the pressure switch on the RH side of the torque converter.

34. Connect the ground strap to the engine.

35. Connect the single ground wire from the wiring harness to the starter solenoid.

36. Connect the wiring harness and the positive battery cable to the starter solenoid.

37. Connect the wiring harness to the alternator.

38. Connect acceptable lifting equipment to the rear shroud and install the engine shroud in place.

39. Install the springs, caps, bolts, flat washers, and self-locking nuts that fasten the rear shroud to the fenders. Tighten the self-locking nuts.

40. Disconnect the lifting equipment from the rear shroud.

41. Install the starter relay on the rear shroud.

42. Install the bolts, flat washers, and self-locking nuts that fasten the starter relay. Tighten the self-locking nuts.

43. Connect the wiring harness plug for the instrument panel.

44. Connect the cables to the master disconnect switch.

45. Install the cover for the instrument panel. Install the cap screws and lock washers that fasten the cover and tighten the cap screws.

46. Remove the cover for the batteries and connect the ground cable.

47. Install the cover.

48. Remove the cover or tape that was used to close the opening in the exhaust elbow of the turbocharger.

49. Install the bracket for the exhaust pipe to the engine. Install the cap screws, lock washers, and flat washers and tighten the cap screws.

50. Install the muffler.

51. Tighten the clamp that holds the muffler to the exhaust elbow on the turbocharger.

52. Tighten the clamp that holds the muffler to the exhaust pipe.

53. Put the fan shroud on the engine fan prior to installing the radiator.

54. Have another person help you lower the radiator between the fan on the engine and the oil cooler.

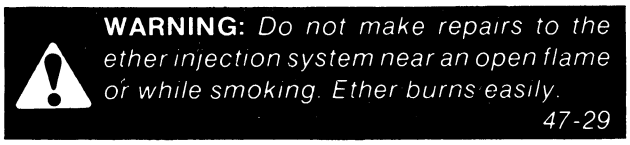
55. Align the holes in the radiator with the holes in the mounting brackets. Install the Allen head screws to hold the radiator in place.

COLD START SYSTEM

General Information

The cold start system injects ether into the intake manifold of the engine. The ether helps the engine to start in cold weather. Each time the cold start button is pushed and released, a measured amount of ether is injected into the intake manifold. See the Operators Manual for the procedure to use the cold start system.

Troubleshooting



The cold start system is equipped with a thermostat. The thermostat prevents the injection of ether if the engine is warm.

1. Make sure the ether can is full of ether. If the ether can is empty, install a new ether can.

2. Check the tube between the valve and the nozzle for damage.

3. Check for loose or broken wires and for corrosion on the terminals.

4. Disconnect the tube from the nozzle. Hold the end of the tube away from your face.

5. Have another person turn the key switch to the ON position and push and release the cold start button.

6. Check the end of the tube for the odor of ether. If there is the odor of ether, the cold start valve is working correctly. Remove the nozzle from the intake manifold and clean the orifices in the nozzle. There are marks on the head of the nozzle. These marks must be horizontal when the nozzle is installed in the intake manifold.

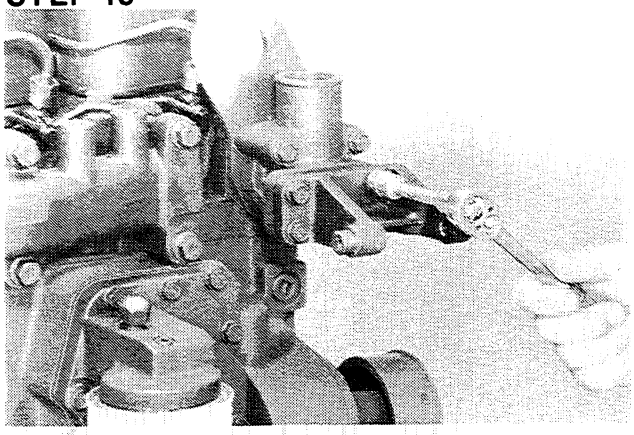
7. If there is no odor of ether at the end of the tube, continue with step 8.

8. See the electrical schematic in Section 4002. The electrical power for the cold start system comes from circuit breaker B. Make sure the button on circuit breaker B is pushed down. If the button comes back up, there is a short circuit in the cold start system.

9. Check the electrical power through the cold start button, the harnesses, and the cold start valve. If there is electrical power available at the cold start valve, check for continuity through the thermostat to ground. If there is no continuity; the engine can be too warm, or the thermostat is damaged.

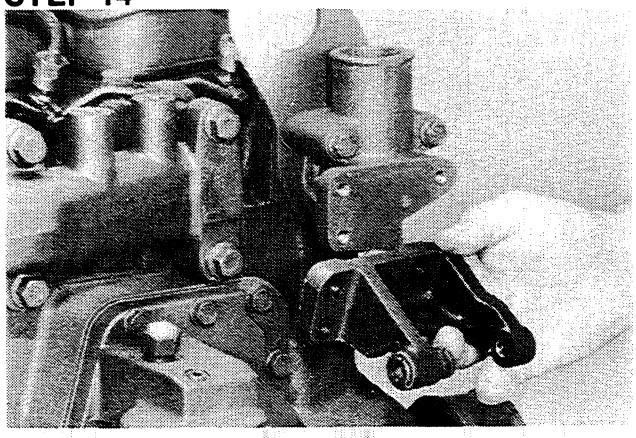
10. If there is electrical power to the cold start valve and the thermostat is good, replace the cold start valve.

STEP 13



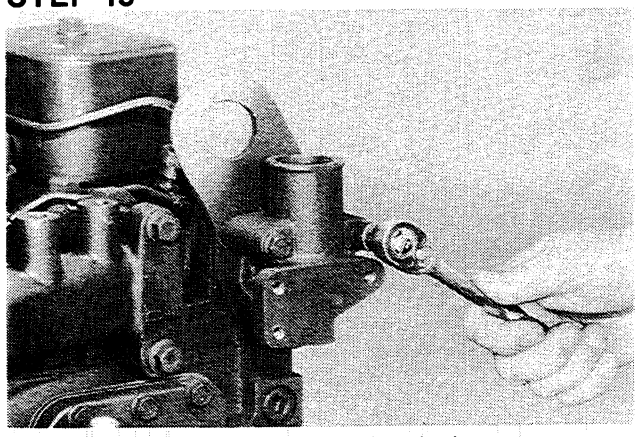
Remove the alternator bracket bolts.

STEP 14



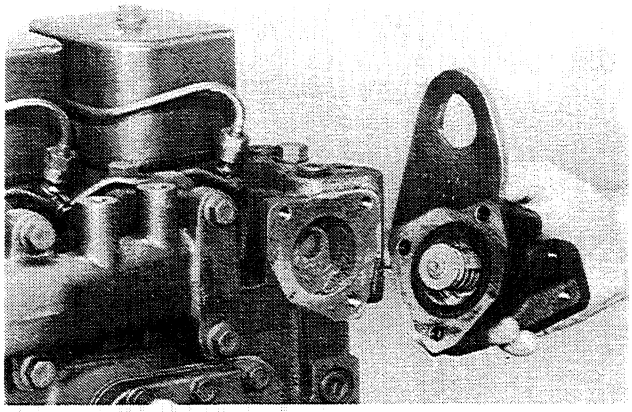
Remove the alternator bracket.

STEP 15



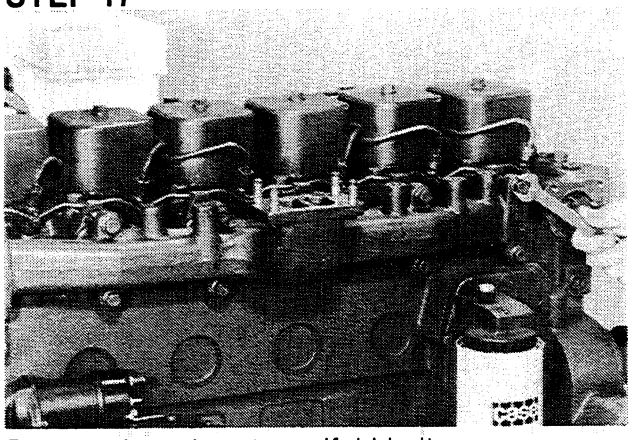
Remove the thermostat housing bolts.

STEP 16



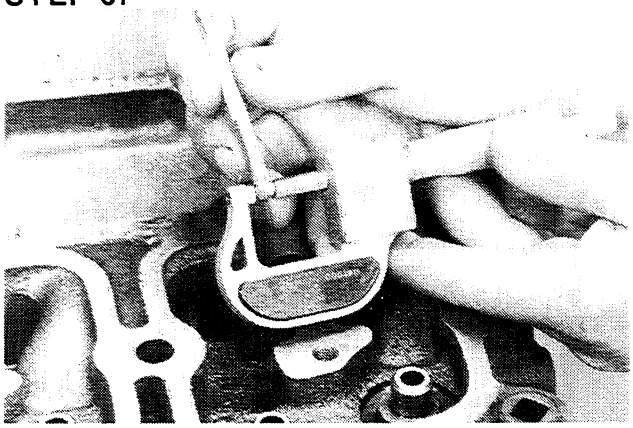
Remove the thermostat housing assembly.

STEP 17



Remove the exhaust manifold bolts.

STEP 67

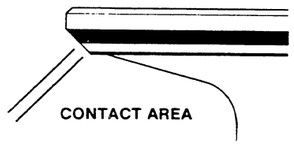


Check the bore gauge with a micrometer.

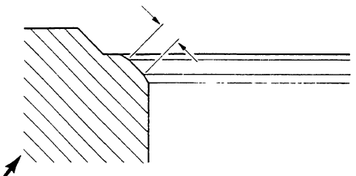
NOTE: *If the diameter is more than 8.089mm, a valve guide must be installed.*

DIAGNOSIS OF DIFFERENT DYE PATTERNS
45 Degree Exhaust valves

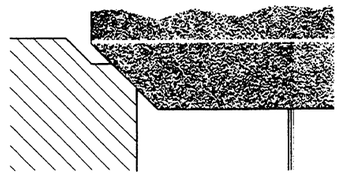
SEAT CONTACT AREA ON THE VALVE TOO LOW



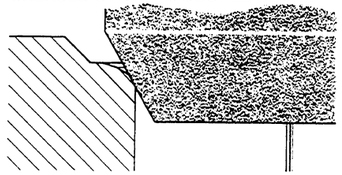
IF THE VALVE CONTACT AREA ON THE SEAT LOOKS LIKE THIS (A SEAT THAT HAS BEEN GROUND).



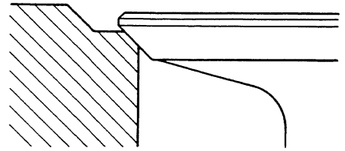
→ USE A 45 DEGREE STONE TO LIFT AND TO MAKE WIDER, THE CONTACT AREA.



→ USE A 60 DEGREE STONE TO NARROW THE LOWER CONTACT AREA, INCREASED BY THE 45 DEGREE STONE.

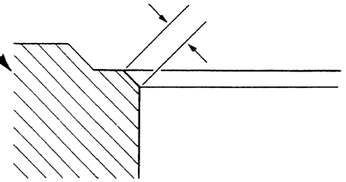


→ CHECK THAT THE VALVE HEAD IS NOT RECESSED MORE THAN 1.52 mm, BELOW THE CYLINDER HEAD SURFACE.

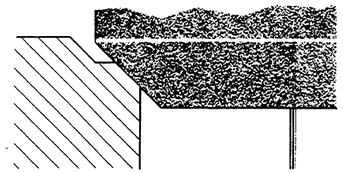


→ IF THE VALVE HEAD IS RECESSED MORE THAN 1.52 mm, REPLACE THE VALVE AND INSTALL A VALVE SEAT.

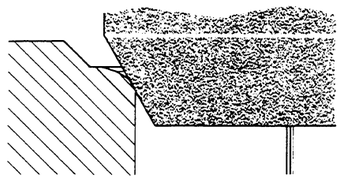
IF THE VALVE CONTACT AREA ON THE SEAT LOOKS LIKE THIS.



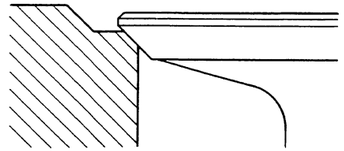
→ USE A 45 DEGREE STONE TO LIFT THE CONTACT AREA.



→ USE A 60 DEGREE STONE TO LIFT AND NARROW THE LOWER CONTACT AREA.

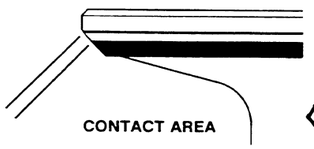


→ CHECK THAT THE VALVE HEAD IS NOT RECESSED MORE THAN 1.52 mm BELOW THE CYLINDER HEAD SURFACE.

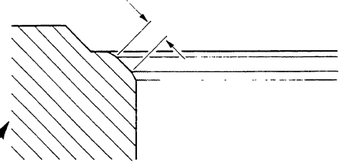


→ IF THE VALVE HEAD IS RECESSED MORE THAN 1.52 mm, REPLACE THE VALVE AND INSTALL A VALVE SEAT.

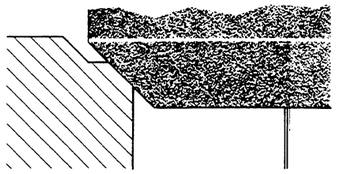
SEAT CONTACT AREA ON THE VALVE TOO HIGH



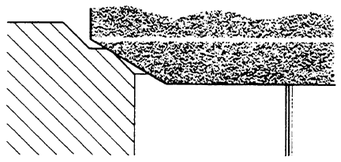
IF THE VALVE CONTACT AREA ON THE SEAT LOOKS LIKE THIS (A SEAT THAT HAS BEEN GROUND).



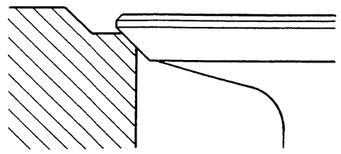
→ USE A 45 DEGREE STONE TO LOWER AND TO MAKE WIDER, THE CONTACT



→ USE A 30 DEGREE STONE TO NARROW THE UPPER CONTACT AREA, INCREASED BY THE 45 DEGREE STONE.

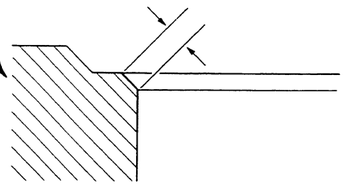


→ CHECK THAT THE VALVE HEAD IS NOT RECESSED MORE THAN 1.52 mm, BELOW THE CYLINDER HEAD SURFACE.



→ IF THE VALVE HEAD IS RECESSED MORE THAN 1.52 mm, REPLACE THE VALVE AND INSTALL A VALVE SEAT.

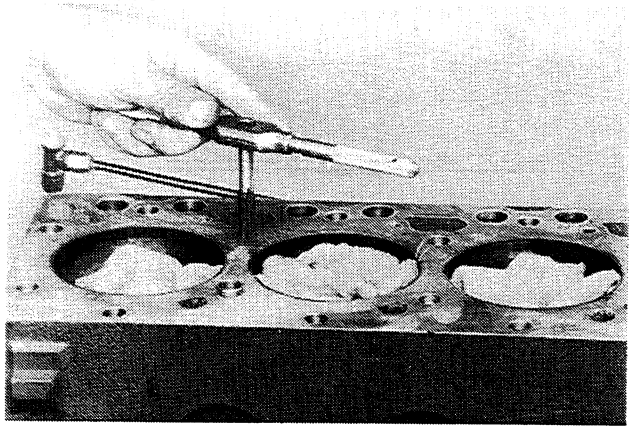
IF THE VALVE CONTACT AREA ON THE SEAT LOOKS LIKE THIS.



→ THE VALVE MUST BE REPLACED AND A VALVE SEAT MUST BE INSTALLED BECAUSE MORE GRINDING WILL NOT CHANGE THE LOWER CONTACT POINT.

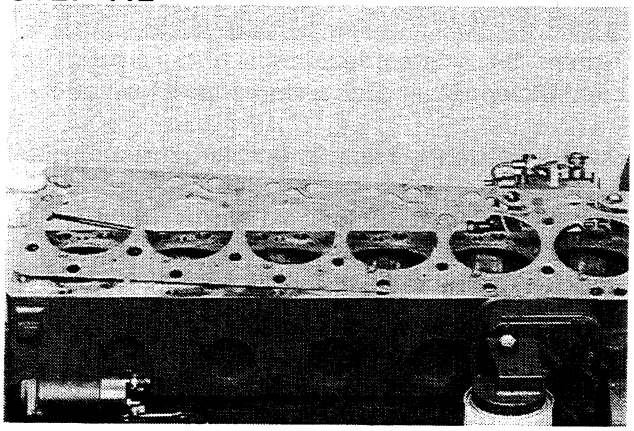
Cylinder Head Installation

STEP 111

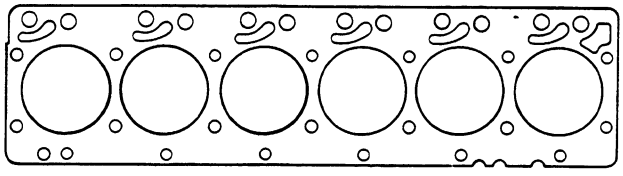


Use the correct tap and clean all head bolt holes of foreign material.

STEP 112



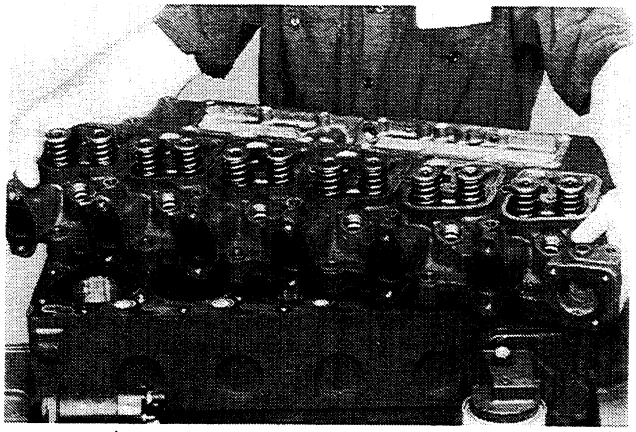
Install the correct head gasket on the engine block, see below.



Head Gasket Application

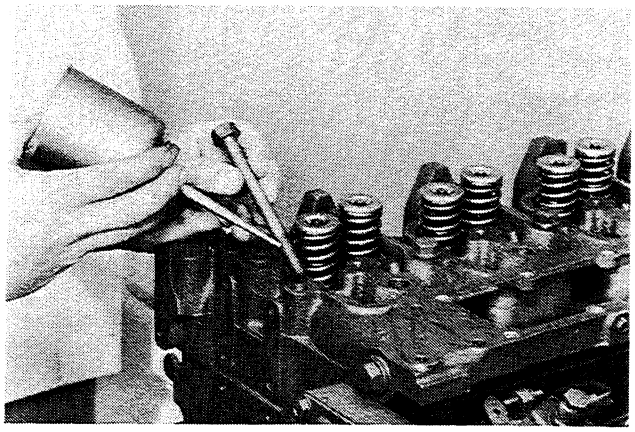
No Notches - Replacement Gasket
2 Notches - 0.25 mm oversize thickness
3 Notches - 0.50 mm oversize thickness

STEP 113



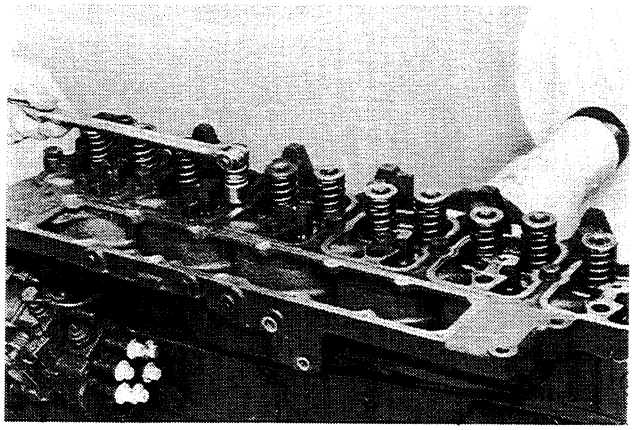
Install the cylinder head.

STEP 114



Put a small amount of clean engine oil on the head bolt threads.

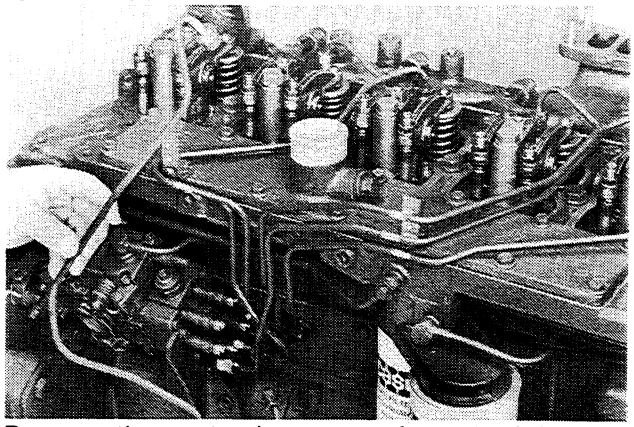
STEP 115



Install the head bolts and washers. Tighten the bolts a small amount.

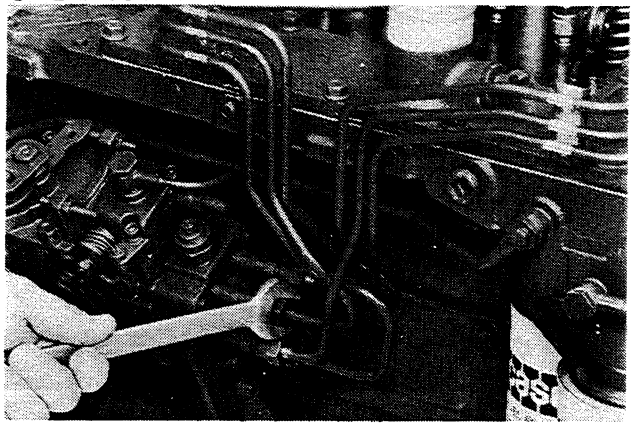
NOTE: *Do not torque the head bolts at this time.*

STEP 160



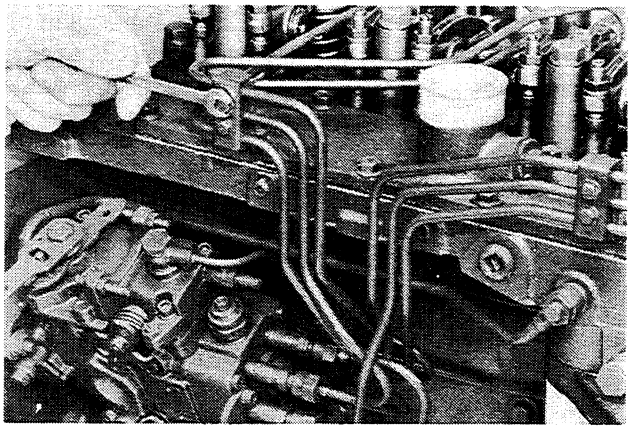
Remove the protective covers from the injection pump and injectors. Install the injector lines.

STEP 161



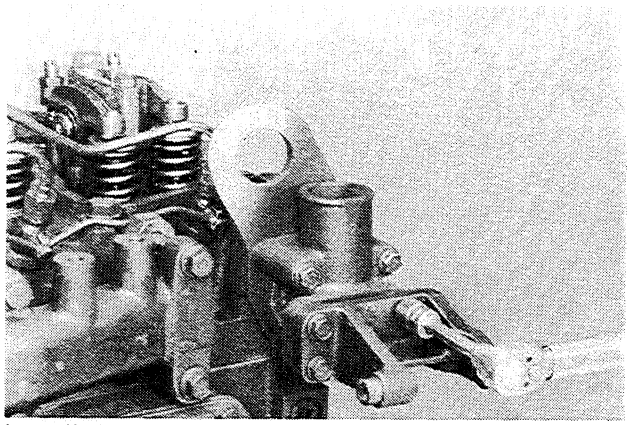
Connect and tighten the injector lines to the injectors and the injector pump.

STEP 162



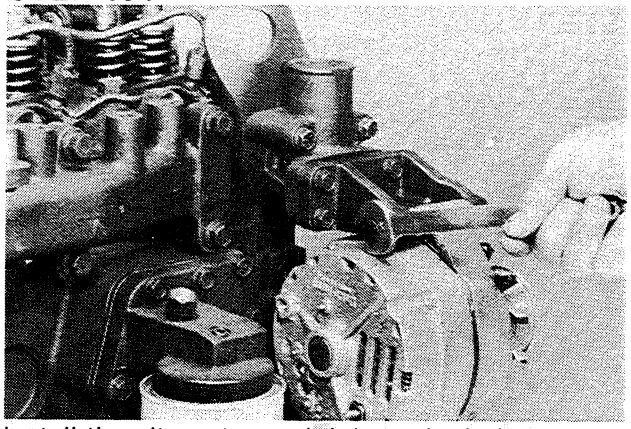
Install the bracket and tighten.

STEP 163



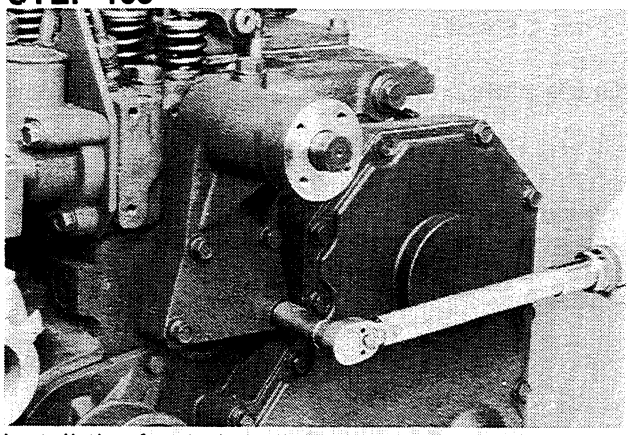
Install the alternator bracket and tighten the bolts to a torque of 18 lb ft (24 Nm)(2.4 kgm).

STEP 164



Install the alternator and tighten the bolts.

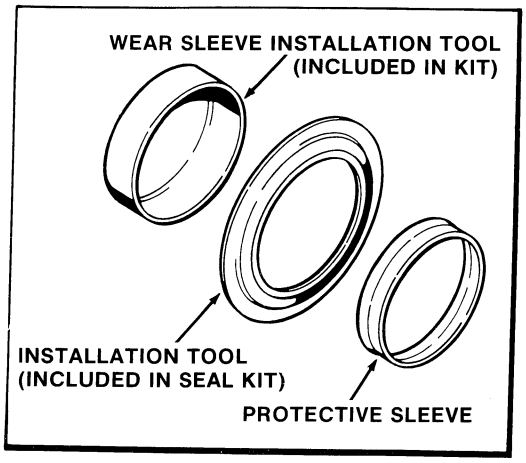
STEP 165



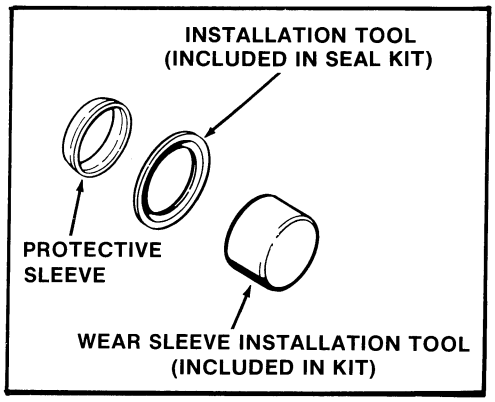
Install the fan belt pulley bracket and tighten the bolts to a torque of 18 lb ft (24 Nm)(2.4 kgm).

SPECIAL TOOLS

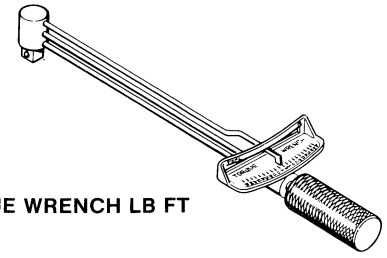
Crankshaft Seals and Wear Sleeve



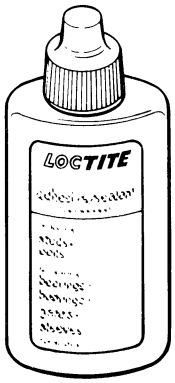
REAR SEAL KIT



FRONT SEAL KIT

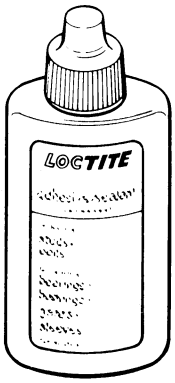


TORQUE WRENCH LB FT

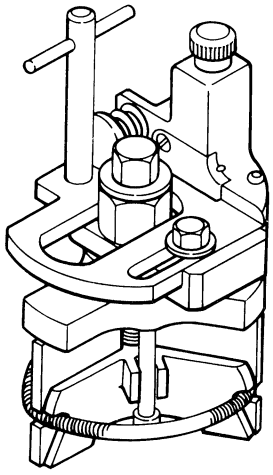


SAFETY SOLVENT
M20863 12 OZ AEROSOL

504 GASKET ELIMINATOR
B17428 50 ml TUBE
B17504 300 ml CARTRIDGE

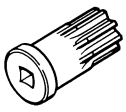


277 PLASTIC GASKET
B17427 50 ml BOTTLE

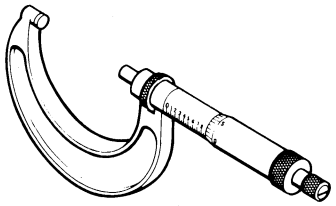


CAS-1358 RIDGE REAMER

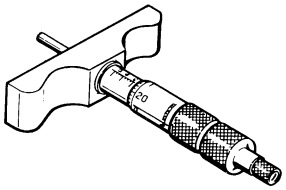
Cylinder Block and Cylinder



CAS-1690 ENGINE TURN OVER TOOL

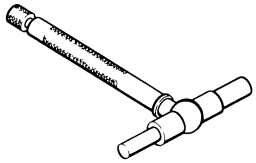


CAS-10056M OUTSIDE MICROMETER



CAS-10064M
0 TO 150 mm DEPTH MICROMETER

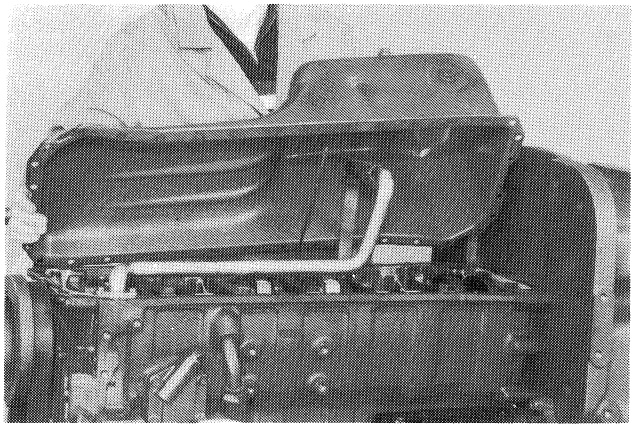
504 GASKET ELIMINATOR
B17428 50 ml TUBE
B17504 300 ml CARTRIDGE



CAS-10063M INSIDE MICROMETER

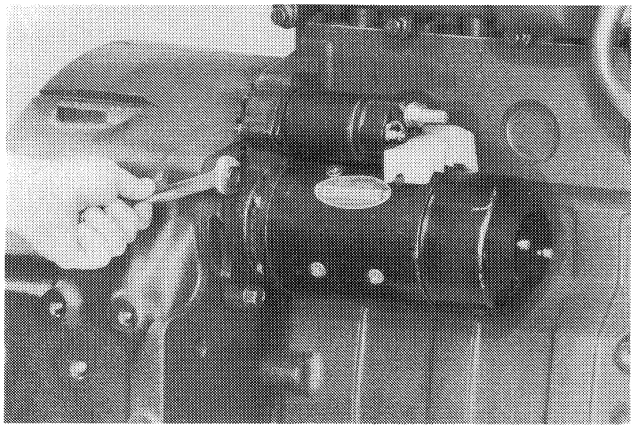
Rear Oil Seal Replacement

STEP 30



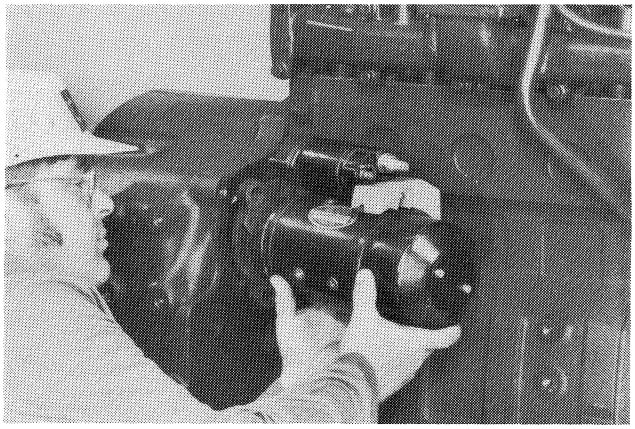
Remove the engine oil pan. See Section 2445 for oil pan removal.

STEP 31



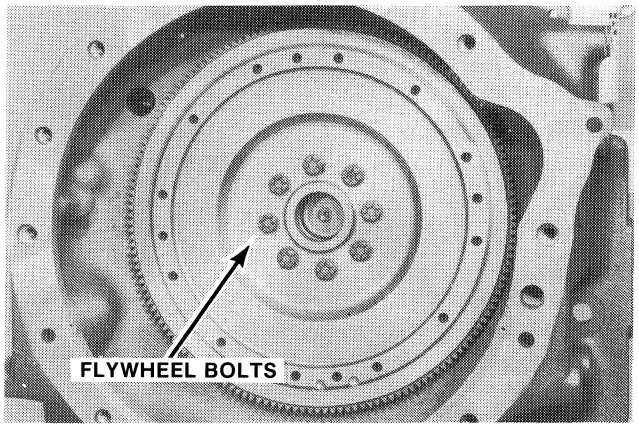
Remove the bolts that hold the starter to the flywheel housing.

STEP 32



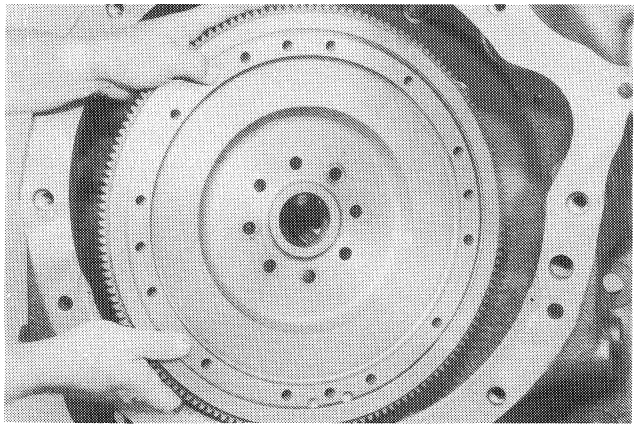
Remove the starter from the flywheel housing.

STEP 33



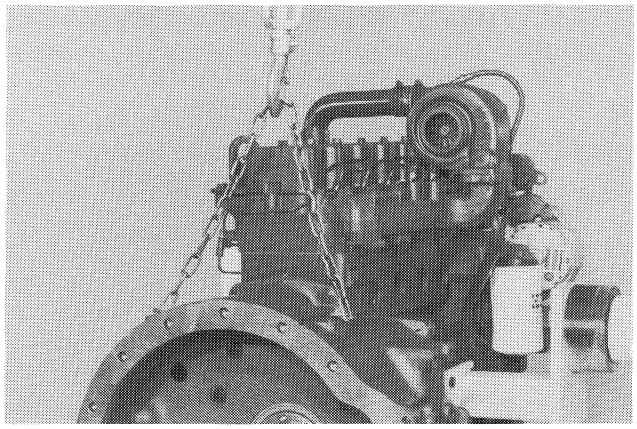
Remove the bolts from the flywheel.

STEP 34



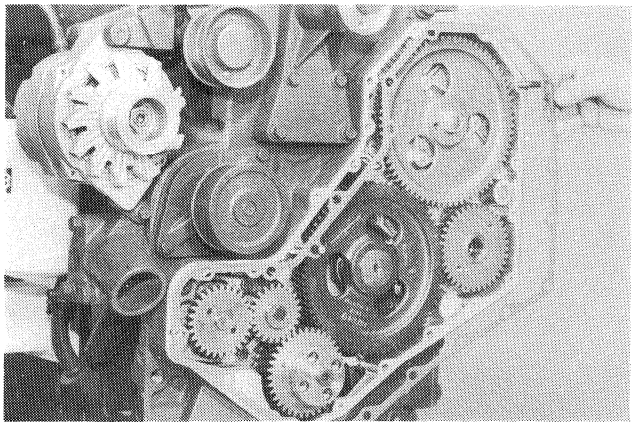
Remove the flywheel from the flywheel housing.

STEP 35



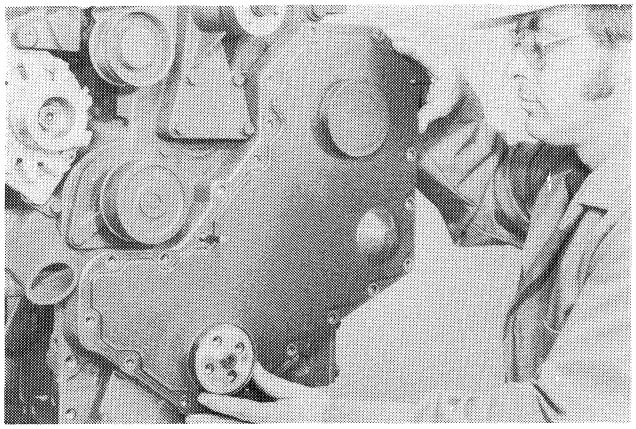
Connect a chain and a hoist to the flywheel housing.

STEP 90



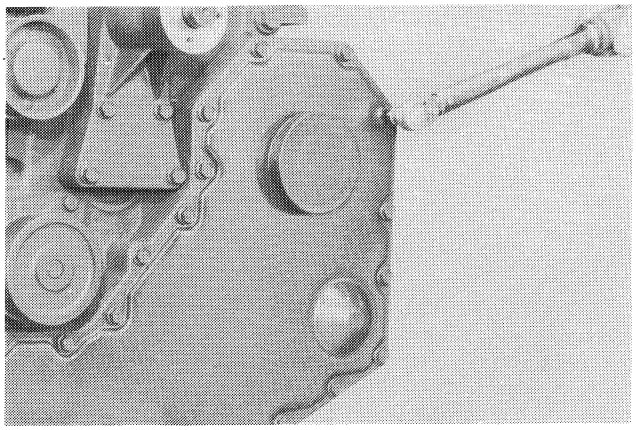
Install a new front cover gasket.

STEP 91



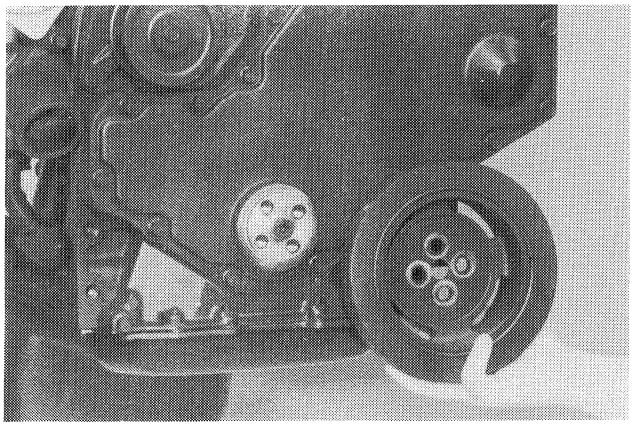
Carefully install the front cover.

STEP 92



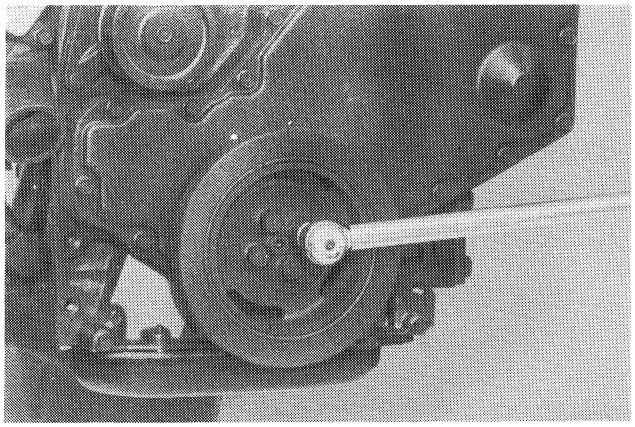
Install the front cover bolts and tighten the bolts to a torque of 18 lb ft (24 Nm)(2.4 kgm).

STEP 93



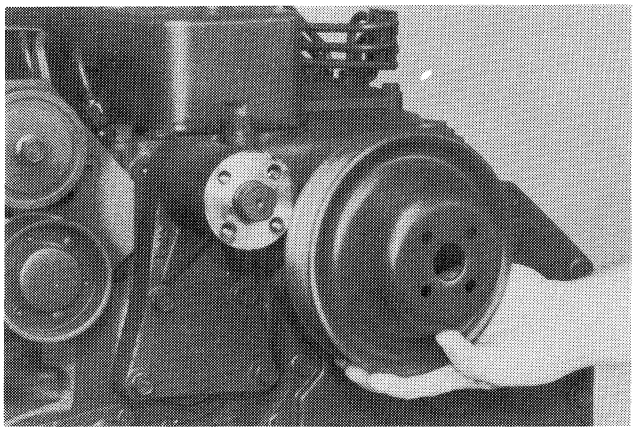
Install the crankshaft pulley.

STEP 94



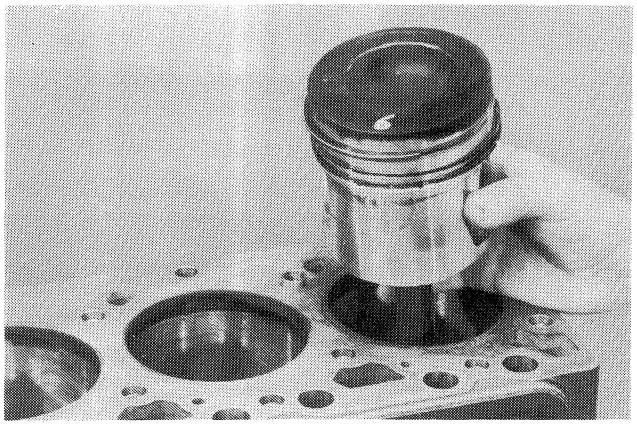
Install the crankshaft pulley bolts and tighten the bolts to a torque of 101 lb ft (137 Nm)(13.7 kgm).

STEP 95



Install the fan pulley and the fan pulley bolts.

STEP 149



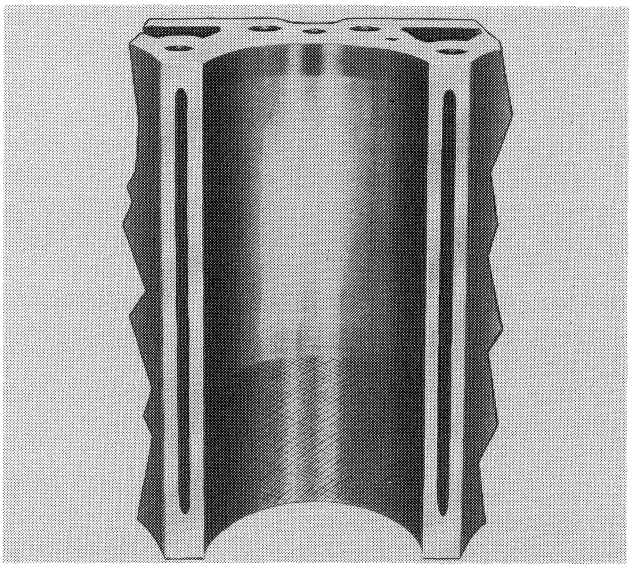
Remove the pistons from the top of the engine block.

Cylinder Wall Inspection

STEP 150

Inspect the cylinder walls for the following conditions.

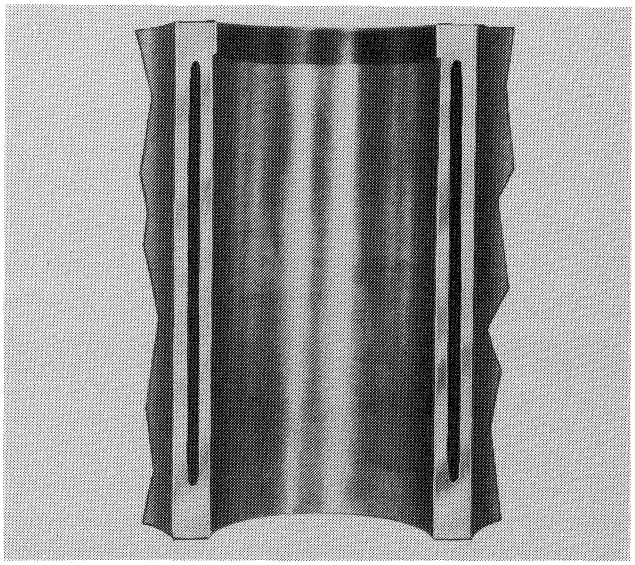
Normal Wear



A smooth surface with some of the cross-hatch pattern showing between the upper and lower limits of the ring movement area shows normal wear. There will always be a small amount of wear present because of combustion pressure moving the top ring against the cylinder wall.

Normal wear shows acceptable cylinder wall conditions. See Step 151 and 152 to measure the cylinder bore for tapes and out-of-round.

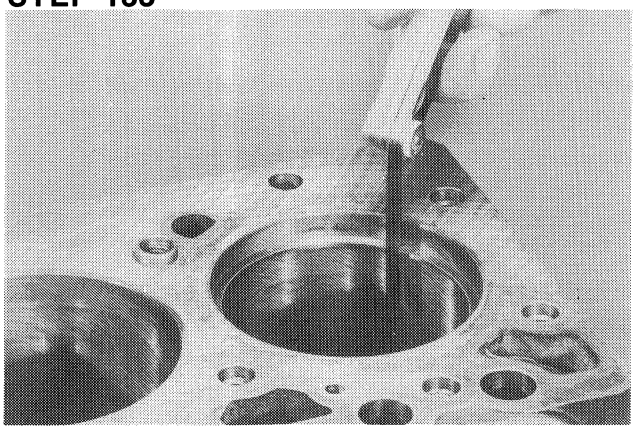
Worn Cylinder Wall



A smooth surface between the upper and lower limits of the ring movement area shows a worn cylinder wall. See Step 151 and 152 to measure the cylinder bore for out-of-round and taper.

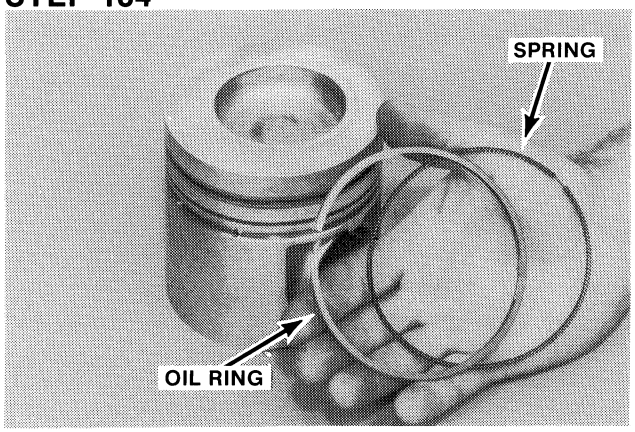
Piston Assembly

STEP 183



Put the piston rings in the cylinder and check end gap. Replace the piston rings if the end gap is more than 0.806 mm.

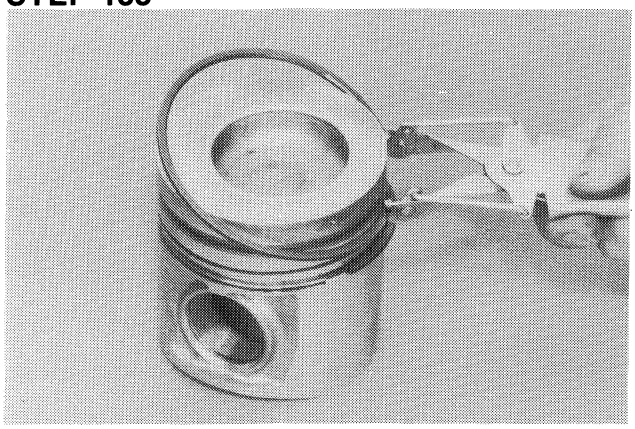
STEP 184



Install the oil ring. Install the spring first and the oil ring second.

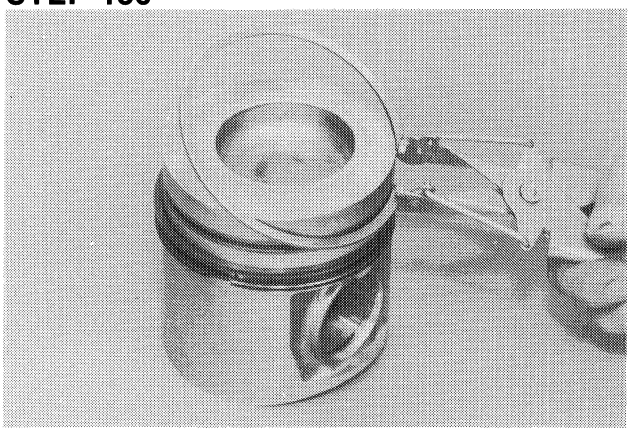
NOTE: *The spring must be between the oil ring and the piston.*

STEP 185



Install the second compression ring. The piston ring must be installed with the side marked TOP toward the top of the piston to give good oil control.

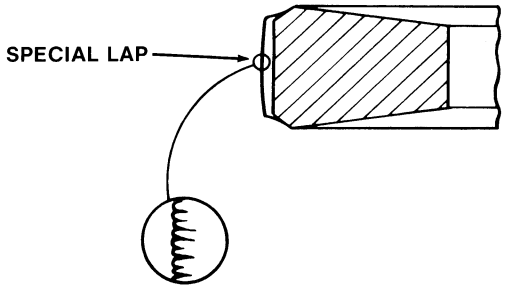
STEP 186



Install the first compression ring on the piston. The piston ring must be installed with the side marked TOP toward the top of the piston to give good oil control.

NOTE: *The top piston ring on the 6T-590 and 6TA-590 engine is a key stone type ring.*

STEP 187

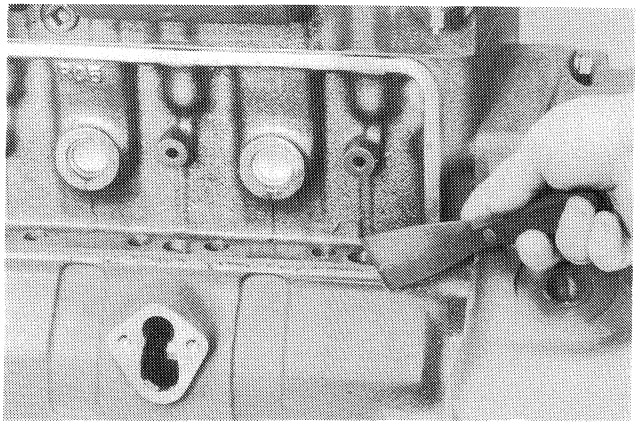


The first compression ring, in a replacement set of rings, must have a special lap design on the surface that contacts the cylinder wall.

STEP 188

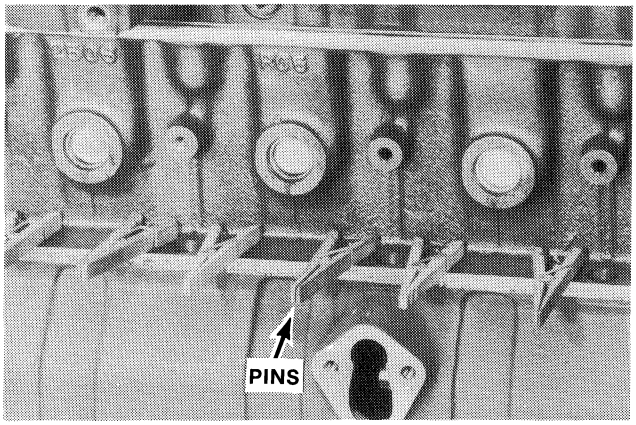
Rotate the piston rings so that the ring ends are separated by 120 degrees.

STEP 235



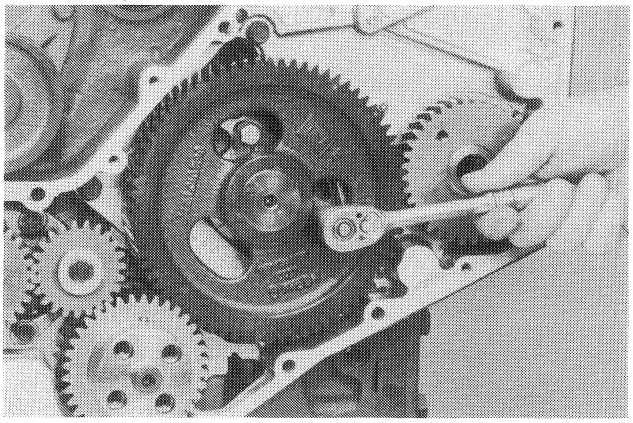
Clean the lifter cover mounting surfaces of all foreign material.

STEP 236



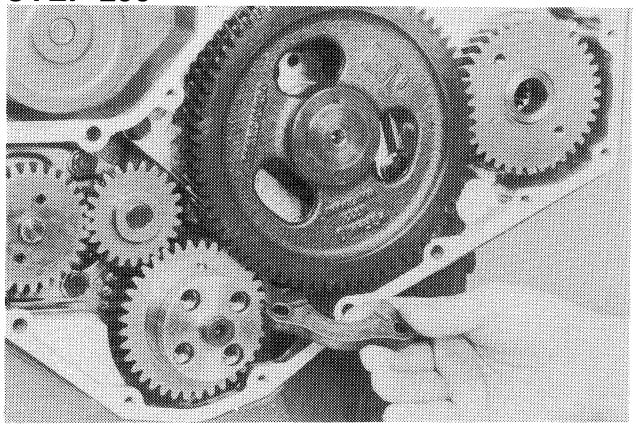
Install pins to hold the lifters in place.

STEP 237



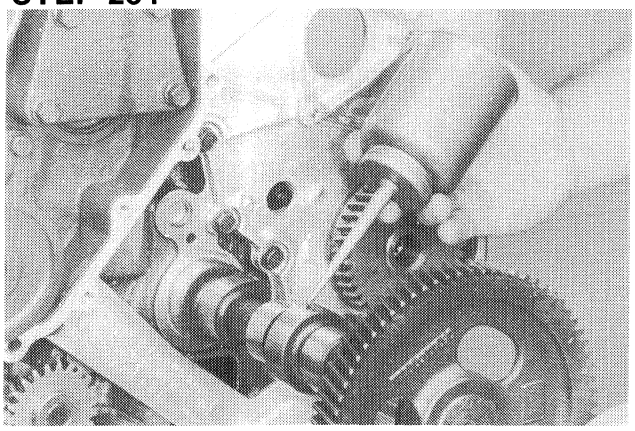
Remove the bolts that hold the camshaft thrust plate.

STEP 238



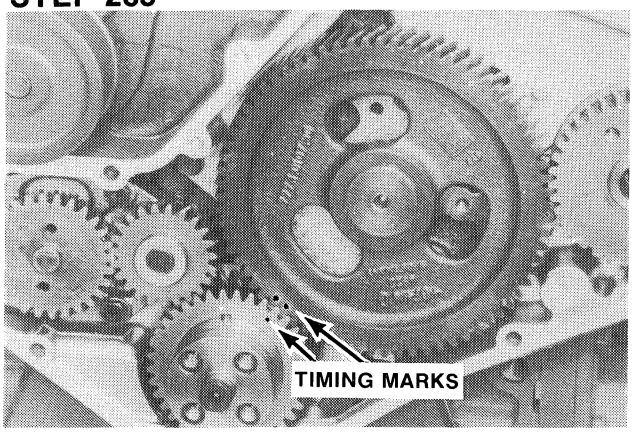
Remove the camshaft thrust plate.

STEP 284



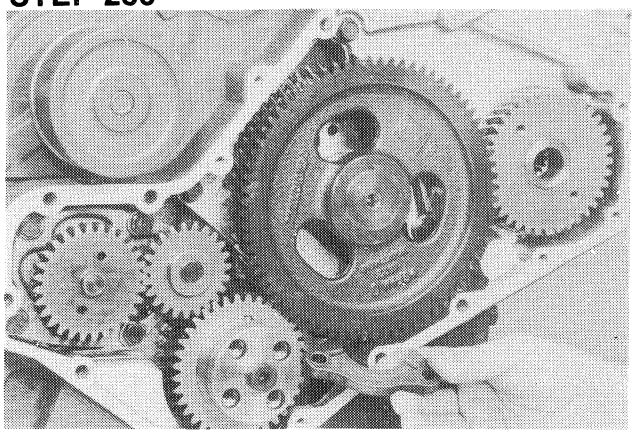
Add lubrication to the camshaft bearing journals. Use clean engine oil.

STEP 285



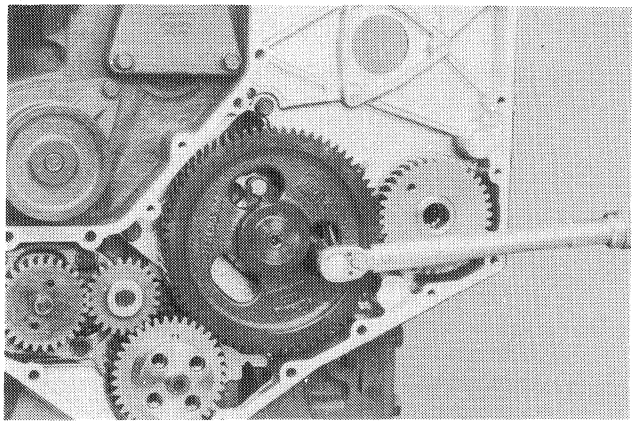
Make sure the timing marks on the crankshaft and camshaft are aligned.

STEP 286



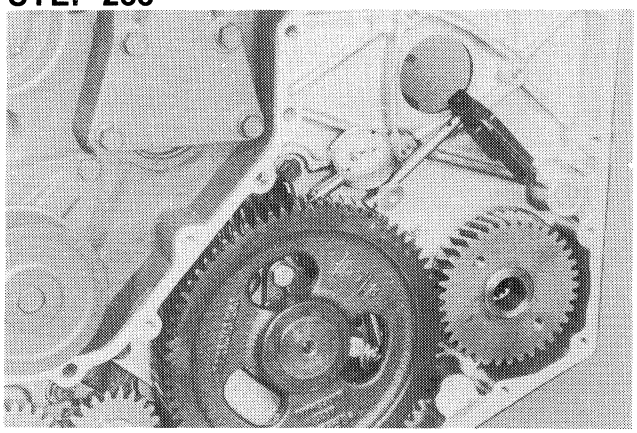
Install the camshaft thrust plate behind the camshaft gear.

STEP 287



Install the thrust plate bolts and tighten to a torque of 18 lb ft (24 Nm)(2.4 kgm).

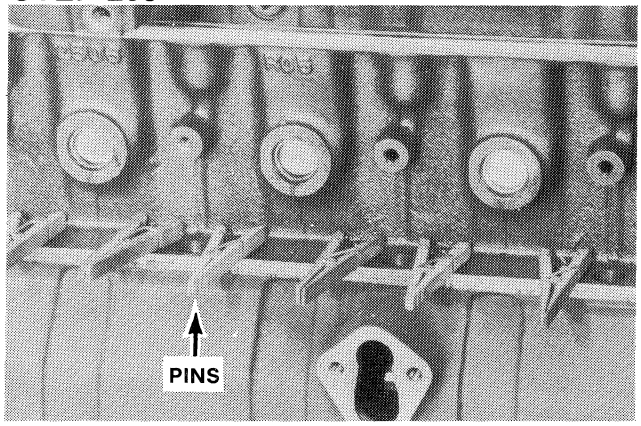
STEP 288



Put a dial indicator on the camshaft gear. Check the backlash between the camshaft gear and the crankshaft gear. Backlash must be 0.08 to 0.33 mm. If backlash is more than 0.33 mm, the gears must be replaced.

NOTE: *Too much backlash can also be caused by a worn camshaft bushing.*

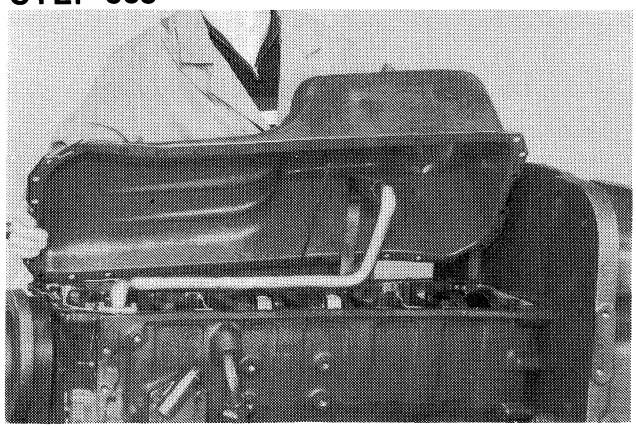
STEP 289



Remove the pins from the lifters.

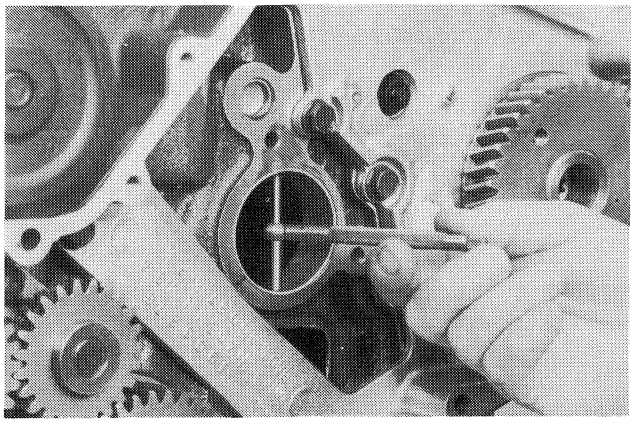
Camshaft Bushing Removal and Installation

STEP 335



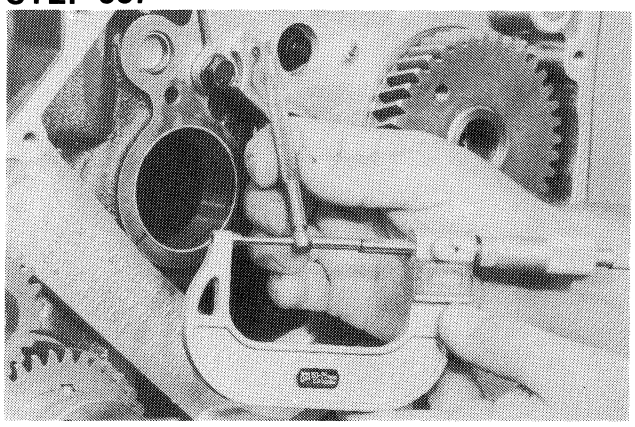
Remove the engine oil pan. See Section 2445 in the service manual.

STEP 336



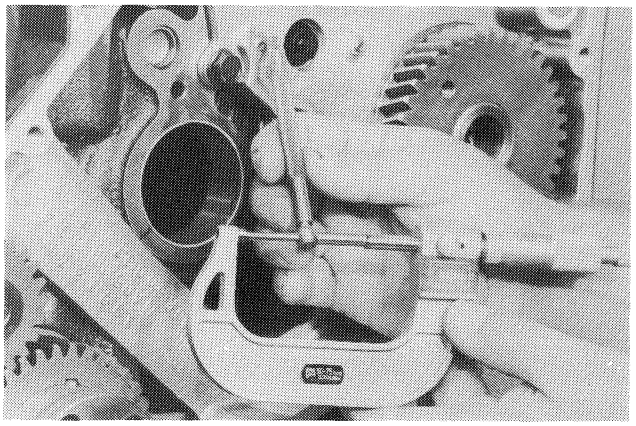
Measure the camshaft bores. Use a bore gauge. The bores must be measured in two positions. Take a second measurement 90 degrees from the first measurement.

STEP 337



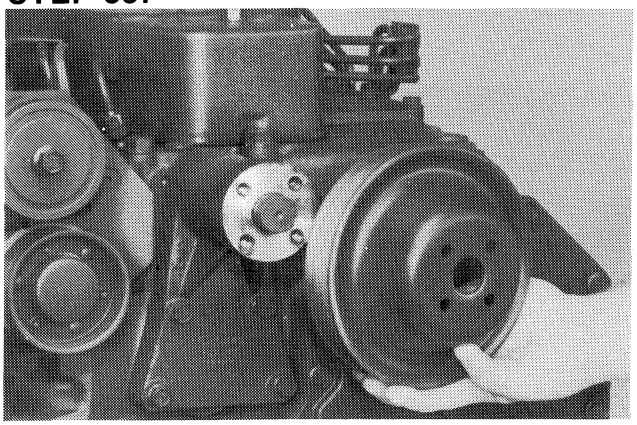
If the bushing diameter is more than 54.146 mm, the front camshaft bushing must be replaced.

STEP 338



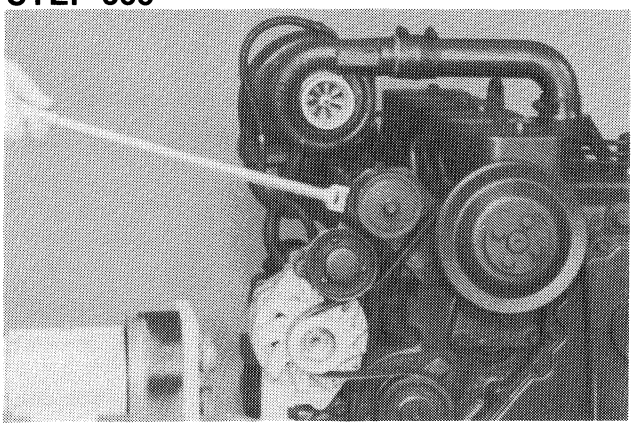
If the intermediate or the rear bores are more than 54.146 mm, disassemble the engine block and line bore the bores. See Section 1024 in the service manual for machining dimensions.

STEP 387



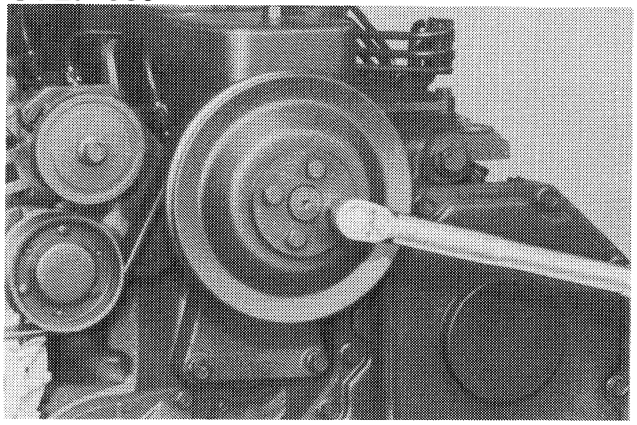
Install the fan pulley and bolts.

STEP 388



Lift the belt tensioner and install the fan belt.

STEP 389

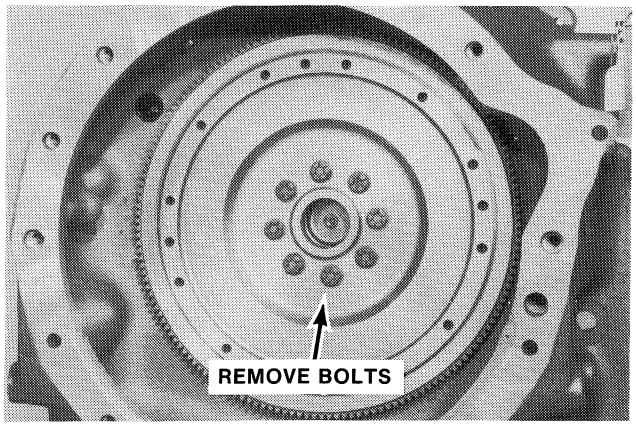


Tighten the fan pulley bolts as follows:
Grade 8.8 ..... 18 lb ft 24 Nm (2.4 kgm)
Grade 10.9 ..... 25 lb ft 34 Nm (3.4 kgm)

FLYWHEEL

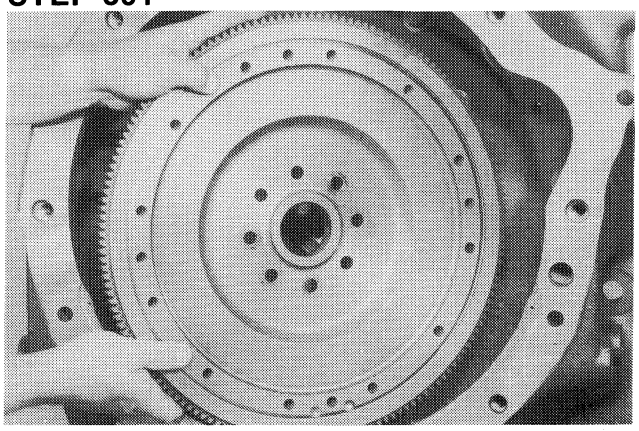
Removal

STEP 390



Remove the bolts from the flywheel.

STEP 391



Remove the flywheel from the flywheel housing.

Testing

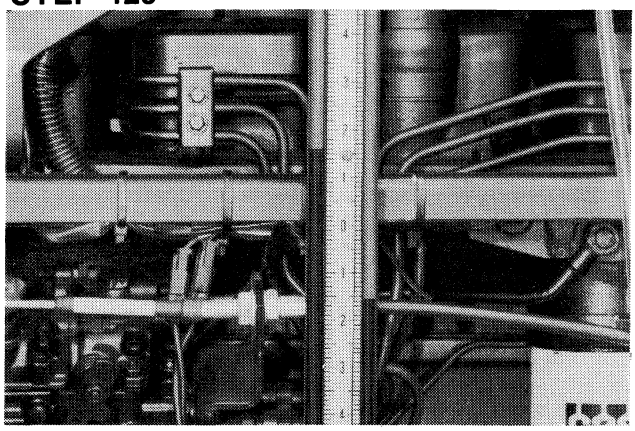
NOTE: *Do the following Steps to get the correct manometer readings.*

Step 1 - Warm the engine to operating temperature.

Step 2 - Operate the engine at the rated speed.

Step 3 - Use the hydraulics to apply a load to the engine during the manometer test.

STEP 429



Take a manometer reading from the engine. Add the number of lowered inches to the number of raised inches for the correct manometer reading. See example below.

LOWERED INCHES+ 1.5
RAISED INCHES 1.5

TOTAL 3.0 INCHES

See the chart for manometer reading and crankcase pressure (Blow By) limits.

MANOMETER READING

Inches of Water	L/min
1	59
2	84
3	103
4	119
5	133
6	145
7	155
8	164
9	172
10	180
11	187
12	193
13	200
14	206
15	211
16	217

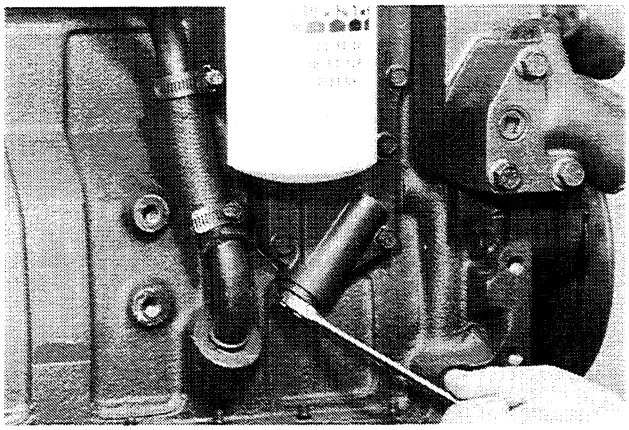
CRANKCASE PRESSURE (BLOW BY) LIMITS

Engine Model	Engine Speed	L/min Maximum New	L/min Worn Limit
6-590	2100	38.0	76.0
	2200	40.0	80.0
	2600	45.0	90.0
6T-590	2100	59.0	118.0
	2200	61.0	122.0
6TA-590	2100	84.0	168.0
	2200	87.0	174.0

OIL PRESSURE RELIEF VALVE

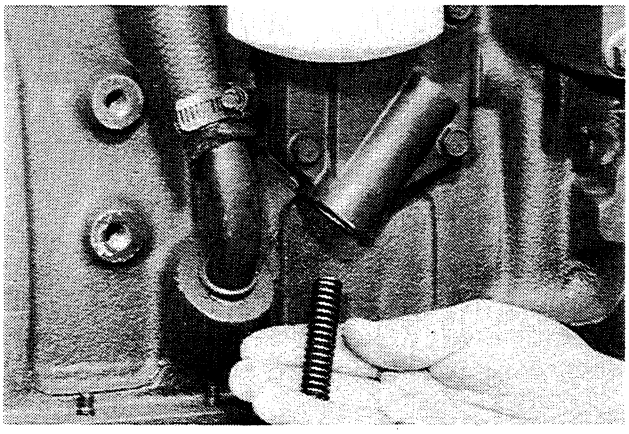
Disassembly

STEP 24



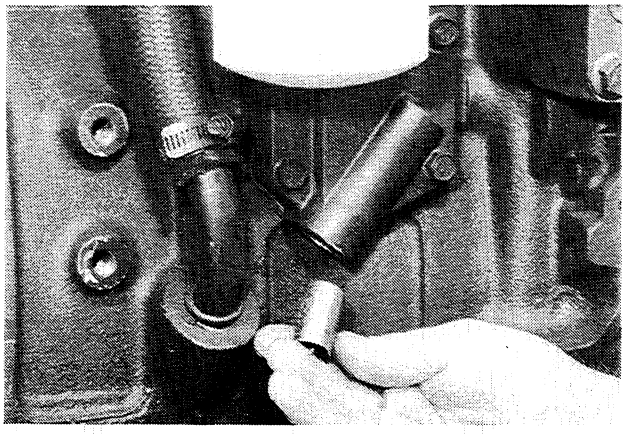
Remove the relief valve plug.

STEP 25



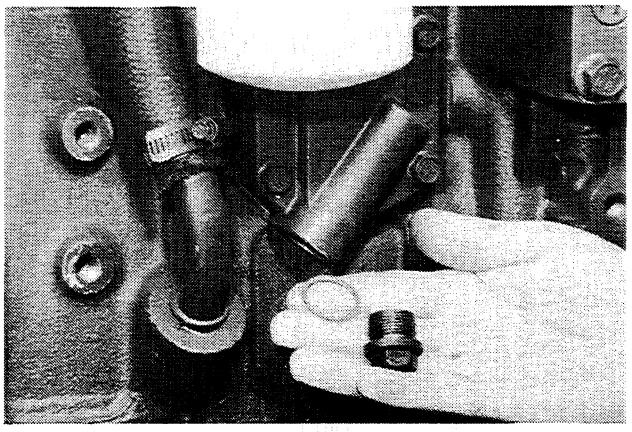
Remove the relief valve spring.

STEP 26



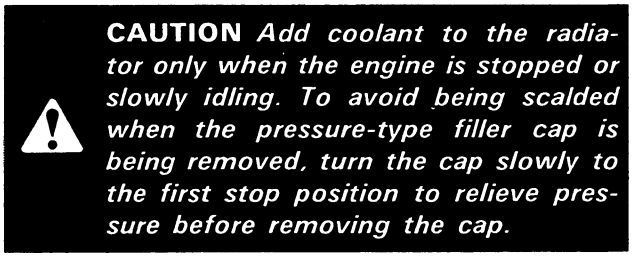
Remove the relief valve.

STEP 27



Remove the gasket from the relief valve plug.

SAFETY RULES



To remove the system pressure, slowly turn the radiator cap counterclockwise to the FIRST stop. This will permit a gradual release of pressure with little coolant loss.

Never put coolant in a hot engine. The engine block or cylinder head can get cracks because of the difference in temperature between the metal and coolant.

How to Clean the Cooling System

Clean the cooling system a minimum of one time each year. In areas where the water has minerals, clean the system with more frequency.

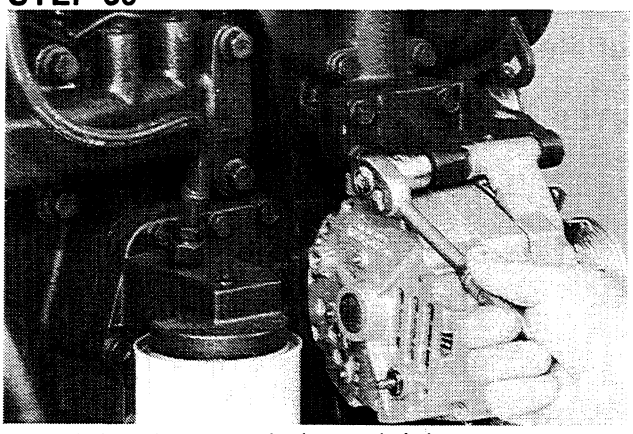
1. When the coolant is hot, open the radiator drain valve and remove the engine block drain plug. Close the valve and install the engine block drain plug after the system is empty.

2. Add a radiator cleaner and fill the system with clean water. Use a good type of radiator cleaner. Follow the instructions given with the radiator cleaner.

3. Remove the radiator cleaner solution. Flush the system with clean water. Fill the system with antifreeze and water for operation. Check the hoses, radiator and water pump for leaks.

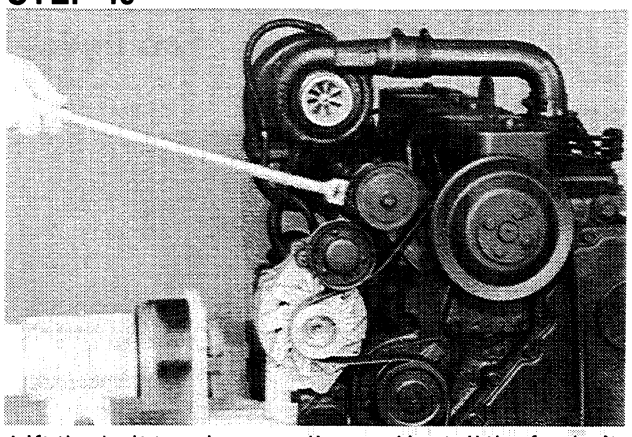
NOTE: *After the cooling system is completely filled, run the engine for approximately 20 minutes to remove all the air from the system. Check coolant level and add coolant if needed.*

STEP 39



Install the alternator bolts and tighten.

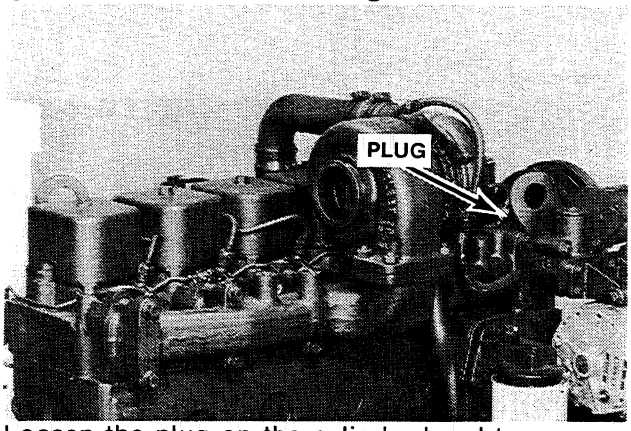
STEP 40



Lift the belt tensioner pulley and install the fan belt.

COOLING SYSTEM AIR REMOVAL

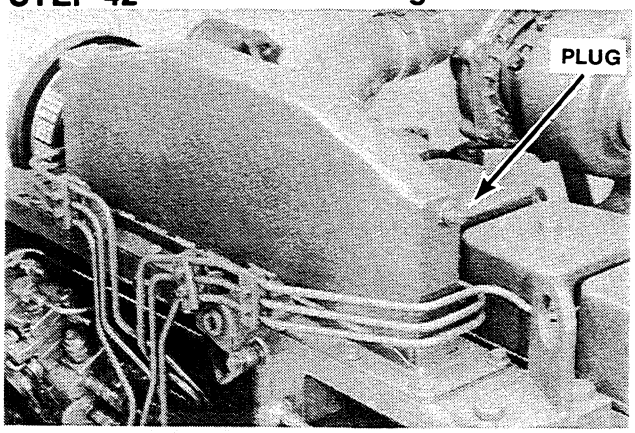
STEP 41 **6T-590 Engine**



Loosen the plug on the cylinder head to remove the air from the cooling system.

NOTE: *See the operators manual for the correct filling procedure.*

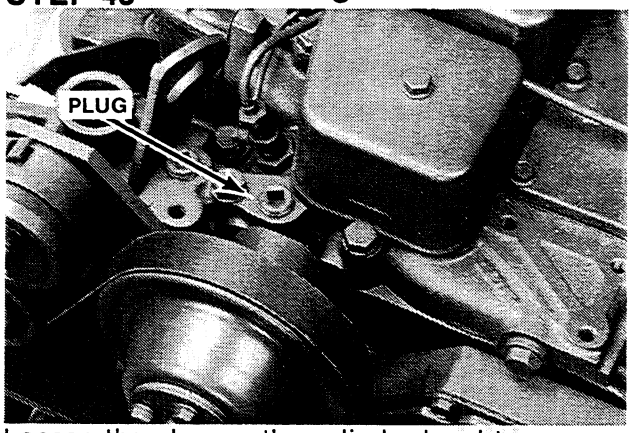
STEP 42 **6TA-590 Engine**



Loosen the plug on the after cooler to remove the air from the cooling system.

NOTE: *See the operators manual for the correct filling procedure.*

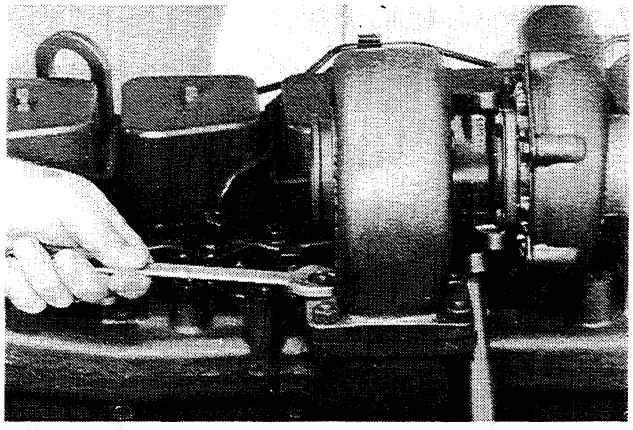
STEP 43 **6-590 Engine**



Loosen the plug on the cylinder head to remove the air from the cooling system

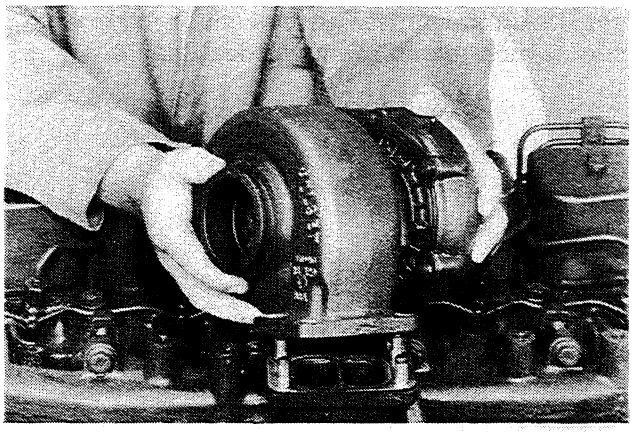
NOTE: *See the operators manual for the correct filling procedure.*

STEP 7



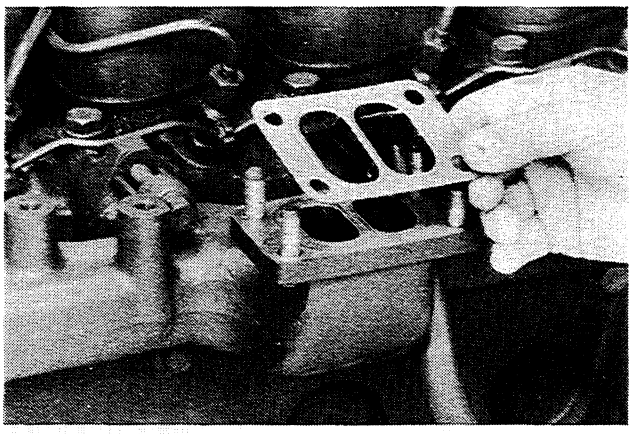
Remove the nuts that hold the turbocharger to the exhaust manifold.

STEP 8



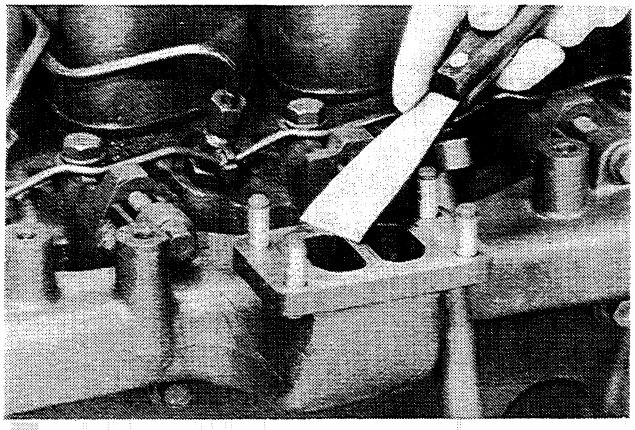
Remove the turbocharger from the exhaust manifold.

STEP 9



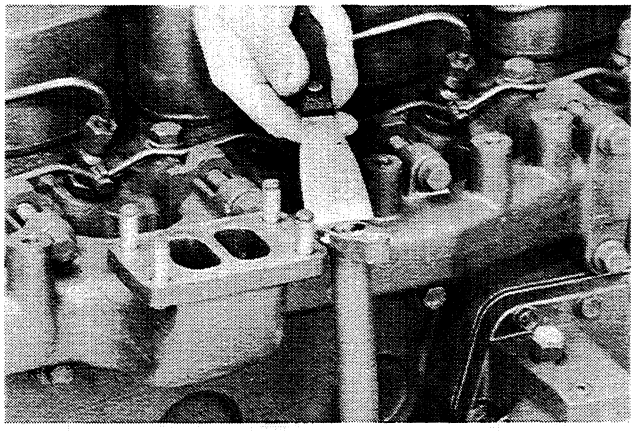
Remove the gasket.

STEP 10



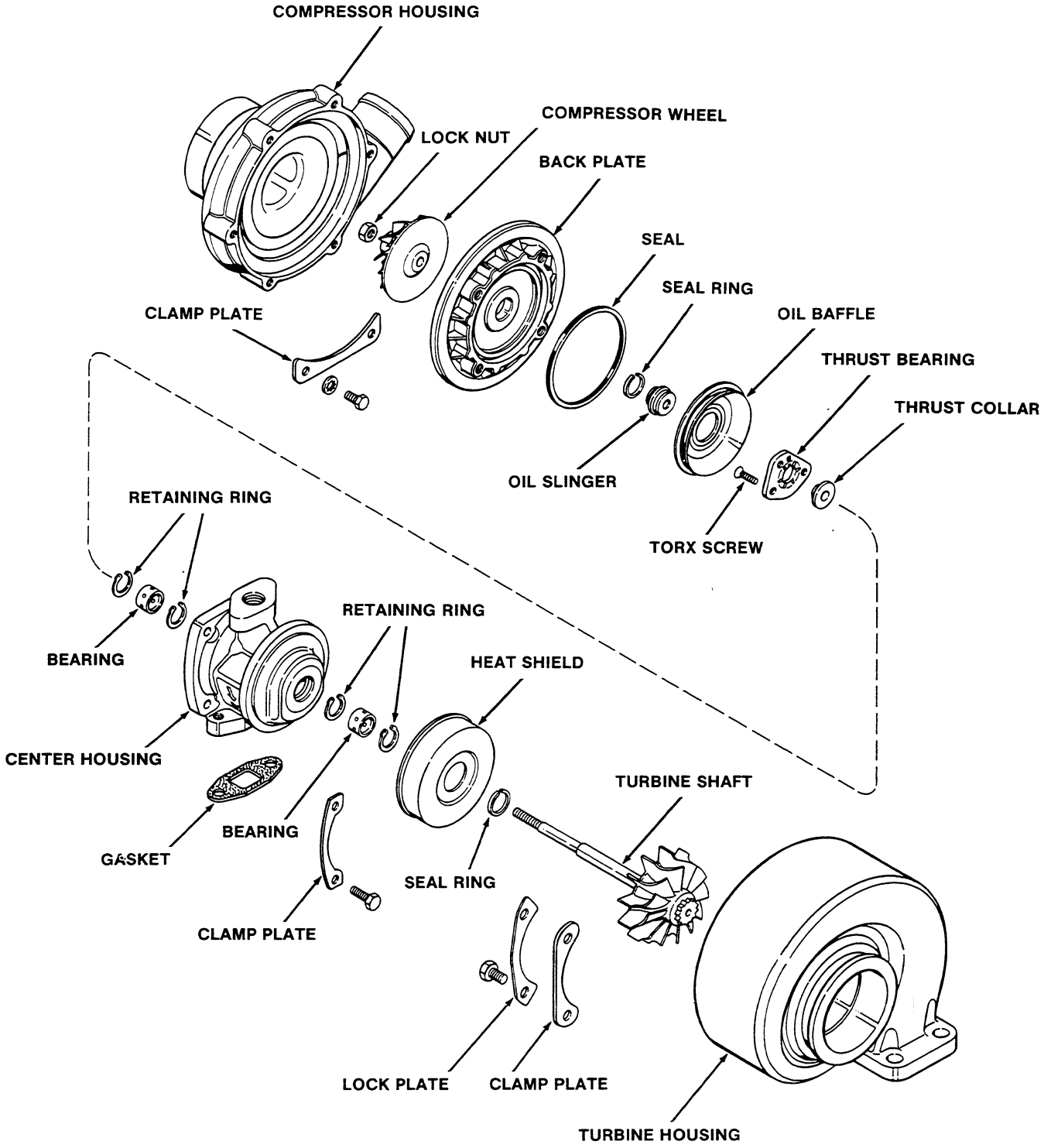
Clean the mounting surface on the turbocharger and the exhaust manifold.

STEP 11



Clean the mounting surface on the turbocharger and the oil drain tube.

Assembly



NOTE: *Lubricate all bearings, seals and the turbine shaft with clean engine oil before assembly.*

Section

2565

TURBOCHARGER FAILURE ANALYSIS

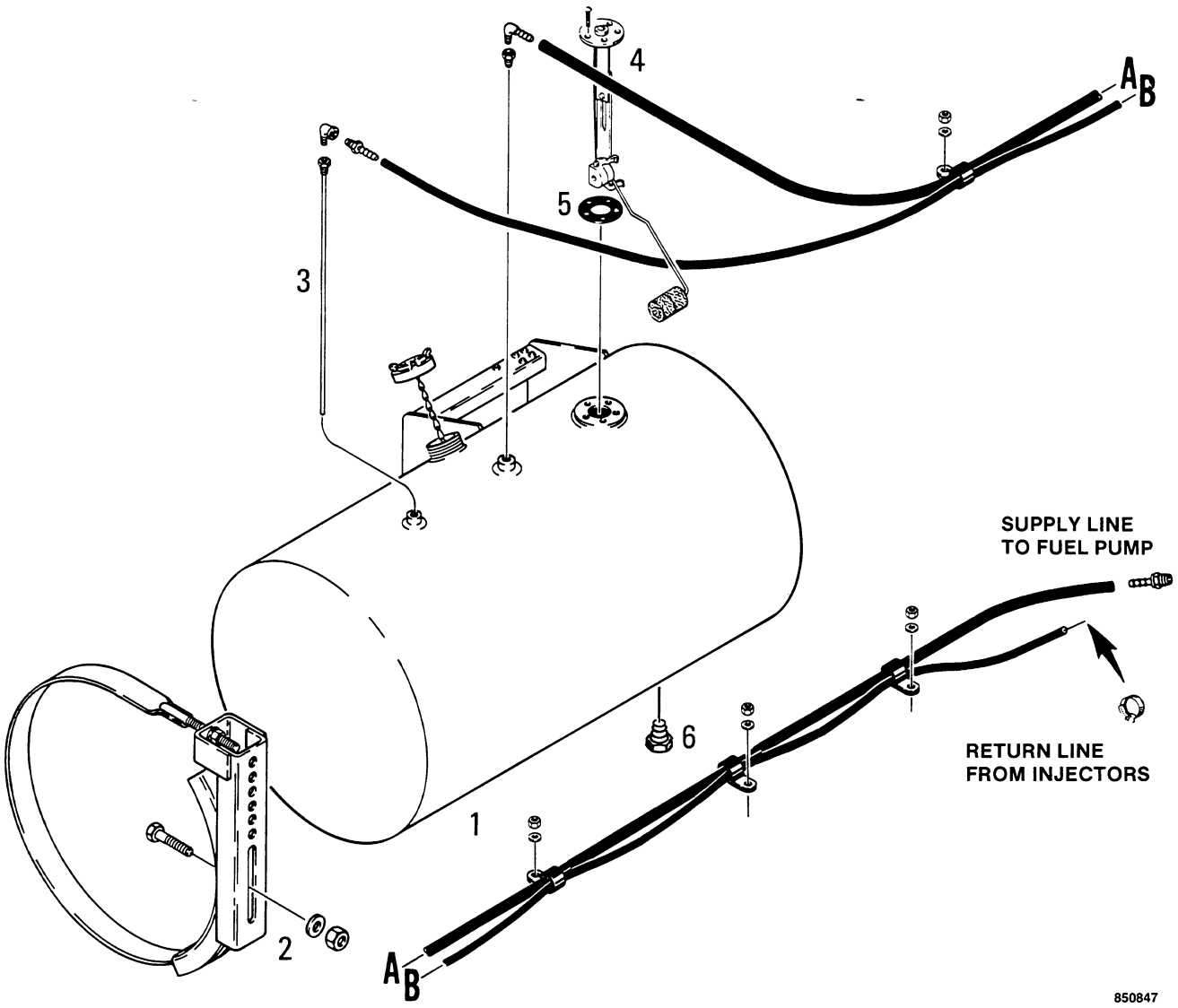
2565

CASE CORPORATION
700 State Street
Racine, WI 53404 U.S.A.

CASE CANADA CORPORATION
3350 South Service Road
Burlington, ON L7N 3M6 CANADA

Rac 9-78235

Printed in U.S.A.
February, 1996



1. *Tank*
2. *Mounting Straps*
3. *Tube*
4. *Fuel Sending Unit*
5. *Gasket*
6. *Drain Plug*

Fuel Tank and Lines

ACCELERATOR SLAVE CYLINDER

Removal

1. Disconnect the accelerator line.

2. Disconnect the linkage from the cylinder push rod.

3. Loosen the U-clamp and remove the slave cylinder.

Disassembly

1. Remove push rod and dust cover.

2. Push against the piston and remove retaining ring (7).

3. Remove piston (6), piston seal (5) and spring (4).

Inspection

Use brake fluid to clean the parts. Look for damage to the cylinder bore and the piston. Install new piston seal. Replace any parts with damage.

Assembly

1. Put the spring into the cylinder body.

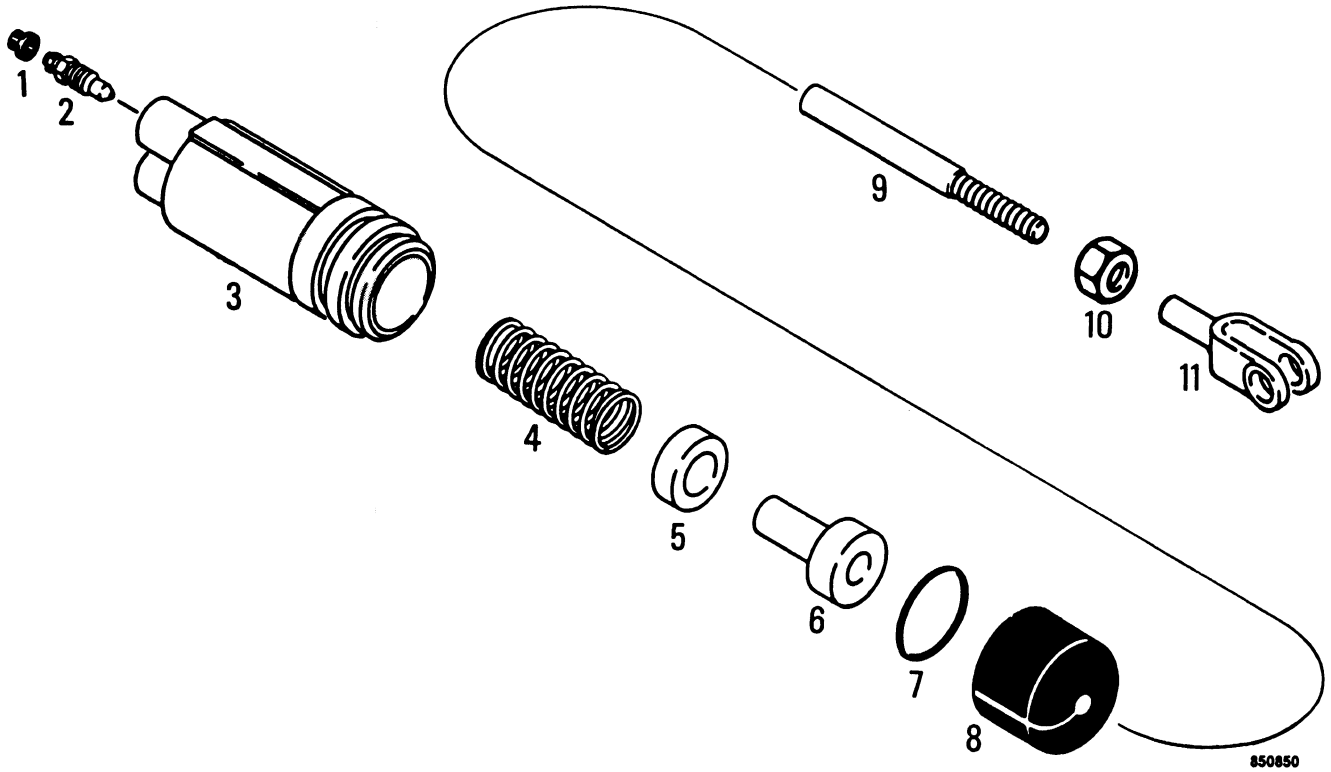
2. Apply clean brake fluid to the piston and seal. Put the seal on the piston and install into the cylinder body.

3. Install the retaining ring. Make sure the retaining ring is fully engaged in the groove.

4. Install the dust cover and the push rod.

Installation

To prevent distortion of the cylinder body, tighten the U-clamp only enough to hold the cylinder in position.

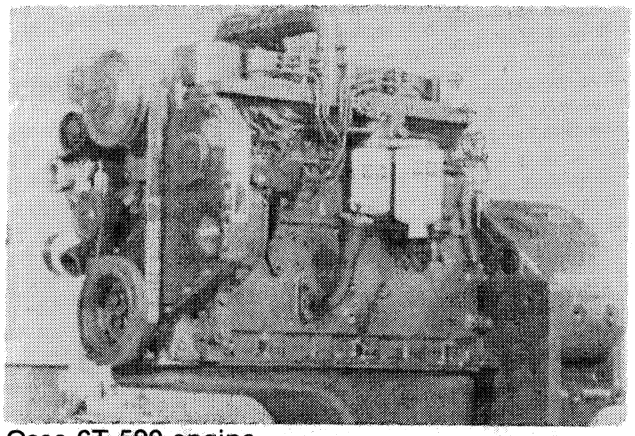


1. *Cover*
2. *Air Removal Screw*
3. *Body*
4. *Spring*
5. *Seal*
6. *Piston*
7. *Retaining Ring*
8. *Dust Cover*
9. *Push Rod*
10. *Nut*
11. *Clevis*

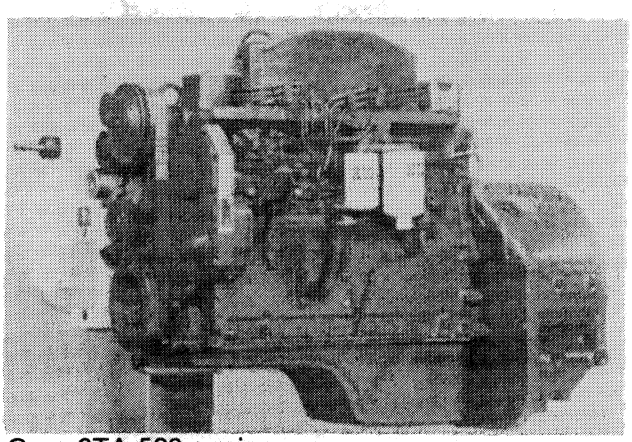
Slave Cylinder

SERVICING THE FUEL SYSTEM
Injection Pump Removal

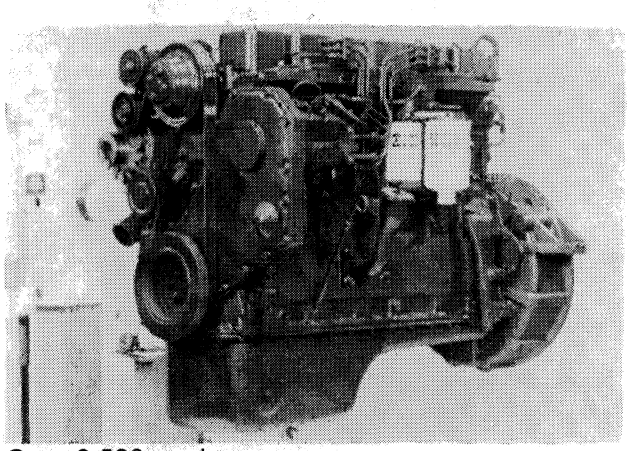
STEP 1



Case 6T-590 engine.

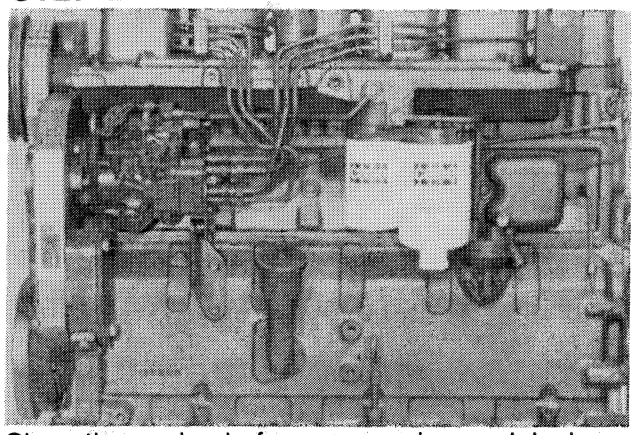


Case 6TA-590 engine.



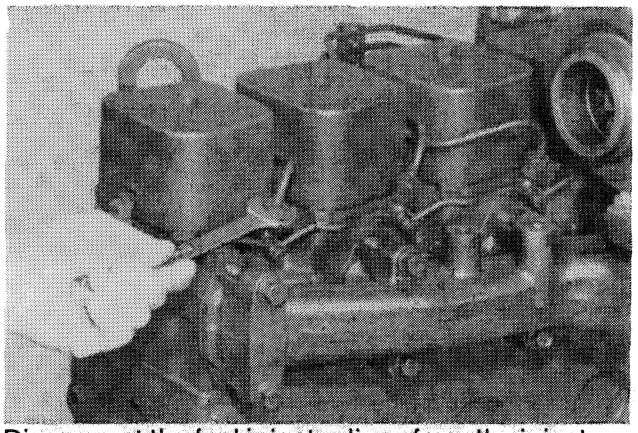
Case 6-590 engine.

STEP 2



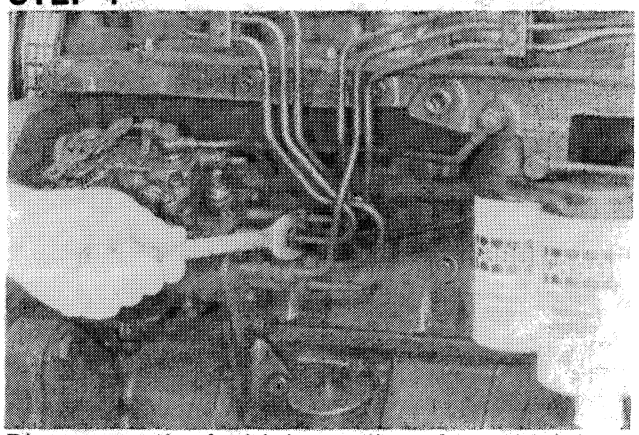
Clean the engine before any service work is done on the fuel system.

STEP 3



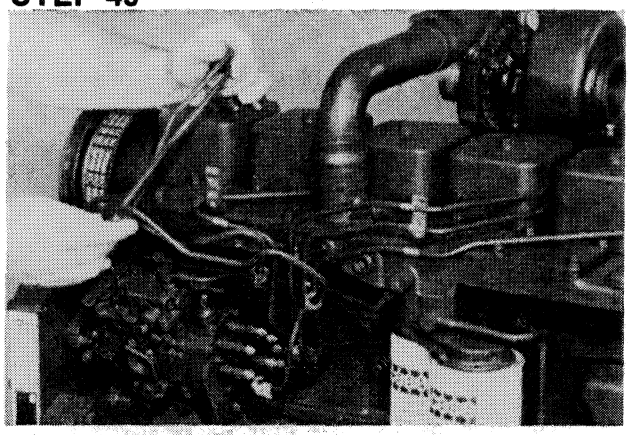
Disconnect the fuel injector lines from the injector.

STEP 4



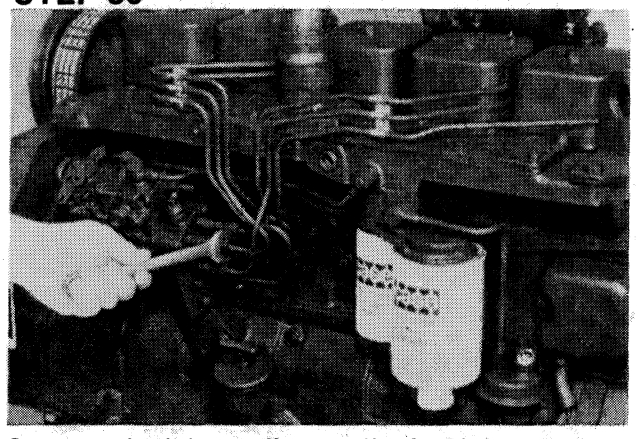
Disconnect the fuel injector lines from the injection pump.

STEP 49



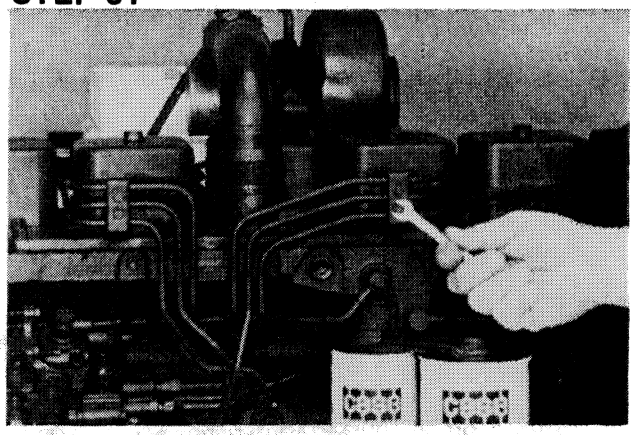
Remove the dust covers and install the injector lines.

STEP 50



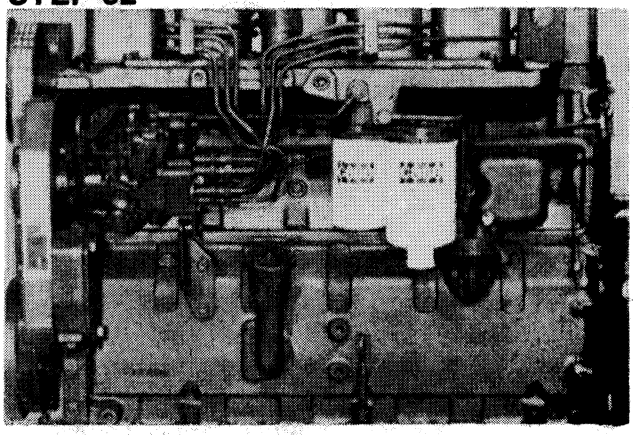
Connect the injector lines to the fuel injectors and the injection pump. Tighten the injector lines a small amount.

STEP 51



Install the fuel line brackets and tighten.

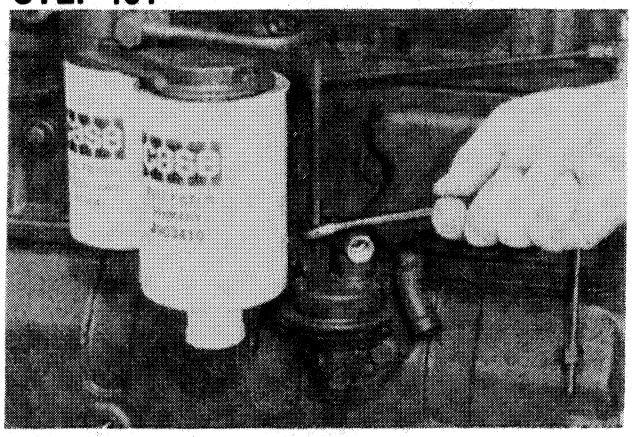
STEP 52



To remove the air from the fuel system see Section 3410 in the service manual.

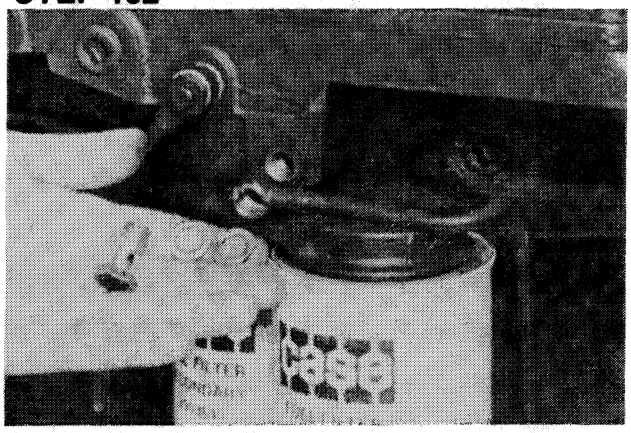
PRIMER PUMP
Removal

STEP 101



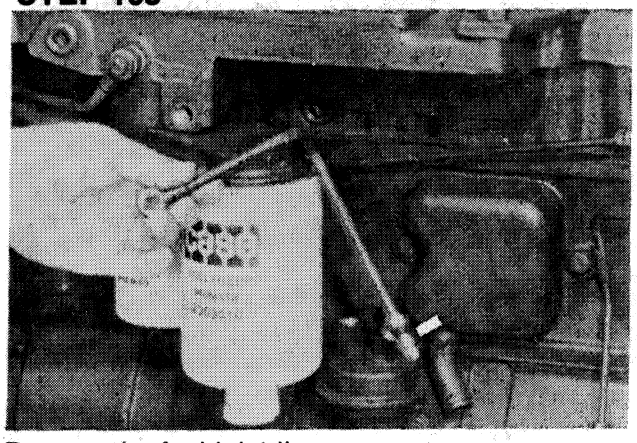
Disconnect the fuel inlet line from the primer pump.

STEP 102



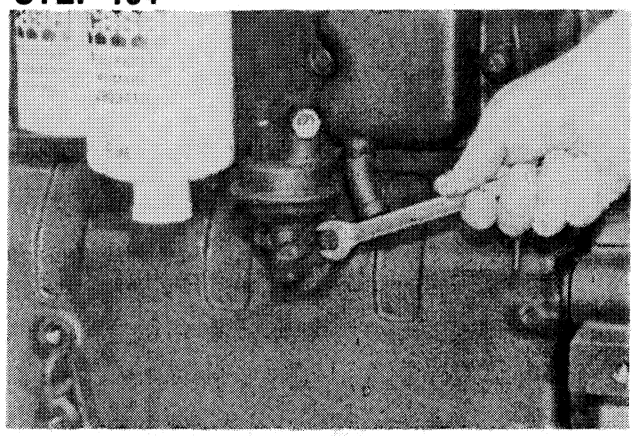
Remove the fitting and gaskets from the fuel inlet line.

STEP 103



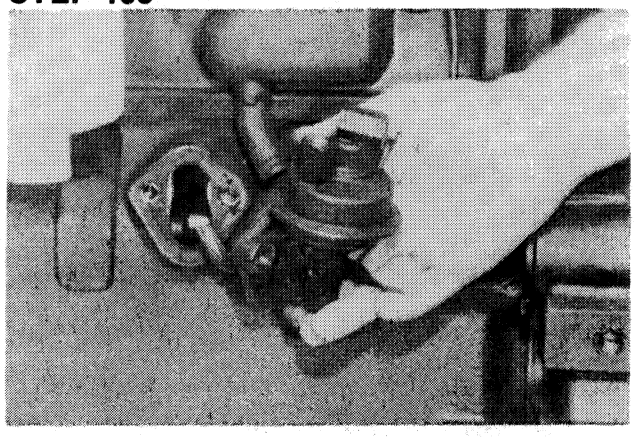
Remove the fuel inlet line.

STEP 104



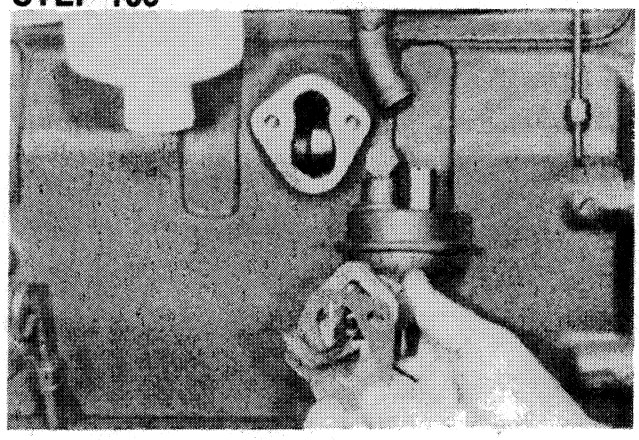
Remove the bolts that hold the primer pump to the engine block.

STEP 105



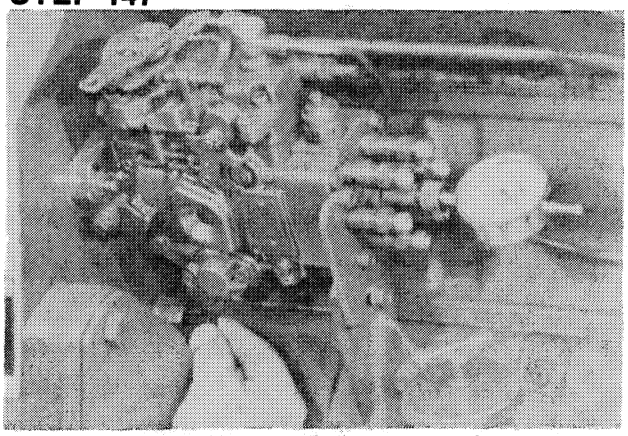
Remove the primer pump from the engine block.

STEP 106



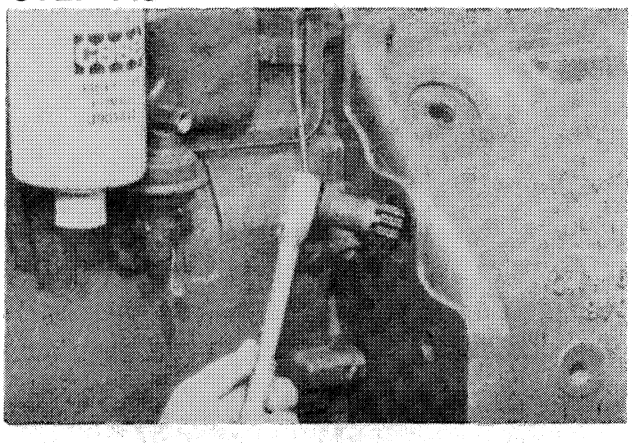
Remove the gasket from the primer pump.

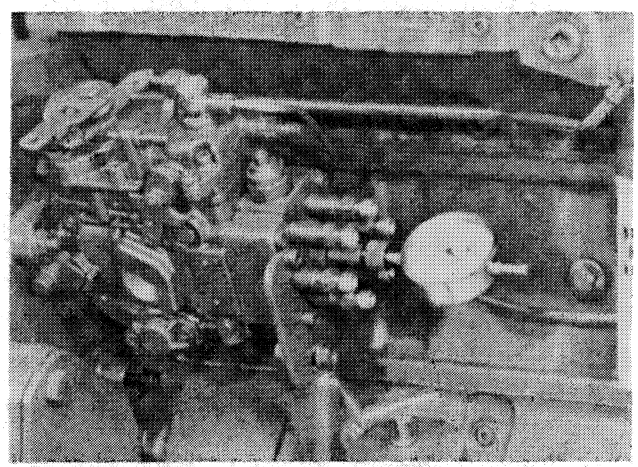
STEP 147



Pull the timing pin out of the camshaft gear.

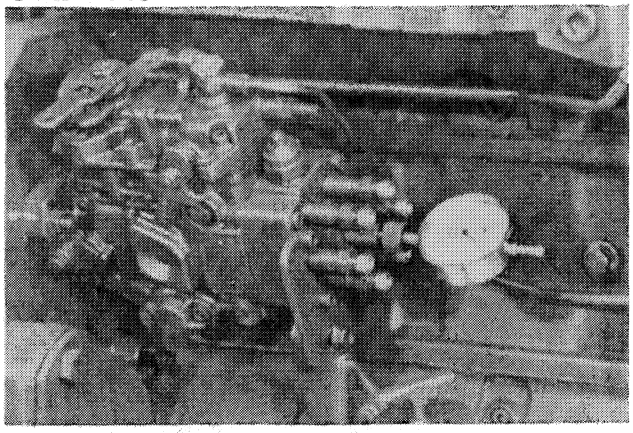
STEP 148





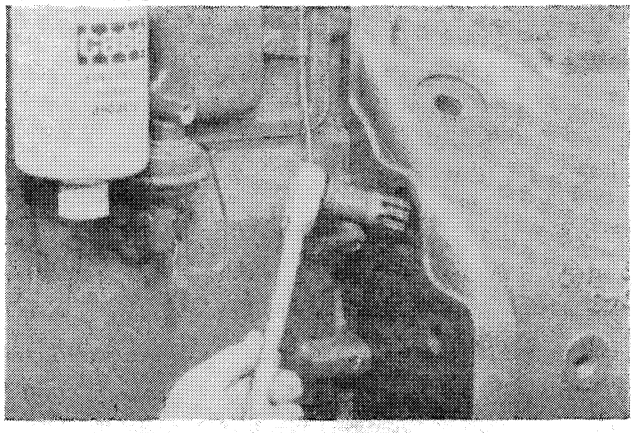
Install the engine turn over tool into the flywheel housing and turn the engine counterclockwise until there is no movement in the dial indicator.

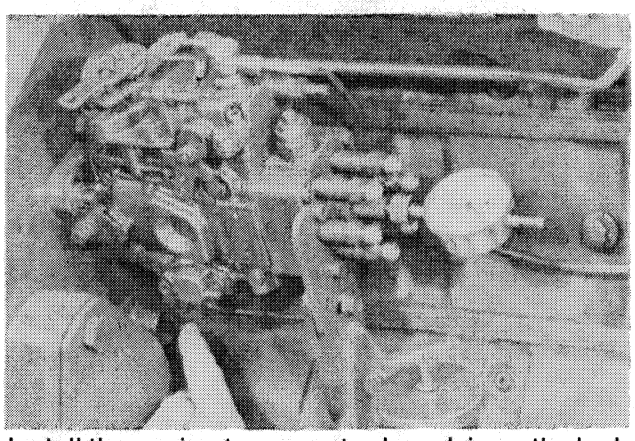
STEP 149



Turn the dial indicator dial to zero.

STEP 150





Install the engine turn over tool, push in on the lock pin and turn the engine clockwise until the lock pin engages into the camshaft gear. The dial indicator should read 1.50 mm. If the reading is correct go to Step 153.

OPERATING PROCEDURES

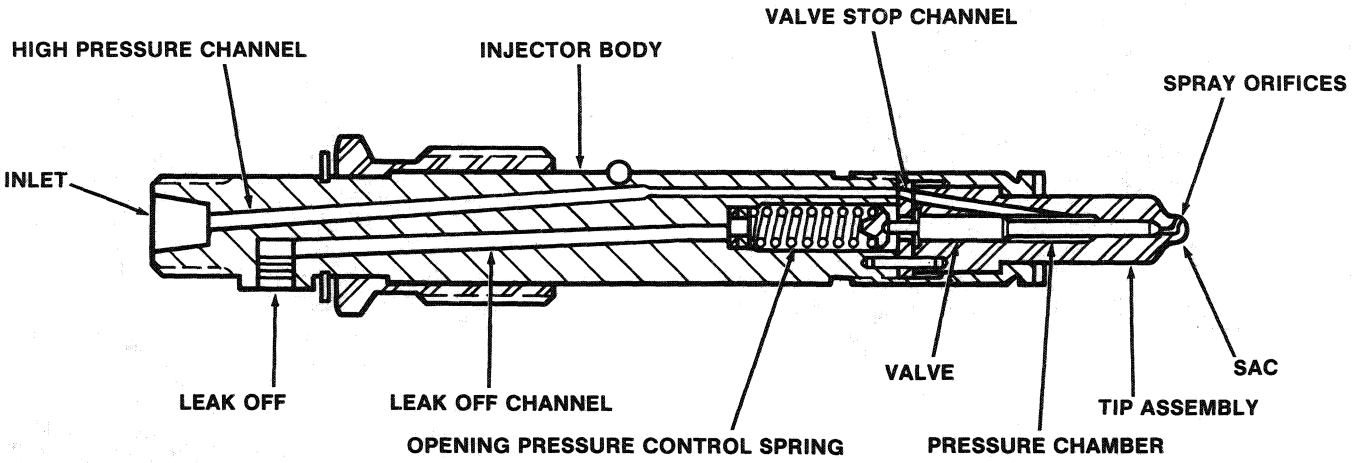
The operation of the injector is easy and positive.

A measured quantity of fuel under high pressure moves from the injection pump to the high pressure channel in the injector body. The fuel then moves through the valve stop channel and enters the pressure chamber which is around the valve in the injector tip.

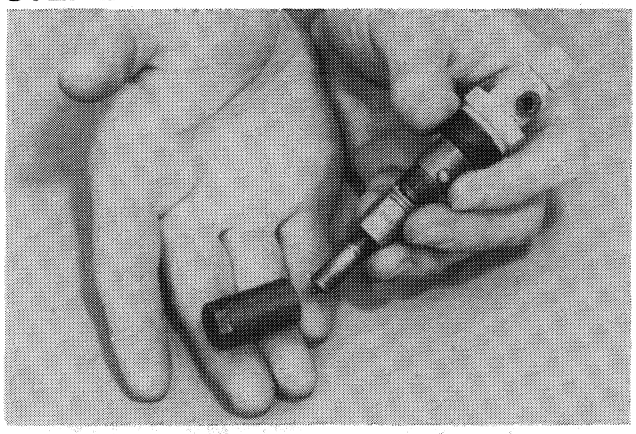
When the pressure of the fuel against the valve is more than the set spring orifice, the valve is moved from the seat. This permits the fuel under high pressure to enter the injector tip. The fuel then moves through the spray orifices and to the combustion chamber. The fuel reaches the combustion chamber in an atomized condition.

When the fuel delivery stops, the pressure against the valve is decreased and the control spring immediately returns the valve to the seat. This removes the danger of leakage, after the measured amount of fuel has been released. The valve opens and closes very rapidly with a very clear noise.

A small amount of fuel leaks, during injection, through the controlled clearance between the tip assembly and the injector body. This leakage adds lubrication to all the moving parts in the injector. This fuel then moves through the leak off channel, leak off lines and returns to the fuel tank.



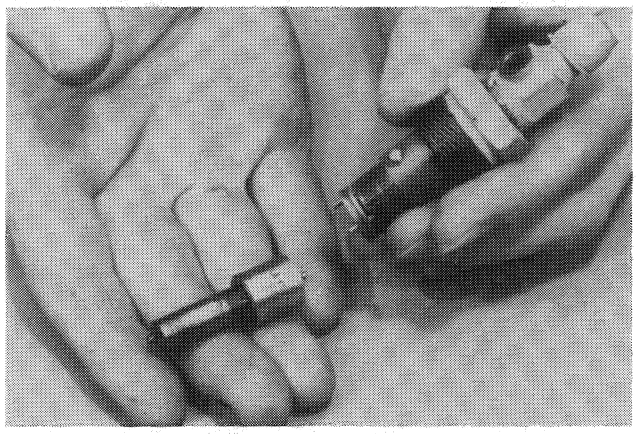
STEP 24



Loosen and remove the nozzle cap nut.

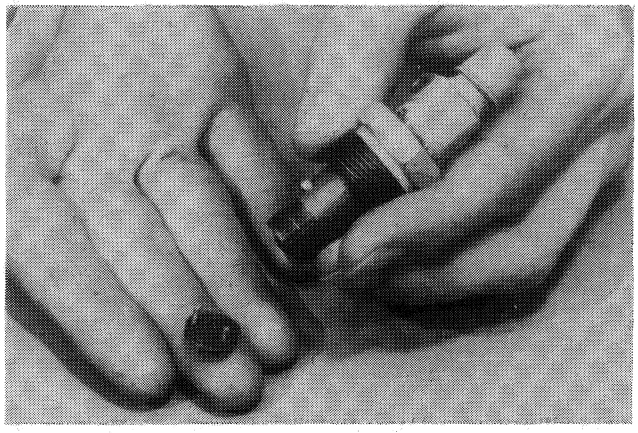
NOTE: *The injector parts have tight tolerances. Dirt will damage a smooth surface. Keep the work location and tools clean. Disassemble and assemble all parts carefully to prevent damage.*

STEP 25



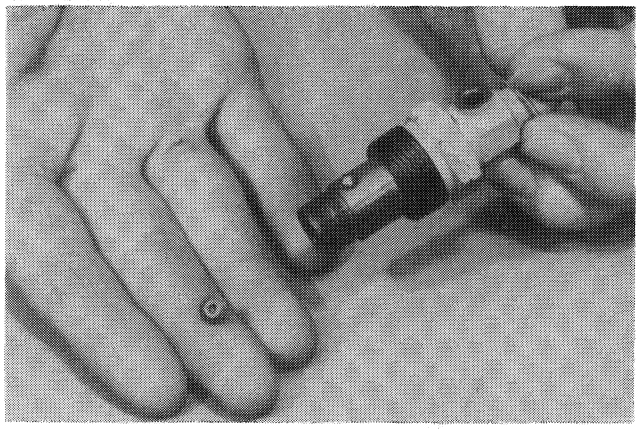
Remove the nozzle assembly.

STEP 26



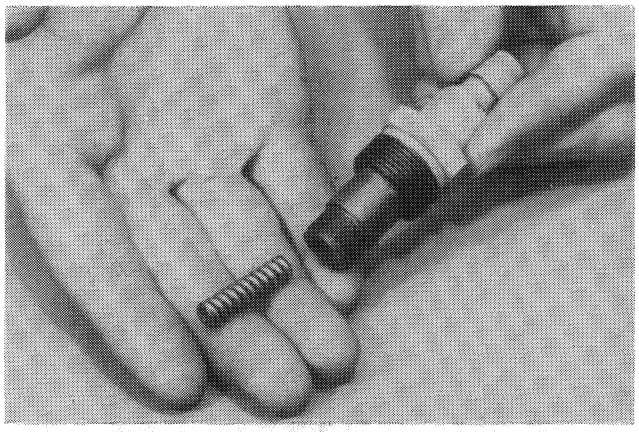
Remove the valve stop assembly.

STEP 27



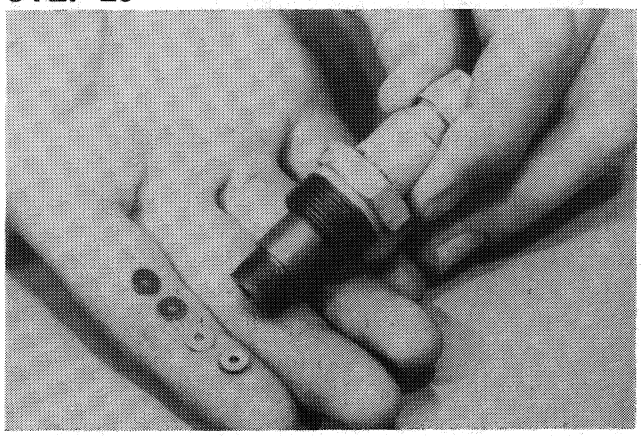
Remove the pressure spring seat.

STEP 28



Remove the pressure spring.

STEP 29



Remove the pressure adjusting shims.

Alternator

PROBLEM	POSSIBLE CAUSE	CORRECTION
Noise coming from the alternator.	Damaged or worn drive belt.	Install new drive belt.
	Damaged or loose pulley on the alternator.	Remove the pulley and check for damage to the rotor shaft and pulley. Install new parts as necessary. Tighten nut to specification in Section 4007.
	Worn or damaged bearings in the alternator.	Disassemble the alternator and replace the bearings as necessary. See Section 4007.
	Short circuit in the rectifier diodes.	Disassemble the alternator and do the diode tests in Section 4007.
	Short circuit in the stator.	Look for burned insulation on the stator coils. Also, do the stator tests in Section 4007.

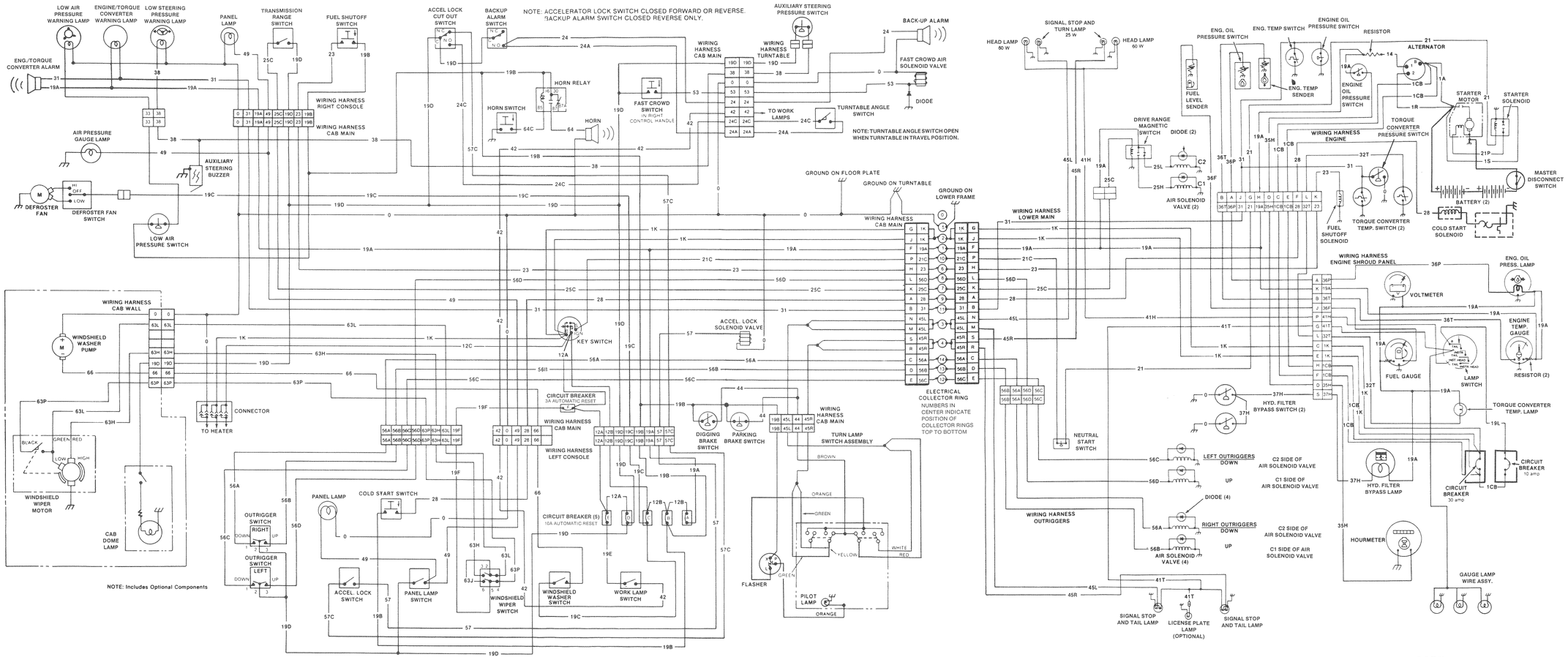
Transmission Range

Current from circuit breaker A goes through the normally closed contacts of the transmission range magnetic switch and energizes the solenoid on the LOW side of the air solenoid valve. The solenoid shifts the spool in the air solenoid valve so that air pressure is applied to the closed end of the air cylinder. As the air cylinder extends, the air cylinder shifts the transmission into the LOW position.

When the transmission range switch is closed, current from circuit breaker D goes to the transmission range magnetic switch. The normally open contacts in the transmission range magnetic switch are then closed and the current goes to the HIGH side of the air solenoid valve. The solenoid shifts the spool in the air solenoid valve so the air pressure is applied to the rod end of the air cylinder. As the air cylinder retracts, the air cylinder shifts the transmission into the HIGH position.

PROBLEM	POSSIBLE CAUSE	CORRECTION
Transmission will not shift	Master disconnect switch in the OFF position.	Turn the master disconnect switch to the ON position.
	Key switch in the OFF position.	Turn the key switch to the ON position.
	Circuit breaker open.	Reset circuit breaker A for the LOW range circuit. Reset circuit breaker D for the HIGH range circuit.
	Not enough air pressure.	See Section 7102 and troubleshoot the air system.
	Linkage between the air cylinder and the transmission is disconnected.	Connect the linkage.
	Damaged air cylinder.	See Section 7108 and repair or replace the air cylinder.
	Loose connections or damaged wire in the drive range circuit.	See the electrical schematic in this section and make repairs as necessary.
	Bad connection at the collector ring.	See Section 4016 and and repair the connection.
	Bad transmission range switch.	Replace the transmission range switch.
	Bad transmission range magnetic switch.	Replace the transmission range magnetic switch.
	Bad solenoid in air solenoid valve.	Replace solenoid.
	Restriction in an exhaust port of the air solenoid valve.	Remove the restriction.
	Damaged air solenoid valve.	Replace the air solenoid valve.
	Damaged transmission.	See Section 6116 and repair the transmission.

Continued on next page



Electrical Schematic

SPECIFICATIONS

Starter

Case part number A169694

Delco-Remy part number 1990499

No-load test at 80° F (27° C)
Volts 20

Current draw ..... 115 to 1175 amperes

Armature speed ..... 3000 to 4800 rpm (r/min)

Pinion clearance ..... .010 to .160 inch (0.25 to 4.06 mm)

Torque for Allen head screws for starter drive housing ..... 13 to 17 pound-feet (18 to 23 N m, 1.8 to 2.4 kg/m)

Lubricant ..... SAE 20 engine oil

Solenoid

Case part number A49756

Delco-Remy part number 1115594

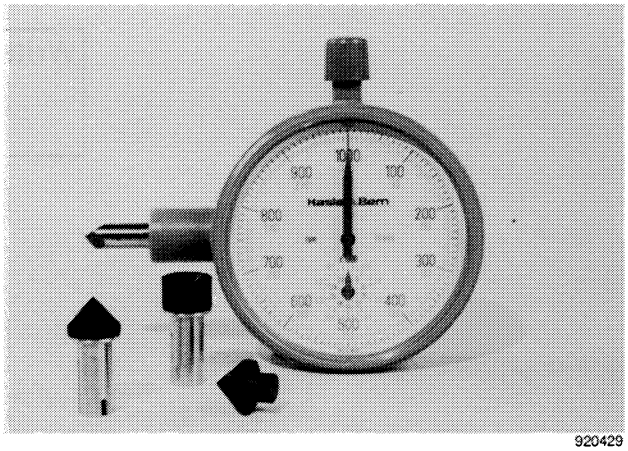
Hold-in coil test at 80° F (27° C) ..... 44.4 to 46.5 amperes at 20 volts

Pull-in coil test at 80° F (27° C) ..... 22.2 to 24.4 amperes at 5 volts

SPECIAL TOOLS

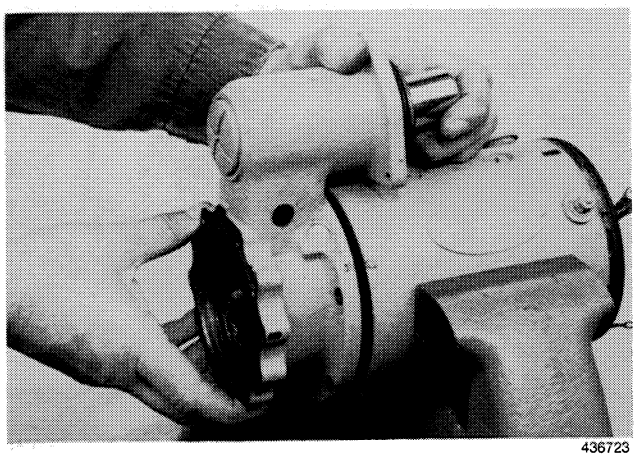
See Section 1001 for information about ordering special tools.

The mechanical revolution indicator is used during the No-Load Test. The part number is CAS-10067.



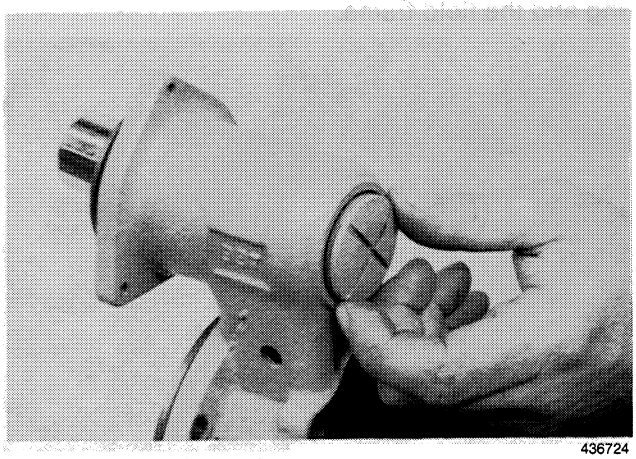
920429

25. Remove the shift lever housing.



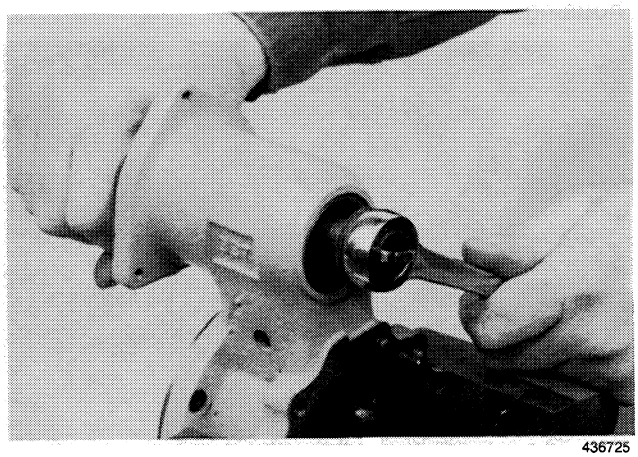
436723

26. Loosen and remove the plug.



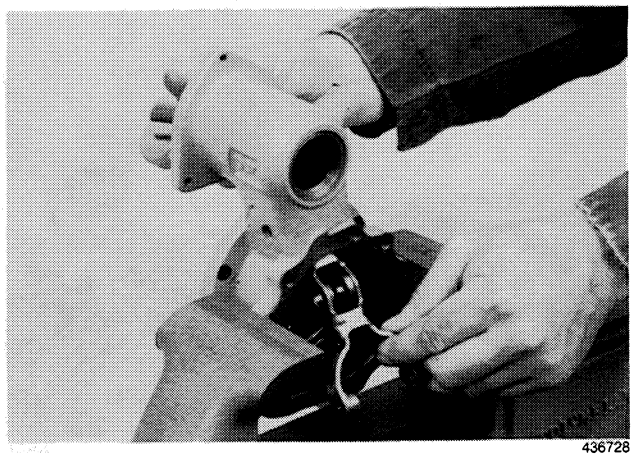
436724

27. Hold the plunger and remove the self-locking nut.



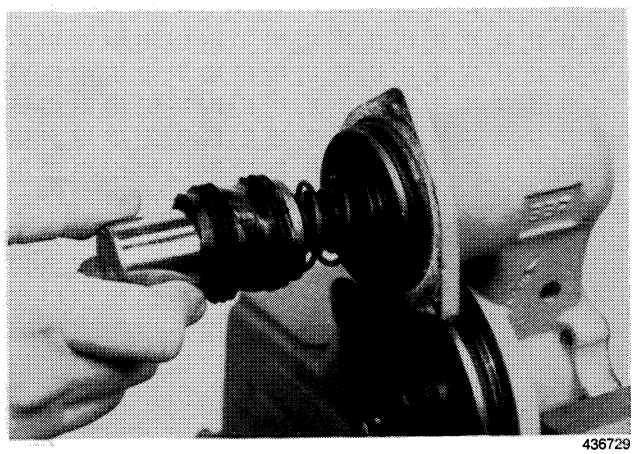
436725

28. Remove the shift lever.



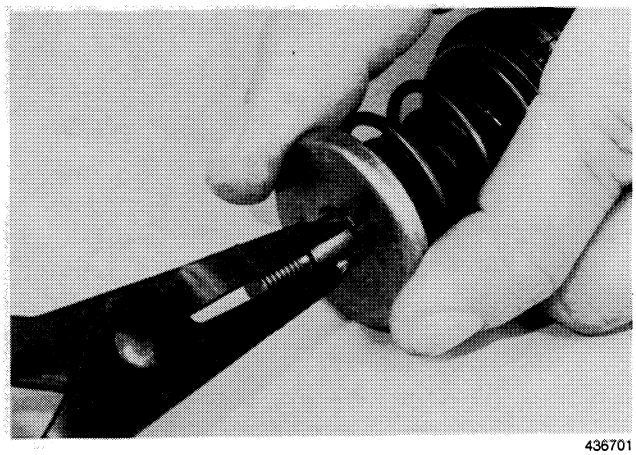
436728

29. Remove the plunger assembly.



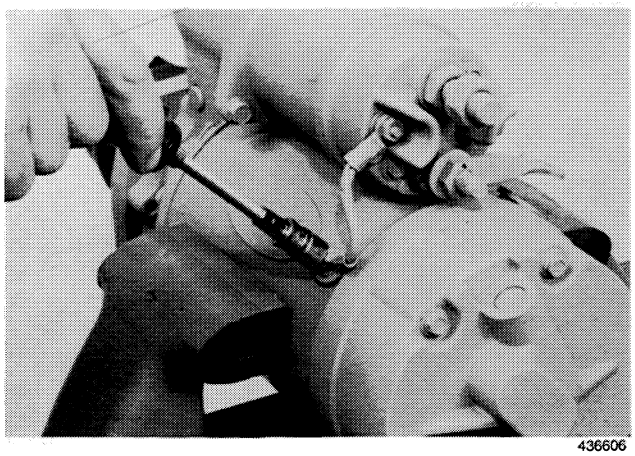
436729

30. Pull the spring seat against the spring tension and remove the snap ring.

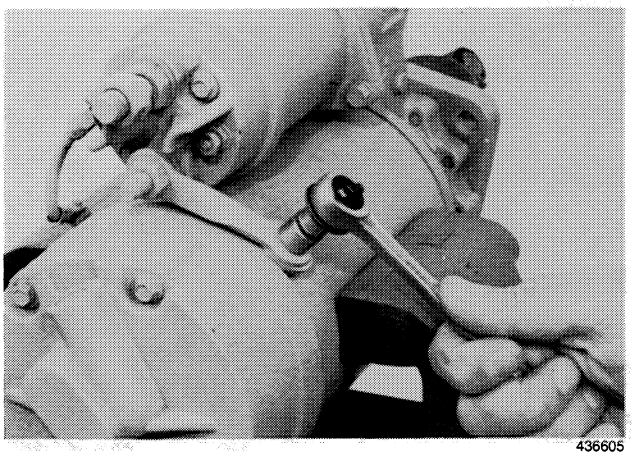


436701

32. Connect the ground lead.



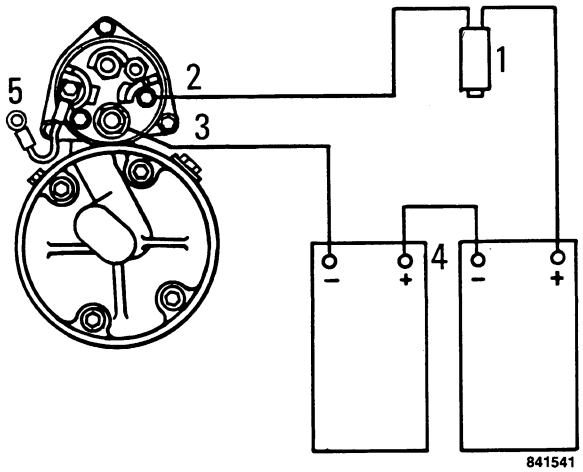
33. Connect the connector.



PINION CLEARANCE

The pinion clearance must be checked when a new starter drive is installed or when the position of the self-locking nut on the plunger is changed.

1. Connect two 12 volt batteries to the starter. Do not connect the ground lead to the motor terminal on the solenoid.

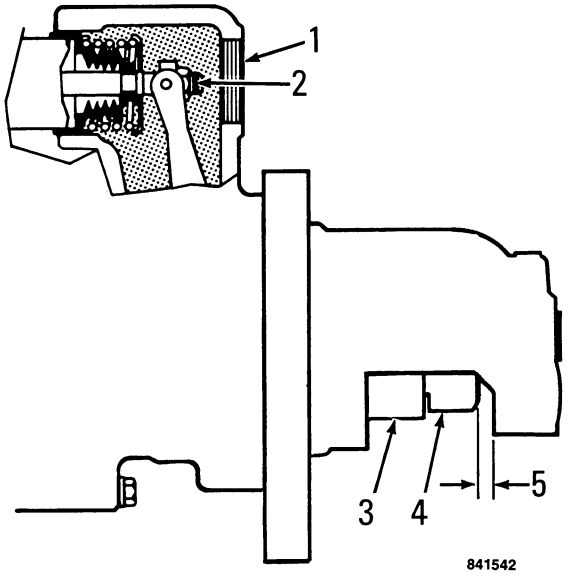


1. *Remote Switch*
2. *Switch Terminal*
3. *Motor Terminal*
4. *12 Volt Batteries*
5. *Ground Lead*

2. Push in and hold the button on the remote starter switch. The starter drive will move into the starting position. The starter drive will stay in the starting position until the button on the remote starter switch is released.

3. Push the starter drive toward the commutator on the armature to remove any end play in the shift lever linkage.

4. Measure the distance between the pinion and starter drive housing as shown below.

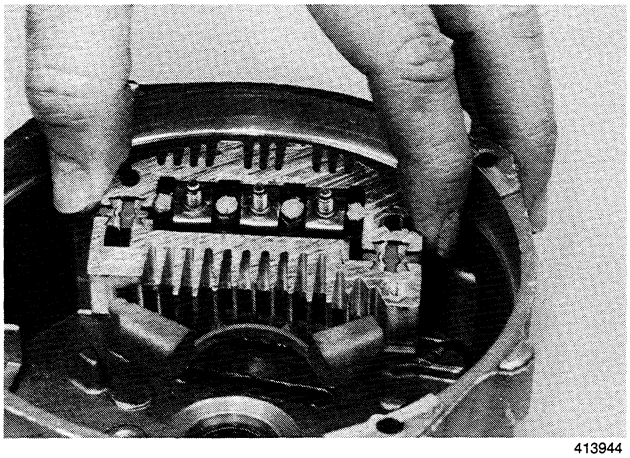


1. *Plug Removed*
2. *Turn Nut To Adjust Pinion Clearance*
3. *Starter Drive. Push Toward Armature To Remove Any Free Movement*
4. *Pinion*
5. *.010 To .160 (0.25 To 4.06 mm)*

5. Release the button on the remote starter switch.

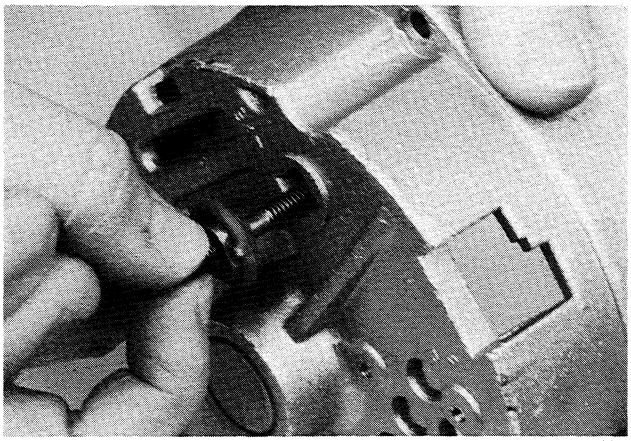
6. If the measurement was correct, go to step 8.

19. Remove the rectifier bridge.



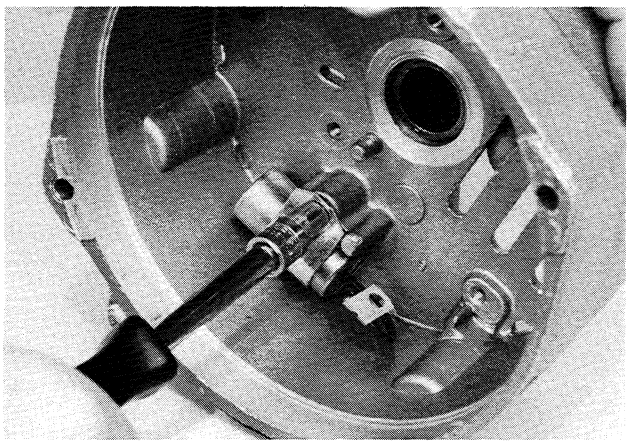
413944

20. Remove the BAT terminal and insulator.



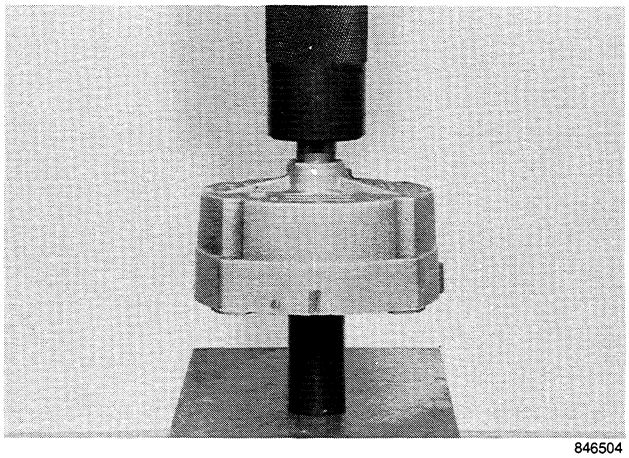
413901

21. If necessary, loosen and remove the cap screw that holds the condenser and remove the condenser.



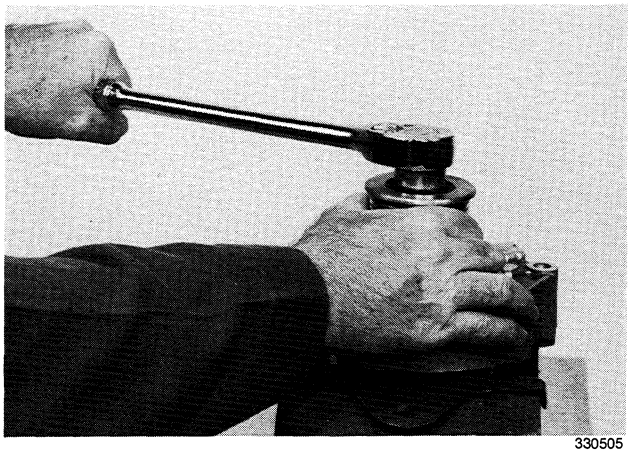
413902

22. Do not remove the bearing from the rear housing unless a new bearing is needed. Reasons for needing a new bearing are worn or damaged rollers or loss of grease. DO NOT try to lubricate the bearing. To remove the bearing, put the rear housing on a hollow support as shown and press the bearing out of the rear housing.



846504

23. Fasten the rotor in a vise that has soft jaws and loosen and remove the nut.

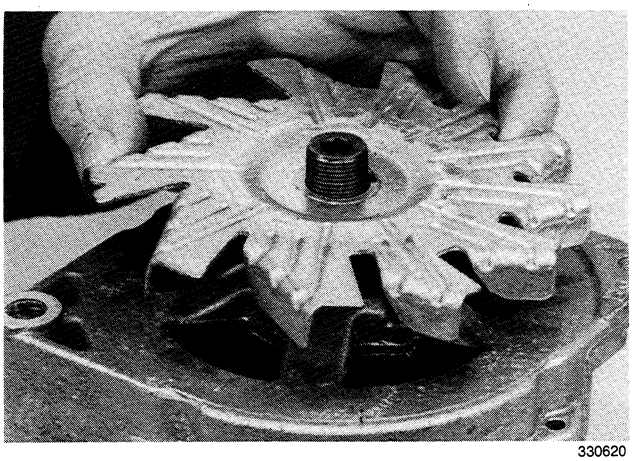


330505

24. Use a hammer and brass rod and hit the pulley to loosen the tapered bushing in the pulley.

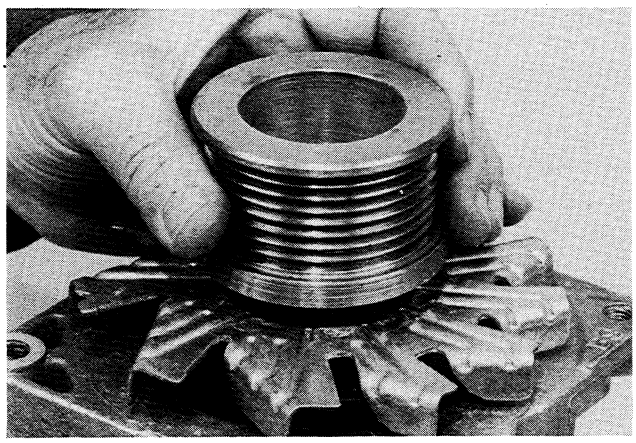
330618

29. Install the fan.



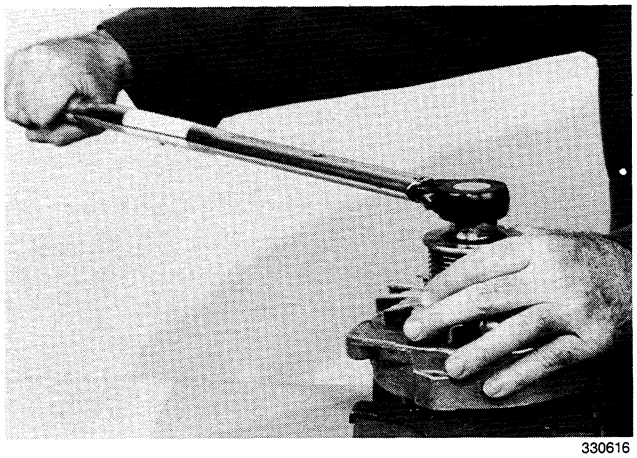
330620

30. Install the pulley, tapered bushing, and lock washer.



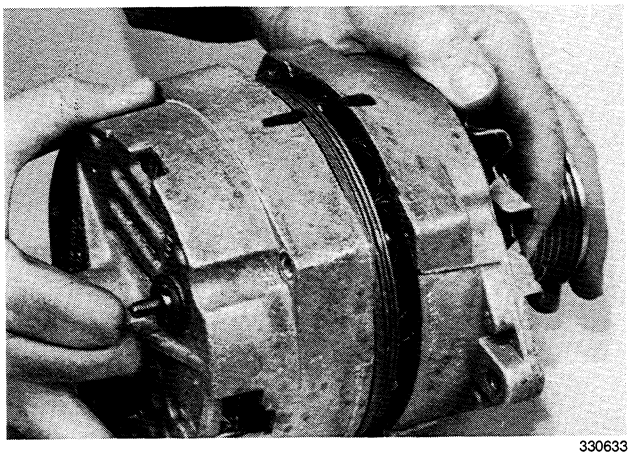
330619

31. Fasten the rotor in the vise with soft jaws and tighten the nut to 40 to 50 pound-feet (54 to 68 N m, 5 to 7 kg/m).



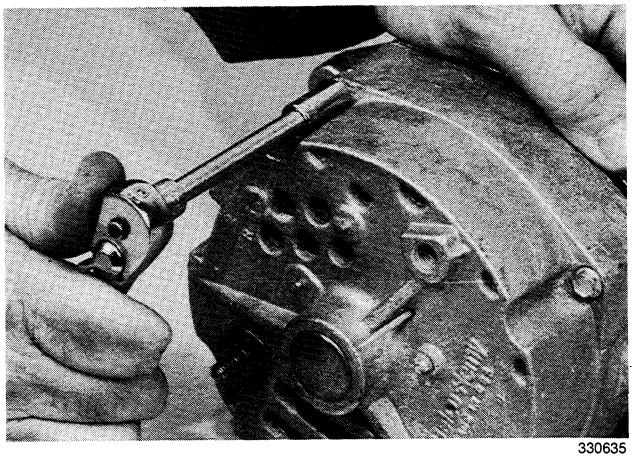
330616

32. Assemble the front and rear housings so that the alignment marks are aligned.



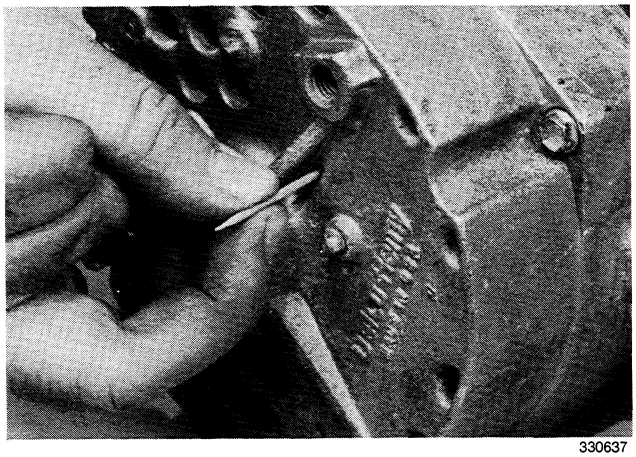
330633

33. Install and tighten the cap screws that hold the alternator together.

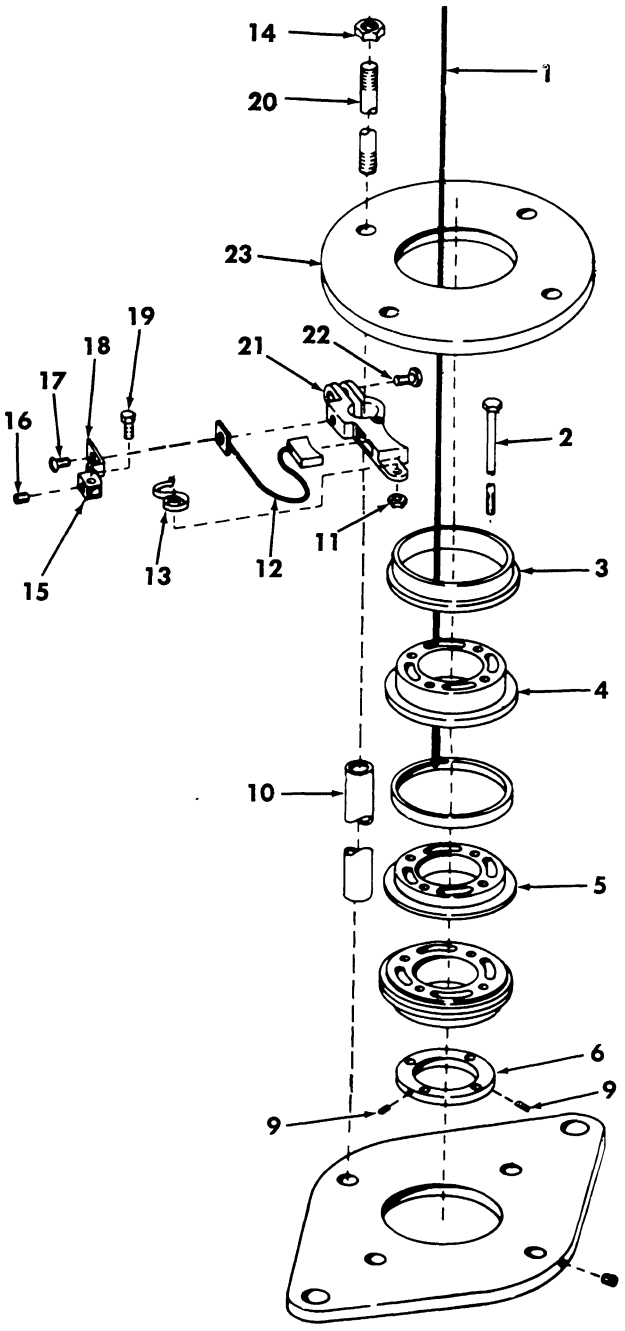


330635

34. Remove the toothpick.



330637



1. Brass Ring and Wire
2. Screw (Quantity of 4)
3. Insulator Ring (¼ inch barrier)
4. Bearing Ring
5. Insulator Ring
6. Collar
7. Bearing Plate and Mounting Ring
8. Set Screw
9. Set Screw (Quantity of 2)
10. Stud Insulator (Quantity of 2)
11. Nut
12. Brush
13. Spring
14. Nut
15. Connector
16. Set Screw
17. Screw
18. Connector
19. Screw
20. Stud (Quantity of 2)
21. Brush Holder
22. Screw
23. Bearing Plate

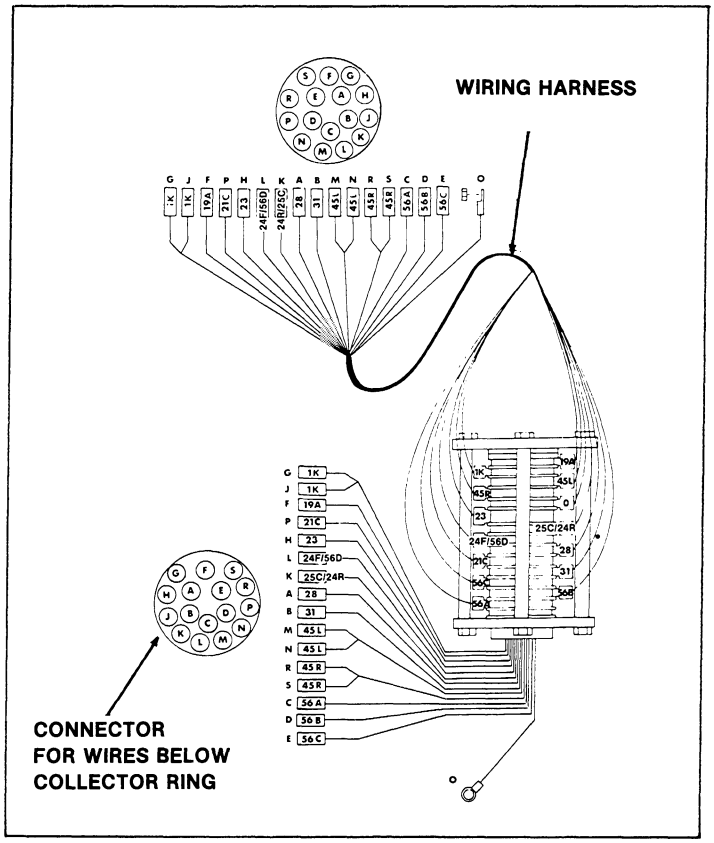
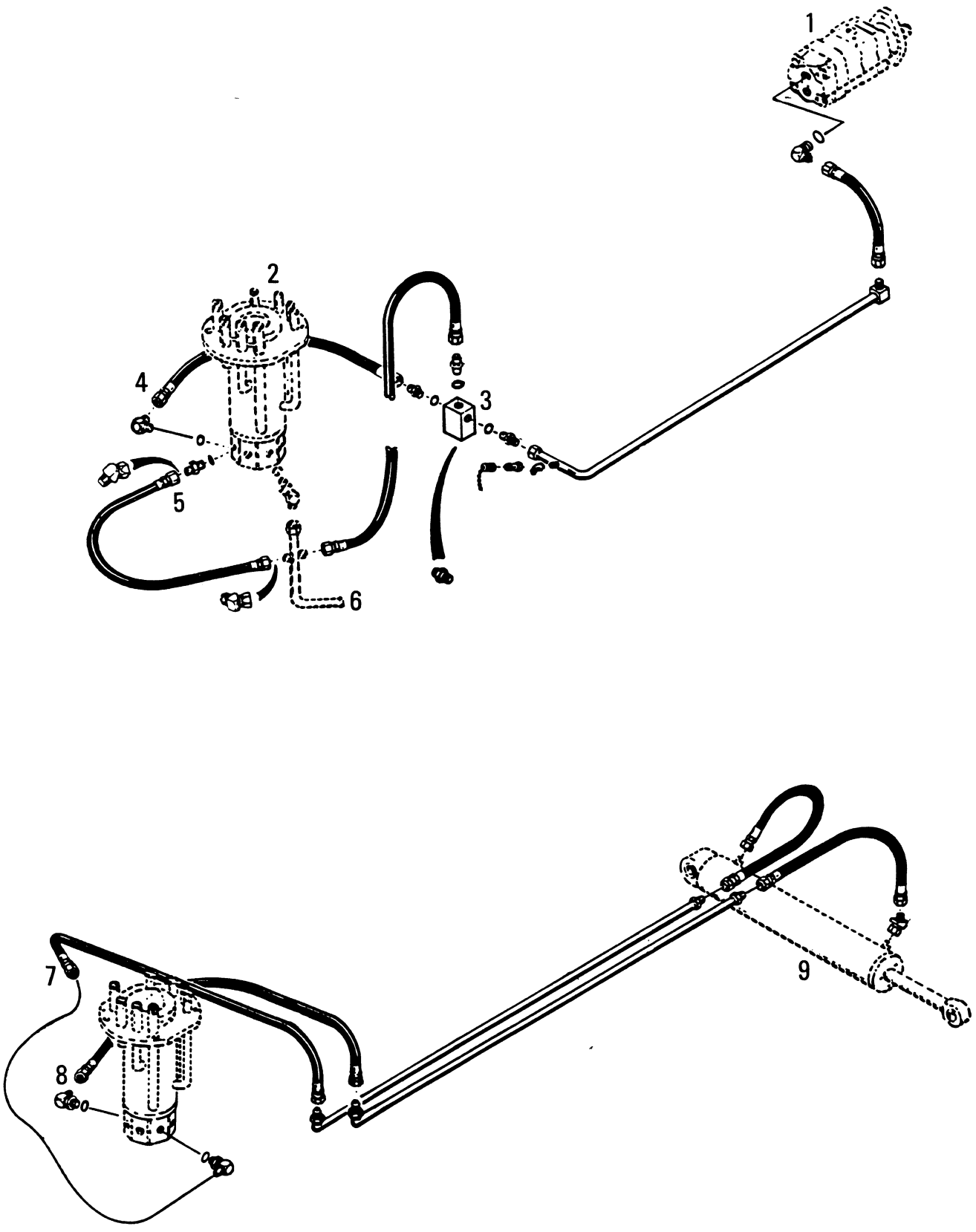


Figure 9. Collector Ring



1. *Hydraulic Pump*
2. *Hydraulic Swivel*
3. *Steering Relief Valve*
4. *To Port 6*
5. *To Port 7*
6. *To Tank*
7. *To Port 4*
8. *To Port 5*
9. *Steering Cylinder*

Steering Lower Hydraulic Circuit

Inspection

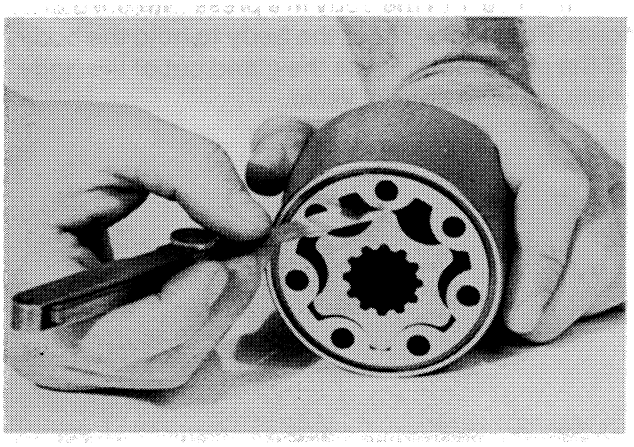
1. Discard the quad ring and seal.

2. Clean all parts in cleaning solvent. Put the parts on paper towels until the parts are dry. Do not use cloths to make the parts dry.

3. Check all machined surfaces for wear and damage.

4. If the spool, sleeve or the bore in the body of the steering control valve are damaged or worn, use a complete new steering control valve. The spool, sleeve or body of the steering control valve are not available separately.

5. Use a feeler gauge to measure the clearance between the rotor and stator. If clearance is more than .005 inch (0.17 mm), a new metering gear set must be used.



836717

6. If there are rough places on the ends of the stator, rotor, or on the machined surfaces on the body, end plate or spacer plate, make the parts smooth by using 600 grit emery cloth. Put the emery cloth on a surface that is flat. The surface must be as flat as a piece of plate glass. If the emery cloth is new, move a piece of steel across the emery cloth six times to remove the sharp pieces of grit. Move the rotor, stator, body, end plate or spacer plate across the emery cloth six times. Then check to see if the rough places have been removed. Use this method until all rough places have been removed. Make sure that the part is kept flat on the emery cloth as the part is moved across the emery cloth. Clean the parts in cleaning solvent to remove any grit from the parts.

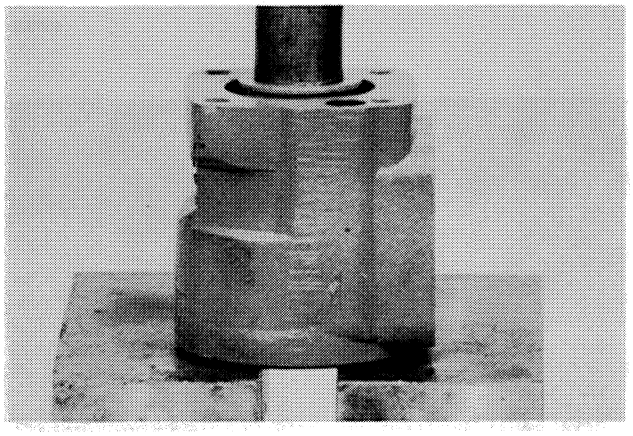
7. Check the steel ball for damage.

8. Check the seat for the check valve for wear and damage.

9. Check the washers and bearing for damage. Use new parts as needed.

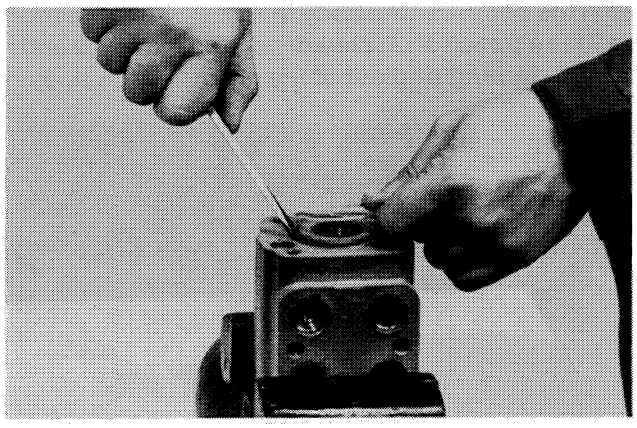
Assembly

1. If the gland was removed from the body, install a new O-ring in the bore for the gland. Put the body in a press. Push the gland into the body of the steering control valve until the gland stops moving.



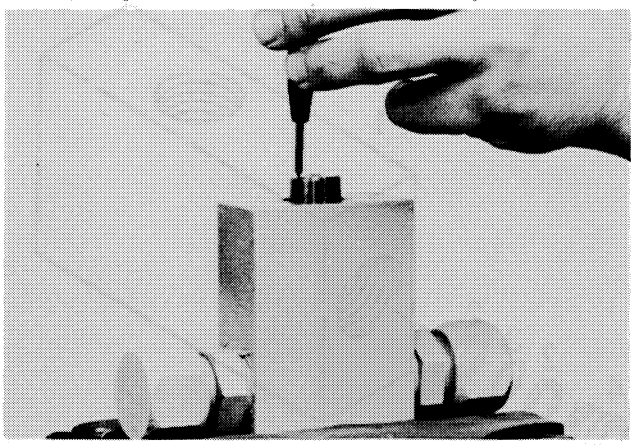
836017

2. Put the body of the steering control valve in a vise with the gland up. Use a screwdriver to start the end of the retaining ring into the groove in the body.



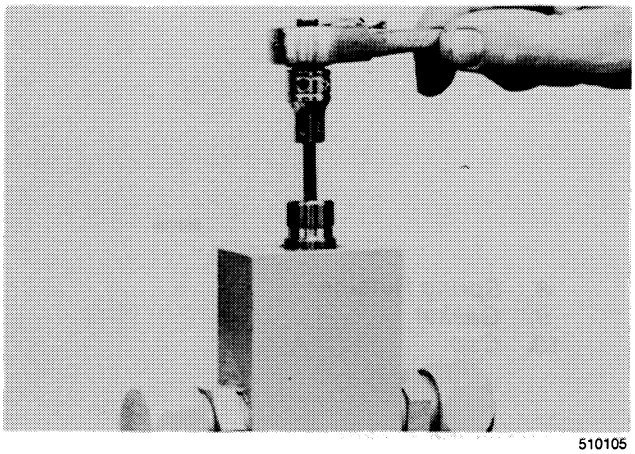
835917

3. Put an identification mark on the body and on the spring retainer for use in assembly.



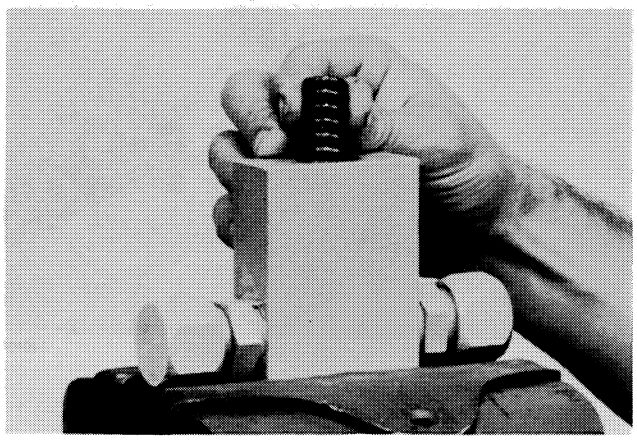
510103

4. Count the number of turns required to remove the spring retainer from the body. Remove the spring retainer from the body.



510105

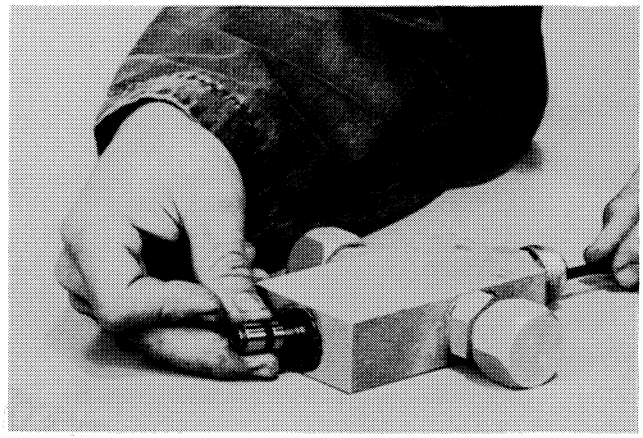
5. Remove the spring.



510107

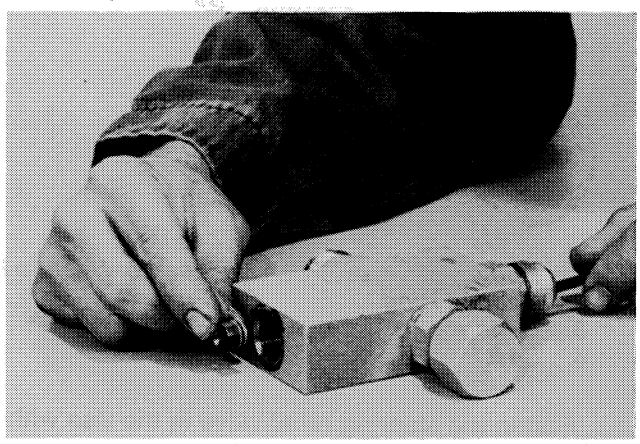
6. Remove the body of the steering relief valve from the vise.

7. Use an acceptable tool and push the piston from the body.



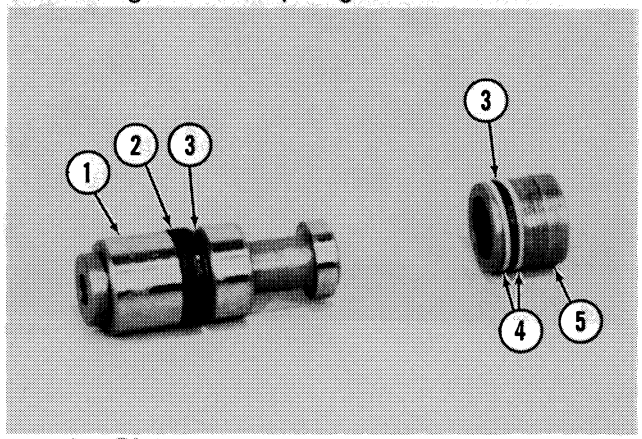
510110

8. Use an acceptable tool and push the seat from the body.



510112

9. Remove and discard the leather backup ring and O-ring from the piston. Remove and discard the O-ring and backup rings from the seat.



510114

1. *Piston*
2. *Leather Backup Ring*
3. *O-ring*
4. *Backup Ring*
5. *Seat*

NOTE: The CASE CORPORATION reserves the right to make improvements in design or changes in specifications at any time without incurring any obligation to install them on units previously sold.

PROBLEM	POSSIBLE CAUSE	REMEDY
Oil becomes too hot	Low oil level.	Fill to correct level. See page 6102-6.
	Loose connections in suction lines for charging pump	Check and tighten suction line connections.
	Worn oil sealing rings in converter.	Repair as required. See Section 6110.
	Worn charging pump.	Replace charging pump.
	Restriction of oil cooler or cooling lines	Check and clean oil cooler and lines.
Torque converter is noisy	Worn charging pump.	Replace charging pump.
	Bad bearings.	Replace bearings. Section 6110.
	Damage to converter blades or worn gears	Repair as required. Section 6110.
Loss of power	Problem in engine or torque converter.	If the hydraulic system works correctly, test the torque converter as instructed
Oil in engine flywheel housing	O-ring between impeller cover and impeller damaged.	Disassemble converter and replace O-ring. See Section 6110.
	Oil baffle O-ring or oil seal damaged	Replace O-ring. See Section 6110.
	O-ring on plug in bore of impeller cover has damage.	Replace O-ring. See Section 6110

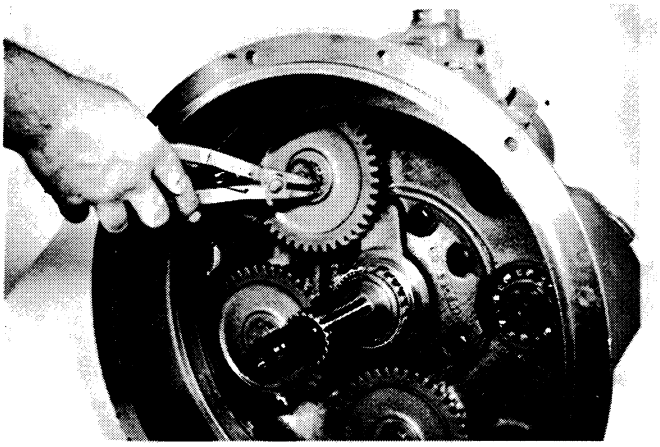


Figure 24
Remove pump drive gear retainer ring.

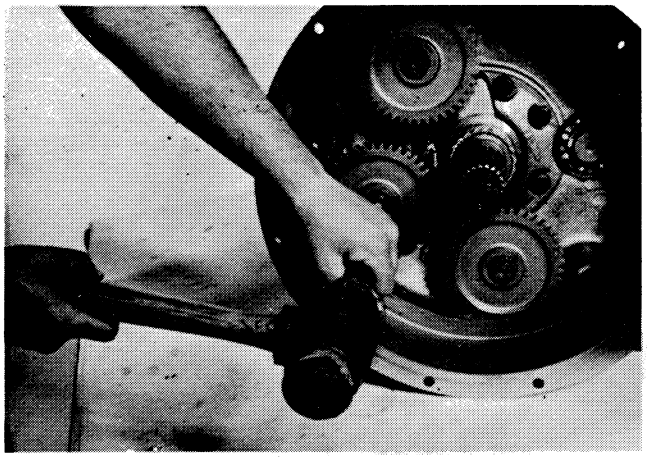


Figure 25
Tap on pump shaft. Remove pump drive gear.

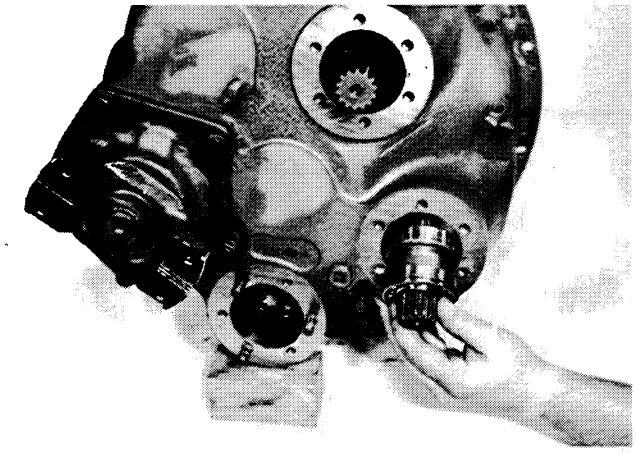


Figure 26
From rear of housing remove pump drive shaft and bearing assembly.

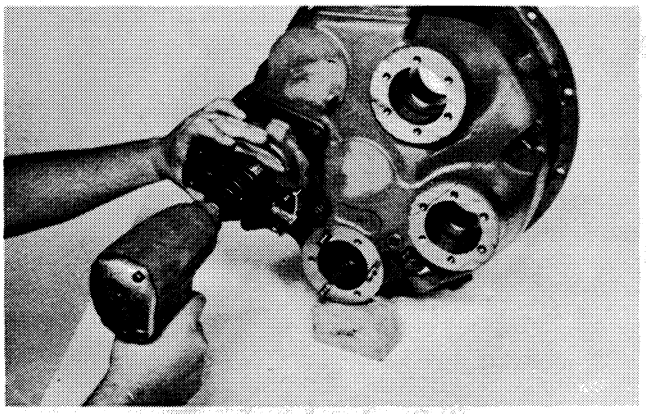


Figure 27
Using an impact wrench (if available) remove output flange nut. If impact wrench is not available a flange retainer bar must be used to hold flange from turning while removing flange nut.

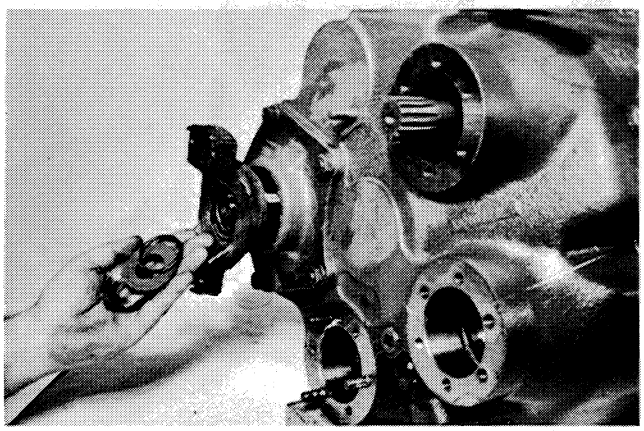


Figure 28
Remove flange nut, washer, o-ring and flange from output shaft.

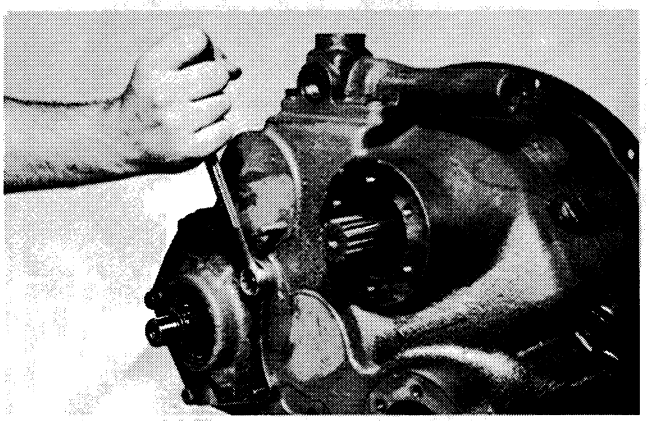


Figure 29
Remove output shaft bearing retainer bolts, stud nuts and washers.

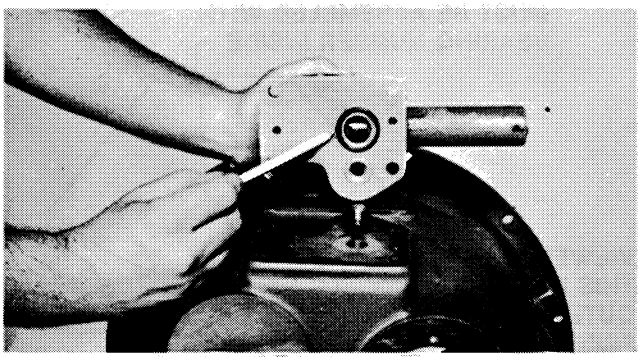


Figure 63

Install new gasket on converter housing, and new o-ring on valve housing. Position valve assembly on converter housing.

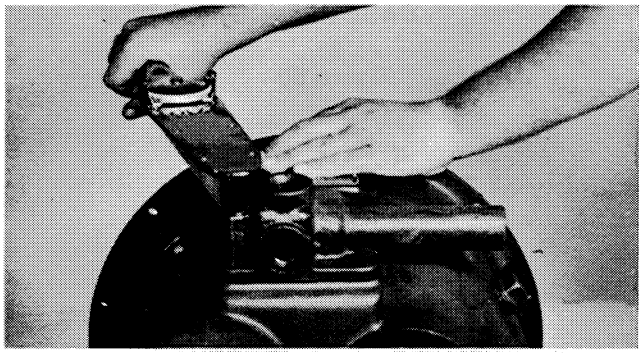


Figure 64

Install valve screws and lockwashers. Tighten 23 to 25 lb-ft (31-34 Nm).

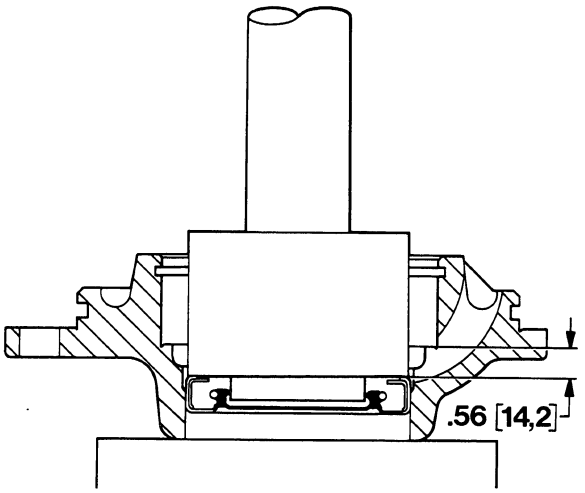


Figure 65

Apply a light coat of Permatex on the outer diameter of the output shaft oil seal. Press oil seal in bearing retainer from inside of retainer as shown and to dimension shown. See assembly instruction, page 6110-15.

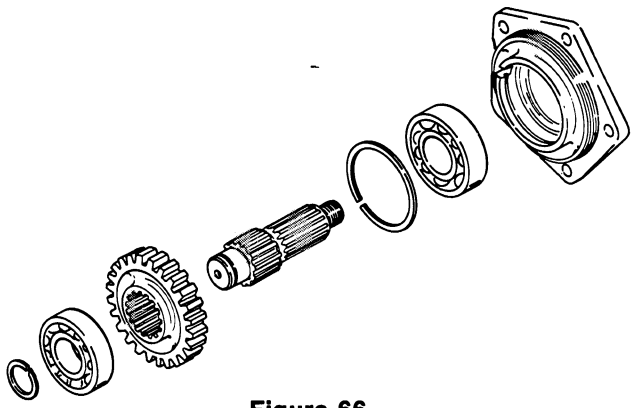


Figure 66

Press outer rear bearing in bearing retainer. Secure with retainer ring. Press output shaft into bearing retainer. Use caution as not to damage oil seal. Position output gear on shaft. Press front output bearing on shaft. **Use bearings with full inner race shoulder only. Do not use bearing with seal or shield grooves on inner race.** Install bearing retainer ring.

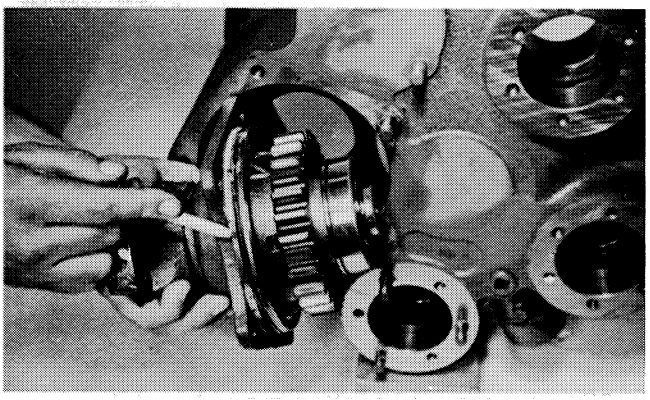


Figure 67

Install output flange, o-ring, washer and flange nut. Tighten nut 200 to 250 lb-ft (271-239 Nm) torque. Install new o-ring on output shaft bearing retainer. Position output assembly on converter housing.

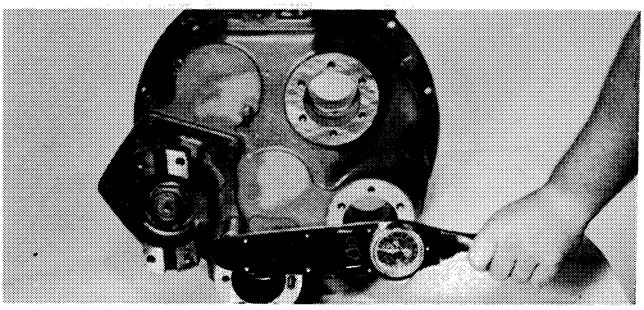


Figure 68

Install lockwashers, capscrews and stud nuts. Tighten stud nuts 41 to 45 lb-ft (56-61 Nm) torque. Tighten capscrews 37 to 41 lb-ft (50-56 Nm) torque.

TABLE OF CONTENTS

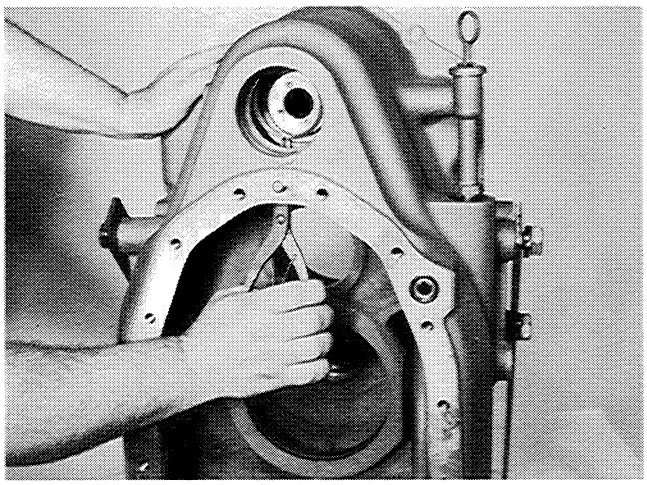


Figure 41
Remove forward clutch shaft drive gear retainer ring. See Figure 42.

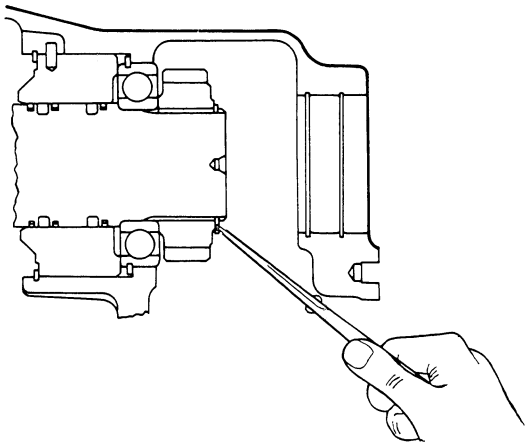


Figure 42

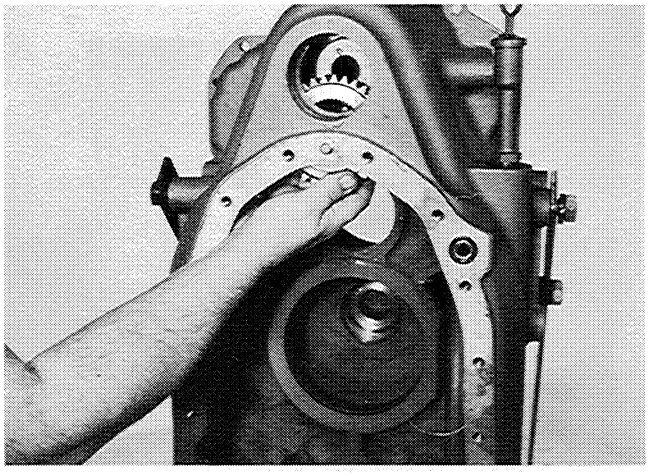


Figure 43
Remove forward clutch shaft drive gear.

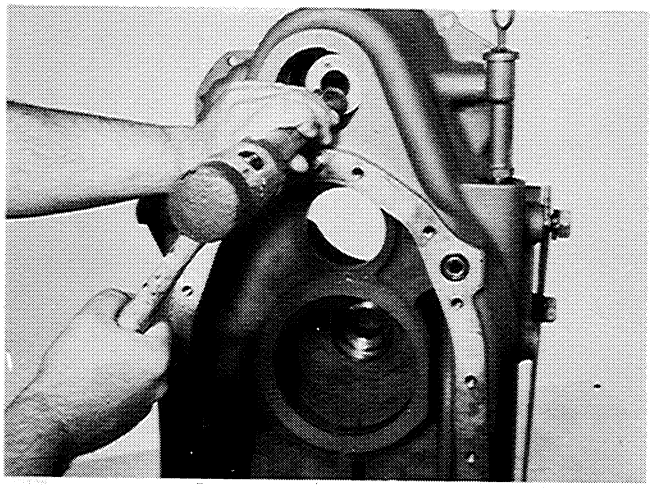


Figure 44
Tap forward clutch from rear bearing.

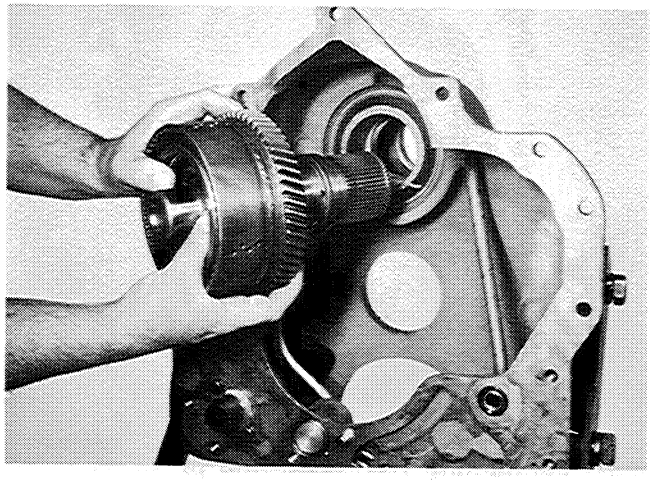


Figure 45
Remove forward clutch assembly.

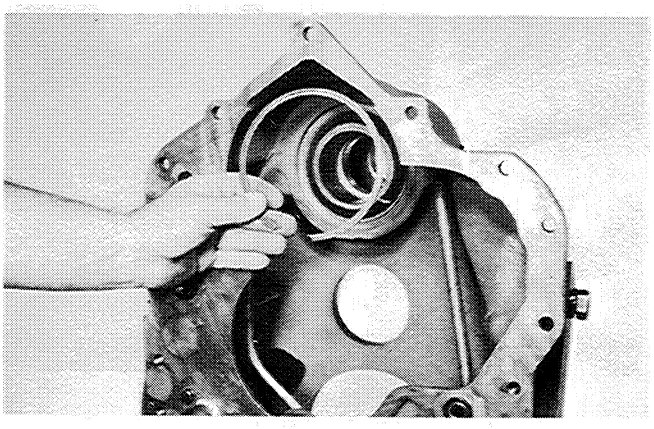


Figure 46
Remove forward clutch piston ring sleeve retainer ring.

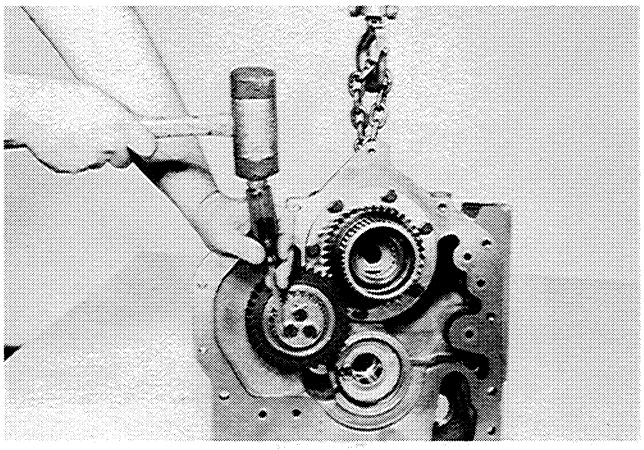


Figure 100
Straighten lockplate tabs from idler gear capscrews.

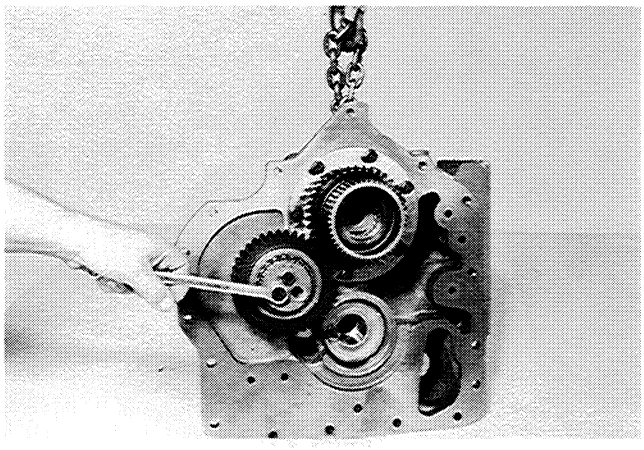


Figure 101
Remove idler gear capscrews.

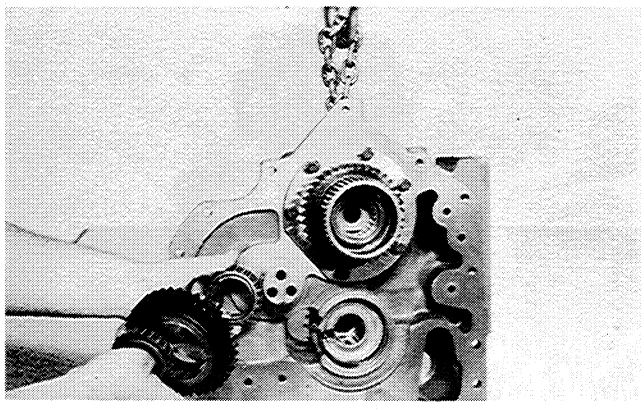


Figure 102
Remove idler gear, outer taper bearing, bearing spacer and inner taper bearing.

NOTE: Keep bearing spacer with inner and outer bearings as this is a pre-selected spacer for proper bearing pre-load.

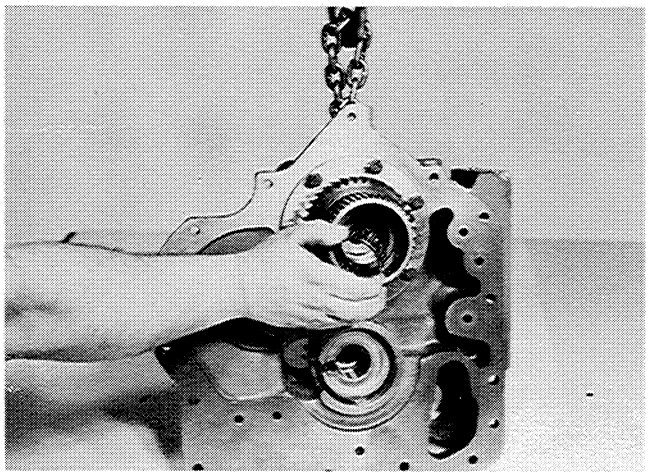


Figure 103
Remove forward clutch shaft pilot bearing.

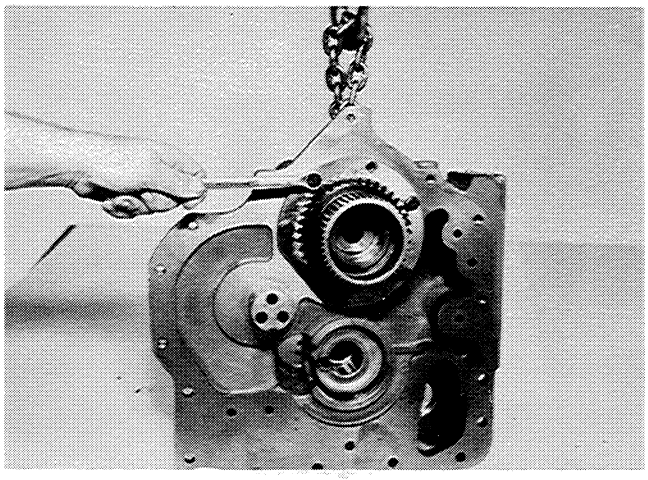


Figure 104
Remove input shaft retainer plate capscrews.

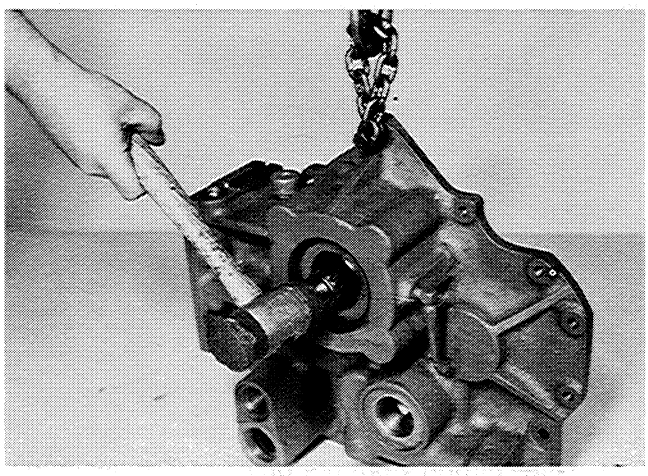


Figure 105
Tap input shaft and bearing assembly from housing.

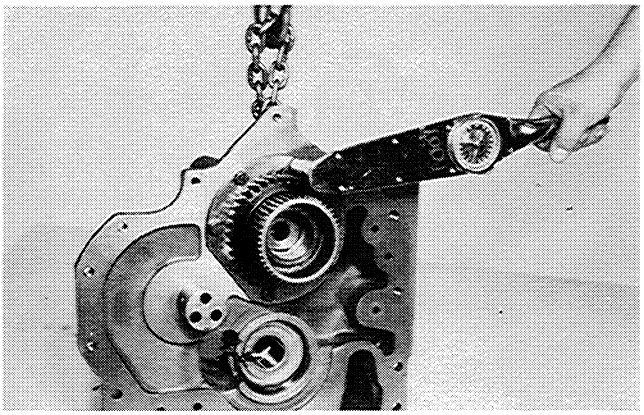


Figure 118

Install retainer plate capscrews and washers. Tighten capscrews 23 to 25 lb-ft (31-34 Nm) torque.

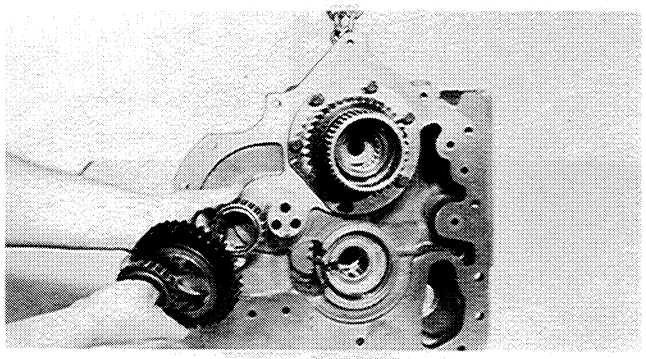


Figure 119

Position reverse idler inner bearing and bearing spacer on shaft. Locate idler gear on shaft and bearing.

NOTE: Long hub of gear out. Install outer taper bearing in gear.

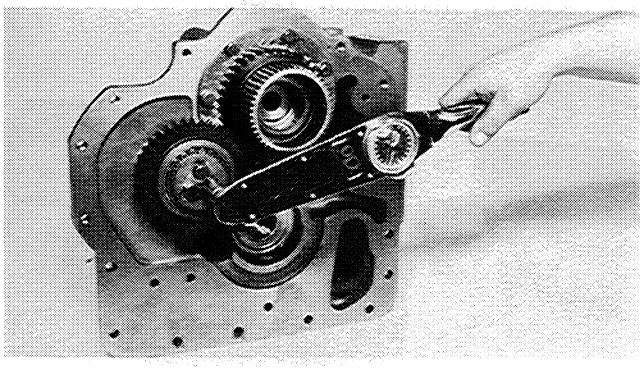


Figure 120

Install bearing retainer plate, lock plate and idler gear capscrews. Tighten capscrews 37 to 41 lb-ft (50-56 Nm) torque. Bend lockplate tabs over capscrew heads to prevent loosening.

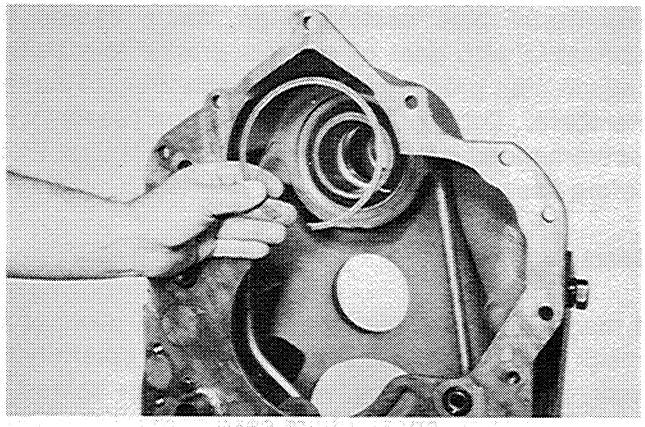


Figure 121

Tap forward clutch shaft rear bearing into bearing bore with bearing snap ring toward front of housing. Align roll pin in forward clutch shaft piston ring sleeve with groove in housing. Tap sleeve into position and secure with sleeve retainer ring.

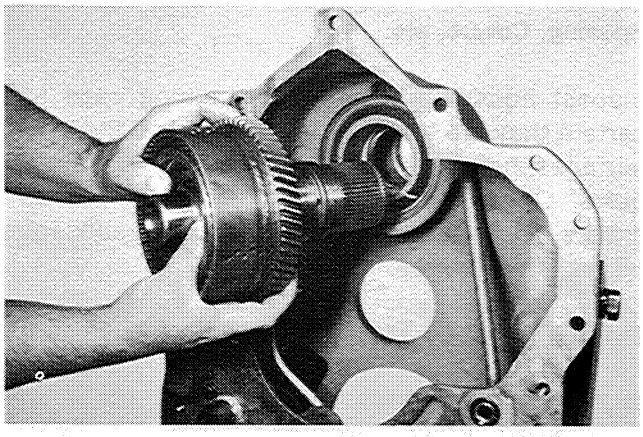


Figure 122

Position forward clutch assembly into transmission housing. Use caution as not to damage forward shaft piston rings.

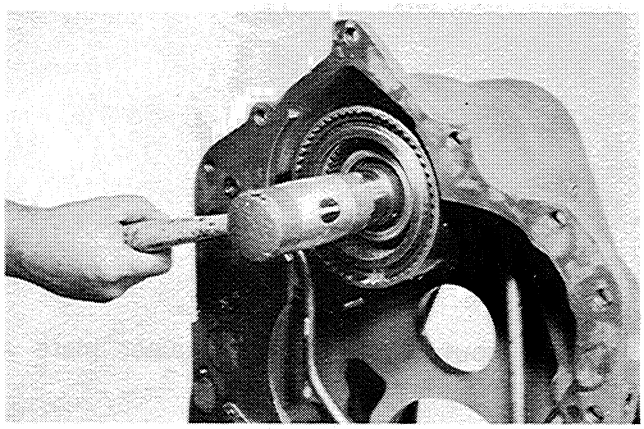


Figure 123

Tap clutch assembly into position.

SERVICING MACHINE AFTER TRANSMISSION OVERHAUL

The transmission, torque converter, and its allied hydraulic system are important links in the drive line between the engine and the wheels. The proper operation of either unit depends greatly on the condition and operation of the other; therefore, whenever repair or overhaul of one unit is performed, the balance of the system must be considered before the job can be considered complete.

After the overhauled or repaired transmission has been installed in the machine, the oil cooler, and connecting hydraulic system must be thoroughly cleaned. This can be accomplished in several manners and a degree of judgment must be exercised as to the method er

The following are considered steps to be taken:

1. Drain engine system thor

2. Disconnect and clean all l Where feasible, hydraulic lines emoved from machine for cleanin

3. Replace oil filter elemen lt filter cases thoroughly.

4. The oil cooler must be th ed. The cooler should be "back oil and compressed air until all ial has been removed. Flushing i normal oil flow will not adequate ooler. If necessary, cooler assemb emoved from machine for cleaning, using oil, compressed air and steam cleaner for that purpose. **DO NOT** use flushing compounds for cleaning purposes.

5. Remove drain plug from torque converter and inspect interior of converter housing, gears, etc. If presence of considerable foreign material is noted, it will be necessary that converter be removed, disassembled and cleaned thoroughly. It is realized this entails extra labor; however, such labor is a minor cost compared to cost of difficulties which can result from presence of such foreign material in the system.

6. Reassemble all components and use only type oil recommended in lubrication section. Fill transmission through filler opening until fluid comes up to **LOW** mark on transmission dipstick.

   Run engine two minutes at 500-600 RPM to prime torque converter and hydraulic lines. Recheck level of fluid in transmission with engine running at idle (500-600 RPM).

   Add quantity necessary to bring fluid level to **LOW** mark on dipstick. Recheck with hot oil (180-200° F) [82, 2-93, 3° C].

   Bring oil level to **FULL** mark on dipstick.

7. Recheck all drain plugs, lines, connections, etc., for leaks and tighten where necessary.

TABLE OF CONTENTS

Differential Case

1. If a new bearing is to be installed on the ring gear case half, press on the new bearing using an OTC No. 12 driver, Figure 20. Press bearing down until it contacts the shoulder on the case.

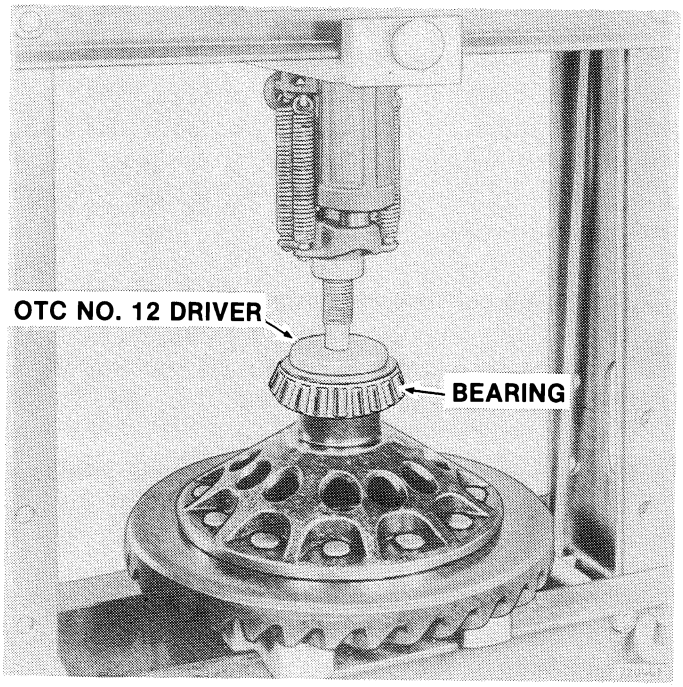


Figure 20. Bearing Installation

2. If a new bearing is to be installed on the other case half, press on the bearing using a OTC No. 12 driver, Figure 21. Press bearing down until it contacts the shoulder on the case.

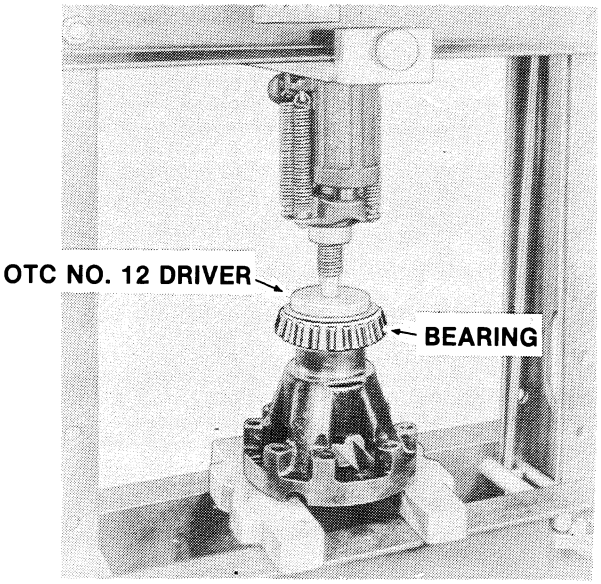


Figure 21. Bearing Installation

3. Install a thrust washer and side gear in the ring gear case half.

4. Units without NoSpin: Refer to Figure 22 and install pinion gears and thrust washers on spider. Place spider assembly in ring gear case half. Install thrust washer on remaining slide gear and place side gear on pinion gears. Figure 23. Bolt case halfs together, making sure identification marks are aligned. Torque bolts. See Specifications on Page 6126-3.

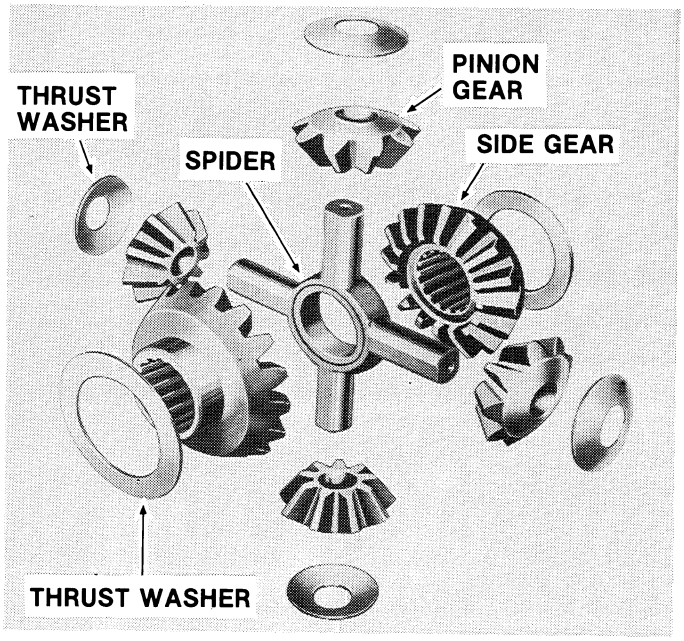


Figure 22. Spider Assembly

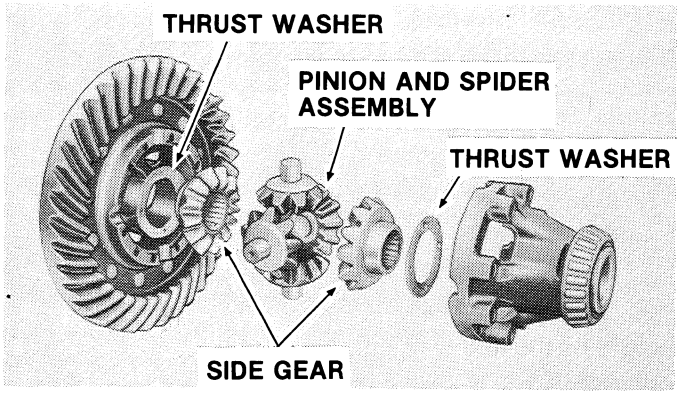


Figure 23. Differential Assembly

Units with NoSpin: Refer to Figure 24 and assemble the NoSpin assembly, being careful to position the spring retainer so that the spring seats inside the cupped section. A bolt and washer can be used to hold the NoSpin assembled, provided the washers are small enough to pass through the differential ends

TABLE OF CONTENTS

PS = Planetary Steering
PR = Planetary Rigid

5. Reassemble the wheel bearing nut lockwasher and outer nut.

Planetary Ring and Sun Gear

1. Install sun gear thrust washer, sun gear and axle shaft snap ring.

2. Install planetary ring gear onto ring gear hub.

Planetary Spider

1. Place the planetary spider on a bench or block up on metal plates.

2. Align inner thrust washer hole with planet pin hole so that locating tab of washer lies in spider indent.

3. Slide in planet gear and outer thrust washer and align bores (and thrust washer tab, if used, with spider indent).

4. Install the planet pin, small diameter end first.

5. Install setscrew to secure planet pin.

6. Proceed in the same manner with the second and third sets of planet pinions and thrust washers.

7. Planet pins should be pressed through until the shoulder of pin butts against inner flange of the spider. Put thrust button for axle shaft into position in bore of spider.

8. Apply gasket material (Case Part No. 35484) to spider flange.

9. Carefully push spider and pinion assembly into hub, aligning teeth of planet pinions with sun gear and ring gear teeth.

10. Align hub holes with spider holes and push spider assembly against hub.

11. Install 16 bolts and washers.

12. Tighten bolts to specified torque. Refer to page 6127-3.

Installation

1. Fill planetaries with recommended lubricant. Refer to Section 1050.

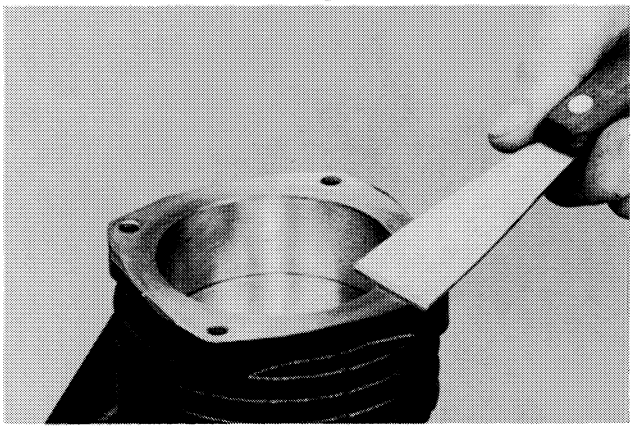
2. Reinstall wheels and torque to specifications. See Section 6129. Then lower wheels to floor.

   NOTE: Wheel nut torque should be checked every two hours until the torque reading has stabilized at the specified torque.

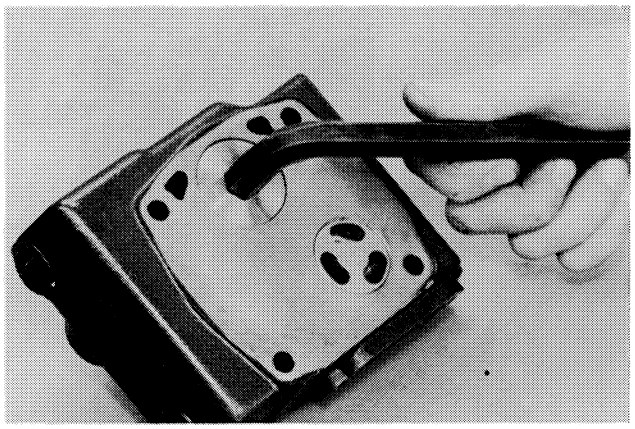
TROUBLESHOOTING CHART

PROBLEM	POSSIBLE CAUSE	REMEDY
Low air pressure	Drain valve for reservoir.	Close drain valve.
	Too much leakage in system.	Find and repair leak. See Air System Diagram.
	Bad air pressure gauge.	Replace air pressure gauge.
	Governor bad or not adjusted correctly.	Check and adjust pressure setting, or repair or replace governor.
High air pressure	Bad air pressure gauge.	Replace air pressure gauge.
	Governor not adjusted correctly or governor is bad.	Adjust, repair or replace governor. See Section 7103.
	Restriction of air line between compressor governor and unloading valve.	Check and correct.
	Bad O-ring on unloader piston.	Replace O-ring. See Section 7103.
Air pressure increases slowly	Engine speed too low.	Increase engine speed.
	Leakage in system.	Find and correct cause of leakage.
	Discharge valve or seat in air compressor worn or damaged.	Replace parts as required. See Section 7103.
	Worn air compressor.	Replace or overhaul air compressor.
	Too much carbon in cylinder head or discharge line.	Remove carbon from cylinder head and lines.
Air pressure decreases quickly with engine stopped and brakes released	Leakage in system.	Find cause of leak and repair.
	Reservoir drain valve leaking.	Replace drain valve.
	Relief valve in air reservoir not closed.	Repair or replace relief valve, Section 7104.
	Leakage in foot brake control valve.	Repair or replace control valve, Section 7105.
	Check valve in discharge line not closing.	Repair or replace check valve.
	Governor for air compressor leaking.	Repair or replace governor, Section 7103.

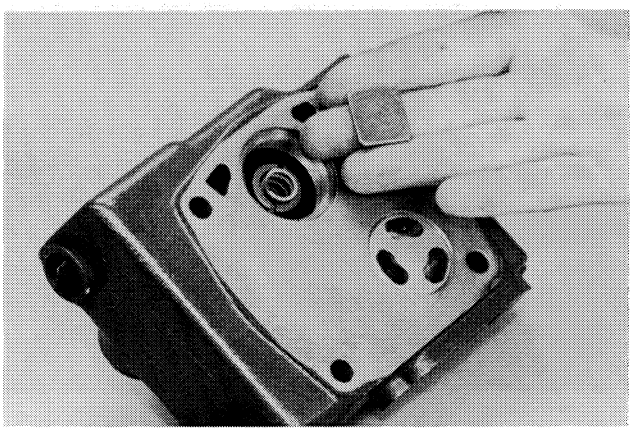
7. Clean the cylinder head and compressor block of all foreign material.



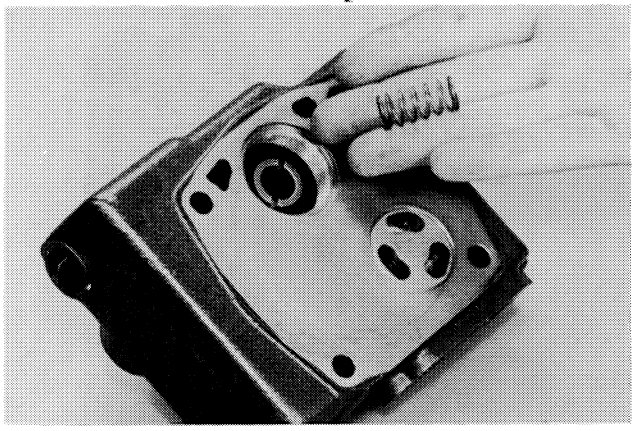
8. Remove the discharge valve seat from the cylinder head.



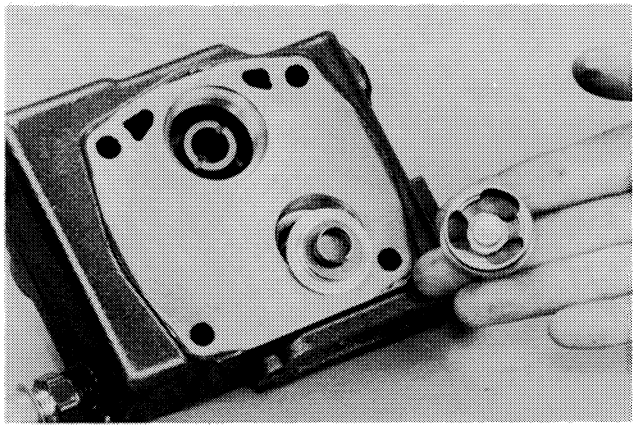
9. Remove the discharge valve from the cylinder head.



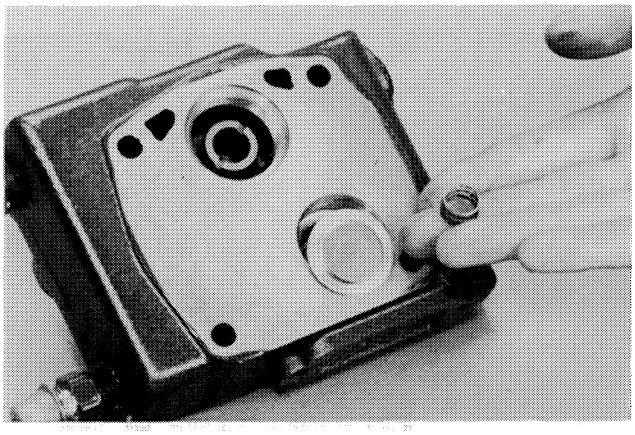
10. Remove the discharge valve spring from the cylinder head.



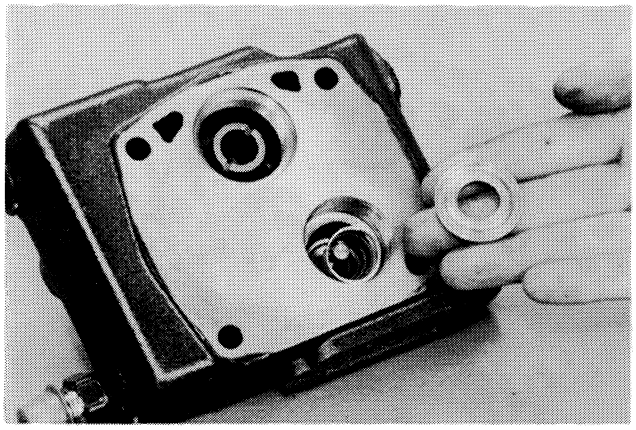
11. Remove the inlet valve stop plug.



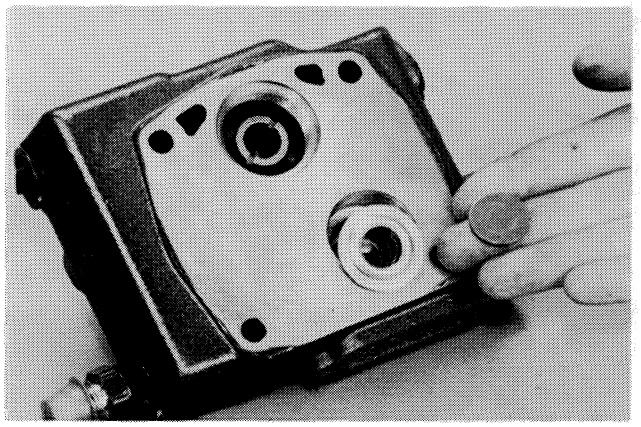
12. Remove the inlet valve spring.



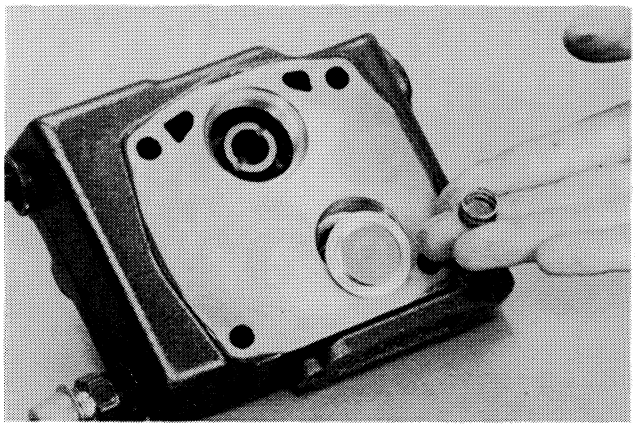
7. Install the inlet valve seat.



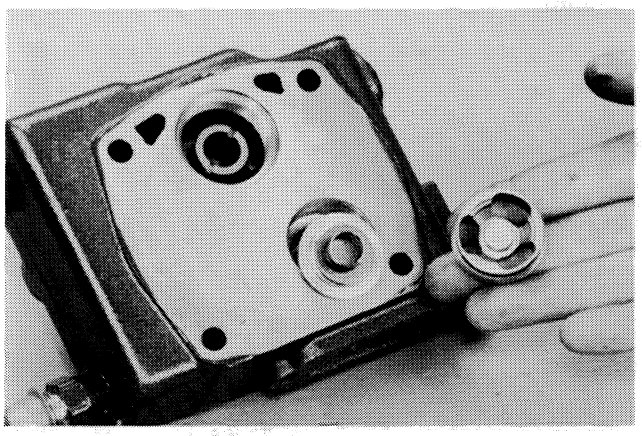
8. Install the inlet valve.



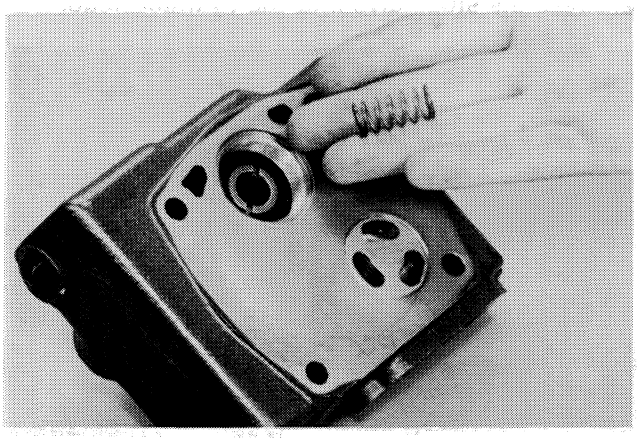
9. Install the inlet valve spring.



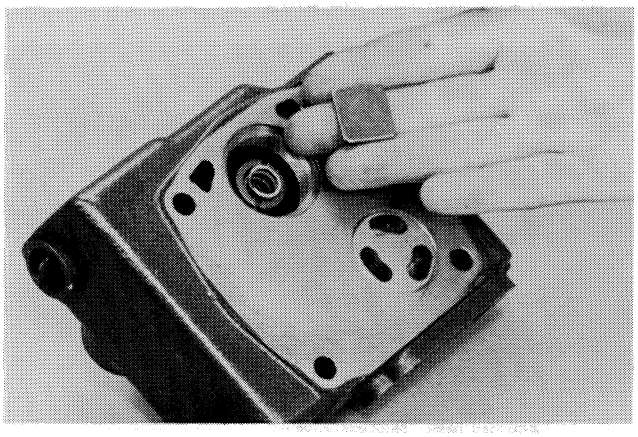
10. Install and tighten the inlet valve stop plug.



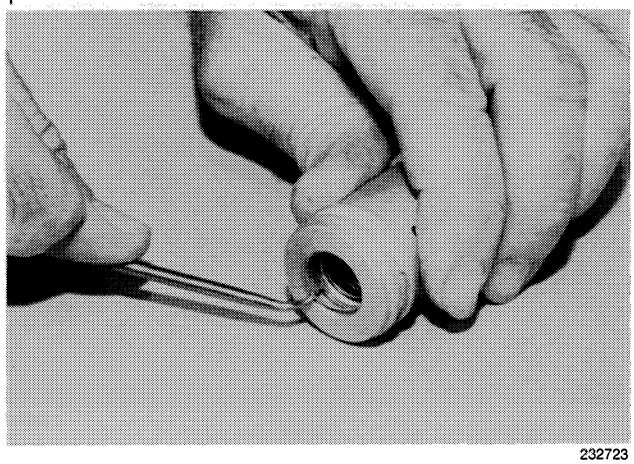
11. Install the discharge valve spring.



12. Install the discharge valve.



8. Remove the spring from the bottom of the piston.



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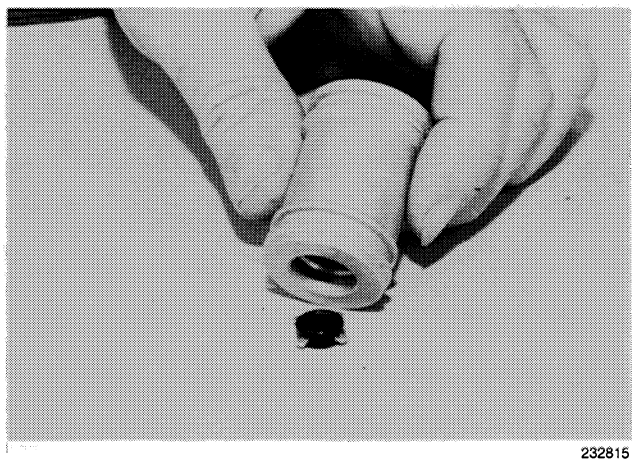
9. Remove the inlet-exhaust valve.



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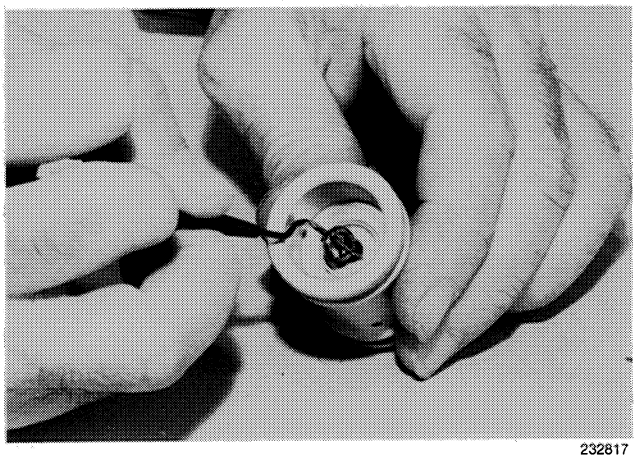
10. Remove the O-ring from the bore of the piston.



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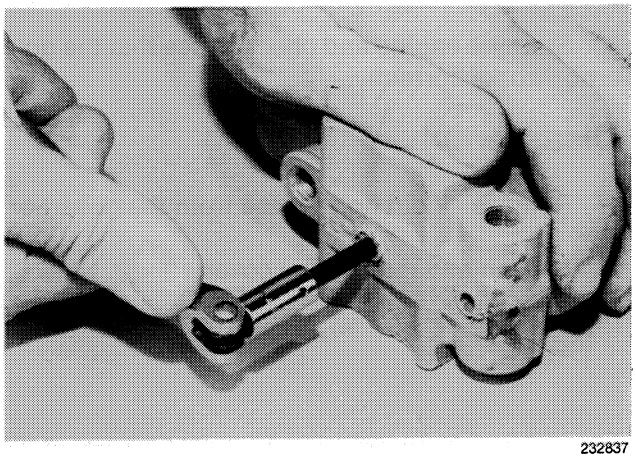
11. If necessary, loosen and remove the plugs.



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Inspection

1. Discard the O-rings and inlet-exhaust valve.

2. Clean all parts in cleaning solvent.

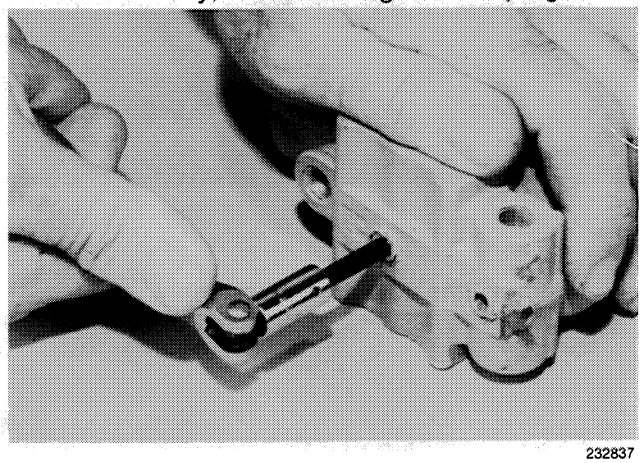
3. Check the body for cracks or other damage. Make sure that all air passages are clean.

4. Check the piston for cracks and corrosion. Make sure that the air passage is open.

5. The parts of the adjustment assembly are not available separately.

Assembly

1. If necessary, install and tighten the plugs.



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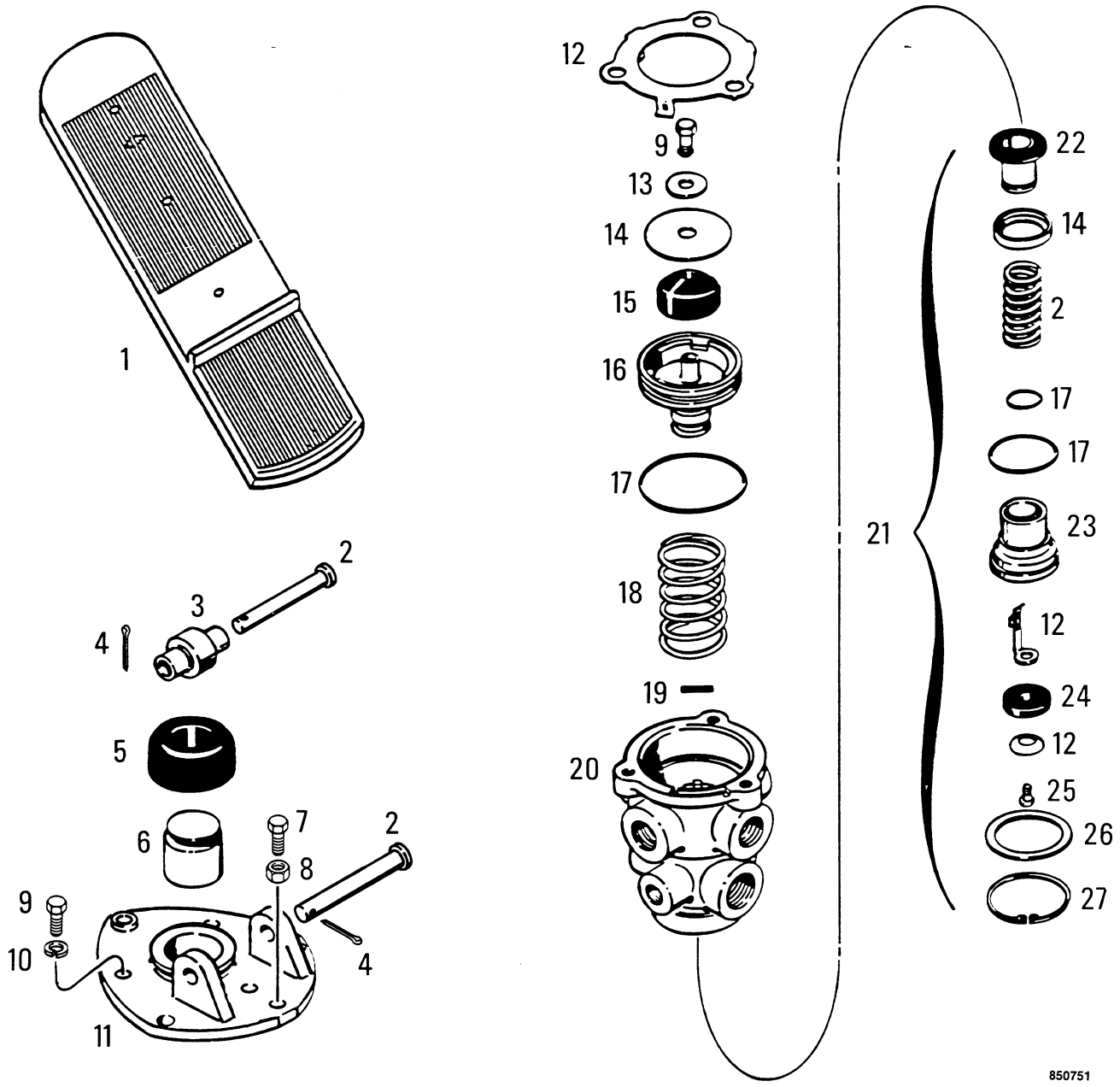
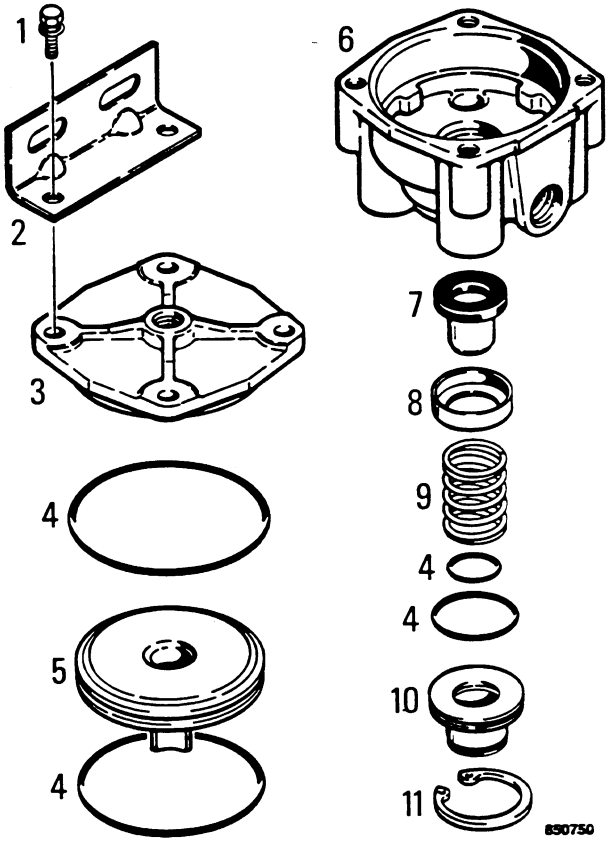
BRAKE VALVE



1. *Pedal*
2. *Pin*
3. *Roller*
4. *Cotter Pin*
5. *Boot*
6. *Plunger*
7. *Stop Bolt*
8. *Lock Nut*
9. *Cap Screw*
10. *Lock Washer*
11. *Mounting Plate*
12. *Retainer*
13. *Flat Washer*
14. *Spring Seat*
15. *Rubber Spring*
16. *Piston*
17. *O-ring*
18. *Spring*
19. *Filter*
20. *Body*
21. *Inlet/Exhaust Valve Assembly*
22. *Inlet/Exhaust Valve*
23. *Guide*
24. *Diaphragm*
25. *Screw*
26. *Identification Ring*
27. *Snap Ring*

Disassembly



1. *Cap Screw*
2. *Mounting Bracket*
3. *Cover*
4. *O-ring*
5. *Piston*
6. *Body*
7. *Inlet/Exhaust Valve*
8. *Spring Seat*
9. *Spring*
10. *Exhaust Port*
11. *Snap Ring*

1. Loosen and remove the remainder of the cap screws that hold cover.

2. Remove the cover.

3. Remove the piston.

4. Remove the O-ring from the cover and piston.

5. Push down and hold the exhaust port and remove the snap ring.

6. Release the tension of the spring.

7. Remove the exhaust port.

8. Remove the spring.

9. Remove the inlet-exhaust valve.

10. Remove the spring seat from the inlet-exhaust valve.

11. Remove the O-rings from the exhaust port.

Inspection

1. Clean all parts in cleaning solvent.

2. Discard the O-rings, spring and inlet-exhaust valve.

3. Inspect all metal parts for damage, scoring and corrosion.

4. Inspect the seat in the body for the inlet valve for wear or damage that will result in leakage.

5. Inspect the seat on the piston for the exhaust valve for wear or damage that will result in leakage.

Assembly

1. Install new O-ring(s) in the groove in the piston, on the cover and in the grooves in the exhaust port.

2. Install the spring seat on the inlet-exhaust valve.

3. Install the inlet-exhaust valve in the bore in the body.

4. Install the spring.

5. Install the exhaust port.

6. Push down and hold the exhaust port and install the snap ring.

7. Lubricate the OD of the piston and the bore in the body with a silicone lubricant.

8. Install the piston in the body.

9. Install the cover.

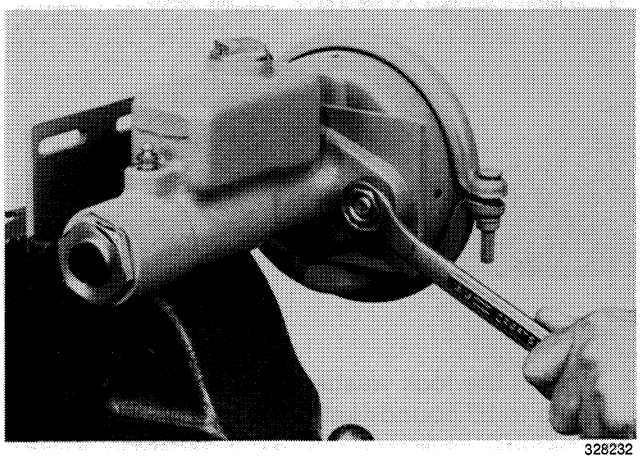
10. Install the two cap screws removed during disassembly.

11. Tighten the cap screws to 80 to 120 pound-inches (9 to 13 N m, 0.9 to 1.4 kg/m).

MASTER CYLINDER

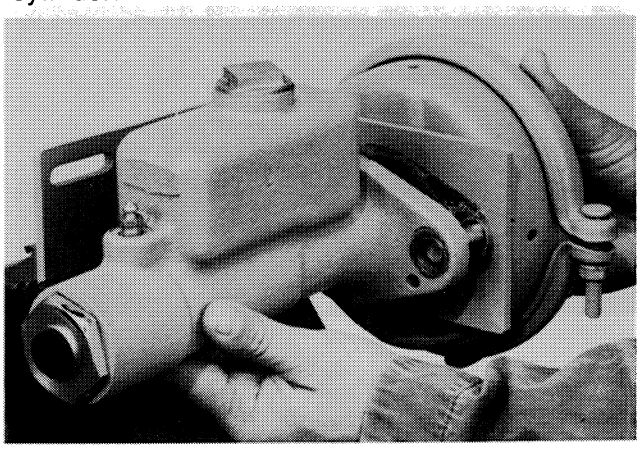
Disassembly

1. Fasten the mounting bracket in a vise and loosen and remove the nuts and lock washers.



328232

2. Hold the air chamber and remove the master cylinder.

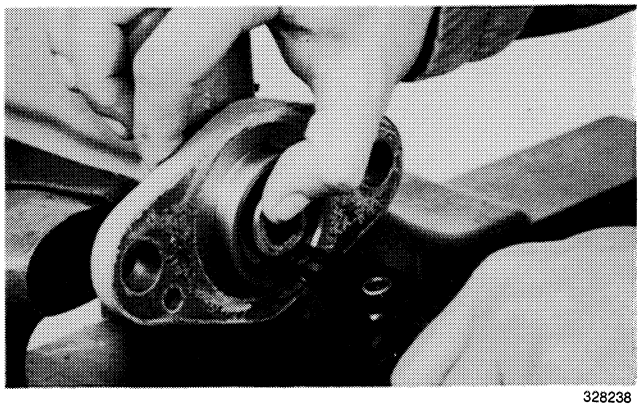


328233

3. Remove the mounting bracket and air chamber from the vise.

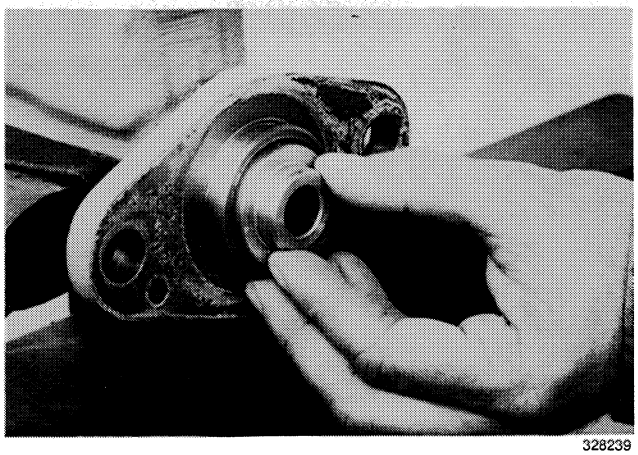
4. Fasten the master cylinder in the vise and remove the guide and the boot.

5. Hold the spacer in place and remove the snap ring.



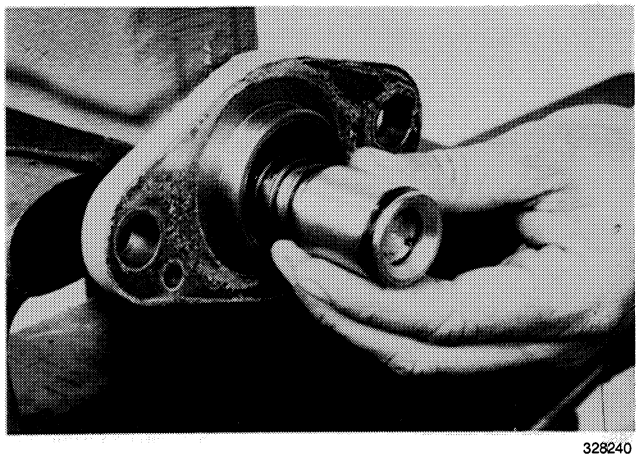
328238

6. Remove the spacer.



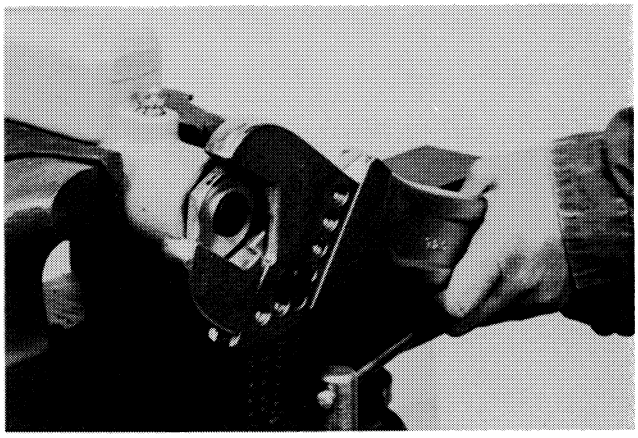
328239

7. Remove the long piston.

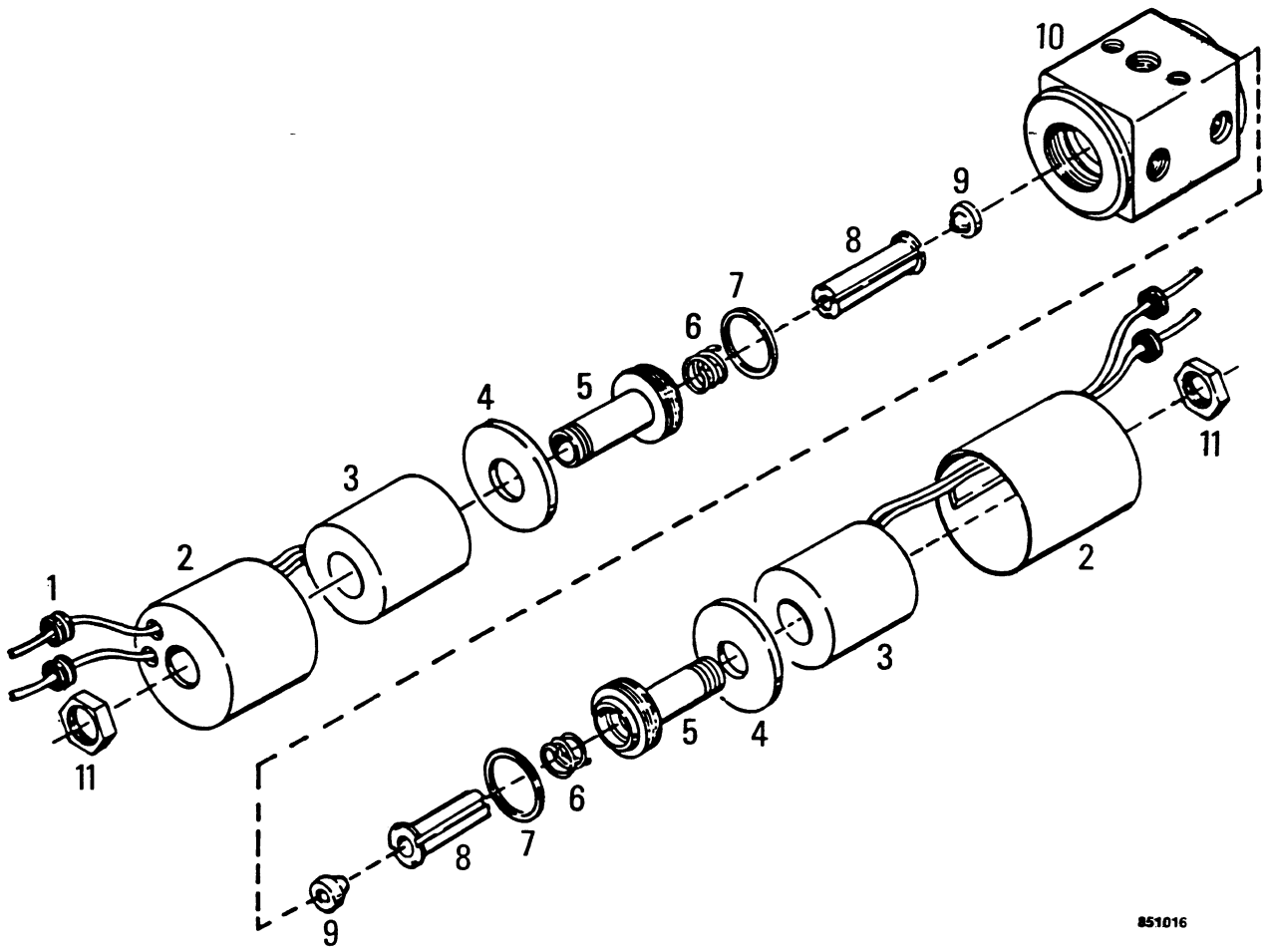


328240

8. Loosen the plug. Do not remove the plug now.



328241



1. *Grommet*
2. *Housing*
3. *Coil*
4. *Fiber Washer*
5. *Plunger Guide*
6. *Spring*
7. *Seal*
8. *Plunger*
9. *Plunger Seat*
10. *Valve Body*
11. *Nut*

Air Solenoid Valve

Disassembly

1. Remove the nut from the plunger guide.

2. Remove the housing and the coil from the plunger guide.

3. Remove the fiber washer from the plunger guide.

4. Remove the plunger guide from the valve body.

5. Remove the spring from the valve body.

6. Remove the plunger from the valve body. Do not remove the plunger seat from the valve body.

7. Remove and discard the seal from the valve body.

8. Repeat this procedure to disassemble the other end of the air solenoid valve.

Inspection

1. Clean the plungers and the valve body with cleaning solvent. Make sure there are no restrictions in the passages in the valve body and the plunger seats.

2. Inspect the plunger seats for damage. If a plunger seat is damaged, you must use a complete new air solenoid valve.

3. Use an ohmmeter to check the coil for continuity. If there is no continuity, replace the coil as follows:

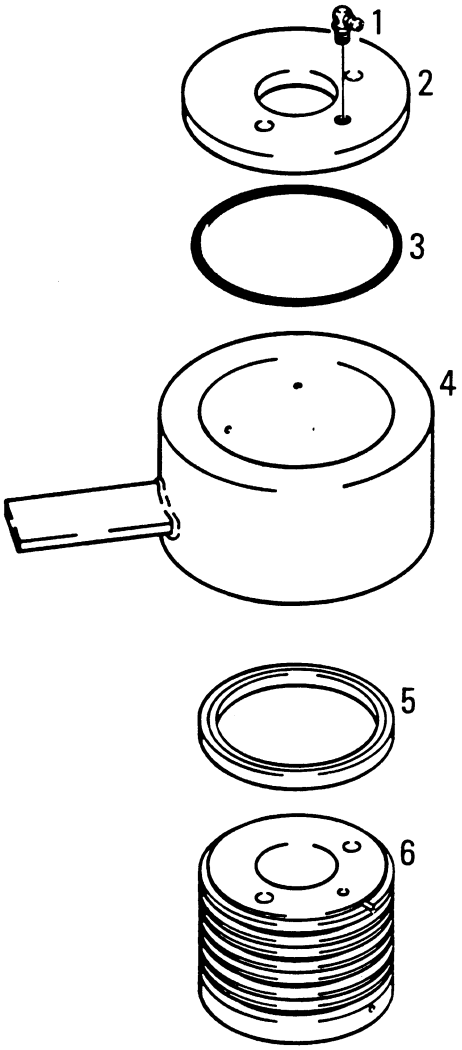
   a. Remove the terminals from the wires.

   b. Remove the coil from the housing.

REMOVAL AND INSTALLATION

See Section 8218 for the procedure to remove and install the center swivel components. It is not necessary to remove the hydraulic swivel to repair the air swivel.

DISASSEMBLY



1. Remove the cover from the housing.
2. Carefully turn the body out of the housing.
3. Remove and discard the O-ring and the seals.

1. *Grease Fitting*
2. *Cover*
3. *O-ring*
4. *Housing*
5. *Seal (4)*
6. *Body*

Parking Brake

PROBLEM	POSSIBLE CAUSE	REMEDY
Brake Will Not Release	Air leak in line between valve and brake actuator.	Locate leak and repair.
	Defective actuator piston.	Disassemble and replace piston seals. Refer to Section 7107.
	Defective or damaged inlet/exhaust valve in control valve.	Disassemble control valve and repair. Refer to Section 7107.
Brake Will Not Hold	Broken spring(s) in brake actuator.	Disassemble actuator and replace spring. Refer to Section 7107.
	Broken spring in control valve.	Disassemble valve and replace spring. Refer to Section 7107.
	Worn brake linings.	Reline brake shoes.

HYDRAULIC PUMP FOR STEERING CONTROL VALVE AND OUTSIDE CONTROL VALVE

Removal

1. Park the machine on a level surface.

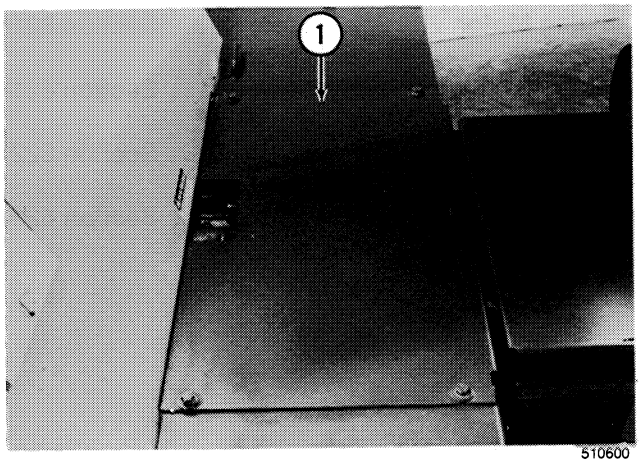
2. Move the turntable until the access cover for the hydraulic pumps can be removed.

3. Lower the boom until the tool is on the floor.

4. Apply the parking brake and stop the engine.

5. Drain the oil from the reservoir. The reservoir contains approximately 18.7 U.S. gallons (70.8 litres) of oil.

6. Loosen and remove the cap screws, lock washers, and flat washers that hold the access cover to the chassis at the rear of the engine compartment.



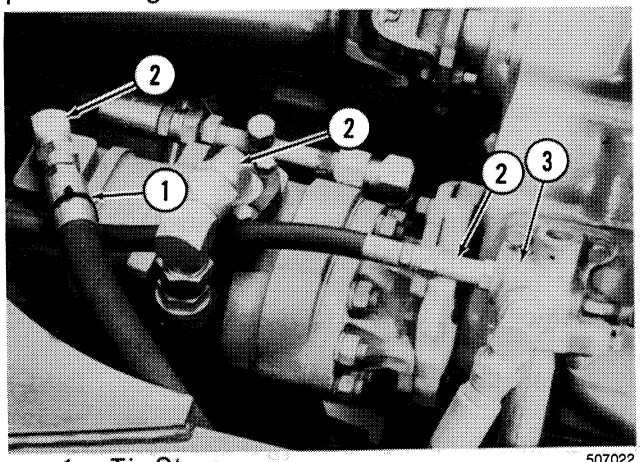
510600

1. Access Cover

7. Remove the access cover.

8. Remove the dirt and grease from the hydraulic pump and the area around the hydraulic pump.

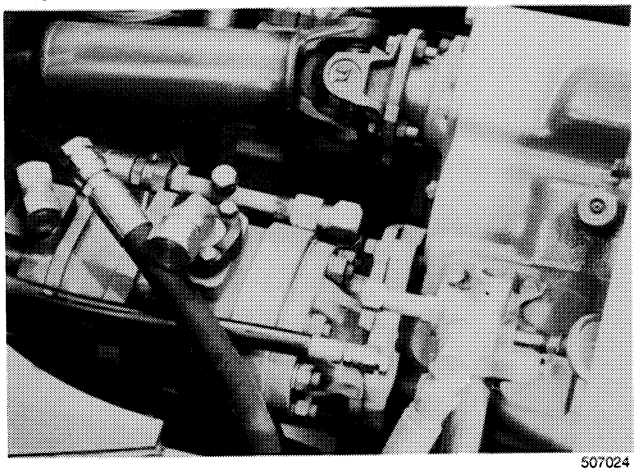
9. Cut and remove the tie strap that fastens the hose from the pressure regulator valve to the hose on the end of the hydraulic pump. Disconnect the hoses from the fittings in the top of the hydraulic pump. Disconnect the hose from the fitting in the pressure regulator valve.



507022

1. Tie Strap
2. Fitting
3. Pressure Regulator Valve

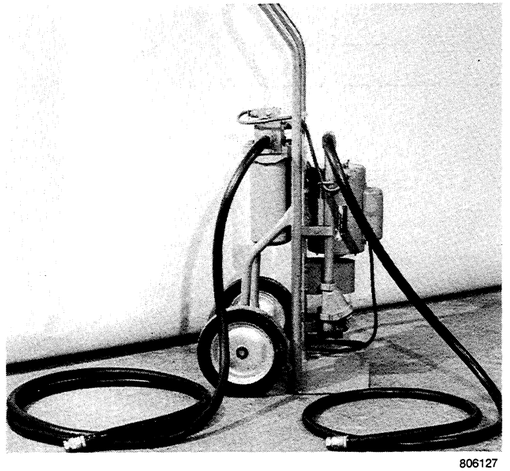
10. Install plugs in the hoses and caps on the fittings.



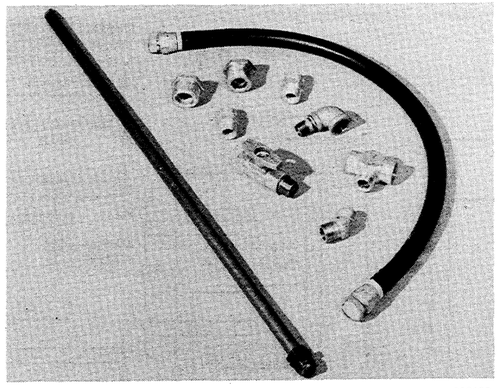
507024

SPECIAL TOOLS

The portable filter and fitting kit are used to clean the hydraulic system. The part number of the potable filter is CAS-10162A. The part number of the fitting kit is CAS-10508. See Section 1001 for information about ordering the special tools.



806127



806128

BAD PERFORMANCE IN ALL CIRCUITS

CHECK	INSTRUCTIONS
1. Maintenance	1. Check the service records of the machine. Make sure that the machine has had the necessary lubrication, maintenance and service. See Section 1002 for correct lubricants and service intervals.
2. Attachments	2. Check field installed attachments that can be causing bad performance in the hydraulic system.
3. Oil level	3. Check the level of the oil in the reservoir. See the Operators Manual.
4. Engine speed	4. See page 8202-11. Check the engine stall speed.
5. Power sensing valve	5. See page 8202-14. Check and adjust the power sensing valve.
6. Pressure settings of both main relief valves	6. See page 8202-11 for instructions.
7. Contamination in the hydraulic system	7. See page 8202-18.

4. Make sure the hand pump is full of Case TCH Fluid. The oil in the hand pump must be 70 to 80° F (21 to 27° C).

5. Operate the handle of the hand pump and read the pressure gauge. Make a record of the highest reading.

6. Make several checks to be sure of the reading.

7. Compare the reading with the specification on page 8202-2.

8. If the pressure setting is not correct, adjust the circuit relief valve.

Pressure Setting Adjustment

1. Remove the dome nut.

2. Loosen the lock nut.

3. Turn the adjusting screw clockwise to increase the pressure setting or counterclockwise to decrease the pressure setting.

4. Hold the adjusting screw in place and tighten the lock nut.

5. Check the pressure setting again. If the pressure setting is still not correct, repeat steps 2 through 5.

6. Install the dome nut.

Power Sensing Valve

General Information

The hydraulic system for the attachment is divided into two separate circuits. Each circuit has a hydraulic pump, main relief valve, and main control valve.

The main relief valve for each circuit keeps the maximum pressure in the circuit below 2650 psi (18 272 kPa, 186 kg/cm²). The total possible pressure for both circuits is 5300 psi (36 543 kPa, 373 kg/cm²).

The engine, however, can operate efficiently at only 4400 psi (30 338 kPa, 309 kg/cm²). The power sensing valve, connected between the two circuits, prevents overloads on the engine by keeping the total pressure of the two circuits below 4400 psi (30 338 kPa, 309 kg/cm²).

The power sensing valve works only when both circuits are used at the same time and load requirements are more than 4400 psi (30 338 kPa, 309 kg/cm²). At this time, the power sensing valve begins to work by reducing the higher pressure and permitting the lower pressure to increase as required, to keep the total of the two pressures below 4400 psi (30 338 kPa, 309 kg/cm²).

Pressure Test

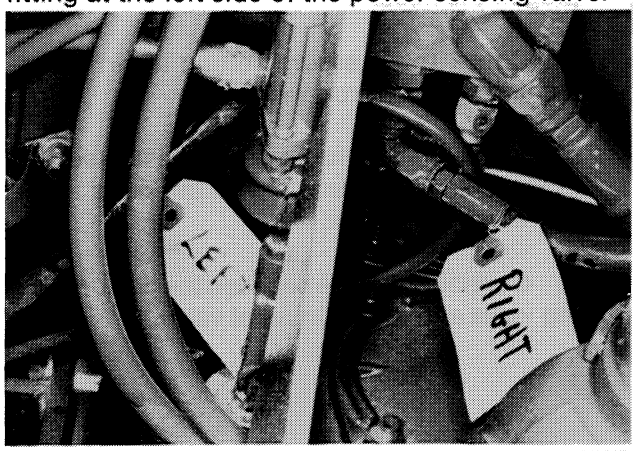
1. Put identification tags on the hoses that are connected to the front of the power sensing valve. Disconnect the hoses from the fittings in the power sensing valve.

510625

2. Install plugs in the hoses and caps on the fittings.

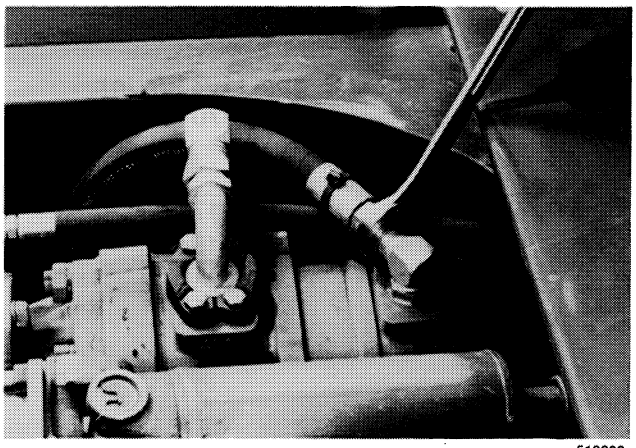
3. See page 8202-20. Check and adjust the pressure settings of both main relief valves.

4. Connect the hose from the left side of the power sensing valve to the fitting at the right side of the power sensing valve. Connect the hose from the right side of the power sensing valve to the fitting at the left side of the power sensing valve.



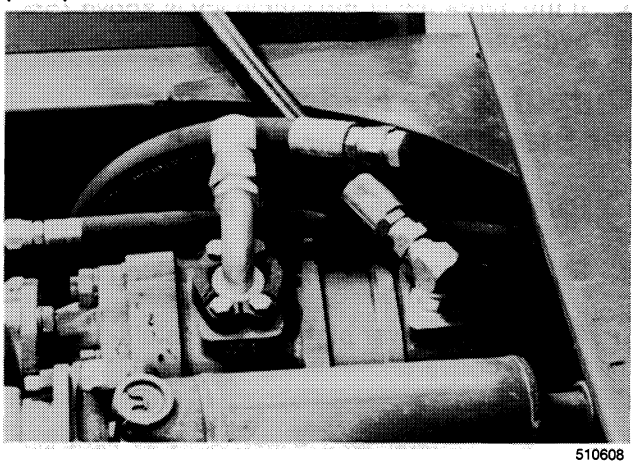
510627

4. Disconnect the hose from the fitting at the rear section of the hydraulic pump.



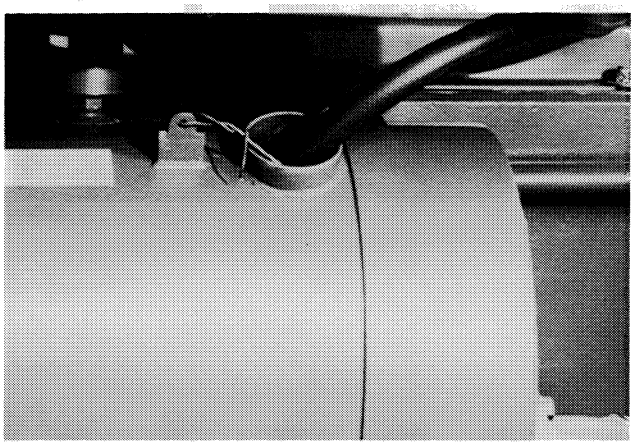
510606

5. Install a plug in the hose. Connect the inlet hose of the flowmeter to the fitting in the hydraulic pump.



510608

6. Put the flowmeter outlet hose in the reservoir. Fasten the outlet hose to the reservoir with a piece of wire.



506901

7. Prepare the flowmeter for the test by doing the following steps:

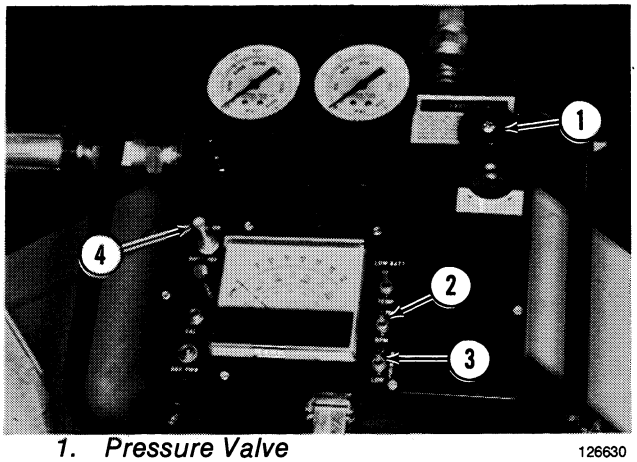
a. Open the pressure valve completely.

b. Move the range switch to the HI position.

c. Make sure the flow switch is in the FLOW position.

d. Pull the on/off switch to the ON position.

e. Make sure all connections are tight.



126630

1. *Pressure Valve*
2. *Range Switch*
3. *Flow Switch*
4. *On/Off Switch*

8. Start and run the engine at 2200 rpm (r/min).

9. Hold the temperature switch in the TEMPERATURE position. The temperature must be at least 130° F (54° C).

10. If the temperature is not correct, close the pressure valve until the pressure is 1000 psi (6893 kPa, 70 kg/cm²).

11. Continue to run the engine at 2200 rpm (r/min) until the temperature of the oil is 130° F (54° C).

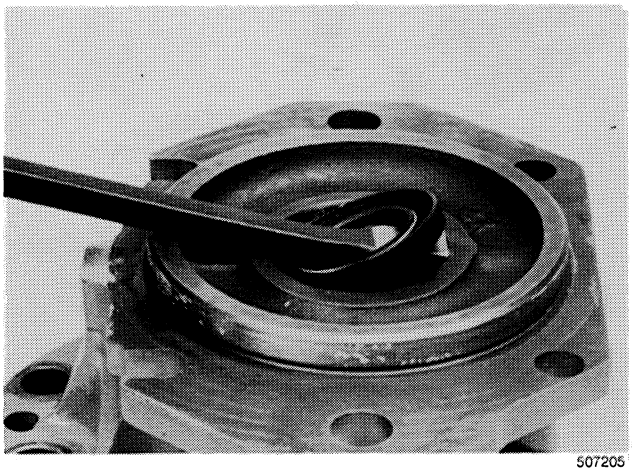
12. Open the pressure valve completely.

13. Make sure the engine speed is 2200 rpm (r/min).

14. Read the flow gauge. Write the flow on line 8 of the check sheet.

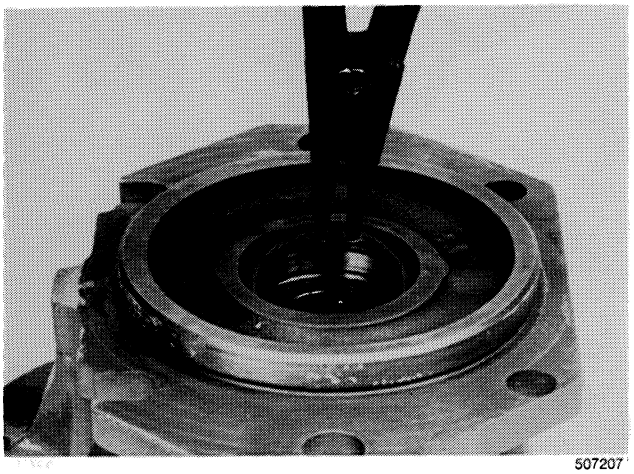
15. Slowly close the pressure valve until the pressure is 1800 psi (12 411 kPa, 126 kg/cm²). Adjust the engine speed to 2200 rpm (r/min).

23. Use a prybar and remove the seal.



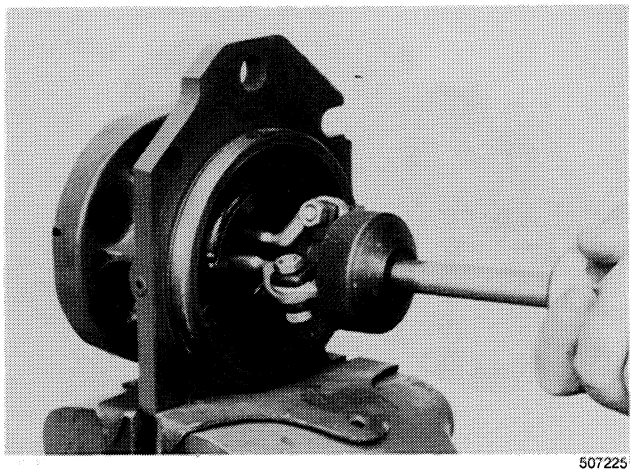
507205

24. Remove the snap ring.



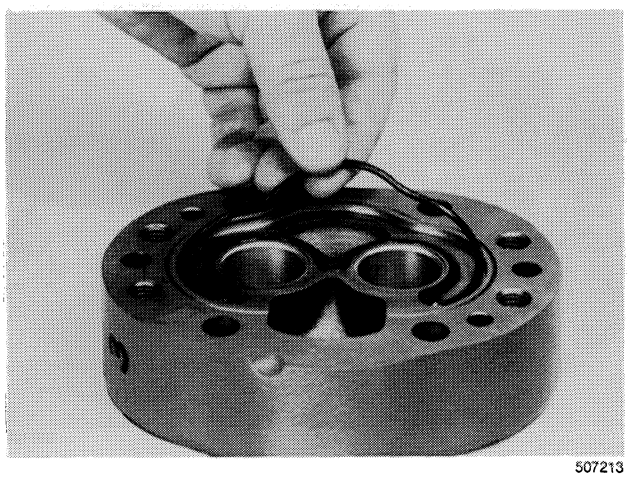
507207

25. Remove the inner seal.



507225

26. Remove the seal retainer and seal from the carrier and port end housing.



507213

SPECIFICATIONS

Manufacturer ..... Sperry-Vickers

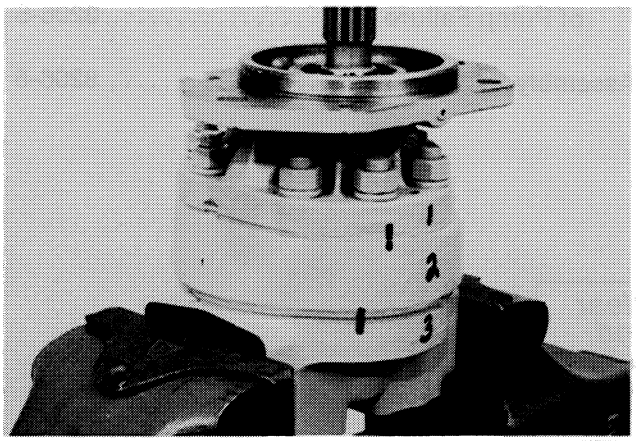
Rotation ..... Counterclockwise at shaft end

Special Torque

Nuts on studs in drive end cover ..... 145 to 155 pound-feet (196 to 210 N m, 20.0 to 21.4 kg/m)

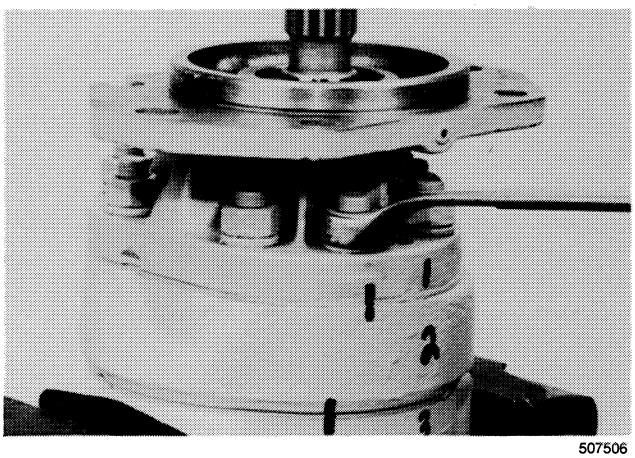
DISASSEMBLY

1. Fasten the pump in a vise. Write numbers on each section of the pump and put alignment marks on each section so the pump can be assembled correctly.



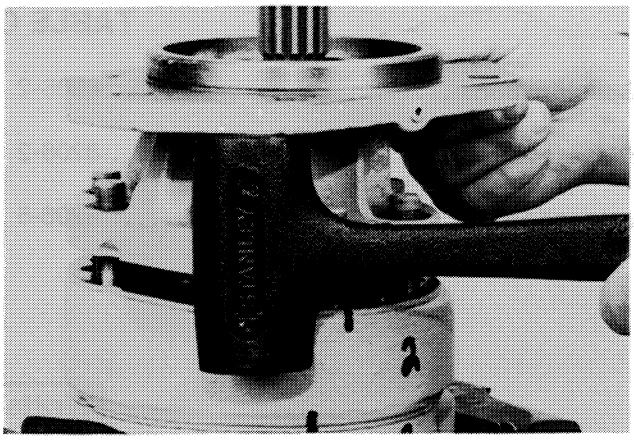
507504

2. Loosen and remove the nuts and lock washers that hold the drive end cover.



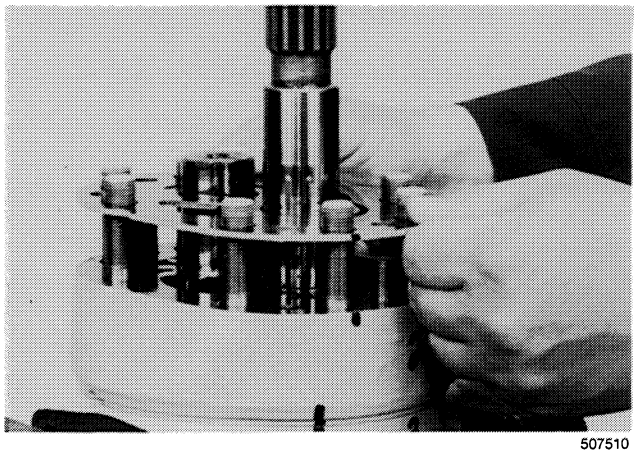
507506

3. Loosen and remove the drive end cover.



507508

4. Remove the wear plate.



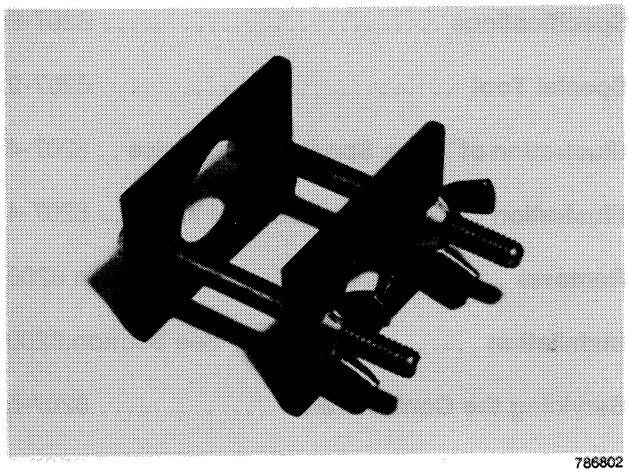
507510

SPECIFICATIONS

Manufacturer	Koehring, Husco Division, 7120 Series
Pressure settings of relief valves	See Section 8202
Spool Travel	3/8 inch (9.5 mm) in and out
Ports	
Inlet, outlet, and work ports	1-5/16 - 12 straight thread, O-ring
Power beyond port	3/4 NPT
Weight (Three Spool or Four Spool)	Approximately 100 pounds (45 kg)

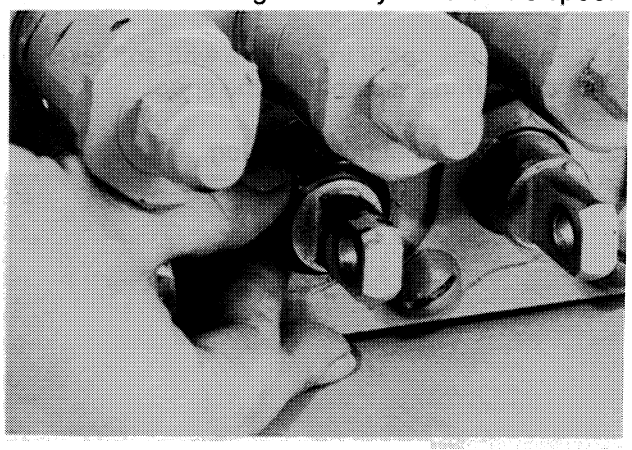
SPECIAL TOOL

The special tool shown below is used to compress the centering spring on the spools. The part number of the tool is CAS-1147-2. See page 1001-5 for information about ordering the tool.



786802

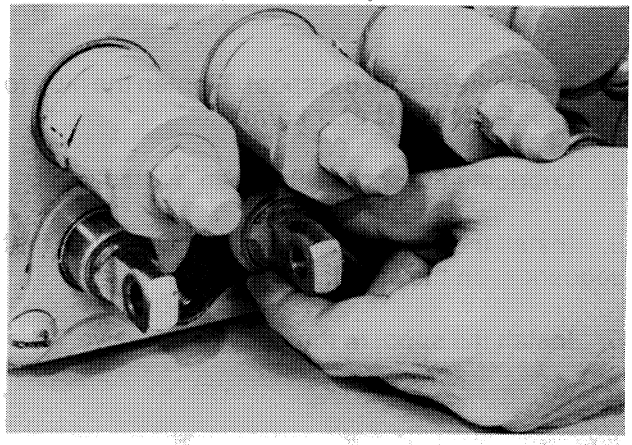
7. Install the O-ring on the eye end of the spool.



430702

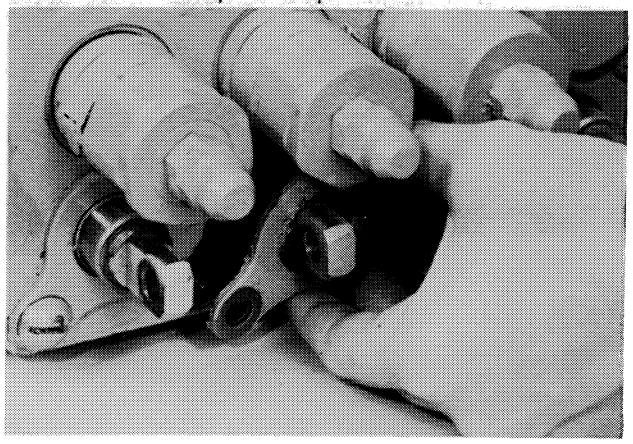
8. Lubricate the O-ring with clean hydraulic oil.

9. Install the wiper on the spool.



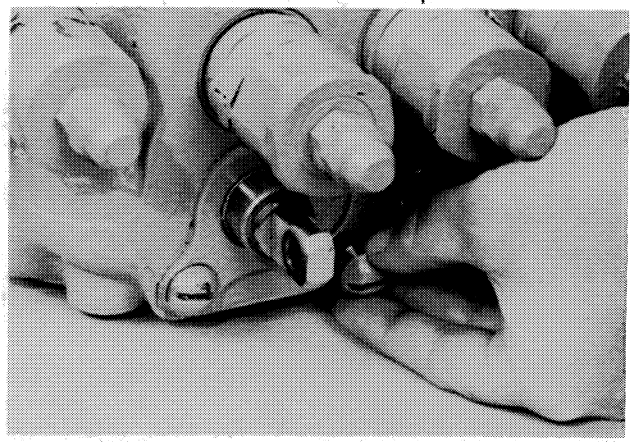
430524

10. Put the seal plate in position on the valve.



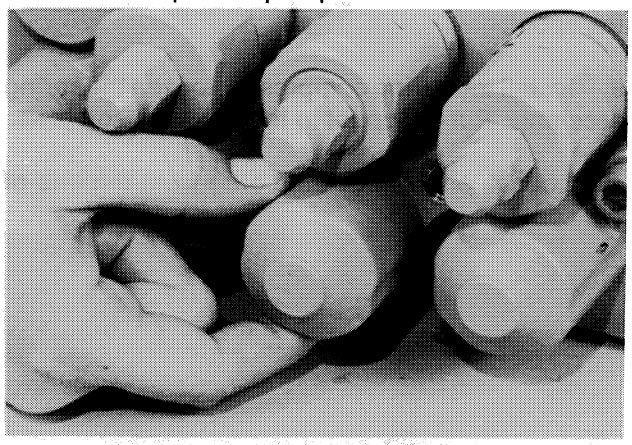
430523

11. Install the screws in the seal plate.



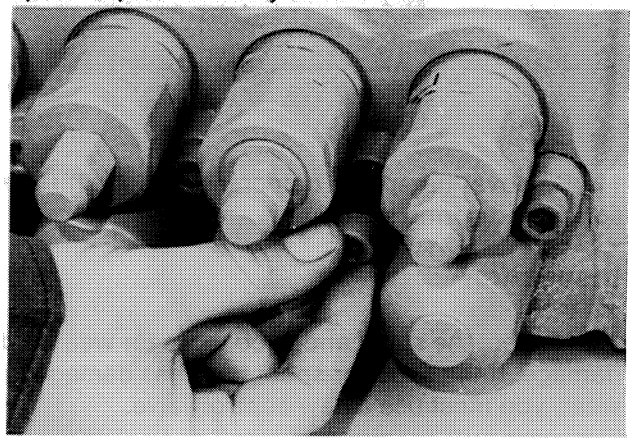
430521

12. Put the spool cap in position on the valve.



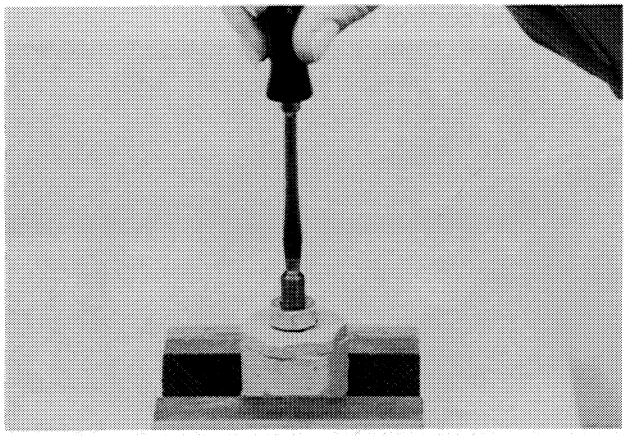
430518

13. Install the Allen head screws that fasten the spool cap to the body of the valve.



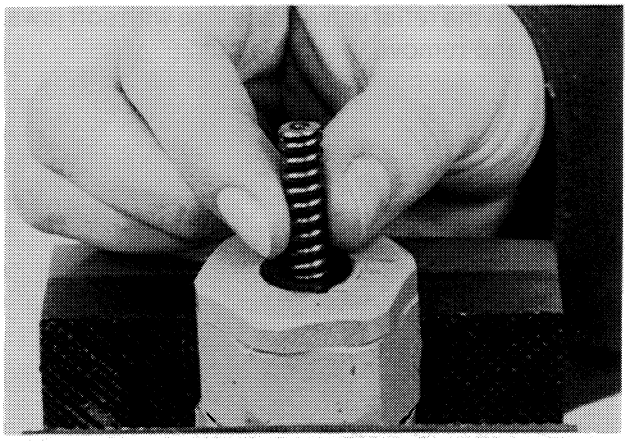
430517

4. Make a count of the number of turns needed to remove the adjusting screw. Remove the adjusting screw.



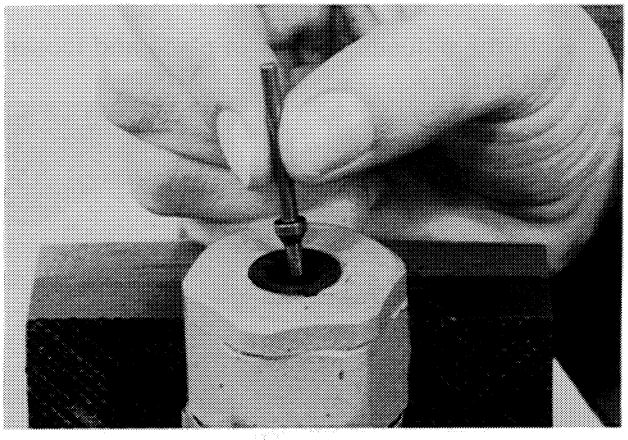
430605

5. Remove the spring from the body.



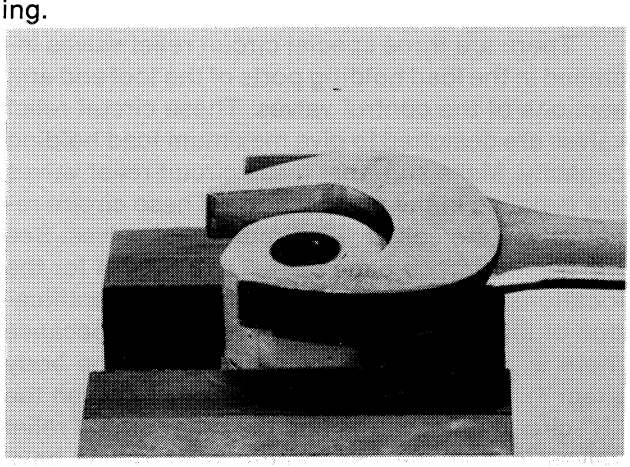
430607

6. Remove the plunger from the body.



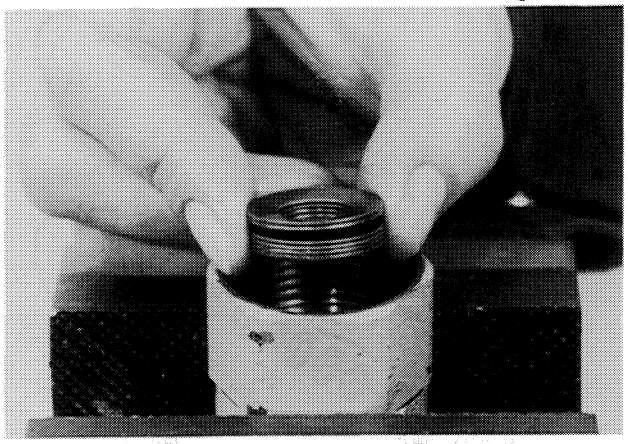
430606

7. Loosen and remove the body from the housing.



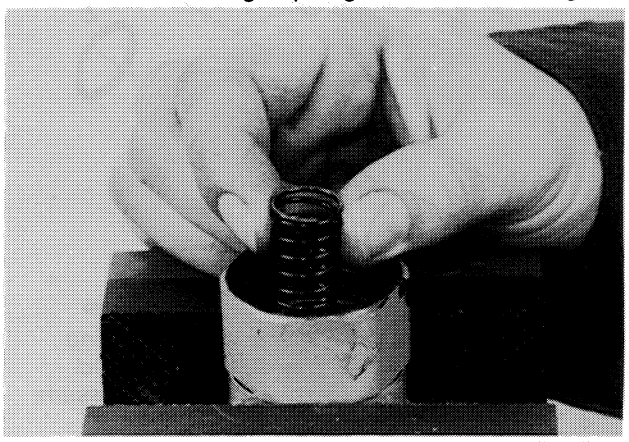
430608

8. Remove the washers from the housing.



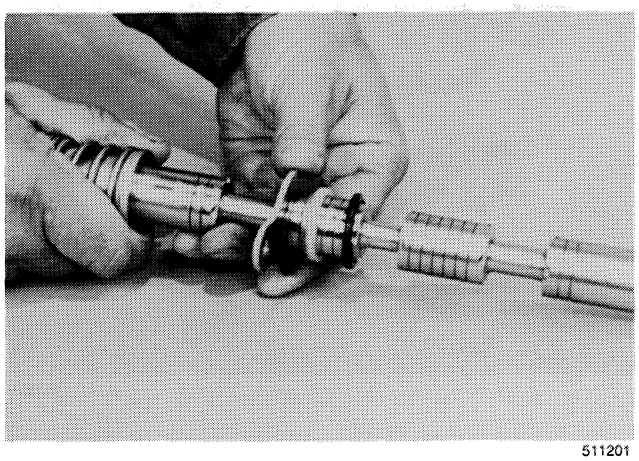
430630

9. Remove the large spring from the housing.



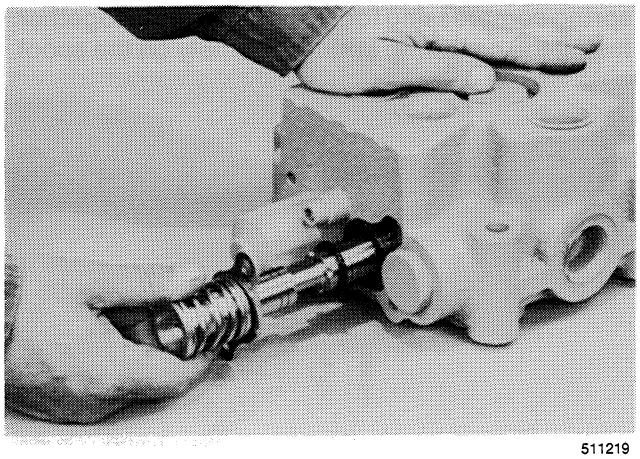
430614

7. Remove the spring compressing tool from the spool. Lubricate the new seal and O-ring. Install the seal retainer, seal, and O-ring on the spool.



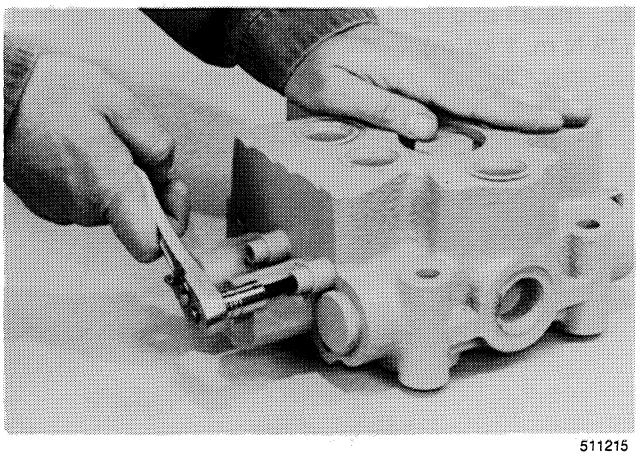
511201

8. Lubricate the spool with clean hydraulic oil. Install the spool.



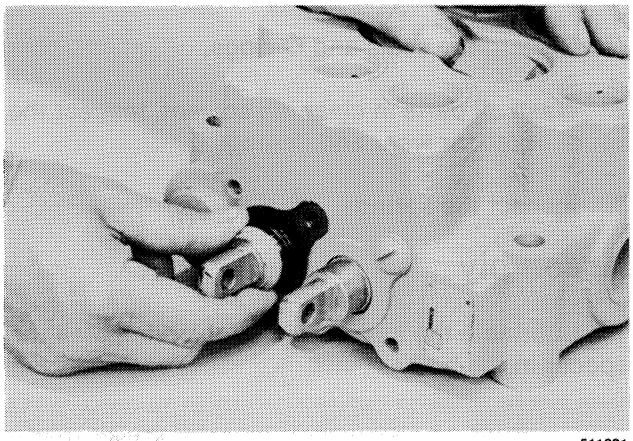
511219

9. Install the spring cap. Tighten the Allen head screws to 25 pound-feet (34 N m, 3 kg/m).



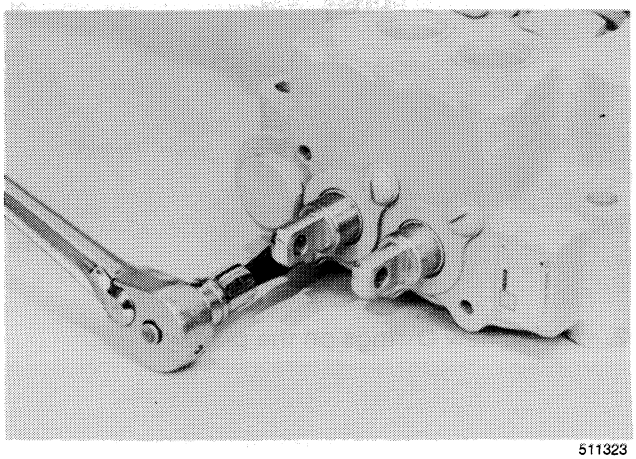
511215

10. Install a new O-ring and seal on the spool.



511321

11. Install the seal retainer and tighten the screws to 10 pound-feet (13 N mm 1 kg/m).



511323

INSPECTION

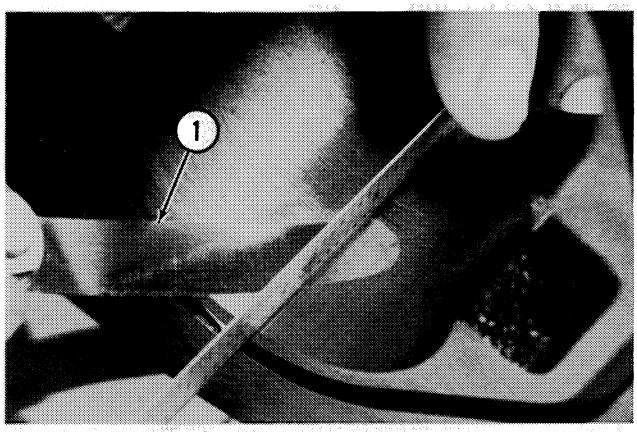
1. Discard all seals, O-rings, and backup rings.

2. Clean all the parts in cleaning solvent.

3. Inspect the gears for wear and damage. Inspect the gear shafts. If there is damage or wear on the gears or shafts, install a new gear set.

4. Inspect the thrust plates for damage and wear. If the thrust plates are damaged, use a new thrust plate.

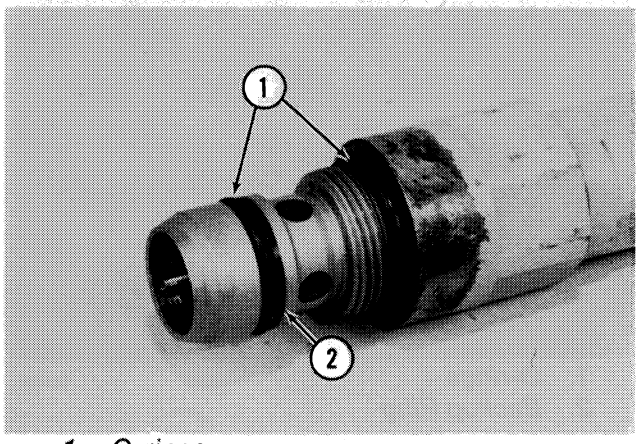
5. Inspect the gear housing. Measure the depth of the gear wear in the gear housing. If the wear is more than .005 inch (0.127 mm), install a new gear housing.



1. Feeler Gauge 511733

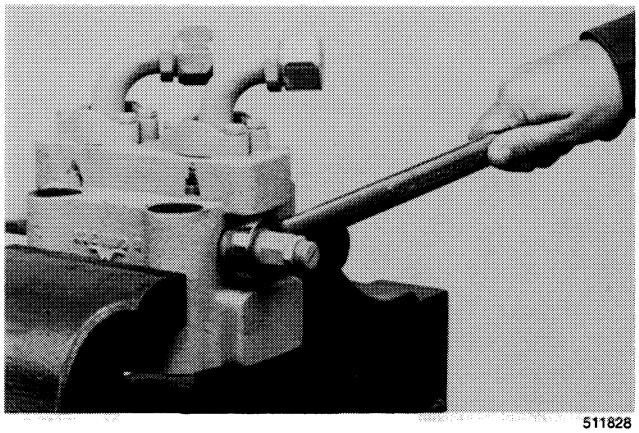
ASSEMBLY

1. Install new O-rings and backup ring on the relief cartridges.



1. O-rings
2. Backup Ring 511829

2. Install the relief cartridges in the port end cover.



511828

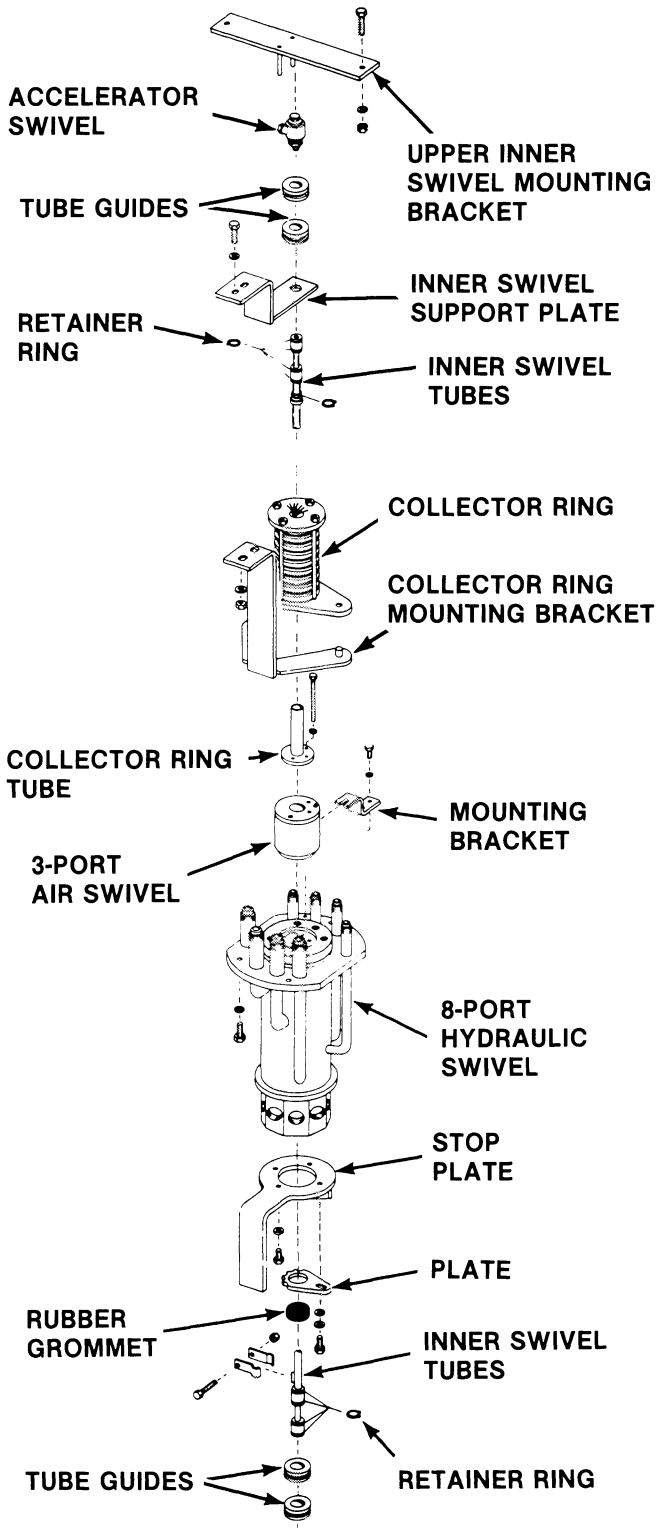


Figure 3. Center Swivel Group

4. Disconnect batteries to prevent damage to electrical harness when disconnecting from the collector ring. Disconnect wiring harness from collector ring. Use an allen wrench to loosen two setscrews at base of collector ring, then pull collector ring off collector ring tube.

5. Remove the three 3/8″ nc x 5-3/4″ long capscrews which fasten the collector ring tube to the air swivel. Remove the tube.

6. Disconnect all air lines from the air swivel, then remove air swivel. Put tags on the air lines for correct installation.

7. Put tags on the fittings and ports at both top and bottom of hydraulic swivel before removing any lines or hoses.

8. Disconnect all hydraulic lines, upper and lower from the swivel. Be ready to collect the oil. Let system drain.

9. Put caps on lines and openings to keep out dirt and foreign material.

10. Put a mark on the swivel and the mounting plate for correct installation.

11. Remove any mounting plates or brackets from below the turntable as needed to give clearance for removal of the swivel.

12. Put a support under swivel before you remove the upper plate.

13. Remove the nuts which hold the upper plate in position.

14. Pull swivel out through the top of the turntable.

Disassembly

See Figure 4.

1. Remove the four capscrews at the top of the swivel. These capscrews hold the swivel shaft in place.

2. Remove the bearing cap from the top of the swivel. Remove and discard the gasket.

Assembly

1. Install new wear rings, wiper and rod seal in head. Refer to cross section view in Figure 1. Install new o-ring and back-up ring in groove on outside of head.

2. Lubricate the piston rod and head bore with hydraulic oil. Slide head gland on the piston rod.

Piston

1. Install new seal assembly in center groove on piston outside diameter. Install wear rings in remaining grooves. Warm the rings to aid in installation.

2. Assemble the piston on the rod:

   a. Install o-ring in counterbore in piston.

   b. Slide the assembled piston onto the rod and secure with self locking nut. Take care not to install the piston backward (see cross section view for proper installation).

   c. Secure the piston rod eye in a vise and support the piston end.

   d. Torque piston locking nut to correct torque. See Figure 1.

Final Assembly

1. Lubricate cylinder bore and outside of piston. Carefully insert piston and rod assembly into cylinder bore. Take care that wear rings and seals are not cut or damaged during installation.

2. Slide head assembly into cylinder bore. Install head and bolts, tighten evenly, then torque to 680 lb-ft (920 Nm).

3. Hand pump clean hydraulic oil into the cylinder. Test cylinder assembly before installation.

Test

To test piston sealing rings, continue to pump oil into rod end after cylinder has bottomed out. Test to 4000 psi (27 580 kPa) static, in both directions. Use the following procedure:

1. Move the cylinder rod through two complete strokes at 800 psi (5 510 kPa) to remove air from the cylinder. Look for external leaks. If the pressure differential between cylinder ports is more than 100 psi (689 kPa) during the second stroke, the cylinder assembly is not acceptable. Disassemble and inspect for foreign material or wrong assembly.

2. Wipe cylinder rod clean, then move the cylinder through four complete strokes at 800 psi (5 510 kPa) without bottoming piston on each retract stroke. After four strokes, extend cylinder rod sufficiently to observe any oil collected during the first four strokes. Inspect the rod for buildup of oil which will indicate rod seal leakage. You will see a definite ring or part of a ring of oil around the rod.

3. Fully retract cylinder. Keep base port open. Apply 4000 psi (27 580 kPa) of pressure to rod port. Hold this pressure for a minimum of 10 seconds. Visually check for internal and external leakage. No internal or external leakage is permitted.

4. Fully extend cylinder. Keep rod port open. Apply 4000 psi (27 580 kPa) of pressure to base port and hold for minimum of 10 seconds. Visually check for internal and external leakage. No internal or external leakage is permitted.

Installation

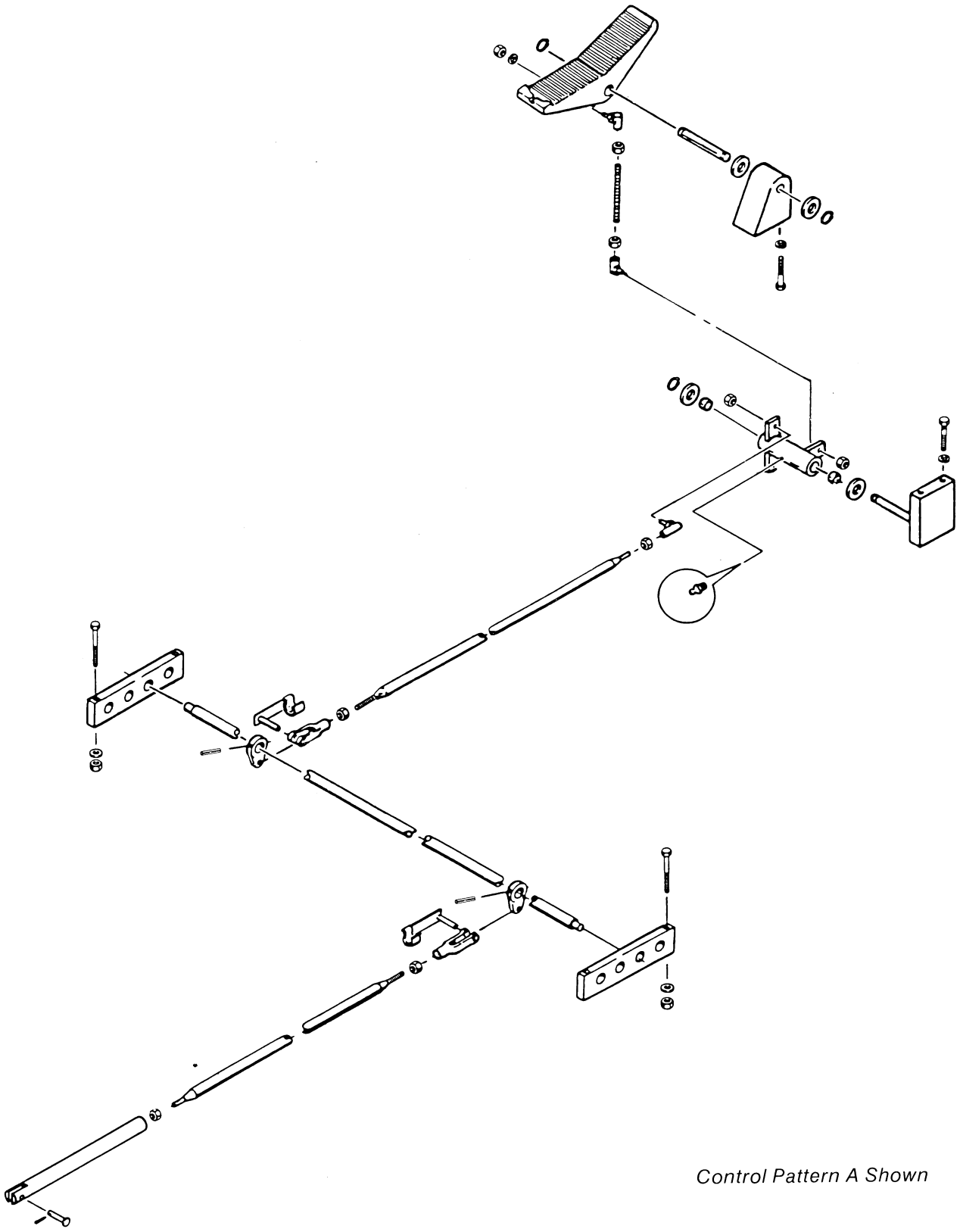
1. Mount cylinder on unit using the correct mounting hardware. See Section 9211.

2. Connect hoses and tubes. Torque all fittings to specifications. See Section 1001.

3. Lubricate cylinder grease fittings with moly-disulfide grease.

4. Check hydraulic oil level and add Case TCH Fluid as required.

5. Start the engine and operate the cylinder(s) through several complete cycles to remove air. Check for leaks. Operate cylinders slowly and do not bottom out the cylinders until movement is positive in both directions. After the circuit is filled with oil, the cylinders can be operated normally.



Control Pattern A Shown

851617

Control Linkage from Right Pedal to Control Valve

7. Expansion plugs in the bottom of gearcase need be removed only if the plugs are to be replaced.

8. Remove snap rings from intermediate and input shaft. Pull bearings from intermediate and input shafts.

9. Pull pinion shaft bearing from support housing with a bearing puller. Remove pinion shaft oil seal from seal retainer.

10. Remove the pinion shaft bearing inner race and oil seal race only if wear or damage is seen. To remove, heat the bearing inner race and oil seal race. When the races are expanded, pull with a bearing puller.

Inspection and Repair

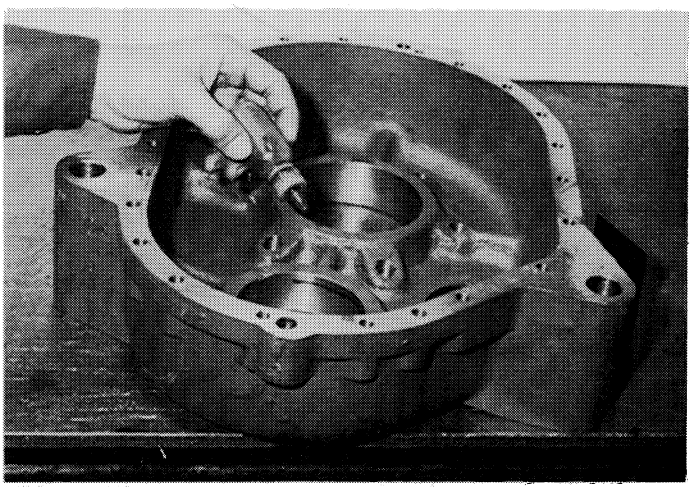
Clean all parts in a solvent that is not flammable. Inspect gears and bearings for wear, corrosion or damage. Remove rough edges with a fine flat file.

Inspect machined surfaces for grooves or damage. Make sure these surfaces are completely smooth.

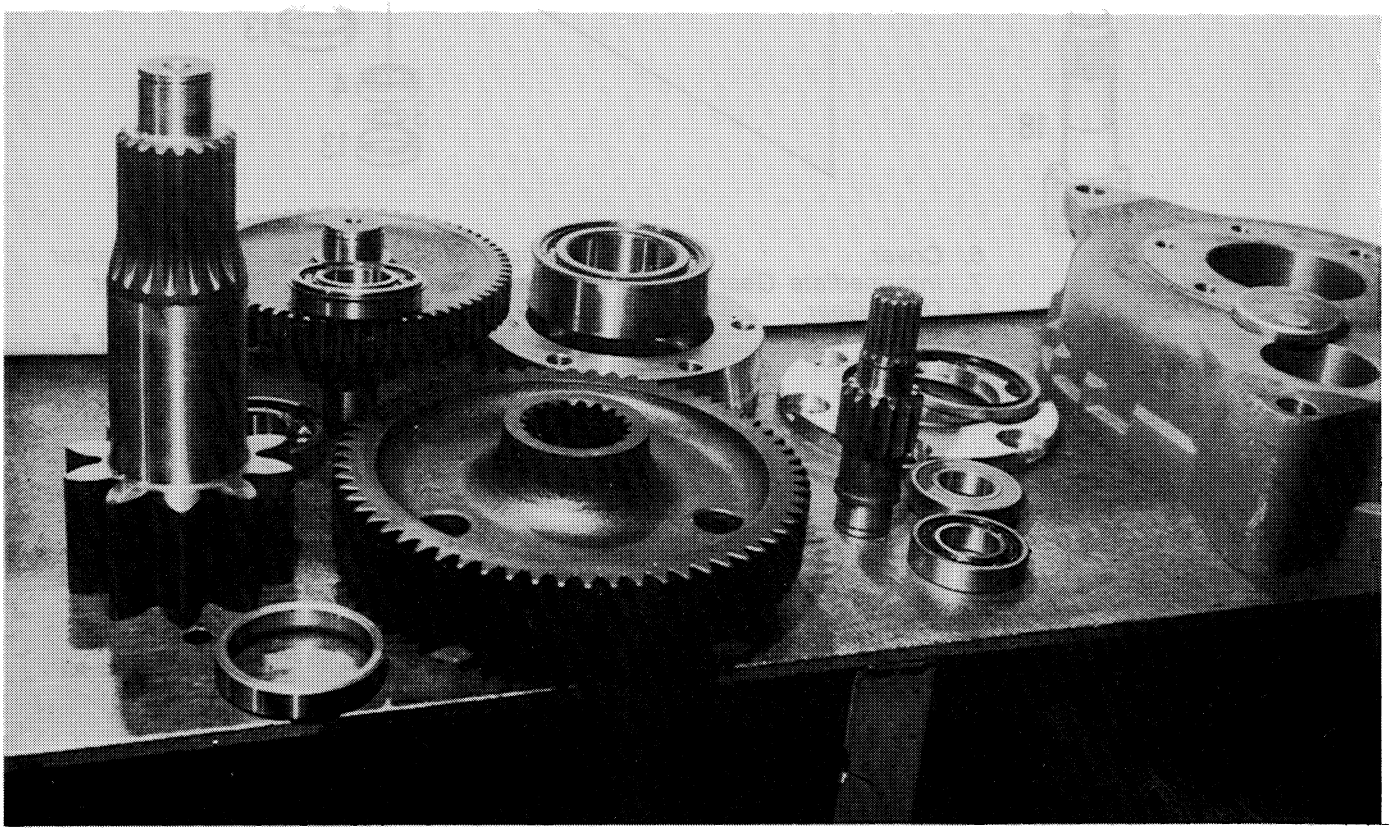
Replace all items that have wear or damage. Inspect the expansion plugs in bottom of gearcase for leaks or damage.

Assembly

1. Apply Loctite TL-271 (red) to the machined bore for the expansion plugs.



Prepare to Install Expansion Plugs



Parts of the Gearbox Before Assembly

SERVICING THE BUSHINGS

Bushings for Cylinder, Buckets, Booms

Service Information

Bushings are installed in the boom assembly at pivot points that will receive wear. These steel bushings are hardened to take severe loads. When worn, the bushings are easily replaced.

Check the bushings regularly. Any bushing which has severe wear must be replaced.

Many bushings are at lubrication points — in these cases, bushing life can be increased by following the recommendations for regular lubrication. Lubrication instructions are in Section 1050.

Removal

1. Bushings held in position by setscrews:

   Some bushings (see boom assembly illustration) have two setscrews. Be sure to loosen both setscrews before trying to remove bushings.

2. Remove the bushing with a press and sleeve or a driver. Using a chisel or cutting torch to remove a bushing often causes damage to the bushing seal.

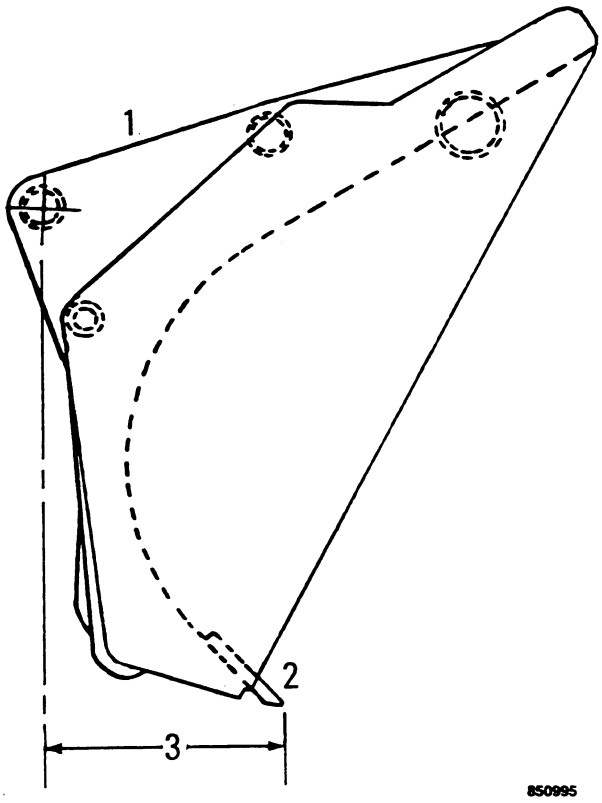
Installation

1. Apply green Loctite to O.D. of bushing. Use a press and install the bushing in the bore.

2. Make sure the bushing is installed in the correct location. Some bushings have lubrication holes, which must be in line with lubrication holes in the mating assembly. Install setscrew(s).

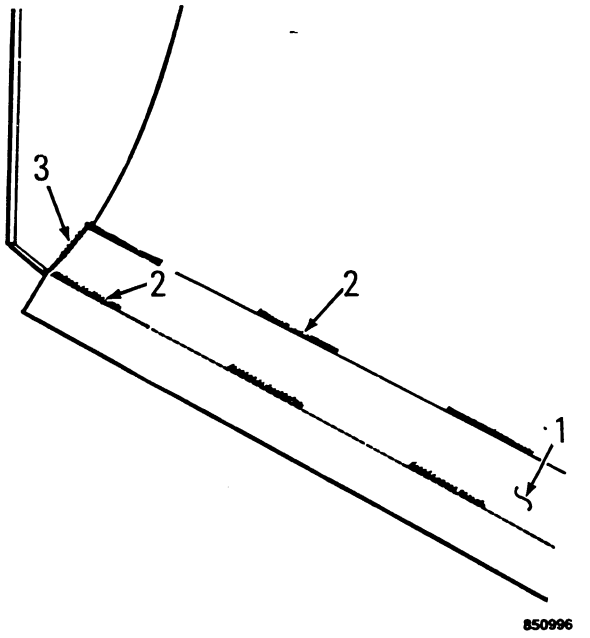
Installation

1. Put the new cutting edge on the blade according to the dimension shown below. Use C-clamps to hold the cutting edge in position.



1. *Blade*
2. *Cutting Edge*
3. *15 Inches (381 mm)*

2. Weld the cutting edge to the blade. Use E-7018 welding rod.



1. *Cutting Edge*
2. *3/16 Inch (5 mm) Fillet Weld 4 Inches (102 mm) Long on 8 Inch (203 mm) Centers*
3. *3/16 Inch (5 mm) Fillet Weld*

3. Connect the wiring to the alternator.