590 Loader Backhoe
Service Manual

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CASE CORPORATION Rac 8-17131

Printed in U.S.A.
June, 1992

Reprinted

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CAPACITIES AND LUBRICANTS

Engine Oil
- Capacity with Filter Change ..... 11.6 U.S. quarts (11 litres)
- Type of oil ..... See Engine Oil Recommendations on page 1002-3

Engine Cooling System
- Capacity without heater ..... 19.0 U.S. quarts (18.0 litres)
- Capacity with heater ..... 19.6 U.S. quarts (18.6 litres)
- Type of coolant ..... Ethylene glycol and water mixed for lowest ambient temperature At least 50/50 mix

Fuel Tank
- Capacity ..... 33 U.S. gallons (124.9 litres)
- Type of fuel ..... See Diesel fuel specifications on page 1002-4

Hydraulic System
- Hydraulic reservoir refill capacity ..... 21.5 U.S. gallons (81.4 litres)
- Type of oil ..... Case TCH Fluid

Transmission
- Refill Capacity ..... 47.6 U.S. quarts (45 litres)
- Total System Capacity ..... 57.1 U.S. quarts (54 litres)
- Type of oil ..... Case Hy-Trans Plus (MS 1207)

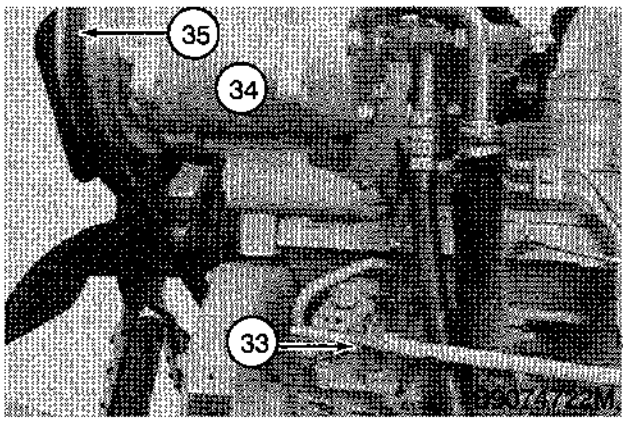
Front Axle - Four Wheel Drive
- Capacity of center bowl ..... 7.4 quarts (7 litres)
- Capacity of planetary (each) ..... 1.1 U.S. quarts (1 litre)
- Type of oil ..... CaseIH 135-H EP gear lube

Brake Reservoir
- Type of fluid ..... Case TCH Fluid

Conversion Formulas

Imperial quart = litres x 0.879877
Imperial gallons = litres x 0.219969

STEP 17



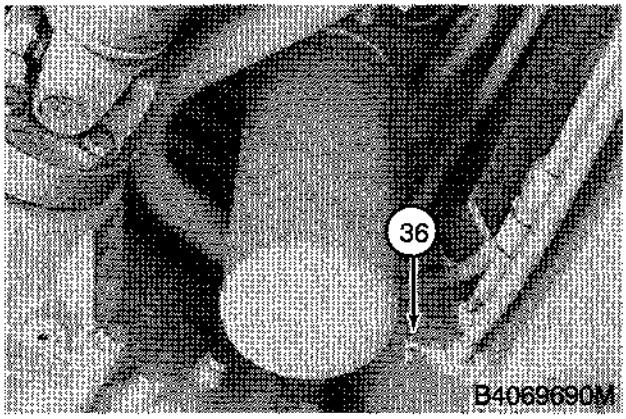
Disconnect throttle rod (33).

Cut the tie strap which fastens the compressor hoses to the wiring harness.

Remove the hardware that fastens the compressor (34) to the bracket. (long bolt, flat washers, lock washer, and nut) Remove the drive belt (35), and lay the compressor (34) over the side of the frame.

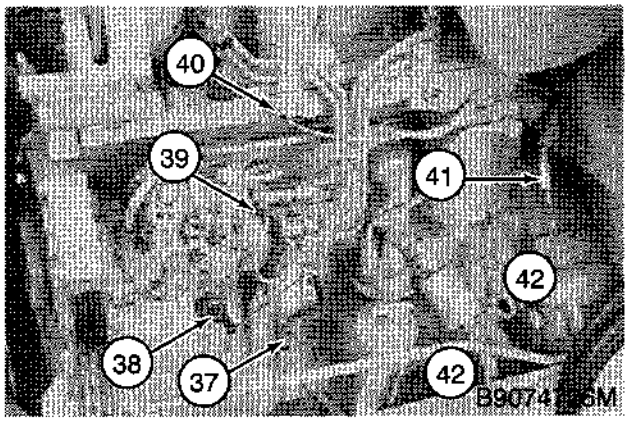
NOTE: *During installation, adjust the drive belt according to instructions in Section 9003.*

STEP 18



Close the fuel shutoff valve (36).

STEP 19



Disconnect the wiring clamp (37).

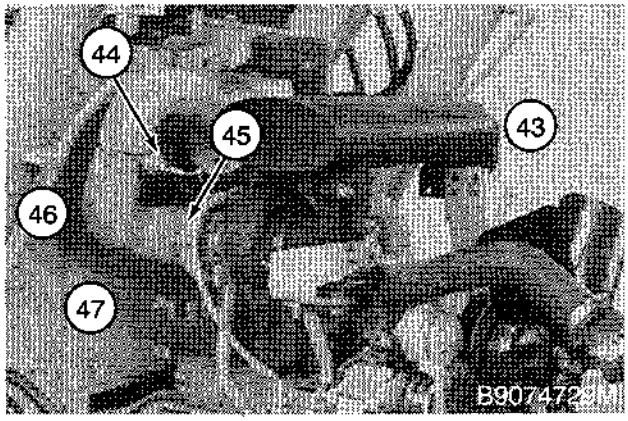
Disconnect the wire from the oil pressure sender (38).

Disconnect the fuel shutoff wire (39).

If the machine has ether injection, disconnect the tube (40) and the wiring connector (41).

Disconnect the fuel lines (42).

STEP 20



Remove the hardware which fastens the muffler (43) to the bracket. (bolts, lock washers, flat washers, and nuts)

Loosen the nuts on the muffler clamp. Remove the muffler (43).

Disconnect the wires from the air restriction switch (44). Then cut the tie straps which fasten the wire to the fuel lines and put the wire out of the way.

Loosen the clamp (45) and remove the hose (46) from the turbocharger.

Remove the hardware that fastens the firewall (47). (cap screws and flat washers or lock washers). Remove the firewall (47) and the air cleaner assembly. If the machine has ether injection, disconnect the wiring connector for the ether injection from the wiring harness.

CHECK SHEET

1. _____ (2250 to 2300 specified) rpm (r/min) hydraulic stall speed

2. _____ (2050 to 2150 specified) rpm (r/min) torque converter stall speed

3. _____ (1450 to 1650 specified) rpm (r/min) hydraulic and torque converter stall speed

rpm (r/min)	
1. 2250 to 2300 2. 2050 to 2150 3. 1450 to 1650	Torque converter, transmission, hydraulic system and engine are probably good.
1. Above 2300 2. Above 2150 3. Above 1650	Engine problem. Check engine speeds. See specifications in Section 9001. Check the timing of the fuel injection pump according to instructions in Section 3412.
1. Below 2250 2. Below 2050 3. Below 1450	Engine problem. Check engine speeds according to instructions in Section 9001. Check the timing of the fuel injection pump according to instructions in Section 3412. Replace the fuel and air filters.
1. Below 2250 2. 2050 to 2150 3. Below 1450	Hydraulic system problem(s). See Section 8002. Check the setting of the main relief valve. Check the output of the pumps.
1. Above 2300 2. 2050 to 2150 3. Above 1650	Hydraulic system problem(s). See Section 8002. Check the setting of the main relief valve. Check the output of the hydraulic pumps. Check for leakage in the loader control valve.
1. 2250 to 2300 2. Above 2150 3. Above 1650	Torque converter or transmission problems. See Section 6002 and check the transmission and torque converter.
1. 2250 to 2300 2. Below 2050 3. Below 1450	Torque converter or transmission problems. See Section 6002 and check the transmission and torque converter.

Valve Springs

Free Length ..... 55.63 mm

Total Coils 7.25

Wire Diameter ..... 4.830 to 4.930 mm

Compressed to 38.53 mm ..... (Valve Open) 785 to 839 N

Maximum Service Limit ..... 765 N

Compressed to 49.25 mm ..... (Valve Closed) 285 to 321 N

Minimum Service Limit ..... 270 N

Valve Seat Installation Dimensions

Exhaust Seat

Diameter of Insert ..... 43.713 to 43.73 mm

Machine Insert Bore to ..... 43.647 to 43.663 mm

Depth of Bore ..... 10.10 to .092 mm

Press Fit ..... 0.05 to 0.102 mm

Intake Seat

Diameter of Insert ..... 47.063 to 47.089 mm

Machine Bore to ..... 46.987 to 47.013 mm

Depth of Bore ..... 10.30 to 10.50 mm

Press Fit ..... 0.05 to 0.102 mm

Valve Guide Installation Dimensions

11 mm Valve Guide Installation Dimensions

Valve Guide OD ..... 11.150 to 11.163 mm

Machine Guide Bore to ..... 11.112 to 11.138 mm

Press Fit ..... 0.012 to 0.051 mm

Installed Height (above top of valve guide boss on head) ..... 11.25 to 11.75 mm

Guide Installed ID ..... 8.19 to 8.39 mm

14 mm Valve Guide Installation Dimensions

Guide Diameter ..... 14.026 to 14.038 mm

Machine Guide Bore to ..... 13.987 to 14.013 mm

Press Fit ..... 013 to 051 mm

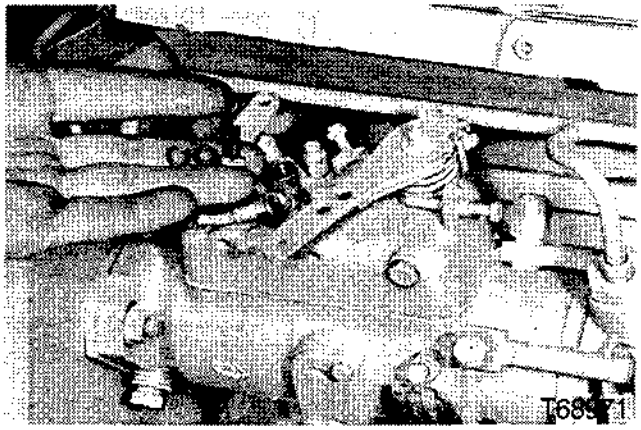
Installed Height (above top of valve guide boss on head) ..... 11.25 to 11.75 mm

Guige Installed ID ..... 8.19 to 8.39 mm

SPECIAL TORQUES

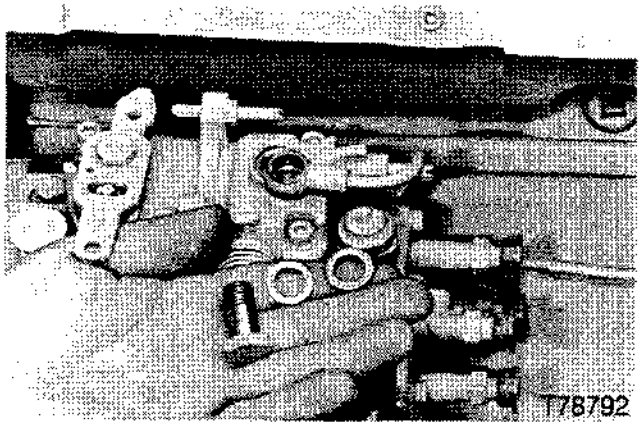
	Metric Value
Aftercooler Bolts	21 to 27 Nm
Alternator Bracket Bolts (Lower)	21 to 27 Nm
Alternator Bracket Bolts (Upper)	21 to 27 Nm
Alternator Retaining Bolt	21 to 27 Nm
Balancer Counter Weight Bolts	21 to 27 Nm
Balancer Mounting Bolts	167 to 183 Nm
Balancer Idler Gear	52 to 62 Nm
Belt Tensioner Bracket Bolts	21 to 27 Nm

STEP 13 CAV INJECTION PUMP



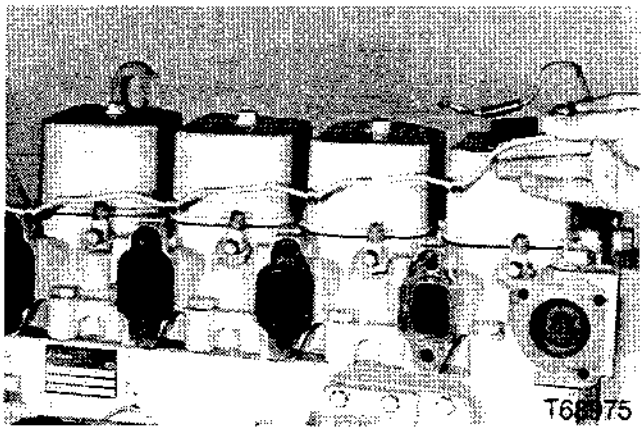
Remove the leak off fitting and gasket.

STEP 14 BOSCH INJECTION PUMP



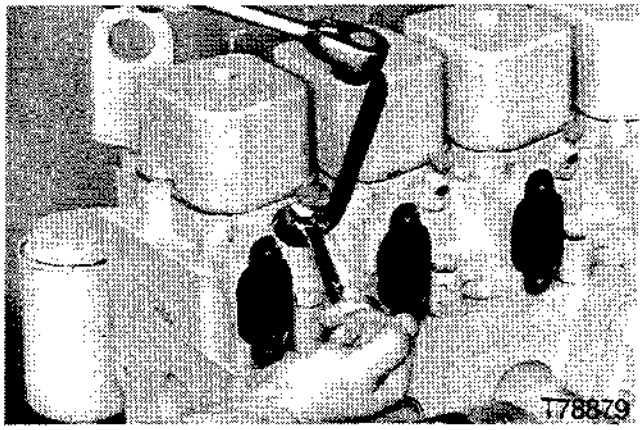
Remove the leak off fitting and gaskets.

STEP 15



Remove the leak off fittings, gaskets and the leak off line.

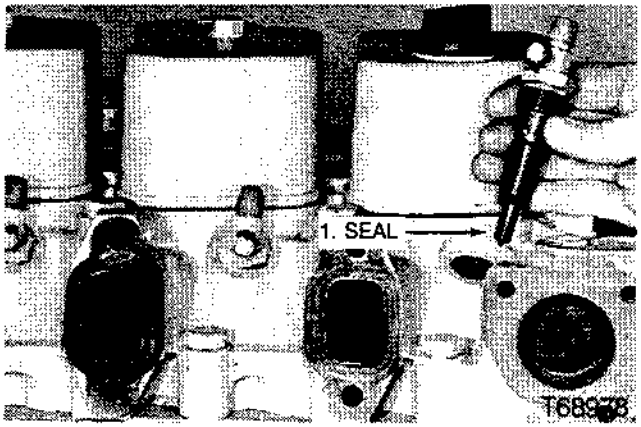
STEP 16



Loosen the nut on the injectors.

NOTE: *The injector must not rotate in the bore of the cylinder head. This will damage the cylinder head.*

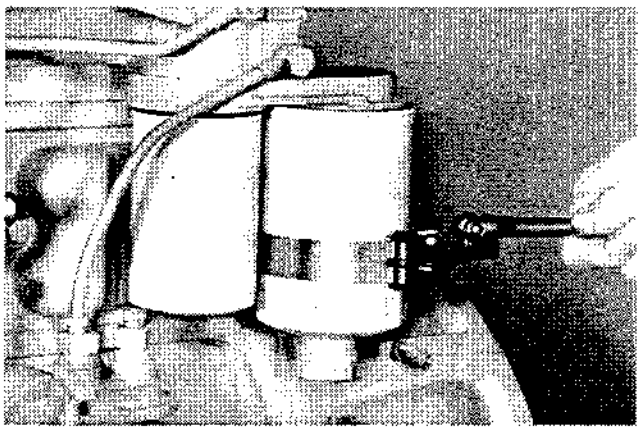
STEP 17



Remove the injectors from the cylinder head.

NOTE: *Make sure the injector seal is removed from the cylinder head.*

STEP 18

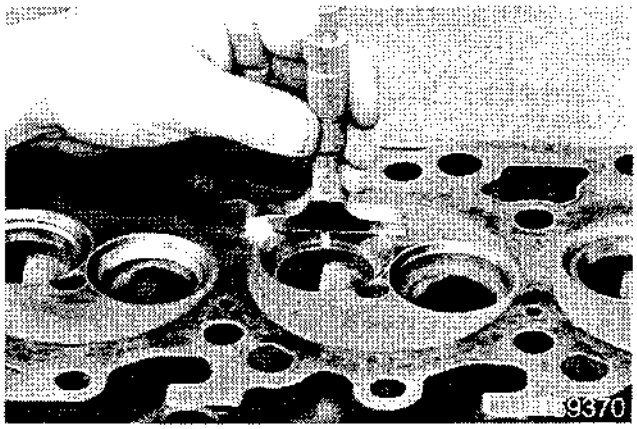


Use a strap type wrench to remove the fuel filters.

NOTE: *Some engines have a single fuel filter.*

VALVE SEAT INSTALLATION

STEP 51



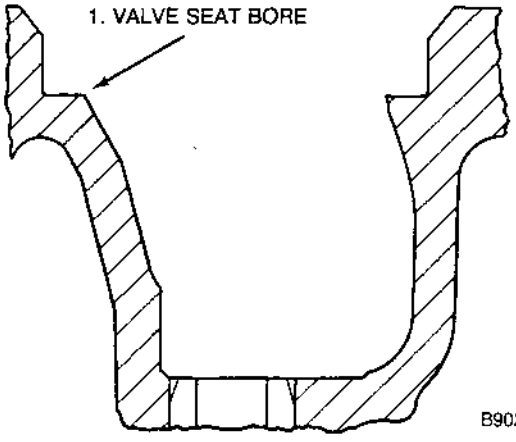
Machine the cylinder head to the following specifications for valve seats.

Exhaust Valve Seat Specifications:

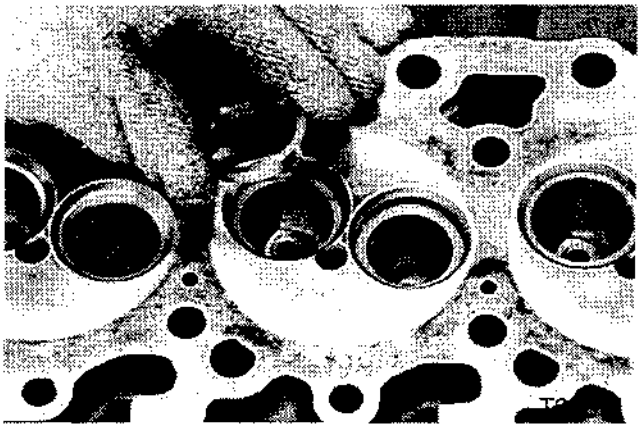
Diameter of Valve Seat ..... 43.713 to 43.739 mm
Diameter of Bore ..... 43.647 to 43.663 mm
Depth of Bore ..... 10.10 to 10.30 mm
Press Fit ..... 0.05 to 0.092 mm

Intake Valve Seat Specifications:

Diameter of Valve Seat ..... 47.063 to 47.089 mm
Diameter of Bore ..... 46.987 to 47.013 mm
Depth of Bore ..... 10.30 to 10.50 mm
Press Fit ..... 0.05 to 0.102 mm



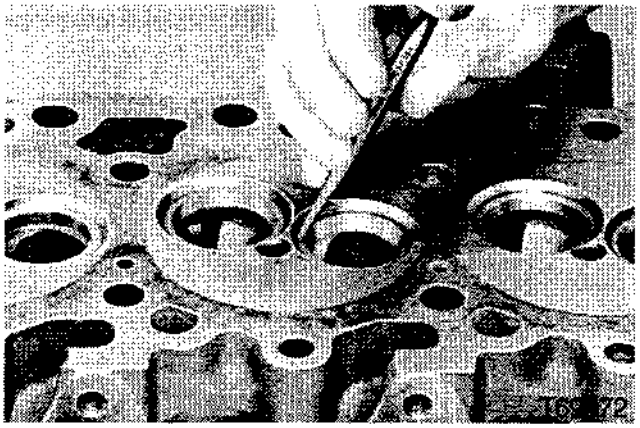
STEP 52



Clean the recessed area in the cylinder head. Put the new valve seats in dry ice for a minimum of one hour to shrink the valve seats for easy installation. Use a driver and install the valve seats.

> ***Always wear gloves to prevent frostbite to your hands when handling frozen parts.***
> SM118A

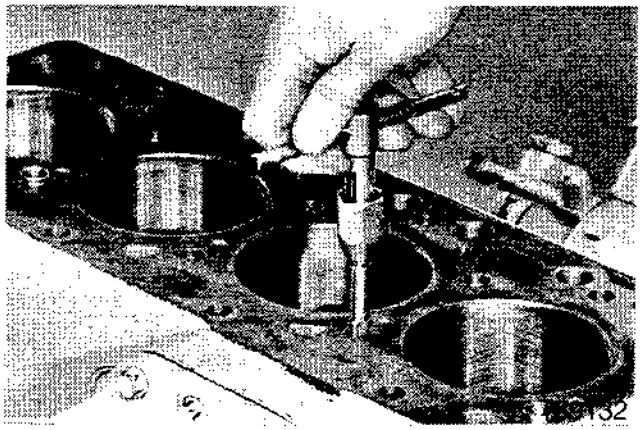
STEP 53



Use a center punch and stake the valve seats in three positions. Grind the valve seats to the correct angle.

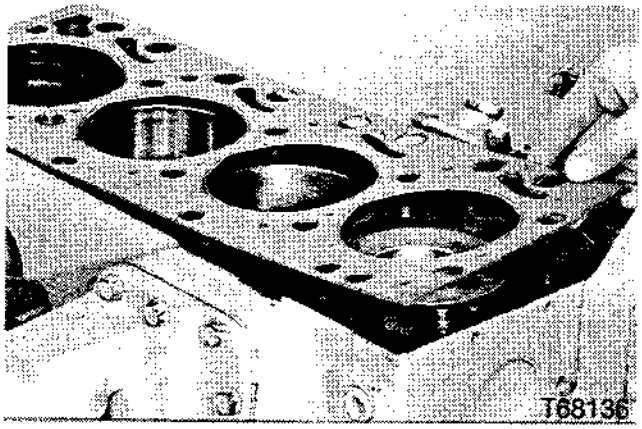
CYLINDER HEAD INSTALLATION

STEP 72

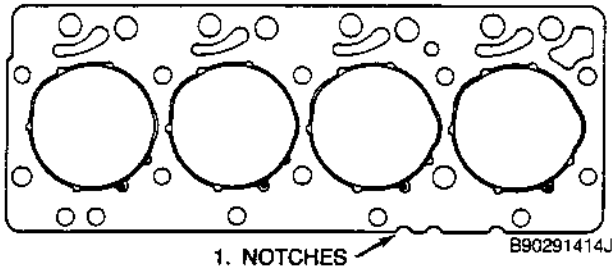


Use the correctr tap and clean all head bolts holes of foreign material.

STEP 73



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



Head Gasket Application

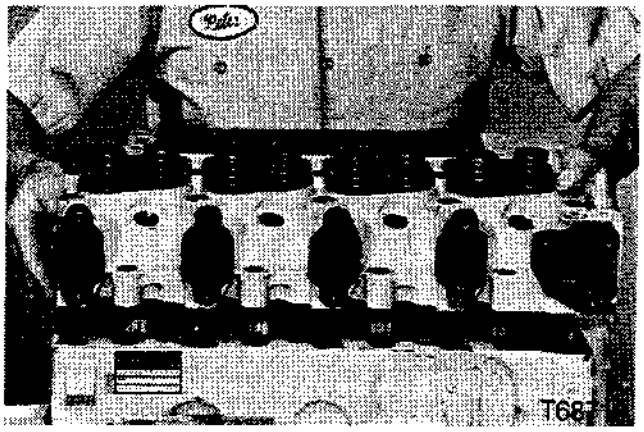
No Notches - Replacement Gaskett

2 Notches - 0.25 mm Oversize Gasket

3 Notches - 0.50 mm Oversize Gasket

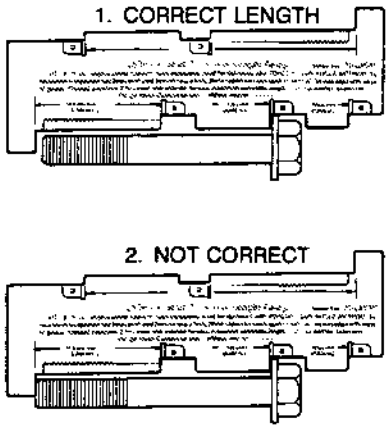
IMPORTANT: *Oversize thickness gaskets are used when the cylinder block has been machined.*

STEP 74



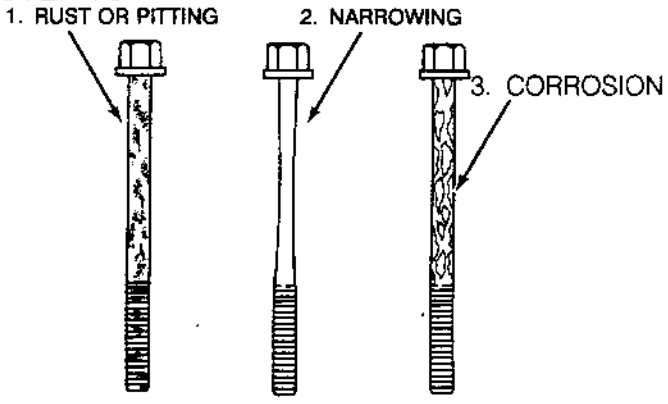
Install the cylinder head.

STEP 75



Use the bolt length gauge to check the head bolt length. If the head bolt length is more than the maximum length on the gauge the bolt must be replaced.

STEP 76



Check and replace all head bolts that have rust, pitting narrowing and corrosion.

Section

2425

CYLINDER BLOCK

Crankshaft, Pistons, Rods, Sleeves, Camshaft, Bearings, Seals and Flywheel

4-390 Diesel Engine

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.

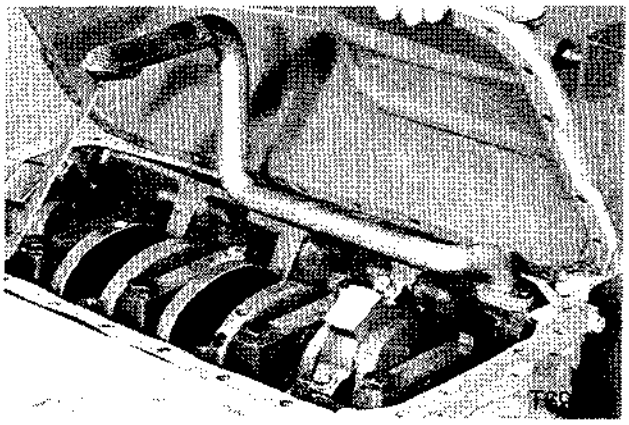
CASE CORPORATION

Rac 8-24183

June, 1983 (Revised February, 1992)

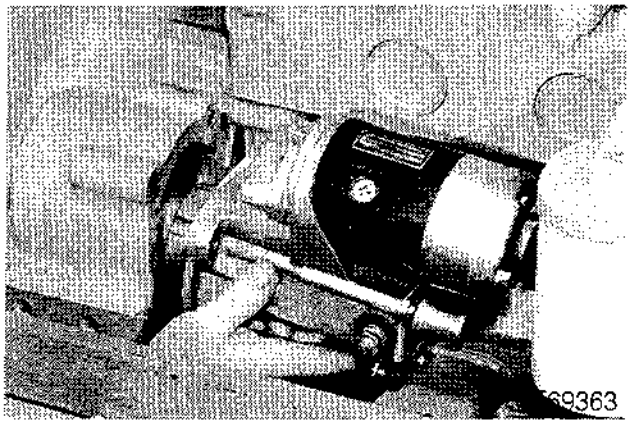
REAR OIL SEAL REPLACEMENT

STEP 19



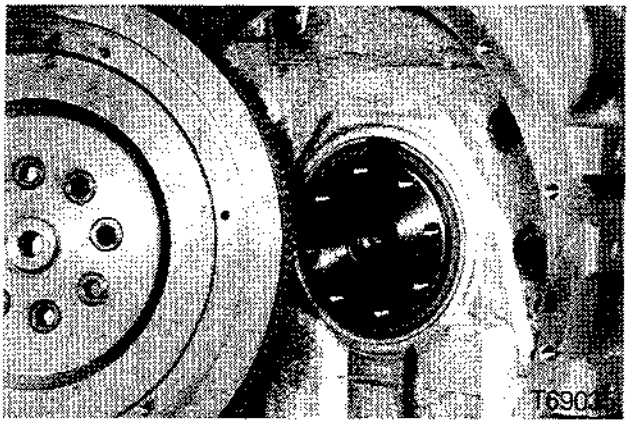
Remove the engine oil pan. See Section 2445 for oil pan removal.

STEP 20



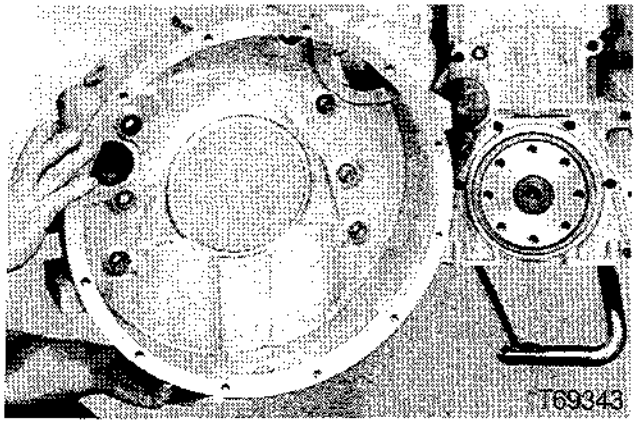
Remove the bolts and the starter from the flywheel housing.

STEP 21



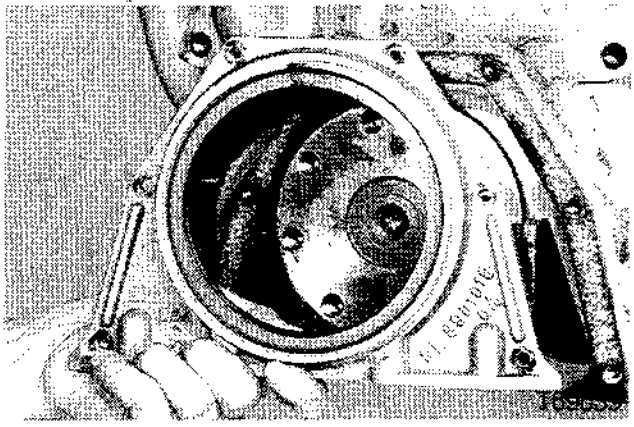
Remove the biolts and the flywheel from the flywheel housing.

STEP 22



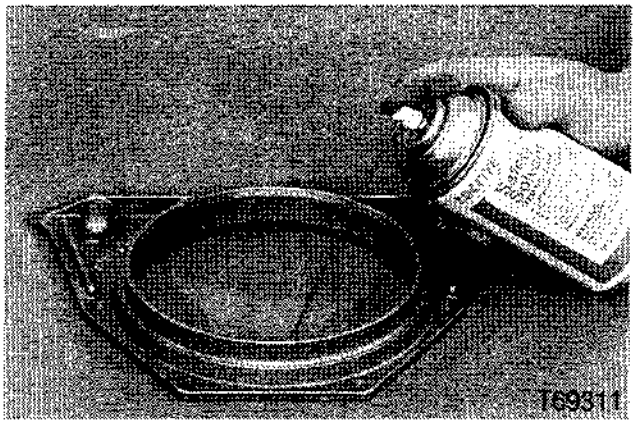
Remove the bolts and the flywheel housing from the engine block.

STEP 23



Remove the seal carrier from the crankshaft.

STEP 24



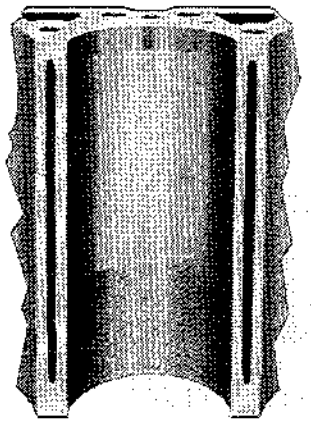
Remove the seal and clean the seal surface with Loctite safety solvent.

CYLINDER WALL INSPECTION

STEP 85

Inspect the cylinder walls for the following conditions.

Normal Wear

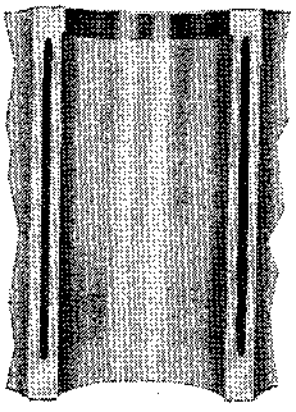


T10766

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 and the cylinder need not be machined.

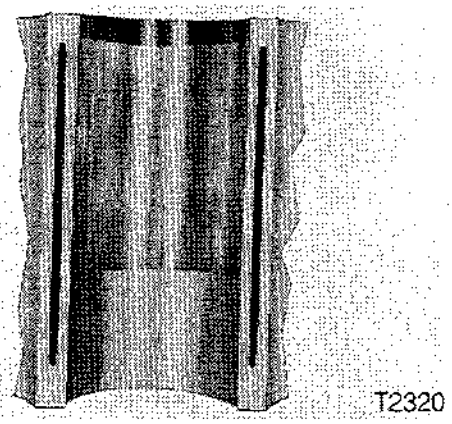
Worn Cylinder Wall



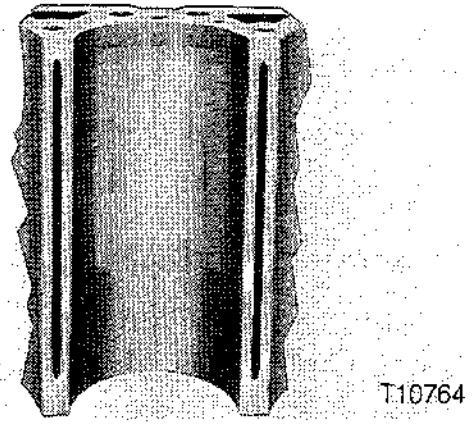
T2319

A smooth surface between the upper and lower limits of the ring movement area shows a worn cylinder wall because of normal wear and the cylinder must be machined.

Scoring on Cylinder Walls



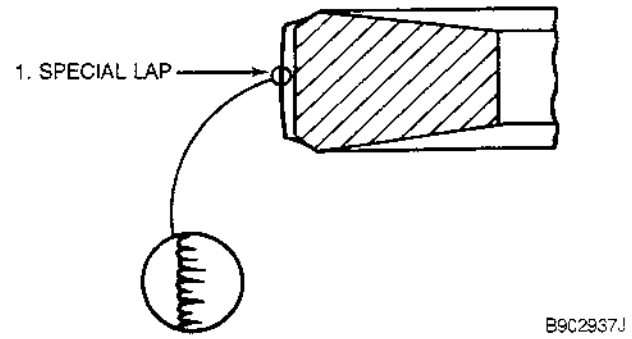
T2320



T10764

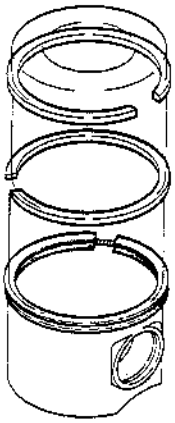
Scoring on cylinder walls is caused by metal moving from one location to a different location. This is shown by heavy vertical lines. The vertical lines are caused by metal coming in contact with the piston. The scoring can be in one specific area or it can occur the complete length of the piston movement. If this condition is present, the cylinder must be machined and the piston and rings replaced.

STEP 119



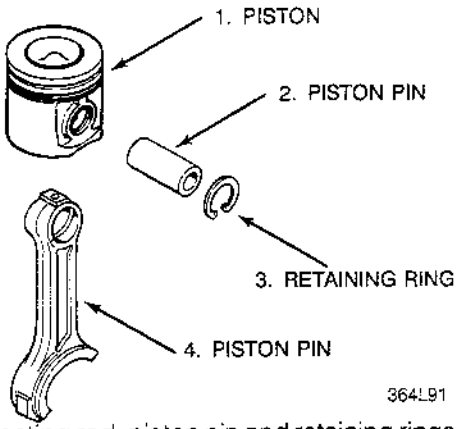
The first compression ring, in a replacement set of rings, must have a special lap design on the surface that contacts the cylinder wall.

STEP 120



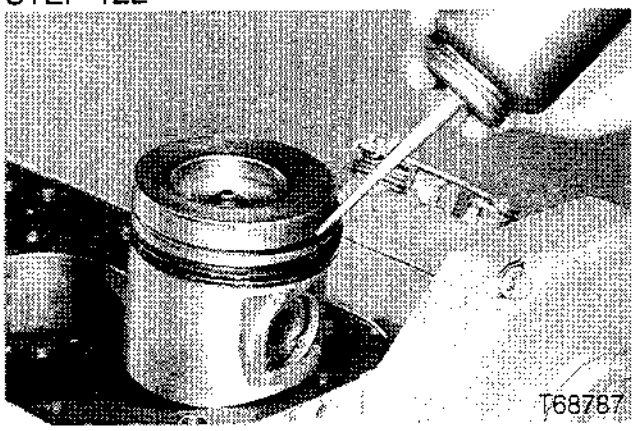
Rotate the piston rings so that the ring ends are separated by 120 degrees.

STEP 121



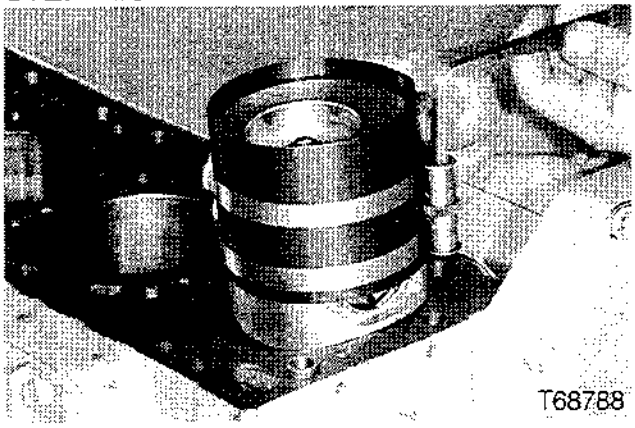
Install the connecting rod, piston pin and retaining rings in the piston.

STEP 122



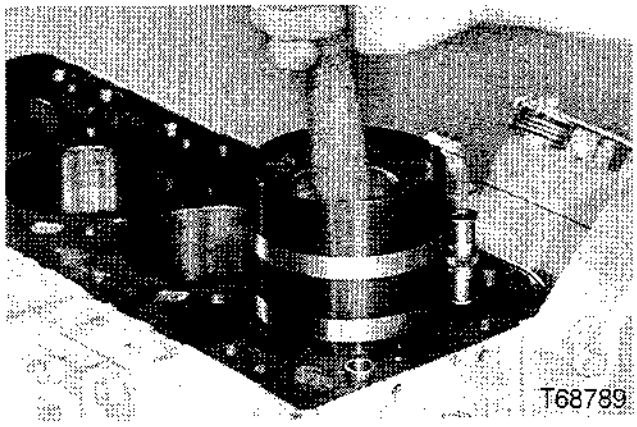
Apply lubrication to the pistons, piston rings and cylinder walls, using clean engine oil.

STEP 123



Install a ring compressor on the piston.

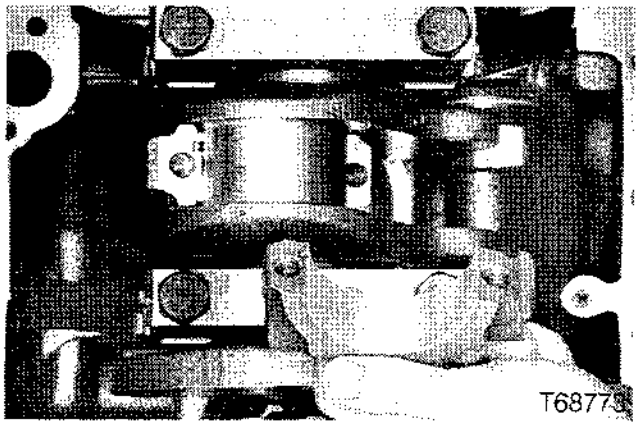
STEP 124



Carefully push the piston down into the cylinder.

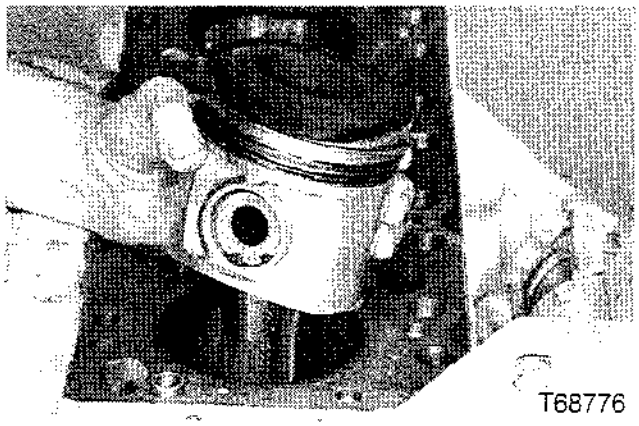
IMPORTANT: *Make sure the arrow or the word FRONT is toward the front of the engine.*

STEP 178



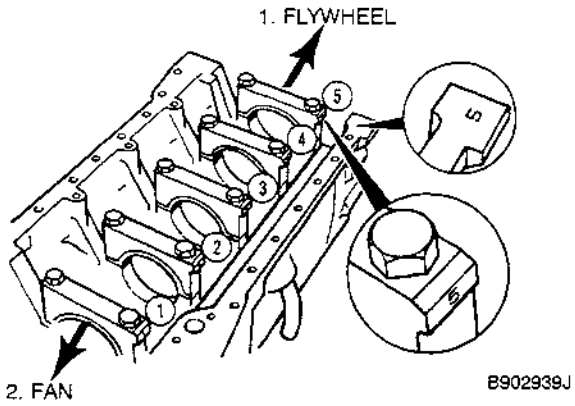
Remove the bolts and the connecting rod bearing caps.

STEP 179



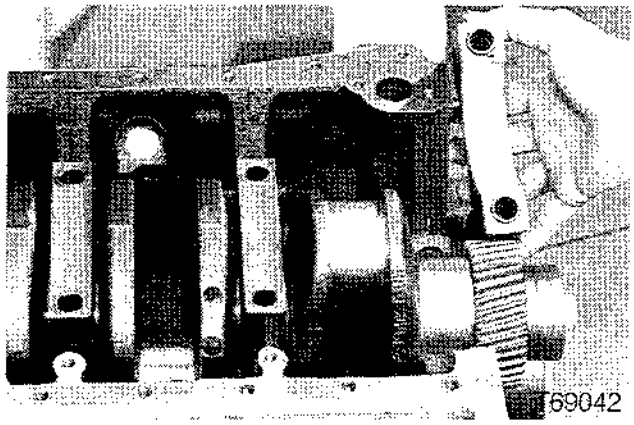
Remove the pistons and connecting rods.

STEP 180



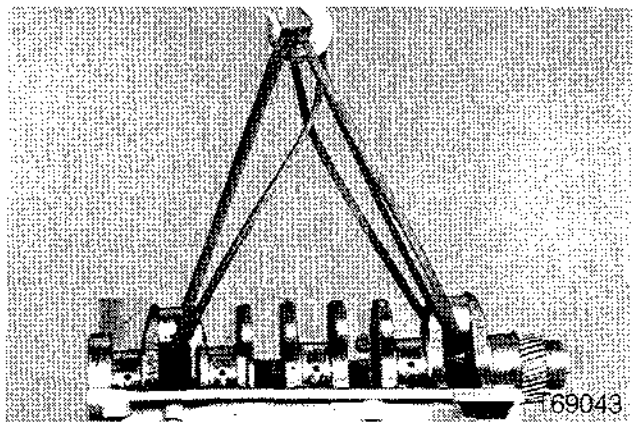
Each bearing cap has a number for assembly identification.

STEP 181



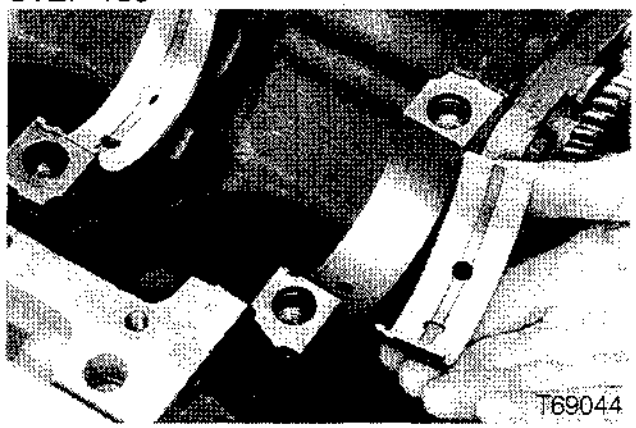
Remove the bolts and the crankshaft main bearing caps.

STEP 182



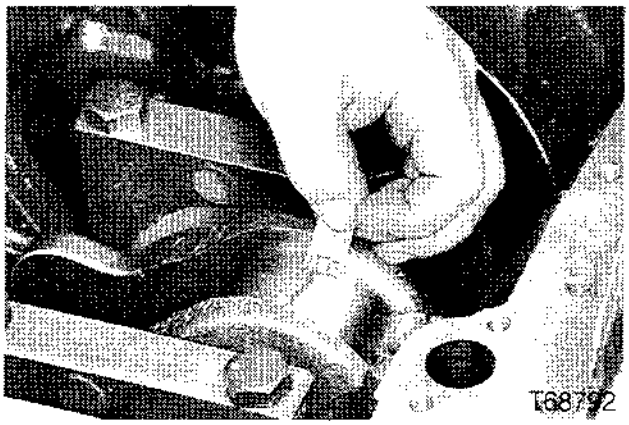
Remove the crankshaft from the engine.

STEP 183



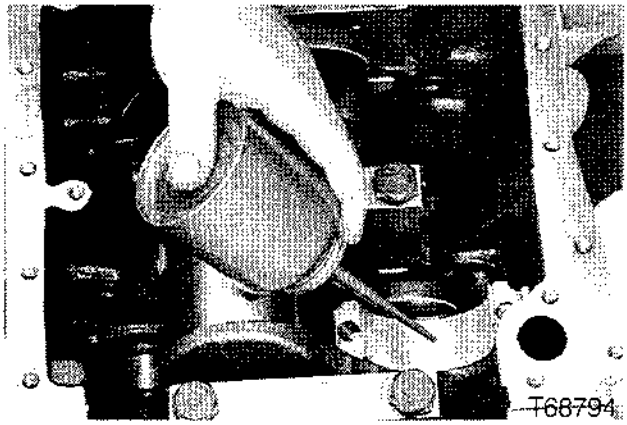
Remove the main bearing liners from the engine.

STEP 235



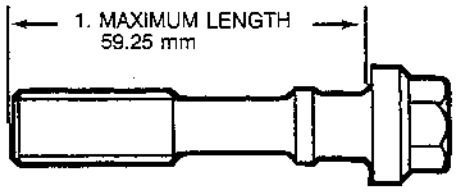
Remove the bearing caps and check the clearance. The clearance must be 0.038 to 0.129 mm. If the clearance is more than 0.129 mm, undersize bearing liners must be installed and reconditioning of the bearing journals must be done. Install new bearing liners which will give a clearance of 0.038 to 0.116 mm.

STEP 236



Add lubrication to the bearing liners. Use clean engine oil.

STEP 237

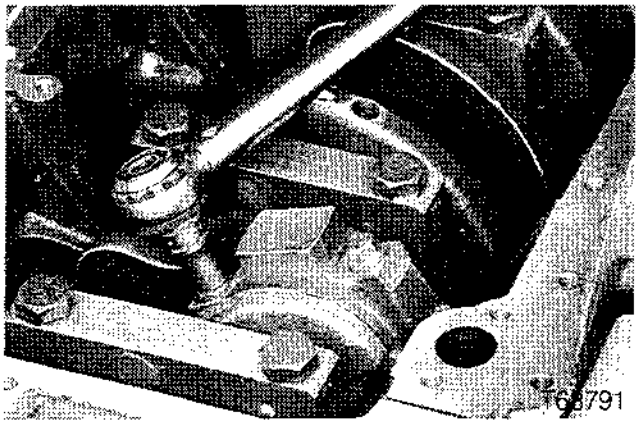


7L92

Measure the length of the connecting rod bolts. If the bolt length is more than 59.25 mm the bolt must be replaced.

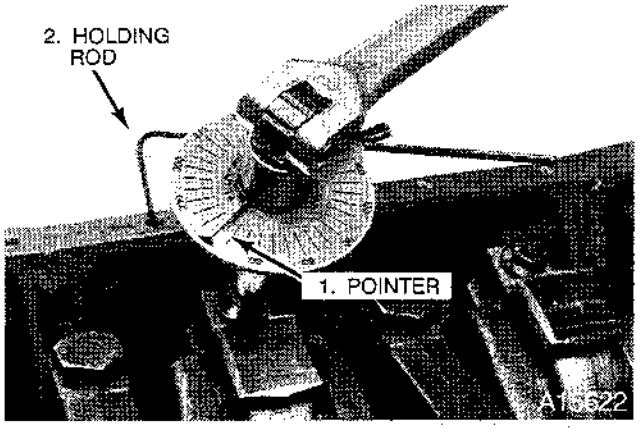
IMPORTANT: *Each bolt length must be checked before installation.*

STEP 238



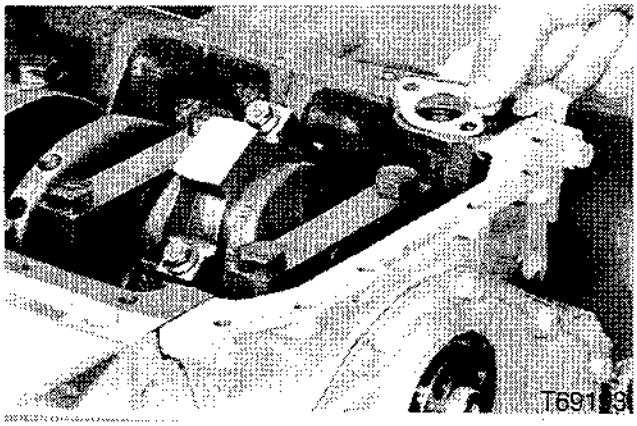
Add lubrication to the rod bolts. Install the rod bolts and tighten to a torque of 60 Nm.

STEP 239



Install the torque angle gauge. Position and lock the holding rod. Turn the pointer to 60 degrees. Tighten the bolt until the pointer is at 0 degrees.

STEP 240

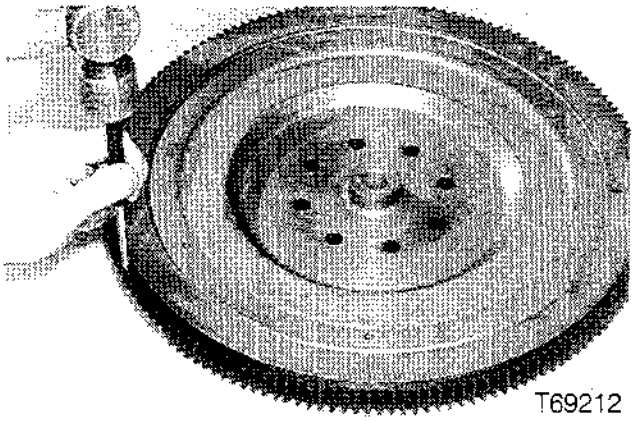


Install a new oil inlet tube gasket. See Section 2445 for oil inlet tube installation.

Ring Gear Removal and Installation

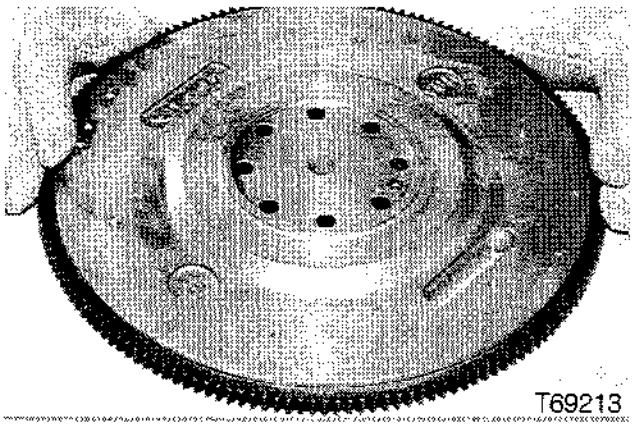
NOTE: *If your flywheel has a welded ring gear, DO NOT try to remove the ring gear. Use a complete new flywheel and ring gear assembly.*

STEP 292



Remove the ring gear from the flywheel, using a drift hammer. Work around the circumference of the ring gear.

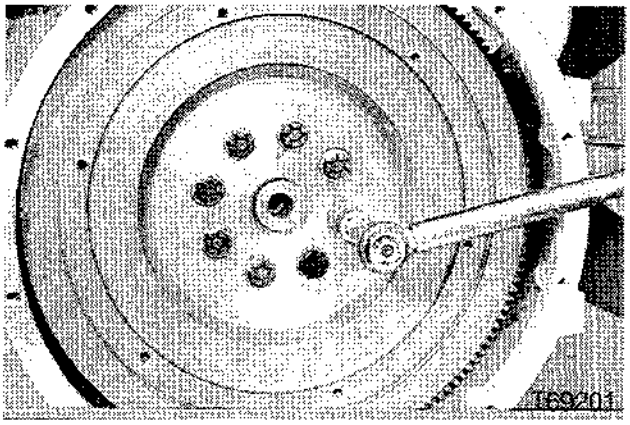
STEP 293



Heat the new ring gear, 400° to 450°F (204° to 232°C), in oil or in an oven. Do not use a torch to heat the ring gear.

Install the ring gear on the flywheel.

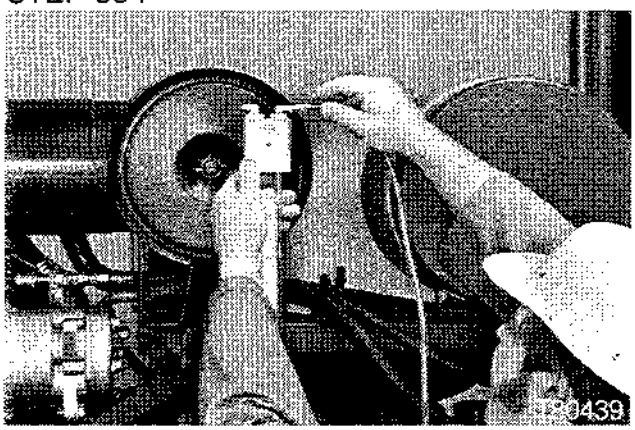
STEP 294



Install the flywheel. Tighten the retaining bolts to a torque of 130 to 144 Nm.

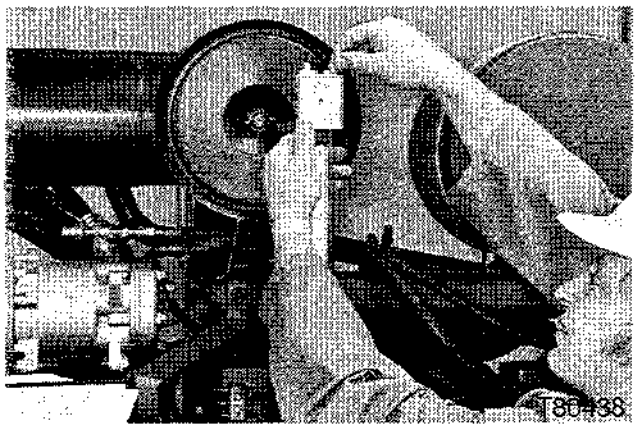
Manometer Removal

STEP 334



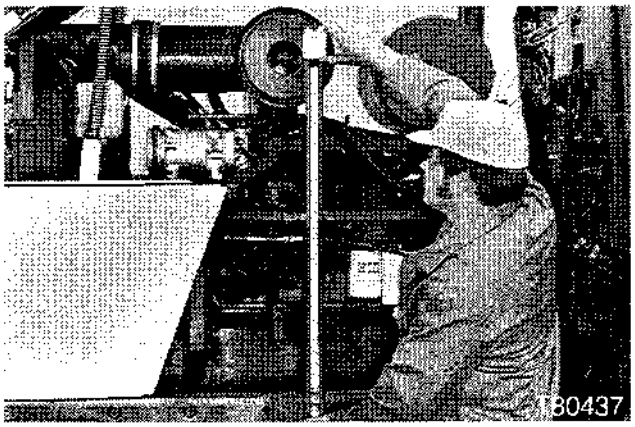
Disconnect the tube from the connector.

STEP 335



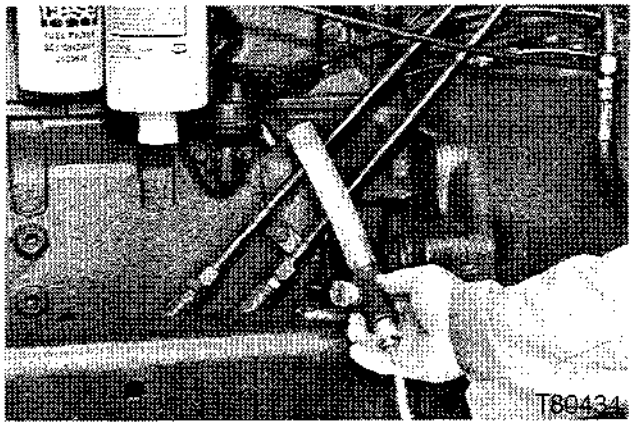
Turn each connector on the manometer one turn clockwise.

STEP 336



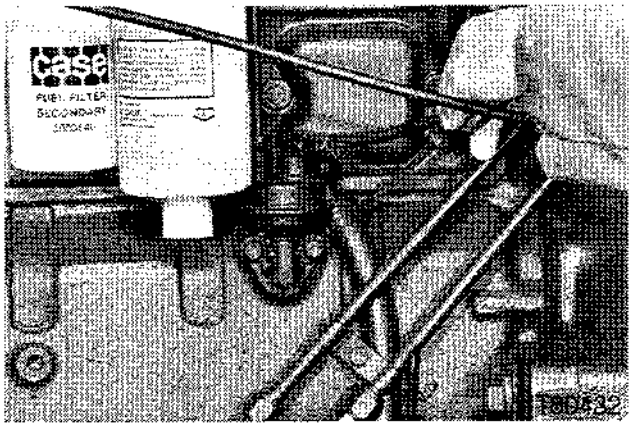
Remove the manometer.

STEP 337



Remove the adapter from the breather tube.

STEP 338



Install breather hose and the hose clamp.

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.

Section

2455

COOLING SYSTEM

Thermostat, Water Pump, Fan Pulley and Belt Tensioner

4-390 Diesel Engine

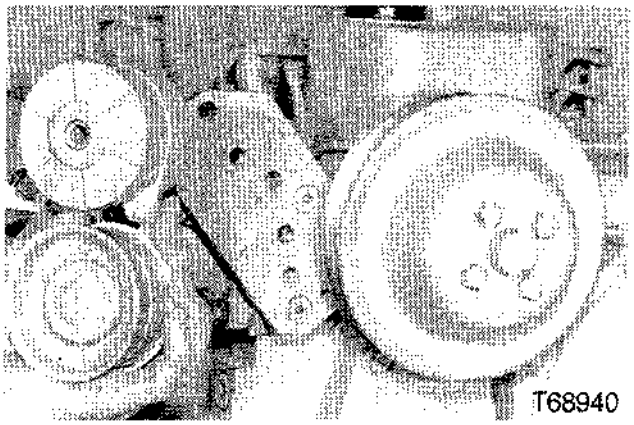
IMPORTANT: This engine was made using the metric measurement system. All measurements and checks must be made with metric tools to make sure of an accurate reading when inspecting parts.

CASE CORPORATION

Rac 8-24203

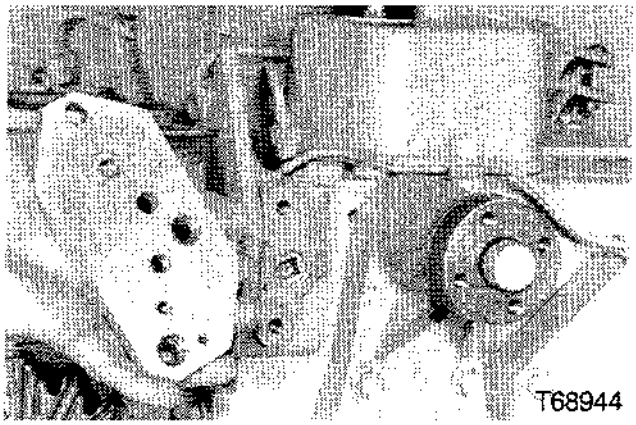
June, 1983 (Revised February, 1992)

STEP 36



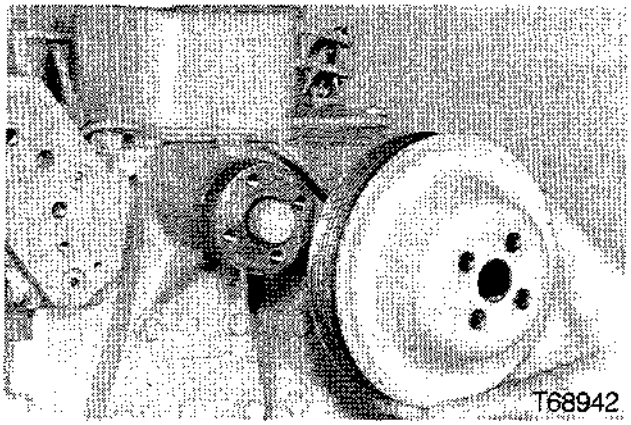
Remove the tensioner bolt and the belt tensioner.

STEP 38



Remove the belt tensioner bolts and the bracket.

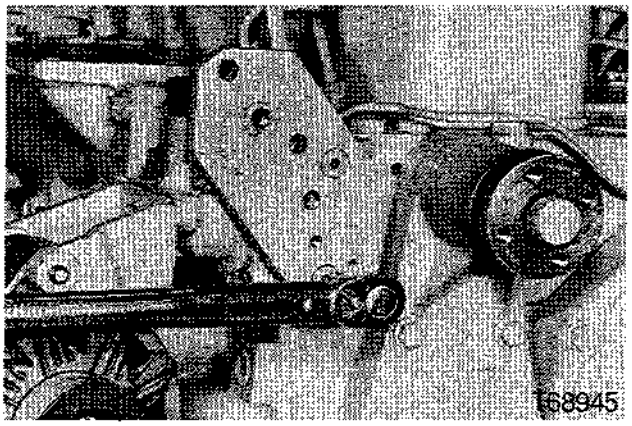
STEP 37



Remove the retaining bolts and fan belt pulley.

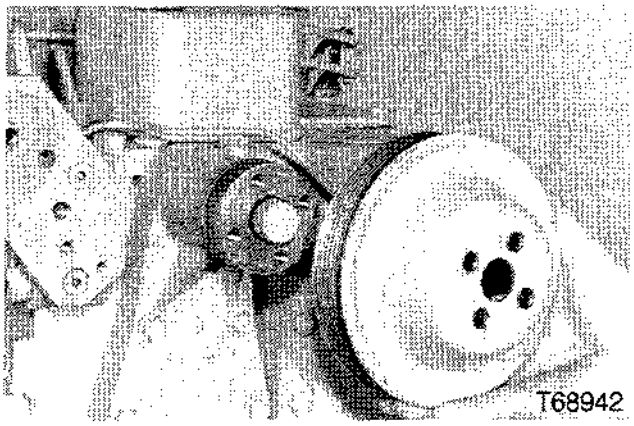
Installation

STEP 39



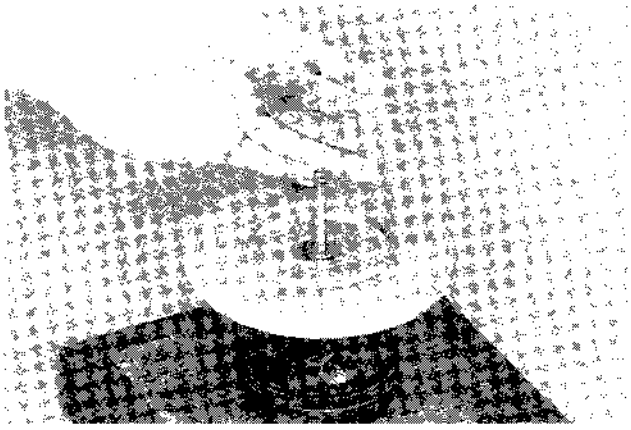
Install the tensioner bracket and tighten the Allen head bolts to a torque of 21 to 27 Nm.

STEP 40



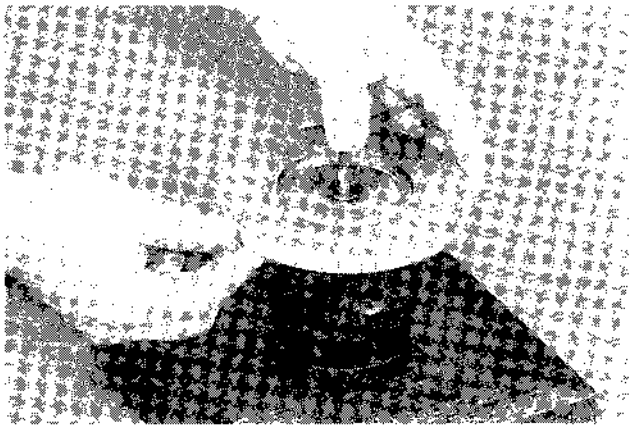
Install the fan belt pulley and retaining bolts.

STEP 26



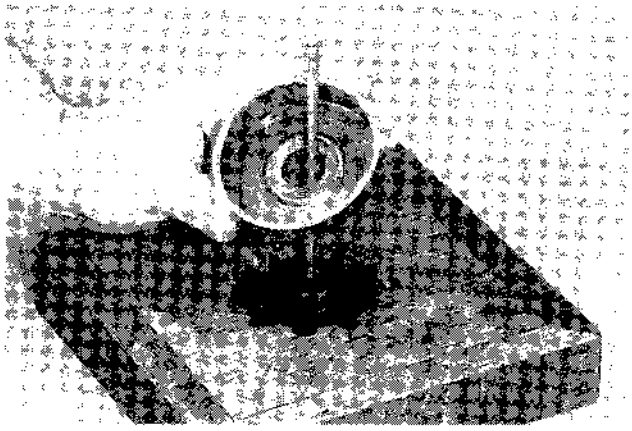
Remove the compressor wheel.

STEP 27



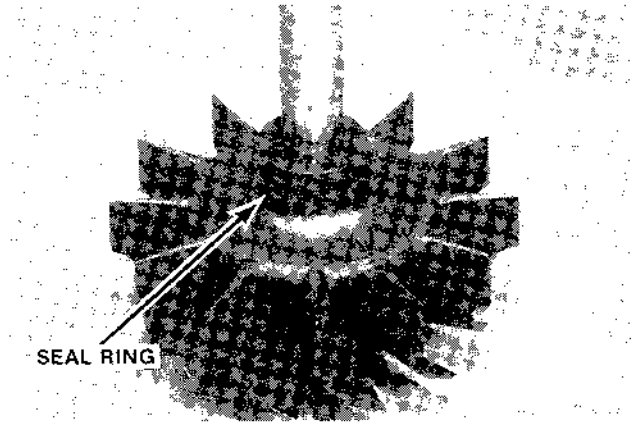
Lift the center housing from the turbine shaft.

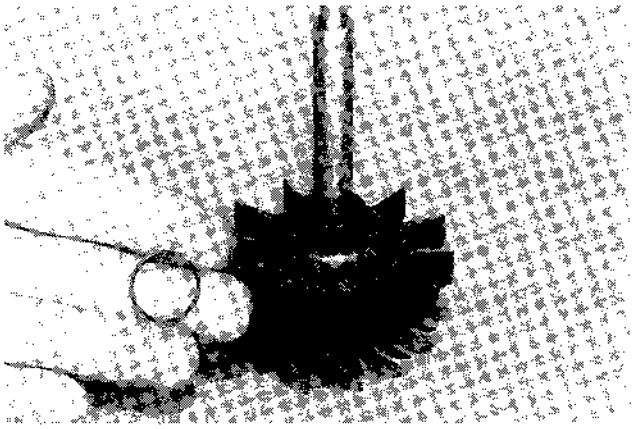
STEP 28



Remove the heat shield.

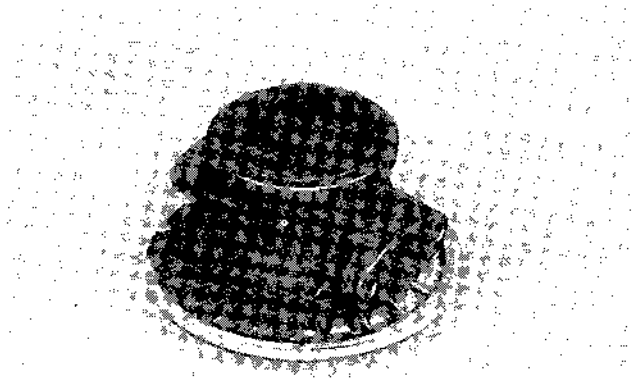
STEP 29





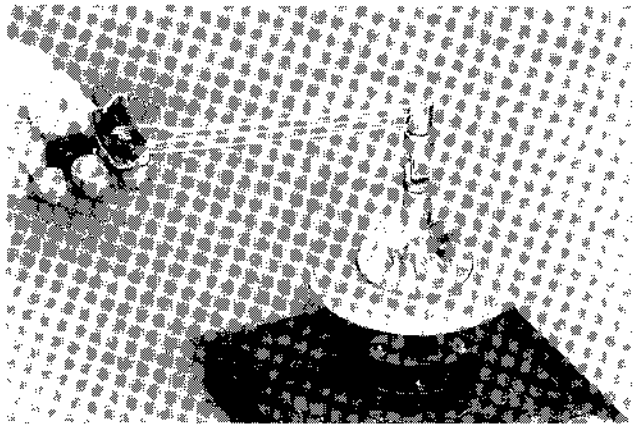
Remove the seal ring from the turbine shaft.

STEP 30



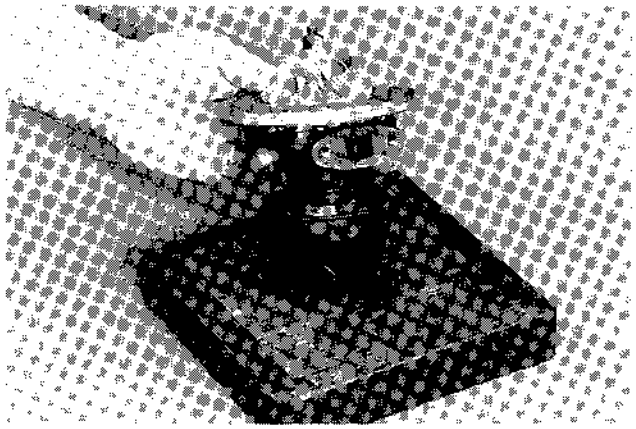
Turbocharger center housing.

STEP 82



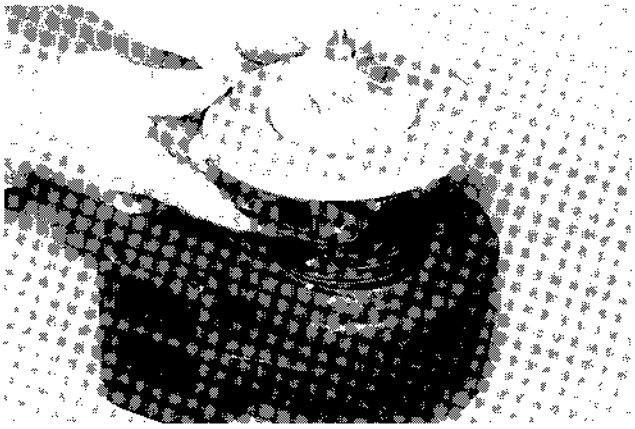
Tighten the lock nut to a torque of 120 lb inch (14 Nm)(1.4 kgm).

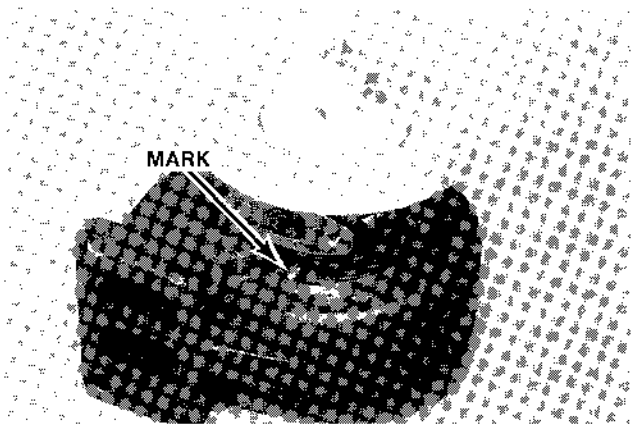
STEP 83



Remove the center housing assembly from the fixture.

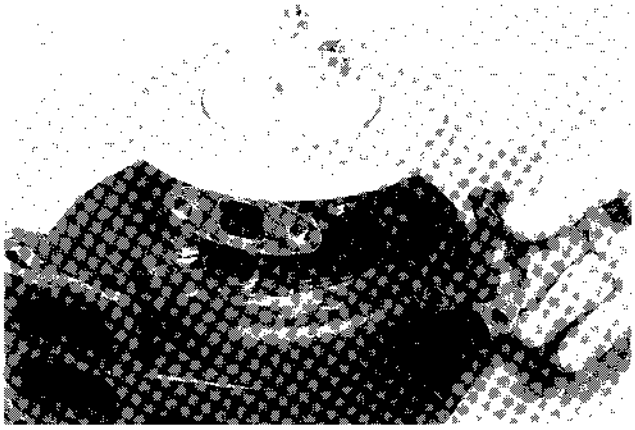
STEP 84





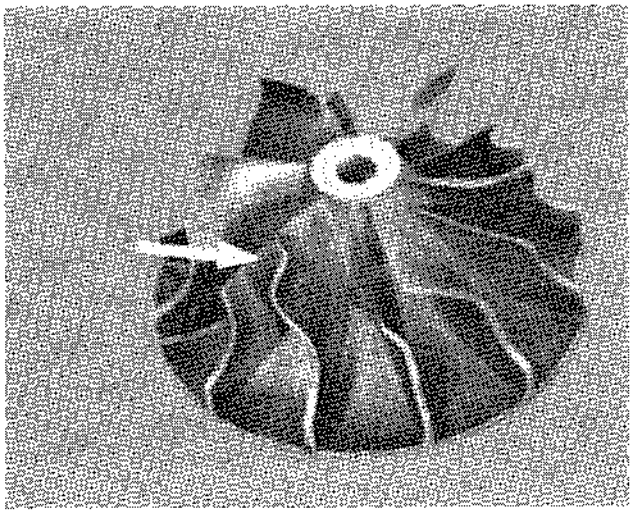
Carefully install the center housing on the turbine housing. Make sure the mark on the turbine housing is in align with the mark on the center housing.

STEP 85



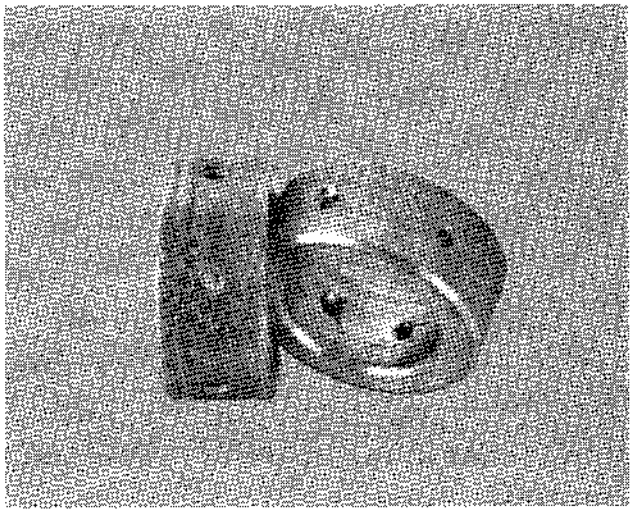
Install the clamp plates and the new lock plates.

Blade Edges Lifted



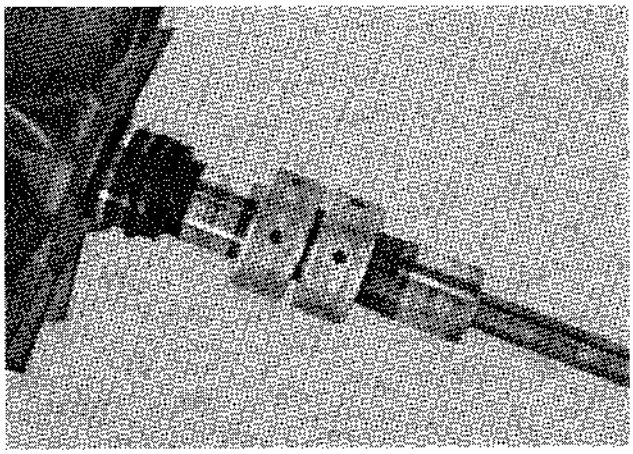
Blade edges of the compressor wheel lifted by improper removal of the compressor housing. Housing should not be pried off but lifted straight off.

Bearing Damage



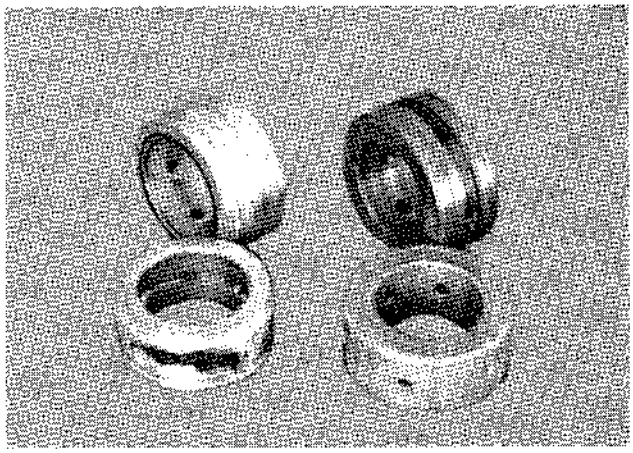
Engine bearing material imbedded in the bearing surfaces. Checkout the engine for possible bearing failure.

Turbine Shaft & Bearings



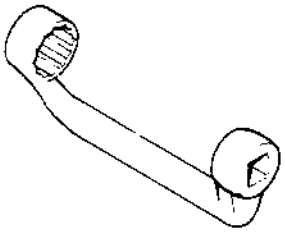
Turbine shaft and bearings showing effect of oil starvation.

Bearing Failure

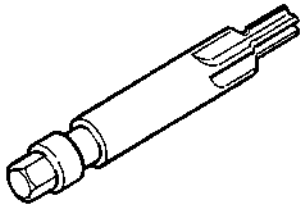


Bearing failures occur in two separate areas. Scoring on the inside as well as the outside is attributed to dirty oil. Abrasive wear can also cause erosion around the oil holes in the bearings. A good bearing is shown in the lower right for comparison.

SPECIAL TOOLS



1. CAS-1066A WRENCH
   SEE PAGE 7



2. CAS-1694 9 mm INJECTOR BORE CLEANING TOOL
3. CAS-2155 7 mm INJECTOR BORE CLEANING TOOL
   SEE PAGE 7

SPECIAL TORQUES

Injector Retaining Nut	55 to 65 Nm
Leak Off Bolt	8 Nm
Nozzle Cap Nut	55 Nm

GENERAL INFORMATION

The fuel injector sends a measured amount of fuel to the combustion chamber from the injection pump. Each quantity of fuel must be sent to the combustion chamber in the form of fine particles. This will make sure that there is complete combustion and efficient engine performance.

IMPORTANT: *The injector tip end and the injector valve are a matched assembly. The two parts are made smooth to fit together with accuracy. The injector tip or the injector valve cannot be replaced separately for service. If it is necessary to replace either the valve or tip, replace the complete tip assembly.*

IMPORTANT: *Do not mix tip assemblies and bodies while the injectors are being disassembled.*

INJECTOR BODY - The body holds the injector parts in the correct position in the cylinder head. The body has a high pressure channel and a leak off channel. The lower face of the body has a finished surface and has two holes in the surface for locating dowel pins.

INJECTOR VALVE - The valve controls the flow of the fuel from the injector.

VALVE STOP - The valve stop has two dowel pins which hold the valve tip to the body. This will make a spray pattern that is correct. Both faces of the valve stop have a fine surface finish. The valve stop controls the distance that the valve will move.

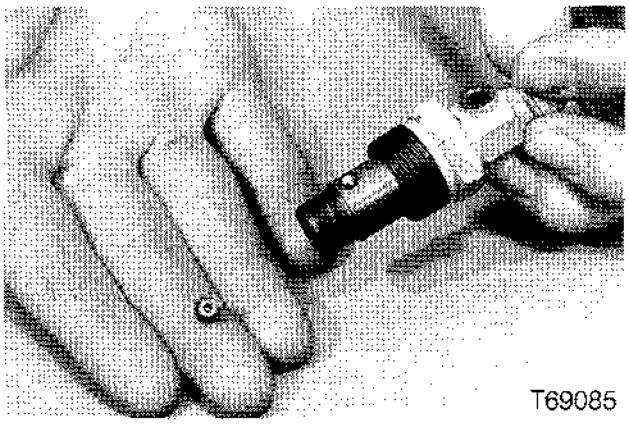
OPENING PRESSURE CONTROL SPRING - The spring controls the fuel pressure that is necessary to lift the valve from the seat.

SHIMS - The shims push down on the spring to keep a given pressure on the valve.

INJECTOR TIP - The valve and the valve seat are in the injector tip. There are orifices in the injector tip that atomize the fuel for better combustion and separate the fuel spray to mix the fuel spray with air.

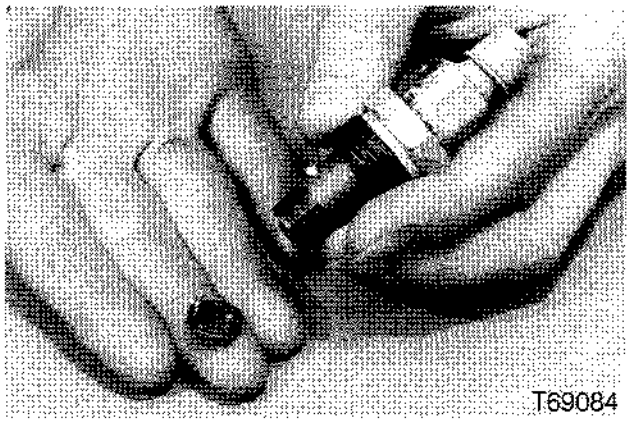
NOZZLE SEAL - The seal is under the cap nut and stops engine compression leakage.

STEP 19



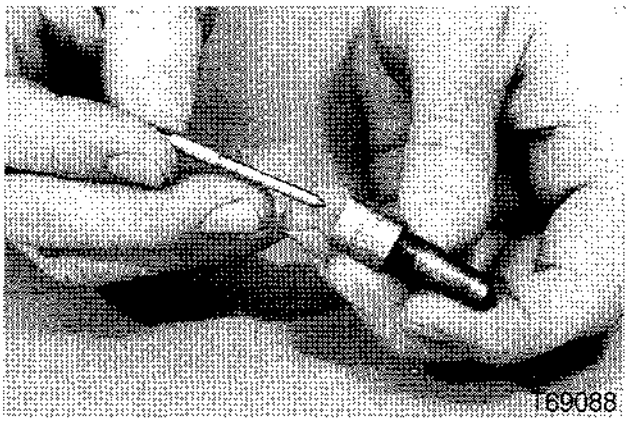
Install the spring seat onto the pressure spring. The small diameter end of the spring seat must be toward the pressure spring.

STEP 20



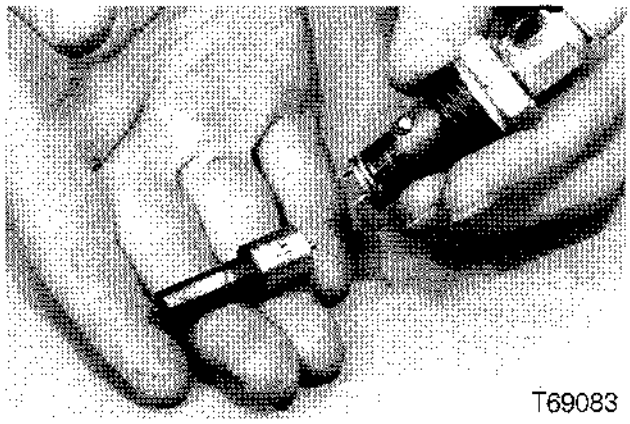
Install the valve stop assembly. Align the dowel pins in the valve stop with the dowel pin holes in the nozzle holder.

STEP 21



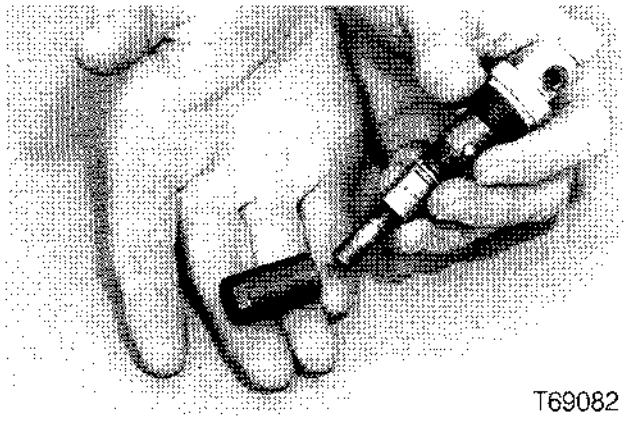
Put a small amount of clean fuel on the nozzle valve and slide the nozzle valve up and down a number of times in the nozzle tip to make sure that there is free movement.

STEP 22



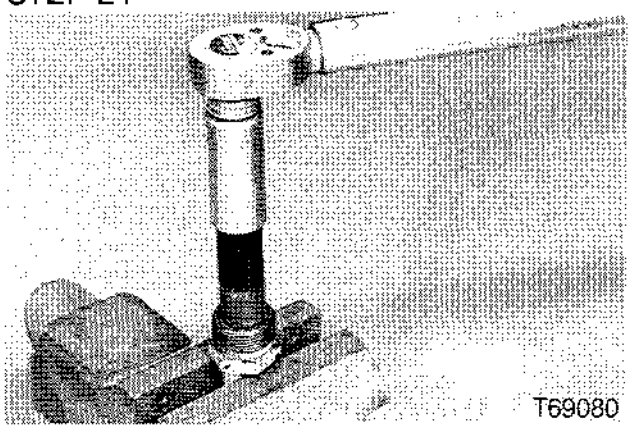
Align the dowel pins in the nozzle tip assembly with the dowel pins in the stop valve assembly. Install the nozzle tip assembly onto the stop valve assembly.

STEP 23



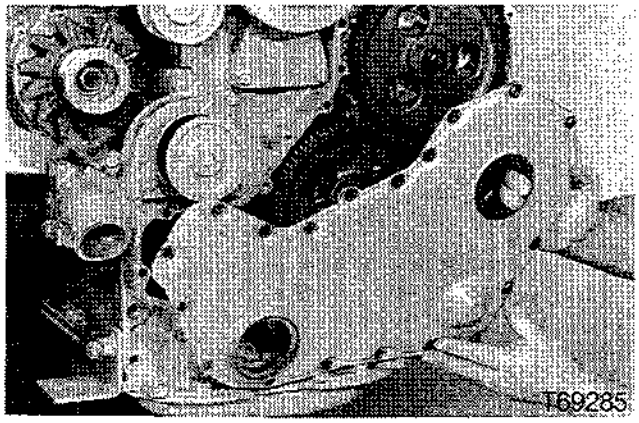
Add lubrication to the nozzle shoulder. Do not put grease on the holder or on the threads of the cap nut. Install the cap nut over the end of the nozzle tip assembly and turn the cap nut clockwise two or three times.

STEP 24



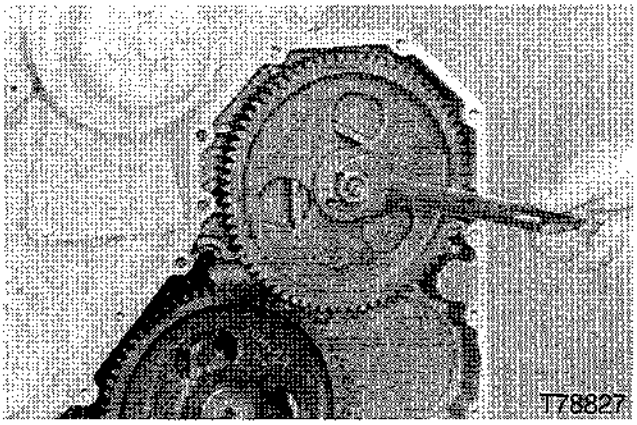
Put the injector in a soft vise with the tip of the injector up. The flat surface of the injector must be toward the face of the vise. Tighten the nut to a torque of 55 Nm.

STEP 22



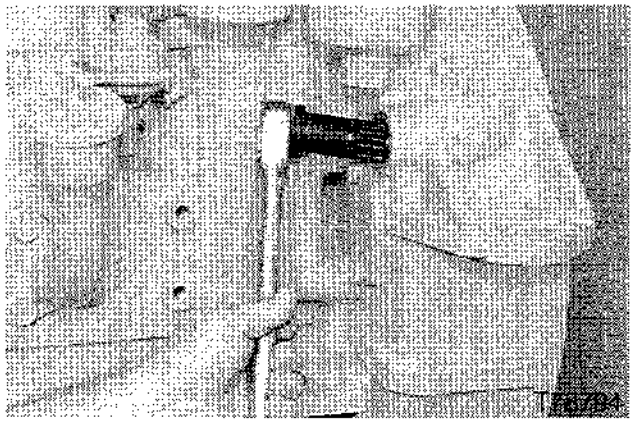
Remove the front cover bolts and the front cover.

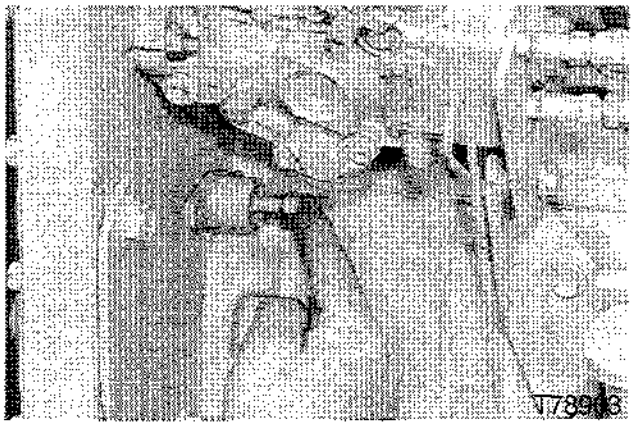
STEP 23



Loosen the nut on the injection pump shaft.

STEP 24

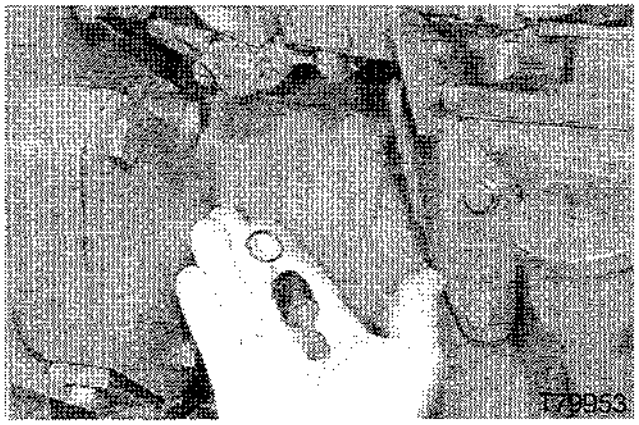




Install the engine turn over tool and turn the engine over until the locking pin engages the camshaft gear.

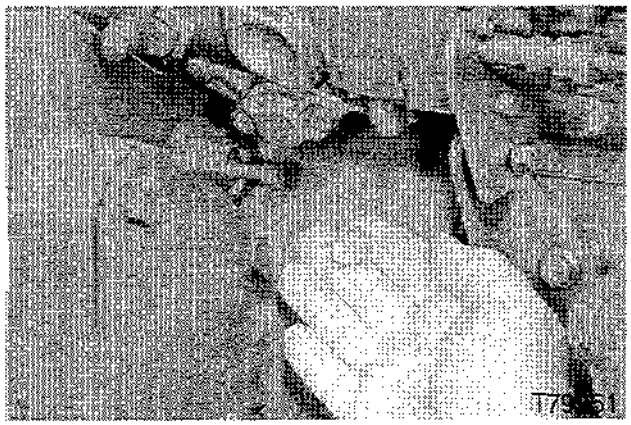
Installation

STEP 71



Install a new o-ring onto the locking pin.

STEP 72



Install the lock pin. Install the retaining ring into the locking pin housing.

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.

INSTRUMENT CLUSTER

Removal

1. Remove the screws (16) that fasten the instrument cluster to the instrument console.

2. Pull the instrument cluster out of the instrument console.

3. Disconnect the connectors for the wiring harness from the instrument cluster.

4. Remove the instrument cluster from the machine.

Installation

1. Connect the connectors for the wiring harness to the instrument cluster.

2. Install the instrument cluster in the instrument console.

3. Install the screws (16) that fasten the instrument cluster to the instrument console.

Replacing a Bulb

1. Remove the instrument cluster from the instrument console.

2. Turn the socket (5) counterclockwise and remove the socket (5).

3. Pull the bulb (3) from the socket (5) and install a new bulb (3).

4. Install the socket (5) and turn the socket (5) clockwise to hold the socket (5) in place.

5. Install the instrument cluster in the instrument console.

Gauge, Voltmeter, or Tachometer Removal and Installation

1. Remove the instrument cluster from the instrument console.

2. Remove the four screws (10) that fasten the cover (17) and the retainer (18) to the body (11).

3. Remove the cover (17).

4. Remove the retainer (18).

5. Remove the screws (21) that fasten the gauge (1, 2, or 15), voltmeter (14) or the tachometer (13) to the body (11).

6. Remove the gauge (1, 2, or 15), voltmeter (14), or tachometer (13) from the body (11). If you are removing a gauge (1, 2, or 15) or voltmeter (14), you must pull the studs of the gauge (1, 2, or 15) or voltmeter (14) from the clips (4) in the body (11).

7. Install a new gauge (1, 2, or 15), voltmeter (14) or tachometer (13) in the body (11). If you are installing a gauge (1, 2, or 15) or voltmeter (14), make sure the studs of the gauge (1, 2, or 15) or voltmeter (14) are pushed into the clips (4) in the body (11).

8. Install the screws (21) that fasten the gauge (1, 2, or 15), voltmeter (14), or tachometer (13) to the body (11).

9. Install the retainer (18).

10. Install the cover (17).

11. Install the screws (10) that fasten the cover (17) and the retainer (18) to the body (11).

12. Install the instrument cluster in the instrument console.

Circuit Board

The circuit board does not normally cause any problems. Use an ohmmeter to check the continuity of the strips. If there is no continuity in any one of the strips, the circuit board must be replaced.

(14) Instrument Cluster

NOTE: *Disconnect the connector from the instrument cluster. Turn the key switch and driving lamp switch to ON. Apply the parking brake.*

Check Points	Reading	Possible Cause of Bad Reading
Terminal T1 in connector to terminal for wire 33 at the master cylinder reservoir level switch (11)	Continuity	Check the circuit between the connector and the master cylinder reservoir level switch (11). Also check the master cylinder reservoir level switch (11).
Terminal T2 in connector to ground	12 volts	Check the circuit between the connector and the key switch (4). Also check the 10 ampere fuse and the key switch (4).
Terminal T3 in connector to ground	Continuity	Check the circuit between the connector and the parking brake switch. Also check the parking brake switch. See page 4002-19.
Terminal T4 in connector to ground	12 volts	Check the circuit between the connector and the cab relay. Also check the 15 ampere fuse and cab relay. See page 4002-27.
Terminal T5 in connector to terminal for wire 34 at alternator (2)	Continuity	Check the circuit between the connector and the alternator (2). Also check the alternator (2).
Terminal T7 in connector to ground	Continuity	Check the circuit between the connector and the oil pressure switch. Also check the oil pressure switch. See page 4002-19.
Terminal T8 in connector to terminal for wire 38 at the air filter switch filter switch. See page 4002-19	Continuity	Check the circuit between the connector and air filter switch. Also check the air filter switch. See page 4002-19.

NOTE: *Have another person hold the key switch in the momentary ground position, halfway between ON and START.*

Terminal T8 in connector to ground	Continuity	Check the circuit from the connector through the diode to the key switch (4). Also check the diode in the circuit. See page 4002-19.

NOTE: *Turn the key switch to ON.*

Terminal T9 in connector to ground	12 volts	Check jumper wire from T2 to T9.
Terminal T10 in connector to ground	Continuity	Check the circuit between the connector and the coolant temperature sender (12). Also check the coolant temperature sender (12).
Terminal T11 in connector to ground	Continuity	Check the circuit between the connector and the converter temperature sender (13). Also check the converter temperature sender (13).

Continued on next page

CONNECTORS A, B, C, AND D
Main chassis harness to side console harness.

CONNECTOR E
Main chassis harness to side console harness.

CONNECTOR G
Main chassis harness to transaxle harness.

CONNECTORS H AND J
Main chassis harness to front console harness.

CONNECTOR K
Main chassis harness to front console harness.

WARNING BUZZER
A warning buzzer that sounds when there is low engine oil pressure, high engine temperature, or parking brake is applied and the transmission is not in NEUTRAL.

TEMPERATURE SWITCH
Contacts closed by high oil or coolant temperature.

CONNECTOR
Connects one harness to another harness.

RELAY
A magnetic switch that directs electrical current.

FUSE
Protects circuit from overload.

CHASSIS GROUND
Completes battery circuit.

FUEL SENDER
Resistor type switch operated by a float in the tank.

FILTER SWITCH
Contact opened or closed by filter pressure.

BOOM LOCK SOLENOID VALVE
An electromagnet that holds a spool in a detented position.

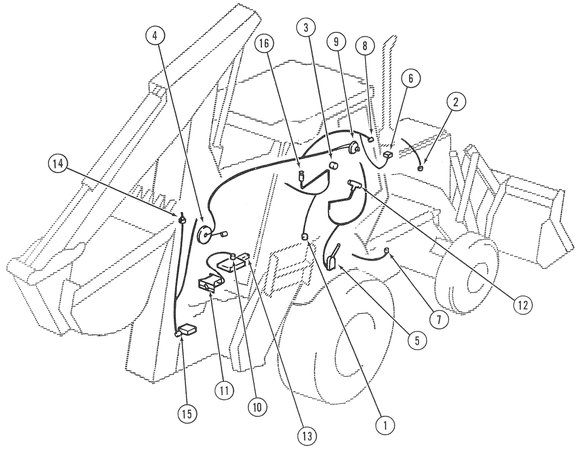
PRESSURE SWITCH
Operated by oil pressure to complete an eletrical circuit.

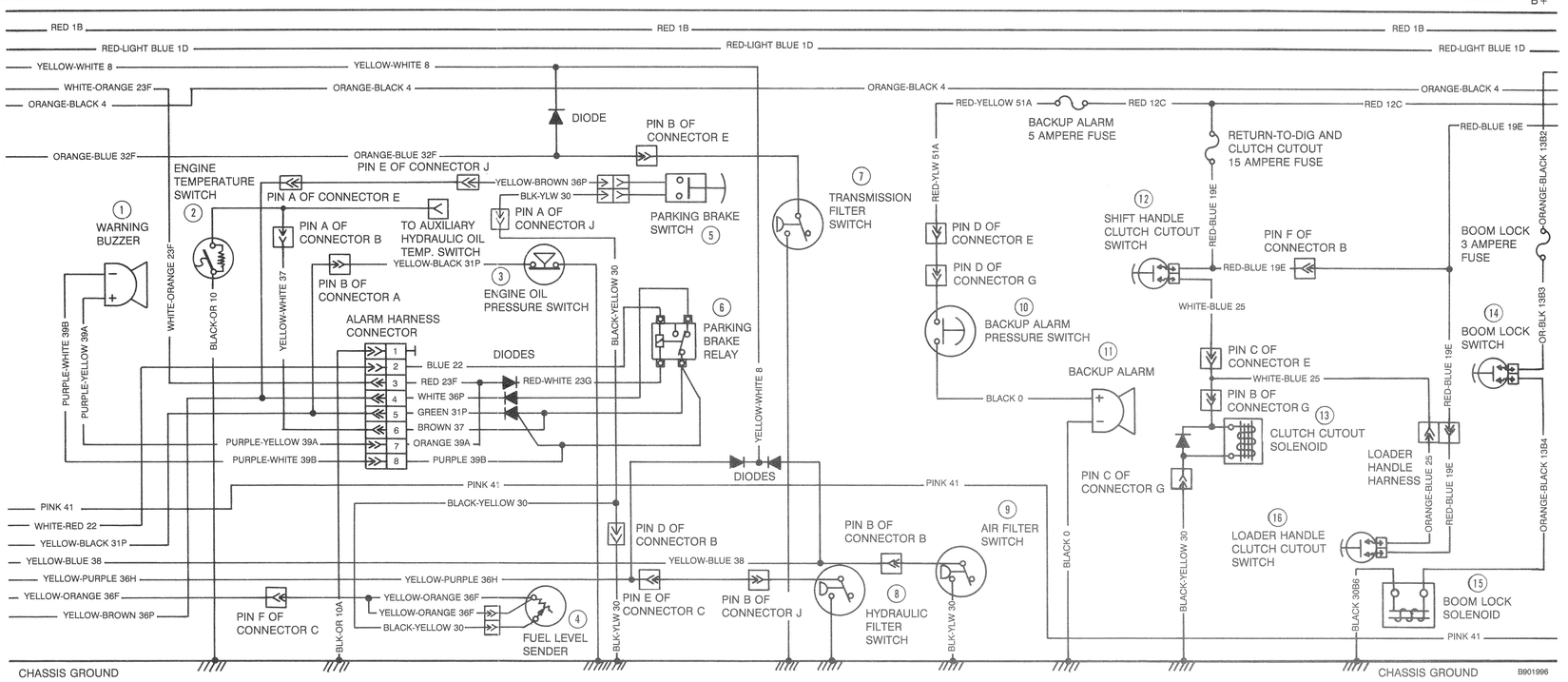
BACKUP ALARM
A warning alarm that sounds when the machine is driven in reverse.

SOLENOID
A magnetic coil that operates spools in the transmission.

PUSH BUTTON SWITCH (SINGLE POLE)
Used to complete an electric circuit.

WARNING BUZZER, PARKING BRAKE, BACKUP ALARM, AND CLUTCH CUTOUT





(13) Low Pressure Switch

Check Points	Reading	Possible Cause of Bad Reading
NOTE: *Turn the key switch to ON. Turn the blower switch to HIGH and the air conditioning temperature switch to COLD.*		
Terminal for wire 60 to ground	12 volts	Bad circuit between the low pressure switch and the air conditioning thermostat switch.
NOTE: *Disconnect the wires from the low pressure switch.*		
Between the terminals of the low pressure switch	Open	Low charge in the air conditioning system. See Section 9002. Bad low pressure switch.

(14) Front Wiper Switch

Check Points	Reading	Possible Cause of Bad Reading
NOTE: *Turn the key switch to ON.*		
Terminal for wire 63 to ground	12 volts	Check the circuit between the front wiper switch and the cab relay. Also check the 15 ampere fuse and the cab relay. See page 4002-27 for the cab relay.
Terminal for wire 69 to ground	12 volts	Bad front wiper switch.
NOTE: *Turn the front wiper switch to LOW.*		
Terminal for wire 66 to ground	12 volts	Bad front wiper switch.
NOTE: *Turn the front wiper switch to HIGH.*		
Terminal for wire 67 to ground	12 volts	Bad front wiper switch.

(16) RH Tail Lamp

Check Points	Reading	Possible Cause of Bad Reading
Terminal 40B to ground	Continuity	Bad ground connection.
Bulb	Good	Bad bulb.

NOTE: *Turn the key switch to ON. Turn the driving lamp switch to ON.*

Terminal for wire 41T to ground	12 volts	Bad circuit between the RH tail lamp and the driving lamp switch. Also check the driving lamp switch. See page 4002-27.

(17) RH Brake Lamp

Check Points	Reading	Possible Cause of Bad Reading
Terminal 40B to ground	Continuity	Bad ground connection.
Bulb	Good	Bad bulb.

NOTE: *Turn the key switch to ON. Have another person push down and hold the brake pedals.*

Terminal for wire 44 to ground	12 volts	Bad circuit between the RH brake lamp and the stop lamp switch. Also check the stop lamp switch. See page 4002-27.

(18) Rear RH Turn Signal and Flasher Lamp

Check Points	Reading	Possible Cause of Bad Reading
Terminal for wire 40A to ground	Continuity	Bad ground circuit.
Bulb	Good	Bad bulb.

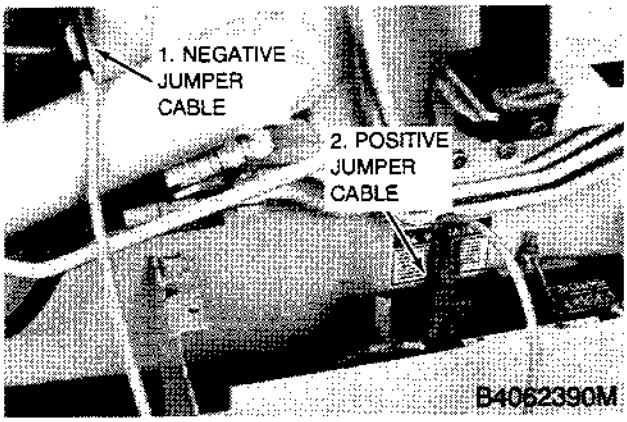
NOTE: *Turn the key switch to ON. Make sure the flasher switch is OFF. Move the turn signal lever for a right turn.*

Terminal for wire 45R to ground	Intermittent 12 volts	Bad circuit between the rear RH turn signal and flasher lamp and the turn signal switch. Also check the turn signal switch. See page 4002-27.

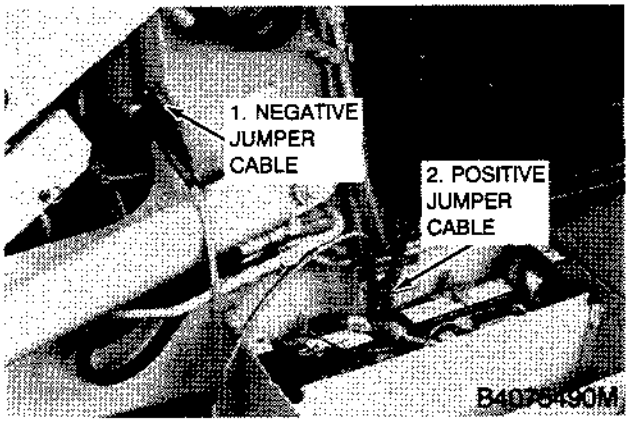
USING BOOSTER BATTERIES TO START THE ENGINE

Batteries contain acid and explosive gas. Explosion can result from sparks, flames, or wrong cable connections. To connect the jumper cables correctly to the battery of this machine, see the correct method shown on this page. Failure to follow these instructions can cause serious injury or death. 50-39

Single Battery



Dual Battery



Two persons are required for this procedure. Make sure the person making the connections is wearing face protection. Use a 12 volt booster battery.

1. Sit in the operators seat and have the other person make the connections.

2. If using another machine for power, make sure the two machines do not touch.

3. Connect the positive (+) jumper cable to the positive (+) battery terminal.

4. Connect the negative (-) jumper cable to a good ground away from the battery.

5. Start the engine and have the other person disconnect the negative (-) jumper cable first and the positive (+) jumper cable last.

CHARGING A BATTERY

Never try to charge the battery if the electrolyte in the battery is frozen. 47 83

Before you charge the battery, check the level of the electrolyte.

It is difficult to give an exact charging rate because of the following variable conditions: (1) temperature of the electrolyte, (2) level of charge, and (3) condition of the battery. Use the charging guide for the correct charging rate and time.

See Specifications in Section 4002 for the reserve capacity of the battery in this machine.

The charging rate must be decreased if:

1. Too much gas causes the electrolyte to flow from the cells.

2. The temperature of the electrolyte rises above 125°F (52°C).

NOTE: *For the best charge, use the slow charging rates.*

The battery is fully charged when, over a three hour period at a low charging rate, no cell is giving too much gas, and the specific gravity does not change.

CHARGING GUIDE FOR MAINTENANCE FREE BATTERIES

Recommended Rate* and Time for Fully Discharged Battery

Battery Capacity - See Reserve Capacity under Specifications	Slow Charge	Fast Charge
80 Minutes or Less	10 Hours at 5 Amperes 5 Hours at 10 Amperes	2.5 Hours at 20 Amperes 1.5 Hours at 30 Amperes
Above 80 to 125 Minutes	15 Hours at 5 Amperes 7.5 Hours at 10 Amperes	3.75 Hours at 20 Amperes 1.5 Hours at 50 Amperes
Above 125 to 170 Minutes	20 Hours at 5 Amperes 10 Hours at 10 Amperes	5 Hours at 20 Amperes 2 Hours at 50 Amperes
Above 170 to 250 Minutes	30 Hours at 5 Amperes 15 Hours at 10 Amperes	7.5 Hours at 20 Amperes 3 Hours at 50 Amperes

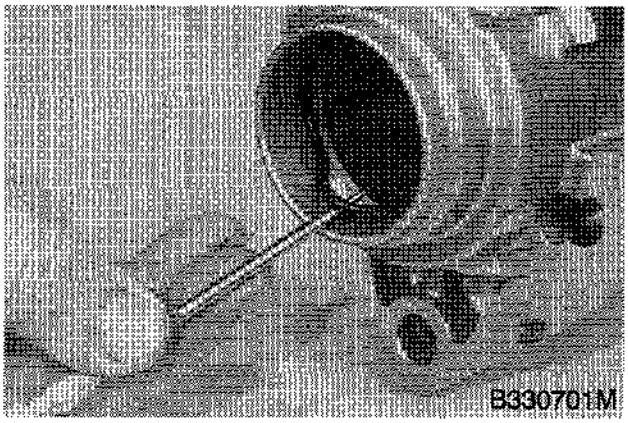
*Initial rate for standard taper charger.

851285

NOTE: *A maintenance free battery will have the words Maintenance Free on the decal on the top of the battery. If the center part of the decal has been removed to get access to the battery caps, it is possible the words Maintenance Free will have been removed from the decal.*

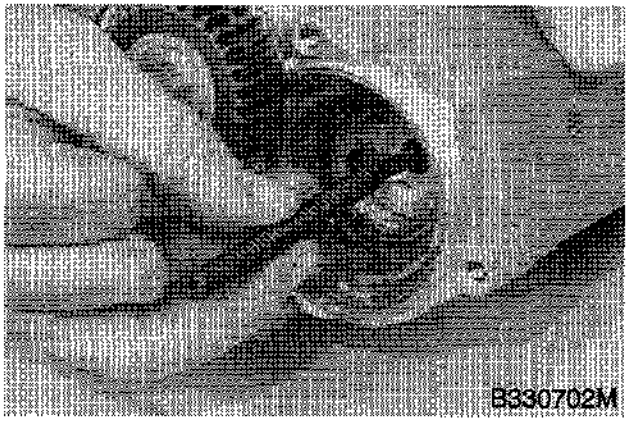
Continued on next page

STEP 13



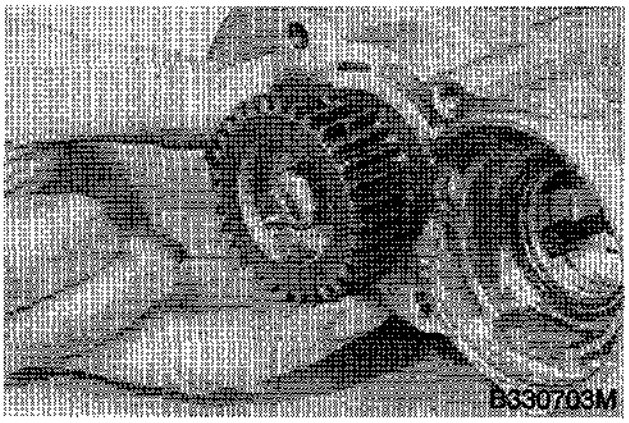
Remove the O-ring from the groove in the starter drive housing.

STEP 14



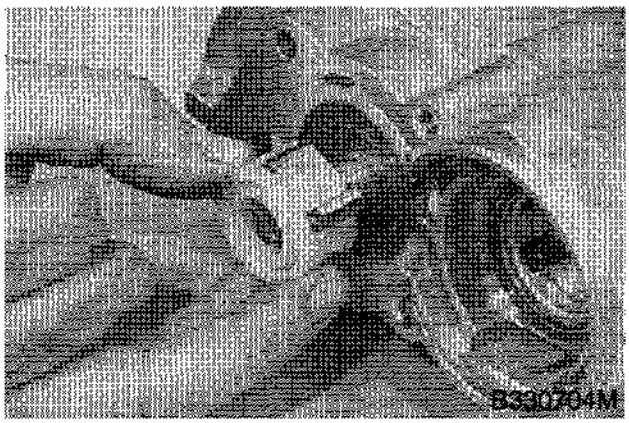
Remove the spring.

STEP 15



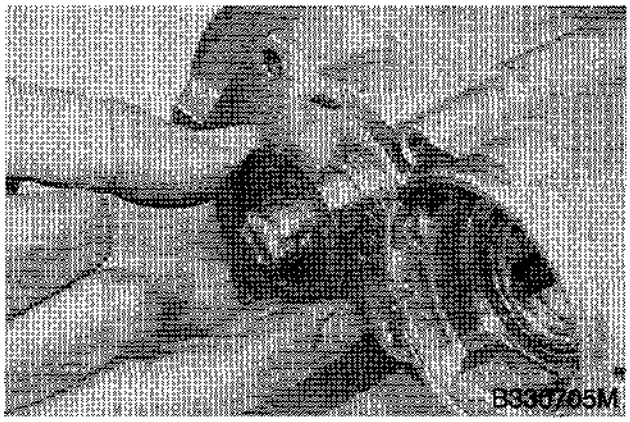
Remove the idler gear.

STEP 16



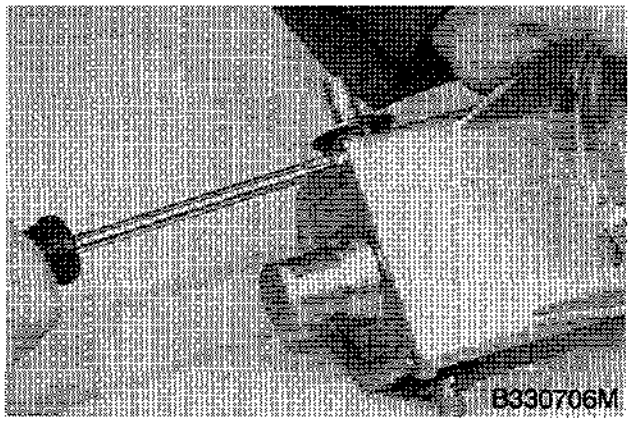
Remove the bearing cage.

STEP 17



Remove the thrust washer.

STEP 18



Loosen and remove the screws that hold the cover.

STARTER SOLENOID TEST

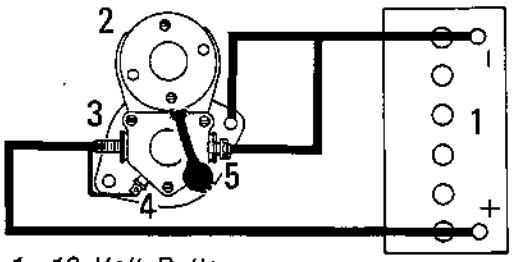
This test will check the condition of the pull-in winding and the hold-in winding in the starter solenoid.

The jumper cable connected to the starter mounting flange and the motor terminal must have a common connection at the negative battery post.

Starter Solenoid Test Procedure

1. Remove the rubber boot from the motor terminal. Remove the nut and lock washer from the motor terminal. Then remove the wire from the motor terminal.

2. Connect a jumper cable to the positive battery post of a fully charged 12 volt battery. Connect the other end of the jumper cable to the battery terminal in the starter solenoid housing.



1. 12 Volt Battery
2. Starter
3. Battery Terminal
4. Switch Terminal
5. Motor Terminal

3. Connect a jumper wire to the battery terminal and the switch terminal in the starter solenoid housing. The jumper wire must be made from No. 10 or larger wire.

4. Connect the jumper cable with the common connection to the starter mounting flange and the motor terminal in the starter solenoid housing.

NOTE: *Steps 5 and 7 must be done in a maximum of 15 seconds to prevent damage to the pull-in winding and the hold-in winding.*

5. Connect the jumper cable with the common connection to the negative battey post. The pinion gear on the starter drive must come all the way out rapidly and with force.

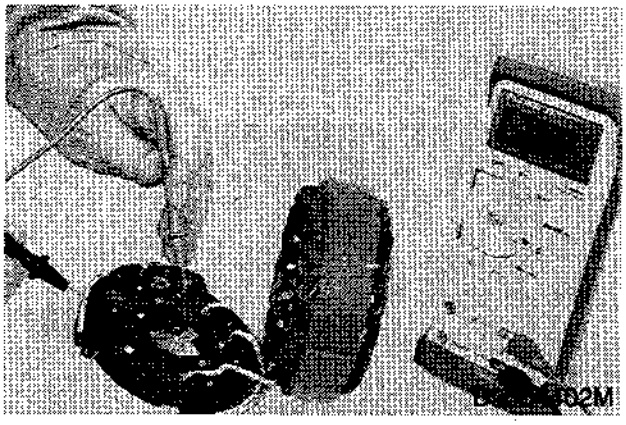
6. If the pinion gear did not come out rapidly and with force, the pull-in winding is damaged. The complete starter solenoid housing assembly must be replaced.

7. Disconnect the jumper cable from the motor terminal in the starter solenoid housing. The pinion gear on the starter drive must not move toward the starter drive housing.

8. If the pinion gear started to move toward the starter drive housing, the hold-in winding is damaged. The complete starter solenoid housing assembly must be replaced.

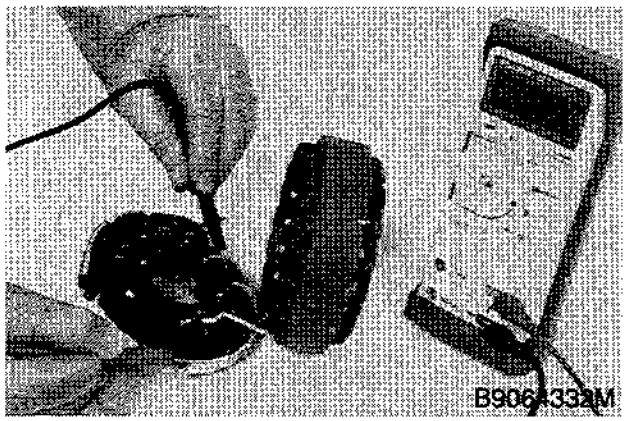
TESTING THE RECTIFIER BRIDGE

STEP 36



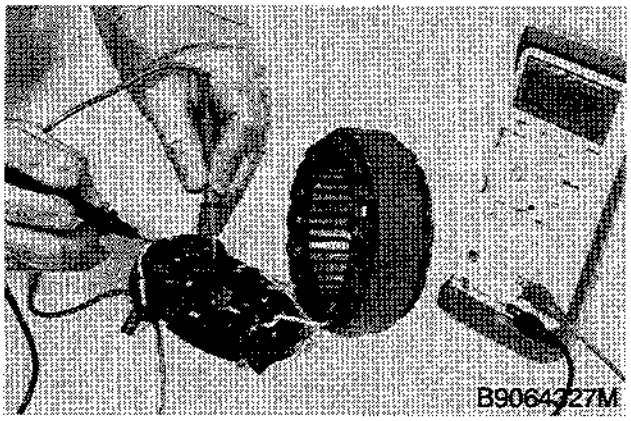
Touch the leads of the ohmmeter to a positive diode and the heat sink as shown. Then reverse the leads. There must be a high reading and a low or zero reading. Then test the other two positive diodes. If a positive diode did not have readings as specified, the positive diode is bad and a new rectifier bridge must be installed.

STEP 37

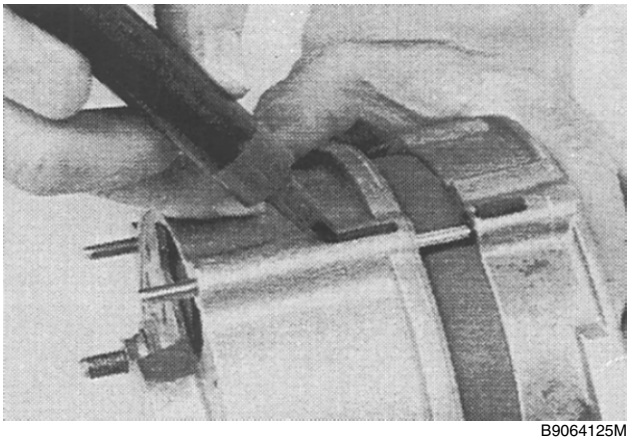


Touch the leads of the ohmmeter to a negative diode and the heat sink as shown. Then reverse the leads. There must be a high reading and a low or zero reading. Then test the other two negative diodes. If a negative diode did not have readings as specified, the negative diode is bad and a new rectifier bridge must be installed.

NOTE: *If the tester you are using has a diode test function, use the tester according to the instructions of the manufacturer to check the positive and negative diodes.*



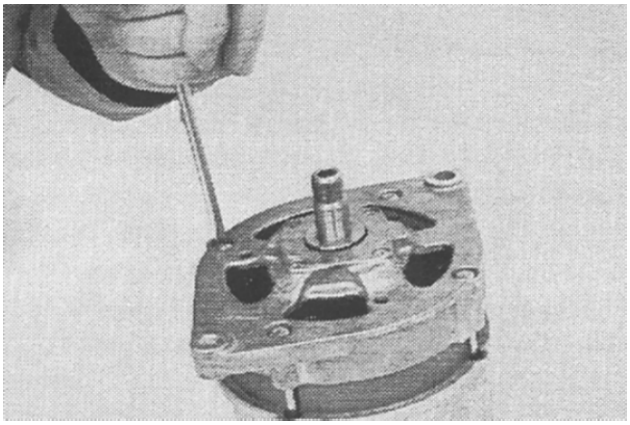
STEP 7



B9064125M

Make an alignment mark on the front and rear housings.

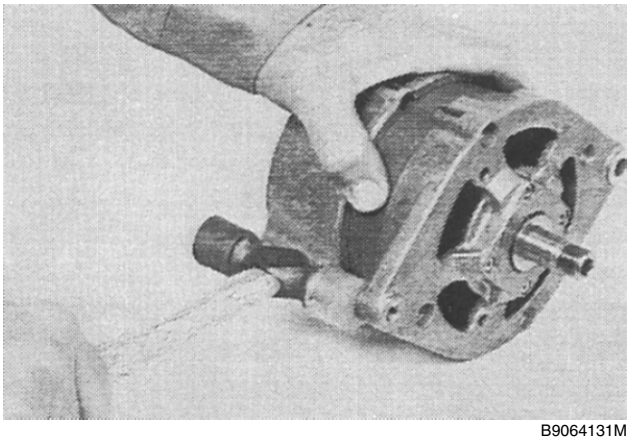
STEP 8



B9064128M

Loosen and remove the screws that hold the front and rear housings together.

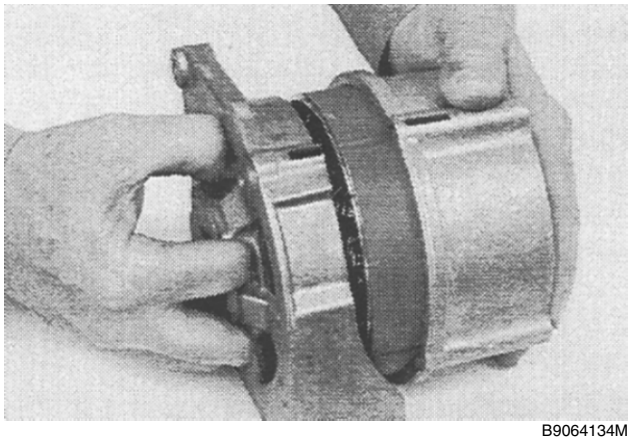
STEP 9



B9064131M

Hold the stator and hit the front housing with a soft hammer to separate the front housing from the stator.

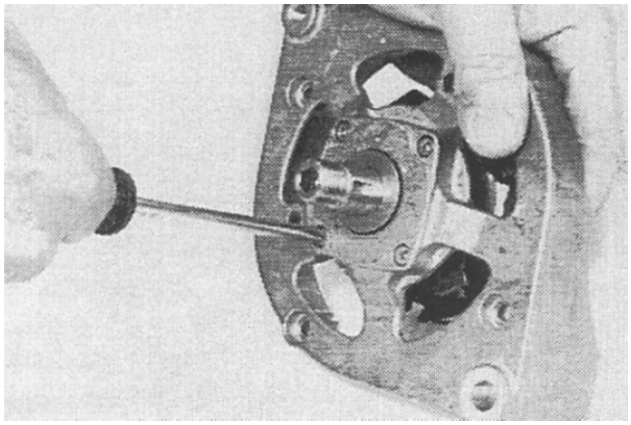
STEP 10



B9064134M

Remove the front housing and rotor from the rear housing.

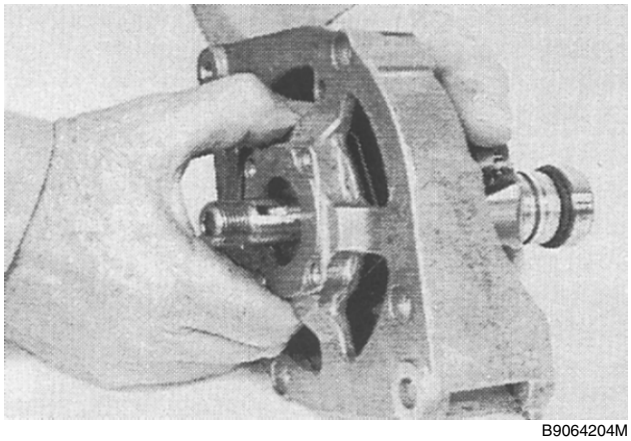
STEP 11



B9064202M

Loosen and remove the screws that hold the retainer for the rotor.

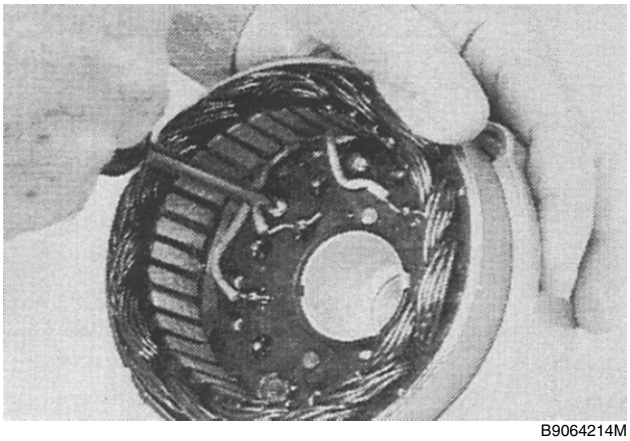
STEP 12



B9064204M

Remove the rotor.

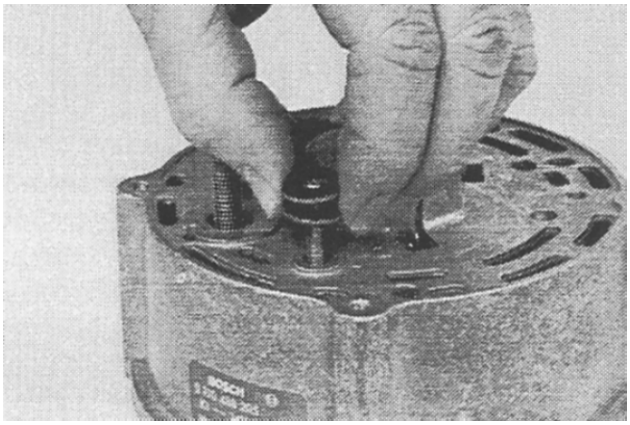
STEP 52



B9064214M

Install and tighten the two screws that hold the rectifier bridge.

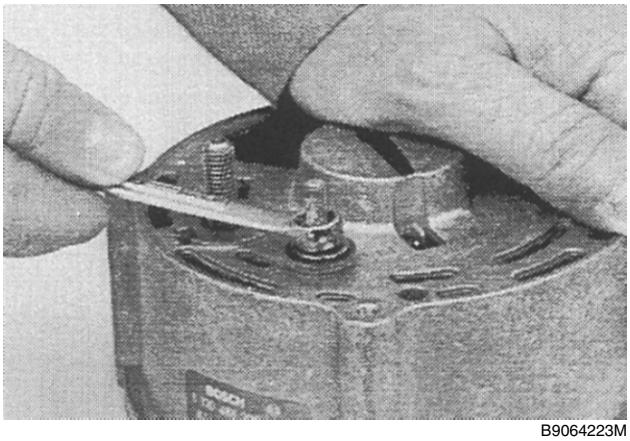
STEP 53



B9064226M

Install the insulators on the D + terminal.

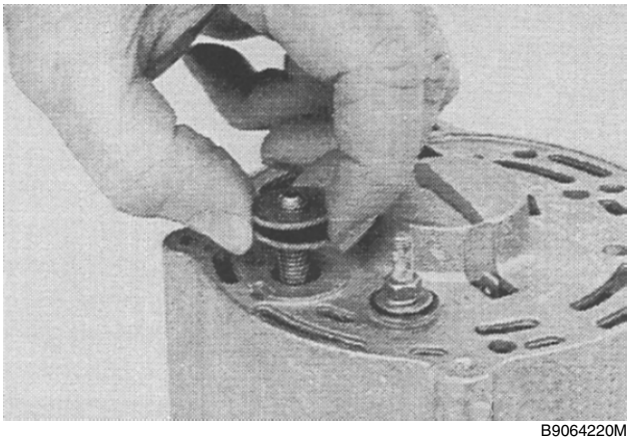
STEP 54



B9064223M

Install the flat washer, lock washer and nut on the D + terminal. Tighten the nut.

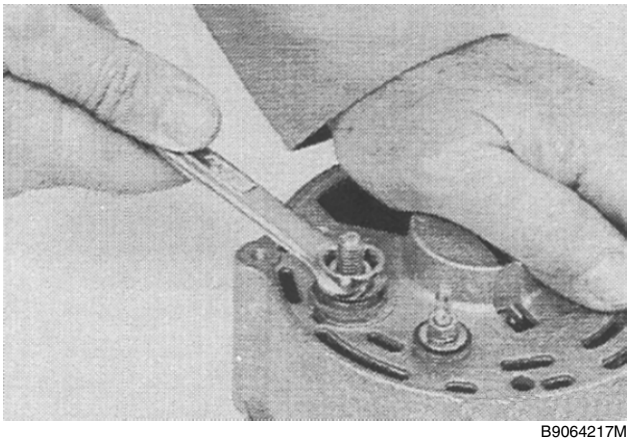
STEP 55



B9064220M

Install the insulators on the B + terminal.

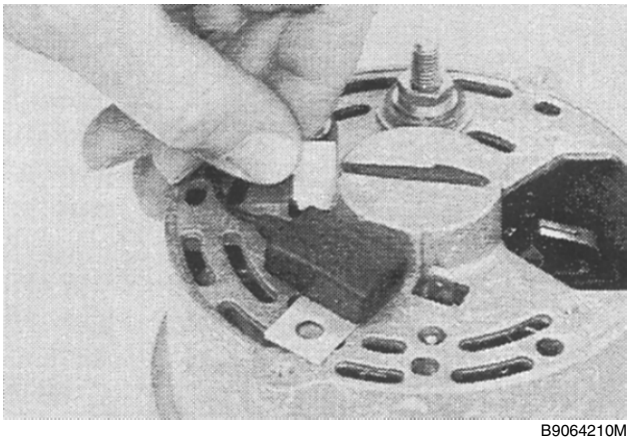
STEP 56



B9064217M

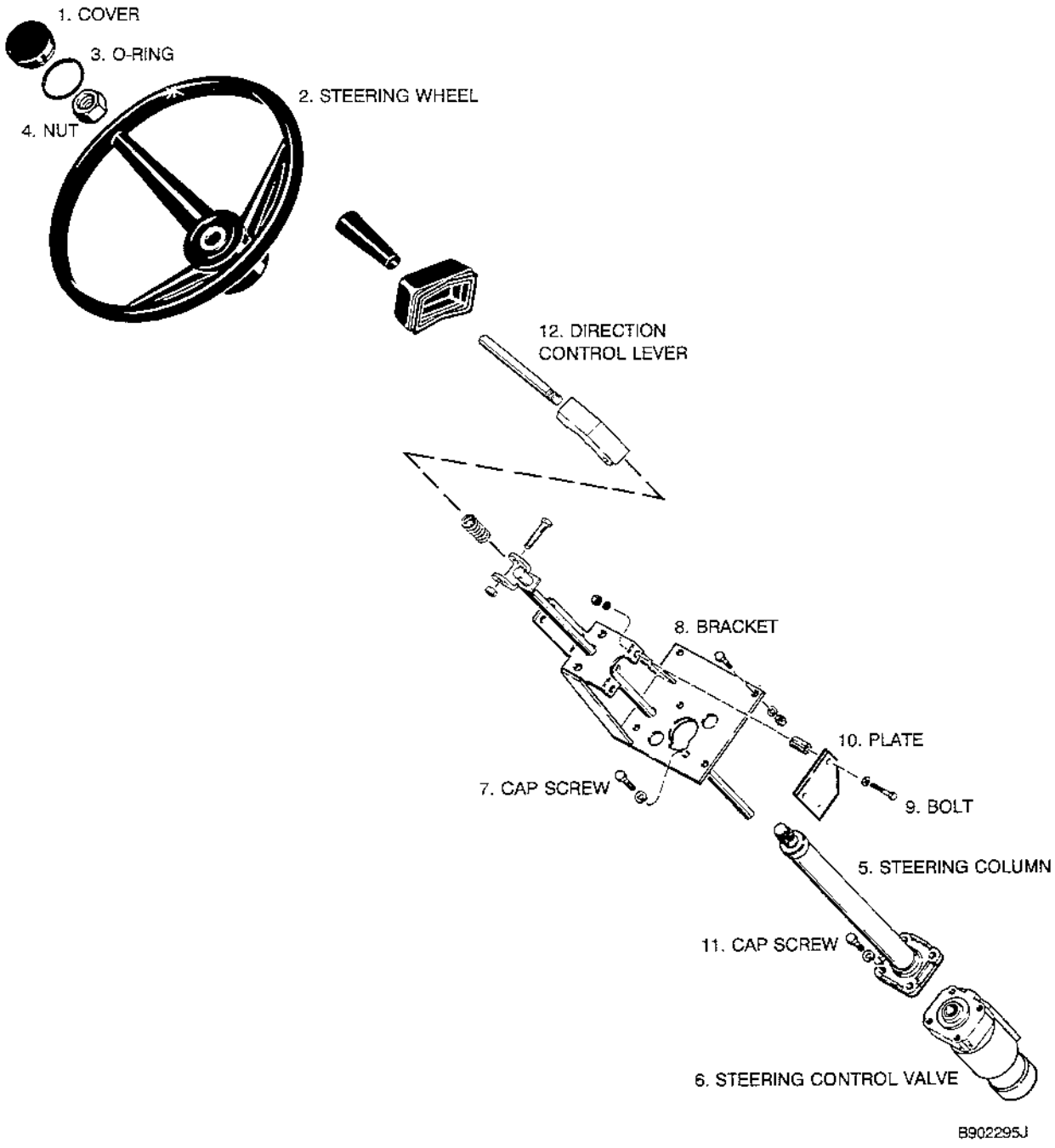
Install the flat washer, lock washer and nut on the B + terminal. Tighten the nut.

STEP 57



B9064210M

Install the lead from the condenser on the B + terminal.



Steering Control Valve Installation

STEERING CYLINDER, FOUR WHEEL DRIVE MACHINES

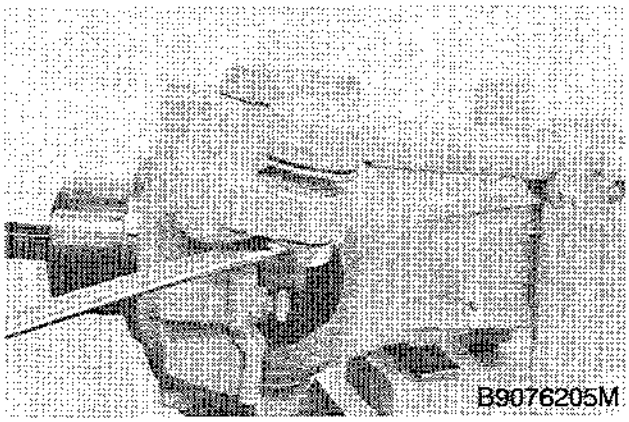
Removal

NOTE: *The following photographs show the steering cylinder being removed from the axle with the axle removed from the machine. It is not necessary to remove the axle from the machine to remove the steering cylinder.*

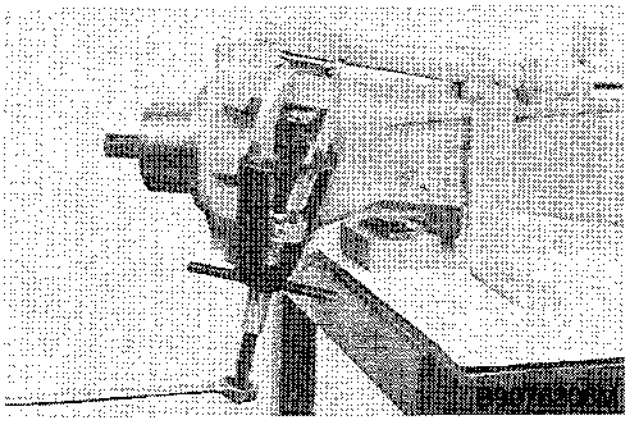
STEP 1
Clean the hose connections at the steering cylinder.

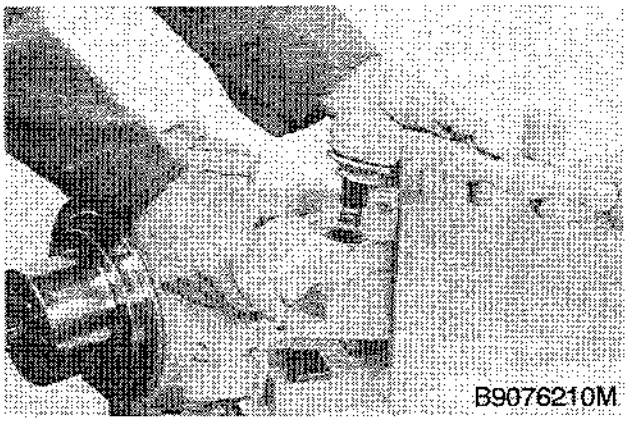
STEP 2
Fasten an identification tag to one of the hoses to the steering cylinder.

STEP 3
Disconnect the hoses from the steering cylinder. Install a plug in each hose and a cap on each fitting.

STEP 4


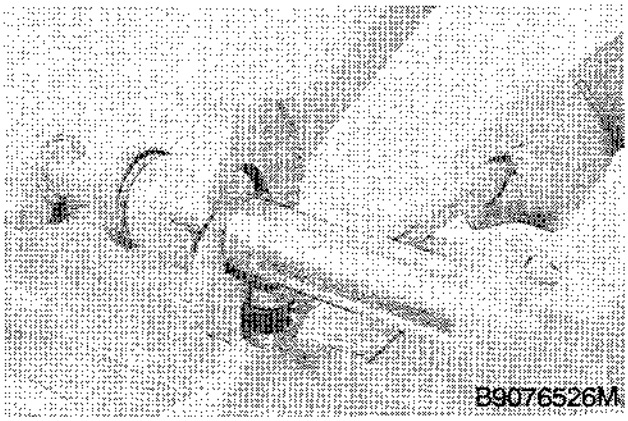
Remove the cotter pin from the ball joint and loosen the nut several turns. Do not remove the nut at this time.

STEP 5

Install the CAS-10486 puller as shown and tighten the screw.

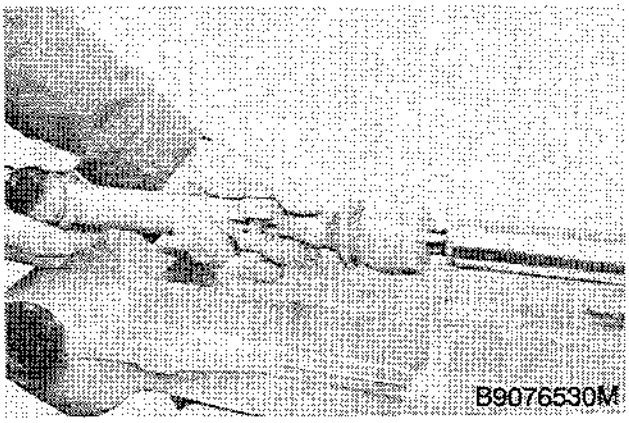
STEP 6


Remove the nut and remove the ball joint from the arm.

STEP 7
Repeat steps 4, 5, and 6 for the other end of the axle.

STEP 8


Install the CAS-2151 tool on the flats of the piston rod and install a wrench on the tie rod. Prevent the piston rod from turning and loosen the tie rod.

STEP 9


Remove the tie rod and ball joint assembly from the piston rod.

Section

5002

SPECIFICATIONS, SCHEMATIC AND TROUBLESHOOTING

CASE CORPORATION

Bur 8-17270

Printed in U.S.A.
Issued January 1991

Section

5004

STEERING CONTROL VALVE - EATON

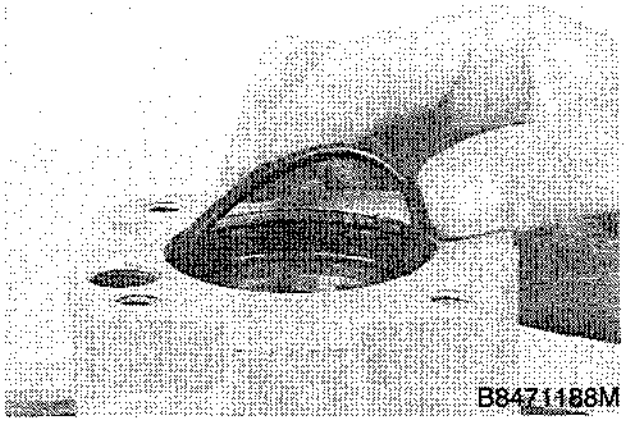
CASE CORPORATION

Bur 8-12440

Printed in U.S.A.
Issued October 1989

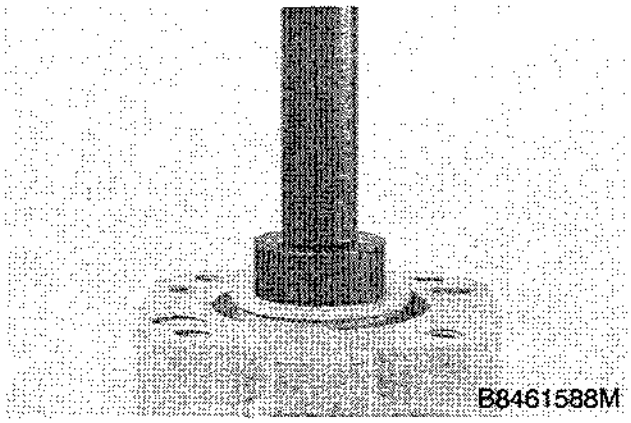
ASSEMBLY

STEP 38



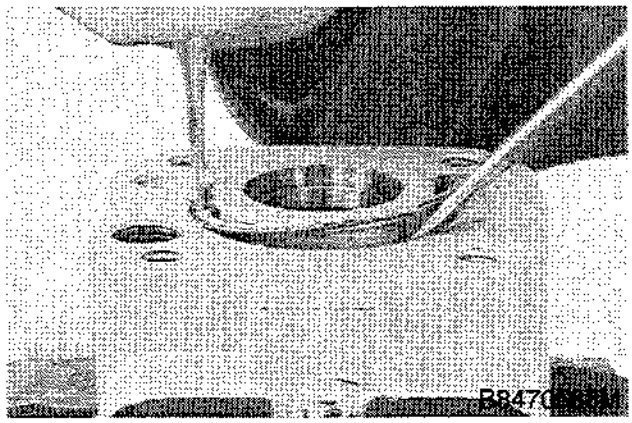
Install a new O-ring in the bore for the gland. Lubricate the O-ring with petroleum jelly.

STEP 39



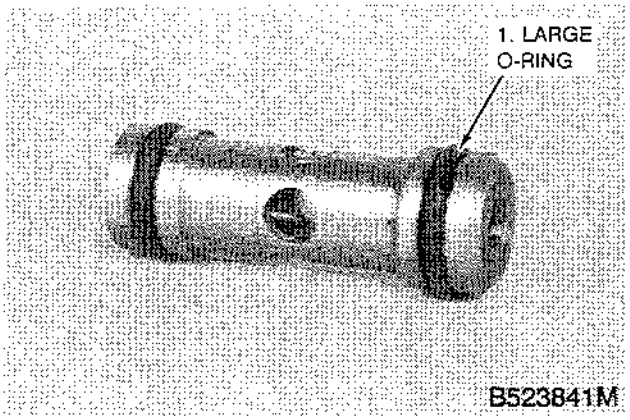
Put the body of the steering control valve in a vise with the gland end up. Drive the gland into the body of the steering control valve until the gland stops moving.

STEP 40



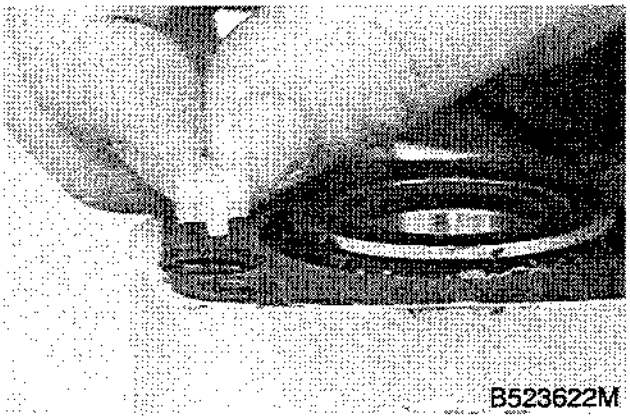
Use a screwdriver and punch to start the end of the retaining ring into the groove in the body. Push the retaining ring into the groove in the body.

STEP 41



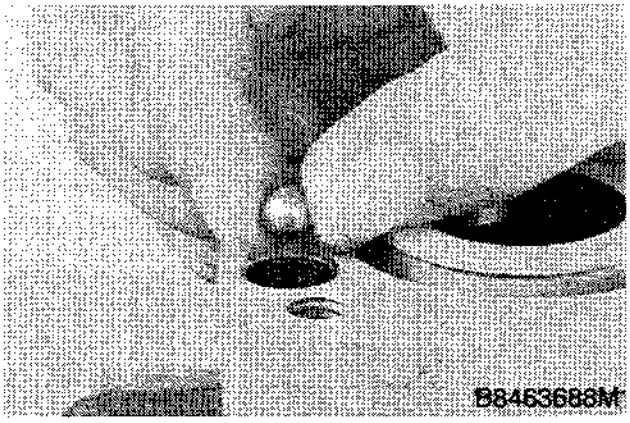
Install new O-rings on the seat for the check valve. Lubricate the O-rings with petroleum jelly. The large O-ring must be installed on the end of the seat that has threads.

STEP 42



Install the retainer in the bore for the check valve. Make sure the retainer is flat in the bottom of the bore.

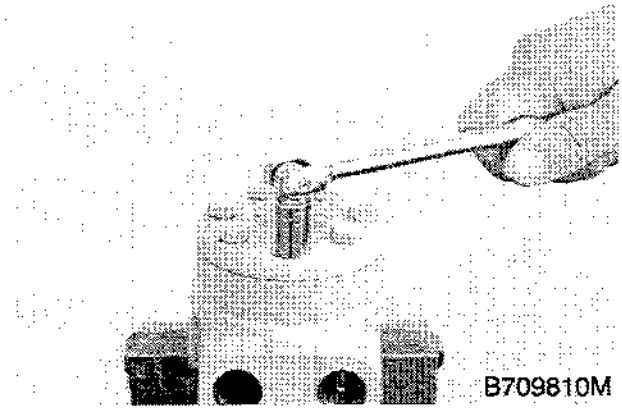
STEP 43



Install the steel ball in the bore for the check valve.

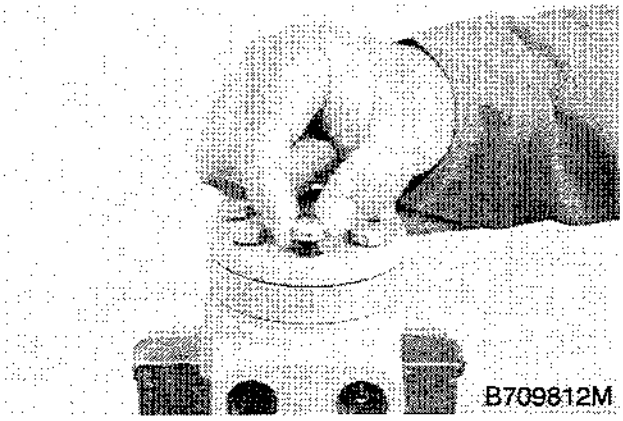
DISASSEMBLY

STEP 1



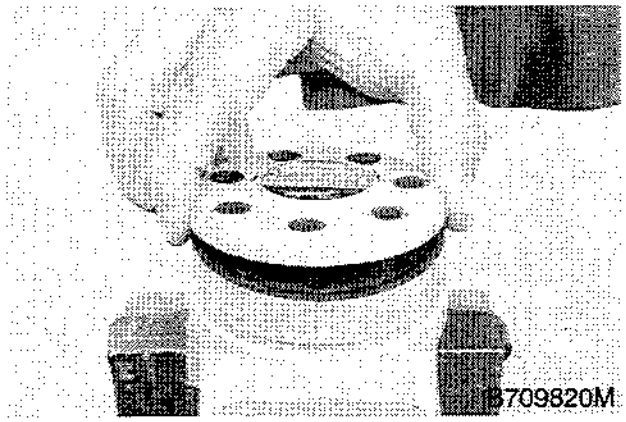
Put the steering control valve in the vise so the end plate is up. Loosen the cap screws.

STEP 2



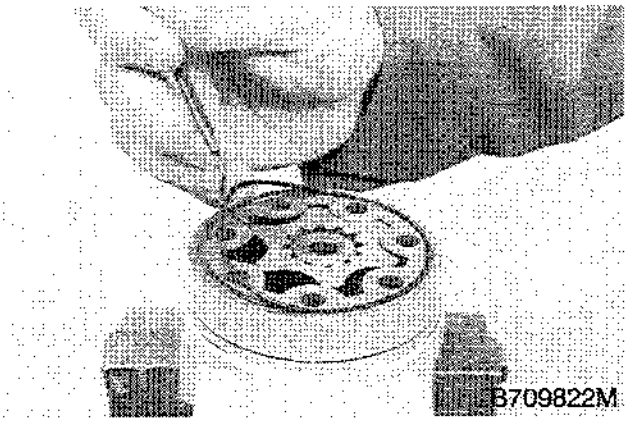
Remove the cap screws and flat washers. One cap screw has a guide pin.

STEP 3



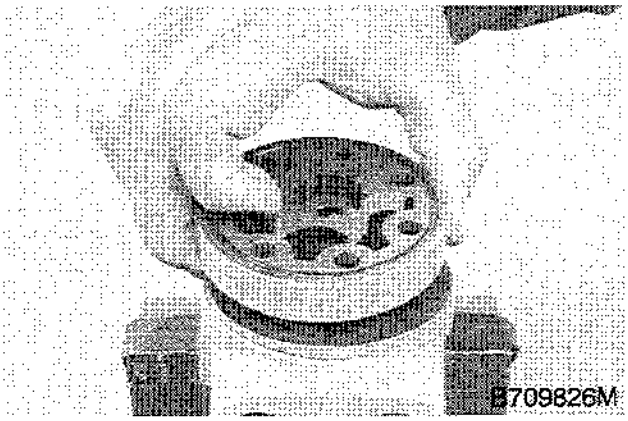
Remove the end plate.

STEP 4



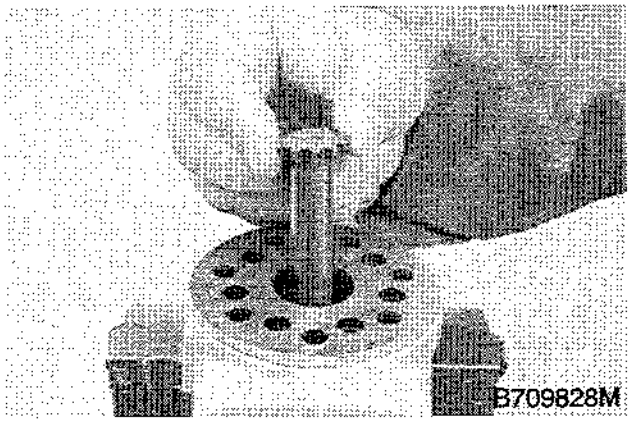
Remove and discard the O-ring from the stator.

STEP 5



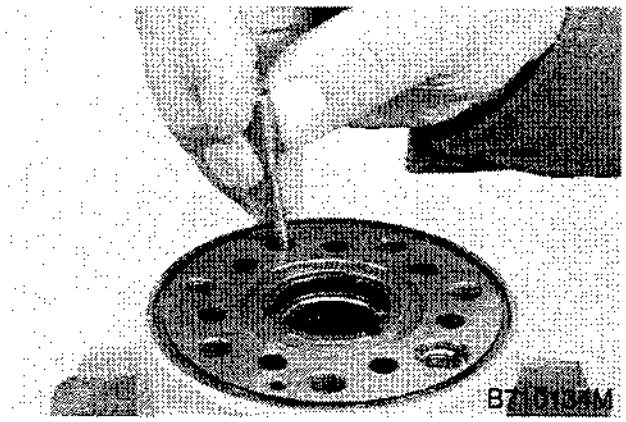
Remove the metering gear set and spacer from the body.

STEP 6



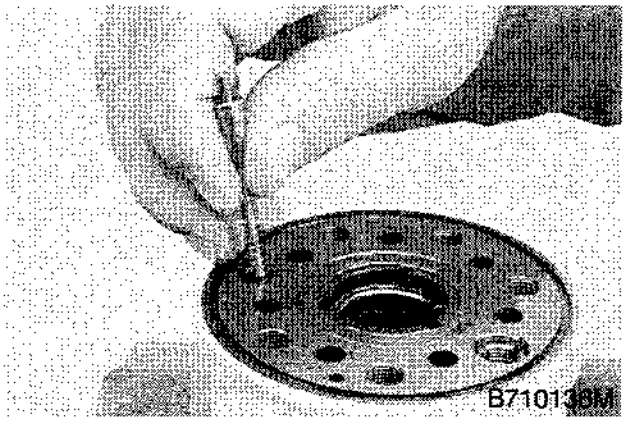
Remove the drive shaft.

STEP 53



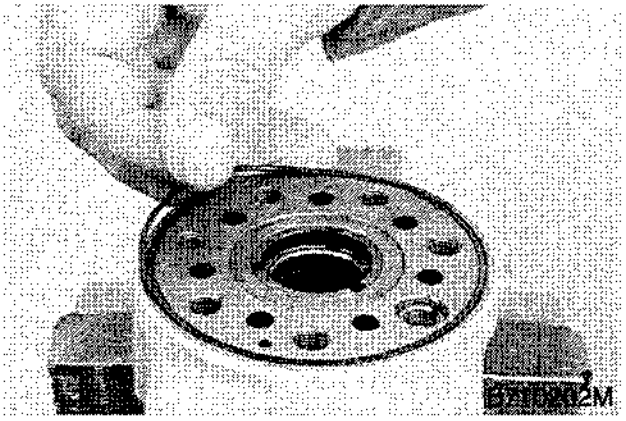
Install the spring and plunger.

STEP 54



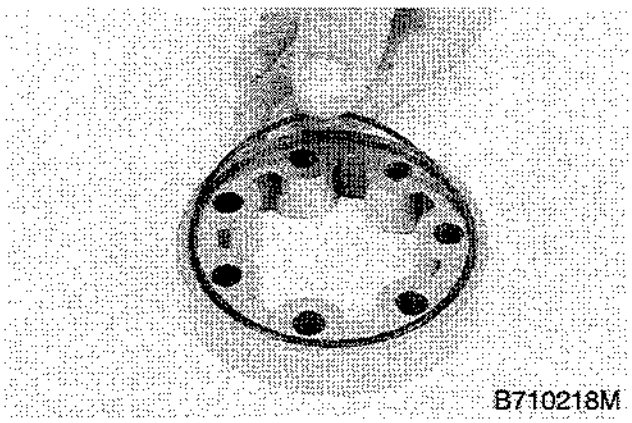
Install the other spring and plunger.

STEP 55



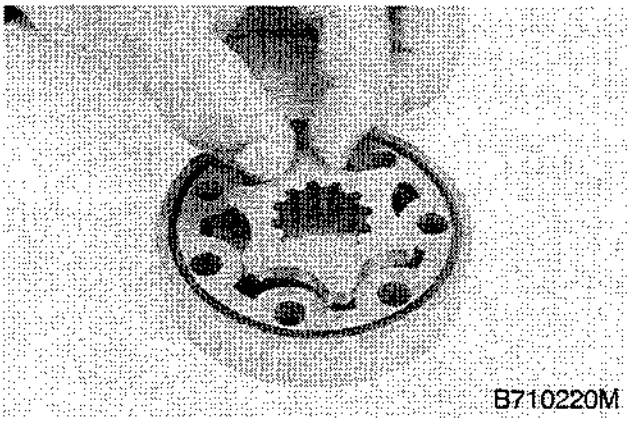
Install the O-ring in the groove in the body.

STEP 56



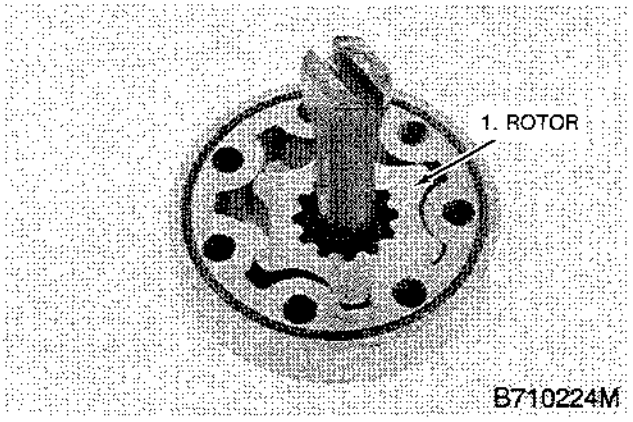
Apply petroleum jelly on each O-ring for the stator. Install an O-ring in the groove in each side of the stator.

STEP 57



Align the rotor and stator and install the rotor in the stator.

STEP 58



The drive shaft must be installed in the rotor in the correct position. Engage the teeth on the drive shaft and the teeth in the rotor so the slot in the end of the drive shaft is between the two teeth on the rotor.

Inspection

1. Discard the parts that were removed from the gland, piston rod assembly, and the tube (10).

2. Clean all parts in cleaning solvent.

3. Inspect the gland, piston rod assembly, and the tube for damage and wear. These parts are not serviced separately, if these parts need to be replaced, a new steering cylinder must be used.

Assembly

See the cross sectional view of the steering cylinder on page 10.

1. Install a new seal (4) in the gland (5). The lip of the seal (4) must be toward the inside of the gland (5).

2. Install a new backup ring (3) next to the gland (5).

3. Install a new wiper (2) in the gland (5). The lip of the wiper (2) must be toward the outside of the gland (5).

4. Install a new O-ring (6) in the groove on the outside of the gland (5).

5. Fasten the piston rod assembly (7) in a vise with soft jaws.

6. Install a new backup ring (14) in the center groove of the piston rod assembly (7).

7. Install a new seal (8) on top of the backup ring (14) in the center groove of the piston rod assembly (7).

8. Install a new wear ring (9) in the groove on each side of the seal (8).

9. Lubricate the seal (8) and wear rings (9) with clean oil. Use a piston ring compression tool to hold the new wear rings (9) in place.

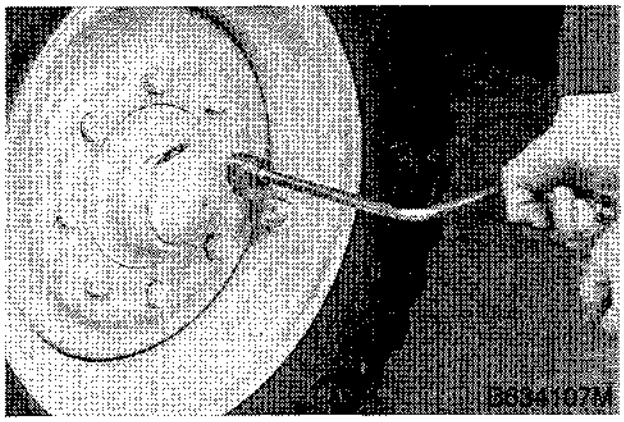
10. Start the tube (10) onto the piston rod assembly (7). Push the tube (10) onto the piston rod assembly (7) until the compression tool is pushed off the piston rod assembly (7). Be careful not to damage the wear rings (9) and the seal (8).

11. Fasten the tube (10) in a vise with soft jaws. Push the piston rod assembly (7) all the way into the tube (10).

12. Lubricate the wiper (2), backup ring (3), seal (4), and O-ring (6) on the gland (5) with clean oil.

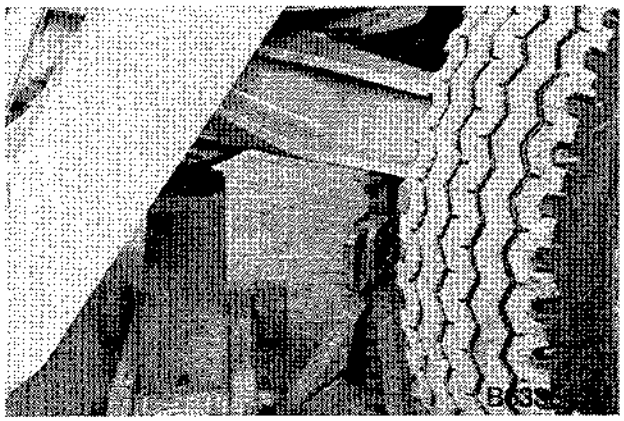
13. Install the gland (5) on the piston rod assembly (7) and push the gland (5) against the tube (10).

STEP 33



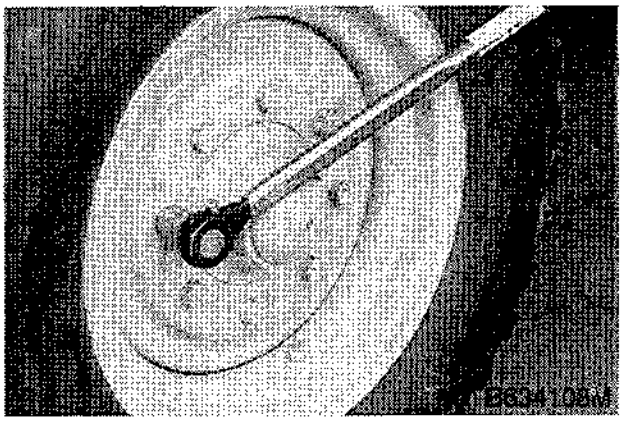
Install the wheel and wheel bolts. Do not use an impact wrench to install the wheel bolts.

STEP 34



Remove the support from under the front axle and lower the wheel to the floor.

STEP 35

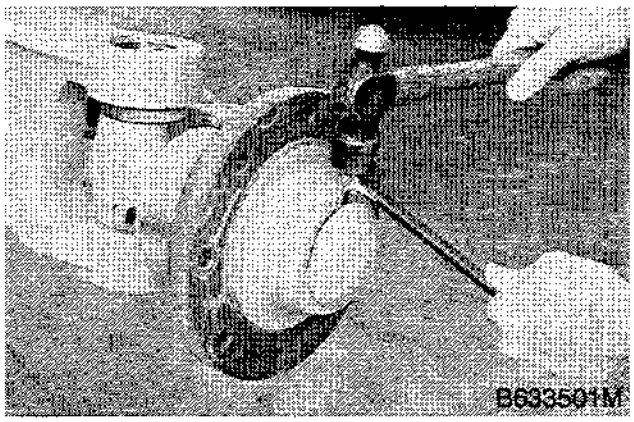


Tighten the wheel bolts to 115 to 150 pound-feet (156 to 203 Nm).

Wheel Bearing Adjustment

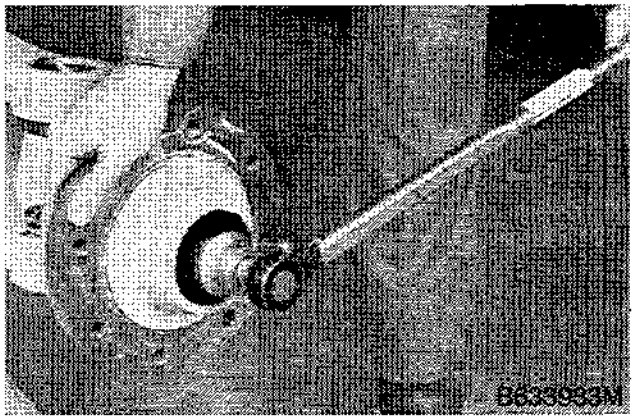
The following photographs show the hub with the wheel off. It is not necessary to remove the wheel from the hub to adjust the wheel bearing.

STEP 36



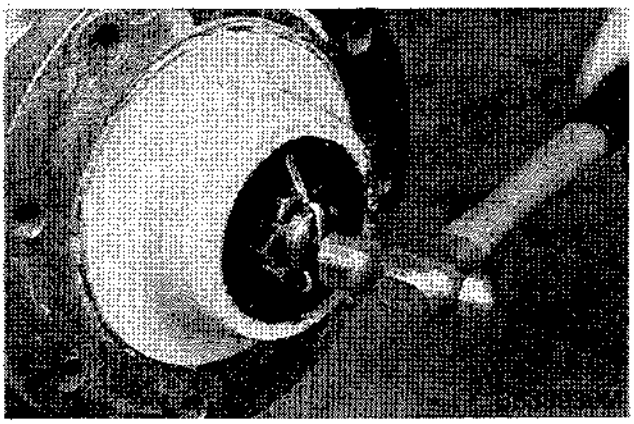
Remove the cap.

STEP 37



Turn the wheel or hub and tighten the nut to 75 to 85 pound-feet (101 to 115 Nm). Then loosen the nut to the first cotter pin hole.

STEP 38

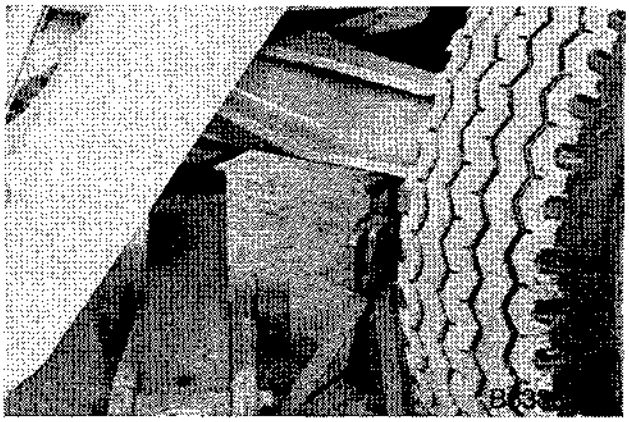


Install a new cotter pin.

KINGPIN BEARINGS AND THRUST BEARINGS

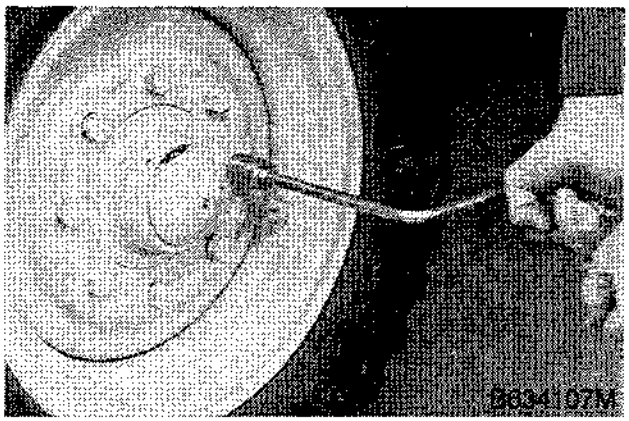
Removal

STEP 93



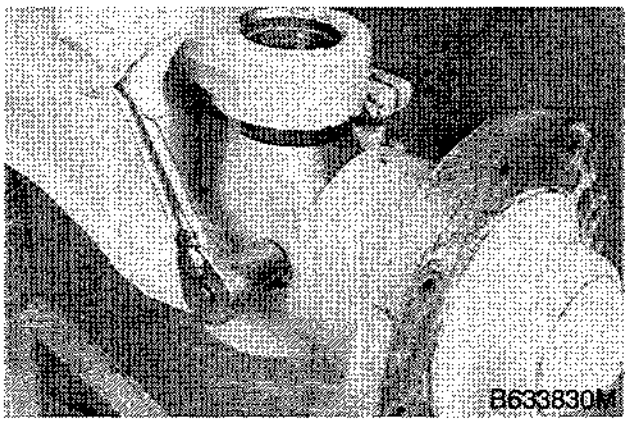
Raise the front wheel and put an acceptable support under the front axle.

STEP 94



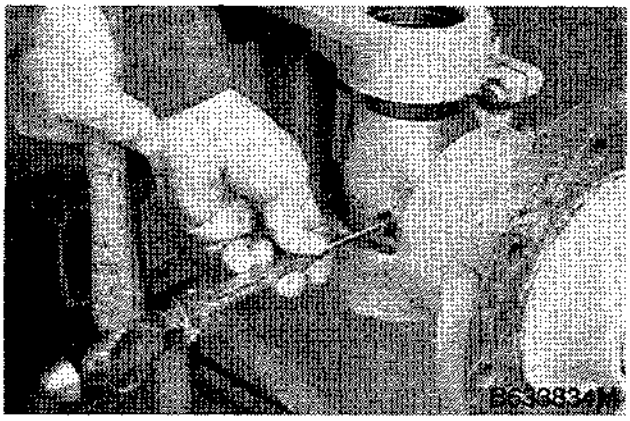
Loosen and remove the wheel bolts. Remove the wheel.

STEP 95



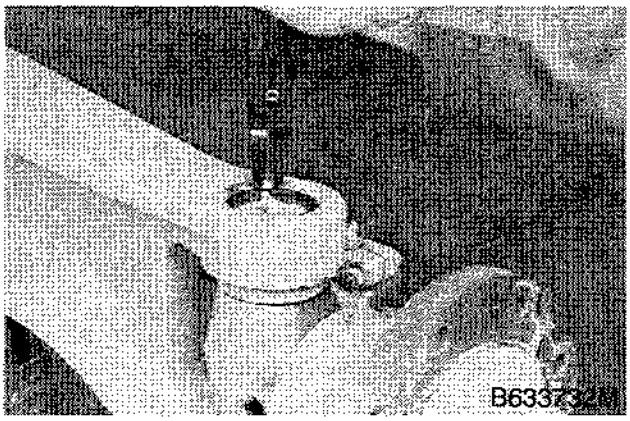
Loosen and remove the nut and lock washer from the lock pin.

STEP 96



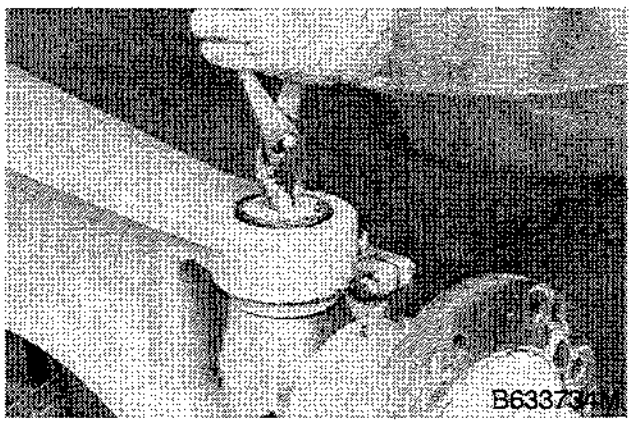
Drive the lock pin out of the spindle.

STEP 97



Remove the snap ring. The O-ring used between the spacer and bearing will cause the snap ring to be difficult to remove.

STEP 98



Remove the spacer.

TABLE OF CONTENTS

SPECIFICATIONS

Backlash for ring gear	0.008 to 0.010 inch (0.20 to 0.25 mm)
Rotating torque for pinion shaft without seal	10 to 20 pound-inches (1.1 to 2.3 Nm)
Gear lubricant	CaseIH Gear Lube (85W-140)

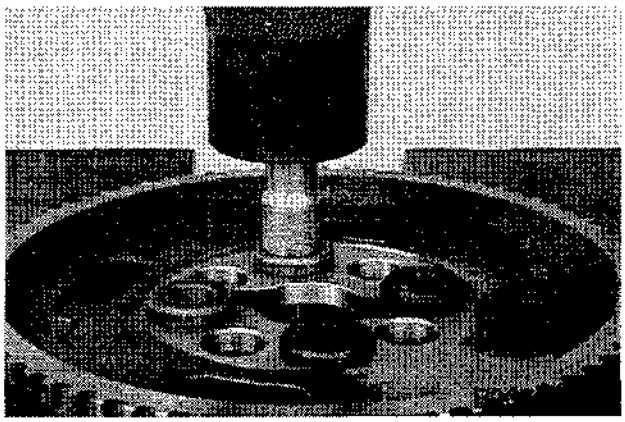
Capacities

Center bowl	7.4 U.S. quarts (7 litres)
Planetary (each)	1.1 U.S. quart (1 litre)

Special torques

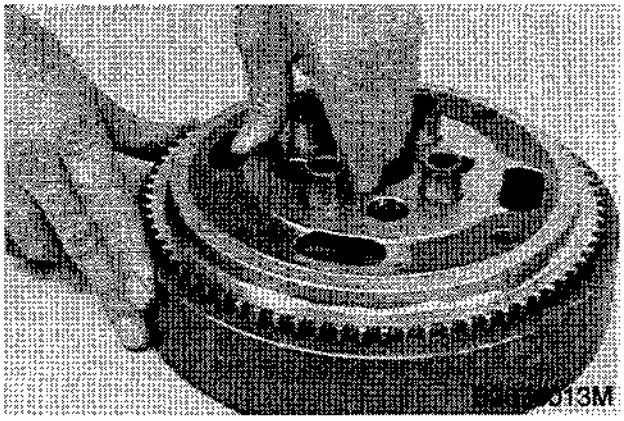
Studs for wheels	52 pound-feet (70 Nm)
Wheel nuts	200 to 240 pound-feet (270 to 325 Nm)
Allen screws for planetary cover with 242 Loctite	300 pound-inches (34 Nm)
Allen screws for carrier	59 pound-feet (80 Nm)
Nut for ball joint	125 to 135 pound-feet (169 to 180 Nm)
Cap screws for king pin	101 pound-feet (137 Nm)
Cap screw for lock for adjusting ring	84 pound-inches (9.5 Nm)
Cap screws for bearing caps	115 pound-feet (156 Nm)
Cap screws for differential case with 271 Loctite	52 pound-feet (70 Nm)
Cap screws for bearing caps	74 pound-feet (100 Nm)
Cap screws for steering cylinder	66 to 79 pound-feet (90 to 107 Nm)
Cap screws for hub for ring gear	184 pound-feet (299 Nm)

STEP 37



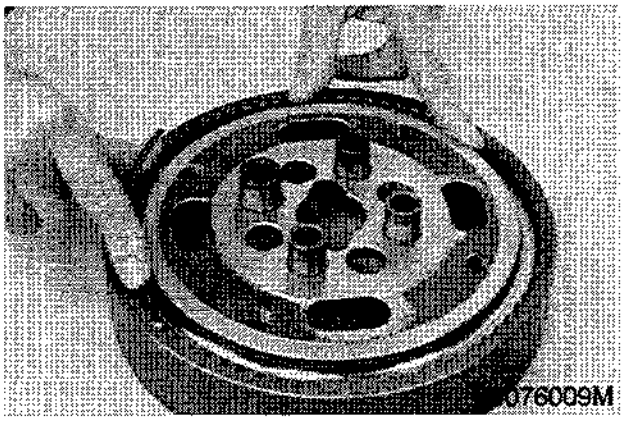
Press bushings into the hub as required.

STEP 38



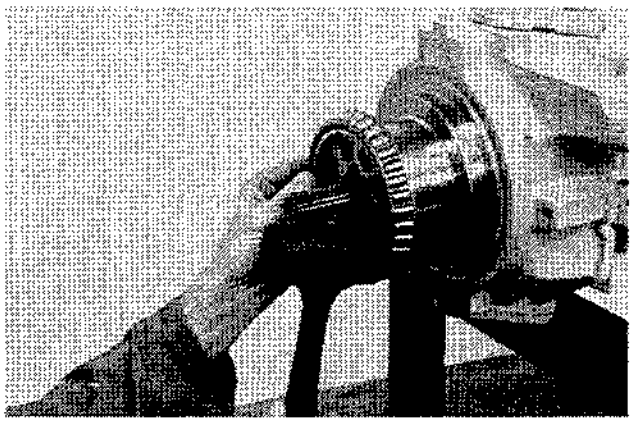
Install the hub.

STEP 39



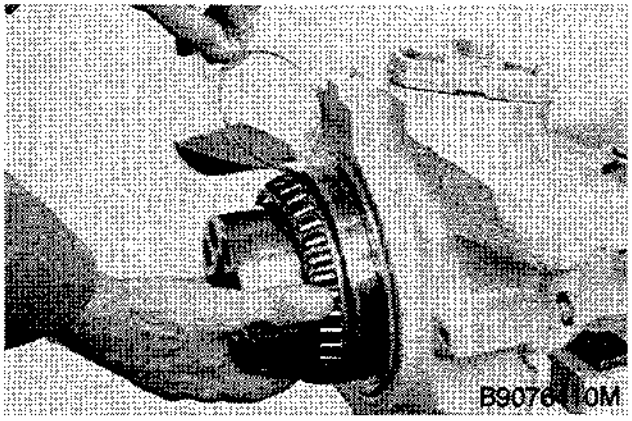
Install the retaining ring.

STEP 40



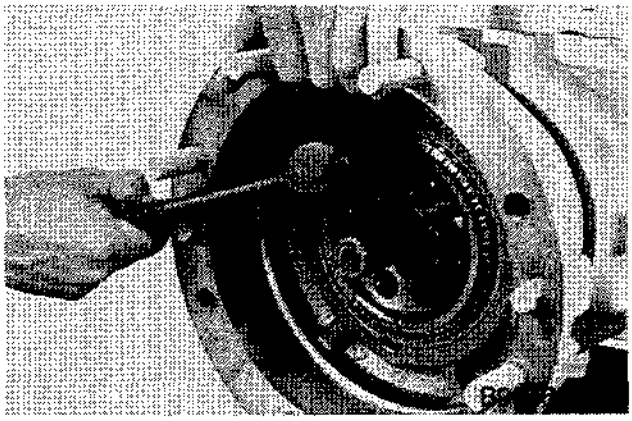
Install a bearing on the swivel housing.

STEP 41



Lubricate the bearings with gear lubricant.

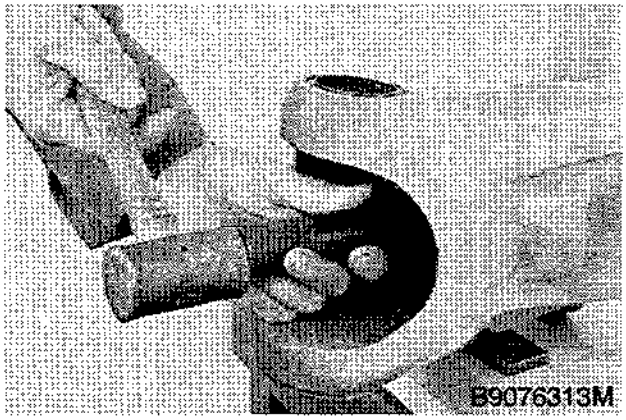
STEP 42



Install the planetary housing and the other bearing.

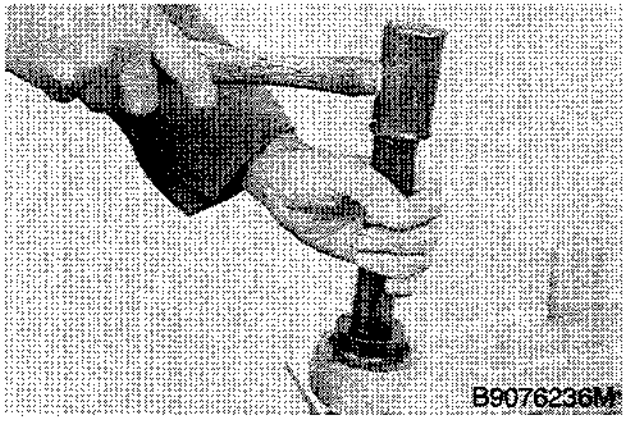
ASSEMBLY AND INSTALLATION OF SWIVEL HOUSING

STEP 99



Drive the bushing into the bore until the bushing is 5/16 inch (8 mm) beyond the end of the bore. Then install the seal.

STEP 100

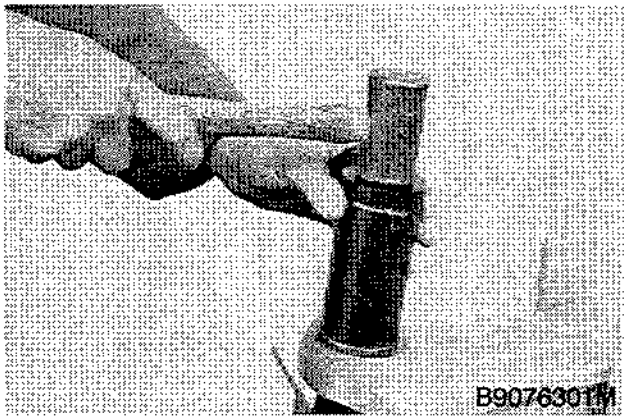


Install the bushing for the top king pin on a driver that has a pilot and drive the bushing all the way into the bore.

STEP 101

Repeat step 100 for the bottom bushing.

STEP 102

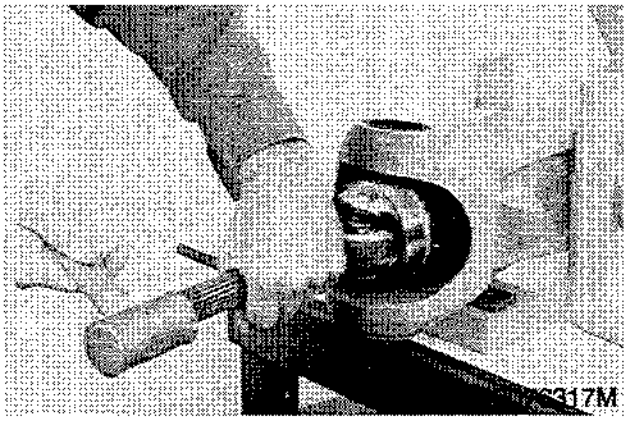


Use a suitable driver and drive the seal all the way into bore.

STEP 103

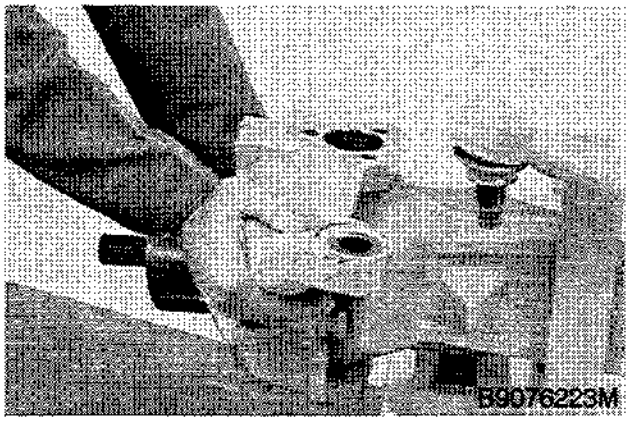
Repeat step 102 for the bottom seal.

STEP 104

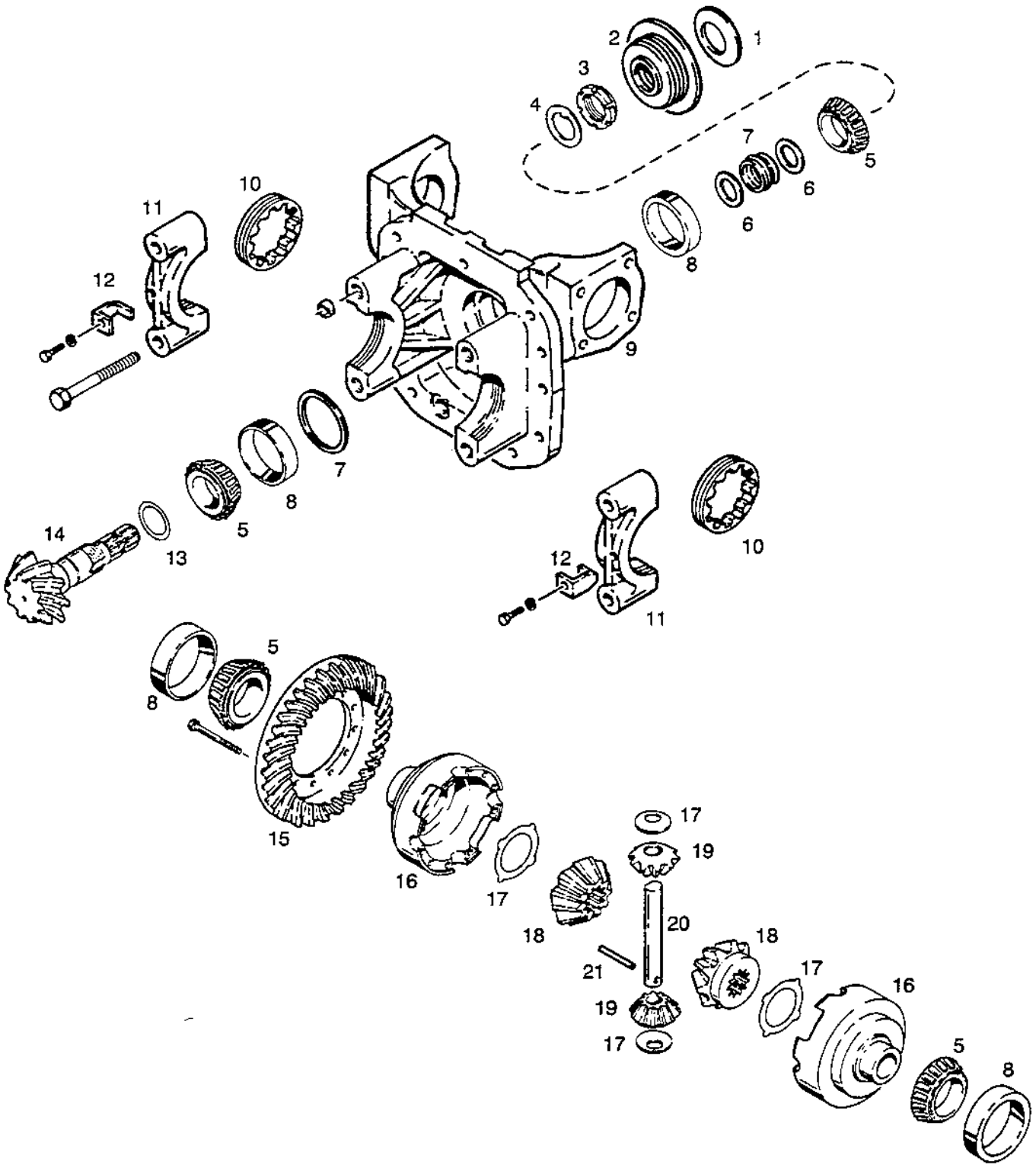


Install the axle shaft.

STEP 105

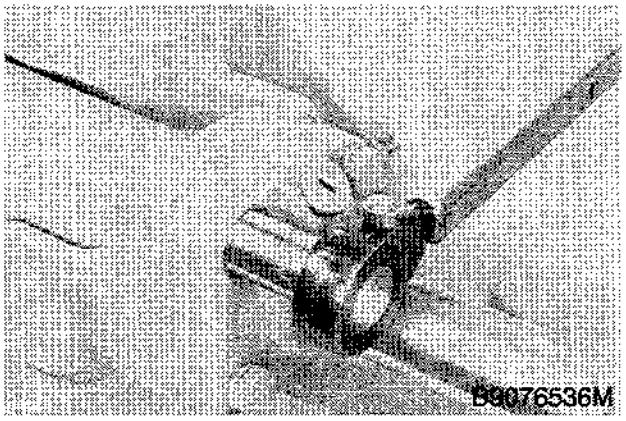


Install the swivel housing.



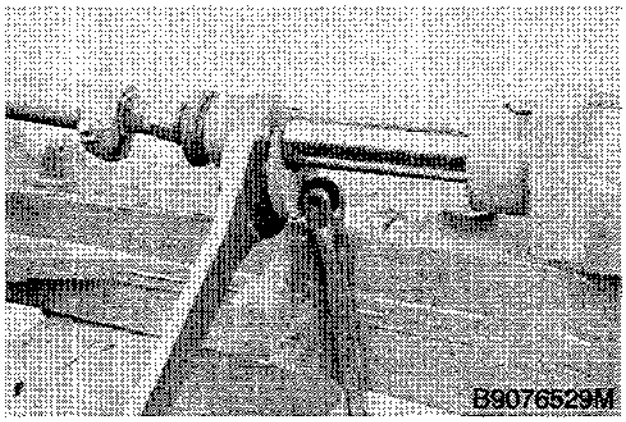
1. *Cover*
2. *Seal*
3. *Pinion Nut*
4. *Washer*
5. *Bearing*
6. *Flat Washer*
7. *Spacer*
8. *Bearing Cup*
9. *Differential Carrier*
10. *Adjusting Ring*
11. *Bearing Cap*
12. *Lock*
13. *Shim*
14. *Pinion Gear*
15. *Ring Gear*
16. *Case Half*
17. *Thrust Washer*
18. *Side Gear*
19. *Pinion Gear*
20. *Pinion Shaft*
21. *Dowel Pin*

STEP 230



Install and tighten the cap screws to 66 to 79 pound-feet (90 to 107 Nm).

STEP 231

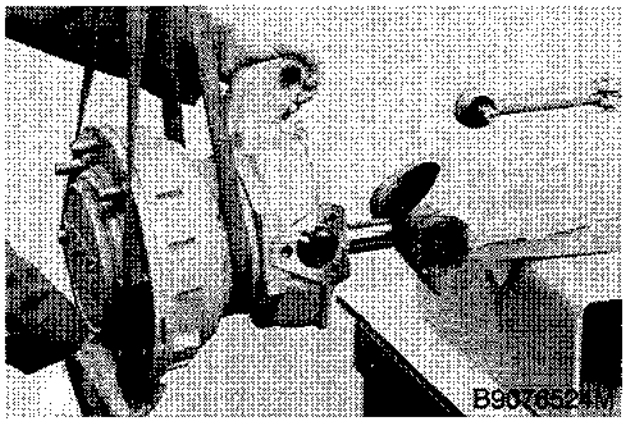


Install and tighten the tie rod.

STEP 232

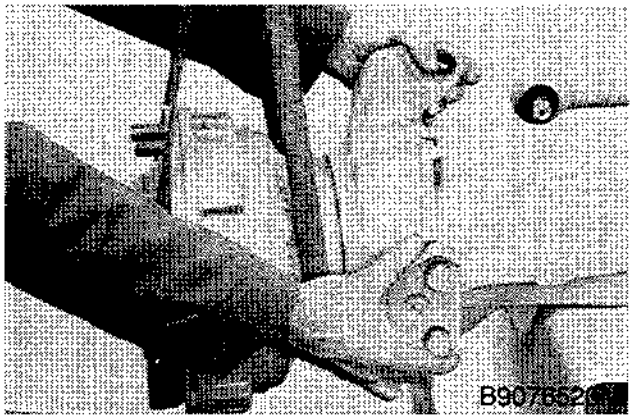
Install and tighten the fitting at the closed end of the steering cylinder.

STEP 233



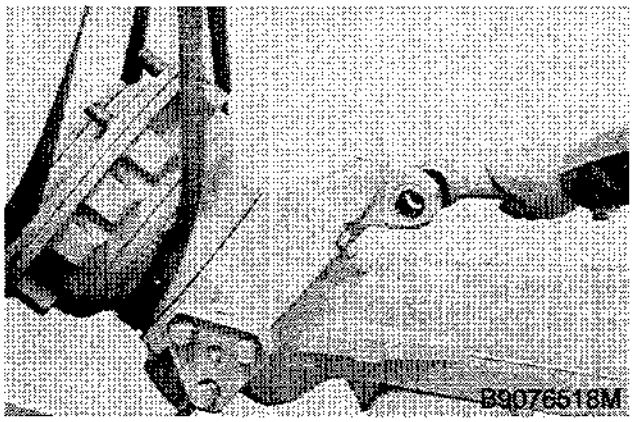
Install the planetary and axle assembly. It can be necessary to have another person turn the pinion shaft.

STEP 234



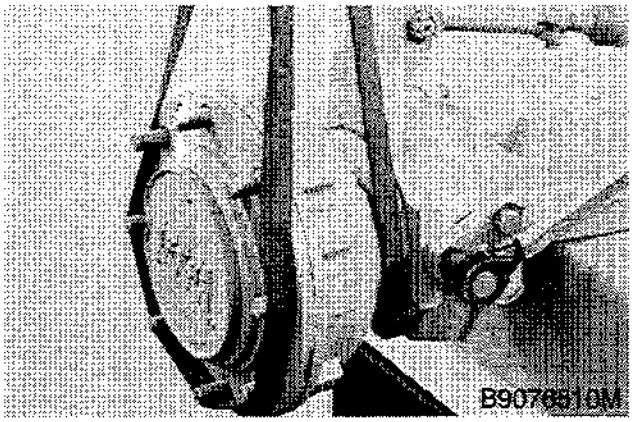
Install the king pins, shims, cap screws and lock washers.

STEP 235



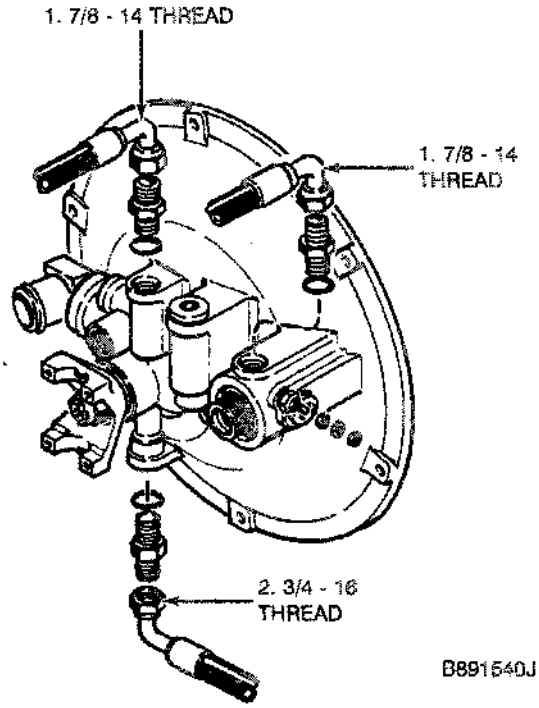
Install the ball joint and nut.

STEP 236



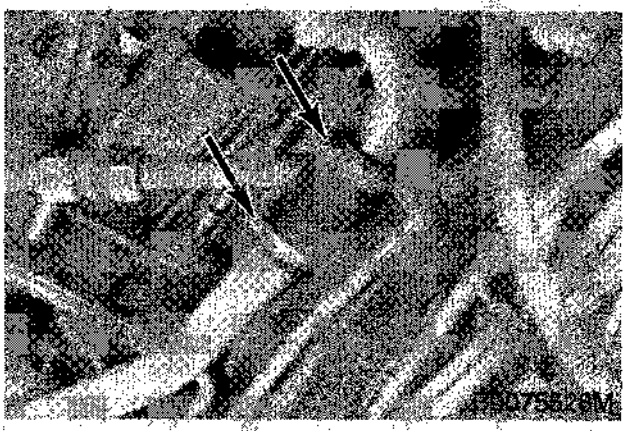
Tighten the cap screws to 101 pound-feet (134 Nm).

STEP 27



Remove the caps from the fittings and the plugs from the hoses and connect the hoses to the torque converter housing.

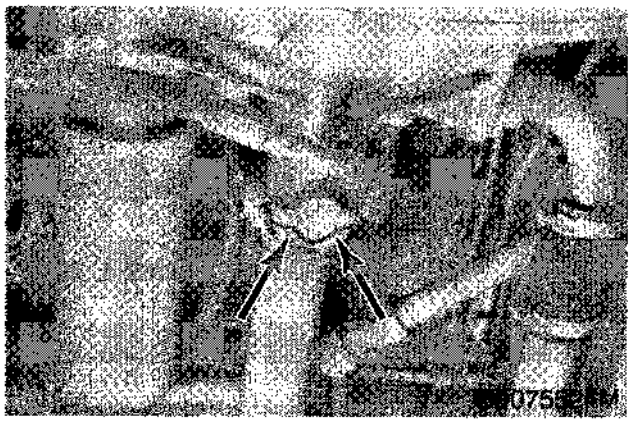
STEP 28



Install the suction tube and tighten each clamp on the hose.

NOTE: *If the hardware for the transaxle was loosened to remove the rear drive shaft, tighten the hardware according to the torque specifications in step 64.*

STEP 29

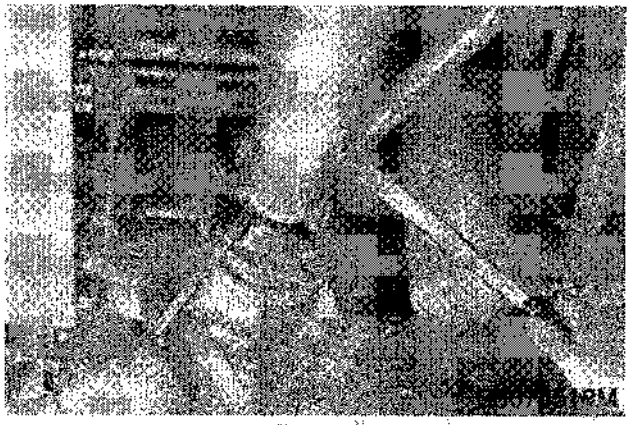


Install the rear drive shaft, clamps, and the Ferry head screws. Tighten the Ferry head screws to 156 to 216 pound-inches (18 to 24 Nm).

STEP 30

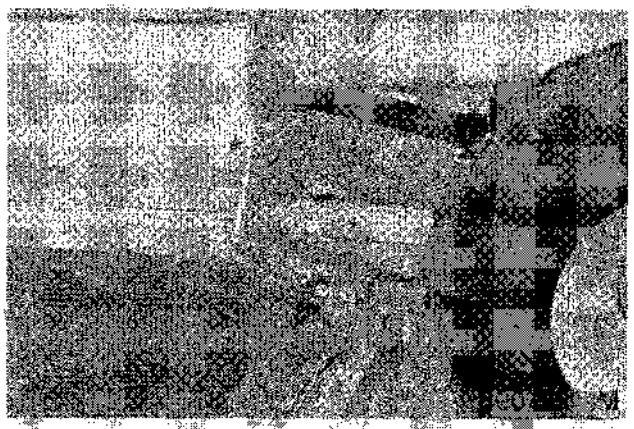
If the machine has four wheel drive, do steps 31 through 35.

STEP 31



Install the front drive shaft and cap screws. Tighten the cap screws to 504 to 576 pound-inches (57 to 65 Nm).

STEP 32

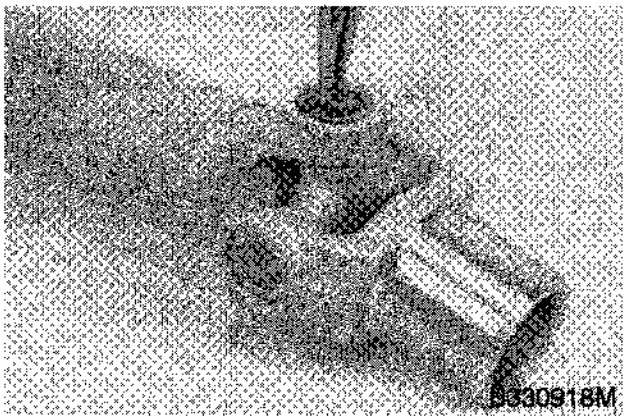


Move the guard in position under the drive shaft.

REPLACING A UNIVERSAL JOINT

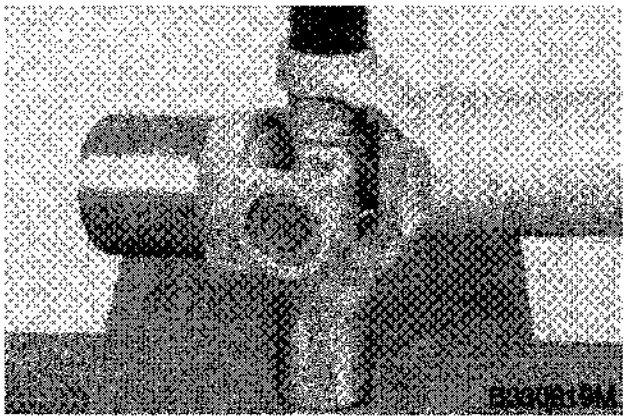
NOTE: *This procedure shows the removal of a universal joint for the rear drive shaft. The procedure is the same for all drive shafts used on this machine.*

STEP 90



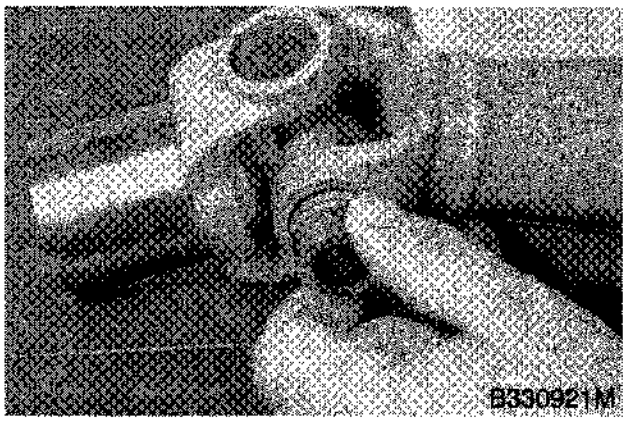
Remove the snap rings.

STEP 91



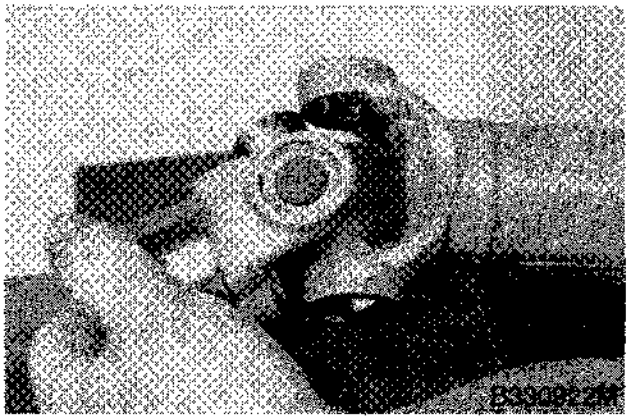
Use an acceptable support and driver and press the bearing caps out of the shaft. Make sure that the grease fitting is up as shown.

STEP 92



Remove the bearing cap. If necessary, use pliers to remove the bearing cap.

STEP 93

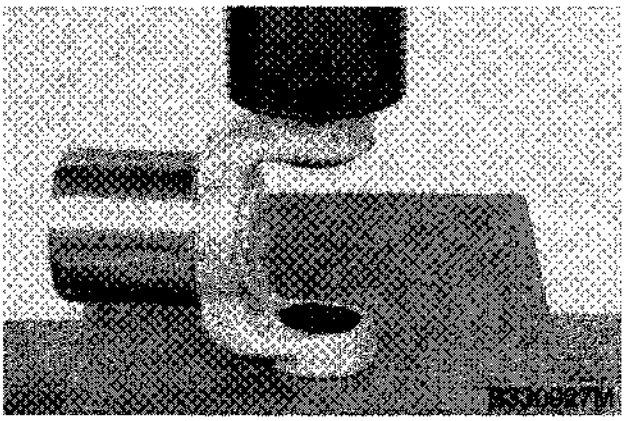


Remove the cross from the shaft.

STEP 94

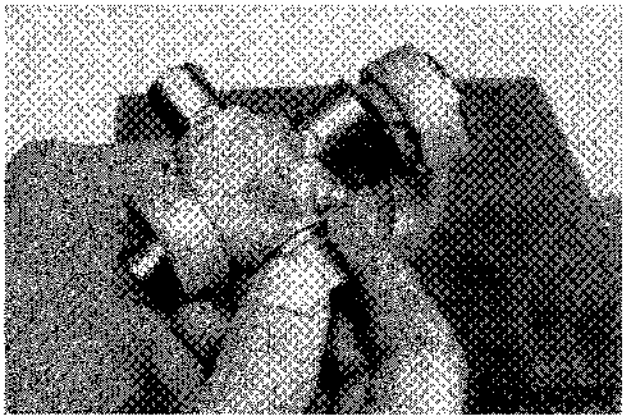
Repeat steps 91, 92, and 93 to remove the cross from the yoke.

STEP 95



Start a bearing cap into the yoke. DO NOT press the bearing cap all the way in.

STEP 96



Install the cross in the yoke.

CHECKING CONVERTER IN PRESSURE AND FLOW

Equipment Required

CAS-10106 or CAS-1808 flowmeter fitting kit.

CAS-2026 Special Fitting Kit

CAS-10280 flowmeter.

Test Procedure

Inlet of flowmeter connected to port 1.

Outlet of flowmeter connected to port 2.

All transmission controls in NEUTRAL.

Parking brake applied.

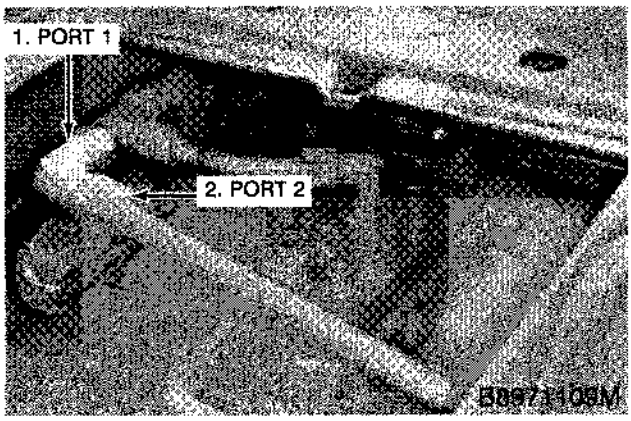
Load valve for flowmeter open.

Oil at operating temperature.

Engine running at 2200 rpm (r/min).

Read the flow gauge and the pressure gauge and record both readings.

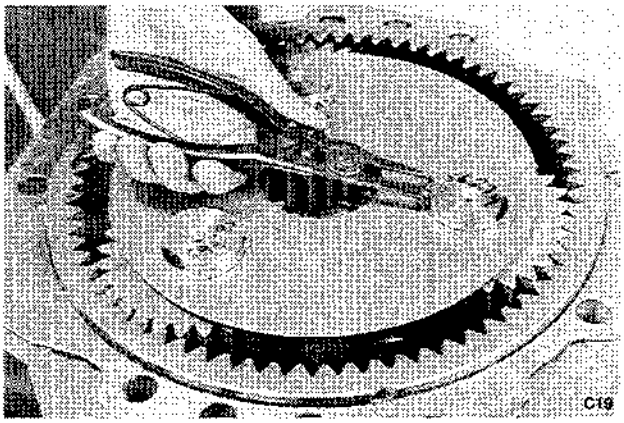
See page 2 for the specifications.



Test point shown is early production. Tube replaced with hose for late production.

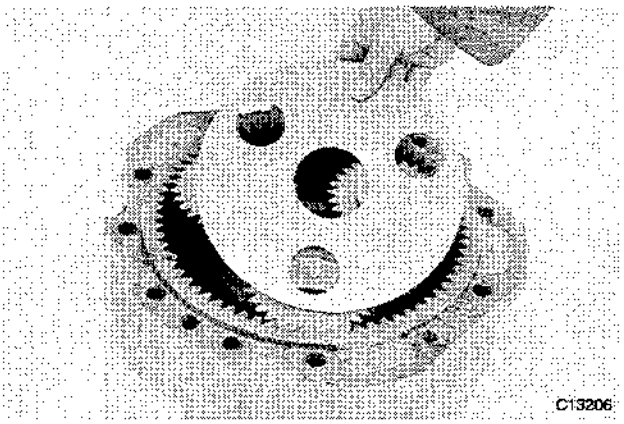
Disassembly

STEP 5



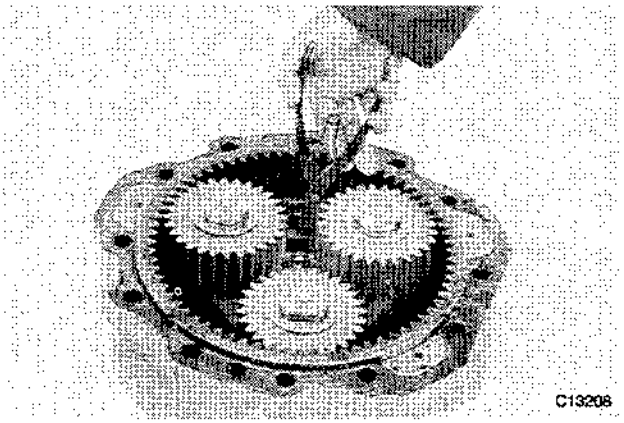
Remove the snap rings from the three planet gear pins.

STEP 6



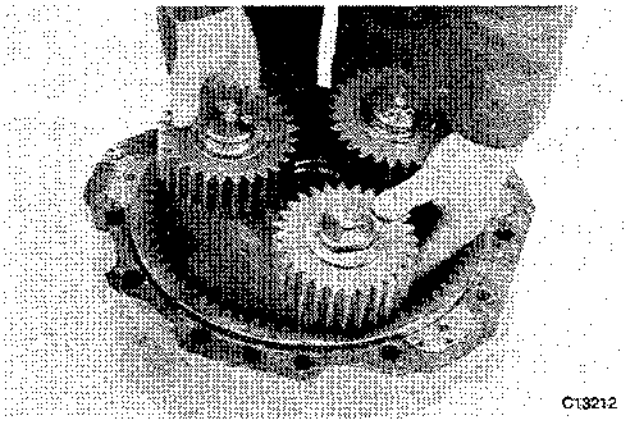
Remove the steel plate.

STEP 7



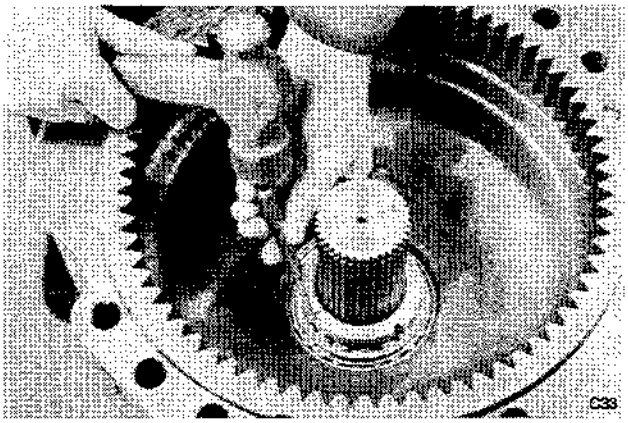
Release the snap ring from the planet gear carrier.

STEP 8



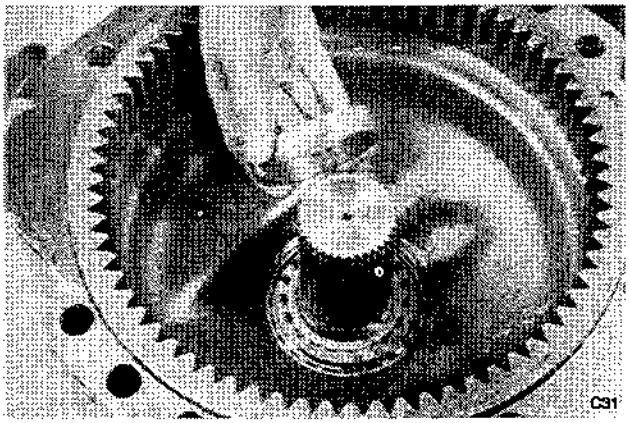
Remove the planet gear carrier assembly from the axle housing.

STEP 9



Use a suitable drift punch to move the tab on the lock washer away from the ring nut.

STEP 10



Use the special tool CAS (2006) to loosen the ring nut. Remove the ring nut.

Section

6202

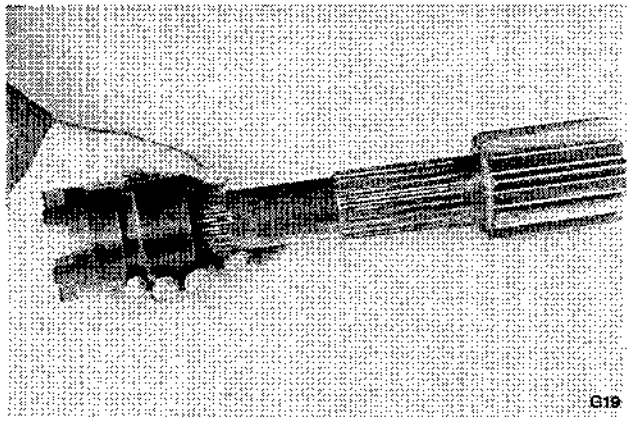
TRANSFER GEARBOX

CASE CORPORATION

Don 7-36990

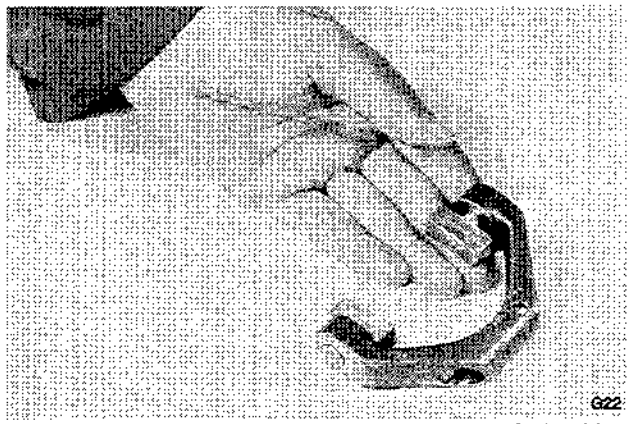
December 1990

STEP 37



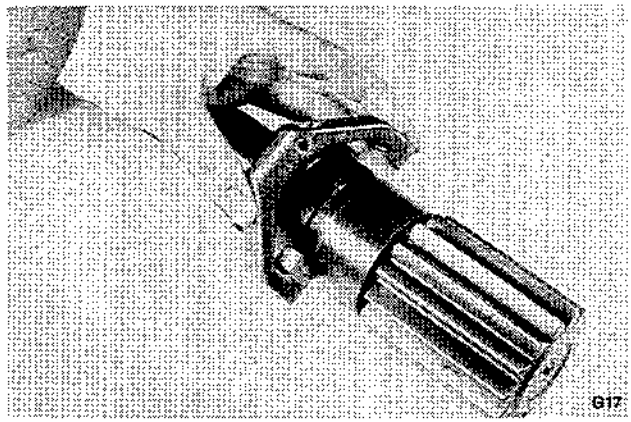
Lubricate the differential lock selector with clean transmission oil then slide it onto the inner splines on the sun shaft. Make sure that the selector teeth are away from the sun gear.

STEP 38



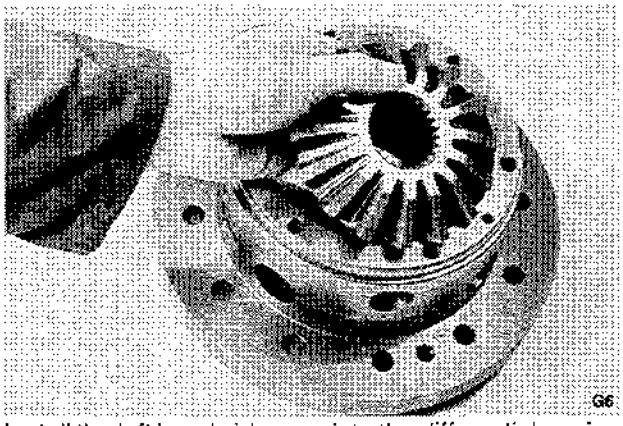
Install the two pads into the selector fork. Use petroleum jelly to hold them in position.

STEP 39



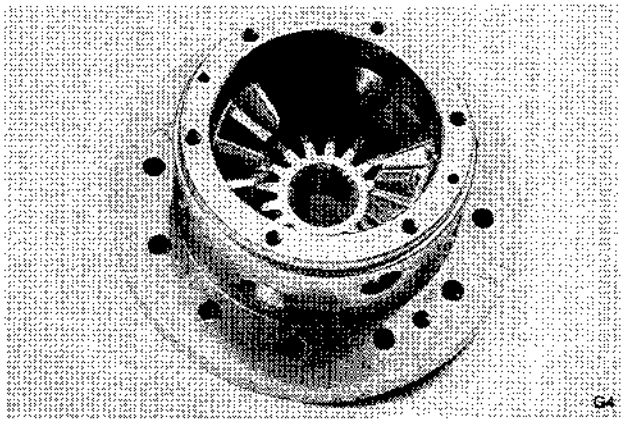
Install the fork into the selector. The hole for the pin must be at the top when the fork is on the left hand side of the selector, looking on the gear end of the sun shaft.

STEP 40



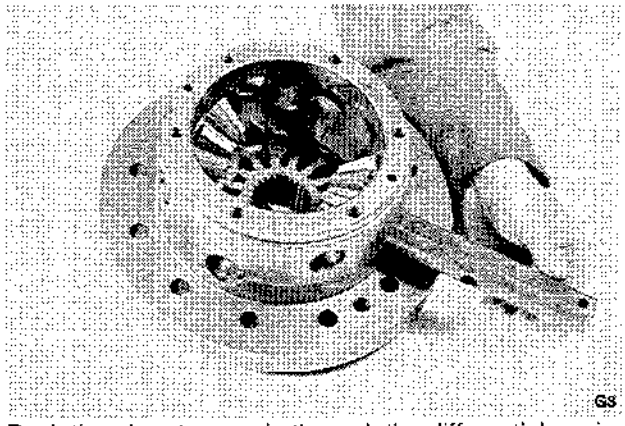
Install the left hand side gear into the differential carrier.

STEP 41



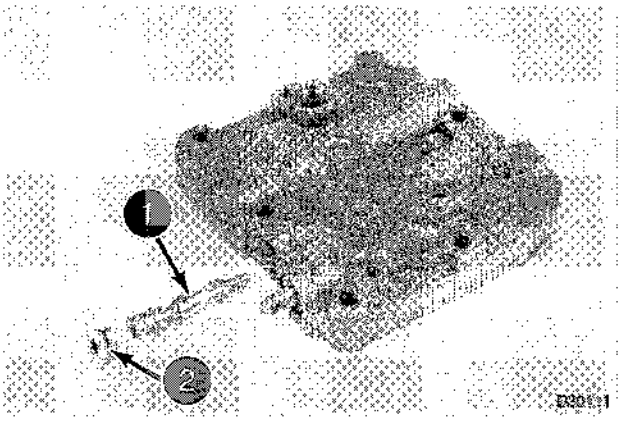
Install the two planet gears.

STEP 42



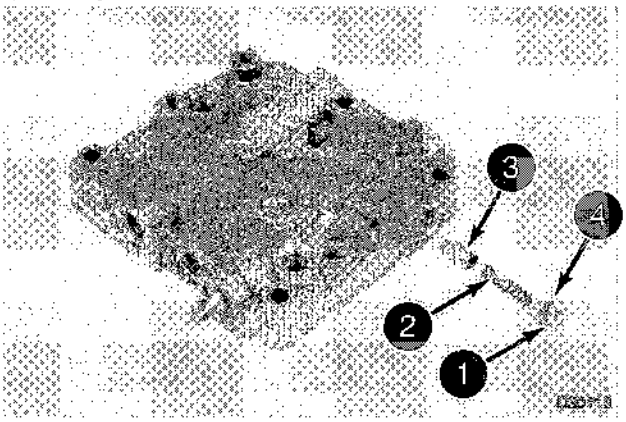
Push the planet gear pin through the differential carrier and the planet gears. Make sure that the hole for the grooved pin is vertical.

STEP 7



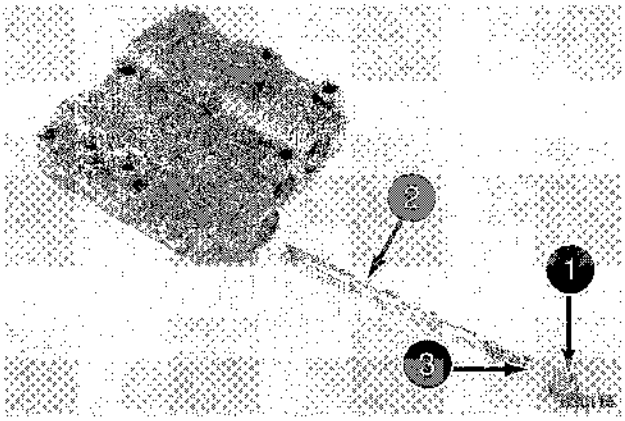
Remove the allen plug from the opposite end of the same bore and remove the modulation pressure regulator spool (1) Discard the o-ring (2) from the plug.

STEP 8



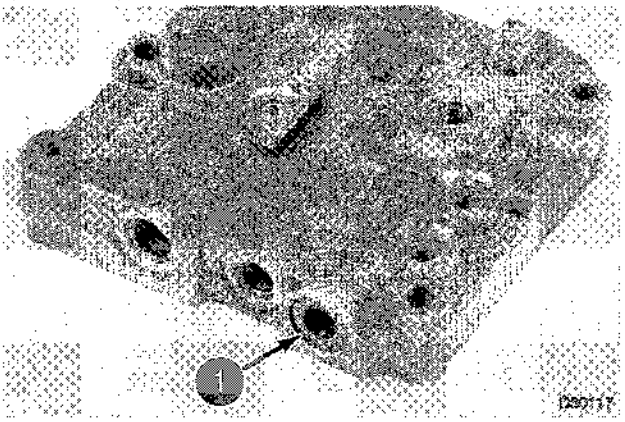
Remove the allen plug (1), spring (2) and detent (3). Discard the o-ring (4).

STEP 9



Remove the allen plug (1) and forward/reverse spool (2). Discard the ring (3) from the spool and o-ring from the plug.

STEP 10



Remove and discard the oil seal (1) from the bore of the forward/reverse spool.

Inspection

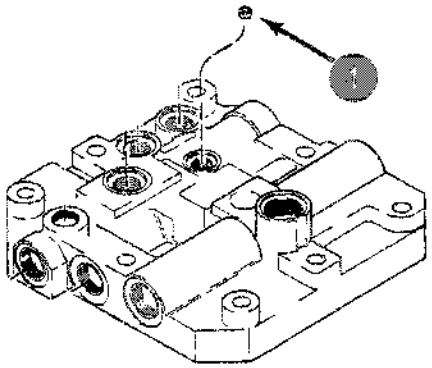
STEP 11

Clean all parts in cleaning solvent. Dry using compressed air. DO NOT use cloths.

STEP 12

Inspect all the components for wear and replace if necessary. Replace the valve assembly if there is any damage to the surfaces of the bores and spools.

STEP 13

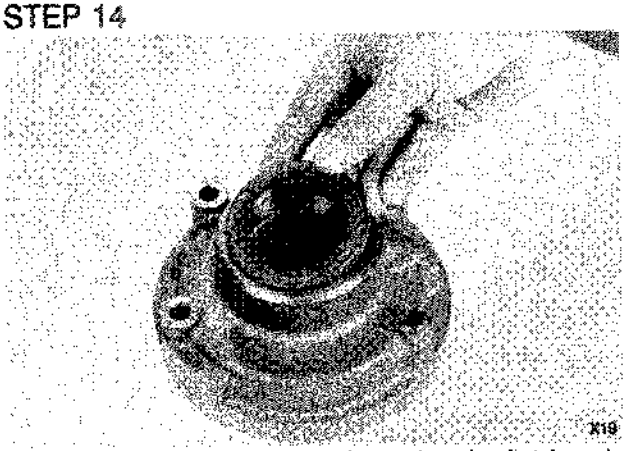


Make sure the oil restrictor (1) is clean. Remove obstructions with compressed air or a soft wire.

STEP 13

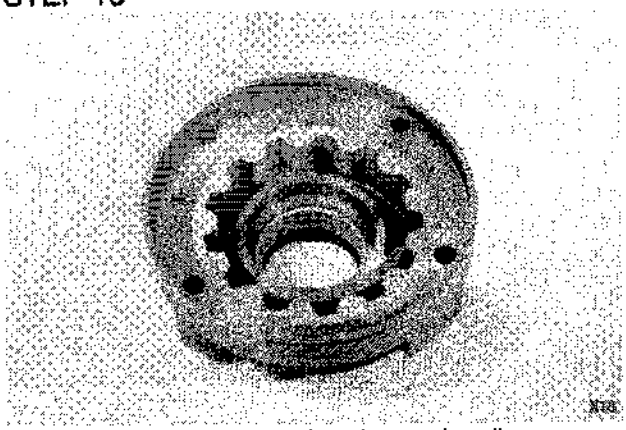
Before assembly, lubricate all the parts with clean transmission oil.

STEP 14



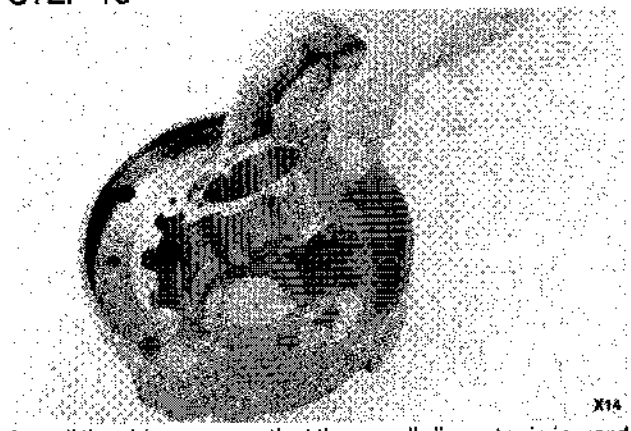
Install a new seal into the body so that the flat face is outward and level with the outer face of the body.

STEP 15



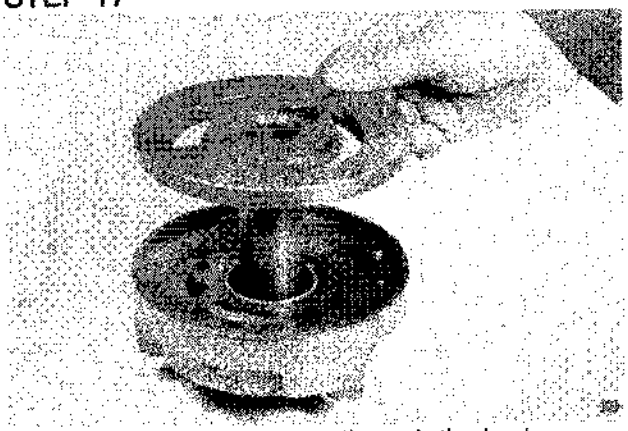
Install the driven gear so that the marks align.

STEP 16



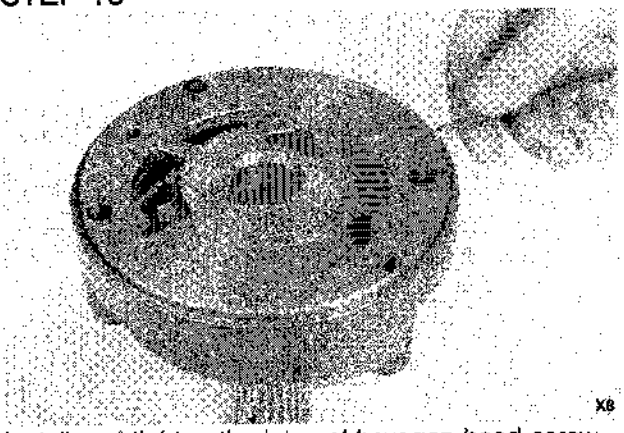
Install the drive gear so that the small diameter is inward and the marks align.

STEP 17



Install the converter support through the body.

STEP 18



Install and tighten the internal hexagon head screw.

TABLE OF CONTENTS

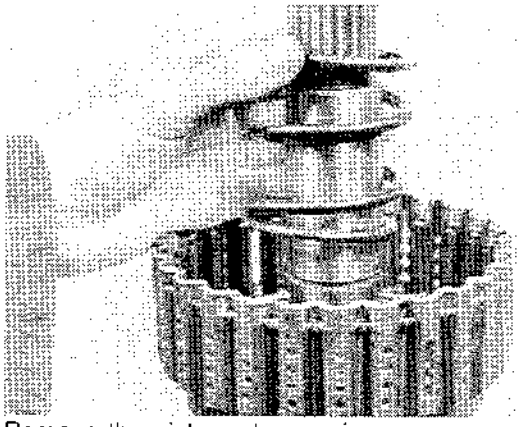
SPECIFICATIONS

Lubricating Oil	Hy-Tran Plus (MS 1207)

SPECIAL TORQUES

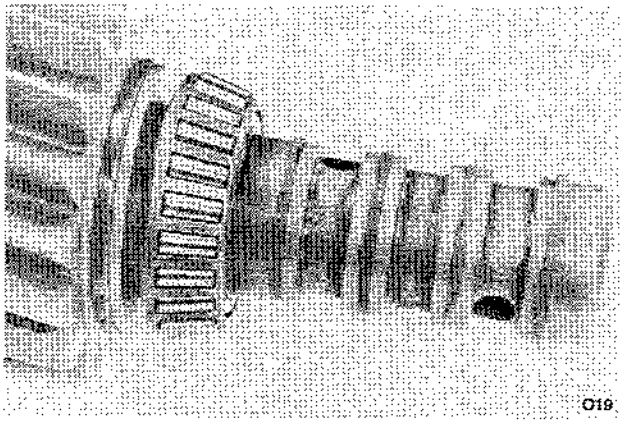
Transmission End Cover Bolt	195 to 250 Nm	145 to 185 lb ft
Pinion Shaft End Bolt	251 to 280 Nm	185 to 205 lb ft
Transmission Rear Cover Bolts	195 to 250 Nm	145 to 185 lb ft
Gear Shift Rail Retaining Bolts	44 to 58 Nm	33 to 43 lb ft

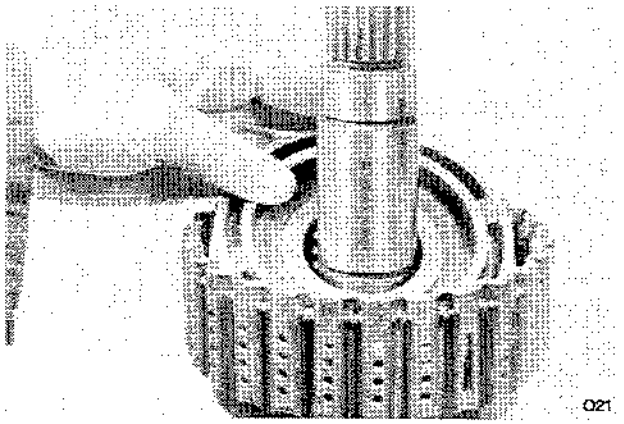
STEP 39



Remove the piston return spring.

STEP 40



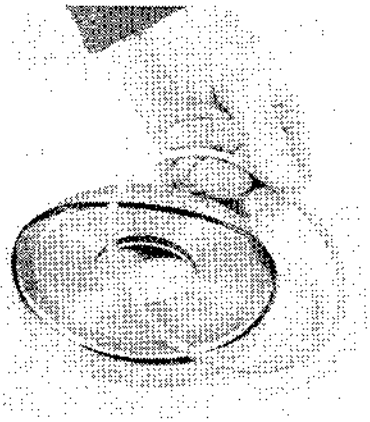


Use compressed air through the following holes in the reverse gear end of the shaft to remove the clutch piston:

Outer hole - forward piston
Inner hole - reverse piston
Middle hole - for lubrication

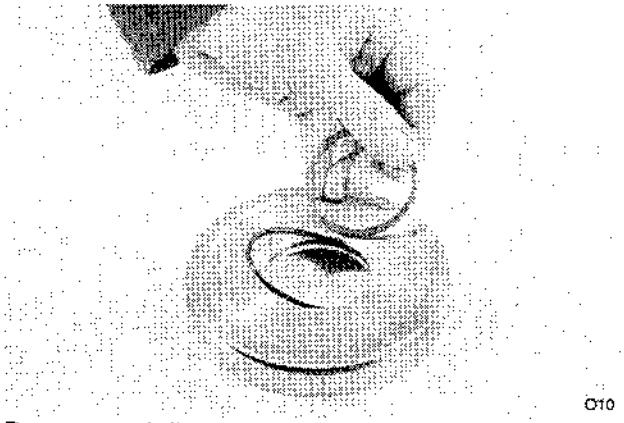
NOTE: *Do not use levers to remove the piston. The piston can be easily damaged by levers.*

STEP 41



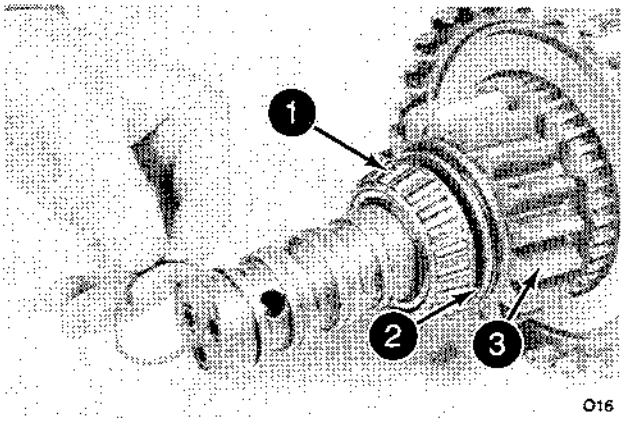
Remove and discard the outer piston seal and o-ring.

STEP 42



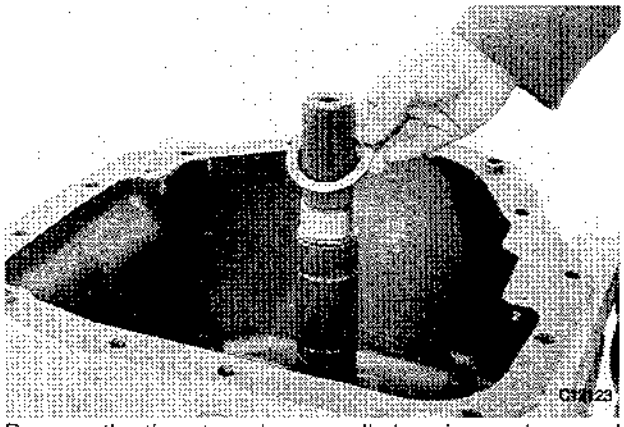
Remove and discard the inner piston seal and o-ring.

STEP 43



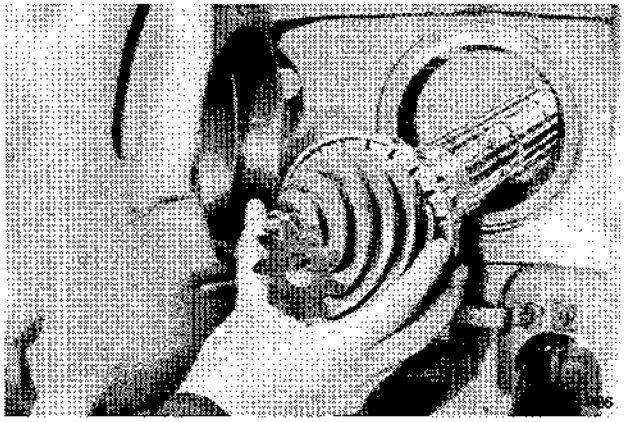
Remove and discard the four sealing rings. Remove the bearing cone (1), snap ring, thrust washer, thrust bearing (2) and gear (3). Repeat STEPS 31 to 42 and disassemble the reverse clutch.

STEP 96



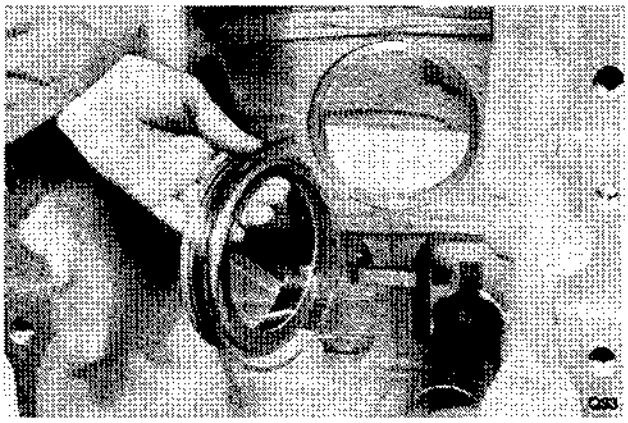
Remove the thrust washer, needle bearing and second thrust washer.

STEP 97



Remove the pinion shaft support and the pinion shaft from the differential housing.

STEP 98



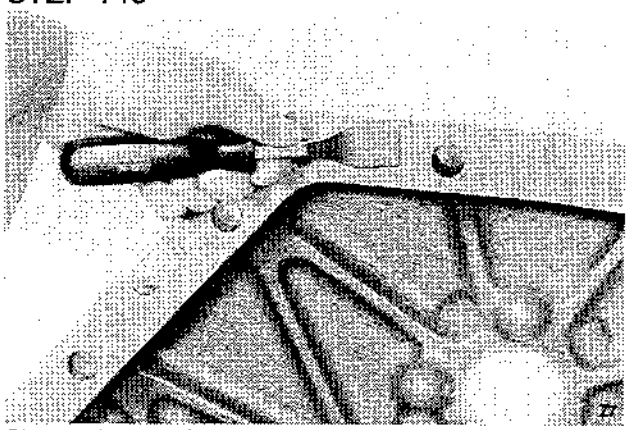
Use a soft drift to remove the pinion bearing cup and shims from the differential housing.

NOTE: *Tie the shim pack together for easy assembly.*

TRANSMISSION END COVER

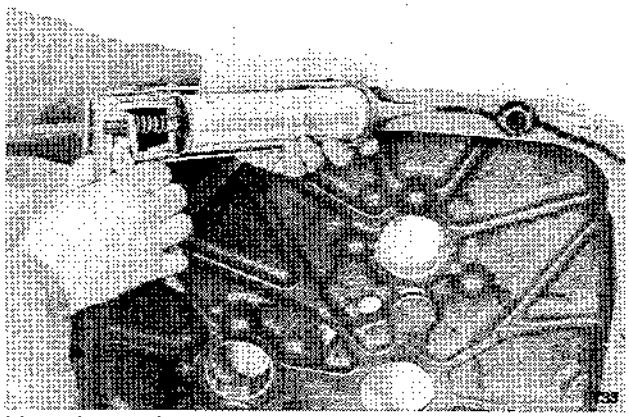
Installation

STEP 140



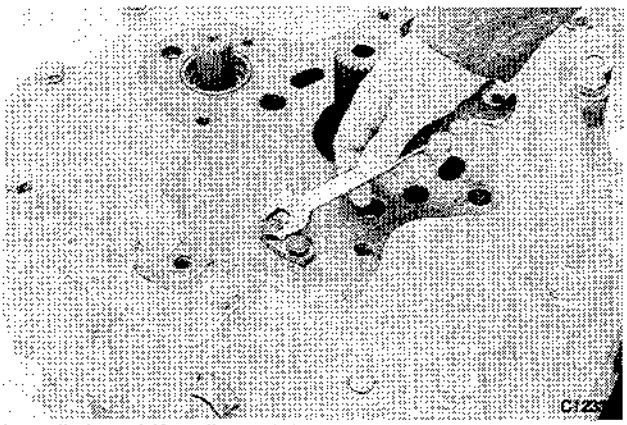
Clean the surfaces of the end cover and the transmission case.

STEP 141



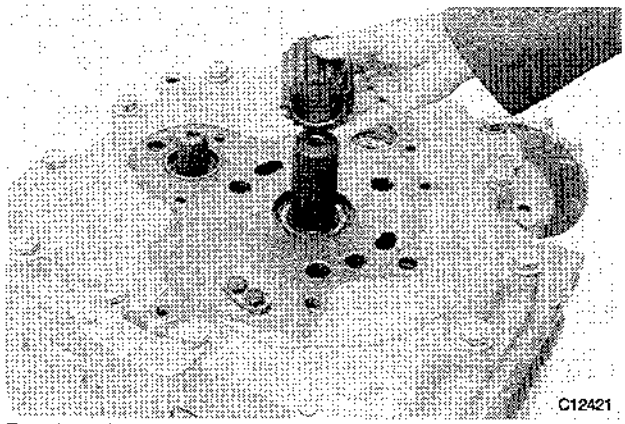
Mounting surfaces must be clean and free of oil. Apply a continuous bead of B17555 (Loctite 515) onto the mounting face of the end cover. Apply Primer 'N' B500637 to the mounting face of the transaxle. Install the cover and torque the bolts to 195 to 250 Nm (145 to 185 lb ft).

STEP 142



Install the shift rail retaining plate and two bolts and tighten to a torque of 44 to 58 Nm (33 to 43 lb ft).

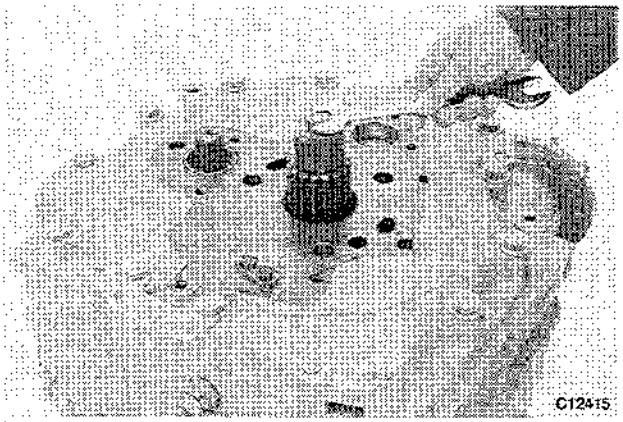
STEP 143



Put the pinion shaft bearing into a bearing oven (OEM 8014) and heat to a temperature of 302°F (150°C). Install the bearing and brake hub onto the pinion shaft.

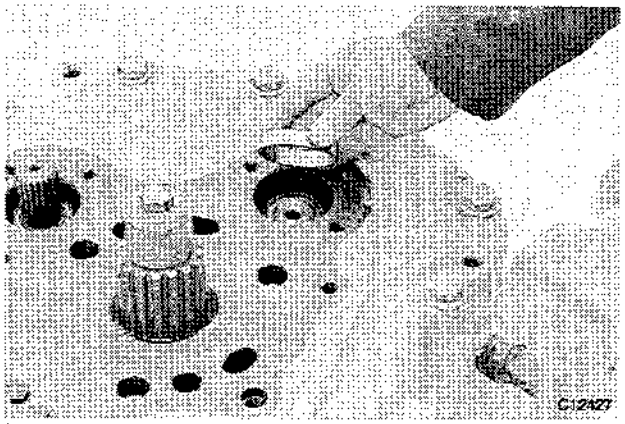
NOTE: *Wear heat protective gloves.*

STEP 144



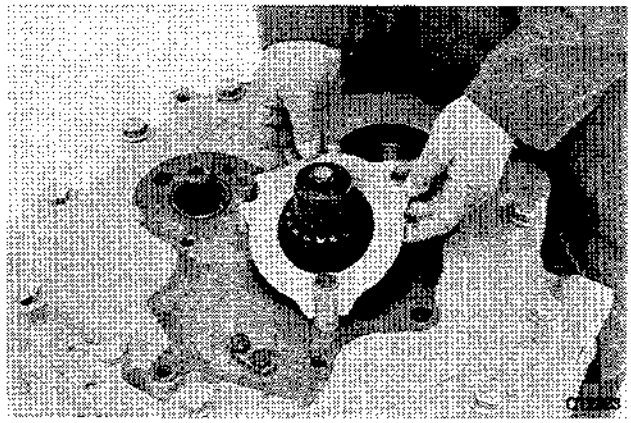
Install the spacer, new shim pack, as calculated in STEP 114. Install the washer and bolt. Tigten the bolt to a torque of 251 to 280 Nm (185 to 205 lb ft).

STEP 145



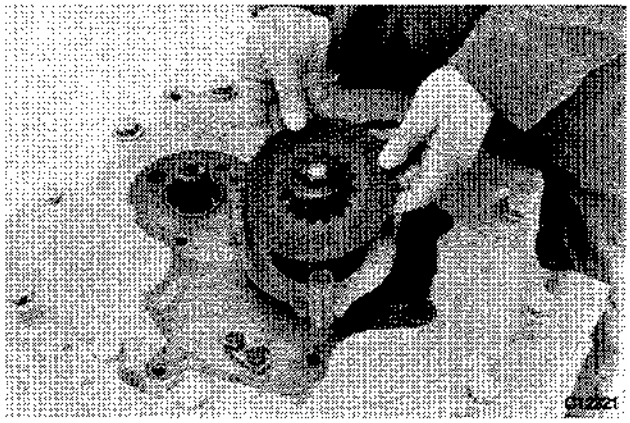
Install the bearing cup and spacer onto the intermediate shaft.

STEP 30



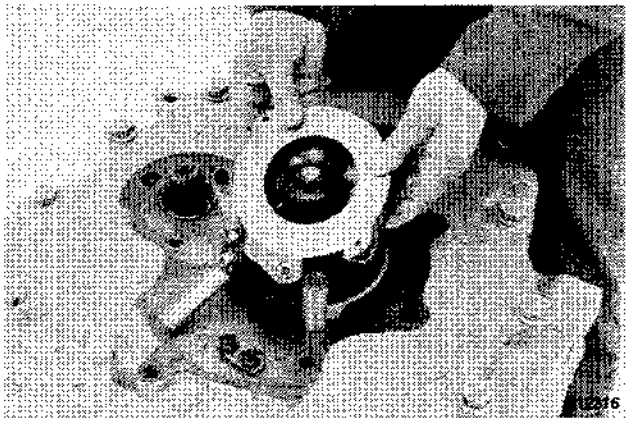
Install the wear plate onto the reaction pins.

STEP 31



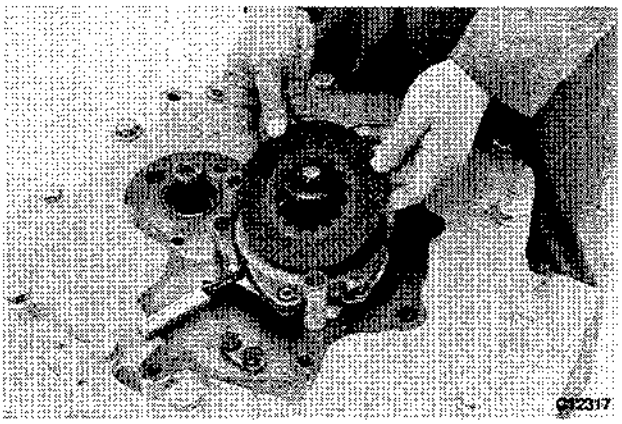
Install the friction disc.

STEP 32



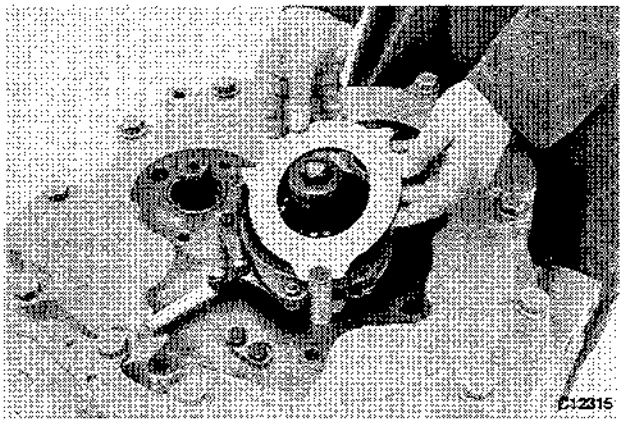
Install the actuator assembly.

STEP 33



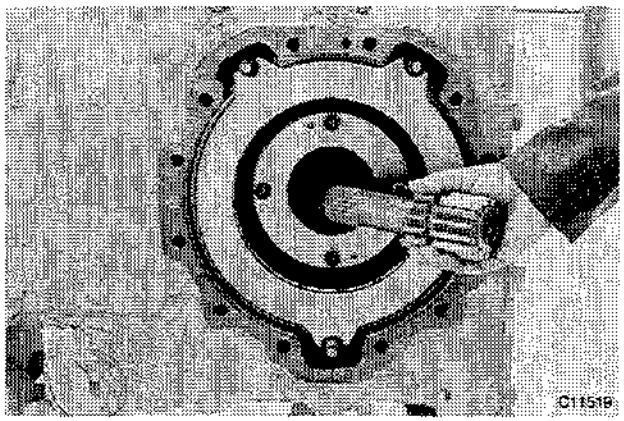
Install the second friction disc.

STEP 34



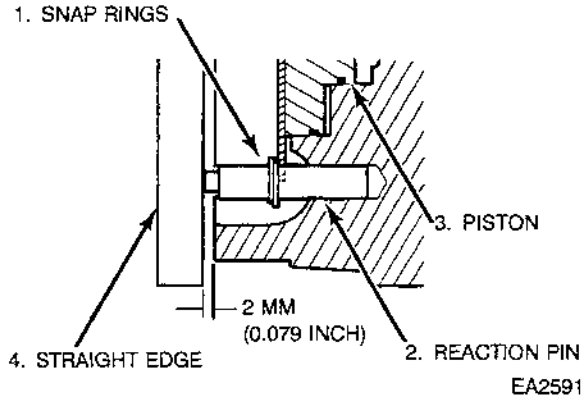
Install the second wear plate.

STEP 18



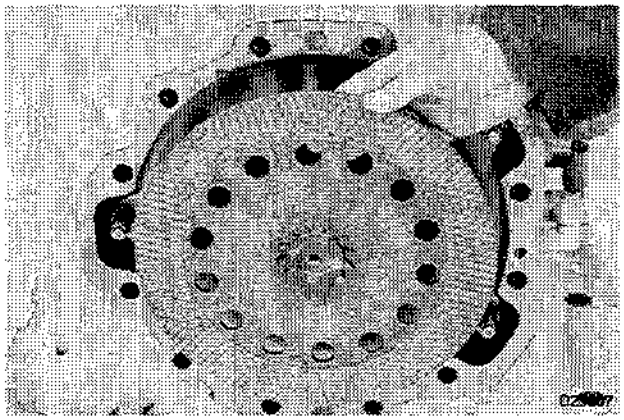
Install the sun shaft.

STEP 19



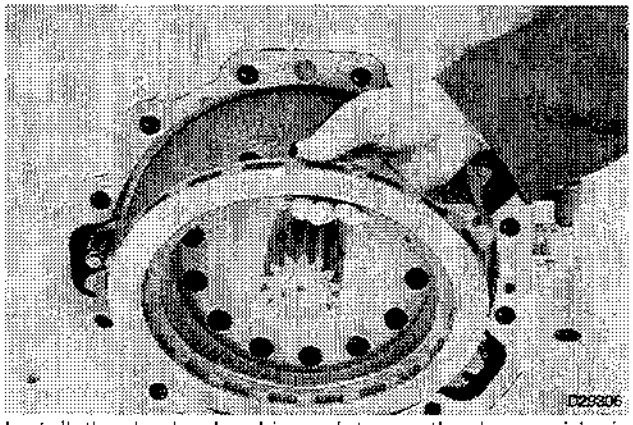
Put a straight edge across the end of the plunger of the reaction pin and measure the distance from the machined surface of the transmission case to the end of the plunger. The measurement must be 2 mm (0.079 inch). Adjust the position of the snap rings if the distance is incorrect. Make sure the edges of the two snap rings are 180° apart. Repeat the procedure for the other two reaction pins.

STEP 20



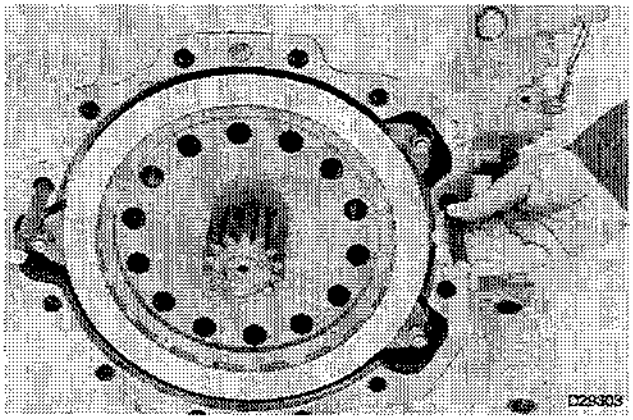
Lubricate and install the friction plate.

STEP 21



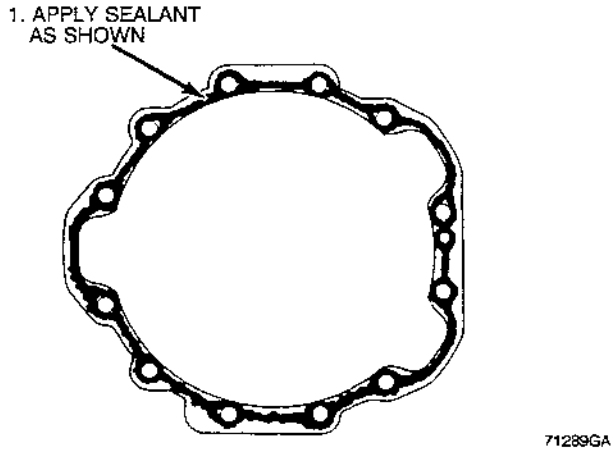
Install the brake backing plate so the large side is towards the friction plate.

STEP 22

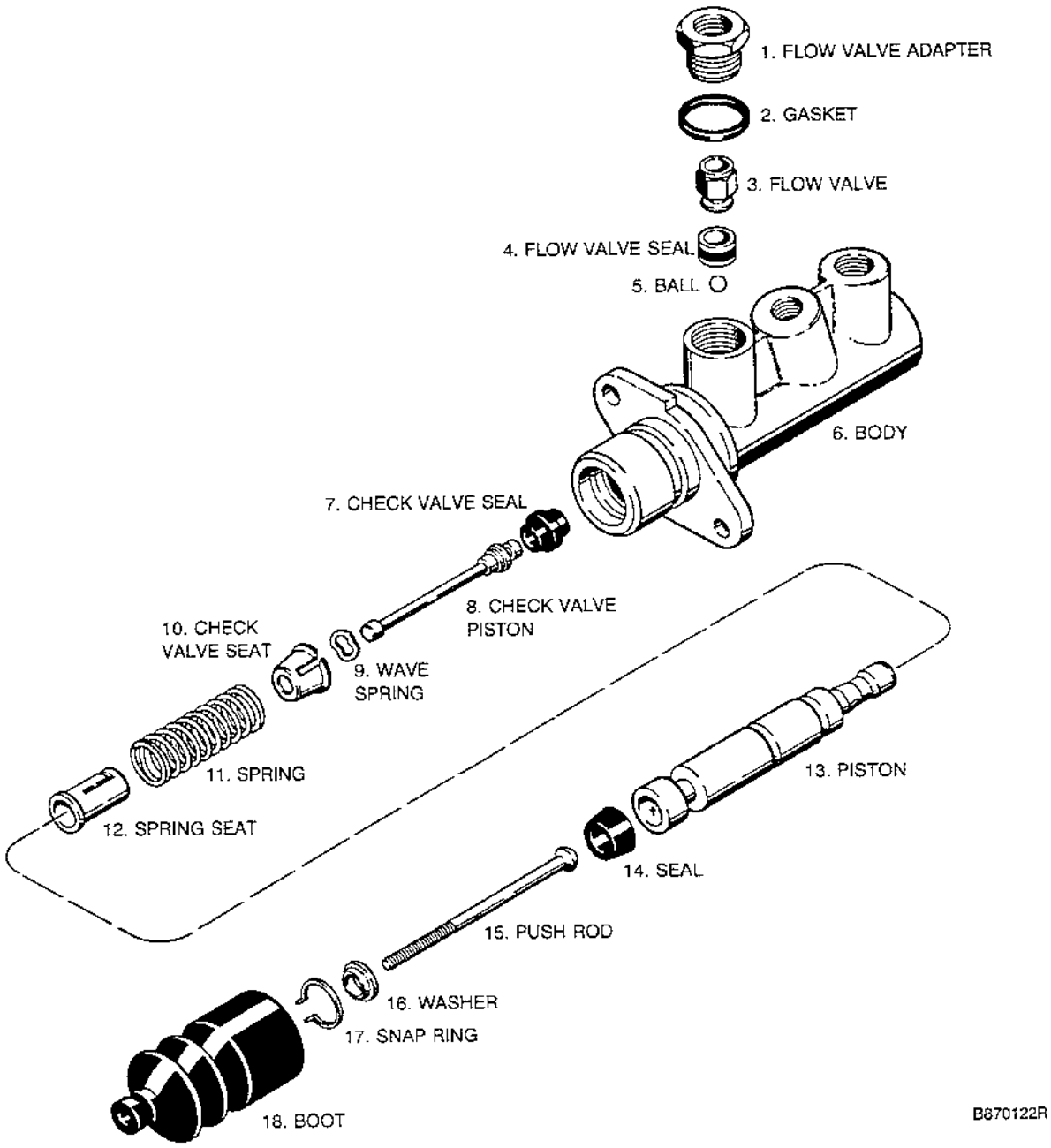


Install the two guide studs into the transaxle housing.

STEP 23

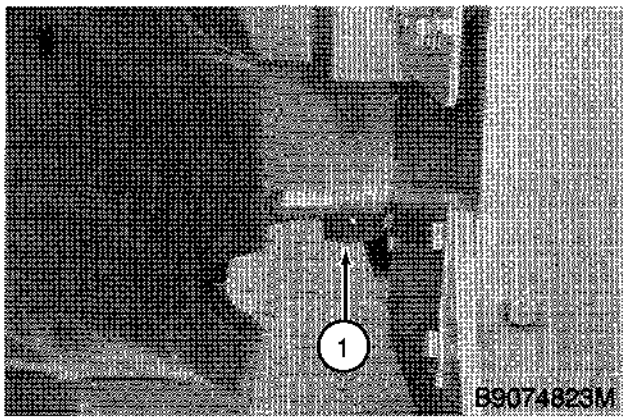


Make sure the joint faces are clean. Apply sealant B500642 (Loctite 324) to the face on the transaxle.



Master Cylinder

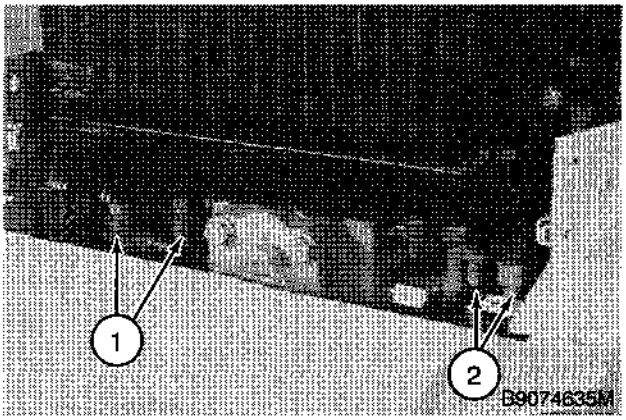
STEP 17



The hydraulic reservoir holds approximately 25 U.S. gallons (95 litres) of oil. Remove the drain plug (1) and drain the oil from the hydraulic reservoir.

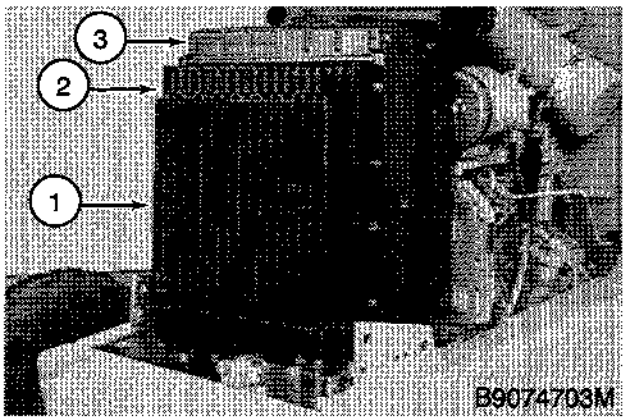
NOTE: *During installation make sure the hydraulic reservoir is filled with oil. See Section 1002 for specifications.*

STEP 18



Disconnect the two hoses (1) from the RH side of the oil cooler. Put identification tags on the hoses (1). Disconnect the two tubes (2) from the LH side of the oil cooler. Install caps on the fittings and plugs in the hoses and tubes.

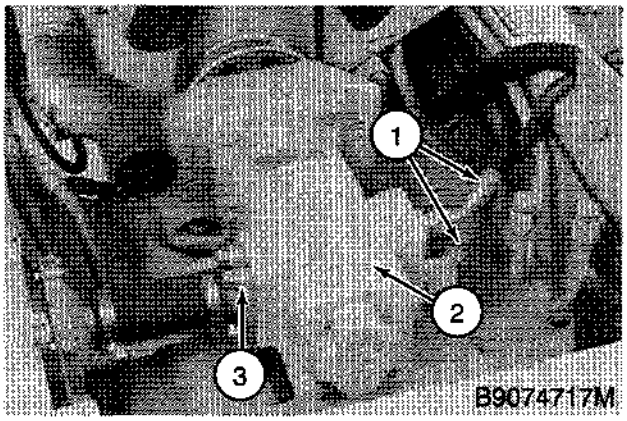
STEP 19



Remove the bolts, lock washers, and flat washers which fasten the condenser (1) to the oil cooler (2) and radiator (3). Move the condenser (1) to the LH side out of the way. Have another person help you remove the oil cooler (2) and radiator (3). The weight of the oil cooler (2) and radiator (3) is approximately 50 pounds (23 kg).

Remove the fan shroud (4).

STEP 20



Disconnect the two hoses (1) from the LH side of the hydraulic pump (2). Remove the bolts and lock washers that fasten the flange (3) on the RH side of the hydraulic pump (2).

Remove the bolts, lock washers, and hardened washers (The hardened washers are on the bottom two bolts only.) which fasten the hydraulic pump (2) to the front engine support. Remove the hydraulic pump (2).

Installation

Installation of the hydraulic pump is the reverse of removal.

NOTE: *During installation, remove and clean the suction screen for the hydraulic pump. Apply Molykote Type G to the splines of the hydraulic pump.*

TROUBLESHOOTING PROCEDURE FOR PROBLEM IN ALL CIRCUITS

Check the machine for leaks and repair as required.

↓

Check the level of the oil in the reservoir. Add oil as required. Is there still a problem? — NO → Troubleshooting complete.

↓ YES

Check setting of main relief valve in loader control valve according to instructions in this section. Is the setting good?

NOTE: *The main relief valve controls the pressure in the loader and backhoe circuits.* — NO → Adjust the main relief valve according to instructions in this section.

↓ YES

Replace the filter. Is there still a problem? — NO → Troubleshooting complete.

↓ YES

Do the stall test according to instructions in Section 2002. Is there still a problem? — NO → Troubleshooting complete.

↓ YES

Check for contaminated oil according to instructions in Section 8003. Is the oil contaminated?.

↓ NO

↓ YES

Clean the hydraulic system according to instructions in Section 8003. Is there still a problem? — NO → Troubleshooting complete.

↓ YES

Do the flowmeter test according to instructions in this section. → Troubleshooting complete.

GENERAL INFORMATION

Contamination in the hydraulic system is a major cause of the malfunction of hydraulic components. Contamination is any foreign material in the hydraulic oil. Contamination can enter the hydraulic system in several ways.

1. When you drain the oil or disconnect any line.

2. When you disassemble a component.

3. From normal wear of the hydraulic components.

4. From damaged or worn seals.

5. From a damaged component in the hydraulic system.

All hydraulic systems operate with some contamination. The design of the components in this hydraulic system permits efficient operation with a small amount of contamination. An increase in this amount of contamination will cause problems in the hydraulic system. The following list includes some of these problems.

1. Cylinder rod seals leak.

2. Control valve spools do not return to NEUTRAL.

3. Movement of control valve spools is difficult.

4. Hydraulic oil becomes too hot.

5. Pump gears, housing, and other parts wear rapidly.

6. Relief valves or check valves held open by dirt.

7. Quick failure of components that have been repaired.

8. Cycle times are slow; machine does not have enough power.

If your machine has any of these problems, check the hydraulic oil for contamination. See Types of Contamination below. If you find contamination, use the Portable Filter to clean the hydraulic system.

TYPES OF CONTAMINATION

There are two types of contamination, microscopic and visible.

1. Microscopic contamination occurs when very fine particles of foreign material are in suspension in the hydraulic oil. These particles are too small to see or feel. Microscopic contamination can be found by identification of the following problems or by testing in a laboratory. Examples of the problems:

   a. Cylinder rod seals leak.

   b. Control valve spools do not return to NEUTRAL.

   c. The hydraulic system has a high operating temperature.

2. Visible contamination is foreign material that can be found by sight, touch, or odor. Visible contamination can cause a sudden failure of a component. Examples of visible contamination.

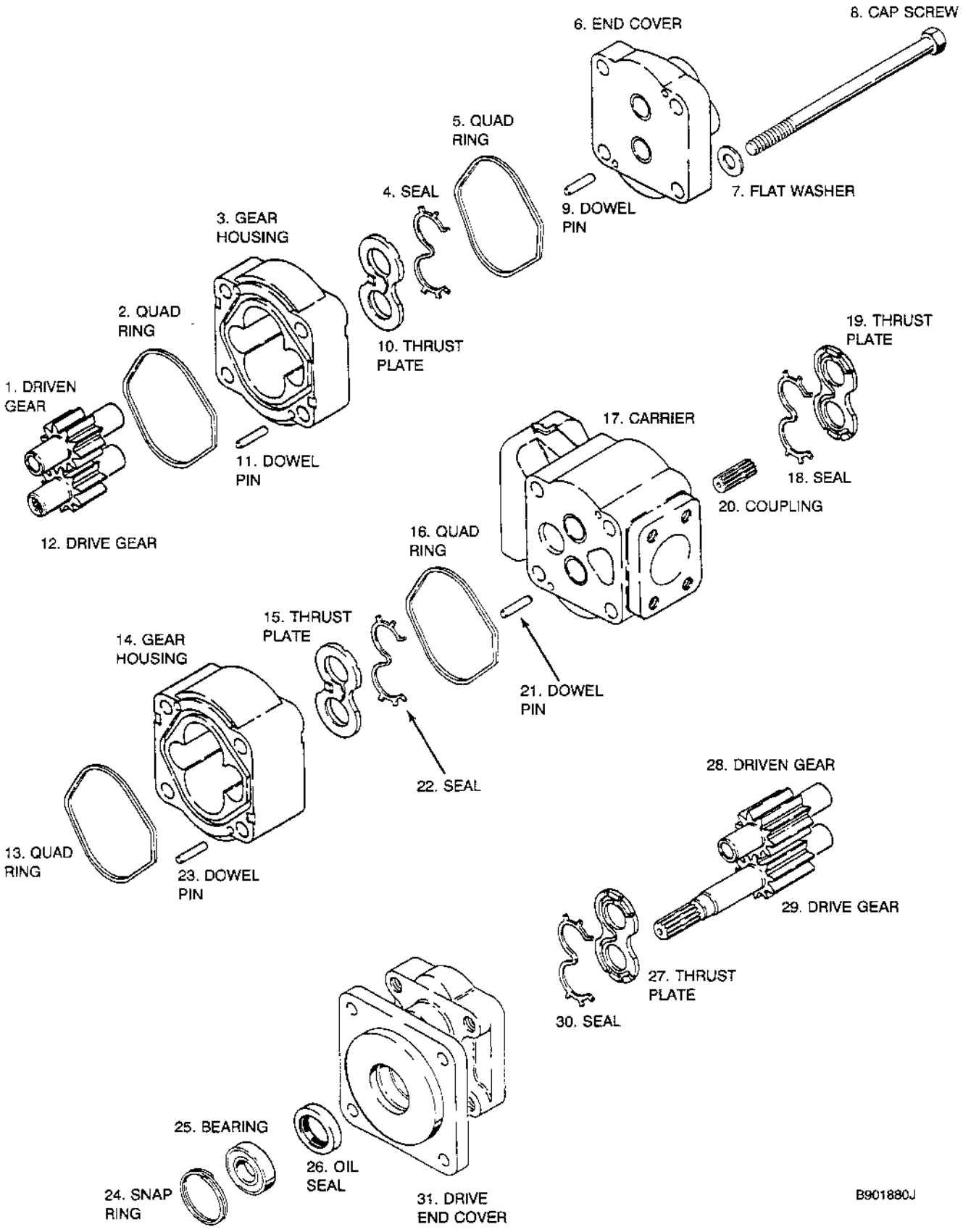
   a. Particles of metal or dirt in the oil.

   b. Air in the oil.

   c. The oil is dark and thick.

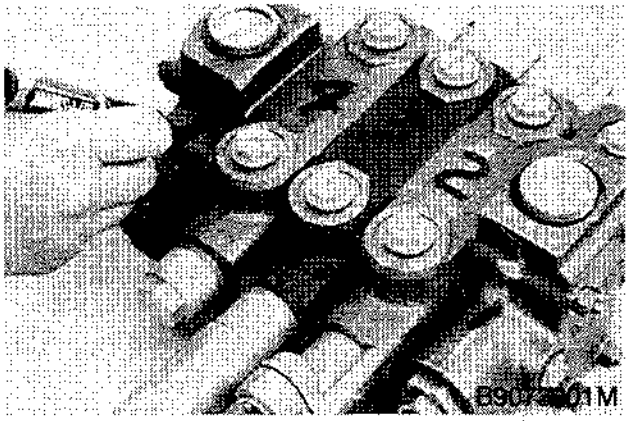
   d. The oil has the odor of burned oil.

   e. Water in the oil. See page 8003-6.


8. CAP SCREW
6. END COVER
5. QUAD RING
4. SEAL
3. GEAR HOUSING
9. DOWEL PIN
7. FLAT WASHER
2. QUAD RING
10. THRUST PLATE
19. THRUST PLATE
1. DRIVEN GEAR
17. CARRIER
11. DOWEL PIN
18. SEAL
20. COUPLING
12. DRIVE GEAR
16. QUAD RING
15. THRUST PLATE
14. GEAR HOUSING
21. DOWEL PIN
22. SEAL
28. DRIVEN GEAR
13. QUAD RING
23. DOWEL PIN
29. DRIVE GEAR
27. THRUST PLATE
30. SEAL
25. BEARING
26. OIL SEAL
24. SNAP RING
31. DRIVE END COVER
B901880J

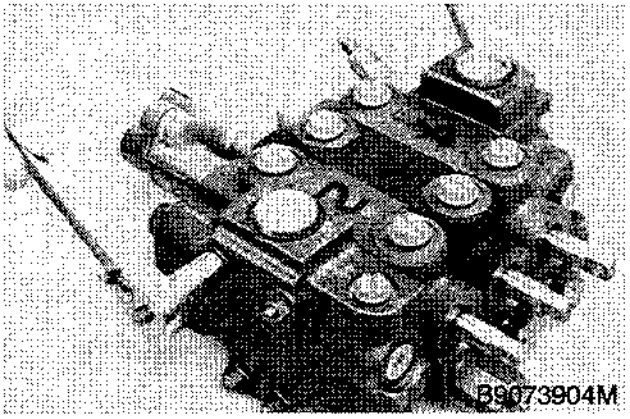
SEPARATING THE VALVE SECTIONS

STEP 1



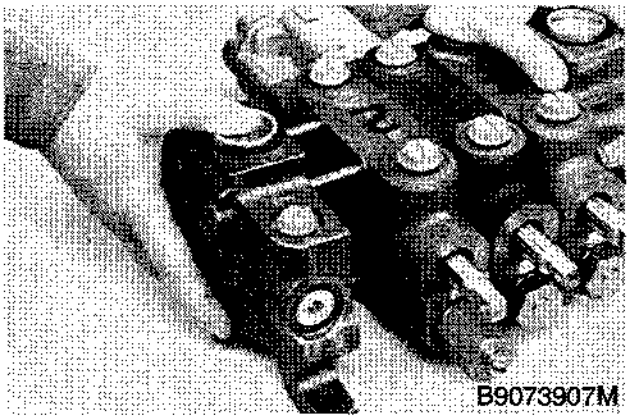
Clean the outside of the loader control valve. Write a number on each section of the loader control valve.

STEP 2



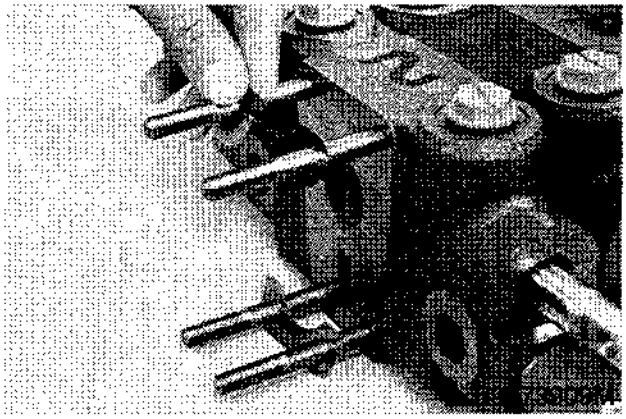
Loosen and remove the nuts that fasten the sections together.

STEP 3



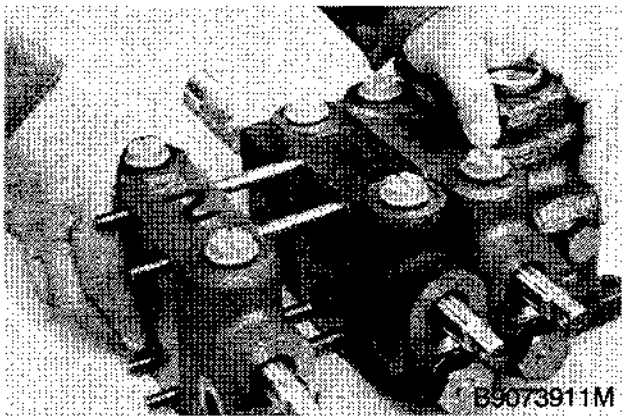
Remove the inlet section

STEP 4



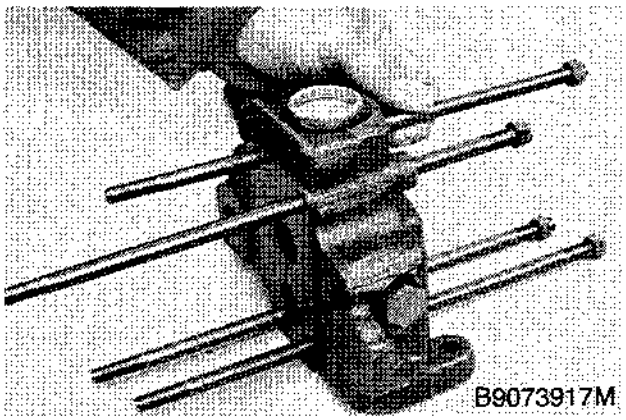
Remove the shims.

STEP 5



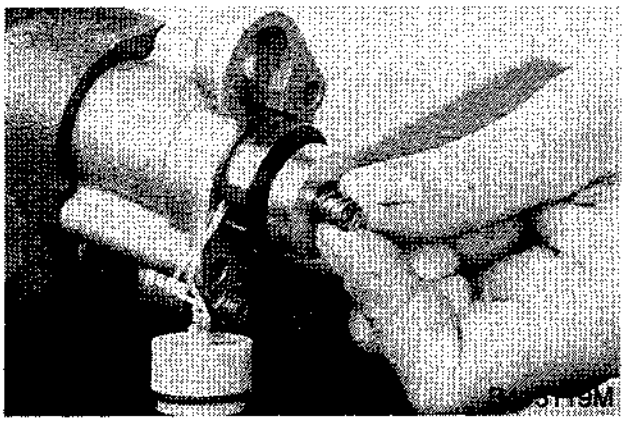
Remove the remainder of the sections and shims.

STEP 6



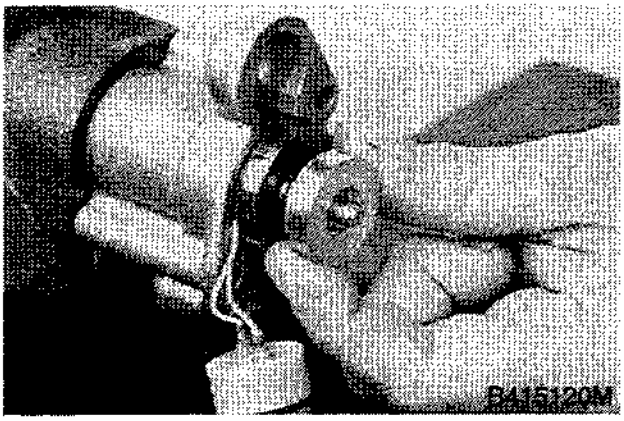
Remove the studs from the outlet section.

STEP 45



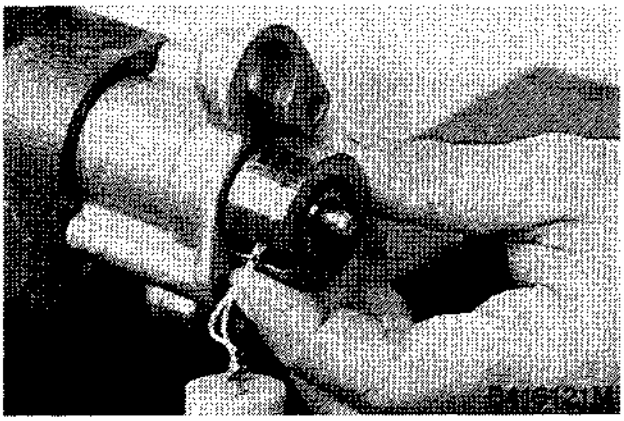
Remove the spring.

STEP 46



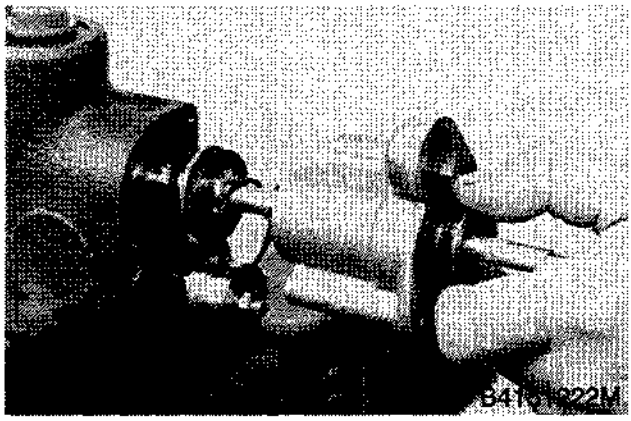
Remove the detent washer.

STEP 47



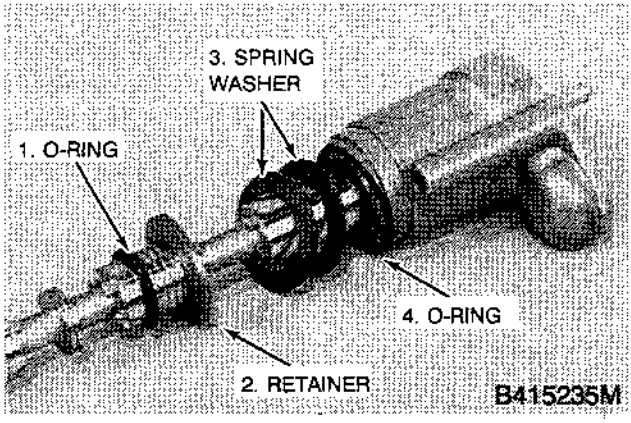
Remove the coil and terminal.

STEP 48



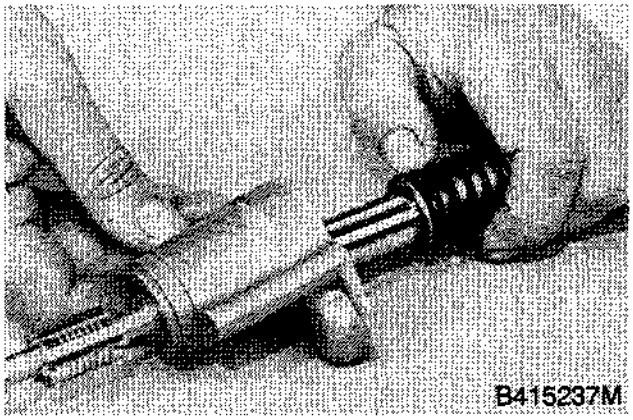
Pull the spool from the body.

STEP 49



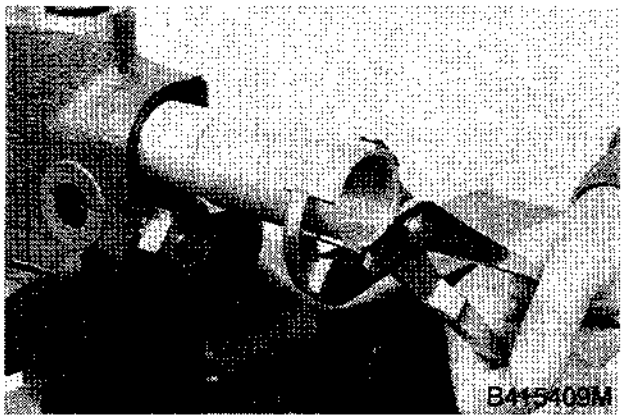
Remove the O-ring, retainer, spring washers, and other O-ring from the spool.

STEP 50



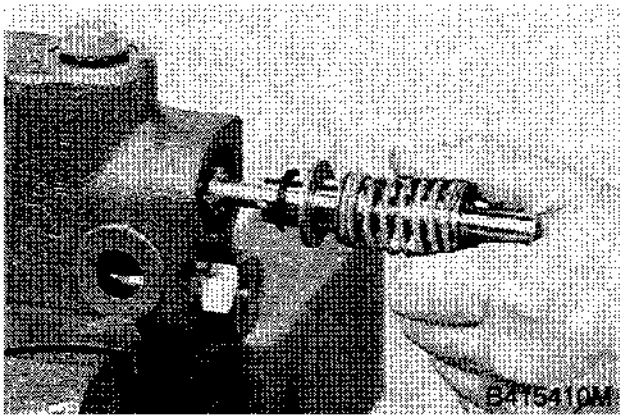
Remove the detent housing.

STEP 97



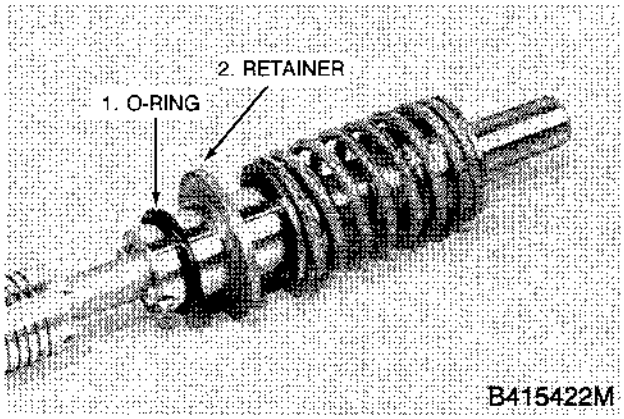
Loosen and remove the detent housing.

STEP 98



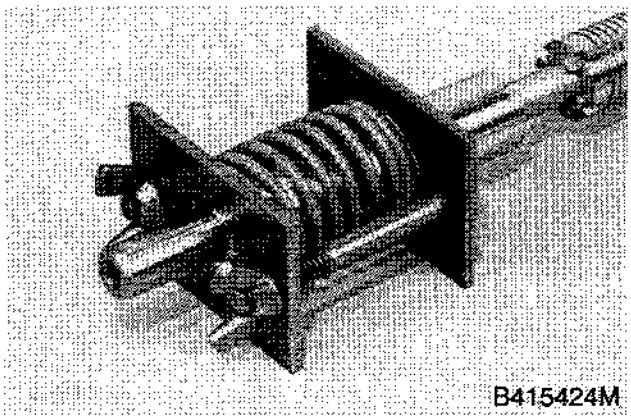
Pull the spool from the body.

STEP 99



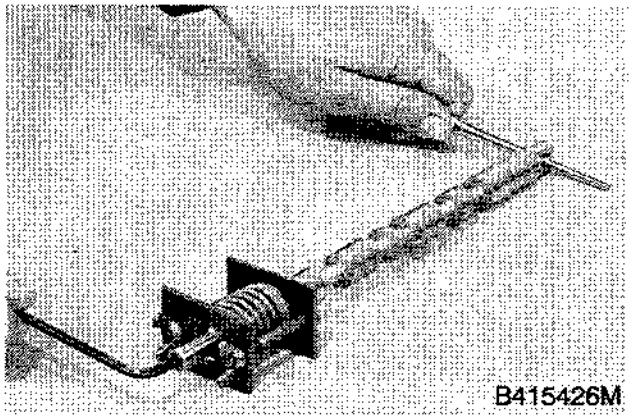
Remove the O-ring and retainer from the spool.

STEP 100



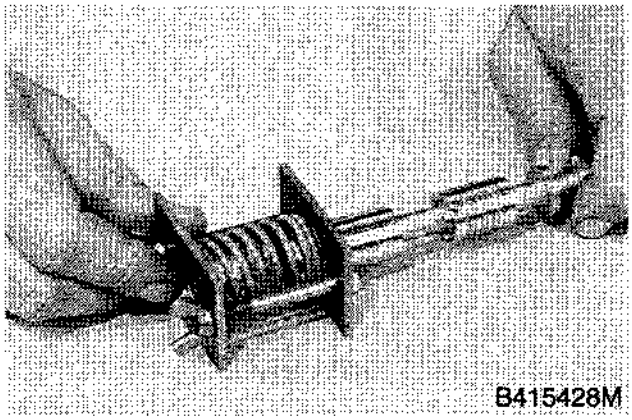
See page 4 for the spring compressing plates. Fasten the spring compressing plates to compress the centering spring.

STEP 101



Loosen and remove the stud.

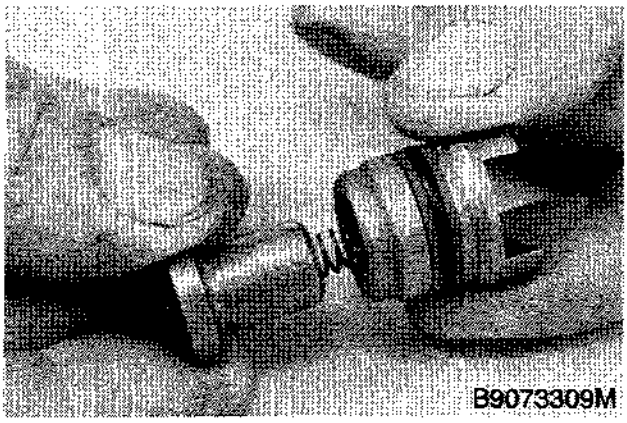
STEP 102



Remove the centering spring and spring seats from the spool.

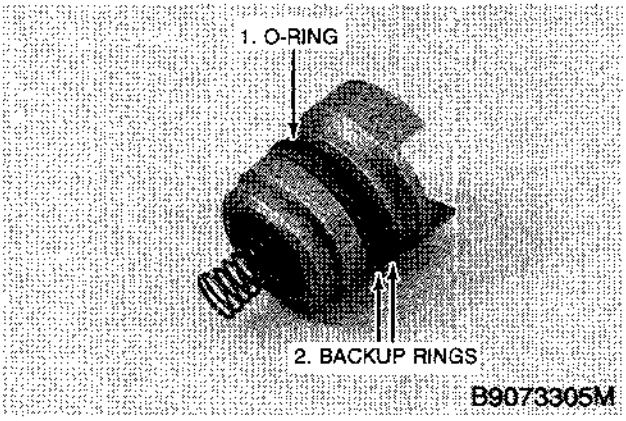
Inspection

STEP 146



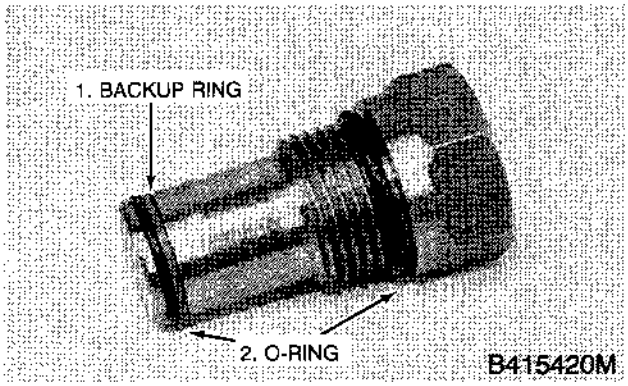
Inspect the load check poppet, spring, and load check plug. Use new parts as necessary.

STEP 147



Replace the O-ring and backup rings on the load check plug.

STEP 148



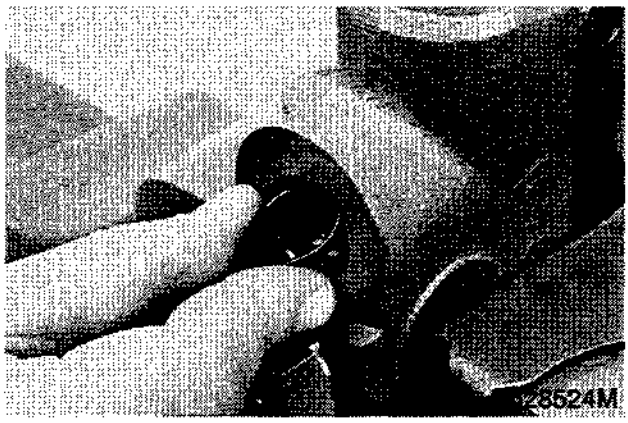
Replace the O-rings and backup ring on the plug.

STEP 149

Inspect the spool bore for wear and damage. If the spool or spool bore is damaged, use a complete new clam section.

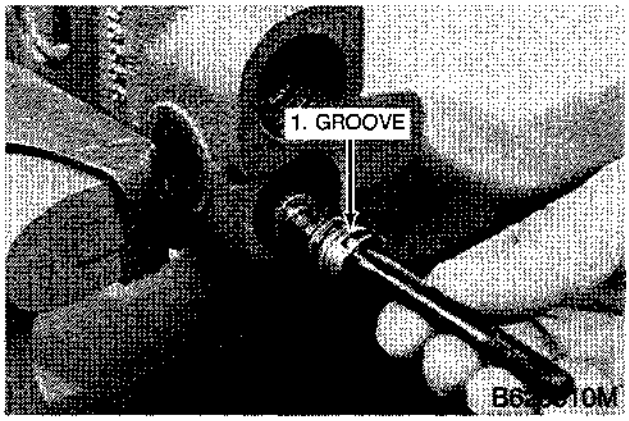
Assembly

STEP 150



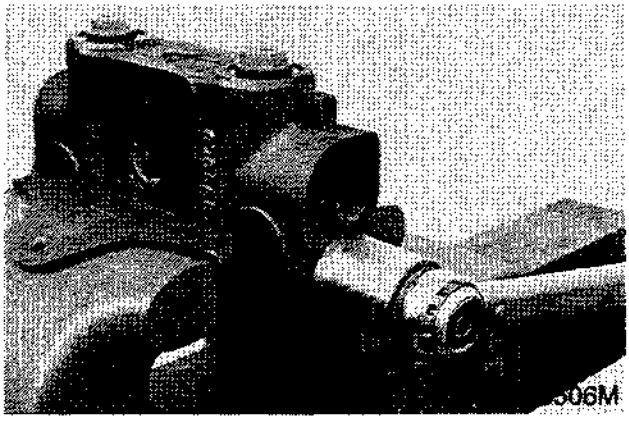
Install a new O-ring in the groove of the spool bore.

STEP 151

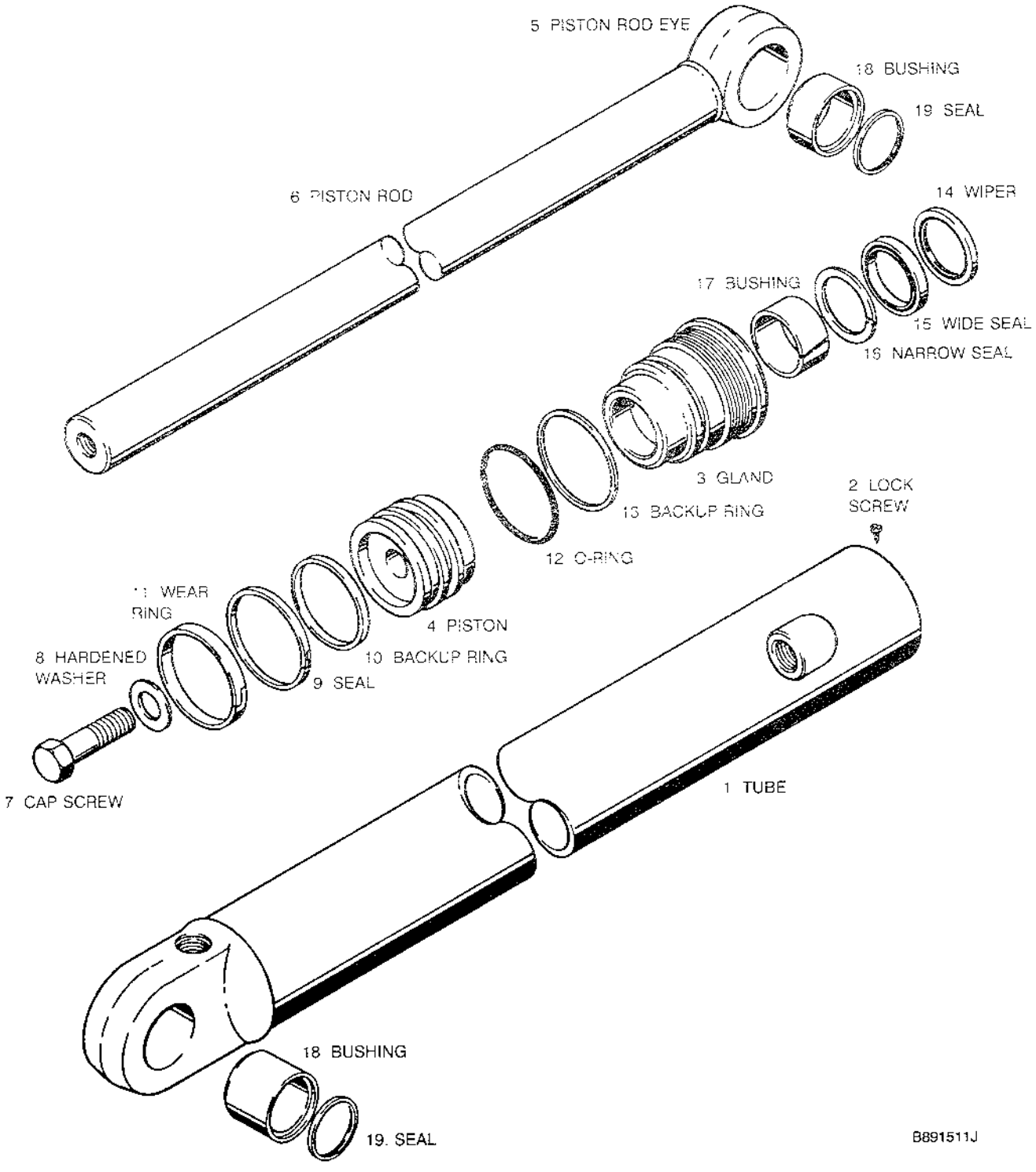


Lubricate the O-ring and backup rings on the load check plug. Use the tool to install the load check plug, spring, and poppet. The groove in the load check plug must be toward the spool bore.

STEP 152



Lubricate the O-rings and backup ring on the plug. Install the plug. Tighten the plug to 65 to 85 pound-feet (88 to 155 Nm).



Typical Cylinder

SPECIAL TOOLS

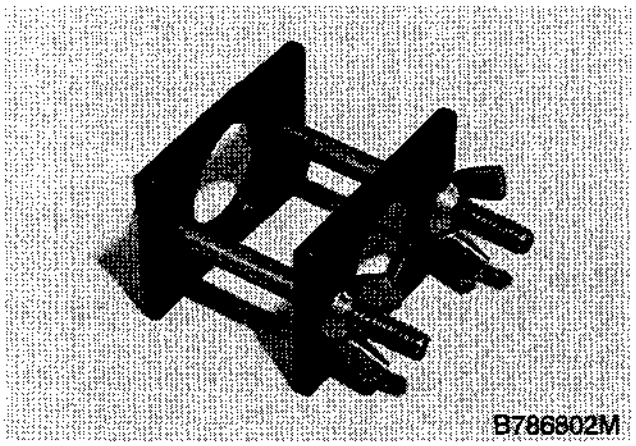
Order special tools from one of the following addresses:

In the U.S.A. and Canada

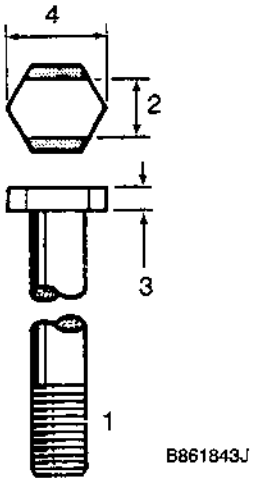
Service Tools
P.O. Box 314
Owatonna, Minnesota 55060

In Europe

VL Churchill Ltd.
P.O. Box 3, Daventry
Northants, NN11 4NF
England

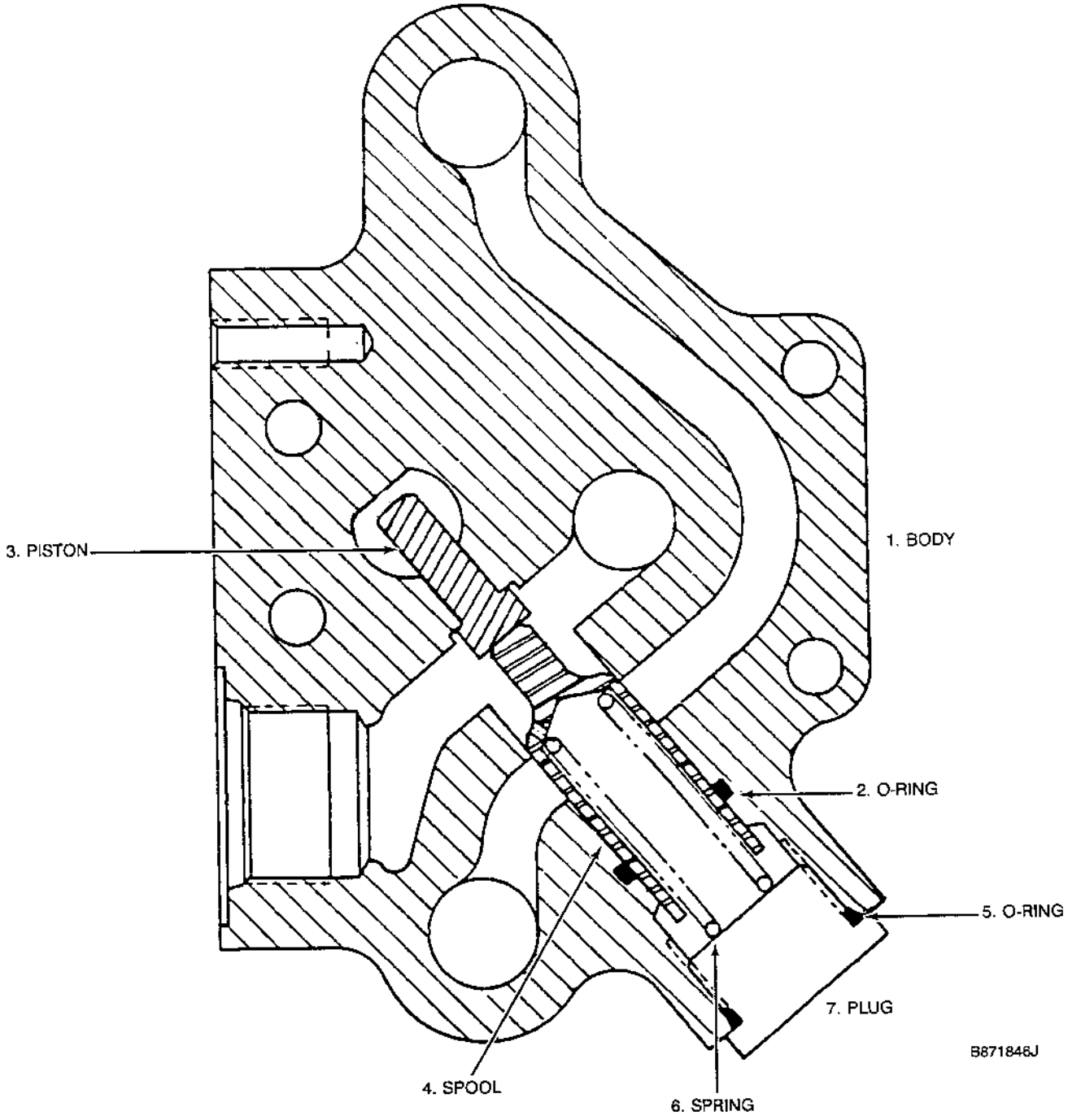


The spring compressing plate is used to compress the centering springs for removal and installation. The part number of the tool is CAS-147-2. This tool is first used on page 16.

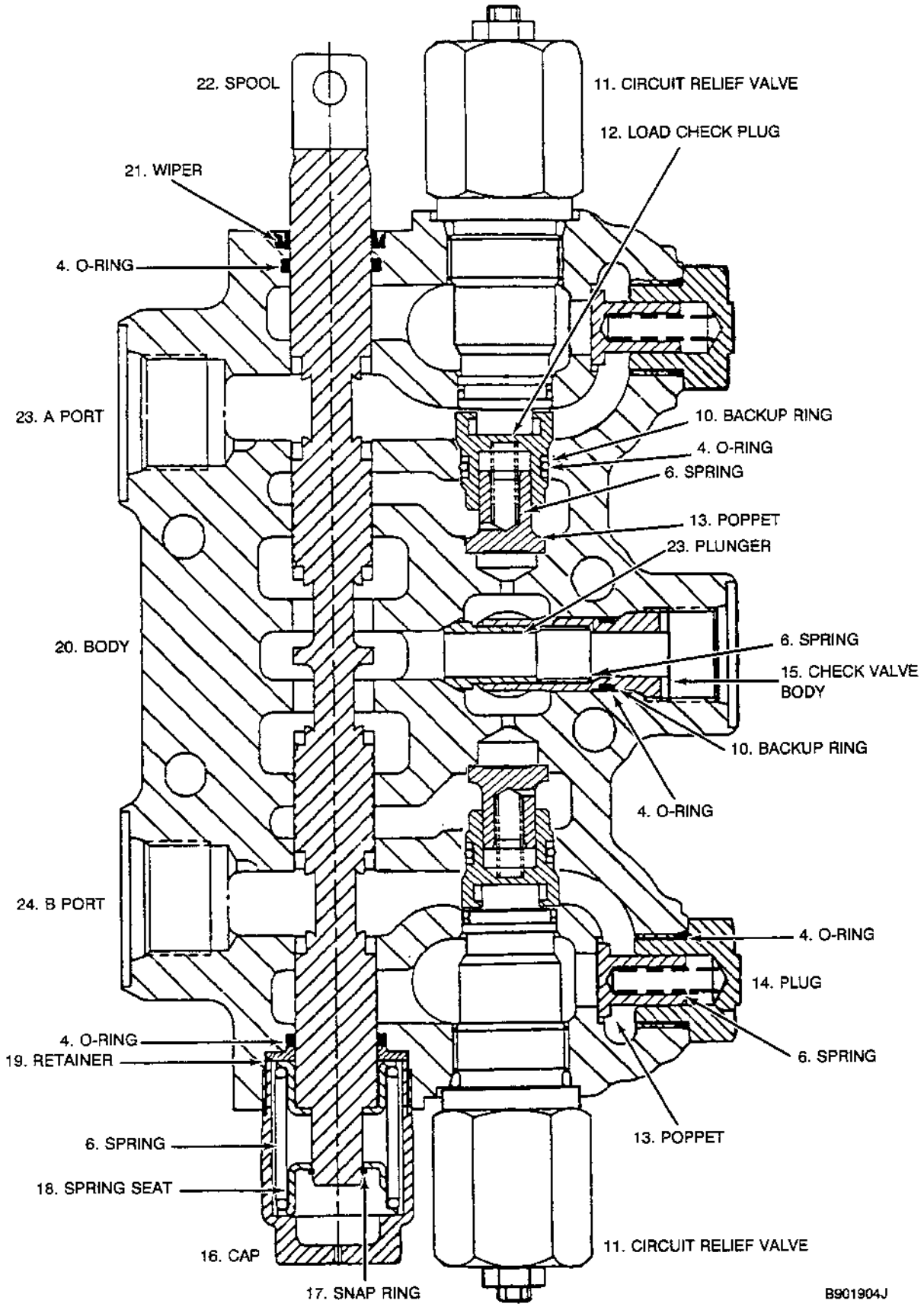


1. *3/8-16 NC x 3 Inches (76 mm) Or Longer Hex Bolt*
2. *Grind Two Sides Evenly To 15/32 Inch (11.9 mm)*
3. *Grind To 1/8 Inch (3.2 mm)*
4. *5/8 Inch (10.1 mm)*

The tool above is used to remove and install the load check plugs. The tool is first used on page 17.



Outlet Section



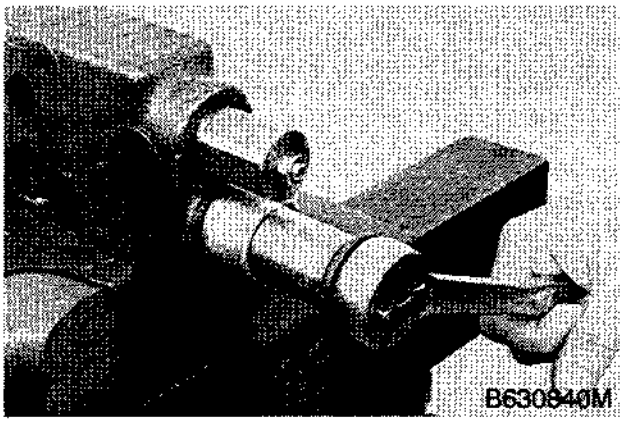
Swing Section

BUCKET, DIPPER, AND EXTENDABLE DIPPER SECTIONS

Disassembly

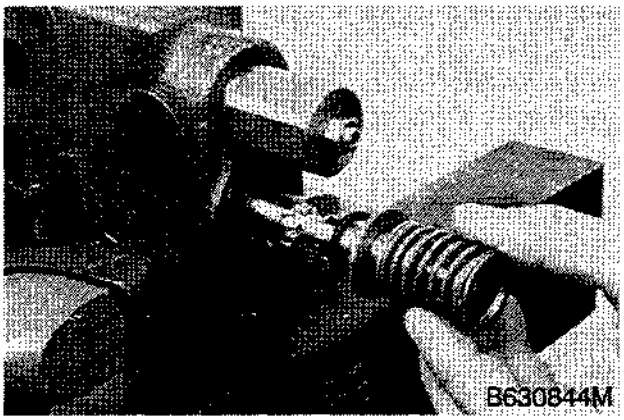
NOTE: *The bucket and dipper sections have circuit relief valves at the A port and B port. The extendable dipper section has plugs in place of the circuit relief valves. The following photographs show the dipper section.*

STEP 113



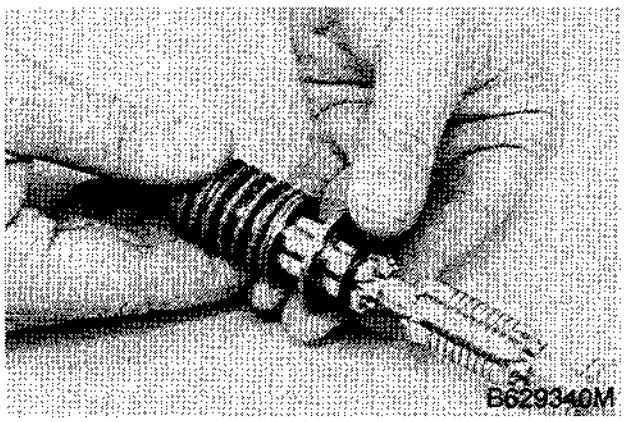
Fasten the section in the vise with soft jaws. Loosen and remove the cap.

STEP 114



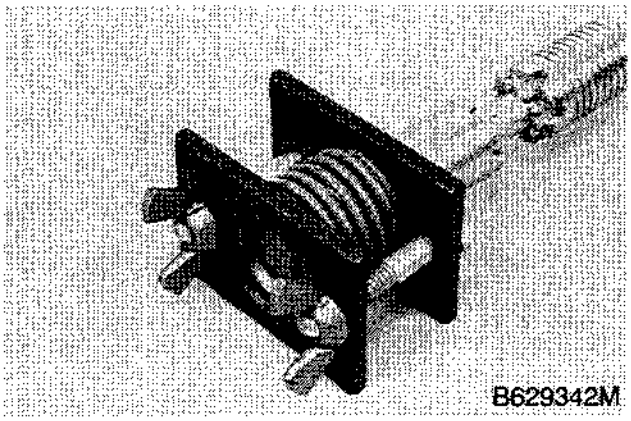
Pull the spool, retainer, and O-ring from the body.

STEP 115



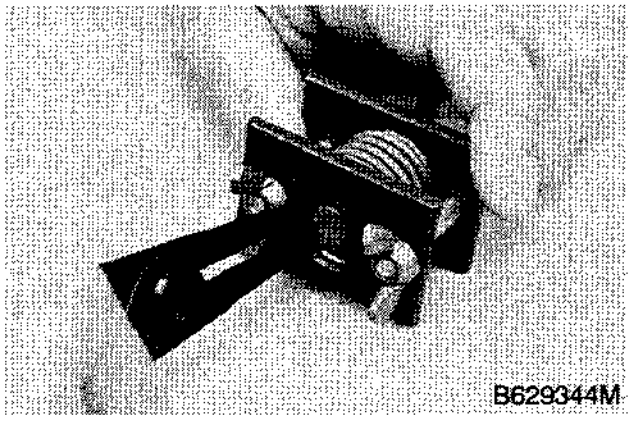
Remove the O-ring and retainer from the spool.

STEP 116



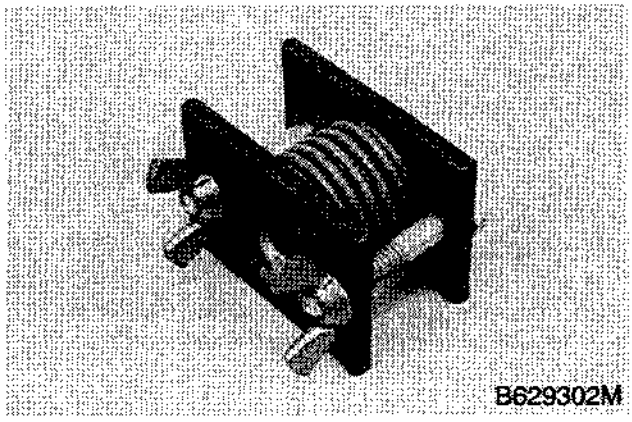
Use the spring compressing plates shown on page 4 to compress the spring.

STEP 117



Remove the snap ring from the spool.

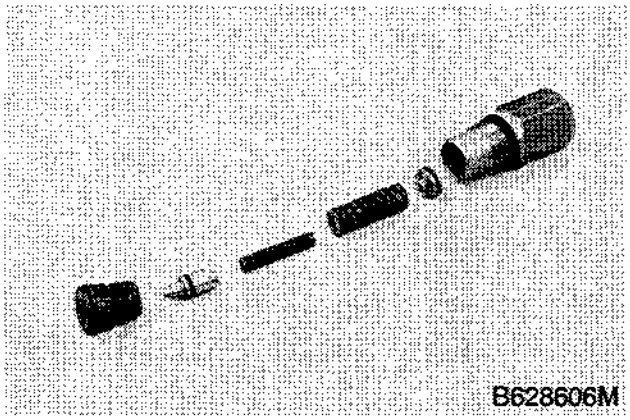
STEP 118

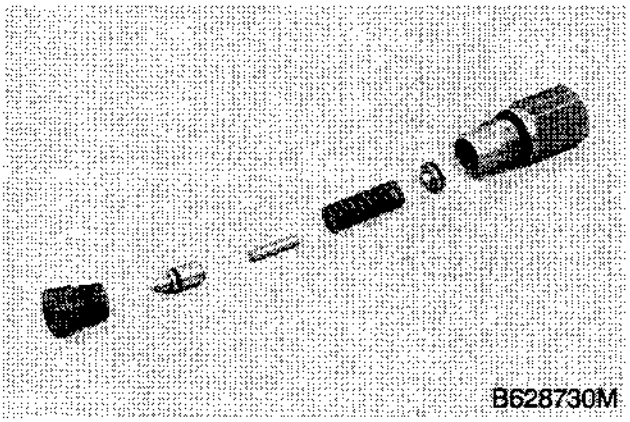


Release the spring tension and separate the spring seats and spring.

Assembly

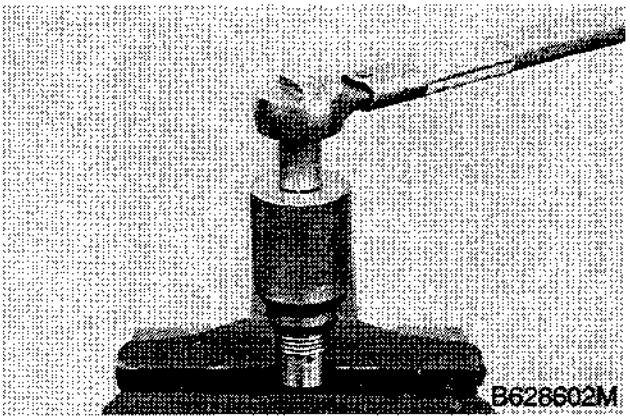
STEP 148





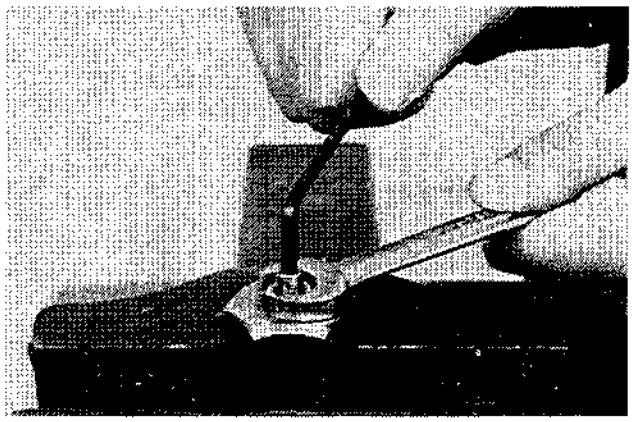
Lubricate the O-rings on the parts of the relief valve. Assemble the parts into the body.

STEP 149



Fasten the poppet seat in the vise with soft jaws. Tighten the body to 96 to 144 pound-inches (11 to 16 Nm).

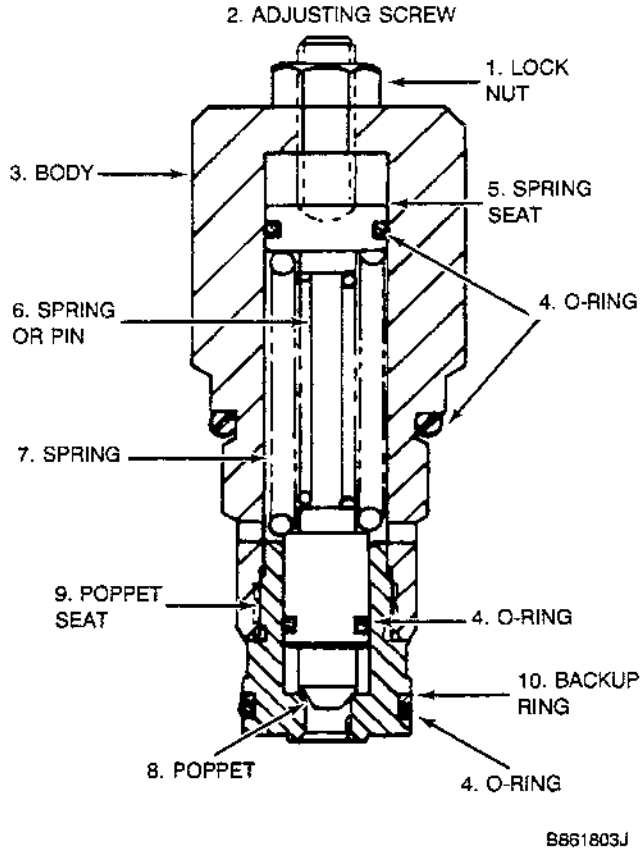
STEP 150



Install the adjusting screw and lock nut in the body.

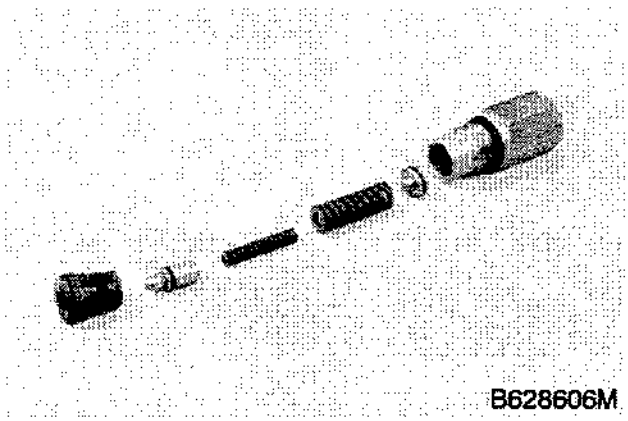
STEP 151

See the procedure in Section 8002. Check and adjust the pressure setting of the circuit relief valve before the relief valve is installed in the section.



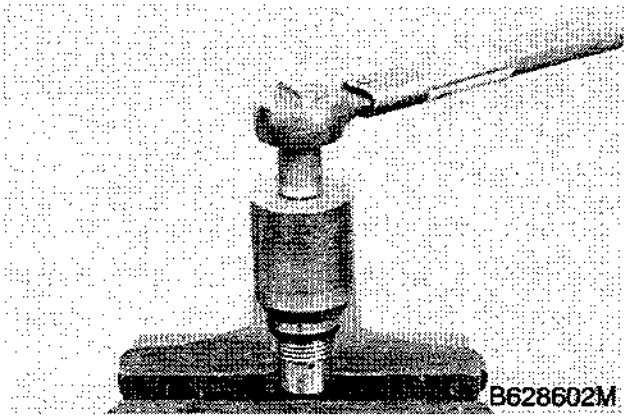
ASSEMBLY

STEP 23



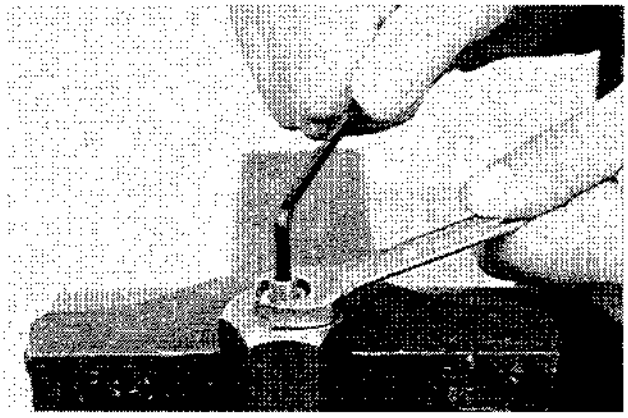
Lubricate the O-rings on the parts of the relief valve. Assemble the parts in the body.

STEP 24



Fasten the poppet seat in the vise with soft jaws. Tighten the body to 8 to 12 pound-feet (11 to 16 Nm).

STEP 25

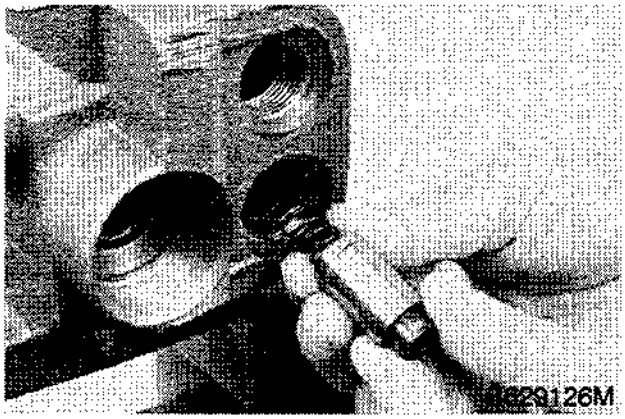


Install the adjusting screw and lock nut in the body.

STEP 26

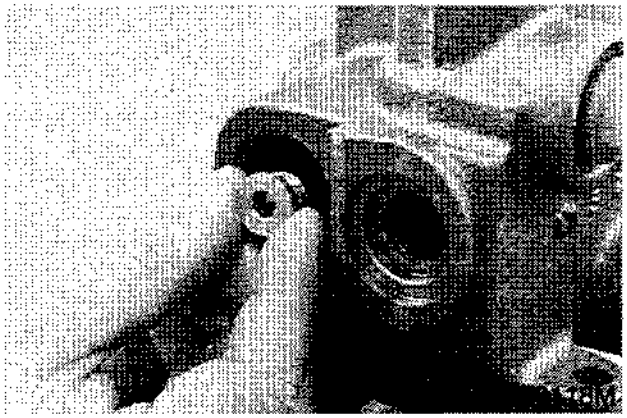
See the procedure in Section 8002. Check and adjust the pressure setting of each relief valve in a test block before the relief valve is installed in the swing sequence valve.

STEP 27



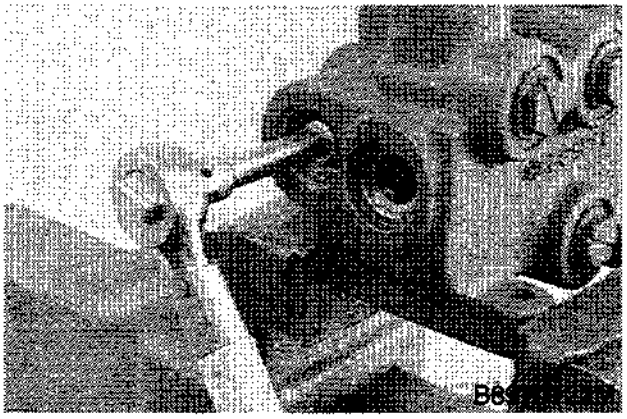
Fasten the body in the vise with soft jaws. Install the spring and plunger in the body.

STEP 28



Lubricate the O-ring on the plug with clean hydraulic oil. Install the plug in the bore for the relief valve.

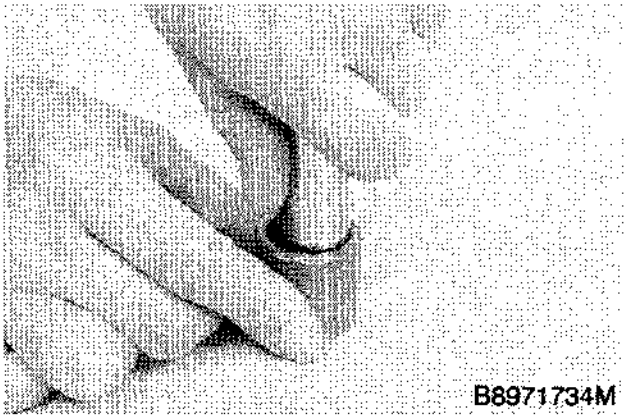
STEP 29



Tighten the plug to 15 to 20 pound-feet (20 to 27 Nm).

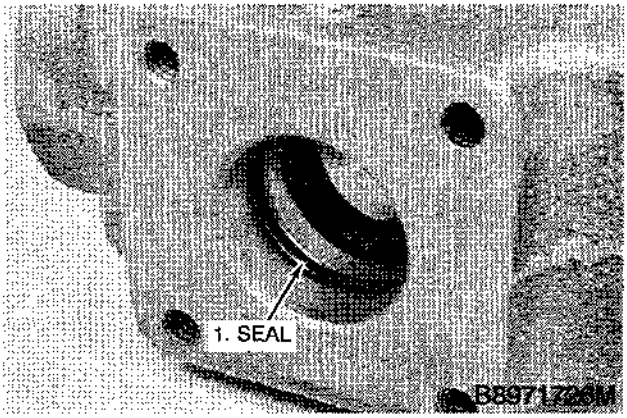
Assembly

STEP 13



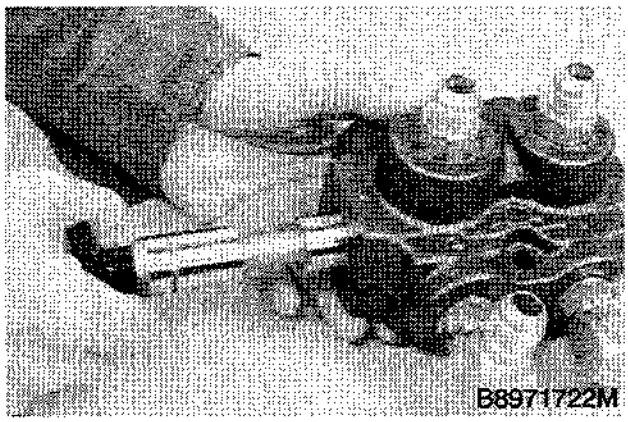
Put the spring and balls in the retainer as shown in the illustration on page 5. Push the retainer assembly into the sleeve.

STEP 14



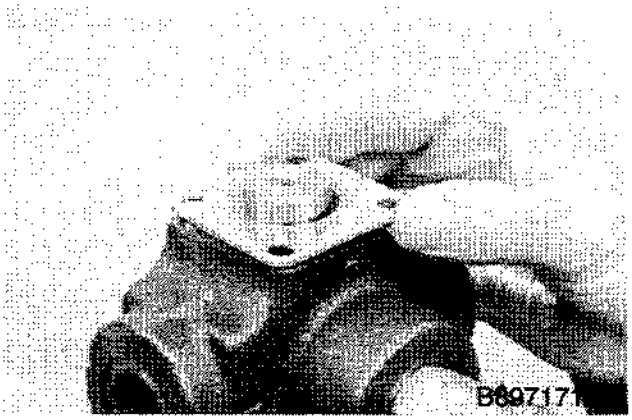
Install new seals in the bore of the body. Lubricate the seals with clean hydraulic oil.

STEP 15



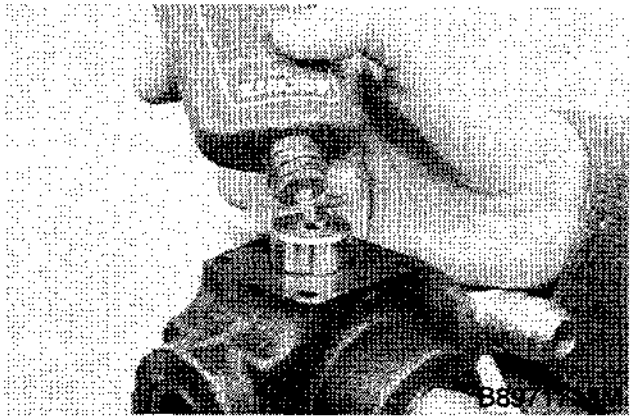
Lubricate the spool with clean hydraulic oil. Install the spool in the body.

STEP 16



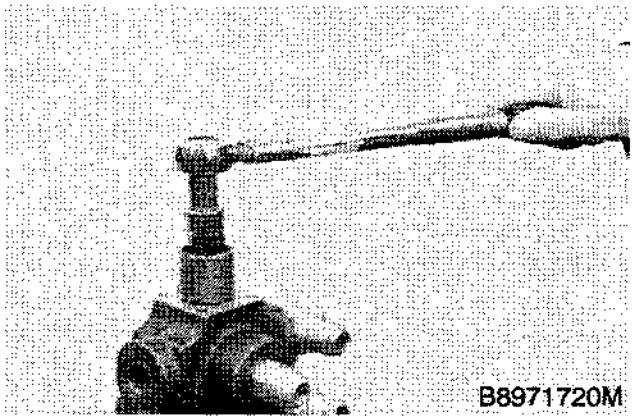
Fasten the body in the vise. Install the plate.

STEP 17

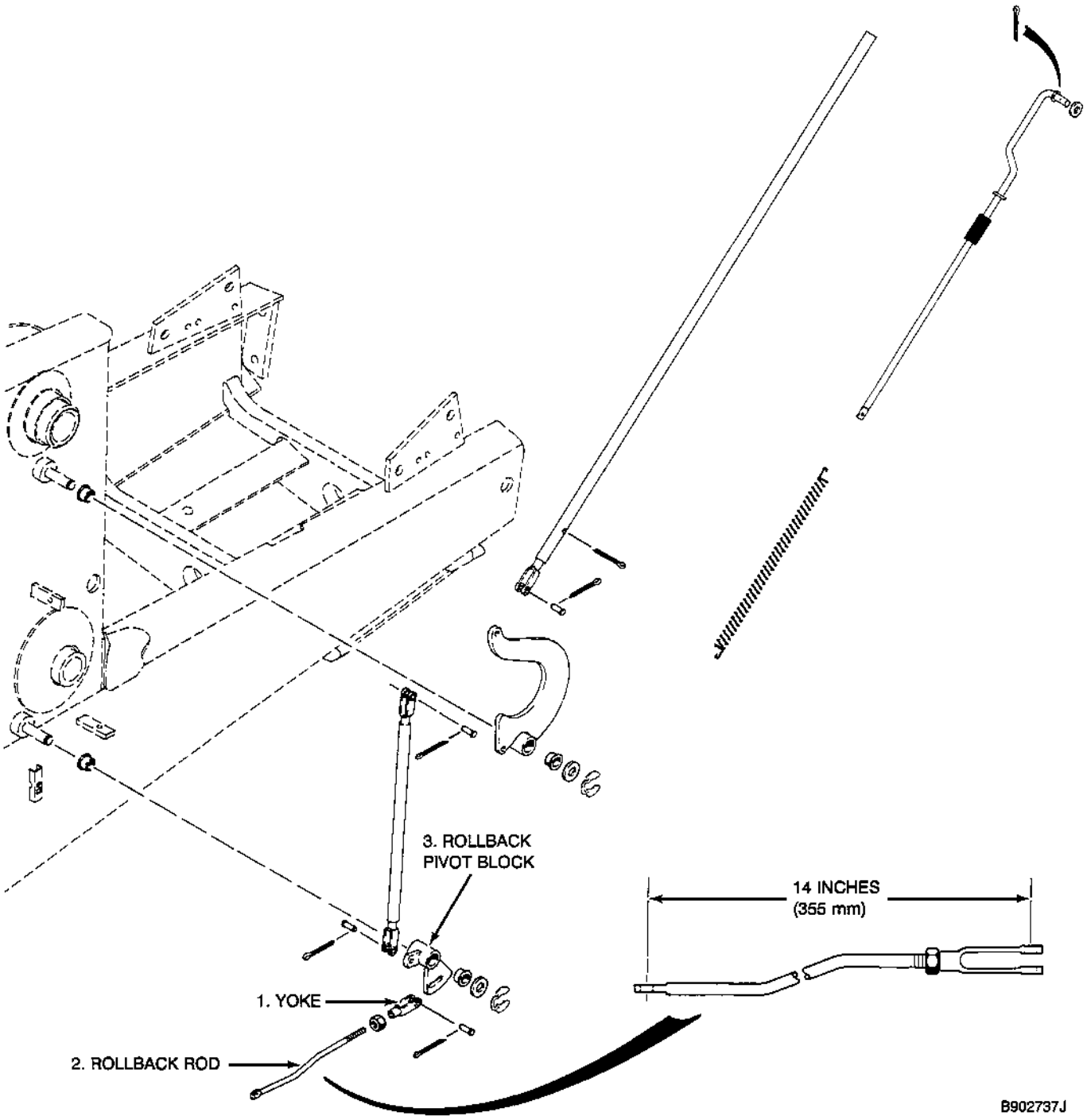


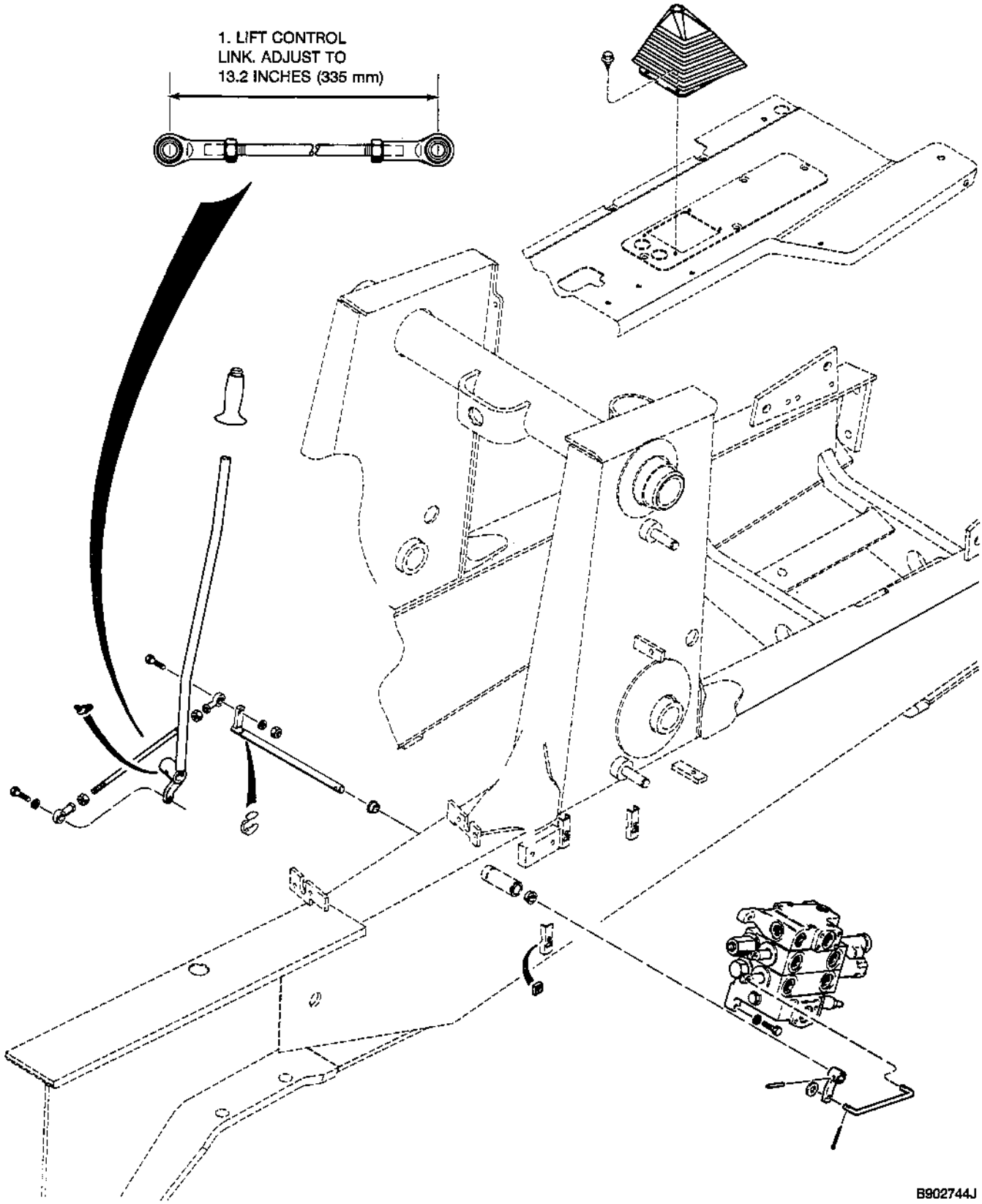
Apply 271 Loctite to the threads in the spool.

STEP 18

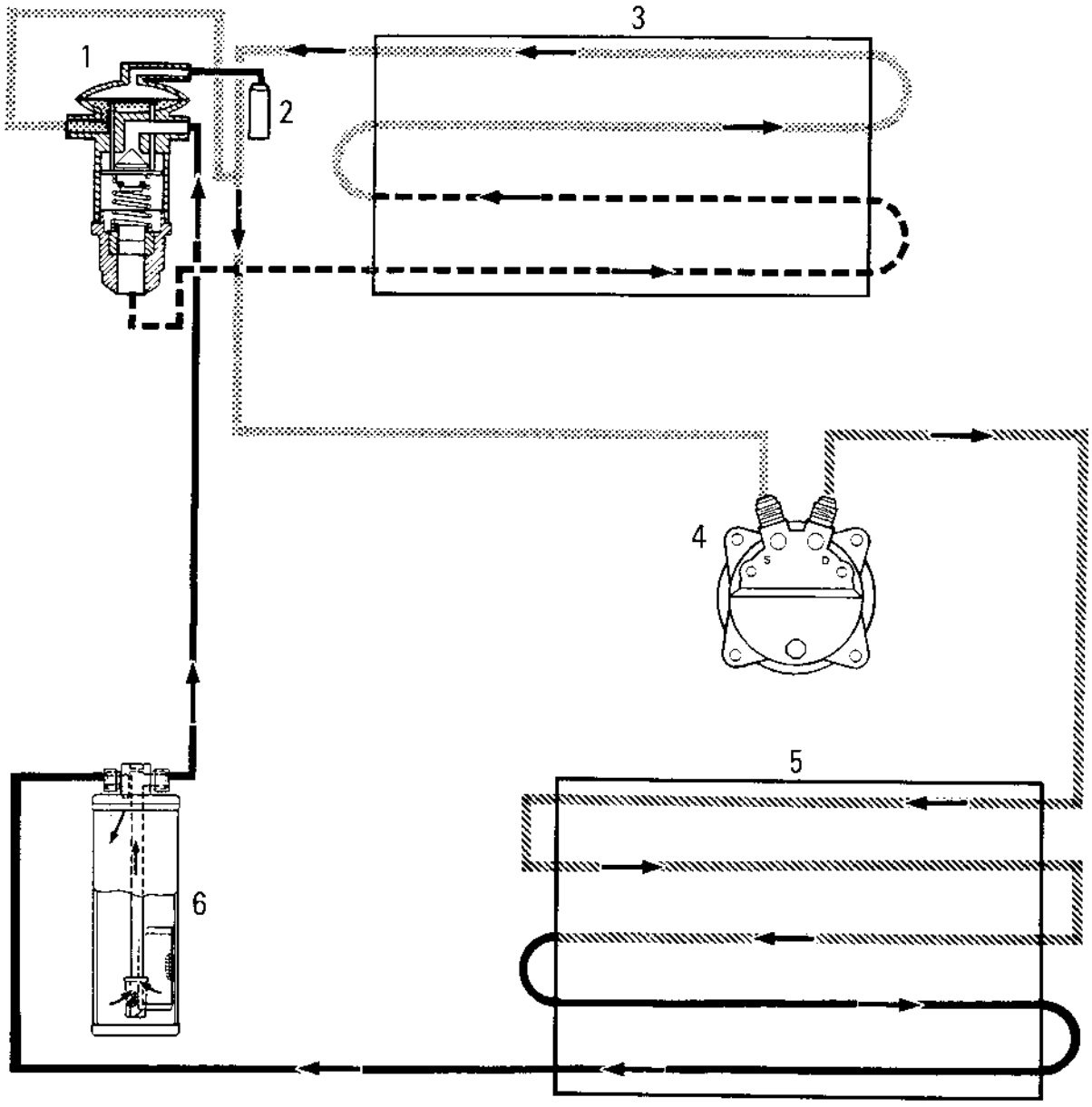


Keep the spool from turning and install and tighten the retainer assembly to 108 to 132 pound-inches (12 to 15 Nm).


3. ROLLBACK
PIVOT BLOCK
14 INCHES
(355 mm)
1. YOKE
2. ROLLBACK ROD
B902737J



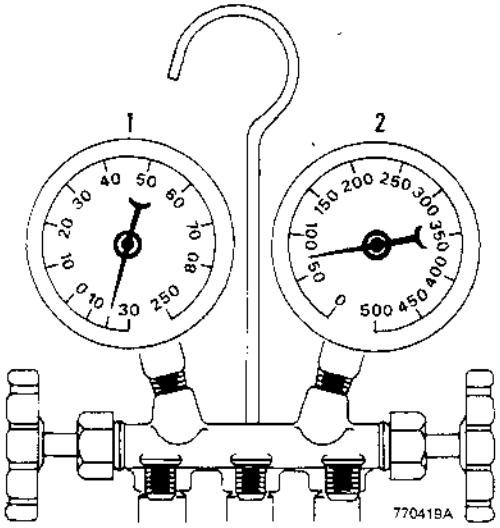
Loader Lift Control Installation



Low Pressure Gas
High Pressure Gas
Low Pressure Liquid
High Pressure Liquid

1. *Typical Expansion Valve*
2. *Temperature Sensor*
3. *Evaporator*
4. *Compressor*
5. *Condenser*
6. *Receiver-Drier*

Problem - No Cooling



1. LOW PRESSURE GAUGE READING IN A VACUUM
2. HIGH PRESSURE GAUGE READING BELOW PRESSURE-TEMPERATURE CHART

Indications of Low Refrigerant Charge

a. Sight glass clear - no bubbles

b. Discharge air from evaporator warm.

1. Test system for leaks, see page 9002-12. It can be necessary to add some refrigerant charge, see Section 9003.

2. Discharge system of refrigerant, see Section 9003.

3. Repair system leaks as necessary. See Air and Moisture Removal in Section 9003.

4. Check compressor oil level, see Section 9003.

5. Remove air and moisture from the system, see Section 9003.

6. Charge system with new refrigerant, see Section 9003.

Indications of a Problem
in Condenser Operation (Continued)

4. Remove and inspect condenser for restrictions caused by oil.
   a. Discharge system, see Section 9003.
   b. Use compressed air to remove oil from condenser.
   c. Replace the receiver-drier.
   d. Remove air and moisture from the system and charge system, see Section 9003.

Indications of Air in System
   a. Bubbles in sight glass.
   b. Discharge air from evaporator warm.

1. Discharge refrigerant from system, see Section 9003.
2. Replace receiver-drier if drying material is full of moisture and removal procedure cannot remove moisture from receiver-drier.
3. Remove air and moisture from the system, see Section 9003.
4. Charge system with new refrigerant. See Section 9003.

DISCHARGING THE AIR CONDITIONING SYSTEM

The air conditioning system must be discharged before beginning the removal of any component of the air conditioning system.

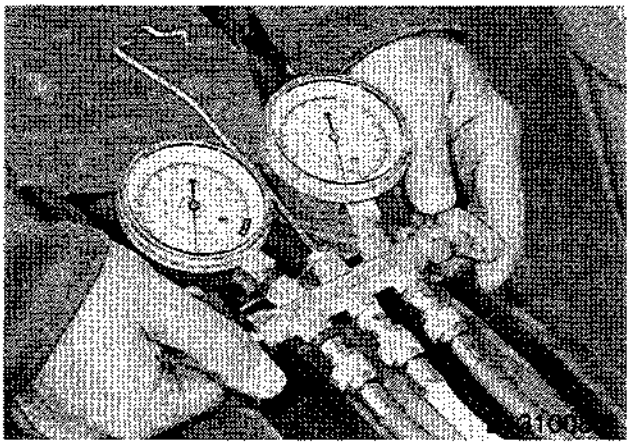
When refrigerant comes in contact with an open flame, it forms phosgene gas. Never breathe these fumes. 46-90

The refrigerant discharged from the air conditioning system does not have the oxygen you need to breathe. Make sure that the repair area has good ventilation. Breathing a large amount of refrigerant can cause personal injury. 46-89A

Always wear safety goggles when working with refrigerant. Liquid refrigerant in your eyes can cause blindness. If you get any near your eyes, rinse them immediately with mineral oil to absorb the refrigerant. Follow by flooding your eyes with a weak solution of boric acid and contact a doctor immediately . 46-86

1. Connect the hoses from the R-12 refrigerant recovery/recycling system to the gauge manifold.

2. Make sure that each valve in the gauge manifold is closed.



3. Loosen and remove the cap from the high pressure port.

4. Connect the hose from the high pressure gauge to the high pressure port.

5. Loosen and remove the cap from the low pressure port.

6. Connect the hose from the low pressure gauge to the low pressure port.

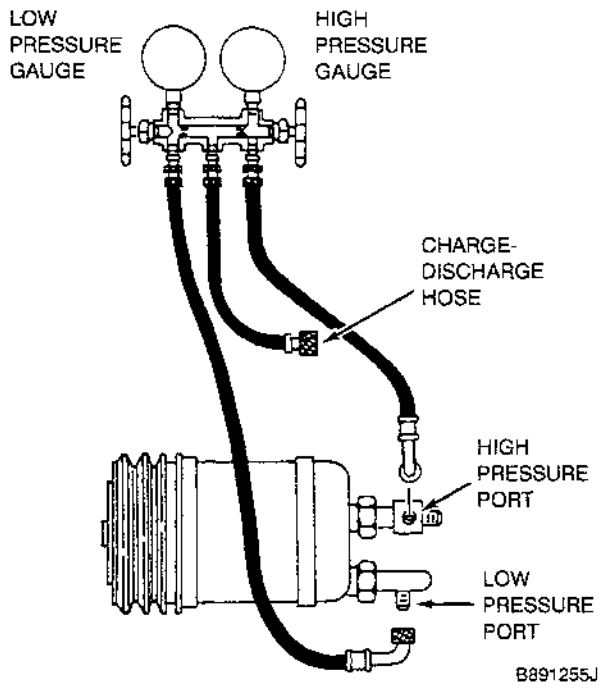
7. Connect the charge-discharge hose (yellow) to the fitting on the side of the R-12 refrigerant recovery/recycling system.

8. Use the R-12 refrigerant recovery/recycling system according th the instructions of the manufacturer.

9. Open the valve for the low pressure gauge a small amount to slowly release the refrigerant.

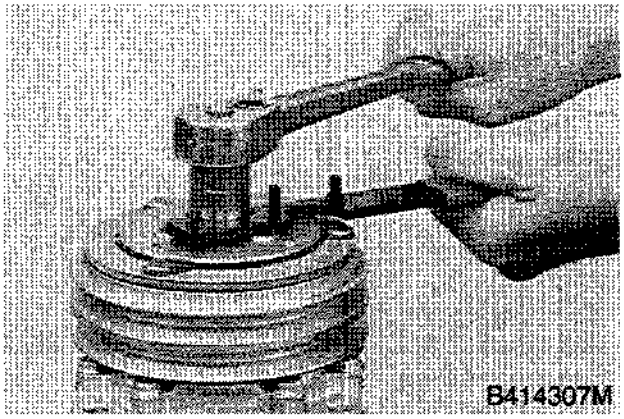
10. Open the valve for the high pressure gauge a small amount to release the refrigerant.

11. When the low pressure gauge and high pressure gauge indicate zero, the air conditioning system is discharged.



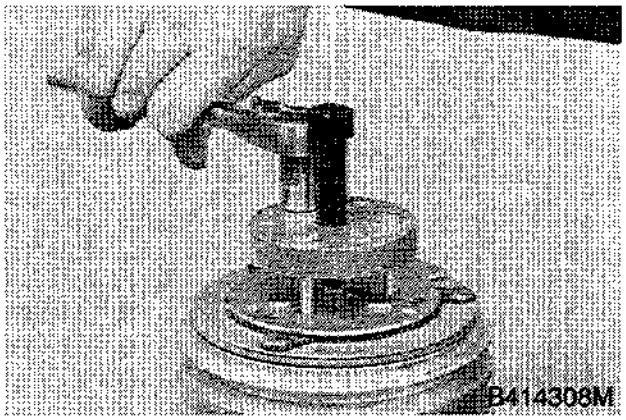
REPLACING THE SEAL

STEP 31



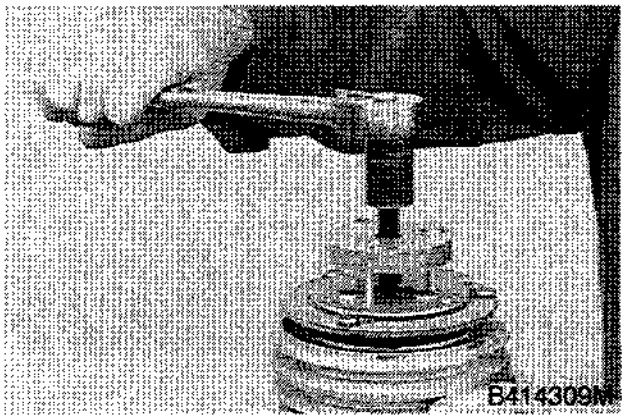
Fasten the compressor in a vise. Remove the cover from the clutch. Loosen and remove the nut that holds the clutch plate.

STEP 32



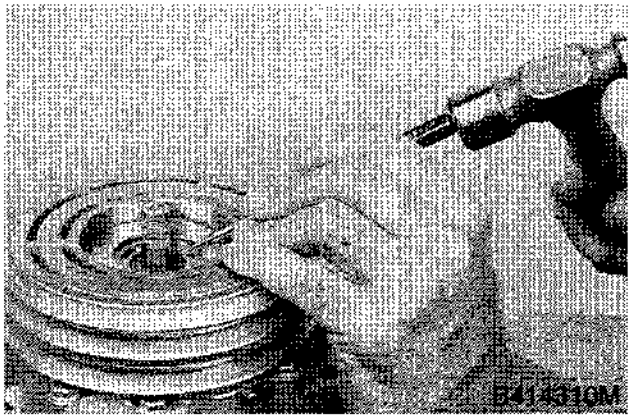
Install the puller for the clutch plate.

STEP 33



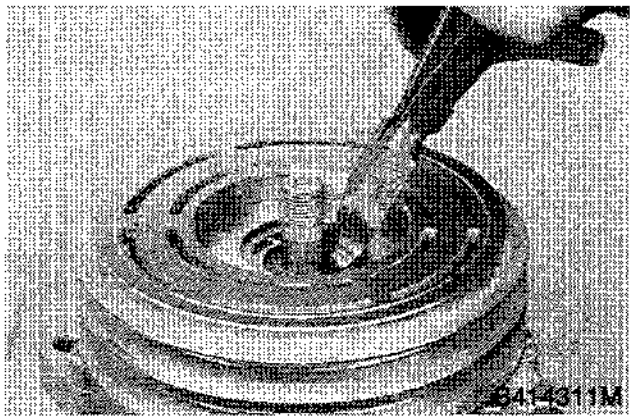
Remove the clutch plate.

STEP 34



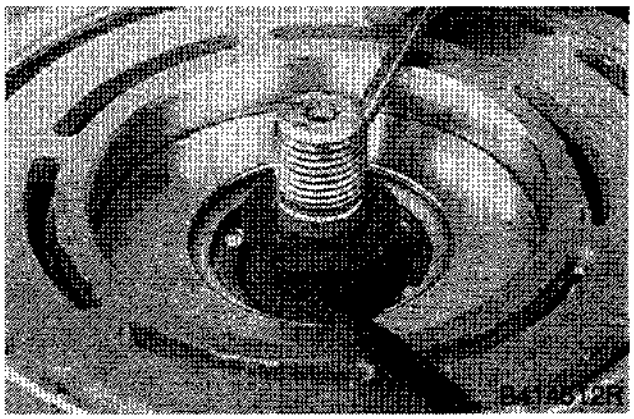
Drive the bottom of the Woodruff key into the keyway.

STEP 35



Use a pair of wire cutters to remove the Woodruff key.

STEP 36



Remove the shims for the clutch plate.

REPLACING THE EVAPORATOR

1. Discharge the air conditioning system according to instructions in this section.

2. Turn the temperature control to HOT.

3. Drain one U.S. gallon (4 litres) of coolant from the radiator.

4. Remove the knobs from the switches, air conditioning control and temperature control.

5. Loosen and remove the screws that hold the control panel.

6. Disengage the control panel from the right vertical cover.

7. Loosen and remove the screws that hold the bottom of the right vertical cover.

8. Disengage the vertical cover from the frame beginning at the top and remove the vertical cover.

9. Disengage the left vertical cover beginning at the top and remove the vertical cover.

IMPORTANT: *The front headliner must be removed first.*

10. Hold the front headliner in place and loosen and remove the screws at the front of the headliner and the screws on each side including the screw at the junction of the front and rear headliners.

11. Lower the front headliner onto the control console.

12. Loosen the clamp on the front drain hoses.

13. Remove the front drain hoses from the drain pan.

14. Loosen and remove the screw from the left and right rear sides of the rear headliner.

15. Hold the rear headliner in place and loosen and remove the screws from the left and right sides of the rear headliner.

16. Carefully lower the rear headliner behind the seat.

17. Loosen both clamps on the hoses connected to the heater.

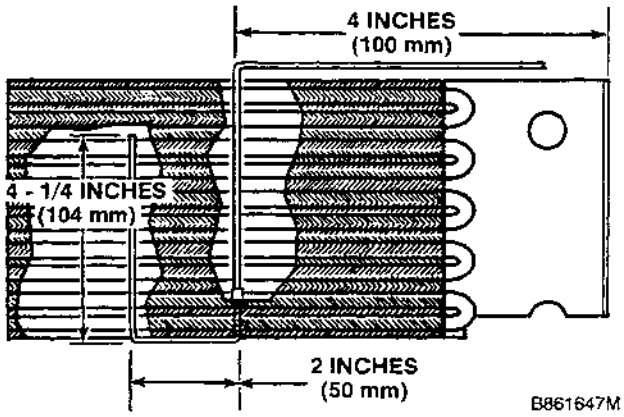
18. Slide the hoses to the rear.

19. Remove the insulation for the connections to the expansion valve and evaporator.

20. Disconnect the tubes from the expansion valve and evaporator.

21. Loosen the cap screws that hold the evaporator.

22. Carefully remove the evaporator and remove the temperature sensor and tube for the air conditioning control from the evaporator.



23. Remove any remaining insulation from the expansion valve and the connections to the evaporator.

24. Remove the clamp that holds the temperature sensor.

25. Disconnect the expansion valve and equalizer tube from the evaporator.

26. Connect the expansion valve to the new evaporator.

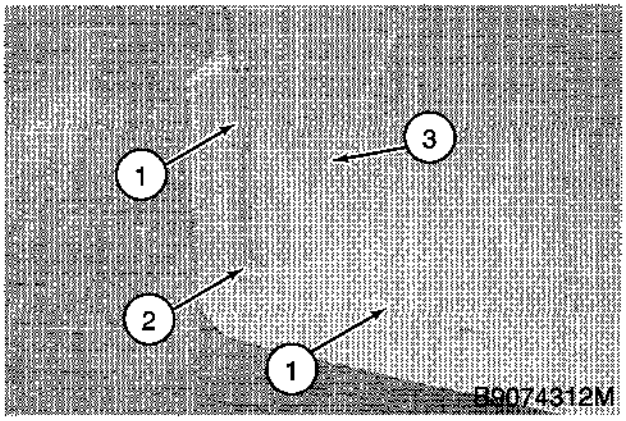
27. Connect the equalizer tube to the outlet tube of the evaporator.

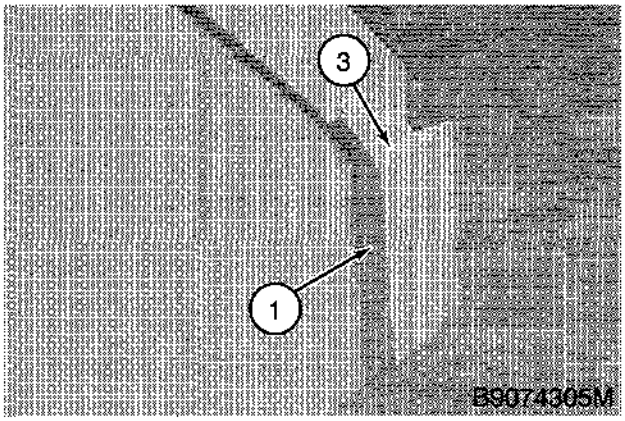
28. Apply a small amount of grease between the temperature sensor and the outlet tube.

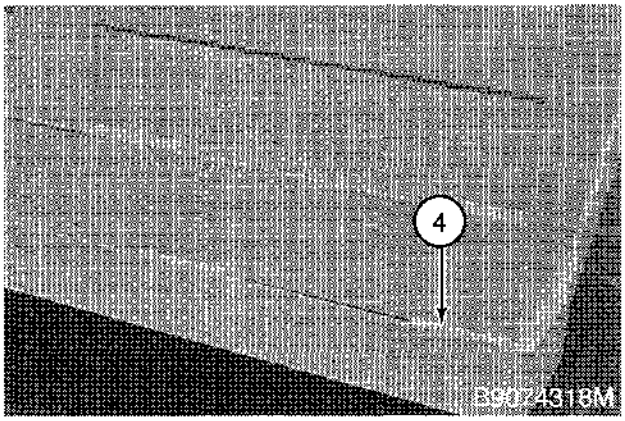
29. Install the clamp that holds the temperature sensor.

30. Apply new insulation tapes to the tubes at each end of the evaporator, the inlet and outlet tubes, and the expansion valve and the equalizer tubes.

Weld Specifications for Short Lip Buckets

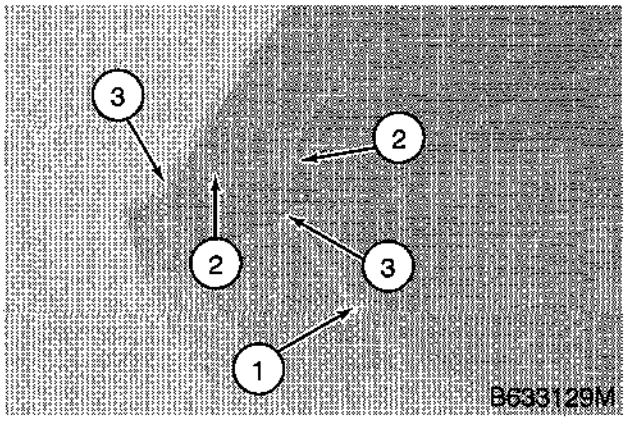


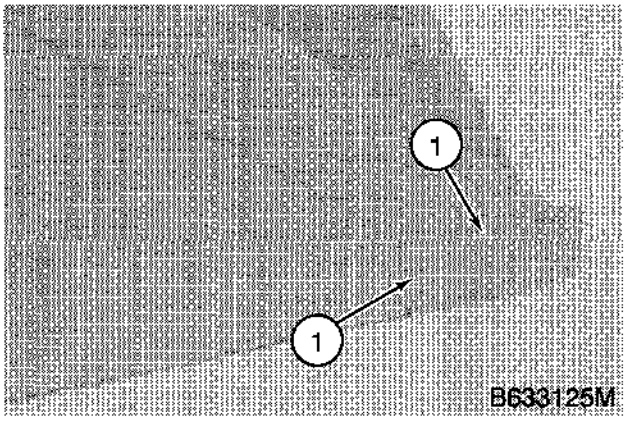


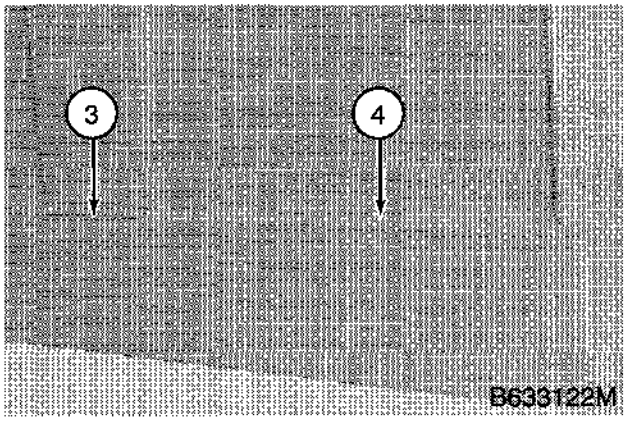


1. 1/4 Inch (6 mm) FIllet
2. Fill Corner
3. 3/16 Inch (5 mm) Fillet
4. 1/4 Inch (6 mm) Fillet 5-1/8 Inches (130 mm) Long on 9.8 Inch (250 mm) Center

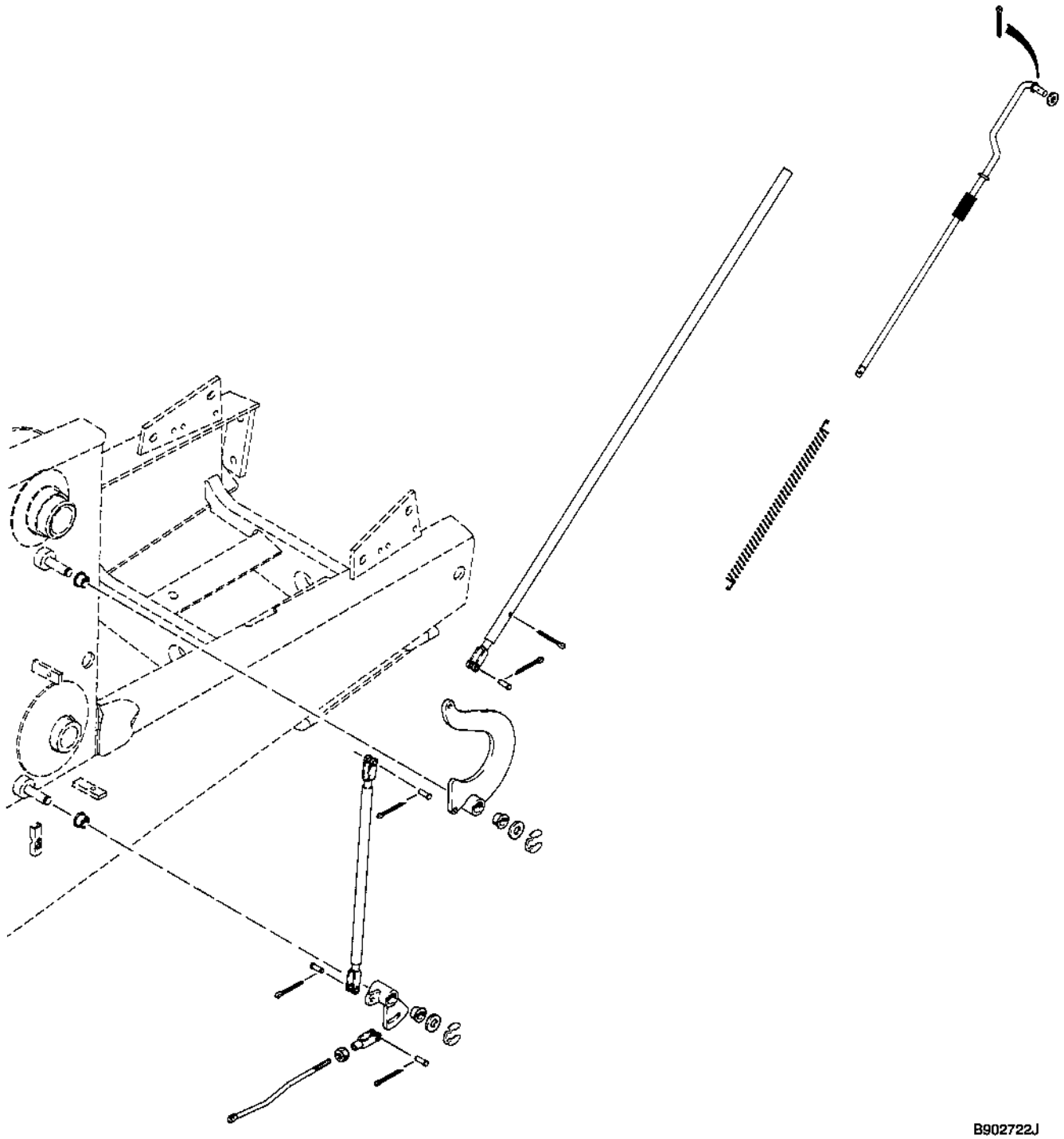
Weld Specifications for Long Lip Bucket







1. 1/4 Inch (6 mm) Fillet
2. Fill Groove
3. Fill Corner
4. 3/16 Inch (5 mm) Fillet



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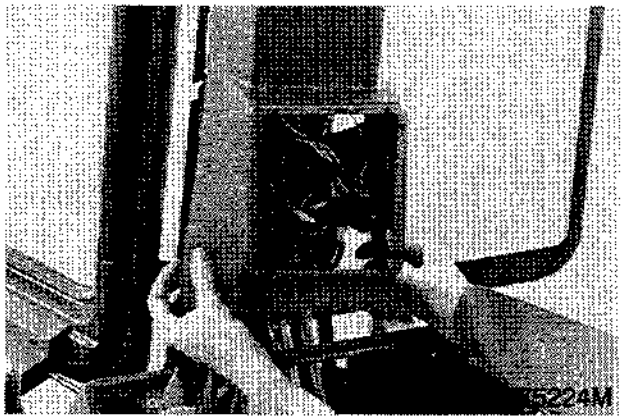
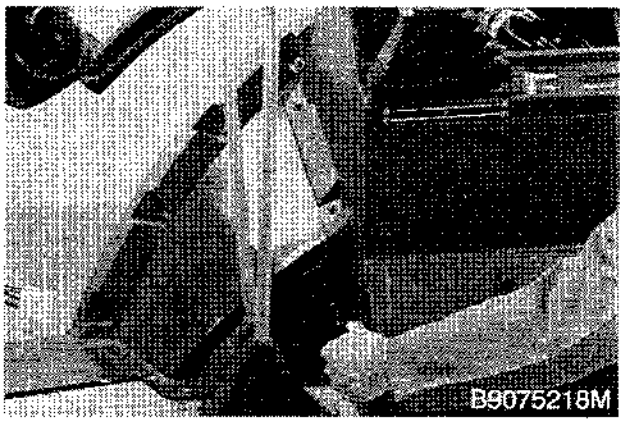
Antirollback Linkage

STEP 33



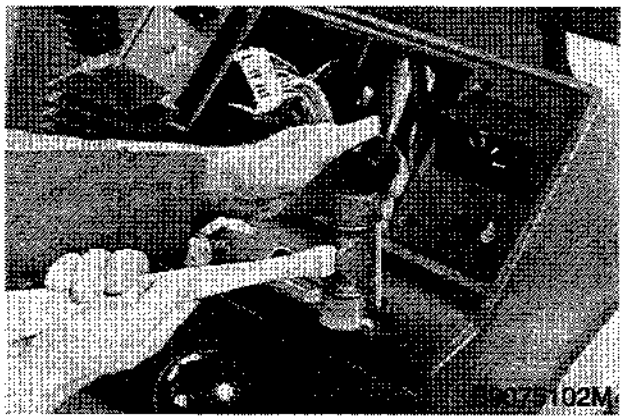
Beginning at the bottom, remove the top vertical cover.

STEP 34



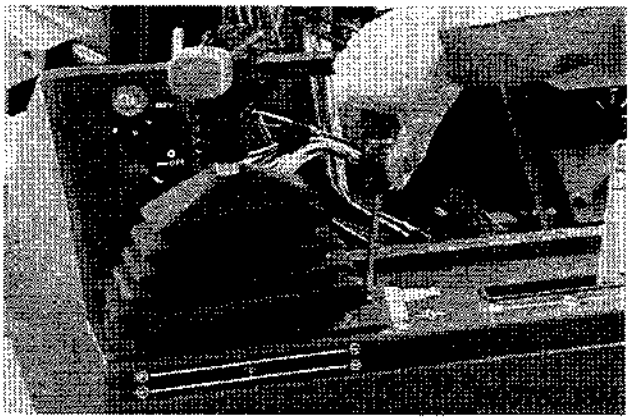
Remove the cap screws and flat washers that hold the instrument console.

STEP 35



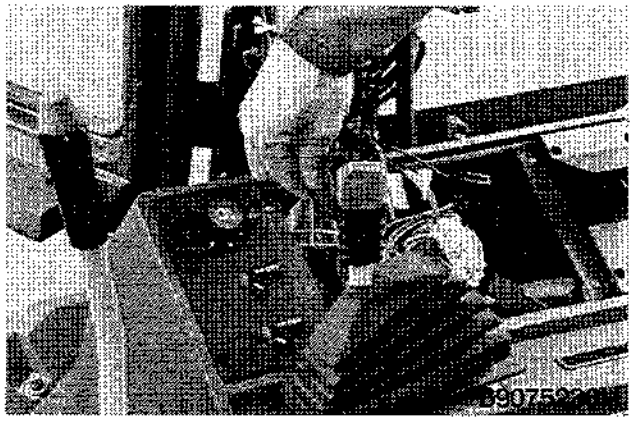
Drive the knob off the lever.

STEP 36



Remove the screws that hold the boot.

STEP 37



Loosen the set screw that holds the handle.

STEP 38

Slide the boot through the opening.

INSTALLATION OF SWING TOWER

1. Installation of the swing tower is the reverse of removal.

2. The bottom pivot pin for the swing tower must be installed so that the grease fitting is on top.

3. Lubricate all pivot pins with molydisulfide grease.

4. With the engine running at 1000 rpm (r/min), slowly operate the bucket, dipper, extension, if equipped, and boom cylinders through four complete cycles to remove any air from the circuits.