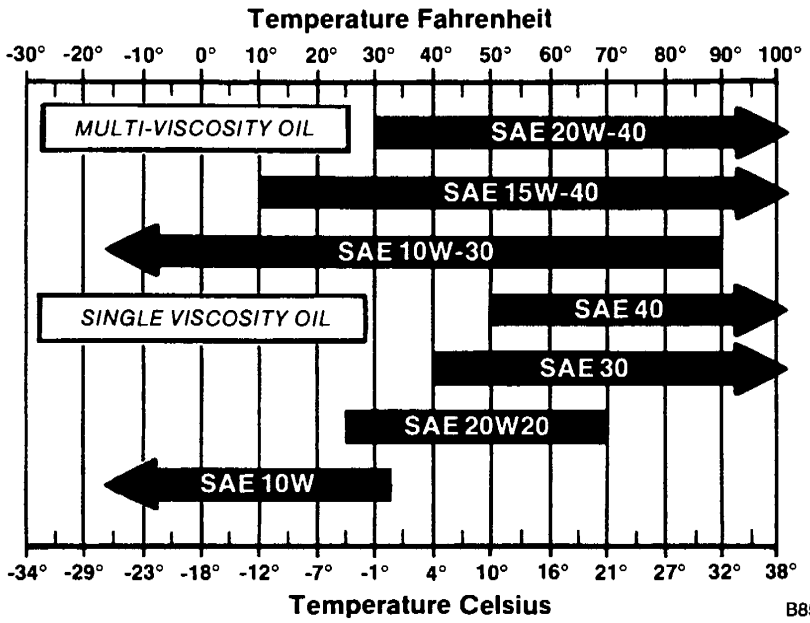
821 Loader
Service Manual

Table of Contents

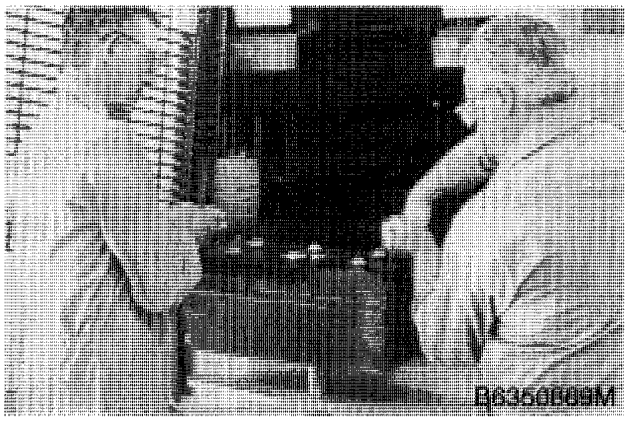
ENGINE OIL RECOMMENDATIONS

Use Case IH Engine Oil of the correct viscosity. See the chart for the temperatures and the recommended viscosity.

AMBIENT AIR TEMPERATURE RANGES

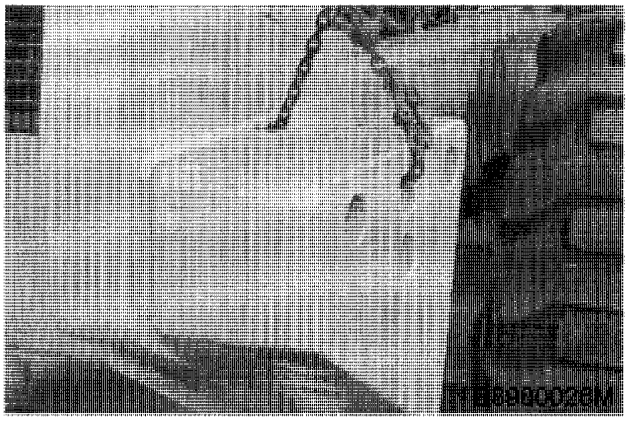


STEP 55



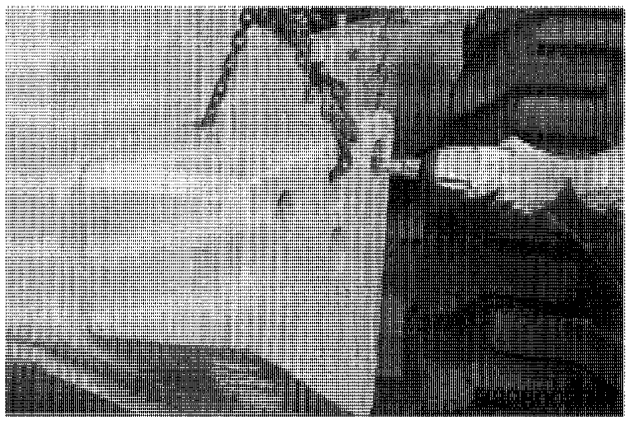
Have another person help you with this step. Remove both batteries.

STEP 56



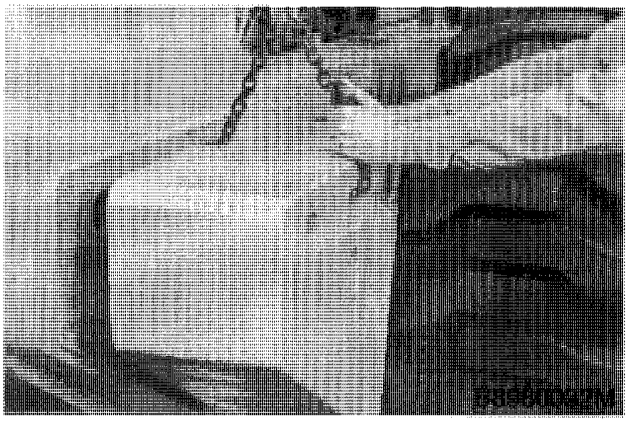
If your machine is equipped with additional counterweights, connect suitable lifting equipment to one of the additional counterweights. The weight of an additional counterweight is 500 pounds (227 kg) or 1000 pounds (453 kg).

STEP 57



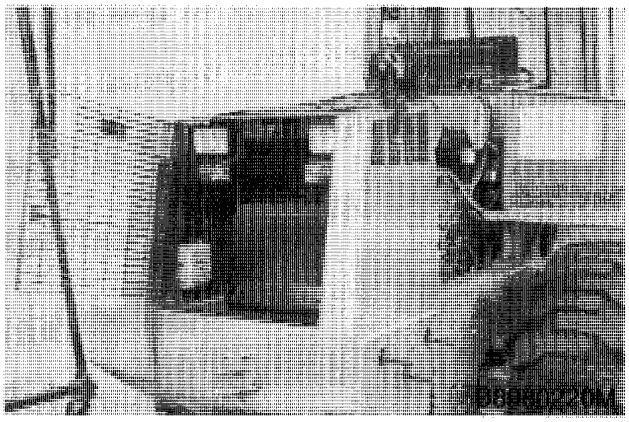
Loosen and remove the outside nuts and hardened washers from the studs that fasten the additional counterweight.

STEP 58



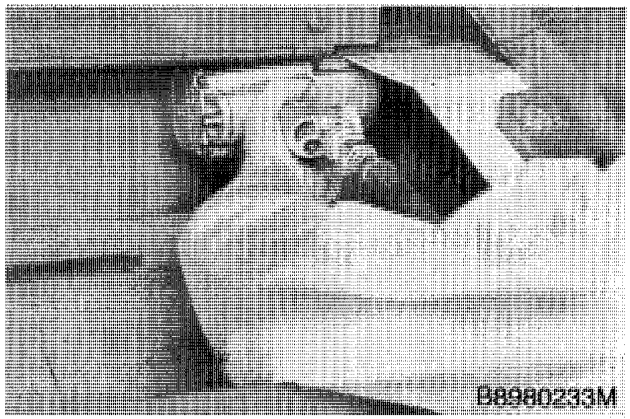
Remove the additional counterweight.

STEP 59



Connect suitable lifting equipment to the large counterweight. The weight of the large counterweight is 1200 pounds (545 kg).

STEP 60



Loosen and remove the inside nuts and hardened washers from the studs for the large counterweight.

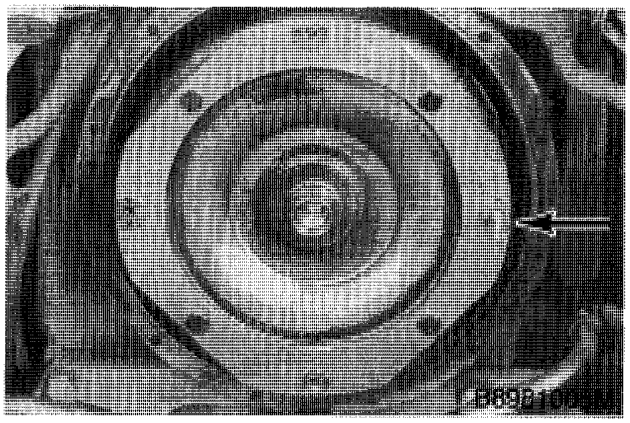
NOTE: *If your machine is equipped with large counterweights only, loosen and remove the nuts and hardened washers from the bolts that fasten the large counterweights to the machine.*

ENGINE INSTALLATION

STEP 142

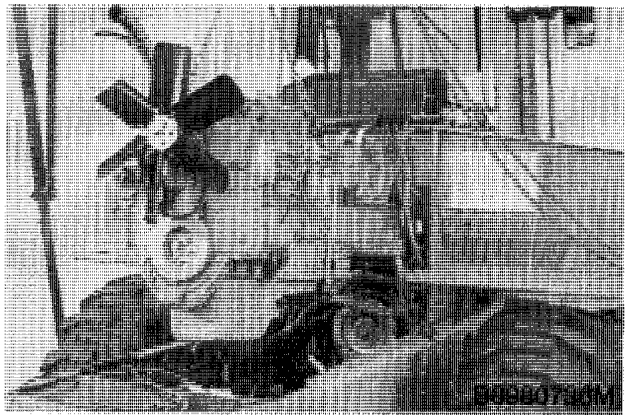
Make sure the torque converter is installed on the transmission. Three splined shafts must be engaged for the torque converter to be installed correctly.

STEP 143



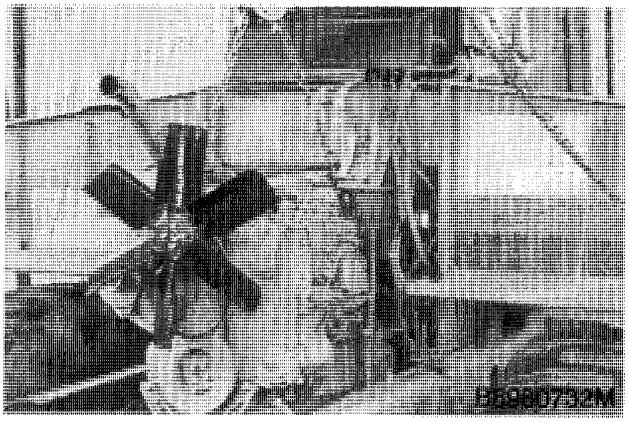
Install a stud 2-3/4 inches (70 mm) long with 10 mm threads in one of the holes in the flex plates so the stud is to the left side as shown. Make sure the flex plates are not bent or damaged.

STEP 144



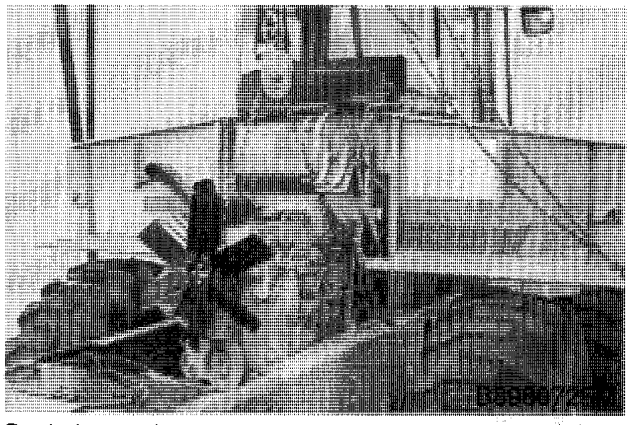
Carry the engine over the frame.

STEP 145



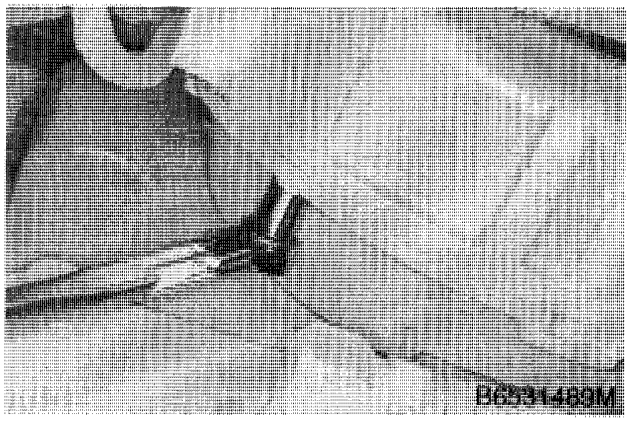
Move the engine forward and lower the engine.

STEP 146



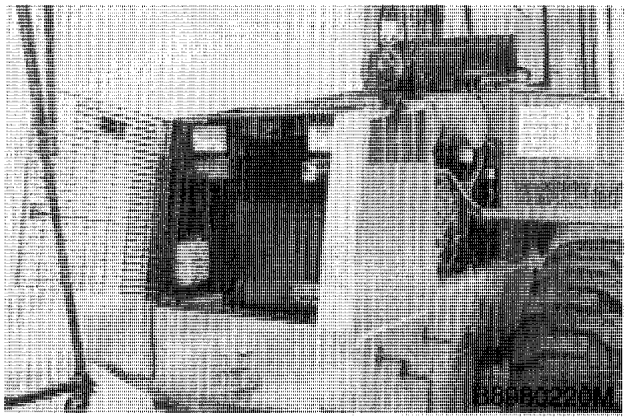
Push the engine toward the front. Have another person align the stud with the hole in the flywheel.

STEP 147



Install the cap screws and lock washers that fasten the clamps for the wire harness, and the bracket for the heater hose to the flywheel housing. Install the remaining cap screws and lock washers that fasten the transmission to the flywheel housing. Tighten the cap screws to 480 to 528 pound-inches (54 to 60 Nm).

STEP 226



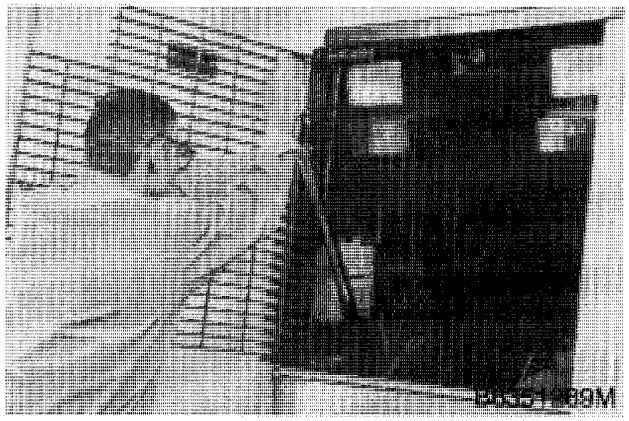
Align the holes in the large counterweight with the holes in the frame and install the studs that fasten the large counterweight. Install the inside nuts and hardened washers on the studs and tighten the inside nuts but not all the way.

NOTE: *If your machine is equipped with large counterweights only, install the bolts, hardened washers, and nuts that fasten the large counterweights to the machine. The nuts and hardened washers must be installed on the inside.*

STEP 227

Repeat steps 225 and 226 for the other large counterweight.

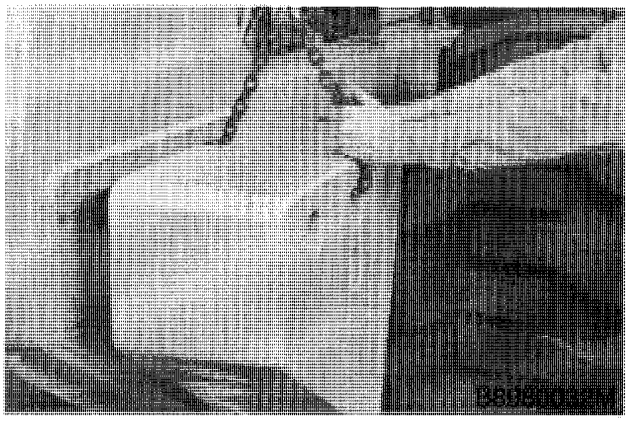
STEP 228



Tighten the inside nuts for both large counterweights to 175 to 225 pound-feet (237 to 305 Nm).

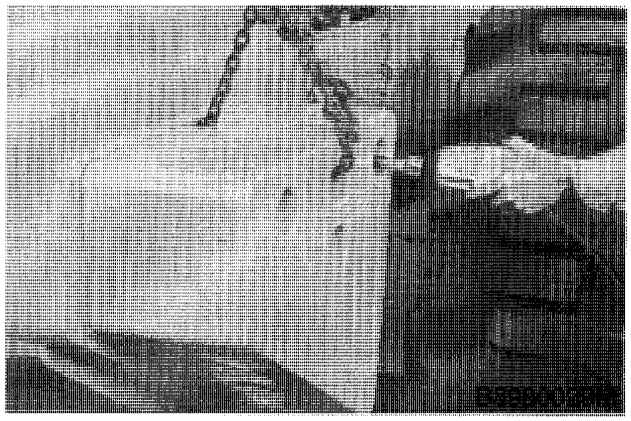
NOTE: *If your machine is equipped with large counterweights only, tighten the nuts on the bolts to 600 pound-feet (813 Nm).*

STEP 229



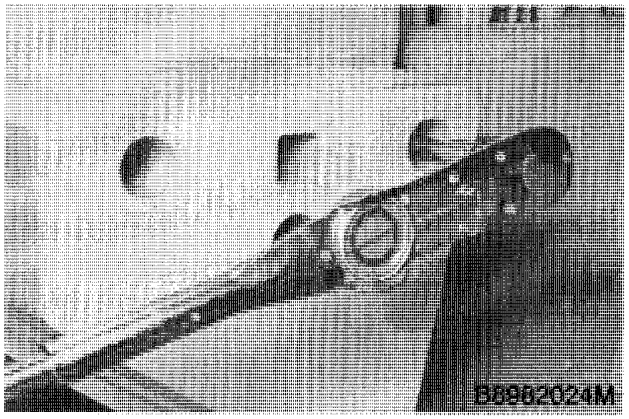
If your machine is equipped with additional counterweights, connect suitable lifting equipment to one of the additional counterweights. The weight of an additional counterweight is 500 pounds (227 kg) or 1000 pounds (453 kg). Align the additional counterweight with the studs and install the additional counterweight.

STEP 230



Install the hardened washers and nuts and tighten the nuts but not all the way.

STEP 231



Remove the lifting equipment and tighten the outside nuts to 550 to 650 pound-feet (745 to 881 Nm).

Piston

Type	Cam Ground
Material	Aluminum Alloy
OD at 12 mm From the Bottom, 90 Degrees From Piston Pin	
Standard Size Piston	113.833 to 113.847
Minimum Service Limit	113.776 mm
ID of Piston Pin Bore	45.006 to 45.012 mm
Maximum Service Limit	45.025 mm
Width of 1st Ring Groove (Top)	3.50 mm
Width of 2nd Ring Groove (Intermediate)	3.08 to 3.10 mm
Width of 3rd Ring Groove (Oil Ring)	4.040 to 4.060 mm
Protrusion Above Cylinder Block (Maximum)	0.380 mm
Protrusion Above Cylinder Block (Minimum)	0.018 mm

Piston Rings

No. 1 Compression 6T830 and 6TA830	Key Stone Type (Barrel Face)
End Gap in 114.020 ID	0.40 to 0.70 mm (See Note)
No. 1 Compression 6-830 Engine	Key Stone Type Barrel Face
End Gap in 114.020 ID	0.40 to 0.70 mm (See Note)
Side Clearance	Use Keystone Gauge
No. 2 Compression	Rectangular Type (Taper Face)
End Gap in 114.020 ID	0.40 to 0.70 mm (See Note)
Side Clearance	0.70 to 0.125 mm
No. 3 Oil Control Rings	Two Piece
End Gap in 114.020 ID	0.30 to 0.60 mm (See Note)
Side Clearance	0.020 to 0.065 mm

NOTE: *Add 0.09 mm gap for every 0.03 mm of bore wear up to maximum worn limit.*

Cylinder Head

Warpage (Maximum) Total Across Head	0.20 mm
Maximum material Removal	1.00 mm
Minimum Head Height	115.75 mm
Valve Guide Bore	15.931 to 15.971 mm
Insert Bore (Intake)	53.897 to 53.927 mm
Insert Bore Depth (Intake)	12.00 to 12.20 mm
Insert Bore (Exhaust)	46.997 to 47.027 mm
Insert Bore Depth (Exhaust)	9.63 to 9.83 mm

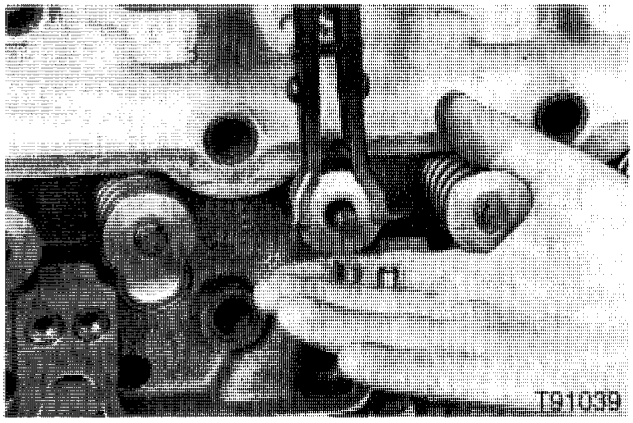
Lifters

Material	Hardened Iron
OD of Lifter	15.929 to 15.980 mm
Minimum Service Limit	15.925 mm

Connecting Rod

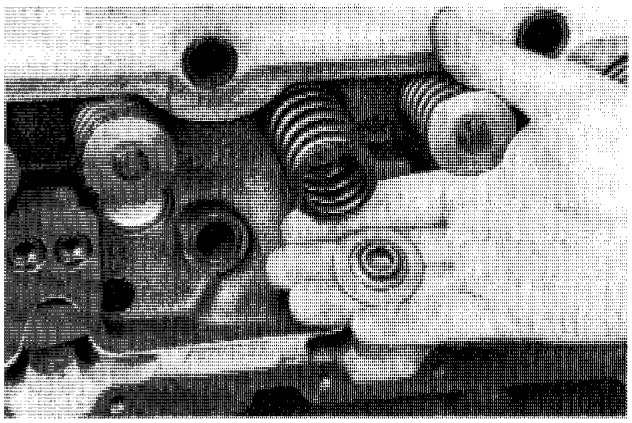
Bushing	Steel Backed Leaded Bronze
Bushing ID Installed (Ream to Size)	45.023 to 45.035 mm
Bearing Liners	Replaceable
Journal ID Without Bearing Liners	80.987 to 81.013 mm
Bearing Oil Clearance	0.033 to 0.117 mm
Side Clearance	0.100 to 0.300 mm
Maximum Service Limit	0.330 mm
Connecting Rod Bend (Maximum)	
Without Bushing	0.200 mm
With Bushing	0.150 mm
Connecting Rod Twist (Maximum)	
Without Bushing	0.500 mm
With Bushing	0.300 mm

STEP 24



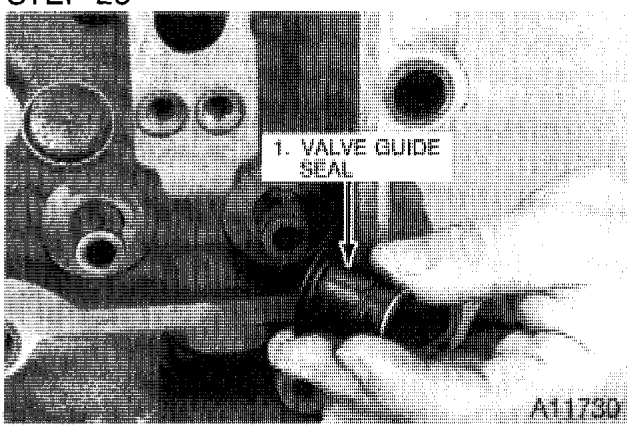
Push the valve springs down with a valve spring compressor and remove the valve keepers.

STEP 25



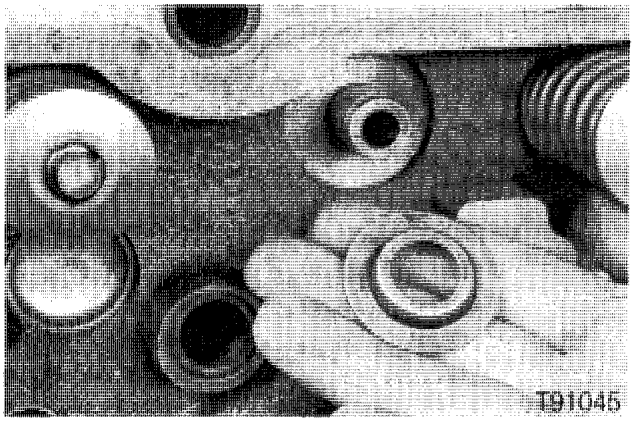
Remove the valve spring retainers and the valve springs.

STEP 26



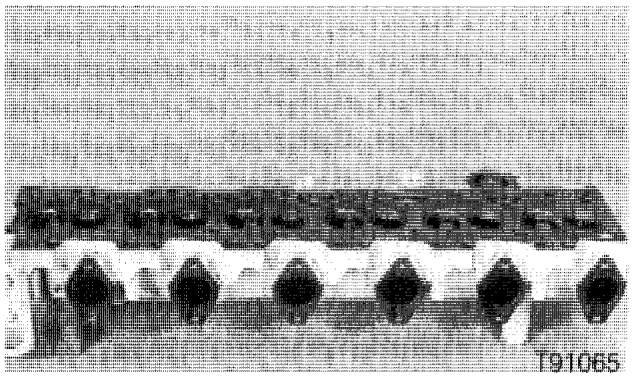
Remove the valve and valve guide seals from the cylinder head. Discard the valve guide seals.

STEP 27



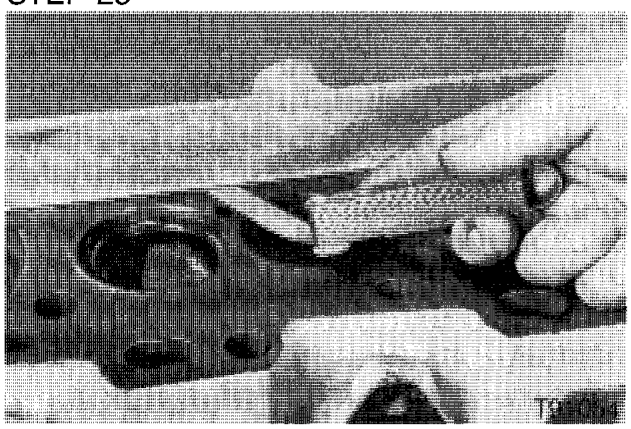
Remove and discard the valve spring seat from the cylinder head (If Equipped).

STEP 28



Clean the cylinder head completely, removing carbon and other deposits. Check for cracks and any sign of damage in the area of the fire ring contact.

STEP 29



Check the cylinder head surface for warpage. Use a straight edge and feeler gauge. Clean the machined surface of the head. Use a heavy, accurate straight edge to check for warpage at each side and between all cylinders. Also, check for end-to-end warpage in six positions or more.

IMPORTANT: *If the measurement is more than 0.020 mm, the cylinder head must be machined or replaced. Replace the cylinder head if the head height is less than 115.75 mm, after the head is machined.*

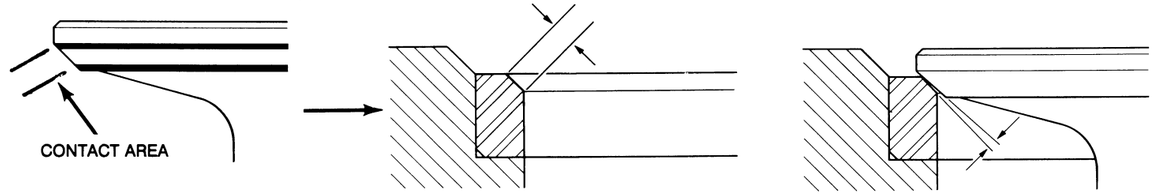
THE CORRECT EXHAUST VALVE CONTACT AREA ON THE SEAT WILL GIVE A SEAT WIDTH OF 1.47 TO 2.07 mm.

→ 1 DEGREE INTERFERENCE ANGLE

→ CORRECT REFACING OF EXHAUST VALVES AND VALVE SEATS WILL GIVE A 1 DEGREE INTERFERENCE ANGLE. THIS ANGLE IS IMPORTANT BECAUSE THE ANGLE GIVES ASSISTANCE IN CUTTING CARBON AND TO SEAT THE VALVES.

→ IF THE VALVE HEAD IS RECESSED MORE THAN 1.62 mm, REPLACE THE VALVE AND THE VALVE SEAT.

THIS IS THE CORRECT SEAT CONTACT



30 Degree Intake Valves

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

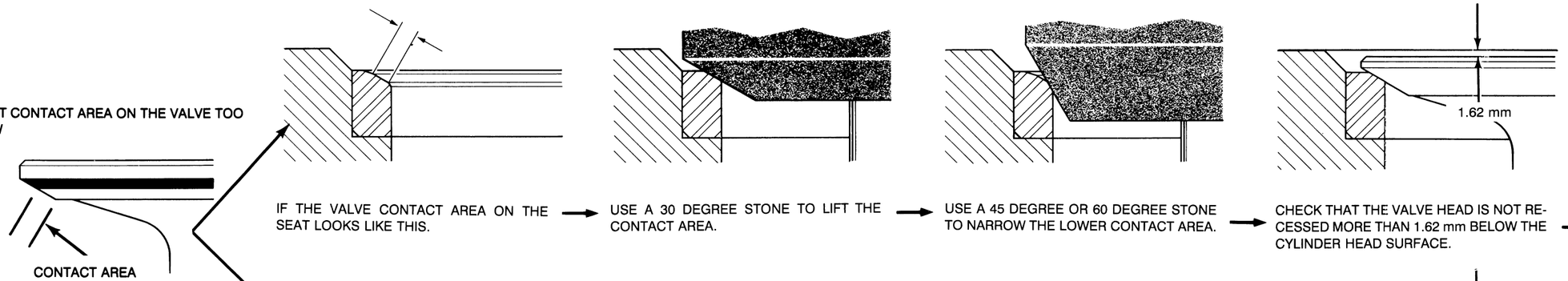
→ USE A 30 DEGREE STONE TO LIFT AND TO MAKE WIDER THE CONTACT AREA.

→ USE A 45 DEGREE OR 60 DEGREE STONE TO NARROW THE LOWER CONTACT AREA INCREASED BY THE 30 DEGREE STONE.

→ CHECK THAT THE VALVE HEAD IS NOT RECESSED MORE THAN 1.62 mm, BELOW THE CYLINDER HEAD SURFACE.

→ IF THE VALVE HEAD IS RECESSED MORE THAN 1.62 mm, REPLACE THE VALVE AND THE VALVE SEAT.

SEAT CONTACT AREA ON THE VALVE TOO LOW



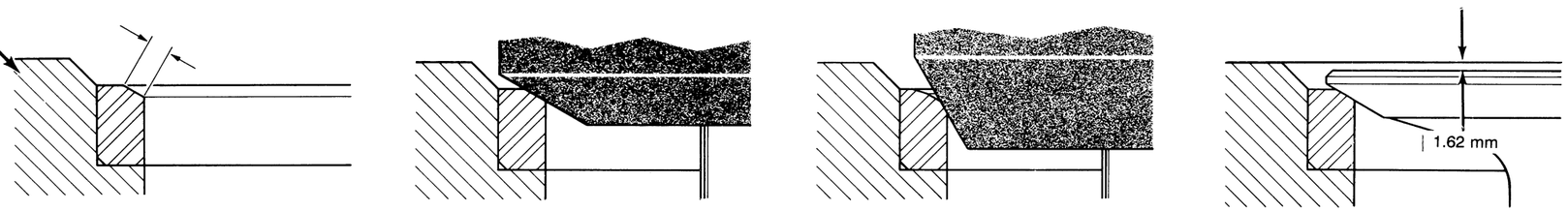
IF THE VALVE CONTACT AREA ON THE SEAT LOOKS LIKE THIS.

→ USE A 30 DEGREE STONE TO LIFT THE CONTACT AREA.

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

→ CHECK THAT THE VALVE HEAD IS NOT RECESSED MORE THAN 1.62 mm BELOW THE CYLINDER HEAD SURFACE.

→ IF THE VALVE HEAD IS RECESSED MORE THAN 1.62 mm, REPLACE THE VALVE AND THE VALVE SEAT.



Section

2425

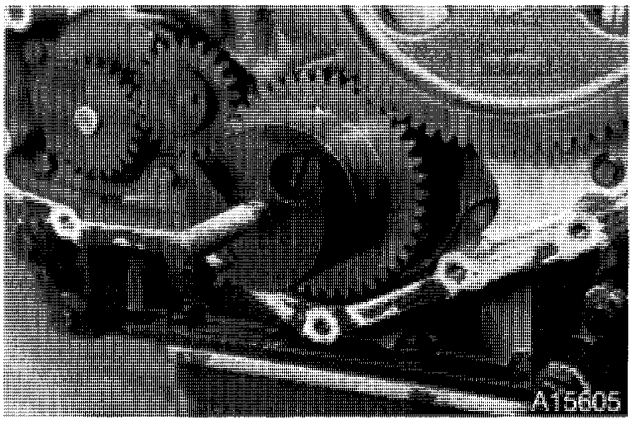
CYLINDER BLOCK

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

6-830 Diesel Engine

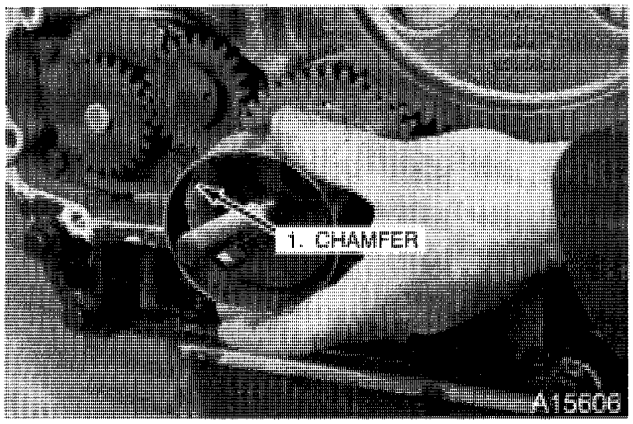
IMPORTANT: *This engine was made using the metric measurement system. All measurements and checks must be made with metric tools to make sure of an accurate reading when inspecting parts.*

STEP 42



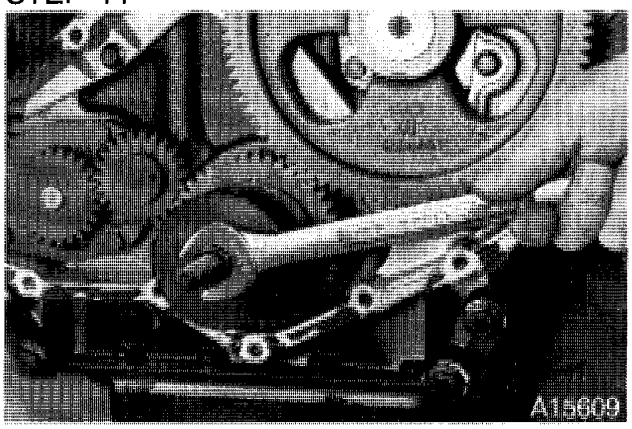
Install the puller stud into the installation tool.

STEP 43



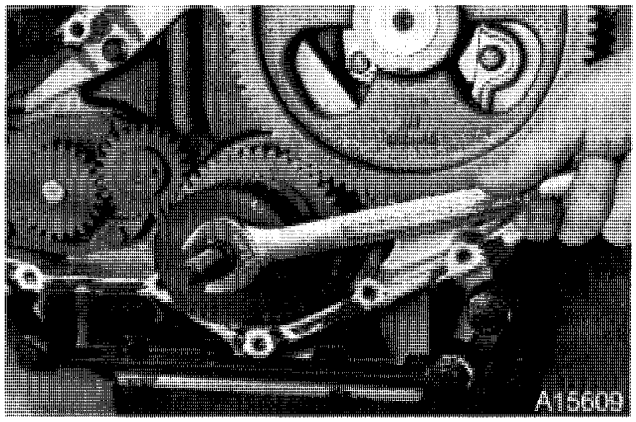
Install the wear sleeve with the chamfer toward the crankshaft.

STEP 44



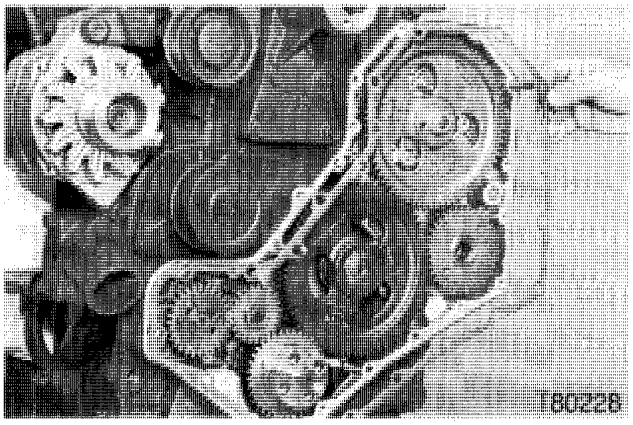
Install the cup and push the sleeve on the crankshaft.

STEP 45



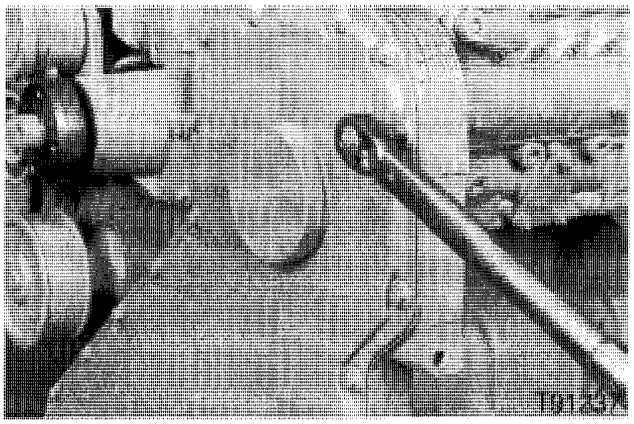
Remove the sleeve installation tool from the crankshaft.

STEP 46



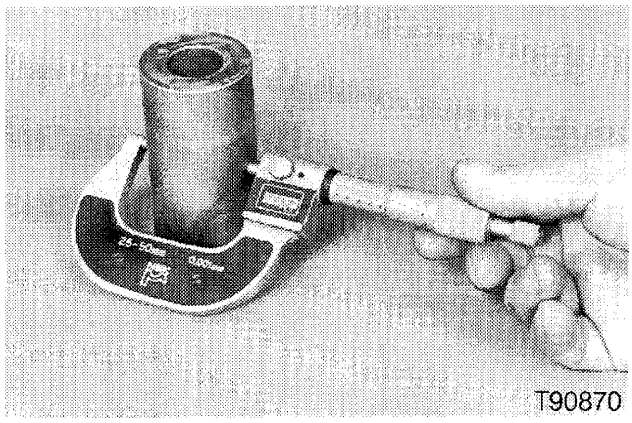
Install a new front cover gasket.

STEP 47



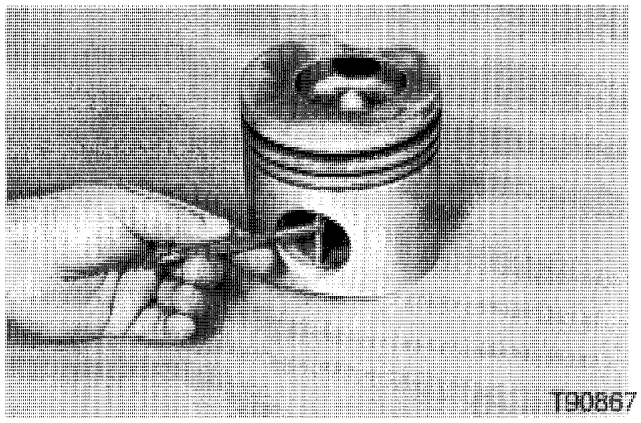
Install the front cover. Tighten the bolts to a torque of 21 to 27 Nm.

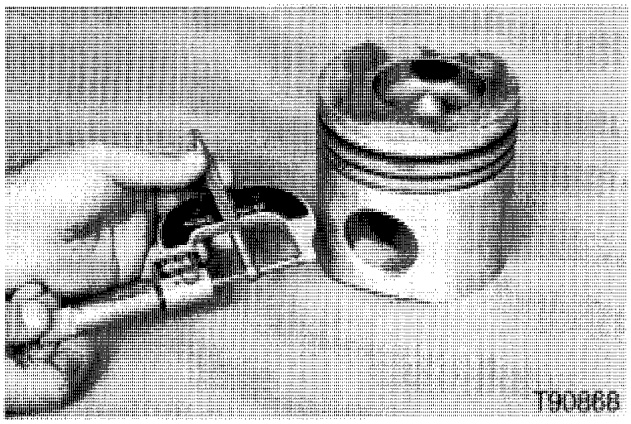
STEP 104



Measure the diameter of the piston pin. If the diameter is less than 44.993 mm the piston pin must be replaced.

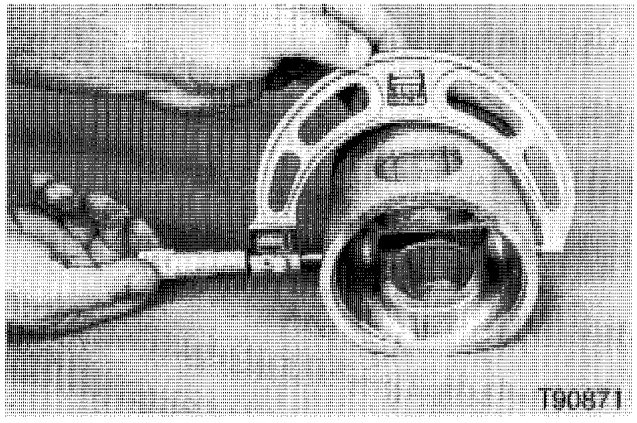
STEP 105





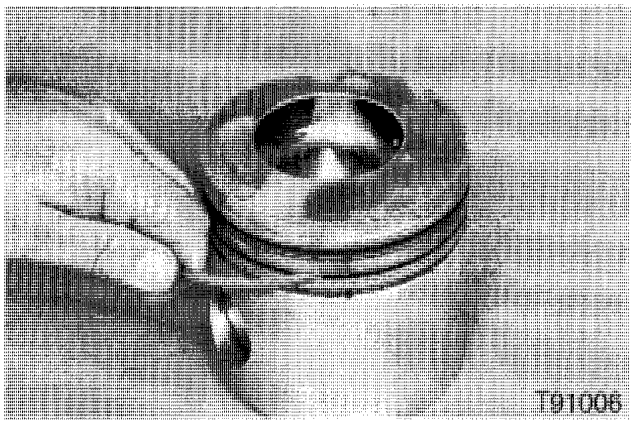
Measure the piston pin bore. If the piston pin bore is more than 45.025 mm the piston must be replaced.

STEP 106



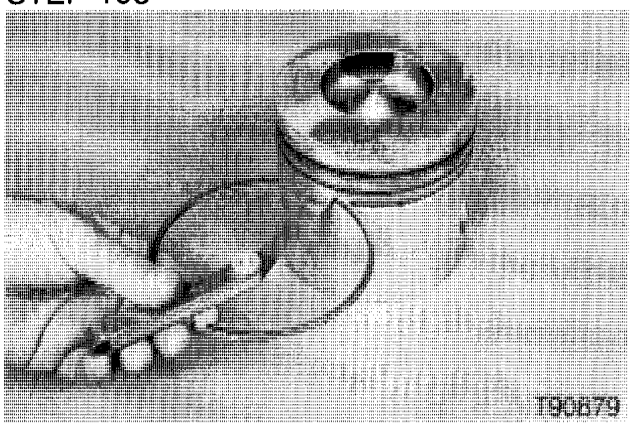
Measure the diameter of the piston across the thrust face 12 mm from the bottom of the piston, at right angles of the piston pin holes. Replace the piston if the diameter is less than 113.776 mm.

STEP 107



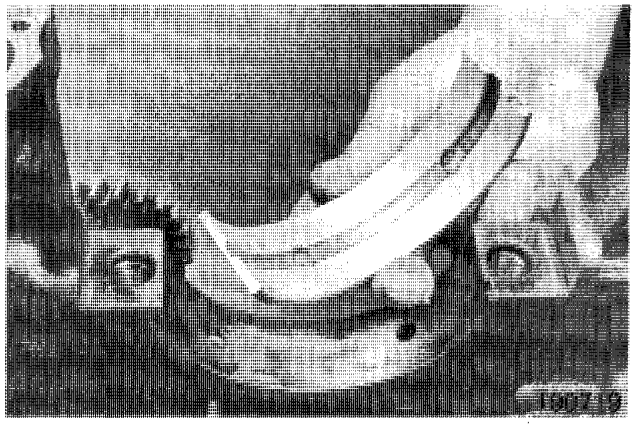
Break an old piston ring in half and use the broken ring half to clean the piston ring grooves. Too much deposit in the ring grooves can force the rings out and will cause scoring.

STEP 108



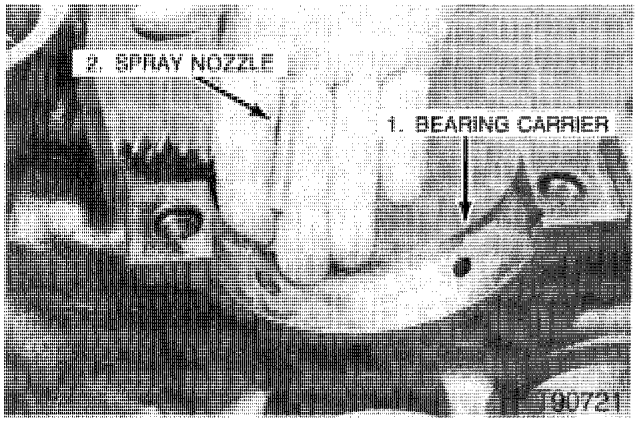
Check the side clearance of the oil ring in the piston. Insert a feeler gauge between the upper surface of a new ring and the piston lands to check the clearance. Replace the piston if side clearance is more than 0.065 mm.

STEP 178



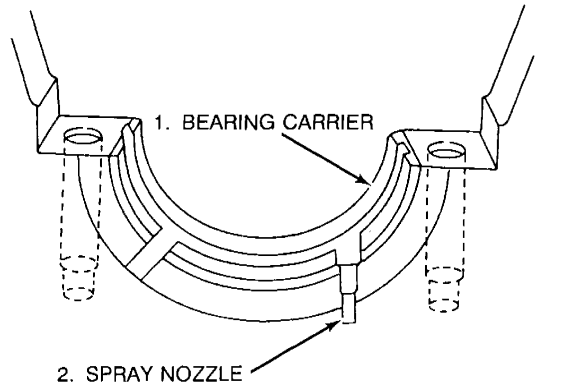
Remove the main bearing liners from the engine.

STEP 180

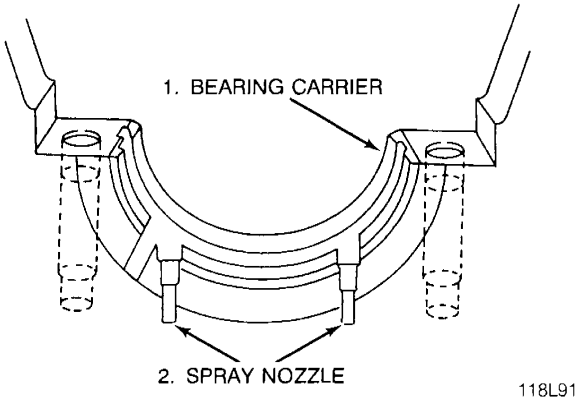


Remove the oil spray nozzle from the bearing carrier.

STEP 179 Prior to Serial Number 4487830

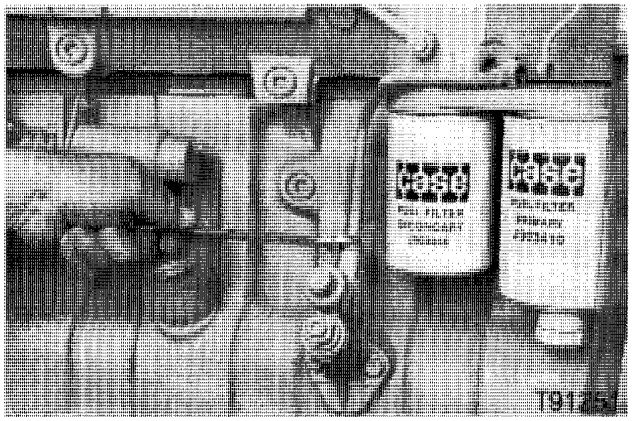


Engine Serial Number 4487830 and After



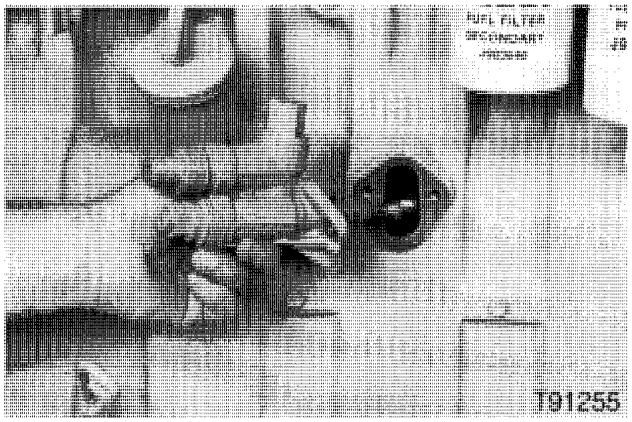
Clean the oil spray nozzles with a small wire, if a nozzle is damaged it must be replaced.

STEP 251



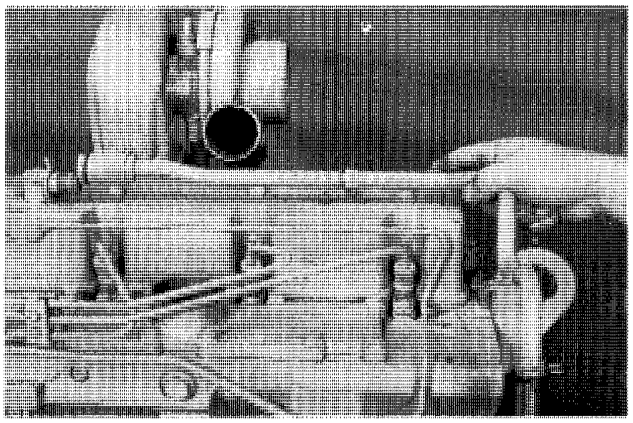
Disconnect the fuel filter inlet line from the lift pump.

STEP 252



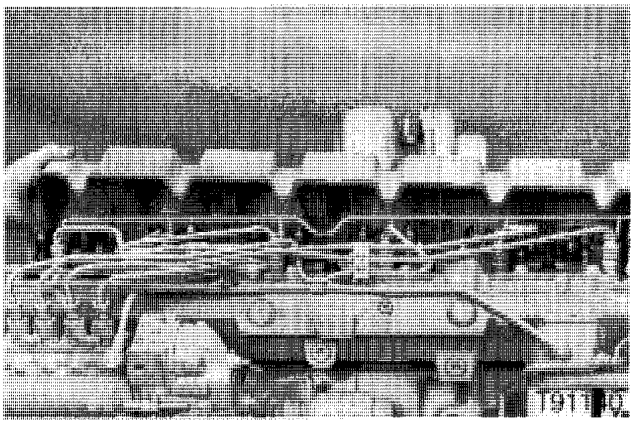
Remove the lift pump bolts and the lift pump from the cylinder block.

STEP 253



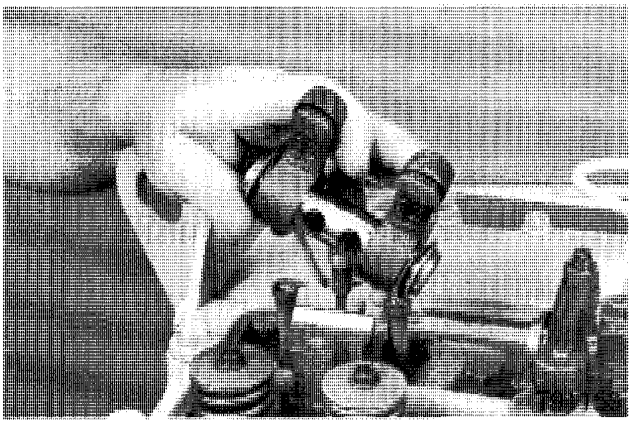
Remove the breather from the valve cover.

STEP 254



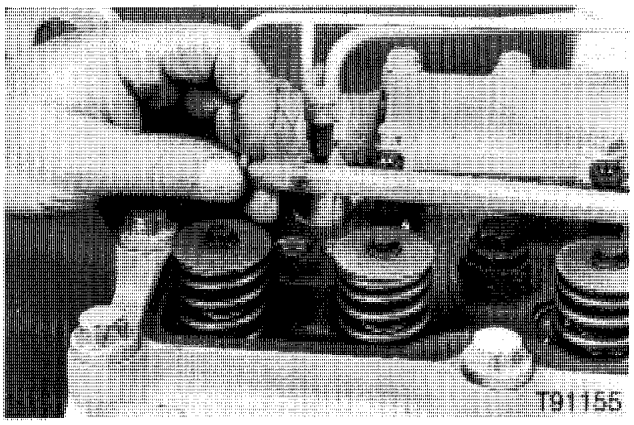
Remove the valve cover.

STEP 255



Remove the rocker arm bolts and the rocker arm assembly.

STEP 256

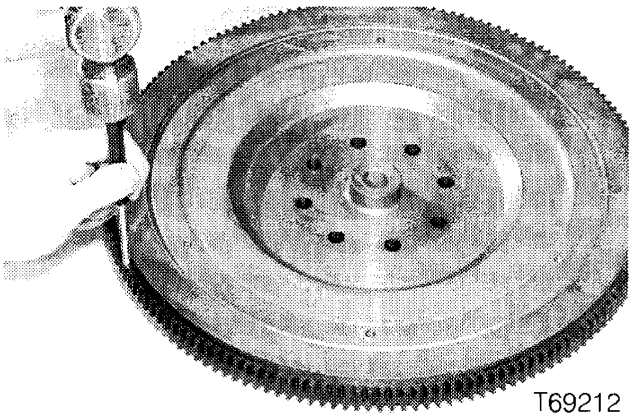


Remove the rocker arm oil supply tube.

IMPORTANT: *A new oil supply tube must be installed if the supply tube is made of nylon material.*

Ring Gear Removal and Installation

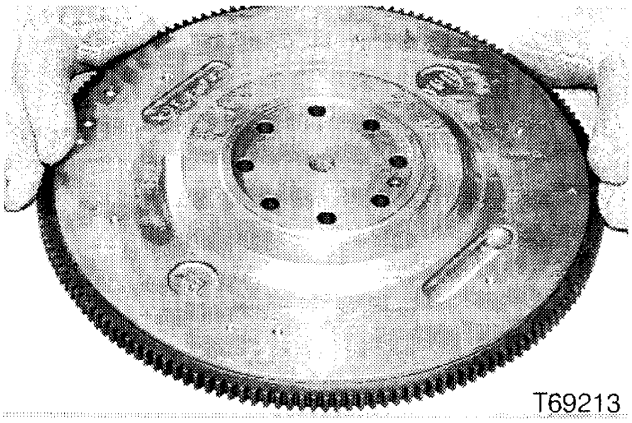
STEP 320



T69212

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

STEP 321

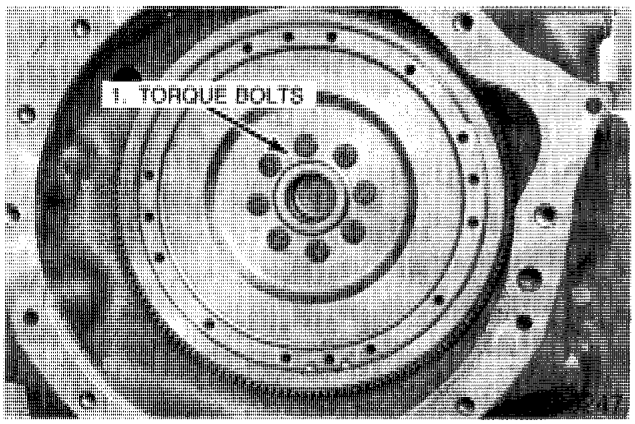


T69213

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.

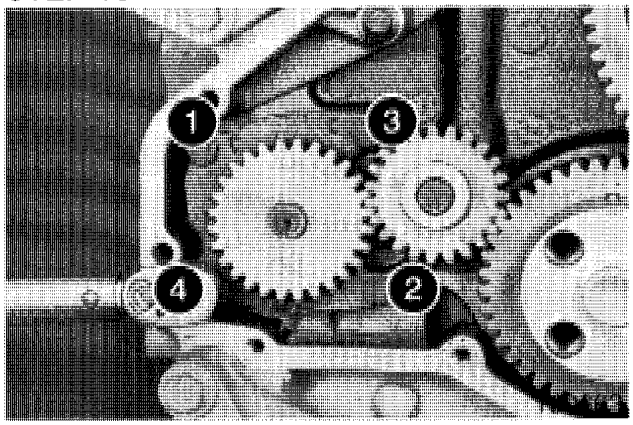
STEP 322



Install the flywheel. Tighten the retaining bolts to a torque of 130 to 141 Nm.

Oil Pump Installation

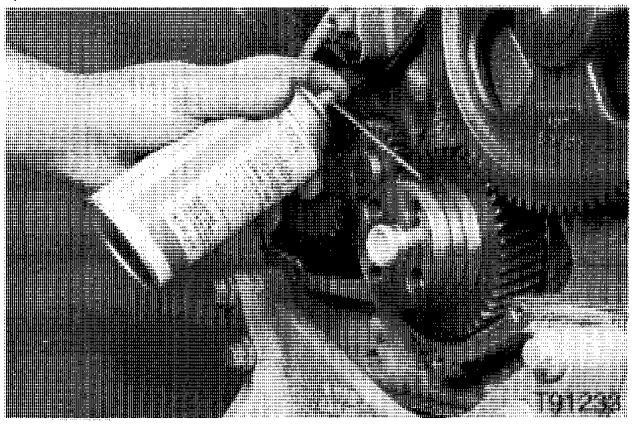
STEP 10



Install the oil pump and pump bolts. Tighten the bolts to a torque of 21 to 27 Nm. Follow the torque sequence above.

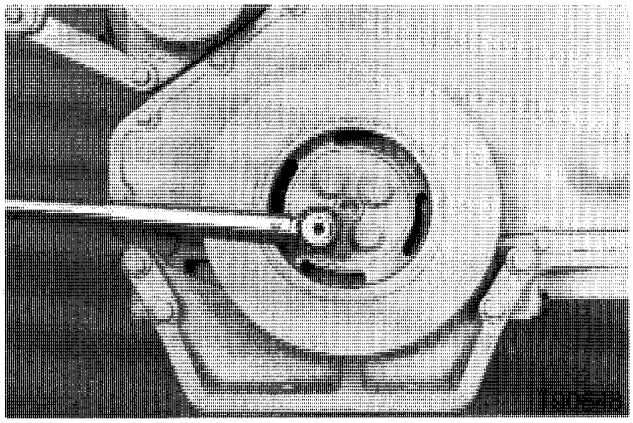
NOTE: *Bolt torque that is to high or uneven, will cause damage to the oil pump. There will be a small clearance between the oil pump flange and the cylinder block.*

STEP 11



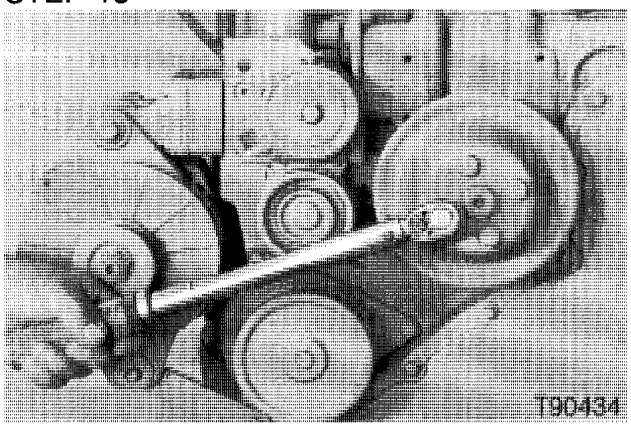
Clean the seal surface on the crankshaft with loctite safety solvent. See Section 2425 in the service manual for front cover installation.

STEP 12



Install the crankshaft pulley and pulley bolts. Tighten the bolts to a torque of 180 to 212 Nm.

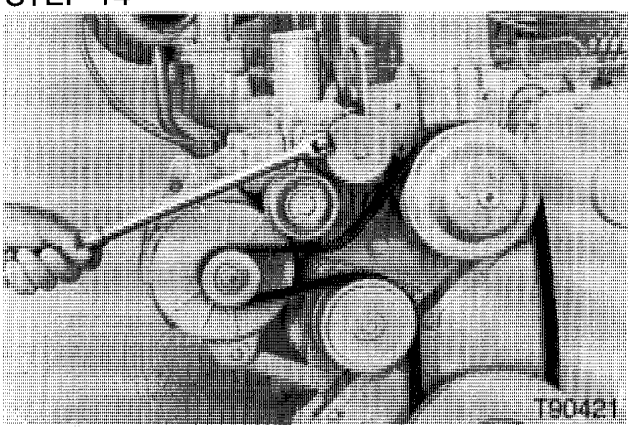
STEP 13



Install the fan pulley and pulley bolts. Torque the fan pulley bolts to a torque of:

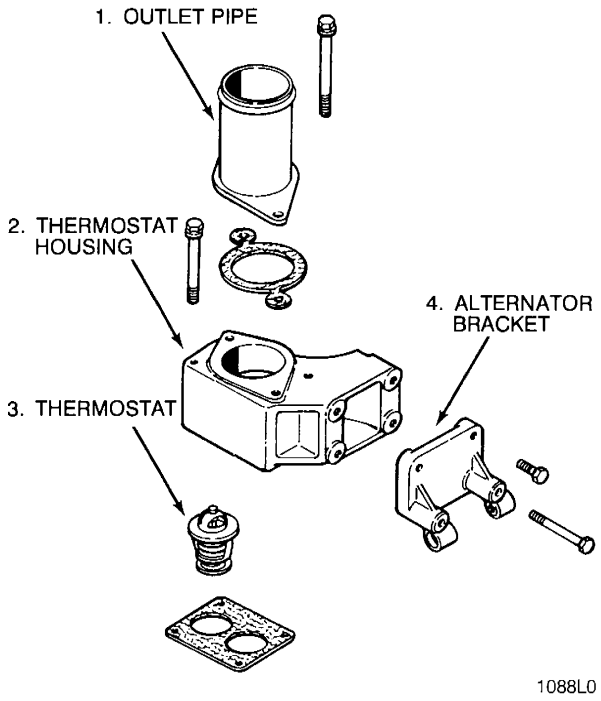
Grade 8.8 Size M8	26 to 31 Nm
Grade 10.9 Size M8	37 to 43 Nm
Grade 8.8 Size M10	51 to 62 Nm
Grade 10.9 Size M10	51 to 62 Nm

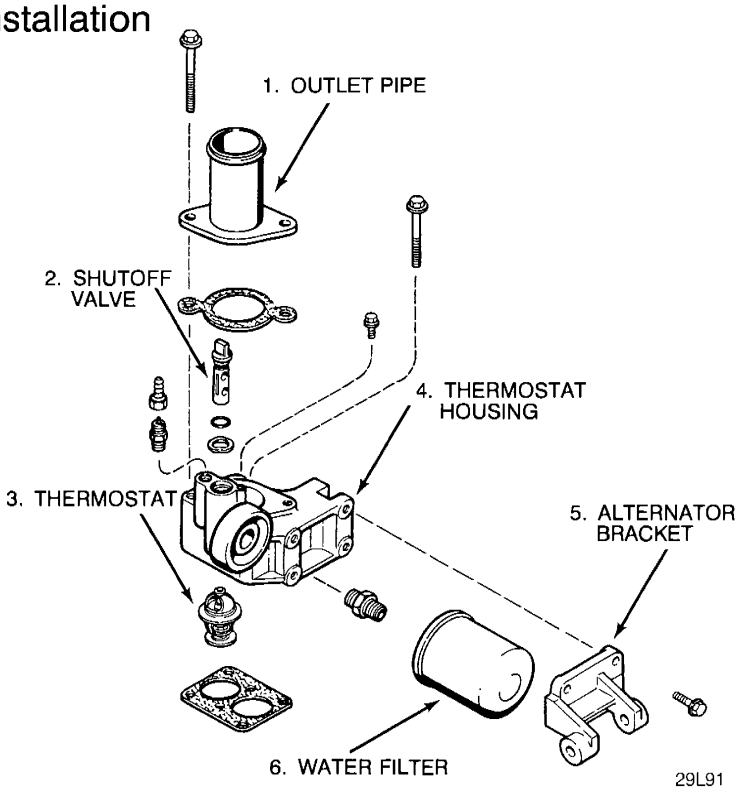
STEP 14



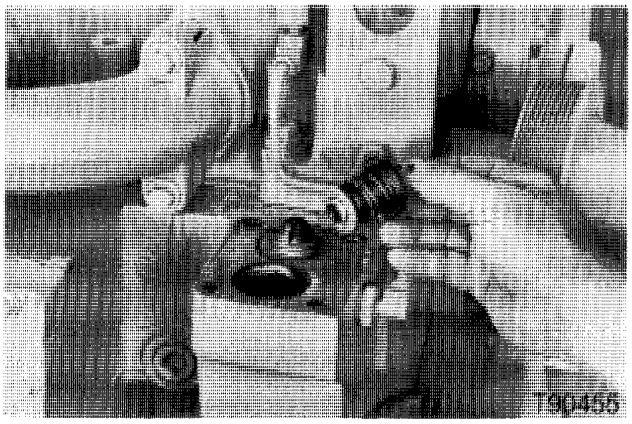
Lift the fan belt tensioner pulley and install the fan belt.

Installation



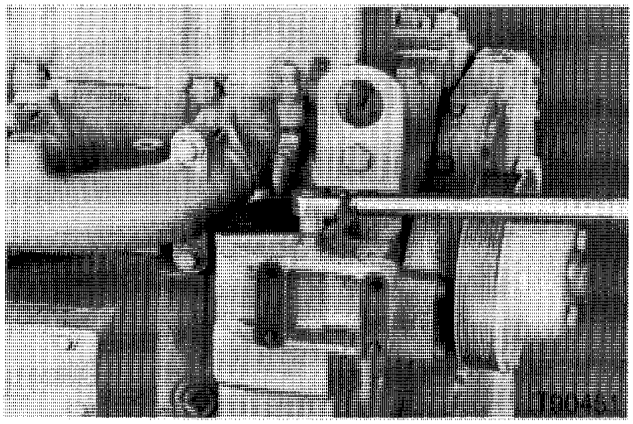


STEP 15



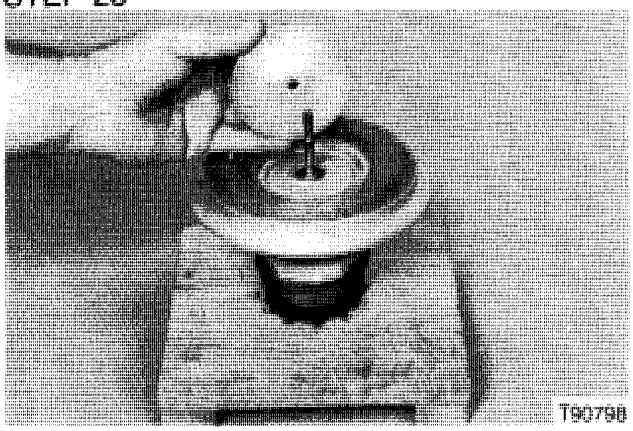
Install the thermostats and gasket into the cylinder block. The thermostats must point up toward the outlet pipe.

STEP 16



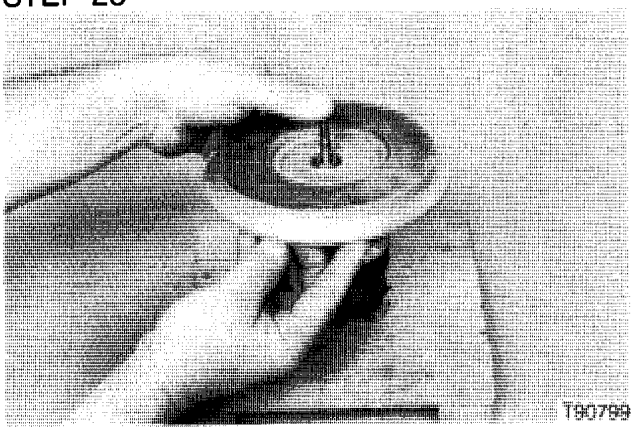
Install the thermostat housing. Install the thermostat housing bolts and tighten to a torque of 21 to 27 Nm.

STEP 25



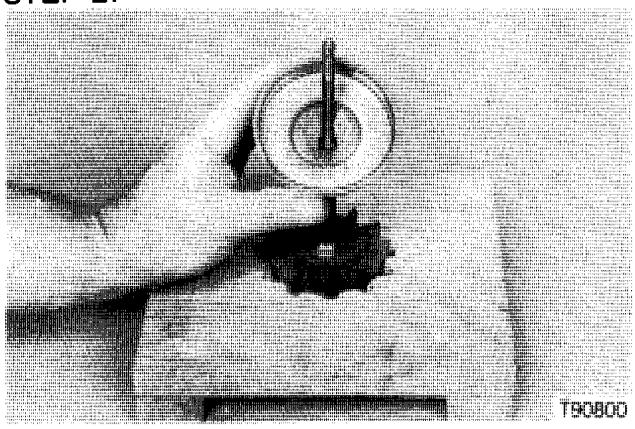
Remove the compressor wheel.

STEP 26



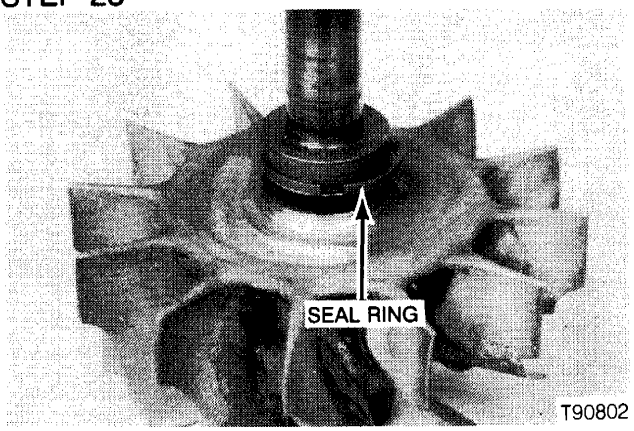
Lift the center housing from the turbine shaft.

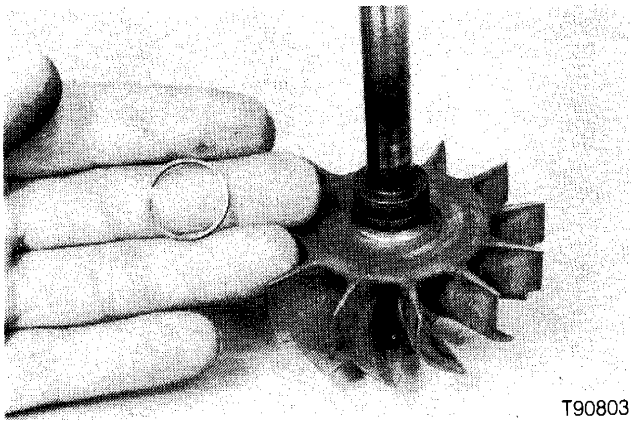
STEP 27



Remove the heat shield.

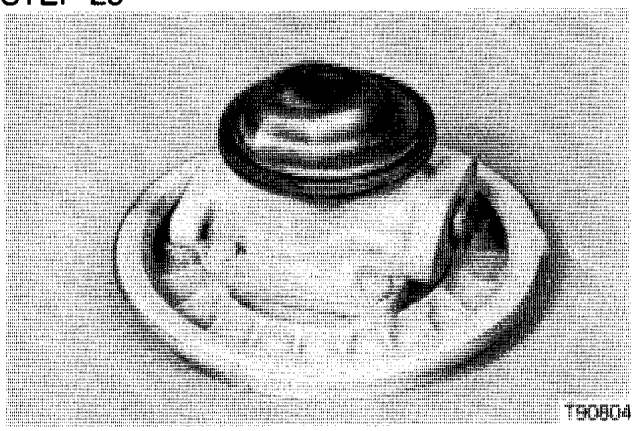
STEP 28





Remove the seal ring from the turbine shaft.

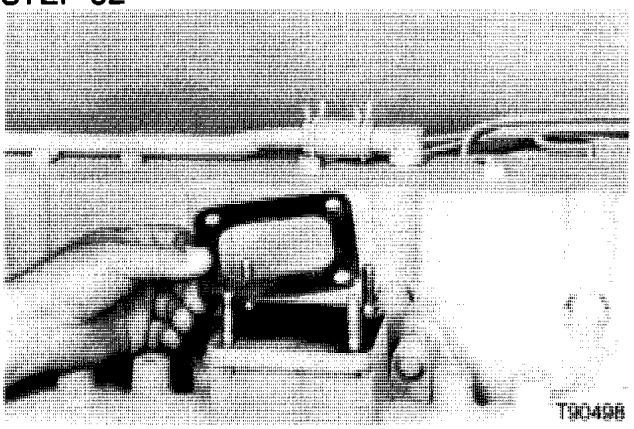
STEP 29



Turbocharger center housing.

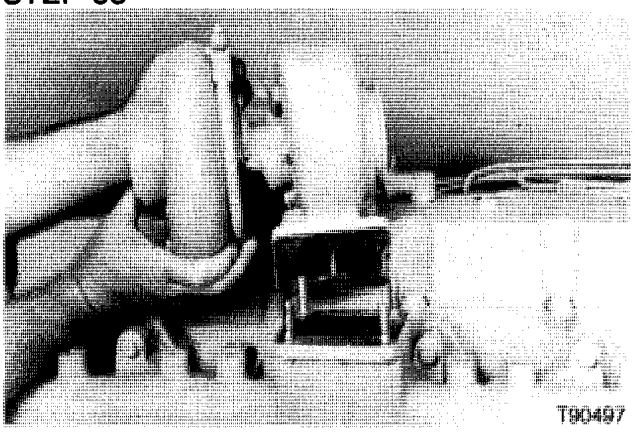
Installation

STEP 92



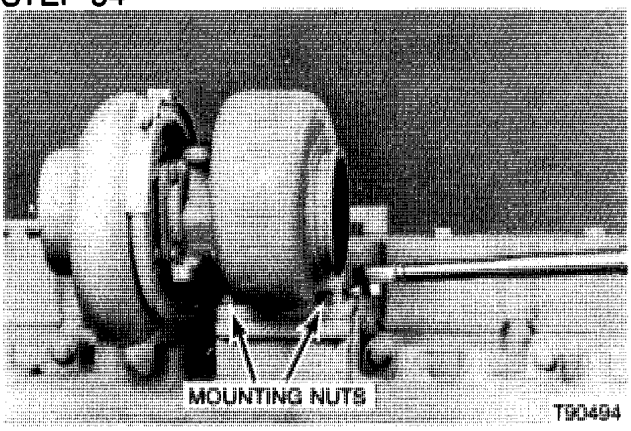
Install a new gasket on the exhaust manifold.

STEP 93



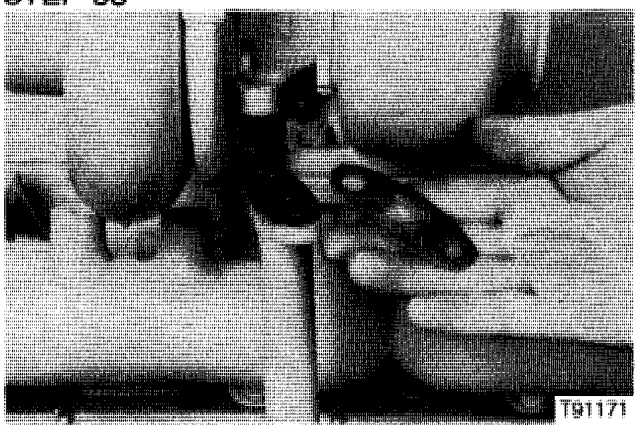
Install the turbocharger on the exhaust manifold.

STEP 94



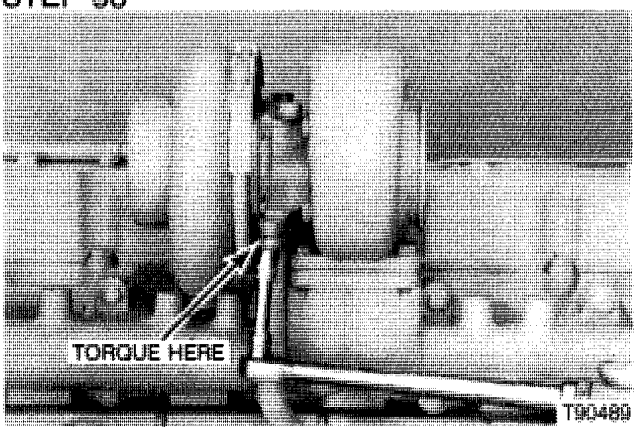
Install the turbocharger mounting nuts and tighten to a torque of 24 lb ft (32 Nm)(3.2 kgm).

STEP 95



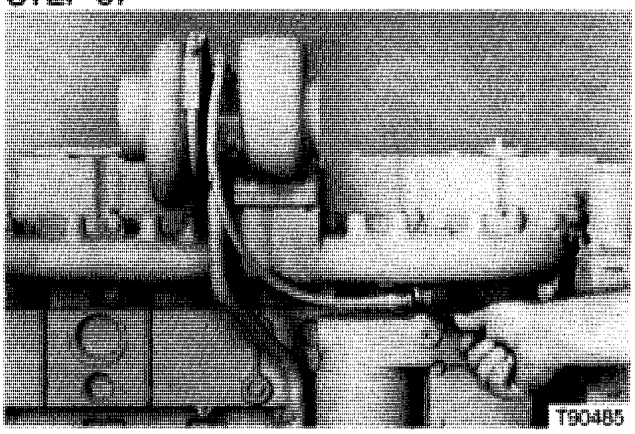
Install a new gasket on the oil drain tube.

STEP 96



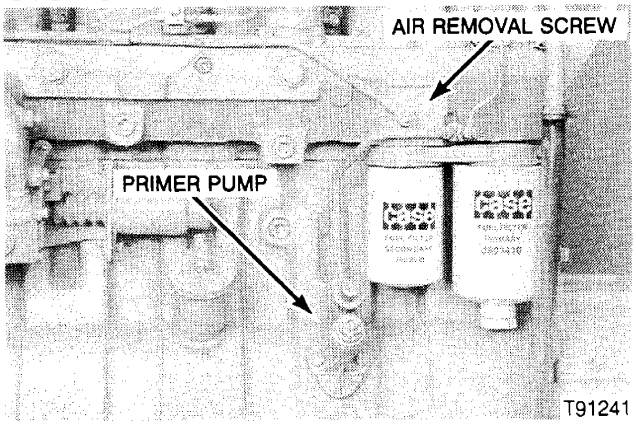
Install the oil drain tube bolts and tighten the bolts to a torque of 18 lb ft (24 Nm)(2.4 kgm).

STEP 97



Connect and tighten the oil supply tube to the turbocharger and the filter housing.

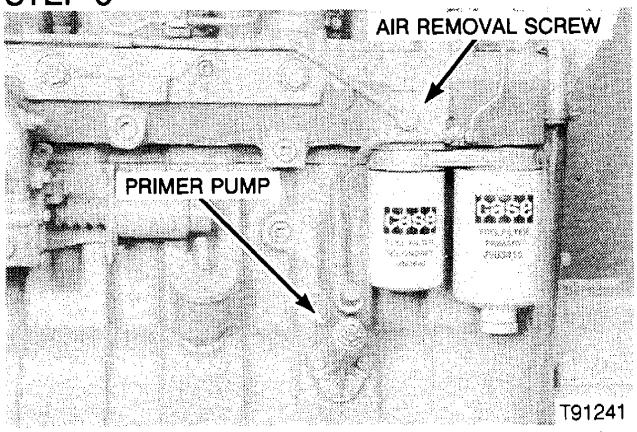
STEP 5



Make sure there is fuel in the fuel tank. Loosen the air removal screw and actuate the hand primer pump. Close the air removal screw when clear fuel with no bubbles flows from the screw.

NOTE: *If the hand lever on the primer pump can not be actuated, turn the engine over until the pump can be actuated.*

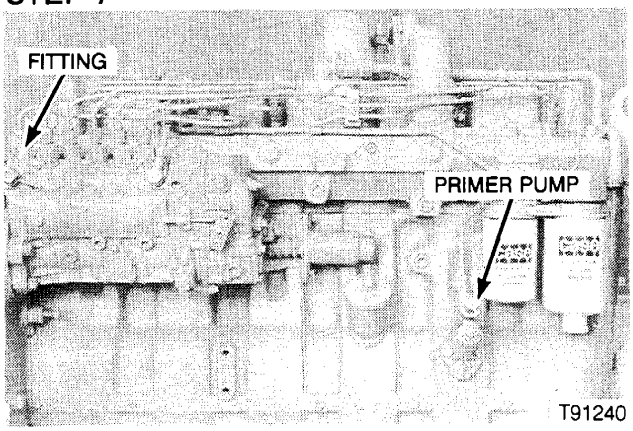
STEP 6



Loosen the air removal screw on the fuel inlet line. Actuate the hand primer pump. Close the air removal screw when clear fuel with no air bubbles, flows from the screw.

NOTE. *If the hand lever on the primer pump can not be actuated, turn the engine until the pump can be actuated.*

STEP 7

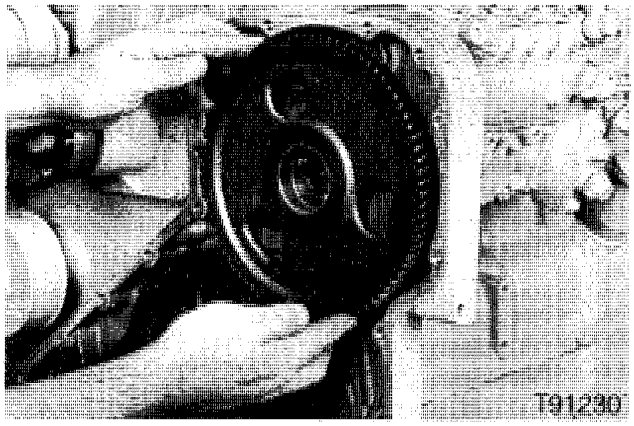


Loosen the fuel return line fitting on the injection pump. Actuate the hand primer pump. Tighten the fuel return line on the injection pump when clear fuel with no air bubbles, flows from the fitting.

NOTE: *If the hand lever on the primer pump can not be actuated, turn the engine until the pump can be actuated.*

Injection Pump Gear Installation

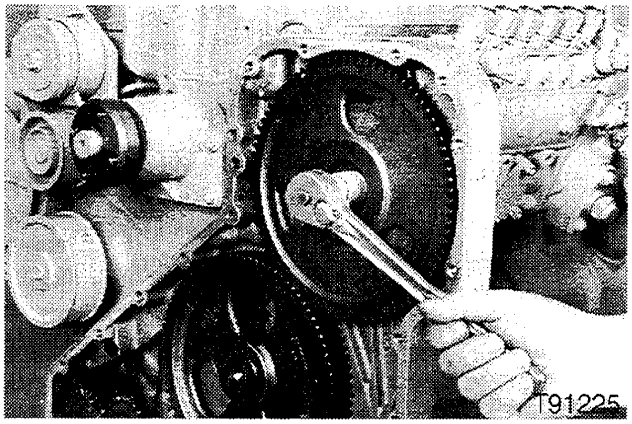
STEP 45



Install the drive gear on the injection pump shaft. The drive gear does not have timing marks.

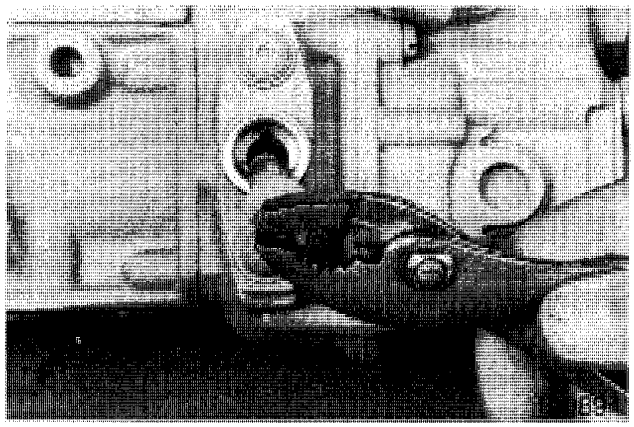
NOTE: *The ID of the drive gear is tapered to fit the injection pump shaft. There is not a key slot in the drive gear.*

STEP 46



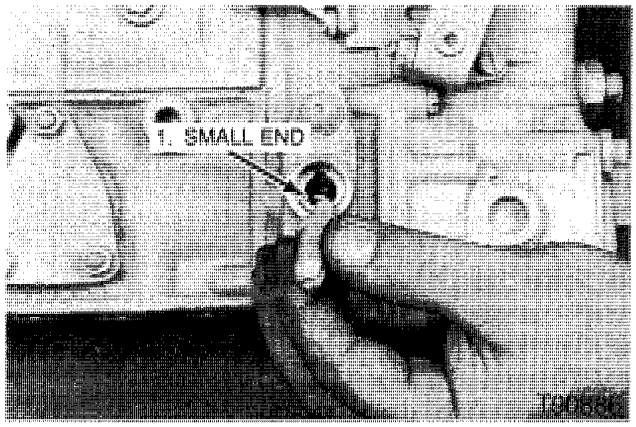
Install the washer and nut on the injection pump shaft and tighten to a torque of approximately 20 Nm.

STEP 47



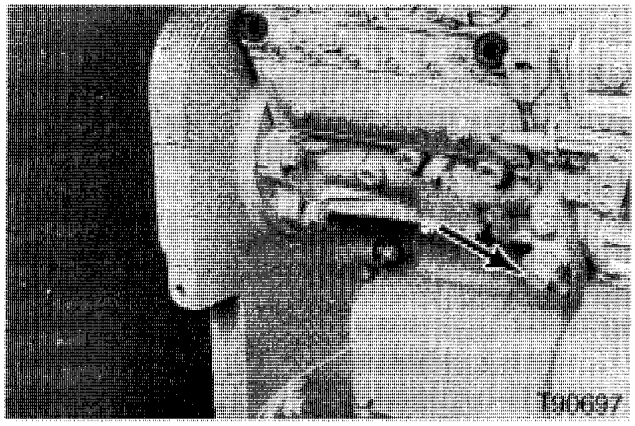
Remove the cover and pull the timing pin out of the injection pump.

STEP 48



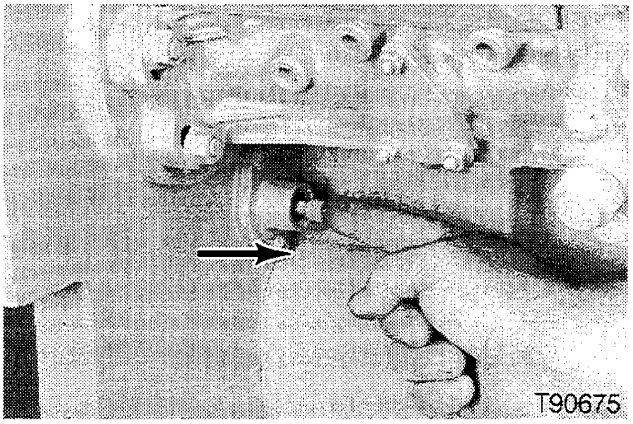
Install the timing pin into the injection pump. The small end must be toward the tab in the injection pump.

STEP 49



Install the timing pin cover and tighten to a torque of 13 to 17 Nm.

STEP 50

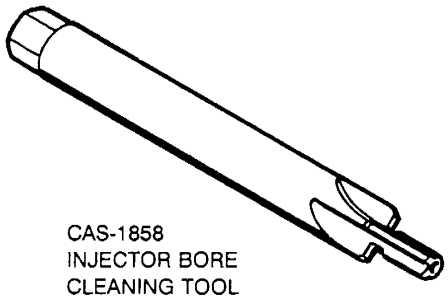


Pull the lock pin out of the camshaft gear.

SPECIAL TORQUES

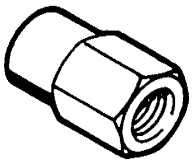
	U.S. Value	Metric Value
Injector Retaining Bolt	18 lb ft	24 Nm (2.4 kgm)
Leak Off Bolt	7 lb ft	9 Nm (0.9 kgm)
Nozzle Cap Nut	18 lb ft	24 Nm (2.4 kgm)

SPECIAL TOOLS

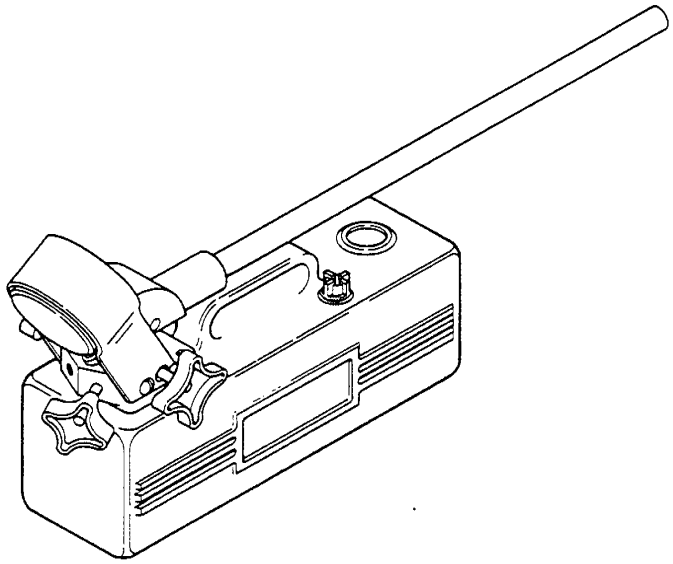


CAS-1858
INJECTOR BORE
CLEANING TOOL

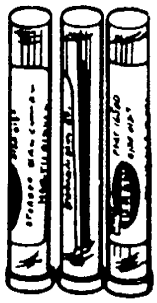
MAGNIFYING GLASS
66-0135



CAS-1815 INJECTOR PULLER ADAPTER

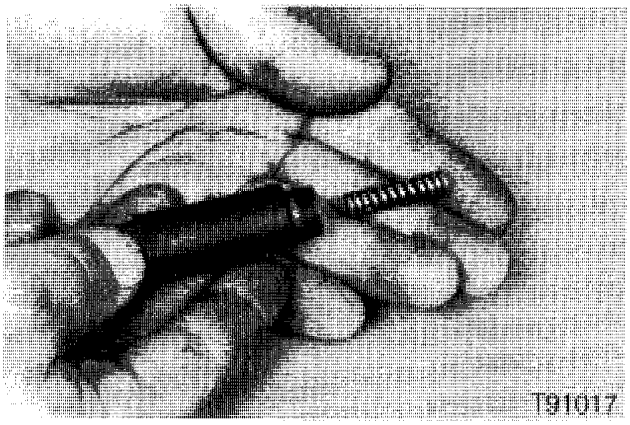


CAS-10091 OR CAS-10249
DIESEL FUEL INJECTION
NOZZLE TESTER



66-0558 ORIFICE
CLEANING WIRES

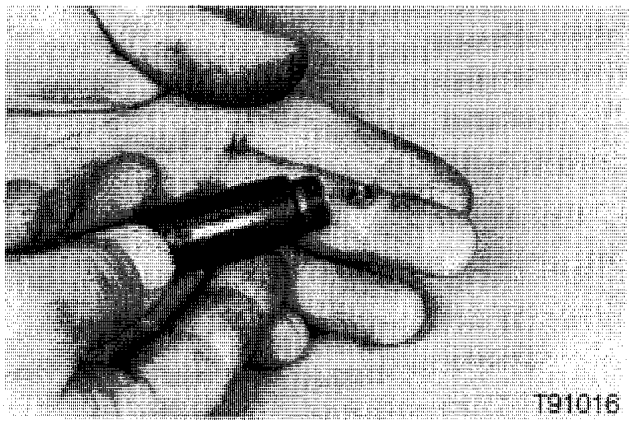
STEP 27



Install the pressure spring in the nozzle holder.

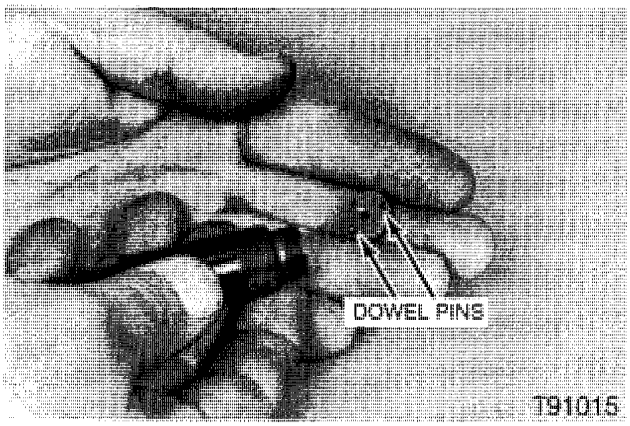
NOTE: *Clean all parts in clean diesel fuel before assembly.*

STEP 28



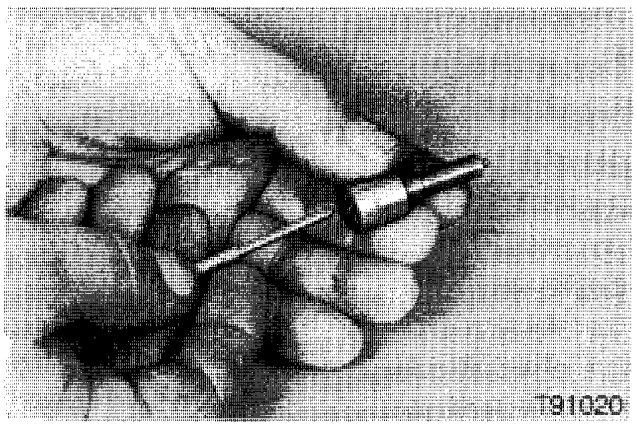
Install the spring seat on the pressure spring. The small diameter end of the spring seat must be toward the pressure spring.

STEP 29



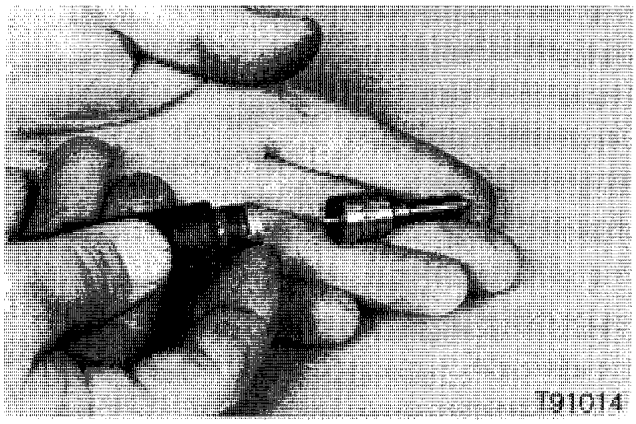
Install the valve stop assembly. Align the dowel pins that are in the valve stop with the dowel pin holes that are in the nozzle holder.

STEP 30



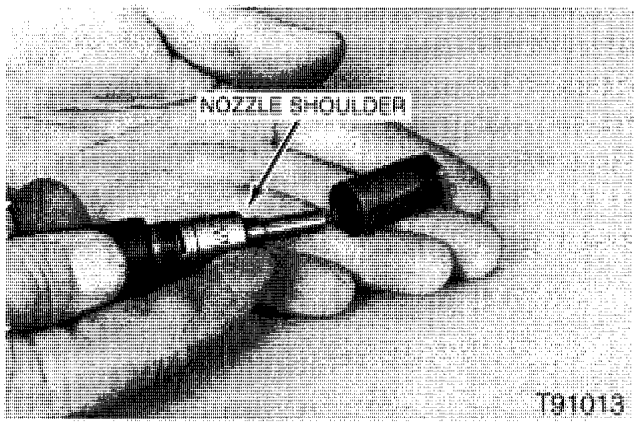
Put a small amount of clean fuel on the nozzle valve and slide the nozzle valve up and down a number of times in the nozzle tip to make sure that there is free movement.

STEP 31



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

STEP 32



Add lubrication to the nozzle shoulder. Do not put grease on the holder or 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.

(19) Ether Injection Switch

Check Points	Reading	Possible Cause of Bad Reading
NOTE: *Disconnect the wires from the ether switch.*		
Between terminals of switch	Continuity	Bad ether switch.
NOTE: *Put the master disconnect switch and the key switch in the ON positions.*		
Terminal for wire 21N to ground	24 volts	Check circuit 21N.

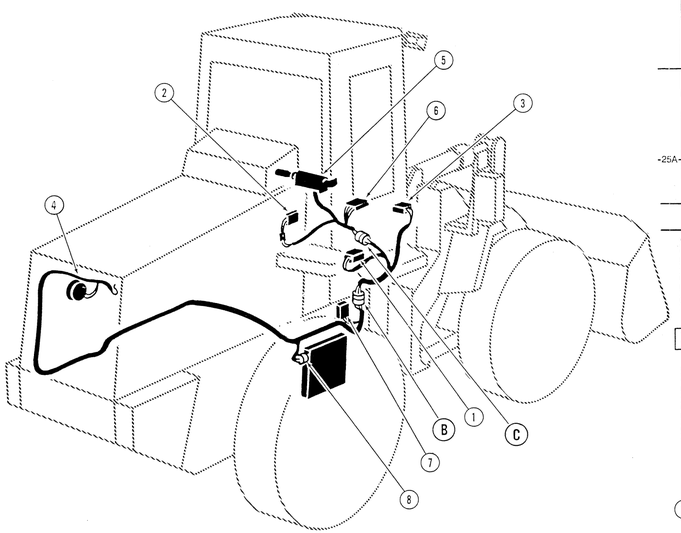
(20) Air/Brake Pressure Switch

Check Points	Reading	Possible Cause of Bad Reading
NOTE: *Put the master disconnect switch in the ON position. Put the key switch in the ON position.*		
Terminal for wire 25S to ground	24 volts	Check the circuit between the air/brake pressure switch and the relay No. 2 transmission clutch cutout on page 13 and 23. Also check relay No. 2.
NOTE: *Start and run the engine at 1000 rpm (r/min) until the air pressure indicator lamp goes off. Stop the engine. Disconnect the wires from the clutch cutout pressure switch.*		
Between the terminals of the air/brake pressure switch	Continuity	Bad clutch cutout pressure switch.

(21) Cab Power Relay

Check Points	Reading	Possible Cause of Bad Reading
Terminal for wire 0 to ground	Continuity	Bad ground circuit.
NOTE: *Put the master disconnect switch in the ON position.*		
Battery terminal to ground	24 volts	Check circuit to batteries.
NOTE: *Put the key switch in the ON position.*		
Terminal for wire 13C to ground	24 volts	Check key switch (12). Also check circuit 13C.
Terminal for switched power	24 volts	Bad cab power relay.

CLUTCH CUTOUT AND TRANSMISSION SHIFTER - EARLY PRODUCTION



CONNECTOR B
Main cab harness to main chassis harness

CONNECTOR C
Main cab harness to front pedestal harness

FUSE
Protects circuit from overload

CONNECTOR
Connects one harness to another harness

SPLICE
Connects one or more circuits that do the same function

CHASSIS GROUND
Completes battery circuit

RELAY
A magnetic switch that directs electrical current

CLUTCH CUTOUT SWITCH
Contacts opened or closed by lever action

SWITCH
Completes an electrical circuit

TRANSMISSION SHIFTER SWITCH
Connects or disconnects current to the transmission solenoids

AUDIBLE ALERT
A warning buzzer that sounds when there is low air pressure for the brake system

DIODE
Allows electrical current to flow freely in one direction only

TRANSMISSION SOLENOID
A magnetic coil that actuates the control spools in the transmission

B+
CLUTCH CUTOUT
TRANSMISSION SHIFTER
B+
TRANSMISSION DIODE MODULE
TRANSMISSION SOLENOIDS
B+

ORANGE 13P
ORANGE 12
LIGHT GREEN 14
WHITE 21N
YELLOW 33P
GREEN 49

1 RELAY NO. 2 TRANSMISSION CLUTCH CUTOUT
ORANGE 19A
-25A-

3 BRAKE CLUTCH CUTOUT (DECLUTCH SWITCH)
NEUTRAL START 7.5 AMPERE FUSE
ORANGE 19F

5 TRANSMISSION SHIFTER
N R F S1 S2 S3
B C J A E D F G H

6 DIODE MODULE
7 RELAY NO. 4 TRANSMISSION CONTROL
8 TRANSMISSION SOLENOIDS
M5 M3 M4 M2 M1

LIGHT BLUE 25C
LIGHT BLUE 25D
LIGHT BLUE 25R
LIGHT BLUE 25G
LIGHT BLUE 25H
LIGHT BLUE 25J
LIGHT BLUE 25F
LIGHT BLUE 25K
LIGHT BLUE 25L
BLACK 0

PIN E OF CONNECTOR C
PIN N OF CONNECTOR C
PIN D OF CONNECTOR C
PIN N OF CONNECTOR B
PIN J OF CONNECTOR C
PIN H OF CONNECTOR C
PIN G OF CONNECTOR C
PIN F OF CONNECTOR C
PIN K OF CONNECTOR C
PIN F OF CONNECTOR B
PIN E OF CONNECTOR B
PIN D OF CONNECTOR B
PIN B OF CONNECTOR B
PIN C OF CONNECTOR B
PIN M OF CONNECTOR B

4 BACKUP ALARM
YELLOW 35R
BACKUP ALARM 3 AMPERE FUSE

2 CLUTCH CUTOUT SWITCH ON LEFT BRAKE PEDAL

TRANSMISSION CONNECTOR

CHASSIS GROUND
CHASSIS GROUND

B891219

(8) Engine Oil Pressure Switch

Check Points	Reading	Possible Cause of Bad Reading
Terminal for 0 to ground	Continuity	Bad ground circuit.

NOTE: *Put the master disconnect switch in the ON position. Put the key switch in the ON position.*

Terminal for wire 31P to ground	Approximately 5 volts	Check instrument cluster (1).

NOTE: *If the readings are good, replace the low air pressure switch.*

(9) Low Air or Brake Pressure Switch

Check Points	Reading	Possible Cause of Bad Reading
Terminal for 0 to ground	Continuity	Bad ground circuit.

NOTE: *Put the master disconnect switch in the ON position. Put the key switch in the ON position.*

Terminal for wire 31L to ground	Approximately 9 volts	Check instrument cluster (1).

NOTE: *If the readings are good, replace the low air pressure switch.*

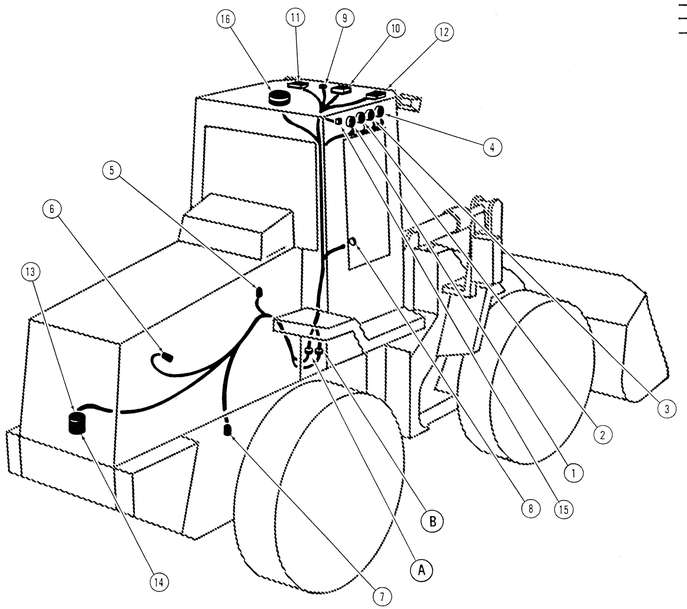
(10) Master Warning Lamp

Check Points	Reading	Possible Cause of Bad Reading
Bulb	Good	Bad bulb.

NOTE: *Put the master disconnect switch in the ON position. Put the key switch in the ON position.*

Terminal for wire 19C to ground	24 volts	Bad 5 ampere fuse in fuse block No. 1.
Between terminal for wire 31W and terminal 4 in the instrument cluster connector	Continuity	Bad circuit between the master warning lamp and the instrument cluster (1). Also check the instrument cluster (1).

GAUGES AND SENDERS, RADIO, AIR DRYER HEATER, AND ROTATING BEACON - EARLY PRODUCTION



CONNECTOR A
Main cab harness to main chassis harness

CONNECTOR B
Main cab harness to main chassis harness

FUSE
Protects circuit from overload

CONNECTOR
Connects one harness to another harness

SPLICE
Connects one or more circuits that do the same function

CHASSIS GROUND
Completes battery circuit

TEMPERATURE SENDER
Resistor type switch activated by oil temperature

OIL PRESSURE SENDER
Resistor type switch activated by oil pressure

AIR PRESSURE SENDER
Resistor type switch activated by air pressure

GAUGE
A solenoid operated pointer that indicates the oil pressure or voltage

LAMP
Produces heat that emits artificial light

SPEAKER
Emits sound

ANTENNA
Receives or transmits radio waves

HIGH TEMPERATURE SWITCH
Contact points open when temperature is too high

HEATING ELEMENT
Produces heat to dry the air in the air dryer

SWITCH
Completes an electrical circuit

ROTATING BEACON
A flashing type of warning lamp

GAUGES AND SENDERS

B+
ORANGE 13P
GREEN 49
ORANGE 12
ORANGE 19C

1 VOLTMETER
2 TRANSMISSION TEMPERATURE GAUGE
3 ENGINE OIL PRESSURE GAUGE
4 AIR PRESSURE GAUGE

GREEN 49
ORANGE 19C
BLACK 0
PURPLE 36X
PURPLE 36P
PURPLE 36A

GAUGE HARNESS CONNECTOR

PURPLE 36X
PIN H OF CONNECTOR B

5 TRANSMISSION TEMPERATURE SENDER
6 ENGINE OIL PRESSURE SENDER
7 AIR PRESSURE SENDER

PURPLE 36P
PIN G OF CONNECTOR B

PURPLE 36A
PIN J OF CONNECTOR B

CHASSIS GROUND

FUSE BLOCK

ORANGE 19C
GREEN 49
ORANGE 12

8 CONSOLE LIGHT

RADIO 5 AMPERE FUSE
ORANGE 19S

9 24 VOLT TO 12 VOLT CONVERTER

BLACK 0
ORANGE 65P

RADIO

ORANGE 13P
GREEN 49

AIR DRYER 10 AMPERE FUSE
PIN 16 OF CONNECTOR A
ORANGE 19R

11 L.H. SPEAKER
12 R.H. SPEAKER

OR-WHITE 65L
BLACK 0Y
RED
LIGHT BLUE
YELLOW
BLACK OR
OR-WHITE 65R

RADIO CONNECTOR

10 RADIO

L.H. SPEAKER GROUND	YELLOW
L.H.SPEAKER SIGNAL	LIGHT BLUE
SWITCHED POWER	
GROUND	BLACK
R.H. SPEAKER SIGNAL	L/GREEN
R.H. SPEAKER GROUND	ORANGE

ANTENNA

AIR DRYER HEATER

13 THERMO SWITCH
ORANGE/WHITE 66

14 AIR DRYER HEATER

BLACK 0

CHASSIS GROUND

ROTATING BEACON

B+
ORANGE 13P
GREEN 49

15 ROTATING BEACON SWITCH
GREEN 49
ORANGE 19L
PINK 46

16 ROTATING BEACON

BLACK 0

B1261B88

(4) Front LH Flood Lamp

Check Points	Reading	Possible Cause of Bad Reading
Terminal for wire 0 to ground	Continuity	Bad ground circuit.
Bulb	Good	Bad bulb.

NOTE: *Put the master disconnect switch in the ON position. Put the key switch in the ON position. Put the light switch in the ON position.*

Terminal for wire 42F to ground	24 volts	Bad circuit between the front LH flood lamp and the light switch (10). Also check the light switch (10).

(5) Front RH Flood Lamp

Check Points	Reading	Possible Cause of Bad Reading
Terminal for wire 0 to ground	Continuity	Bad ground circuit.
Bulb	Good	Bad bulb.

NOTE: *Put the master disconnect switch in the ON position. Put the key switch in the ON position. Put the light switch in the ON position.*

Terminal for wire 42F to ground	24 volts	Bad circuit between the front RH flood lamp and the light switch (10). Also check the light switch (10).

(6) RH Head Lamp

Check Points	Reading	Possible Cause of Bad Reading
Terminal for wire 0 to ground	Continuity	Bad ground circuit.
Bulb	Good	Bad bulb.

NOTE: *Put the master disconnect switch in the ON position. Put the key switch in the ON position. Put the light switch in the ON position.*

Terminal for wire 41D to ground	24 volts	Bad circuit between the RH head lamp and the light switch (10). Also check the light switch (10).

(7) Rear LH Flood Lamp

Check Points	Reading	Possible Cause of Bad Reading
Terminal for wire 0 to ground	Continuity	Bad ground circuit.
Bulb	Good	Bad bulb.

NOTE: *Put the master disconnect switch in the ON position. Put the key switch in the ON position. Put the light switch in the ON position.*

Terminal for wire 42R to ground	24 volts	Bad circuit between the rear LH flood lamp and the light switch (10). Also check the light switch (10).

AIR CONDITIONING, FRONT WIPER, AND WASHER - EARLY PRODUCTION

CONNECTOR A
Main cab harness to main chassis harness.

CONNECTOR B
Main cab harness to main chassis harness.

FUSE
Protects circuit from overload.

CONNECTOR
Connects one harness to another harness.

SPLICE
Connects one or more circuits that do the same function.

CHASSIS GROUND
Completes battery circuit.

RELAY
A magnetic switch that directs electrical current.

PRESSURE SWITCH (LOW)
Pressure actuated contact points close when pressure is too low.

PRESSURE SWITCH (HIGH)
Pressure actuated contact points close when pressure is high.

ELECTRIC CLUTCH (COMPRESSOR)
A magnetic field coil on compressor pulley. When energized allows rotation of compressor crankshaft. When not energized pulley free wheels.

LAMP
Produces heat that emits artificial light.

CIRCUIT BREAKER
Heat actuated automatic or manual reset, protects electrical circuits from overload.

ELECTRIC MOTOR (CONDENSER FAN)
An electric motor.

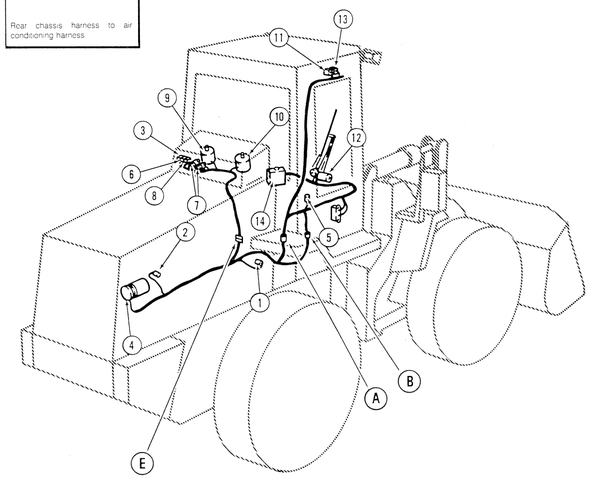
ELECTRIC MOTOR (WIPER)
An electric motor.

ELECTRIC MOTOR (WASHER PUMP)
An electric motor.

WIPER SWITCH
Directs electrical current to the wiper motor.

WASHER SWITCH
Completes an electrical circuit to the motor.

CONNECTOR E
Rear chassis harness to air conditioning harness.

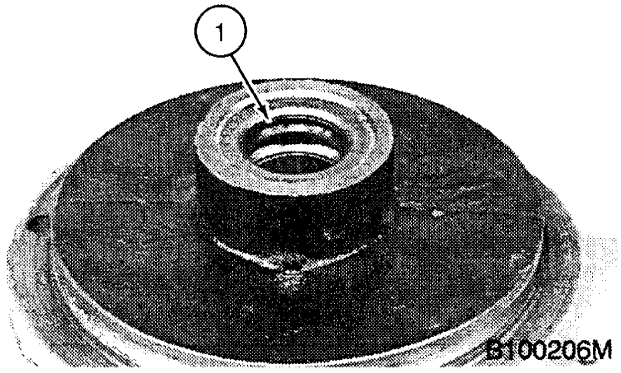


B+
COMPRESOR CLUTCH RELAY
COMPRESSOR CLUTCH
CONDENSOR FAN RELAYS AND MOTORS
FRONT WIPER SWITCH
WASHER SWITCH AND PUMP MOTOR
B+
ORANGE 13P
GREEN 49
RED 1
PIN A OF CONNECTOR E
10 AMPERE CIRCUIT BREAKERS
7
PIN L OF CONNECTOR B
ORANGE-WHITE 61M
PIN F OF CONNECTOR E
ORANGE-WHITE 61A
LOW PRESSURE SWITCH 1
HIGH PRESSURE SWITCH 2
ORANGE-WHITE 61R
6 CONDENSOR FAN RELAY NO. 1
8 CONDENSOR FAN RELAY NO. 2
ORANGE 19U
ORANGE 19V
BLACK 0
PIN 15 OF CONNECTOR A
5 AIR CONDITIONING WARNING LAMP
ORANGE-WHITE 61N
ORANGE-WHITE 61P
PIN D OF CONNECTOR E
PIN C OF CONNECTOR E
ORANGE-WHITE 61C
PIN E OF CONNECTOR E
3 COMPRESSOR CLUTCH RELAY
4 COMPRESSOR CLUTCH
9 CONDENSOR FAN MOTOR NO. 1
10 CONDENSOR FAN MOTOR NO. 2
11 FRONT WIPER SWITCH
FRONT WIPER AND WASHER 10 AMPERE FUSE
ORANGE 19D
ORANGE-WHITE 63L
ORANGE-WHITE 63H
ORANGE-WHITE 63C
12 FRONT WIPER MOTOR
13 WASHER SWITCH
ORANGE-WHITE 67
14 WASHER PUMP MOTOR
CHASSIS GROUND
CHASSIS GROUND
B1264B88

Issued 10-91 Printed in U.S.A.

TABLE OF CONTENTS

6. Press a new seal into the shift lever housing.

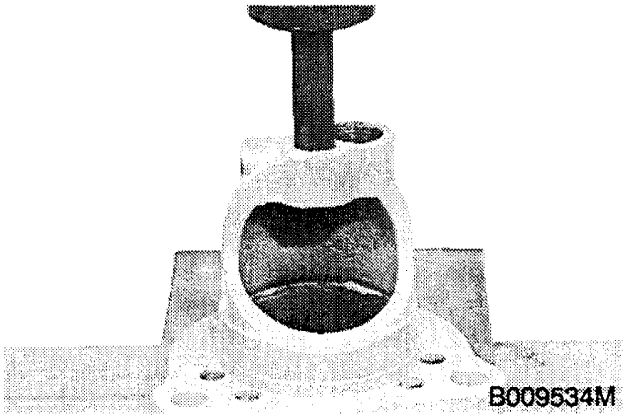


1. Seal

Typical of Procedure

Starter Drive Housing

1. Press the bushing out of the starter drive housing

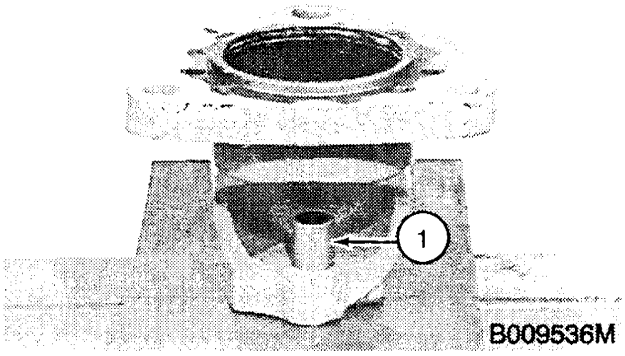


Typical Starter Drive Housing

2. Put the new bushing in a container of SAE 20 engine oil for two minutes.

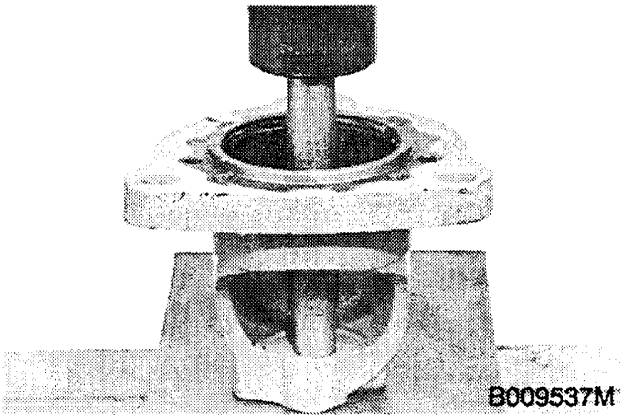
3. Fill the wick in the starter drive housing with SAE 20 engine oil.

4 Put the bushing in position in the bore of the starter drive housing



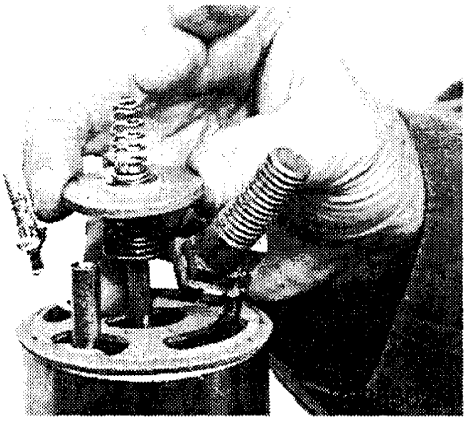
1. Bushing

5. Press the bushing into the bore until the bushing is even with the top of the bore.



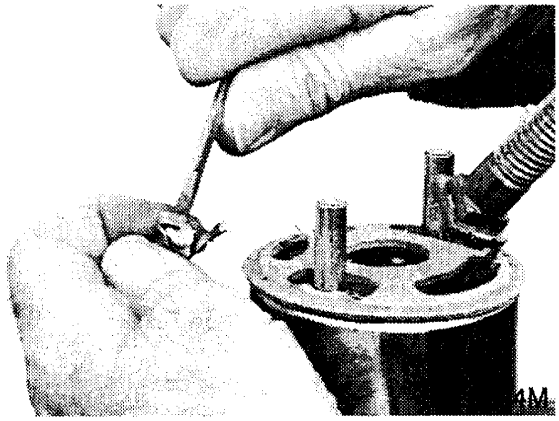
IMPORTANT: *DO NOT ream the bushing. The bushing is made of sintered bronze. Reaming the bushing, using any method, will prevent oil in the wick from going through the bushing to lubricate the armature shaft.*

STEP 95



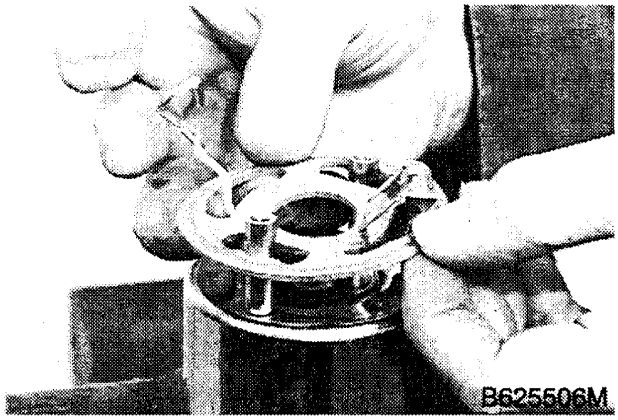
Remove the contact assembly.

STEP 96



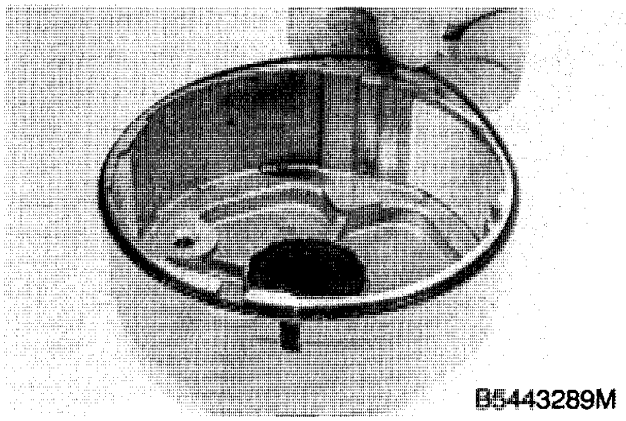
Remove the terminals from the wire terminals.

STEP 97



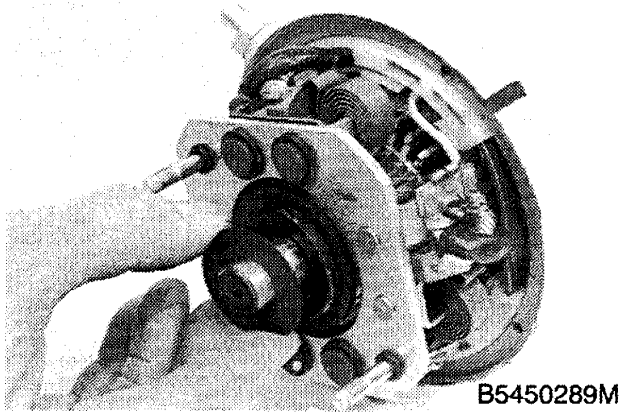
Remove the gasket.

STEP 11



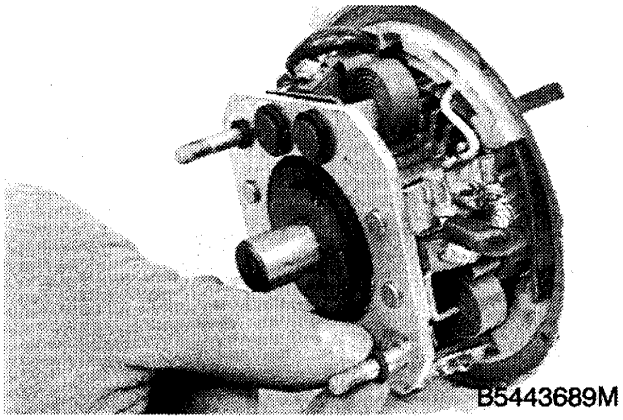
Remove and discard the O-ring.

STEP 12



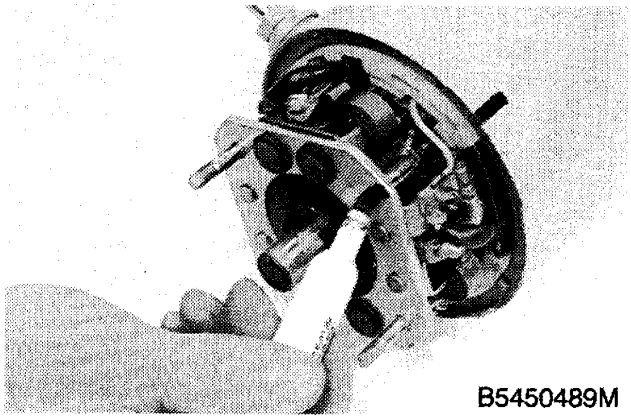
Remove the thrust washer.

STEP 13



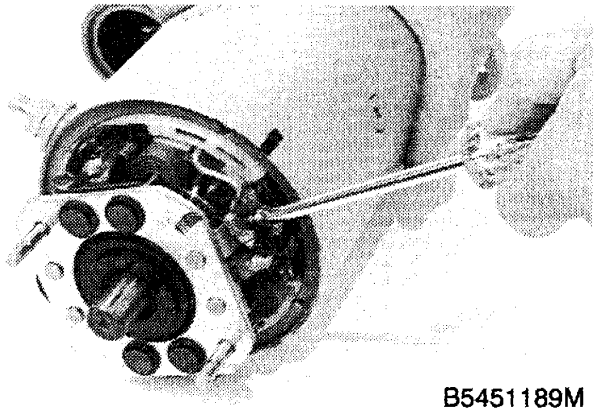
Remove and discard the O-rings.

STEP 14



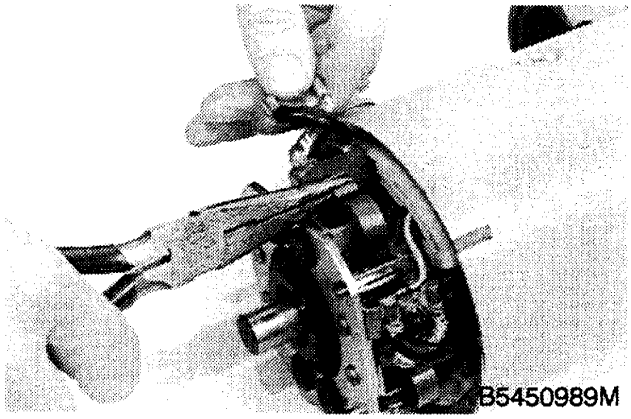
Make an alignment mark on the field frame and the brush holder.

STEP 15



Remove the screws and lock washers that fasten the brushes to the brush holder.

STEP 16



Remove the brushes.

Parking Brake

Turn the key switch from OFF to ON and wait three seconds for the instrument cluster to complete the self-test. If the warning lamp does not illuminate during the self-test, the instrument cluster is bad and must be replaced.

After the self-test the warning lamp must be illuminated only when the key switch is in the ON position and the parking brake is applied.

If the warning lamp does not illuminate when the parking brake lever is all the way up, the cause can be:

1. An open circuit in the wire that connects the parking brake switch to the instrument cluster. The wire (yellow) is connected to the No. 16 terminal in the connector for the instrument cluster.

2. An open circuit in the wire that connects the parking brake switch to the ground connection.

3. The parking brake switch is bad.

If the warning lamp illuminates when the parking brake lever is all the way down, the cause can be:

1. A short circuit to ground in the wire that connects the lamp switch to the instrument cluster. The wire (yellow) is connected to the No. 16 terminal in the connector for the instrument cluster.

2. The parking brake switch is bad.

MASTER WARNING LAMP

The master warning lamp is mounted on the steering column and is controlled by the instrument cluster.

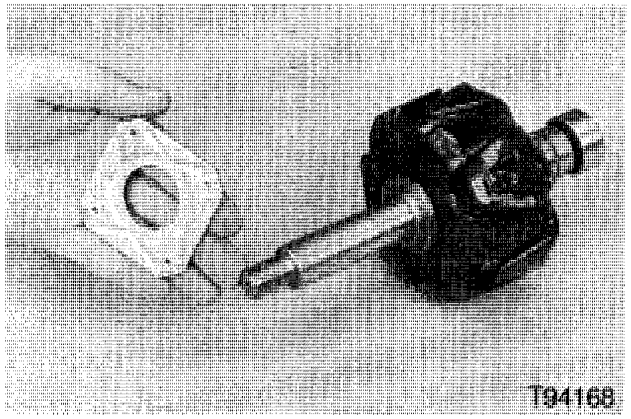
The master warning lamp must illuminate continuously during the self-test. Turn the key switch from OFF to ON and wait three seconds for the instrument cluster to complete the self-test. If the master warning lamp does not illuminate during the self test, check for a bad bulb. If the bulb is good check for an open circuit in the wires that connect the master warning lamp to the instrument cluster and to the ground connection. If there is not an open circuit, the instrument cluster is bad and must be replaced.

The master warning lamp must illuminate intermittently when any of the following warning lamps are illuminated. If the master warning lamp does not illuminate, the instrument cluster is bad and must be replaced.

1. Engine oil pressure
2. Air pressure
3. Auxiliary steering
4. Engine coolant temperature
5. Parking brake, when transmission is in FORWARD or REVERSE
6. Alternator
7. Transmission oil temperature
8. Hydraulic oil temperature

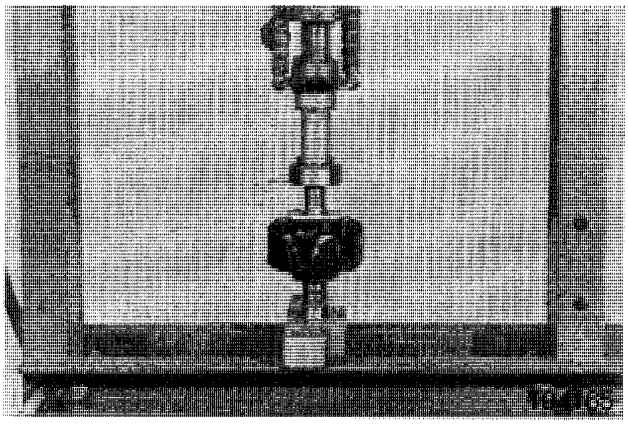
The master warning lamp must illuminate intermittently when the top two bars of the engine temperature gauge are illuminated. If the master warning lamp does not illuminate, the instrument cluster is bad and must be replaced.

STEP 44



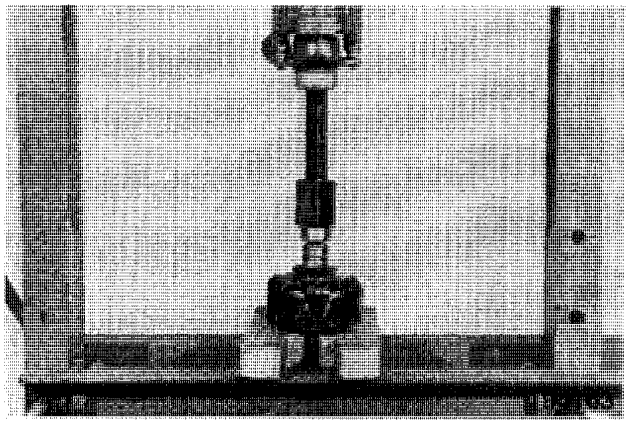
Install bearing retaining plate.

STEP 45



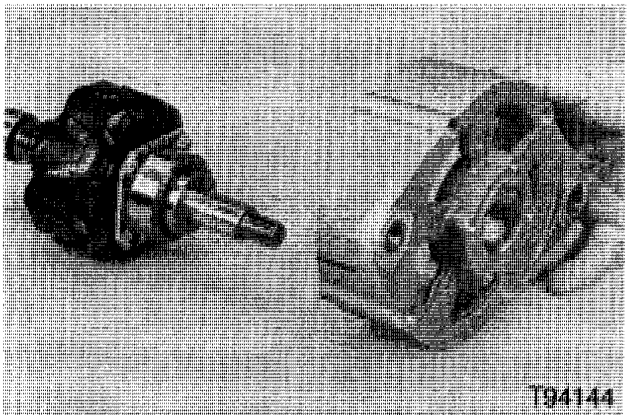
Install a new front bearing on the rotor shaft if it has been removed. Install bearing and spacer ring with a hydraulic press.

STEP 46



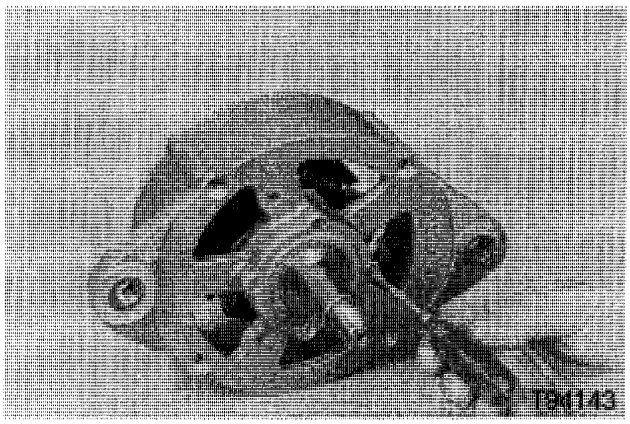
Install a new rear bearing on the rotor shaft if it has been removed. Install bearing using a hydraulic press.

STEP 47



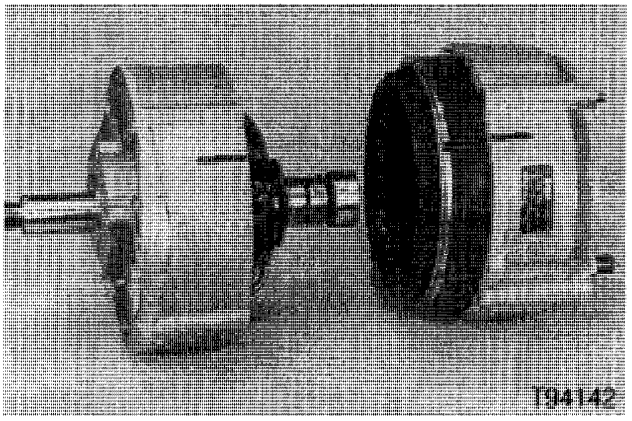
Install the rotor in the front housing.

STEP 48

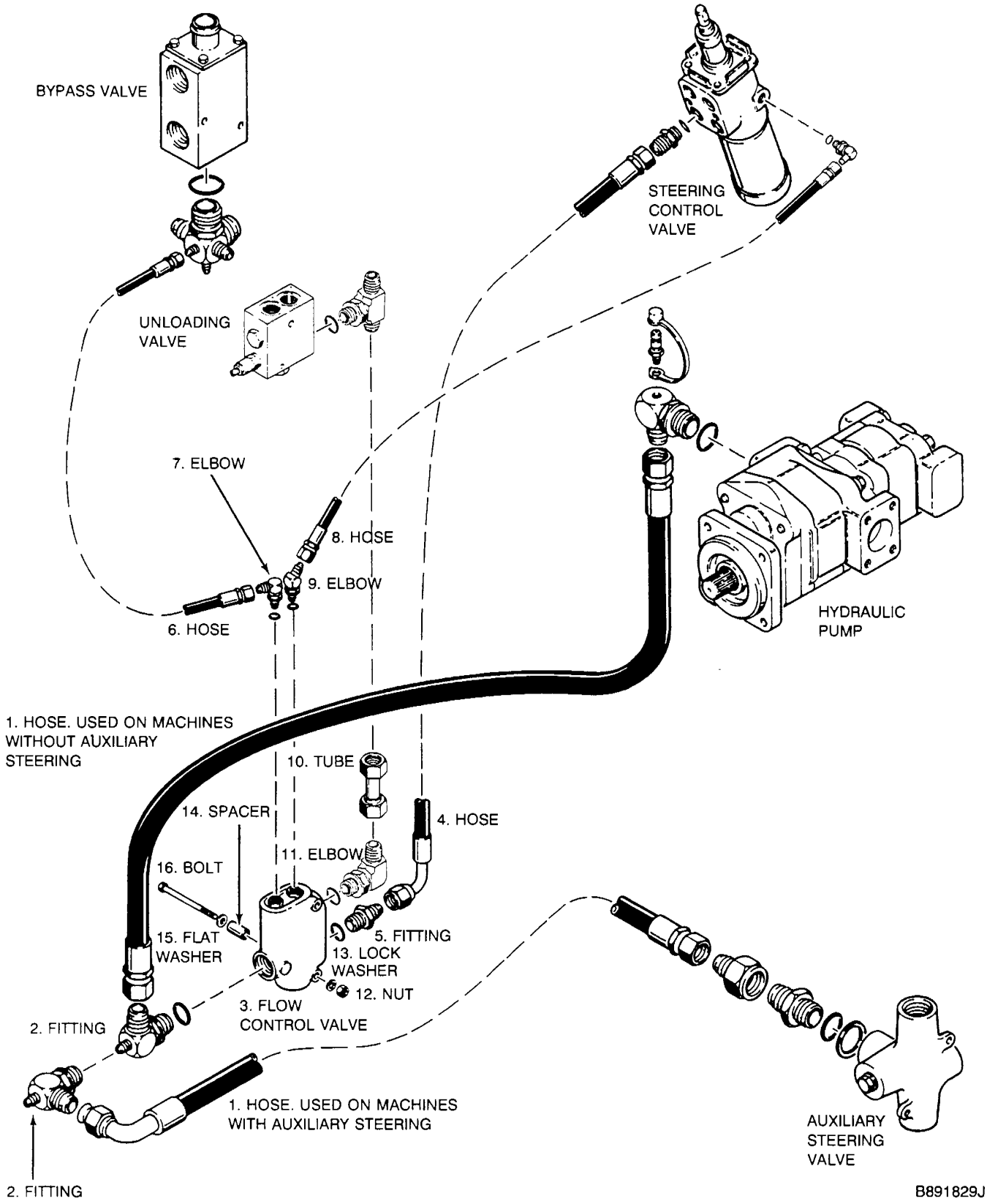


Install and tighten the four screws that hold the rotor in the front housing.

STEP 49



Assemble the front housing and rear housing making sure the reference marks align.


BYPASS VALVE
STEERING CONTROL VALVE
UNLOADING VALVE
7. ELBOW
8. HOSE
9. ELBOW
6. HOSE
HYDRAULIC PUMP
1. HOSE. USED ON MACHINES WITHOUT AUXILIARY STEERING
10. TUBE
14. SPACER
4. HOSE
11. ELBOW
16. BOLT
15. FLAT WASHER
5. FITTING
13. LOCK WASHER
12. NUT
3. FLOW CONTROL VALVE
2. FITTING
1. HOSE. USED ON MACHINES WITH AUXILIARY STEERING
AUXILIARY STEERING VALVE
2. FITTING
B891829J

Section

5002

STEERING TROUBLESHOOTING AND PRESSURE CHECK

CASE CORPORATION

Bur 8-13282

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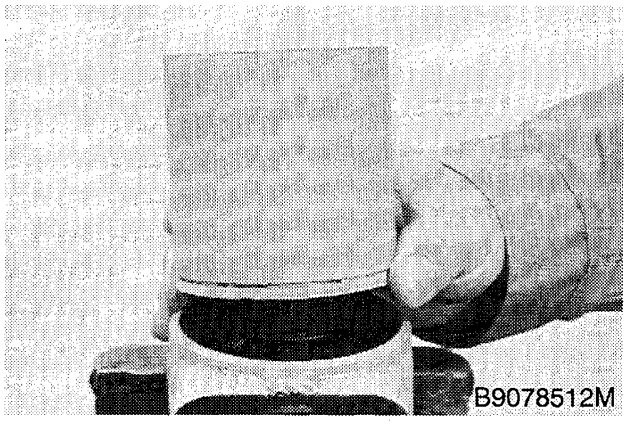
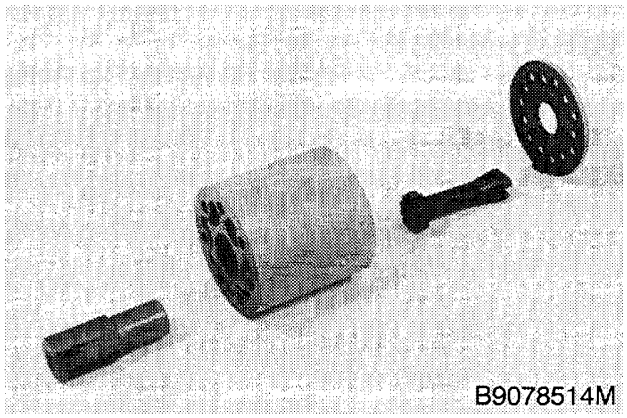
STEP 6



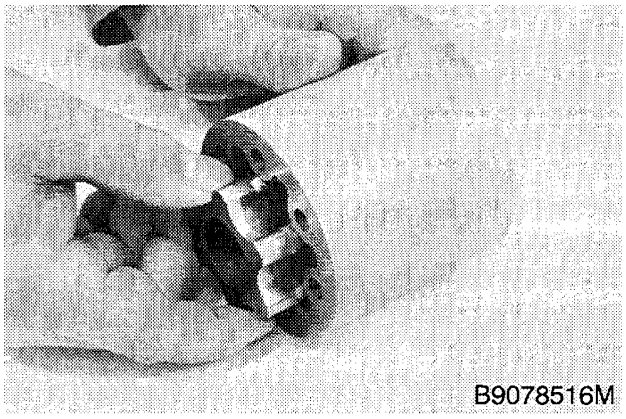
Lift the gerotor set, the drive shaft spacer, the drive shaft, and the spacer plate as an assembly from the body.

STEP 7



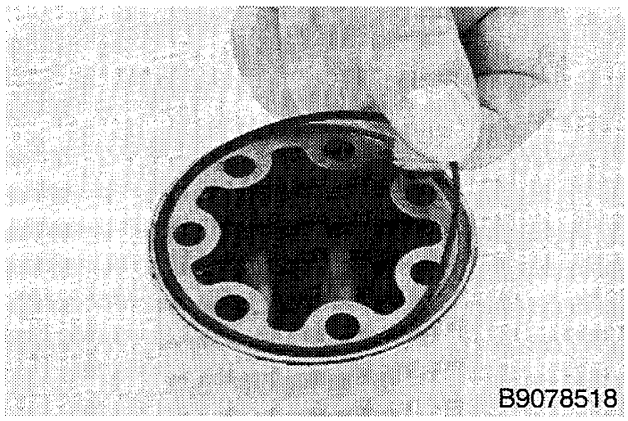
Separate the drive shaft spacer, the drive shaft, the gerotor set, and the spacer plate.

STEP 8



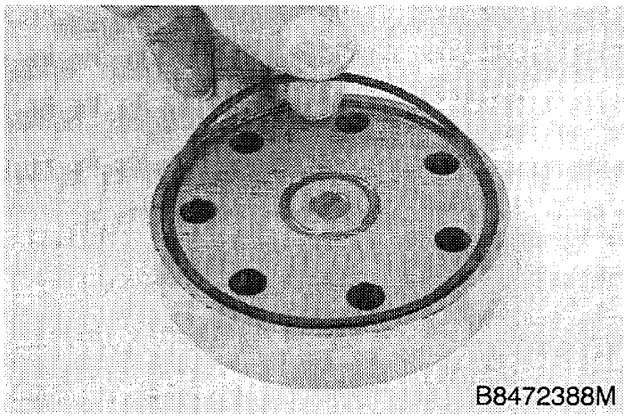
Remove the rotor from the stator.

STEP 9



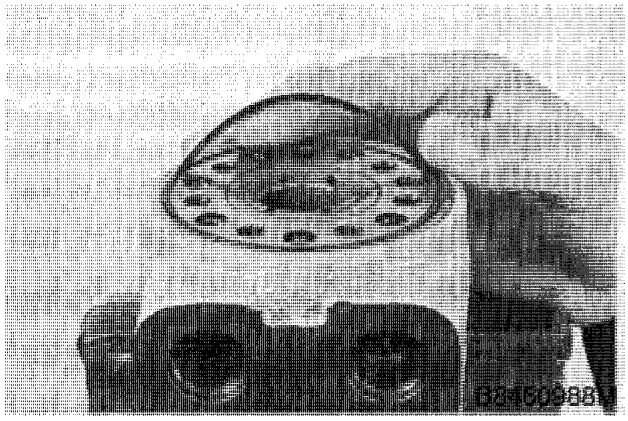
Remove and discard the O-ring from the stator.

STEP 10



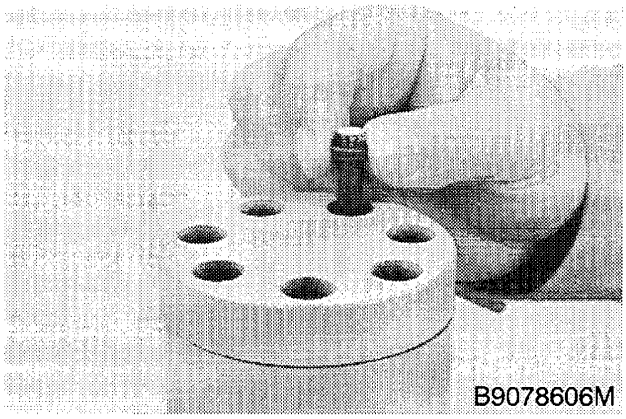
Remove and discard the O-ring from the end plate.

STEP 11



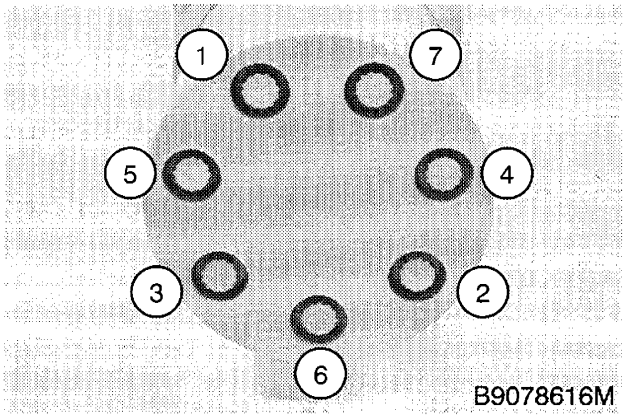
Remove and discard the O-ring from the body.

STEP 74



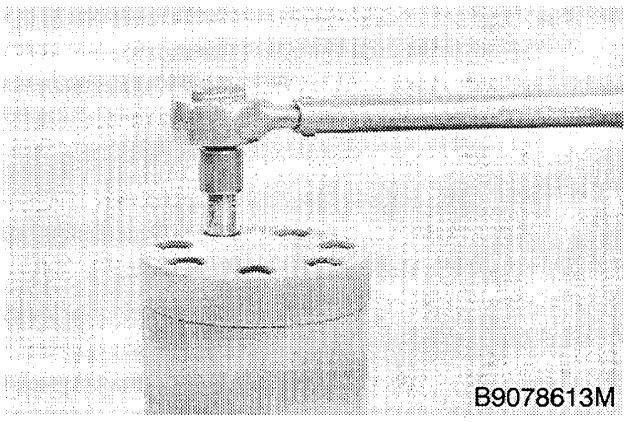
Install the Ferry head screws.

STEP 75



Tighten the Ferry head screws to 100 to 150 pound-inches (11 to 17 Nm) in the sequence shown.

STEP 76



Tighten the Ferry head screws to 225 to 275 pound-inches (25 to 31 Nm) in the sequence shown in step 75.

Assembly

1. Install the wide seal (5) in the gland (18). The wide seal (5) must be installed so that the lips of the wide seal (5) are toward the small end of the gland (18). The wide seal (5) can be difficult to install. Use tools that will not damage the wide seal (5).

2. Install the narrow seal (15) in the gland (18).

3. Install the bushing (10) in the gland (18).

4. Install the wiper (4) in the gland (18).

5. Install the O-ring (16) on the gland (18). The O-ring (16) must be toward the small end of the gland (18).

6. Install the backup ring (17) on the gland (18). The backup ring (17) must be toward the large end of the gland (18). If the backup ring (17) is not flat on both sides, the side that is not flat must be toward the O-ring (16).

7. Fasten the rod eye on the piston rod (1) in the vise.

8. Lubricate the piston rod (1) and the bore in the gland (18) with clean hydraulic oil.

NOTE: *If a new gland (18) is being installed, write the part number of the cylinder on the gland (18).*

9. Push the gland (18) onto the piston rod (1). If necessary, use a soft hammer to drive the gland (18) onto the piston rod (1).

10. Put a support below and near the end of the piston rod (1). Put a cloth between the support and the piston rod (1) to prevent damage to the piston rod (1).

11. Install a new wear ring (6) on the piston (9).

12. Install a new backup ring (7) on the piston (9).

13. Install a new seal (8) over the backup ring (7).

14. Clean the threads on the end of the piston rod and the threads of the cap screw using Loctite cleaning solvent. Allow to dry. Apply Loctite 242 to the piston rod threads 1/4 inch from the open end of the piston rod so that there is 1/2 inch of Loctite 242 on the piston rod threads. DO NOT apply Loctite to the first 1/4 inch of the piston rod threads.

15. Install the cap screw (11) and hardened washer (12) in the piston (9).

16. Install the piston (9) on the piston rod (1) and start the cap screw (11) into the piston rod (1).

17. Tighten the cap screw (11) to the torque shown in the illustration.

18. Fasten the tube (20) in the vise or other holding equipment. Be careful not to damage the tube (20).

19. Apply petroleum jelly to the O-ring (16) and backup ring (17) on the gland (18) and to the sealing surface in the tube (20).

20. Lubricate the piston (9) and the inside of the tube (20) with clean hydraulic oil.

21. Push the piston (9) straight into the tube (20). Be careful not to damage the wear ring (6) and seal (8) on the piston (9).

22. When the piston (9) is in the smooth part of the tube (20), start the gland (18) into the tube (20).

23. If the original parts are being assembled:

a. Tighten the gland (18) to 100 to 400 pound-feet (135 to 542 Nm) until the holes for the lock screw (19) are aligned.

b. Install and tighten the lock screw (19).

c. If, after tightening the gland, the lock screw (19) holes are not aligned, a new hole for the lock screw (19) must be drilled. See the next step.

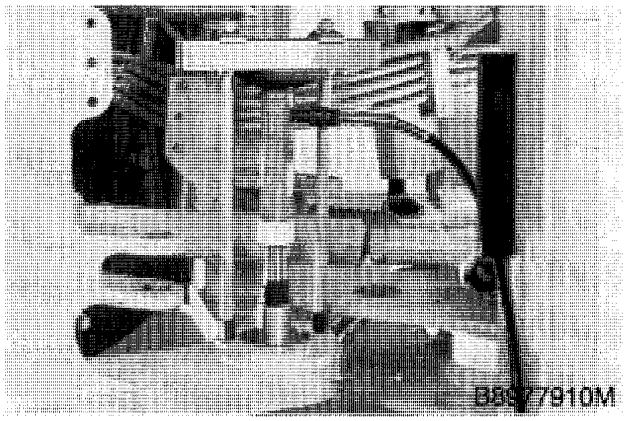
24. If a new gland (18) or a new tube (20) is being assembled:

a. Tighten the gland (18) to 100 to 400 pound-feet (135 to 542 Nm).

b. Use a No. 26 drill and drill a hole half in the gland (18) and half in the tube (20). Drill to a depth of 7/16 inch (11 mm). Do not drill within 1/2 inch (12 mm) of a hole for the gland wrench.

c. Install and tighten the lock screw (19).

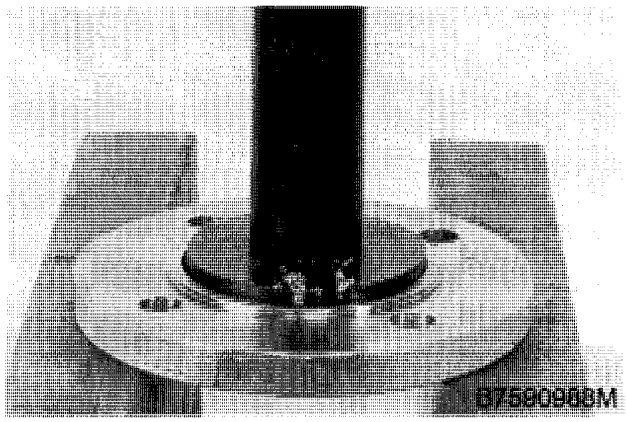
STEP 41



Use the ram, hand pump, and a suitable driver and remove the bearings and spacer from the bottom pivot.

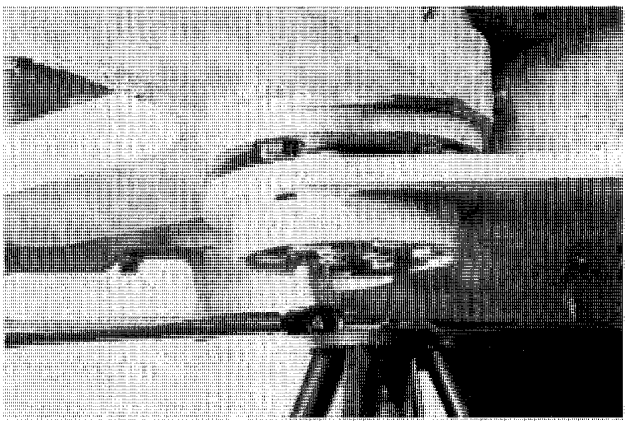
NOTE: *The spacers are matched to the bearing sets. Do not mix the spacers. Do not use old spacers if new bearing sets are being installed.*

STEP 42



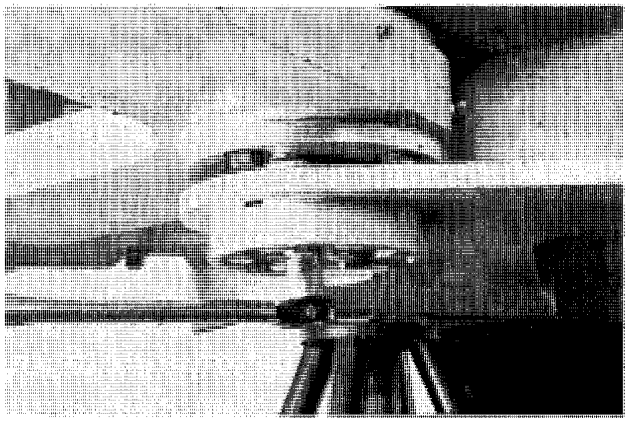
Use an acceptable driver and press the seals out of the bearing retainers.

STEP 95



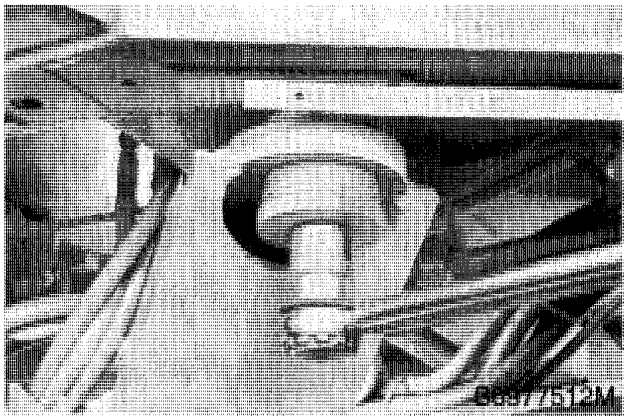
Tighten the six outer cap screws to 220 pound-feet (298 Nm).

STEP 96



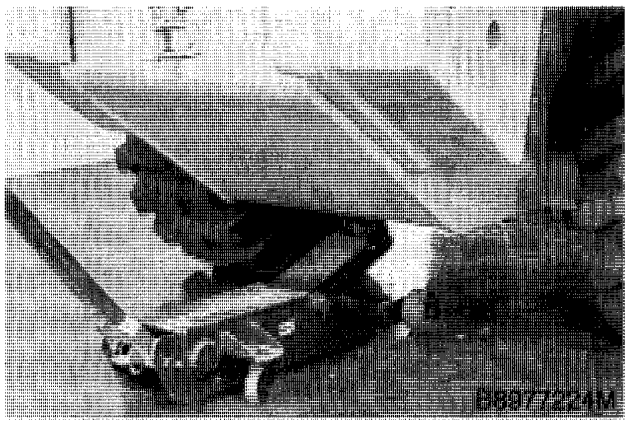
Tighten the three inner cap screws to 245 pound-feet (332 Nm).

STEP 97



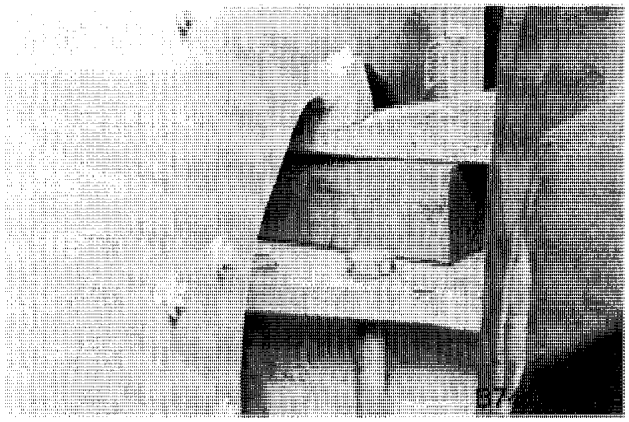
Install the insulator, bolt, flat washer, hardened washer, and nut that fasten each side of the ROPS cab or ROPS canopy to the front of the rear frame. Tighten the bolts to 570 to 630 pound-feet (772 to 854 Nm).

STEP 98



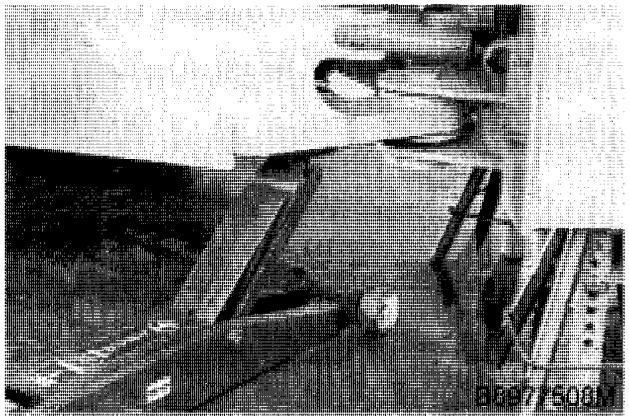
Remove the floor jack from under the center of the rear frame.

STEP 99



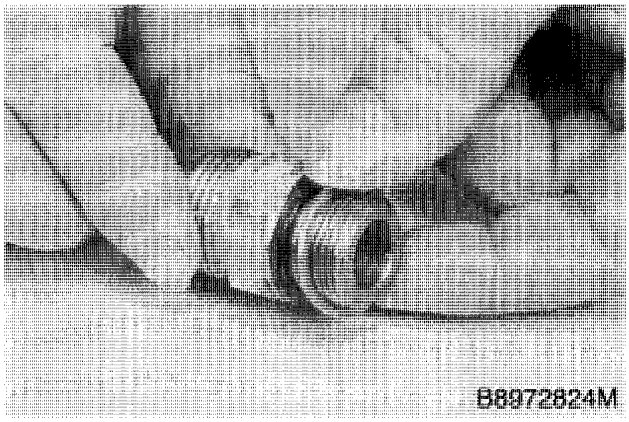
Remove the blocks from between the rear axle and the rear frame.

STEP 100



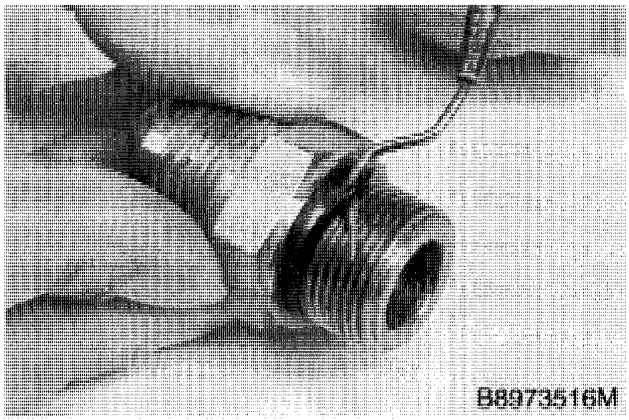
Remove the floor jack from under the front center of the rear frame.

STEP 43



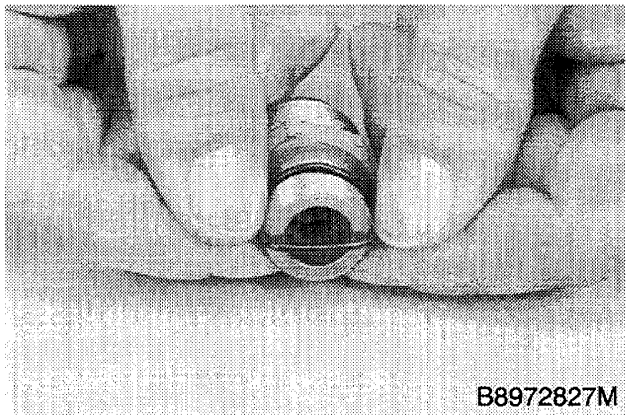
Remove the backup ring from the outlet fitting.

STEP 44



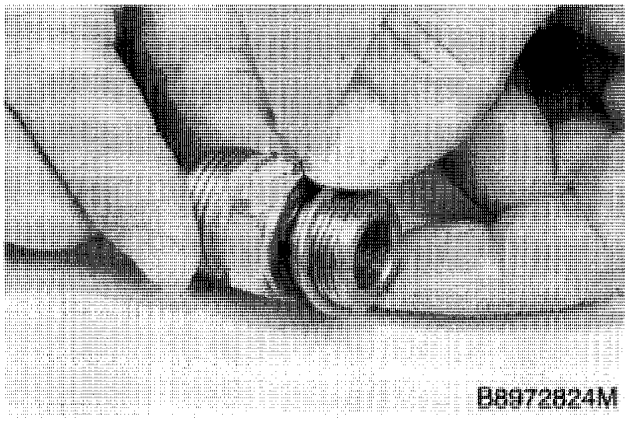
Remove the O-ring from the outlet fitting.

STEP 45



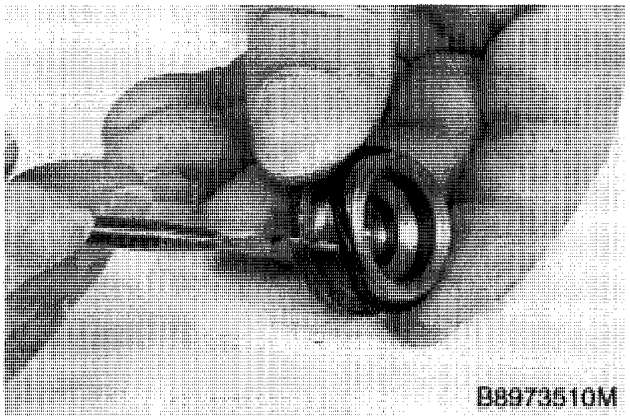
Install a new O-ring on the outlet fitting.

STEP 46



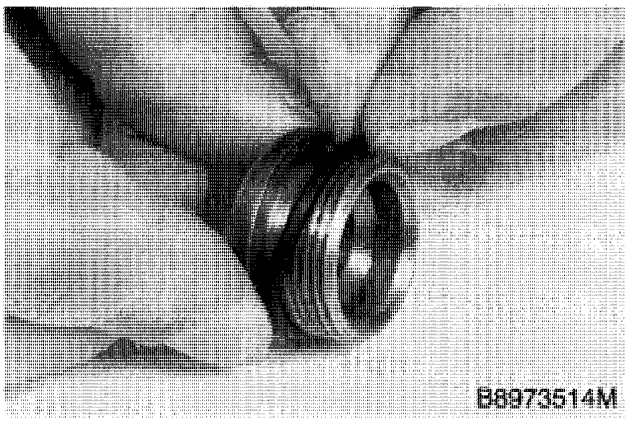
Install the backup ring.

STEP 47



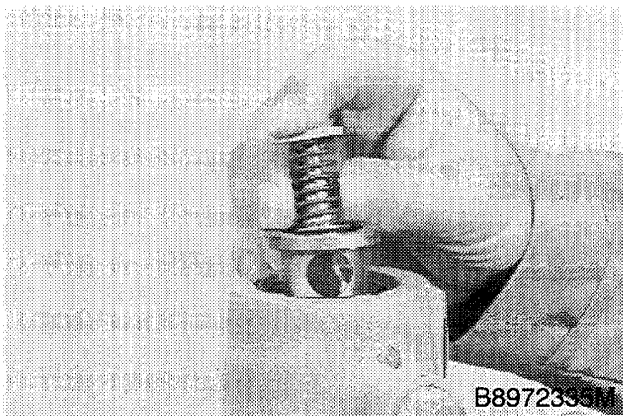
Remove the O-ring from each slotted plug.

STEP 48



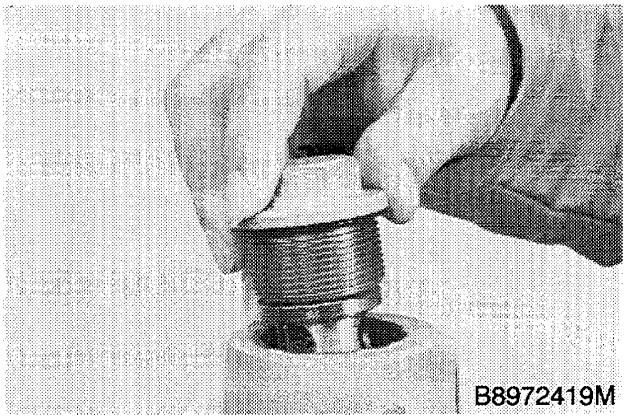
Install a new O-ring on each slotted plug.

STEP 109



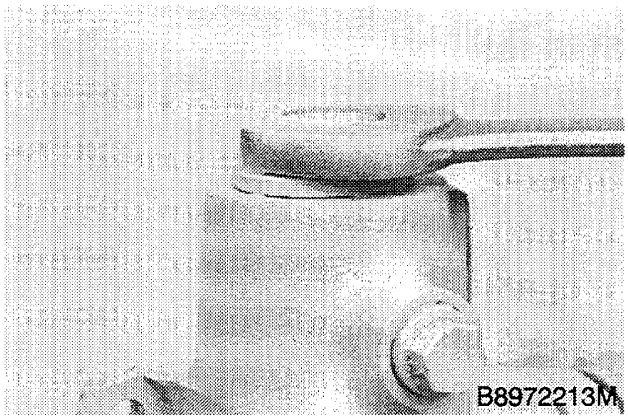
Install the small check valve in the valve sleeve.

STEP 110



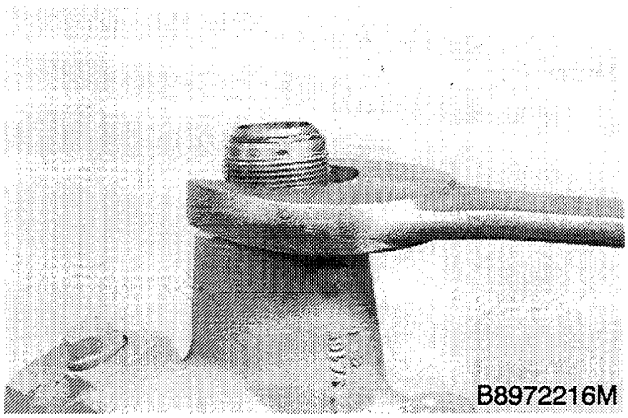
Use the large plug to push the parts into the bore of the valve body, and start the large plug into the threads in the bore.

STEP 111



Tighten the large plug.

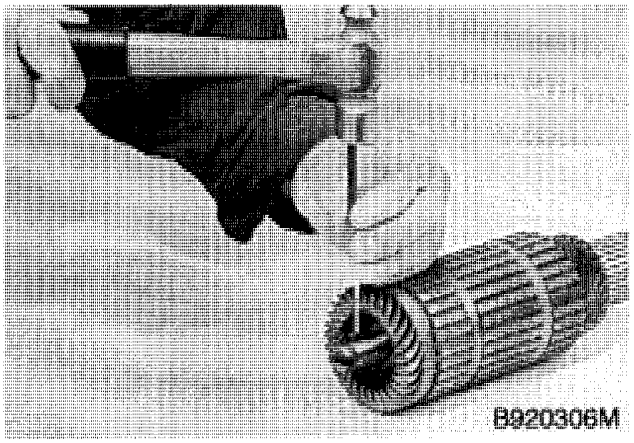
STEP 112



Install the fitting in the top of the valve body.

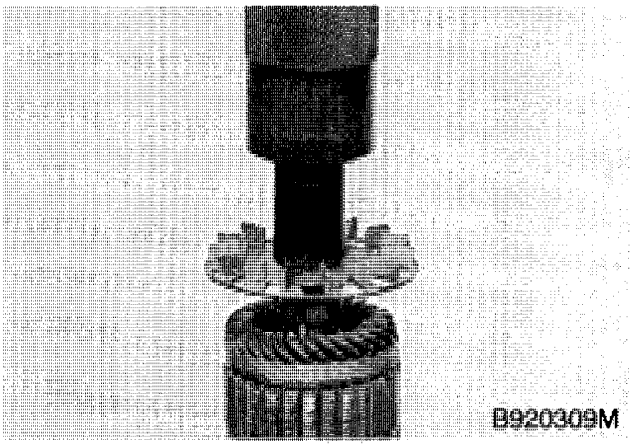
Assembly

STEP 26



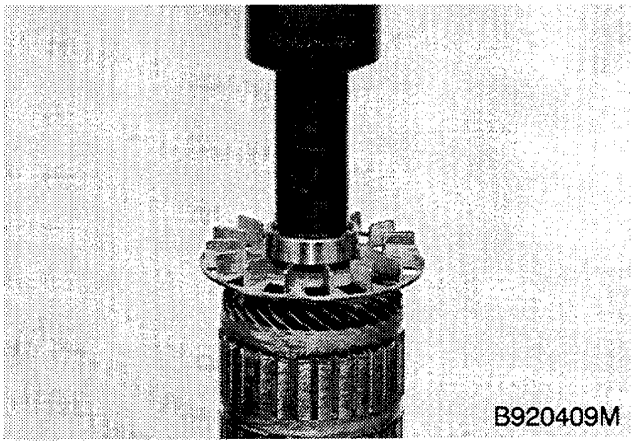
Install the Woodruff key.

STEP 27



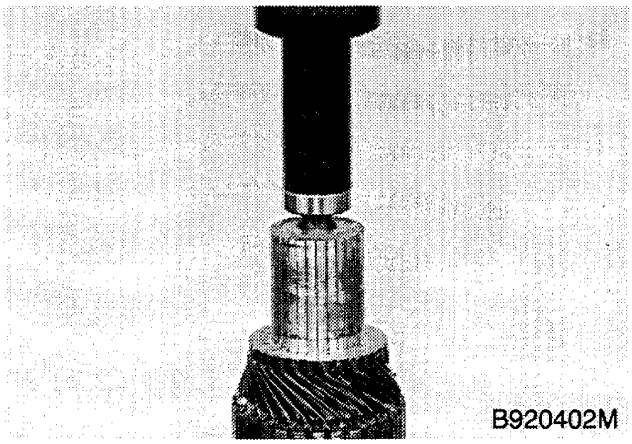
Use an acceptable driver and press the fan onto the shaft.

STEP 28



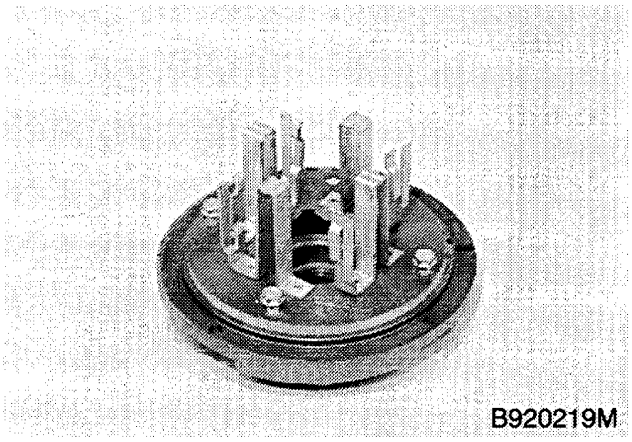
Use an acceptable driver and press the bearing onto the shaft.

STEP 29



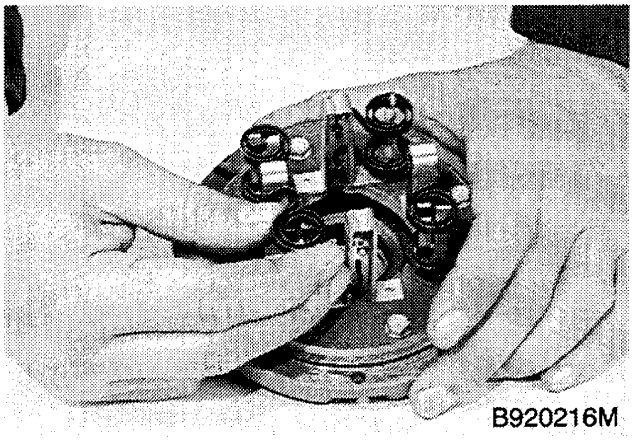
Press the bearing onto the shaft.

STEP 30



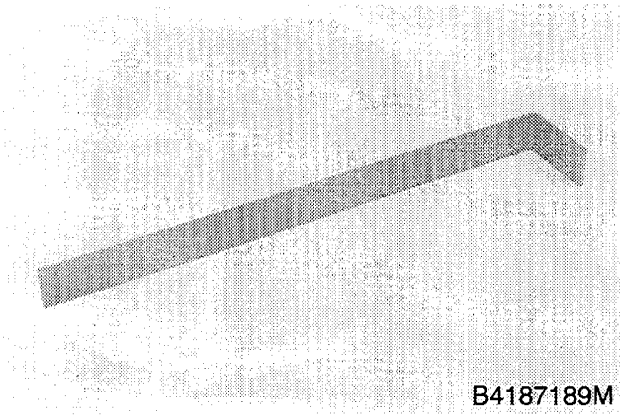
Align the brush holder with the commutator end cover and install and tighten the cap screws.

STEP 31

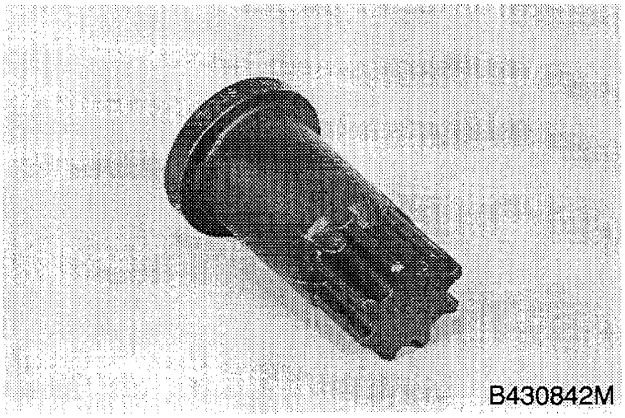


Install the brush springs.

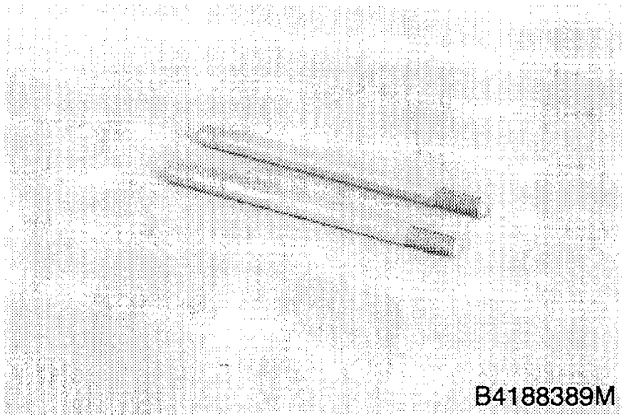
SPECIAL TOOLS



CAS-2020 lever used for Removal and Installation of Hydraulic Pump. Shown in use in Step 114.



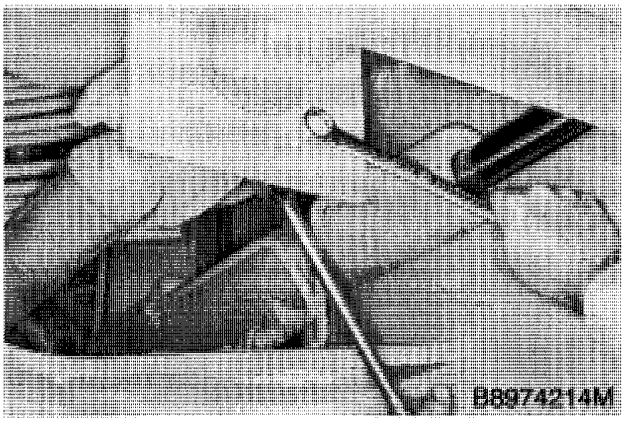
CAS-1960 Used to turn flywheel. Shown in use in step 145.



CAS-1927 Guide Studs. Used to Remove and Install the Transmission Control Valve. Instructions for use are in step 241.

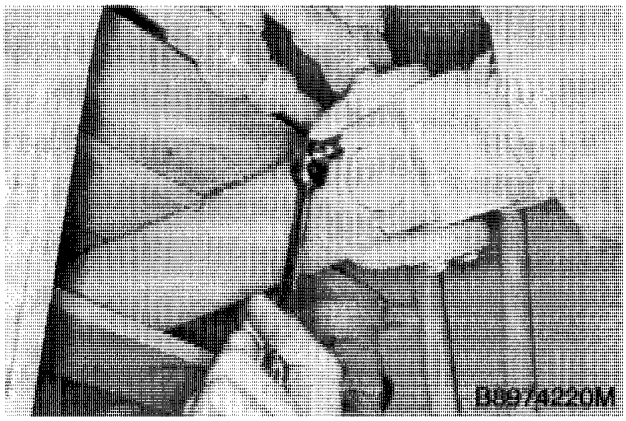
REMOVAL OF FRONT AXLE

STEP 1



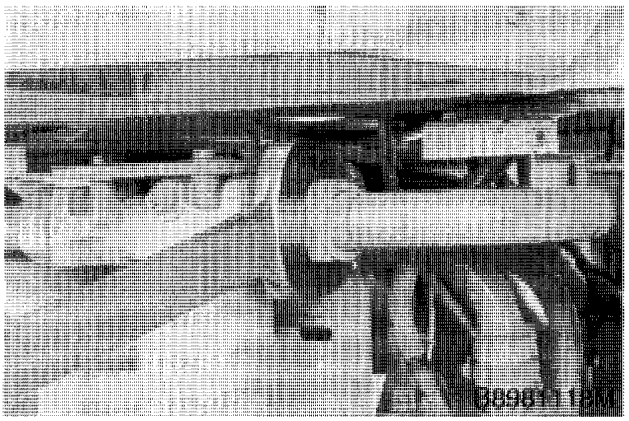
Loosen and remove the nuts and lock washers from the bolts that hold the center bearing.

STEP 2



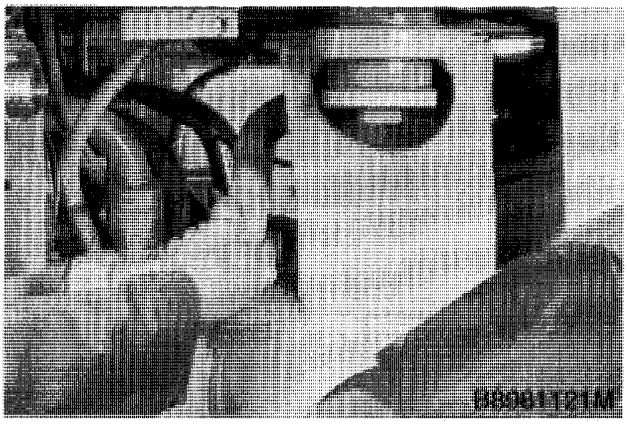
Loosen and remove the Ferry head screws and clamps.

STEP 84



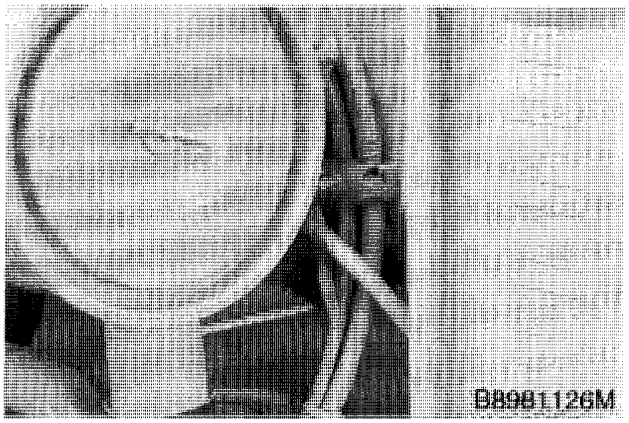
Disconnect the tube from the filters.

STEP 85



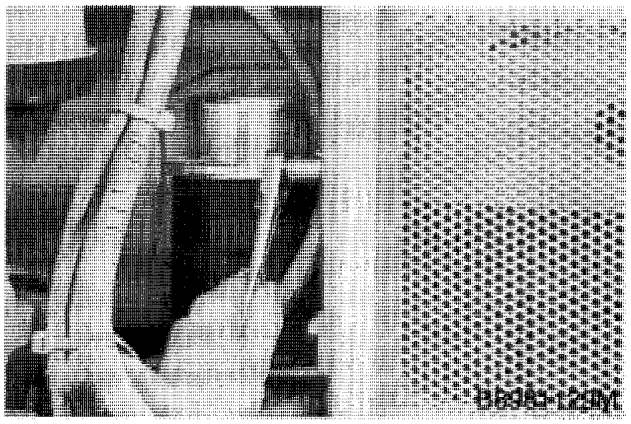
Remove the tube.

STEP 86



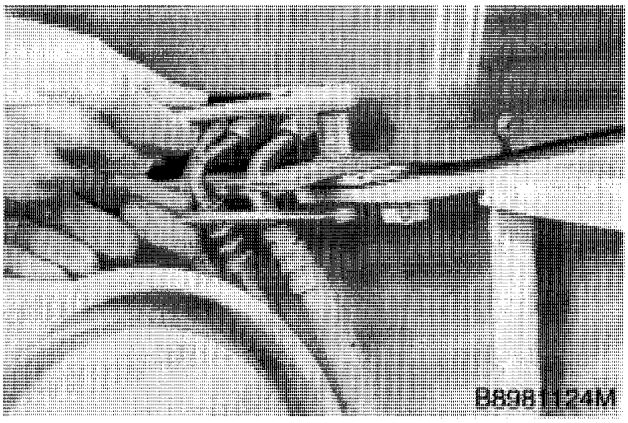
If equipped with air conditioning, loosen and remove the nut and lock washer that hold the clamp for the wiring harness and the clamp for the hoses.

STEP 87



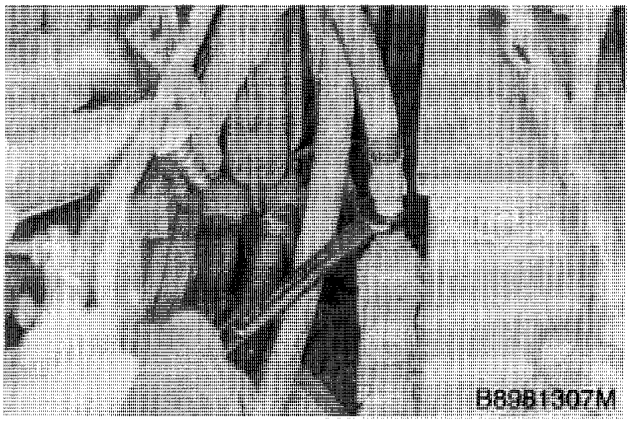
Loosen and remove the nut and lock washer that hold the clamp for the hose to the reservoir.

STEP 88



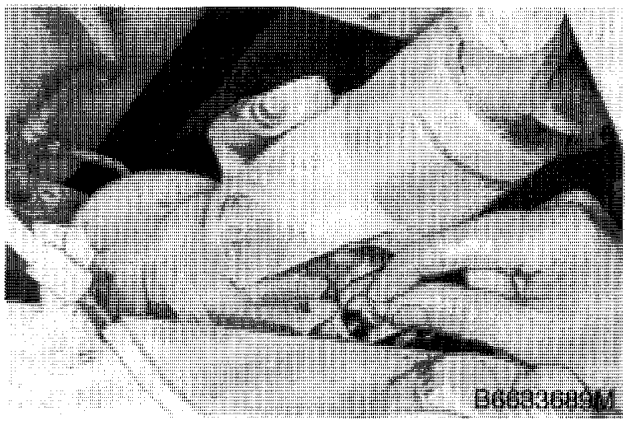
If equipped with air conditioning, loosen and remove the nuts, lock washers and bolts that hold the condenser. Do not remove the condenser now.

STEP 89



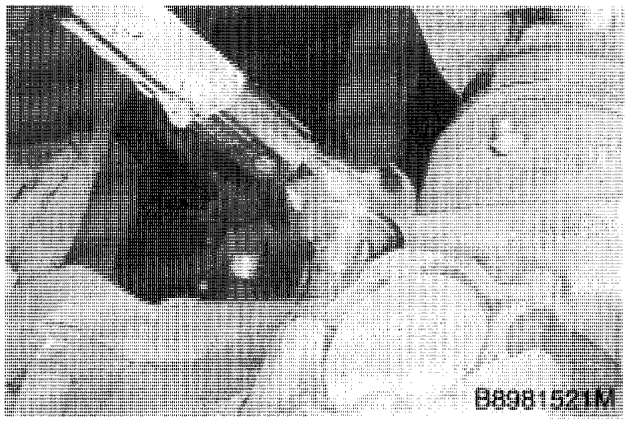
Disconnect the hose from the pressure protection valve.

STEP 174



Install the rear drive shaft and the clamps and Ferry head screws.

STEP 175

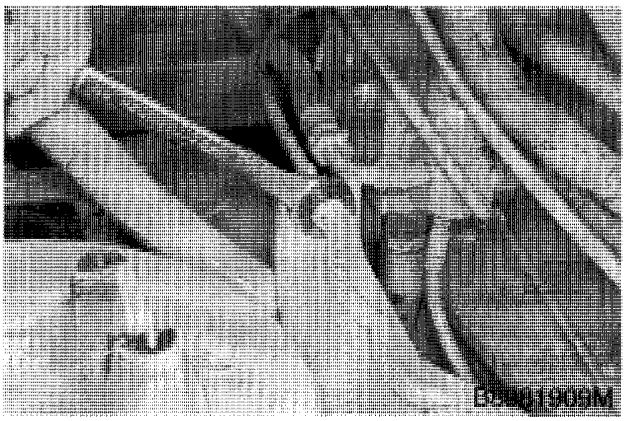


Tighten the Ferry head screws to 55 to 60 pound-feet (75 to 81 Nm).

STEP 176

Install new gaskets and the screen for the filler tube. Install the cap screws and tighten the cap screws to 230 to 275 pound-inches (26 to 31 Nm).

STEP 177

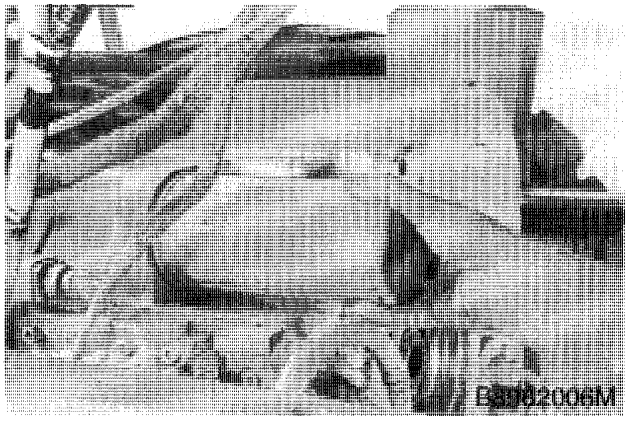


Engage the parking brake cable with the mounting bracket and tighten the bottom nut.

STEP 178

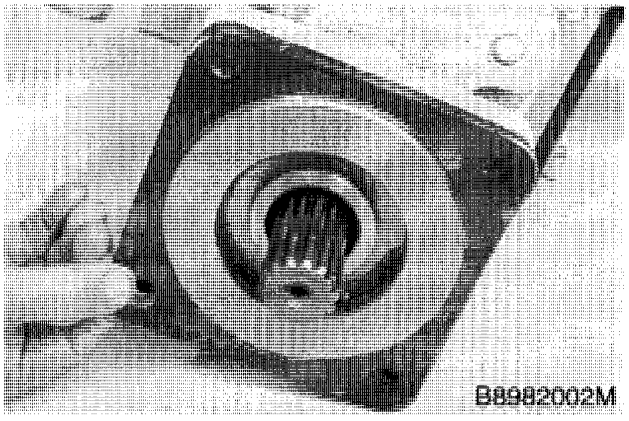
Install the clevis pin and a new cotter pin.

STEP 179



Install the filter.

STEP 180



Install a new gasket for the pump. Use gasket sealant to hold the gasket.

Section

6002

TRANSMISSION SPECIFICATIONS, SCHEMATIC, AND TROUBLESHOOTING - ZF TRANSMISSION WITH CLARK SHIFTER

CASE CORPORATION

Bur 8-12021

Printed in U.S.A.
Issued October 1991

LUBRICATION PRESSURE CHECK

Test Equipment Required

0 to 100 psi (689 kPa, 7 bar) gauge
1 5/16-12 tee connector

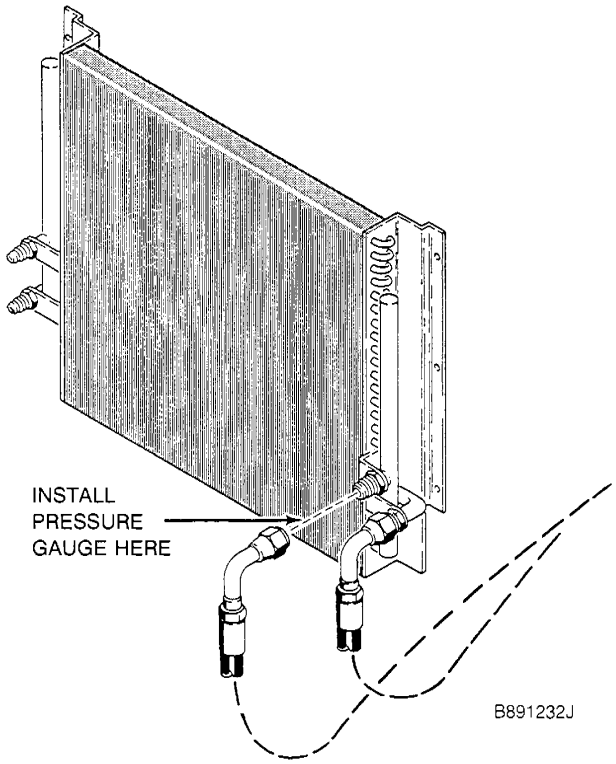
Test Procedure

1. Block the machine tires.

2. Apply the parking brake.

3. Heat the oil to an operating temperature of 176° to 212°F (80° to 100°C).

4. Install pressure gauge in the line from the cooler to the transmission.



NOTE: *Be careful when disconnecting and connecting the line from the cooler. Leakage can result if excessive force is used.*

5. Run engine at full throttle.

6. While in the cab, put transmission in each gear and record the readings in the chart at the end this section. Pressure must be 3 to 18 psi (20.7 to 124 kPa, 0.2 to 0.8 bar).

6. If any readings in step 5 were not correct, do the following procedure:

   a. Make sure that the key switch is in the OFF position.

   b. Remove the screws which fasten the cover at the upper front part of the steering pedestal.

   c. Remove the cover from the steering pedestal.

   d. See the wiring diagrams in Section 4001 and disconnect the two pairs of connectors which fasten the controller harness to the pedestal harness. Turn the key switch to the ON position and check for system voltage at wire 25V of the pedestal harness. If the reading is not system voltage, wire 25V between the transmission control module and the controller harness is bad. Repair or replace as necessary. If the reading is system voltage, turn the key switch to the OFF position and connect a jumper wire between wire 25V of the pedestal harness and the red wire of the controller harness. This jumper wire will supply current to the transmission controller during the test in step 6e.

   e. Put the key switch in the ON position. Check for system voltage at each wire of the controller harness in each shifter position. The readings must be as shown in the chart to the right. If any readings are not correct, the transmission controller is bad and must be replaced. If all readings are correct, the problem is in the wiring between the transmission controller and the transmission control module. See the wiring diagrams in Section 4001 and use an ohmmeter to check for open circuits in the wiring. Connect the harness and continue if no problem is found.

7. Clutch Cutout - To find a problem in the clutch cutout circuit, put the key switch in the ON position. Check for voltage between test point 35 and 22 during any of the three following conditions:
   a. Left-hand brake pedal pushed down while the left-hand side of the declutch switch on the right-hand console is pushed down.
   b. Parking brake applied.
   c. Low brake pressure.

921 ONLY NOTE: *If the park brake switch is in the off position and the key switch is turned off, the park brake will automaticly apply. To release the brake, turn the key switch on and move the park brake switch to the on position. Then move the park brake switch to the off position. This will reset the relay for proper test conditions.*

The indication at test point 22 must be zero volts when the cut out is activated during any of the above three conditions. The indication must be system voltage when none of the above three conditions is present. If either indication is not correct, see Section 4001 and check for a problem in the clutch cutout circuit. If the indications are both correct, but the clutch cutout does not work correctly, the problem is in the transmission control module.

Controller Positions

	Forward				Reverse			Neutral			
	1	2	3	4	1	2	3	1	2	3	4
Wire Colors											
pink					×	×	×				
green			×	×			×			×	×
yellow	×	×	×	×							
violet	*	*	*	*	*	*	*	*	*	*	*
blue	×			×	×			×			×
gray								×	×	×	×
black	×	×	×	×	×	×	×	×	×	×	×

* When the down shift button is pressed in any controller position, there must be system voltage at the violet wire. When the down shift button is released, the reading at the violet wire must be zero volts for any controller position.

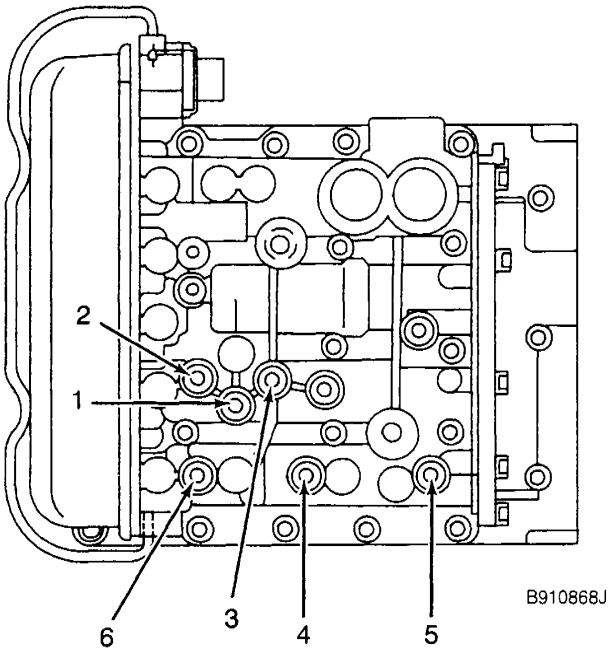
CLUTCH PRESSURE CHECKS

Test Equipment Required

0 to 400 psi (2758 kPa) gauge with hose long enough to take readings in the cab, 10 mm, 90 degree elbow adapter.

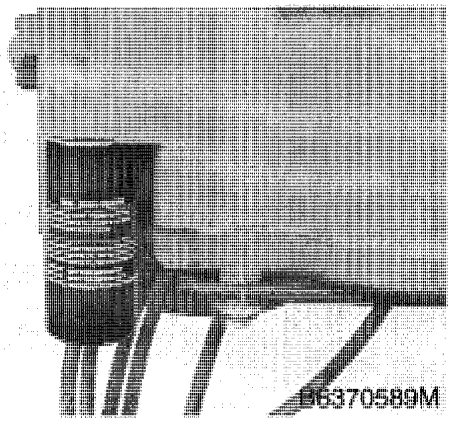
Test Procedure

1. Block the machine tires.
2. Apply the parking brake.
3. Heat the oil to an operating temperature of 176° to 212°F (80° to 100°C).
4. While in the cab, run engine at full throttle.
5. Take reading at desired gear test point. Record the reading in the chart at the end of this section. Clutch pressures must be 220 to 250 psi (1517 to 1724 kPa).



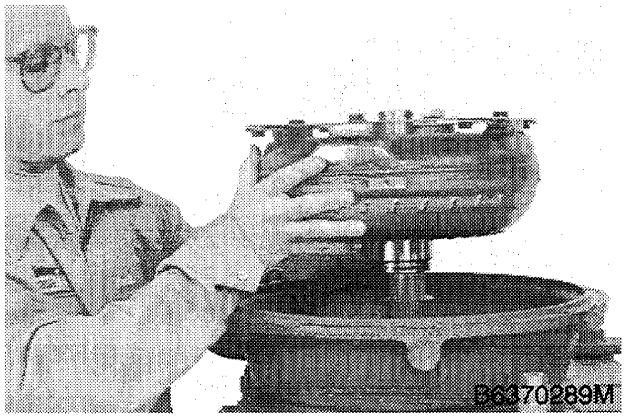
1. First Gear
2. Second Gear
3. Third Gear
4. Fourth Gear
5. Forward Gear
6. Reverse Gear

STEP 17



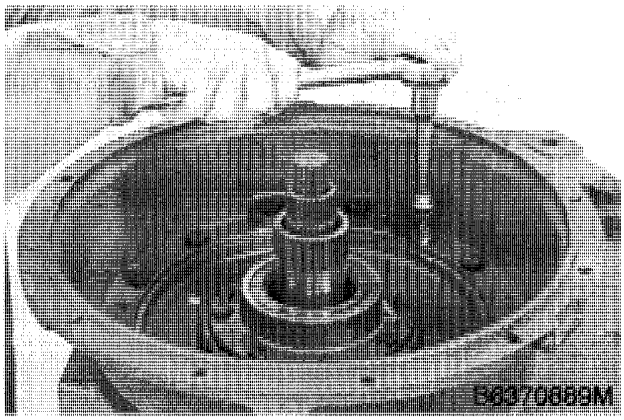
Remove the filter from the transmission housing.

STEP 18



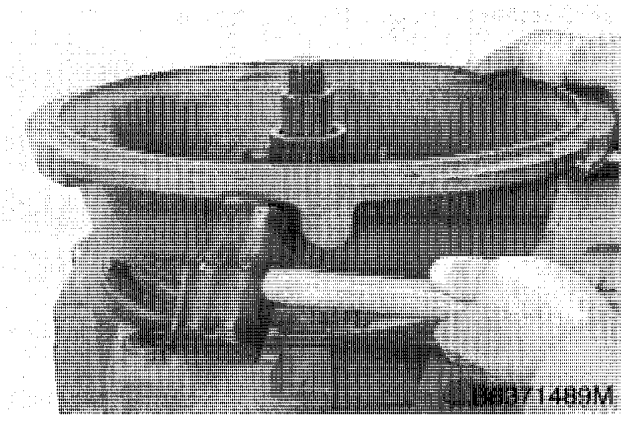
Remove the torque converter from the transmission.

STEP 19



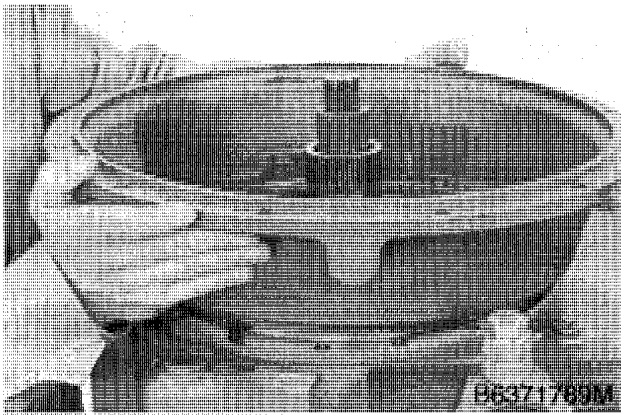
Remove the cap screws and nut from the torque converter housing.

STEP 20



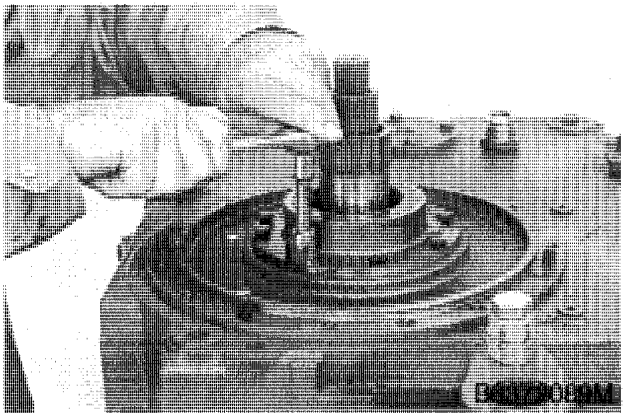
Loosen the torque converter housing with a rubber hammer.

STEP 21



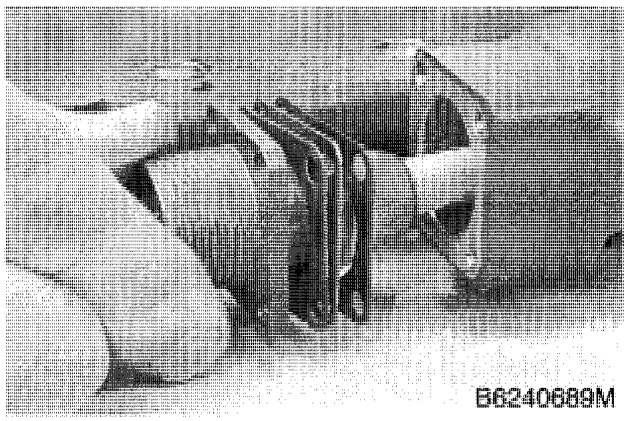
Remove the torque converter housing.

STEP 22



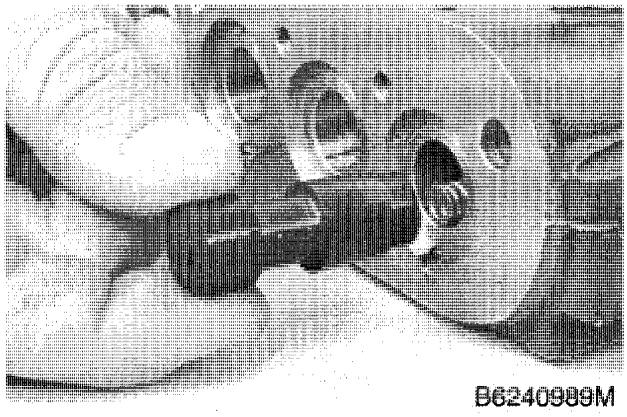
Remove the cap screws from the bearing cover.

STEP 82



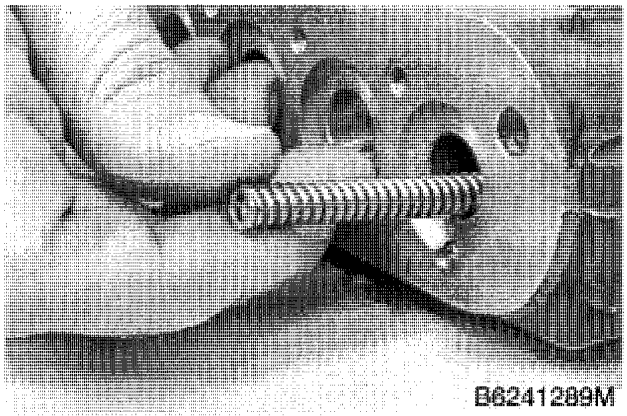
Remove the control valve harness. Do not lose the gaskets.

STEP 83



Remove the number one valve spool from the bore.

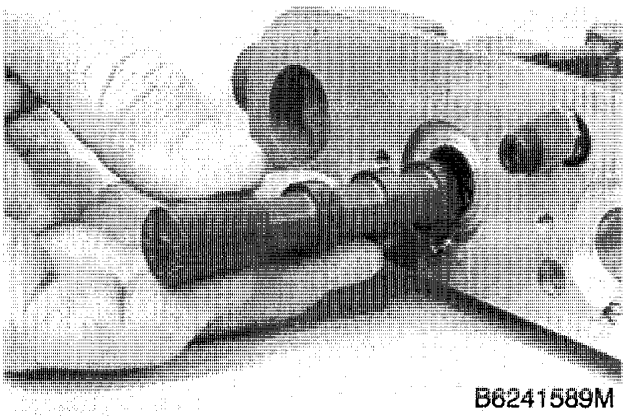
STEP 84



Remove the spring from the same bore.

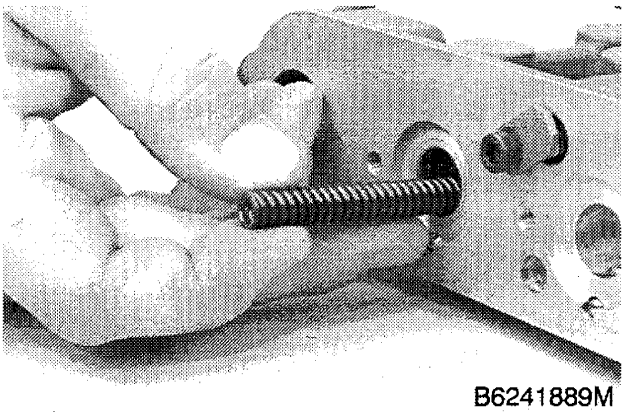
NOTE: *Fasten an identification tag to each spool and spring, and identify each bore for proper assembly.*

STEP 85



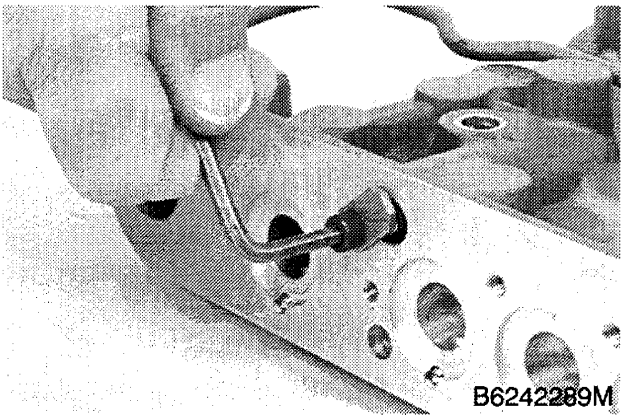
Remove the number four valve spool from the bore.

STEP 86



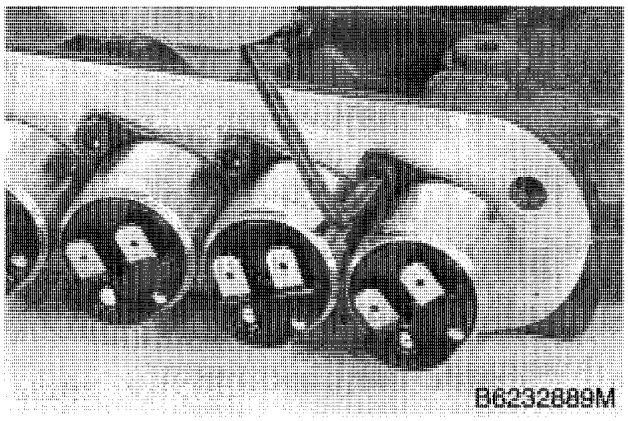
Remove the spring from the same bore.

STEP 87



Loosen the support plate Allen head screw. Slide the support plate away from the bore.

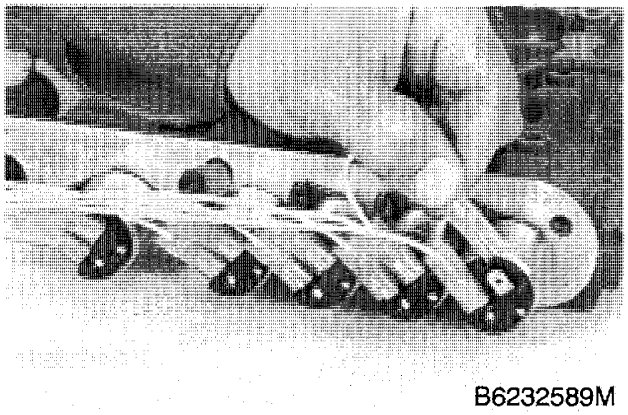
STEP 159



B6232889M

Install the solenoid valve support plates using the Allen head screws.

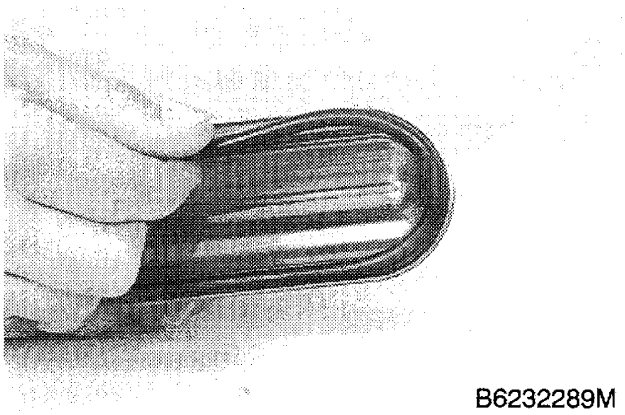
STEP 160



B6232589M

Connect the wires to the solenoid valves.

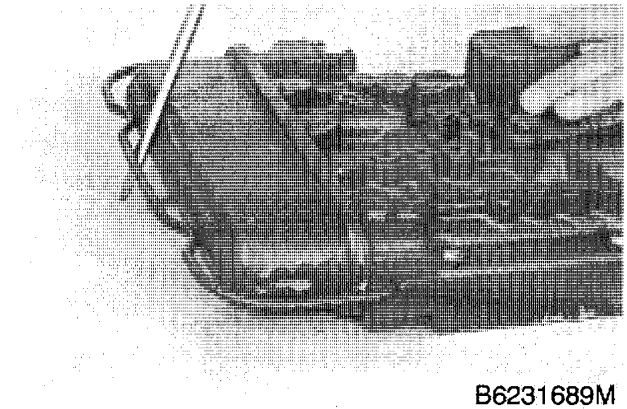
STEP 161



B6232289M

Install the O-ring on the solenoid valve cover.

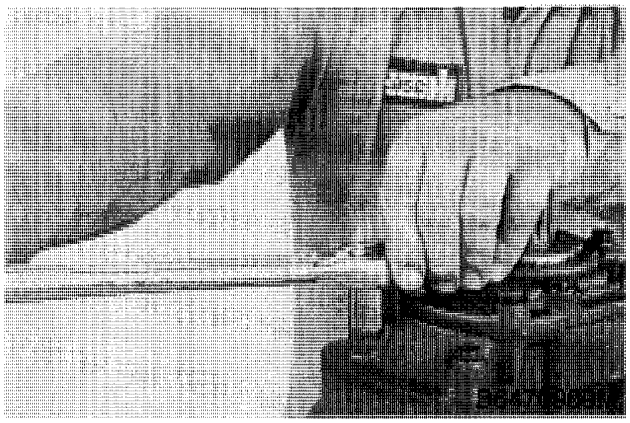
STEP 162



B6231689M

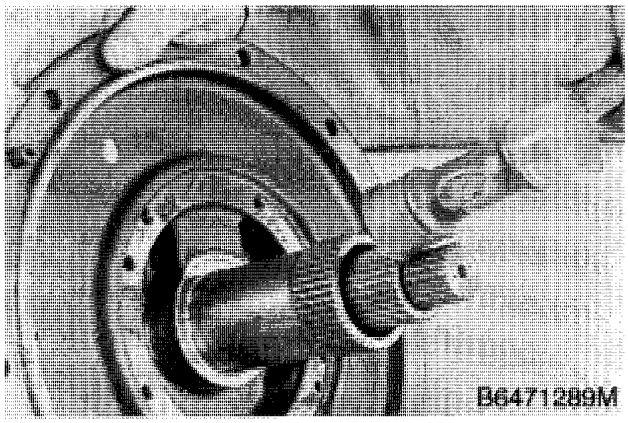
Install the solenoid valve cover and engage the spring clip.

STEP 225



Install the remaining two cap screws and tighten all the cap screws to 204 to 221 pound-inches (23 to 25 Nm).

STEP 226



If the input gear does not rotate freely, tap the end of the shaft until the input gear rotates freely.

INSPECTION OF THE FORWARD AND LOW CLUTCHES

STEP 291

Check the teeth on the gears for wear and damage. If a tooth is badly damaged, be sure to inspect the gear that is in mesh with the damaged gear. Inspect the splines in the gears for wear and damage, be sure to inspect the shaft that the gear is installed on.

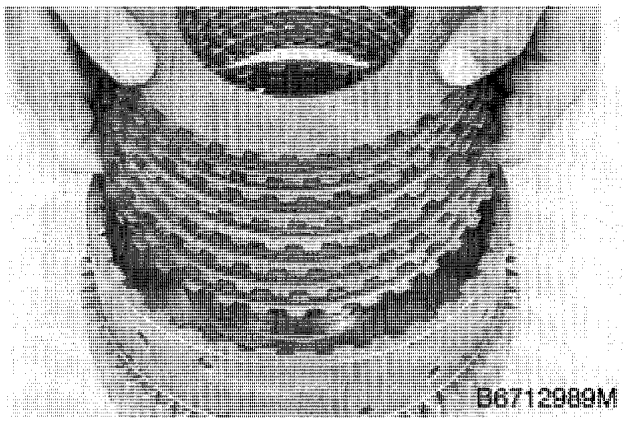
STEP 292

Check the ball, roller and needle bearings for flat areas, pitting and other damage. Check the cages, inner races and outer races for damage also.

STEP 293

Check each metal and friction disc with a straight edge to be sure each part is flat. If a metal or friction disc is not flat, a new part must be installed during assembly. If the friction discs are smooth or almost smooth, use new parts during assembly. Inspect the metal discs for pitting, scoring or other damage. If there is any damage, use new parts during assembly. Also, check the splines for wear. Inspect the bore and shaft in the clutch housing for damage that will cause leakage when the clutch is assembled. Use new parts as required during assembly.

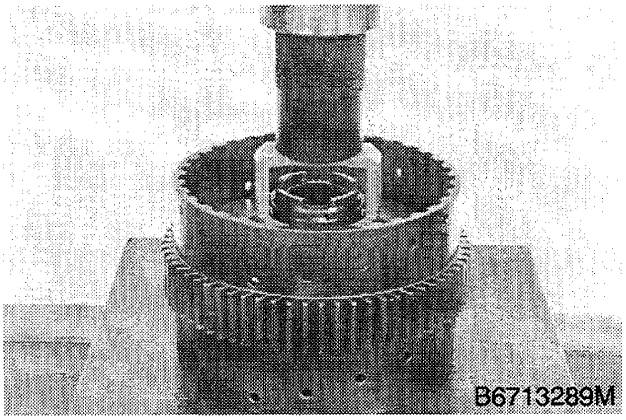
STEP 360



Remove the friction and metal discs.

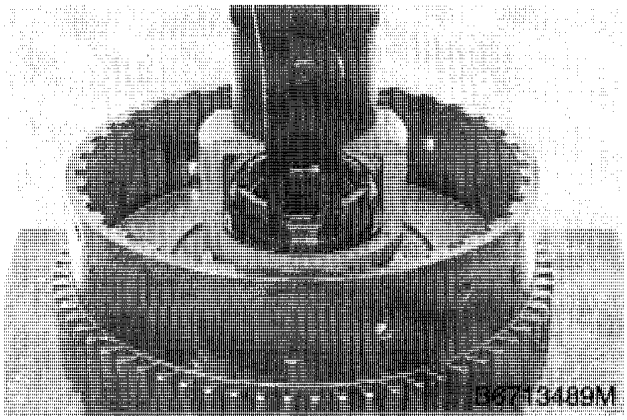
NOTE: *The discs must be soaked in transmission fluid until assembly.*

STEP 361



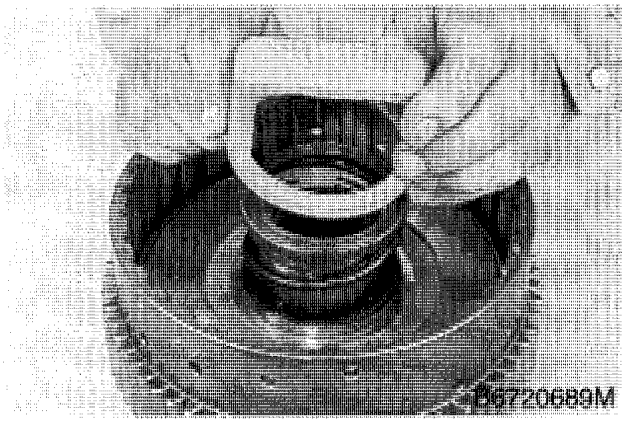
Place the clutch assembly in a press with preload compressor CAS-1932.

STEP 362



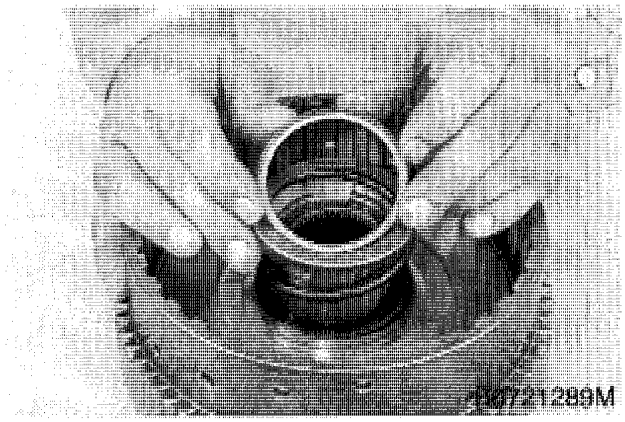
Slowly apply pressure until the snap ring can be removed.

STEP 363



Slowly release the pressure of the press and remove preload compressor CAS-1932.

STEP 364



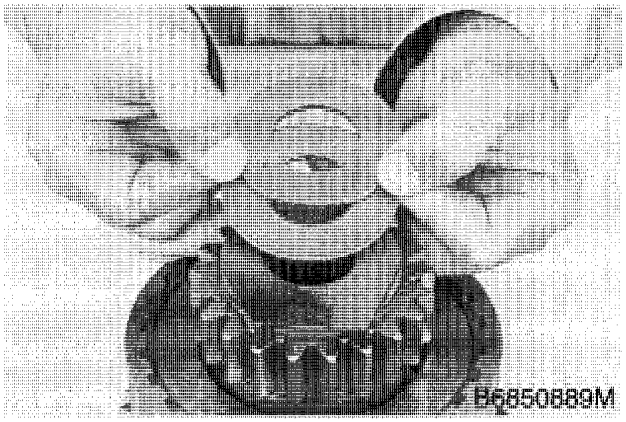
Remove the guide ring from the shaft.

STEP 365

Remove the upper spring guide.

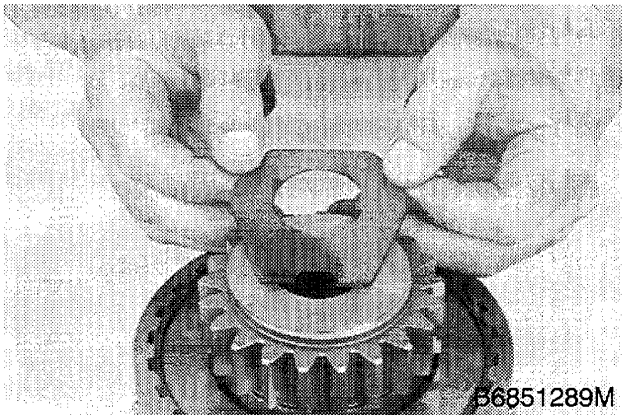
DISASSEMBLY OF THE FOURTH AND THIRD CLUTCHES

STEP 430



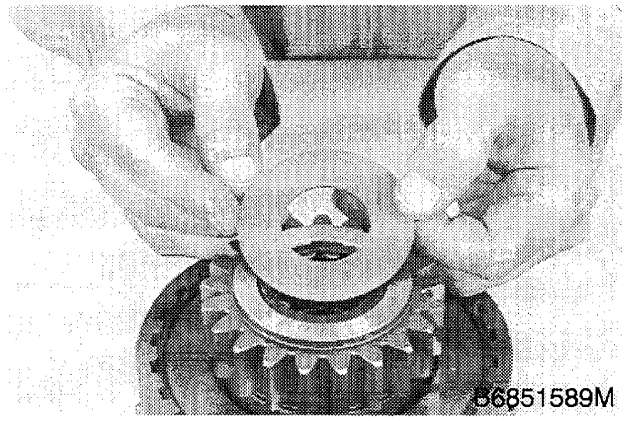
Remove the shim(s) from the fourth gear.

STEP 431



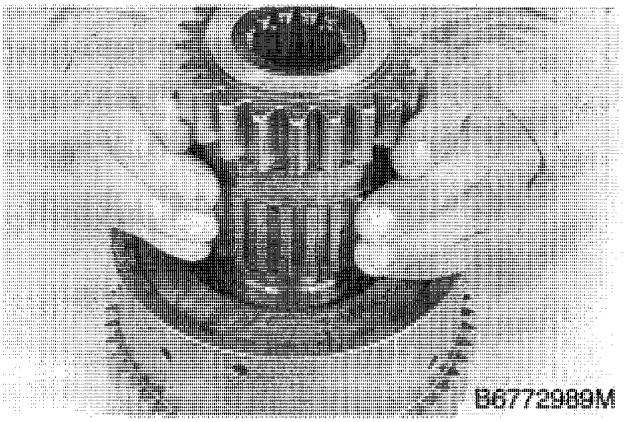
Remove the slotted thrust washer.

STEP 432



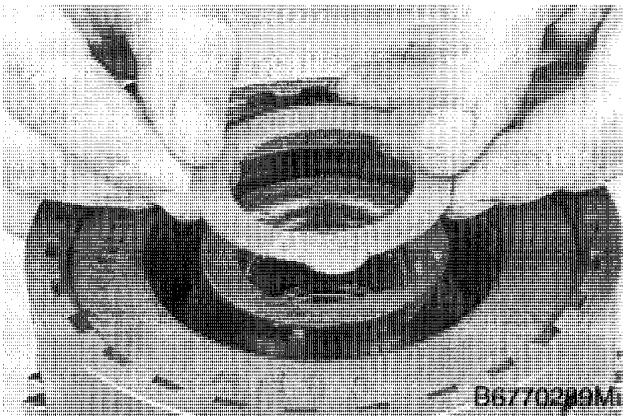
Remove the plastic thrust washer.

STEP 433



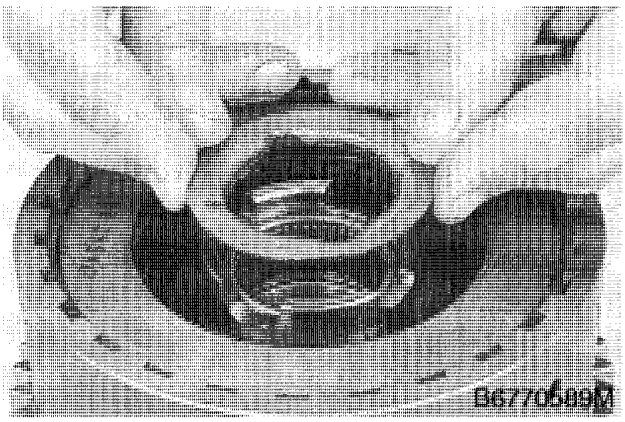
Remove the fourth gear from the clutch assembly.

STEP 434



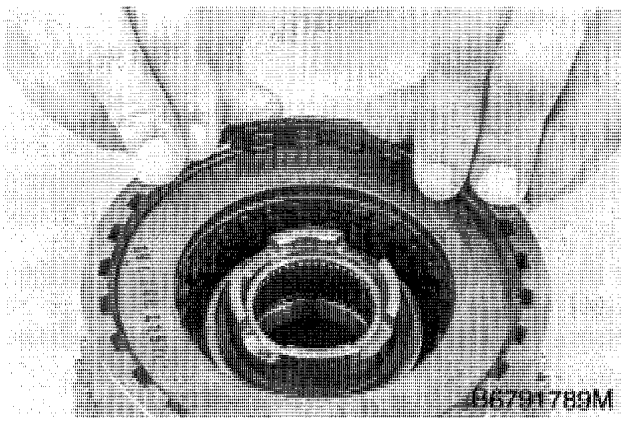
Remove the tab thrust washer from the clutch plate pack.

STEP 435



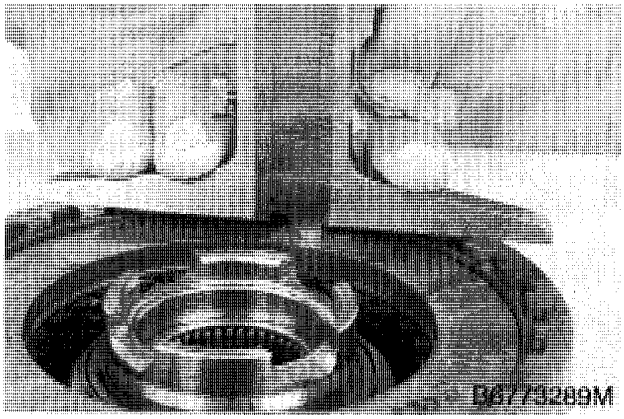
Remove the thrust plate.

STEP 504



Install the retaining ring.

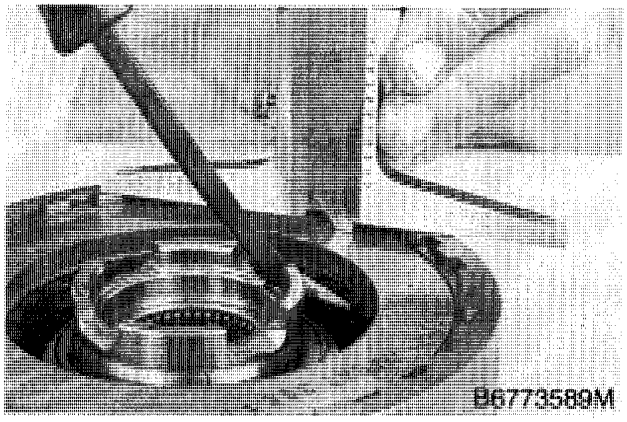
STEP 505



Use caliper CAS-1938 and measure the distance from the face at the clutch housing to the pressure plate.

Example: Dimension A = 0.21 inch (5.4 mm)

STEP 506



Pry the pressure plate until it is against the retaining ring. Use caliper CAS-1938 and measure the distance from the face of the pressure plate to the clutch housing.
Example: Dimension B = 0.12 inch (3.0 mm)

STEP 507

Determine the end play by subtracting the figure determined in step 506 from the figure determined in step 505.

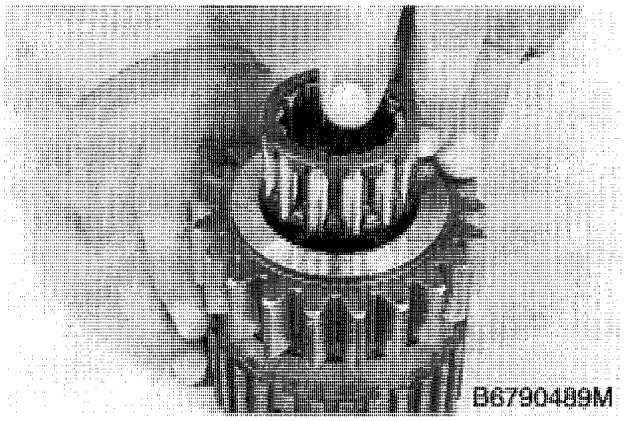
Example:	Dimension A	0.21 inches	(5.4 mm)
	Dimension B	– 0.12 inches	(3.0 mm)
	Dimension C	0.09 inches	(2.4 mm)

IMPORTANT: *The required disc clearance is 0.08 to 0.15 inch (2.0 to 2.9 mm). This value must be corrected by the installation of a metal compensation disc of the appropriate thickness.*

If the calculated disc clearance is larger than 0.15 inch (2.9 mm) it must be reduced by changing the metal discs for thicker ones. The thicker metal discs must be put nearer the piston than the pressure plate.

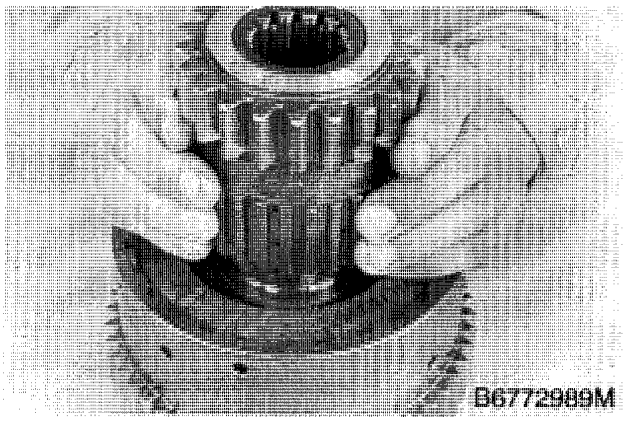
If the calculated disc clearance is smaller than 0.08 inch (2.0 mm) it must be corrected by using thinner metal discs. The thinner metal discs must be put nearer the pressure plate than the piston.

STEP 508



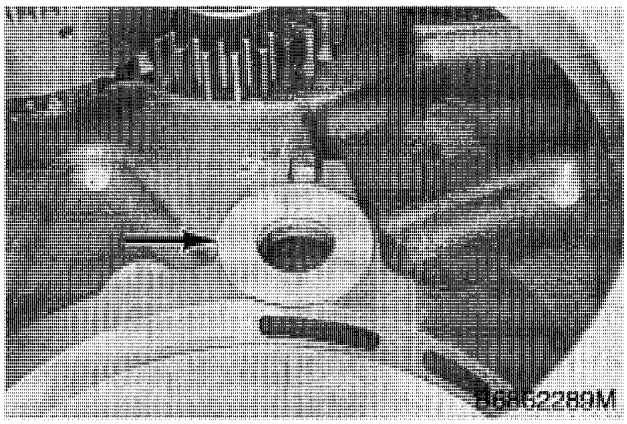
Install the roller bearing in the fourth gear.

STEP 509



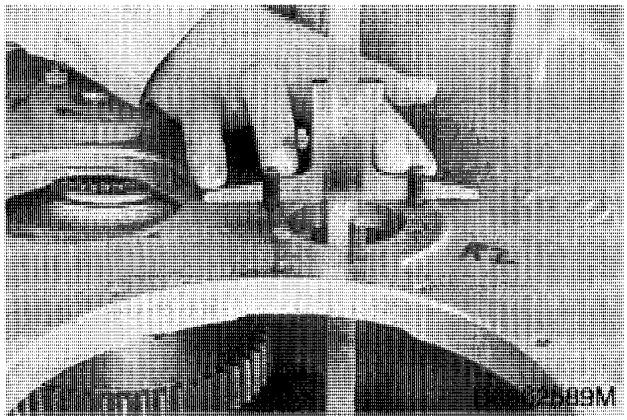
Install the fourth gear on the clutch pack. Make sure the discs are aligned so that the fourth gear is fully seated in the clutch pack.

STEP 584



Install the slotted and plastic thrust washers for the reverse and second gear clutch assembly in the transmission housing. The slotted washer fits the tab in the transmission housing.

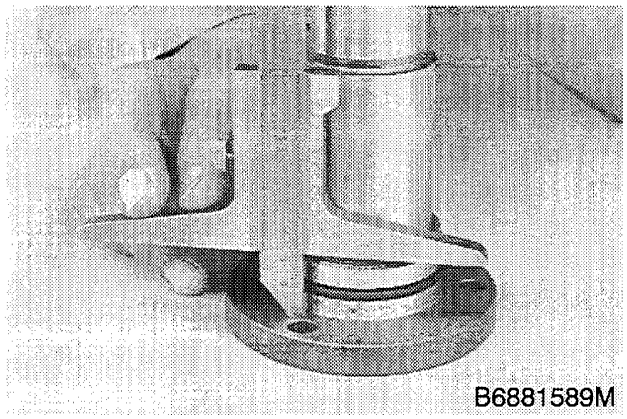
STEP 585



Use caliper CAS-1938 and measure the distance from the housing to the plastic thrust washer.

Example: Dimension A = 9.93 inches (252.2 mm).

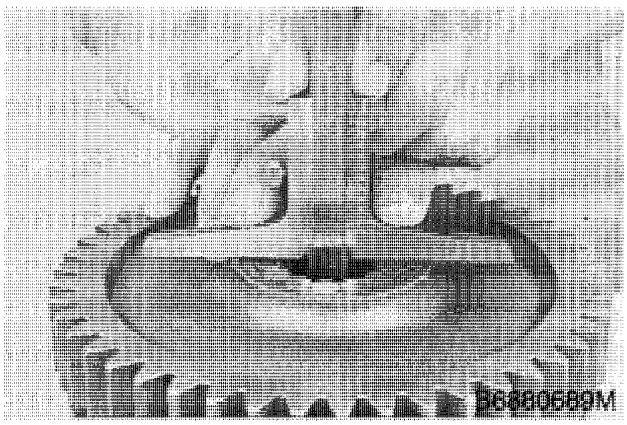
STEP 586



Use caliper CAS-1938 and measure the distance from the contact area of the bearing rollers to the flange face.

Example: Dimension B = 0.89 inch (22.6 mm).

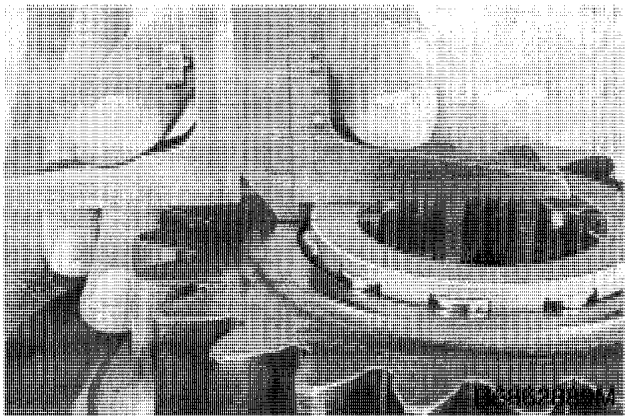
STEP 587



Use caliper CAS-1938 and measure the distance from the plane surface of the second gear to the contact area of the reverse gear.

Example: Dimension C = 8.99 inches (228.3 mm).

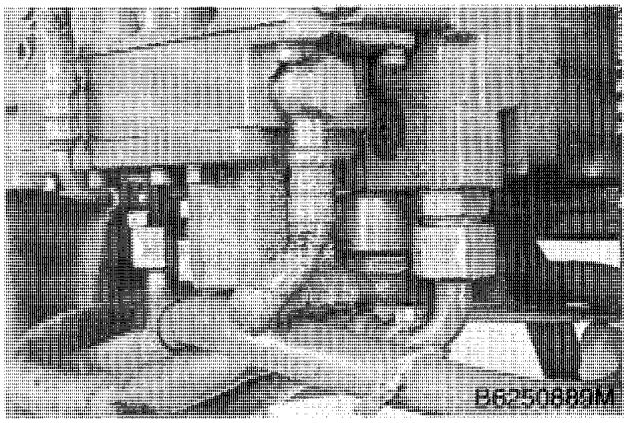
STEP 588



Use caliper CAS-1938 and measure the distance from the plane surface of the reverse gear to the face of the rollers.

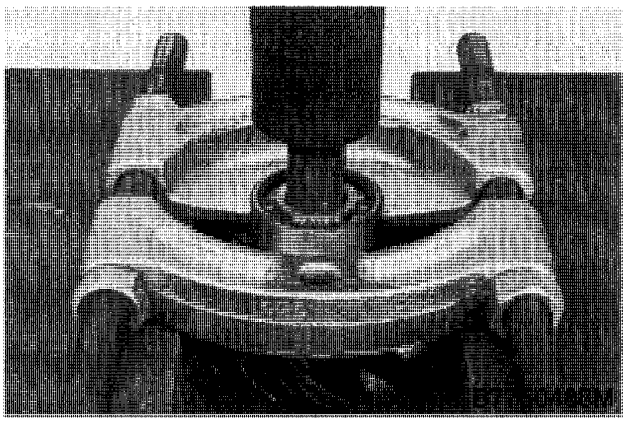
Example: Dimension D = 0.01 inch (0.2 mm).

STEP 665



Connect the pressure hose from the control valve to the channel plate.

STEP 62



Press the pinion shaft out of the roller bearing.

INSPECTION OF PARTS OF DIFFERENTIAL CARRIER

Clean all parts in cleaning solvent.

Inspect the rollers in the tapered roller bearings for flat areas, pitting, scoring and other damage. Also check the inner race for damage. If any of these defects are found, a new bearing and bearing cup must be installed.

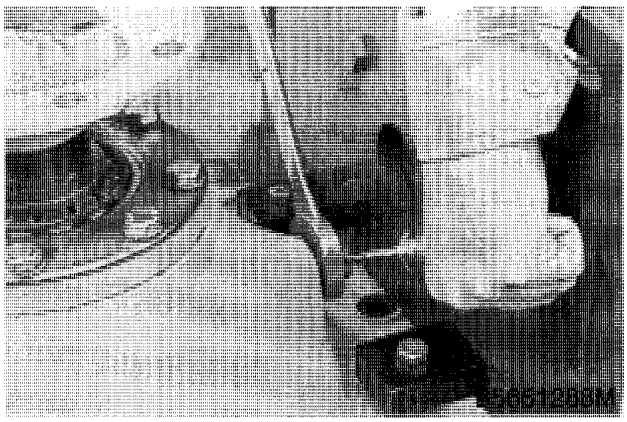
Inspect the bearing cups for flat areas, pitting, scoring and other damage. If any of these defects are found, a new bearing cup and bearing must be installed.

Inspect the teeth on the pinion gear and the ring gear for pitting, scoring and broken teeth. The ring gear and pinion gear must be replaced as a set.

Inspect the thrust washer for scoring, pitting and other damage. If one thrust washer must be replaced, all thrust washers must be new.

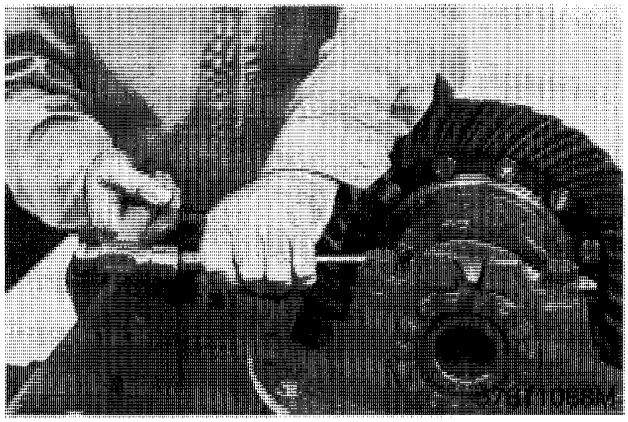
Inspect the teeth on the pinion gears and side gears for pitting, scoring and broken teeth. Also inspect the thrust surface and bore or each pinion gear. If one pinion gear is to be replaced, all pinion gears must be new. Check the splines in the side gears for wear.

STEP 122



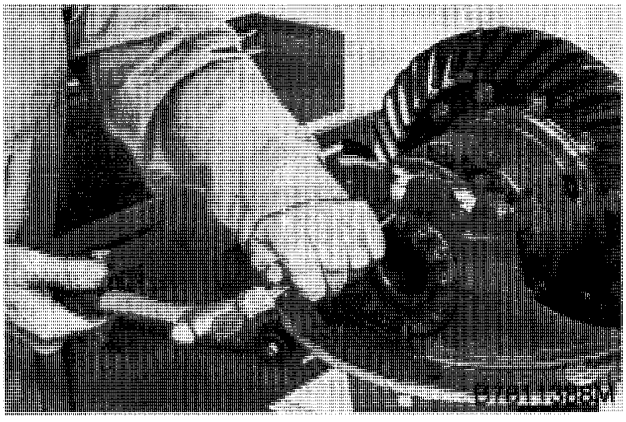
Prevent the thrust screw from turning and tighten the lock nut.

STEP 123



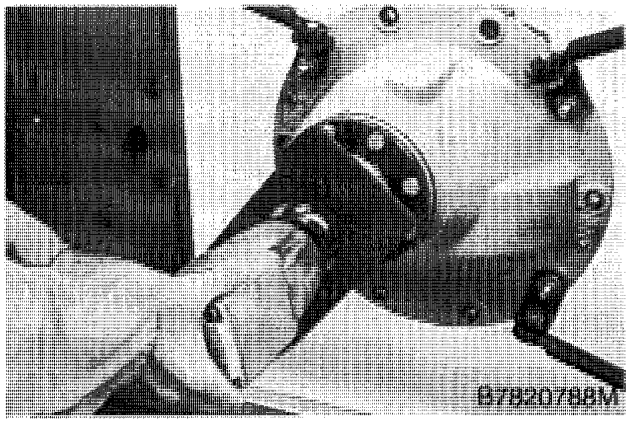
Bend the locks against the head of each cap screw.

STEP 124



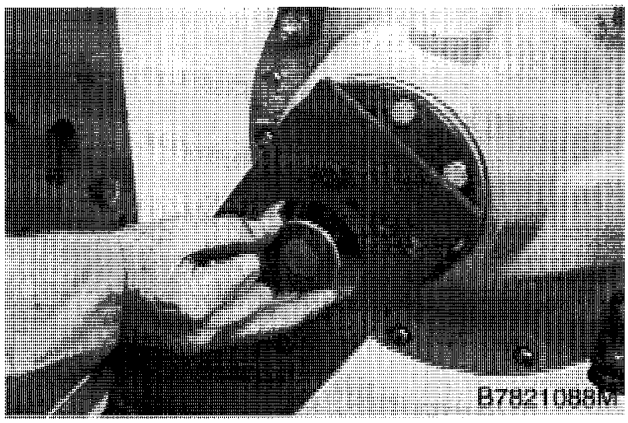
Bend the locks into each adjusting ring.

STEP 125



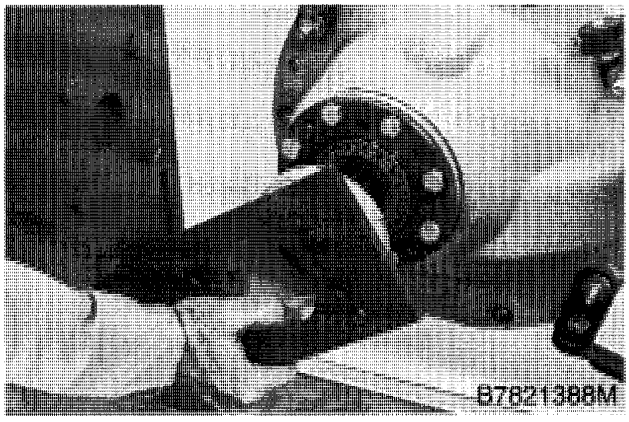
Loosen and remove the nut.

STEP 126



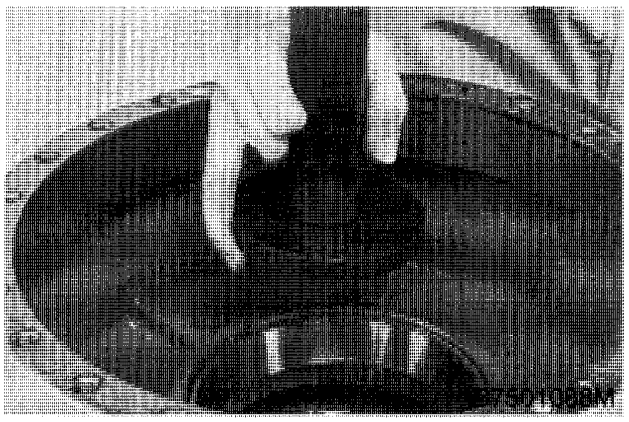
Remove the hardened washer.

STEP 127



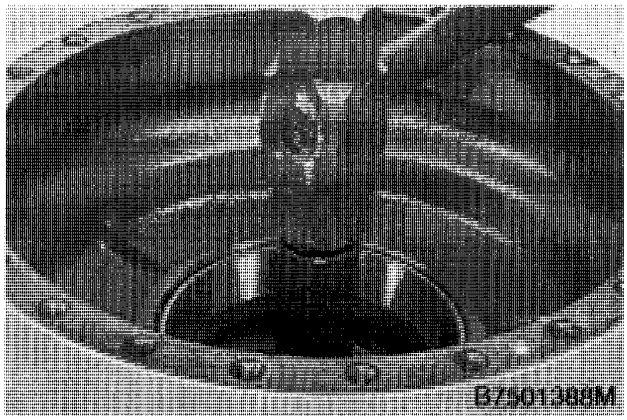
Remove the yoke.

STEP 198



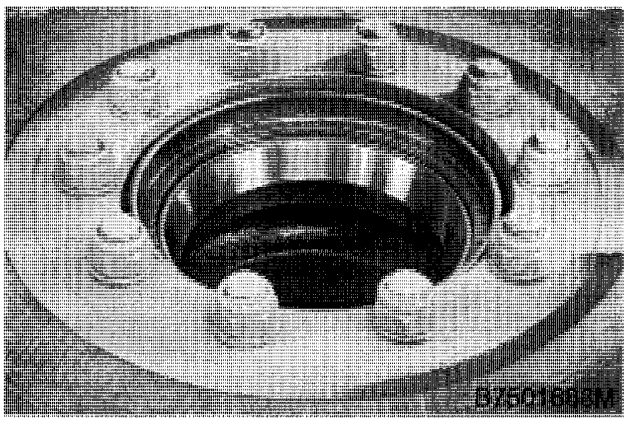
Put an acceptable driver on the inner race of the wheel bearing.

STEP 199



Drive the seal and wheel bearing out of the planetary housing.

STEP 200



Use acceptable equipment and remove the bearing cups as required.

INSPECTION OF PARTS OF PLANETARY

Clean all parts in cleaning solvent.

Discard the seal and O-rings.

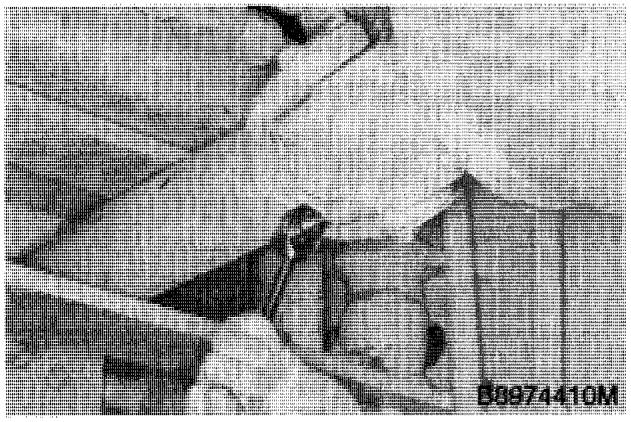
Inspect the rollers in the wheel bearings for flat areas, pitting, scoring and other damage. Also check the inner race for damage. If any of these defects are found, a new wheel bearing and bearing cup must be installed.

Inspect the bearing cups for flat areas, pitting, scoring and other damage. If any of these defects are found, a new bearing cup and wheel bearing must be installed.

Inspect the pinion shafts and the bore of the pinion gears for wear and damage. Inspect the teeth of the pinion gears, ring gear and sun gear for wear, pitting, scoring and other damage. Use new parts as required.

Inspect the splines on the spindle and in the hub of the ring gear for wear and other damage.

STEP 7
Remove paint or rust from the shaft and apply WD40 or similar oil to loosen any rust between the inner race and the shaft.

STEP 8


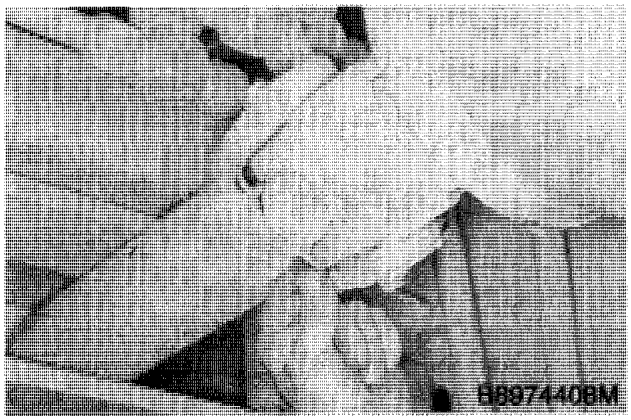
Loosen and remove the Ferry head screws and clamps.

STEP 9

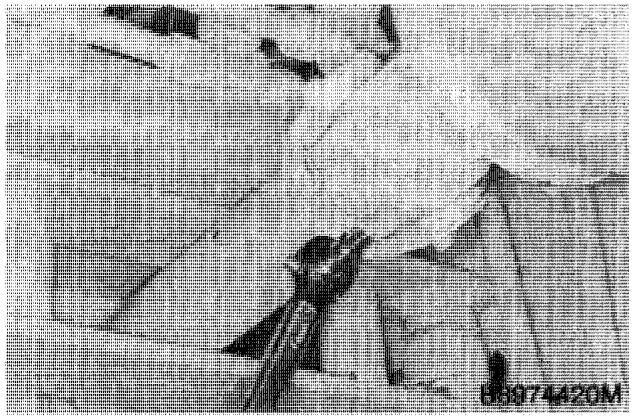

Disengage the universal joint from the yoke and remove the front drive shaft. If necessary, use brass hammer to drive the shaft out of the center bearing.

INSTALLATION OF FRONT DRIVE SHAFT

STEP 10
Apply antiseize compound to the shaft.

STEP 11


Install the front drive shaft and the clamps and Ferry head screws.

STEP 12


Tighten the Ferry head screws to 55 to 60 pound-feet (75 to 81 Nm).

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WHEEL NUTS

General Information

The wheel nuts must be tightened after every 20 hours of operation until the wheel nuts stay tight:

If the machine is new.

If a wheel has been removed and installed.

Torque Specification

150 pound-feet (203 Nm) in the sequence shown on page 6006-3, then a final torque of 560 to 600 pound-feet (759 to 813 Nm) in the same sequence.

TIRE PRESSURE

20.5 x 25 16 PR L2....55 psi (379 kPa, 3.8 bar)

20.5 x 25 16 PR L3....50 psi (345 kPa, 3.4 bar)

23.5 x 25 12 PR L2....45 psi (310 kPa, 3.1 bar)

23.5 x 25 12 PR L3....40 psi (276 kPa, 2.8 bar)

23.5 x25 R25 RL-2F L2....55 psi (379 kPa, 3.8 bar)

20.5 x R25 Michelin, all

Recommended pressure

Front....60 psi (414 kPa, 4.1 bar)

Rear....40 psi (276 kPa, 2.8 bar)

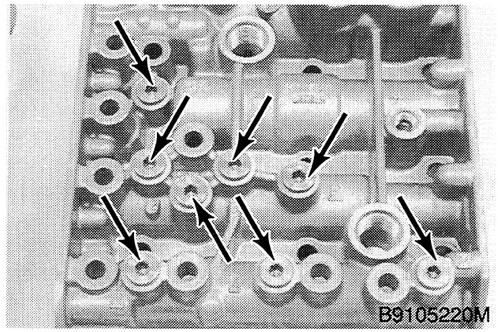
Pressure range

Front....55 to 65 psi (379 to 448 kPa, 3.8 to 4.5 bar)

Rear....25 to 45 psi (172 to 310 kPa, 1.7 to 3.1 bar)

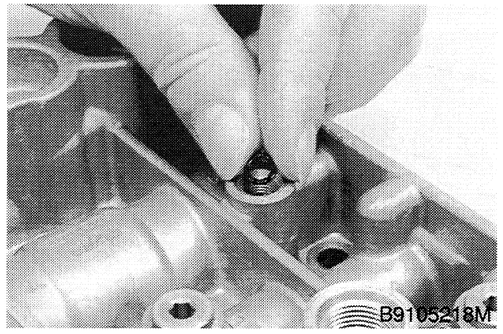
ASSEMBLY

STEP 44



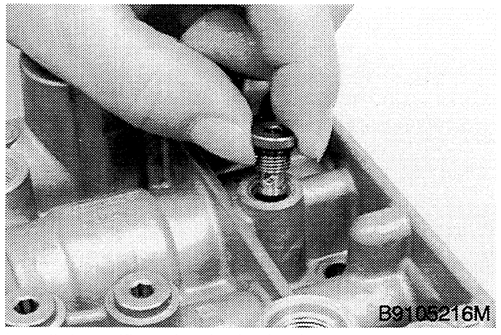
If any of the passage plugs were removed, install the passage plugs in the body.

STEP 45



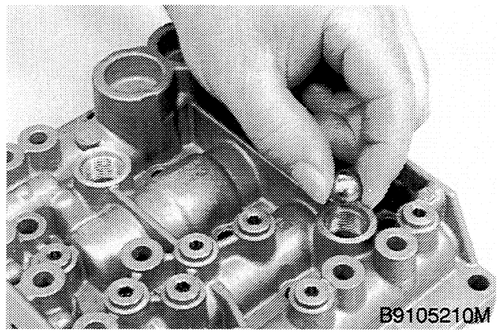
Install a new O-ring in the bore for the orifice plug.

STEP 46



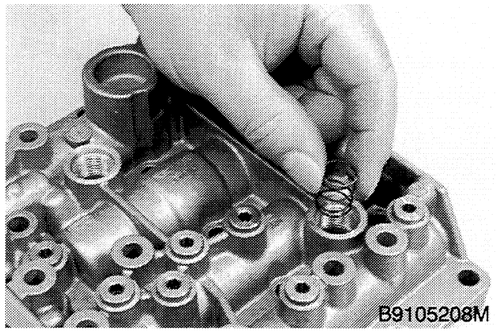
Install the orifice plug in the body.

STEP 47



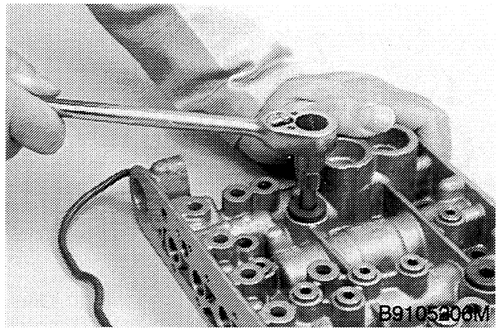
Install the balls in the body.

STEP 48

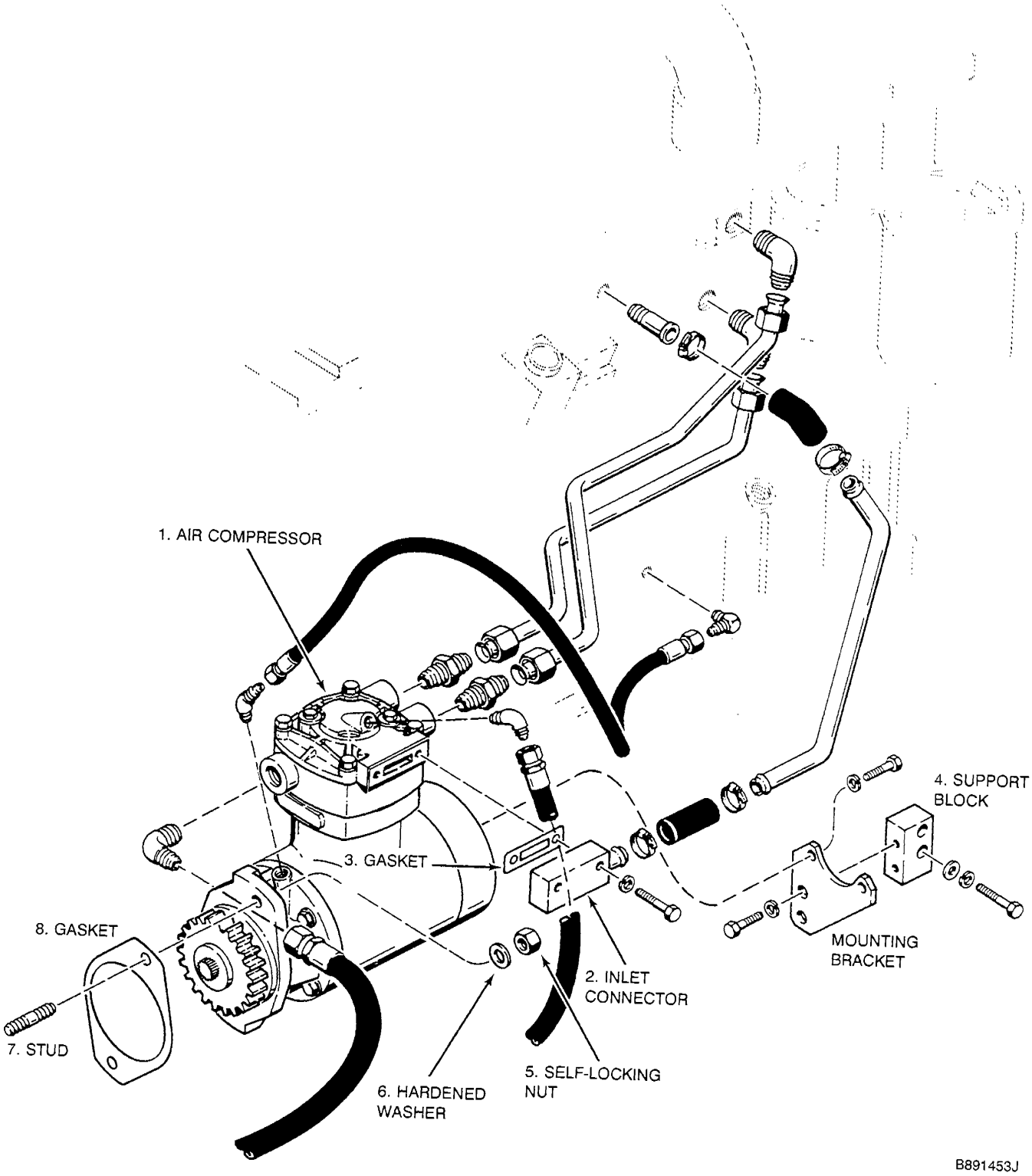


Install the springs.

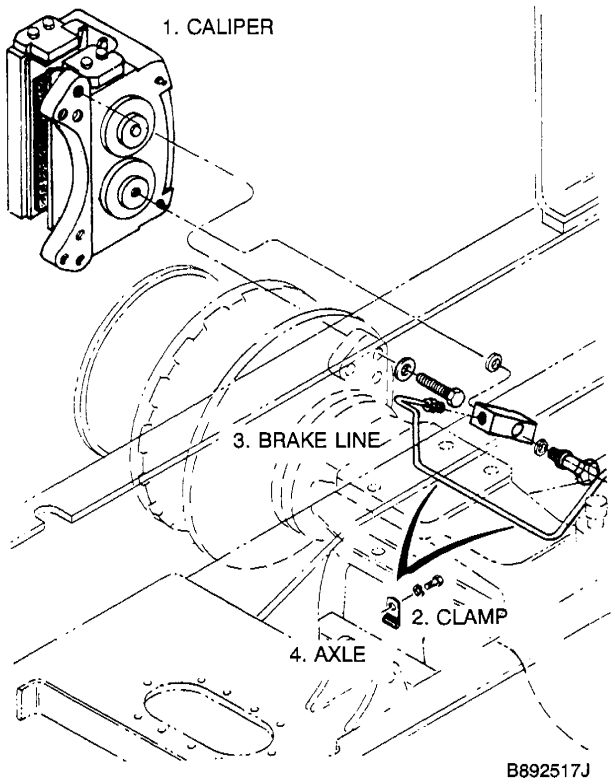
STEP 49



Install the check valve plugs.


1. AIR COMPRESSOR
2. INLET CONNECTOR
3. GASKET
4. SUPPORT BLOCK
5. SELF-LOCKING NUT
6. HARDENED WASHER
7. STUD
8. GASKET
MOUNTING BRACKET
B891453J

INSTALLING A BRAKE CALIPER



1. Use suitable lifting equipment to install the caliper (1) on the axle (4). The weight of the caliper is approximately 90 pounds (41 kg).

2. Install the cap screws and hardened washers that hold the caliper (1) to the mounting plate on the axle (4). Disconnect and remove the lifting equipment.

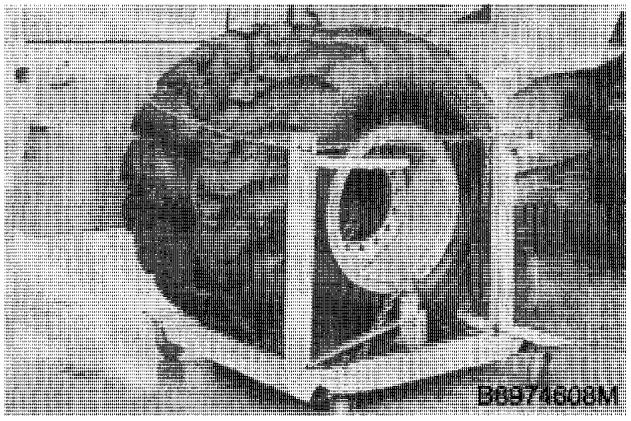
3. Tighten the cap screws that hold the caliper (1) to 340 to 420 pound-feet (461 to 569 Nm).

4. Remove the plug from the brake line (3) and connect the brake line (3) to the caliper (1).

5. Install the cap screw and lock washer that fasten the clamp (2) for the brake line (3) to the axle (4). Tighten the cap screw.

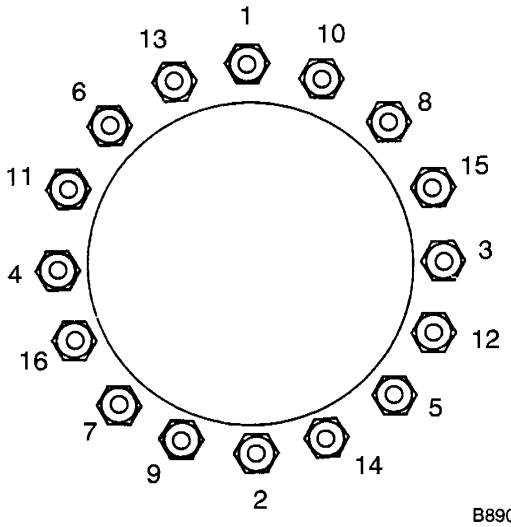
6. Remove the air from the brake system according to the instructions in this section.

7. Install the wheel and tire.



8. Install the hardened washers and wheel nuts. Tighten the wheel nuts with a hand wrench. DO NOT use an impact wrench to tighten the wheel nuts.

9. Tighten the wheel nuts to 150 pound-feet (203 Nm) in the sequence shown.



7002

SPECIFICATIONS, SCHEMATIC, TROUBLESHOOTING, LEAKAGE TESTS, AND ADJUSTMENTS

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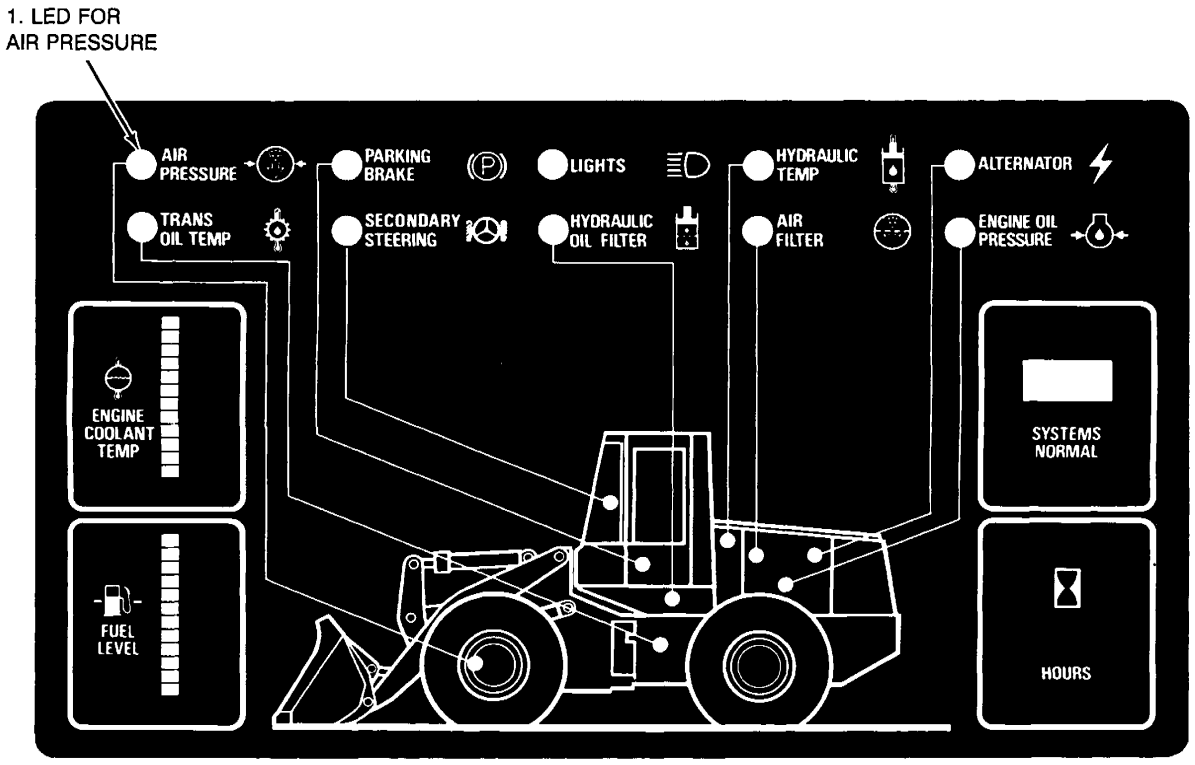
CASE CORPORATION

Bur 8-13410

Printed in U.S.A.
Issued September 1989



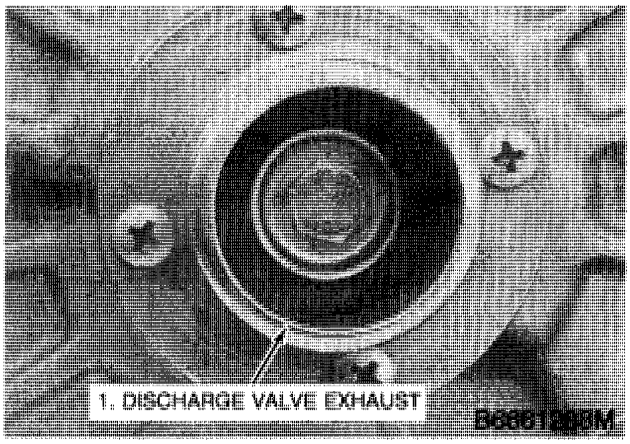
B1072A88J

4. Run the engine at 1000 rpm (r/min) until the LED for air pressure is no longer illuminated.

5. Continue to run the engine until an audible discharge of air is released from the discharge valve exhaust cover on the air dryer.

6. Run the engine at low idle for two minutes to complete the discharge cycle.

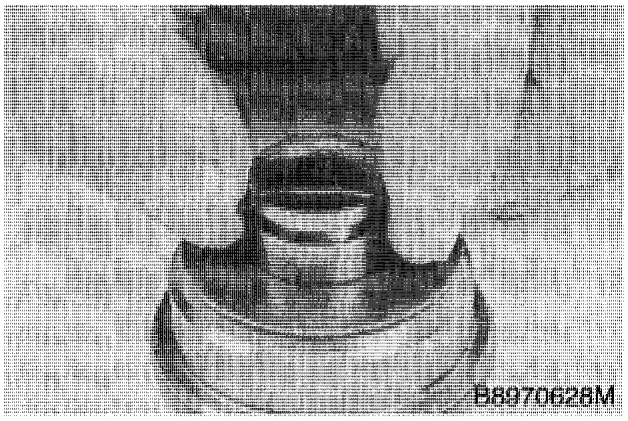
7. Apply a soap solution to and around the discharge valve exhaust.



8. There must be only a small amount of leakage.

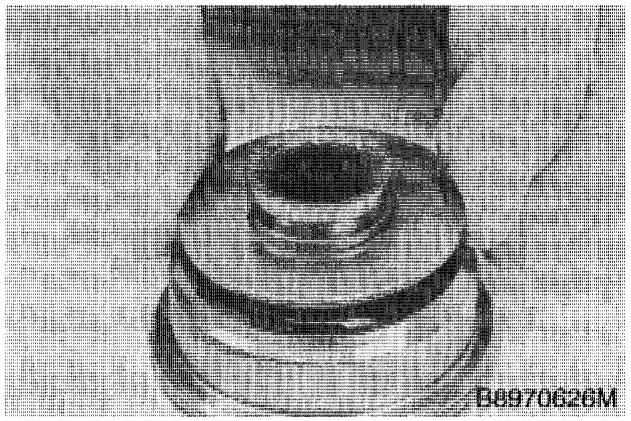
9. If there was excess leakage in step 8, see Section 7010, disassemble and inspect the discharge valve.

STEP 43



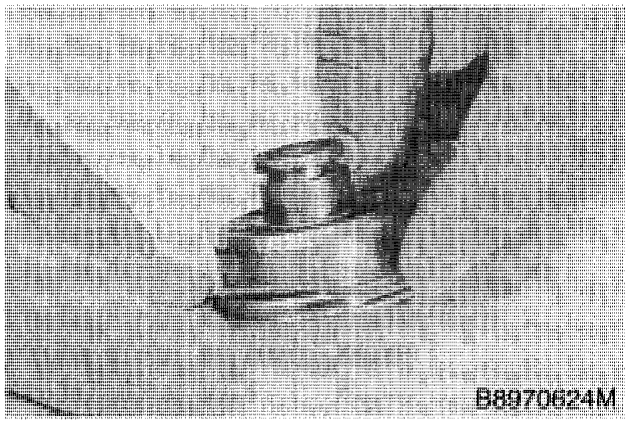
Remove the O-ring from the exhaust valve.

STEP 44



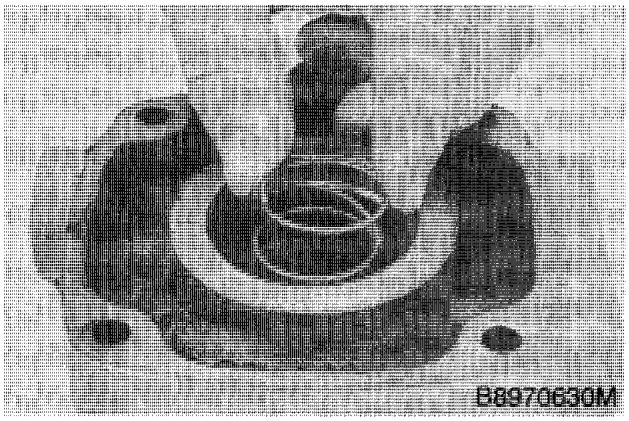
Remove the bottom spring seat.

STEP 45



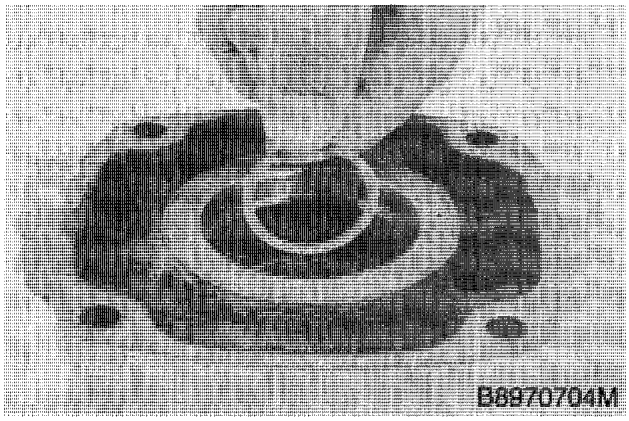
Remove the O-ring.

STEP 46



If necessary, remove the bottom spring from the housing.

STEP 47



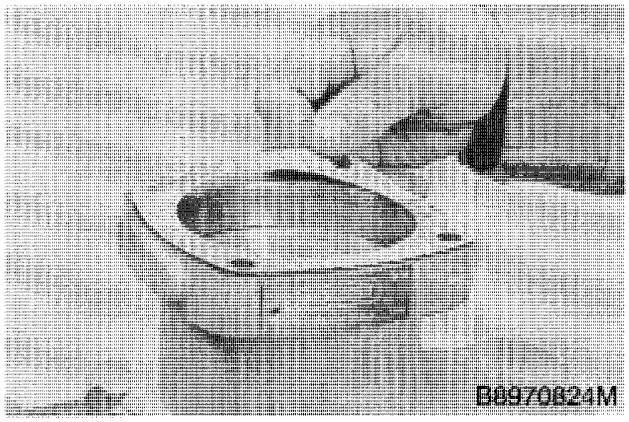
If necessary, remove the wear plate from the housing.

Inspection

1. Discard the gaskets and O-rings.

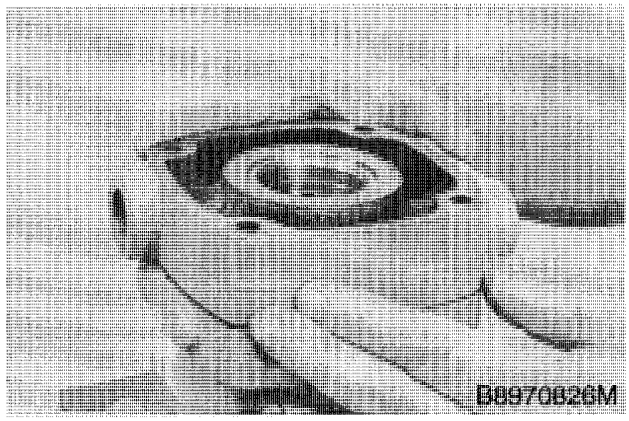
2. Clean all parts of the air compressor in cleaning solvent.

STEP 89



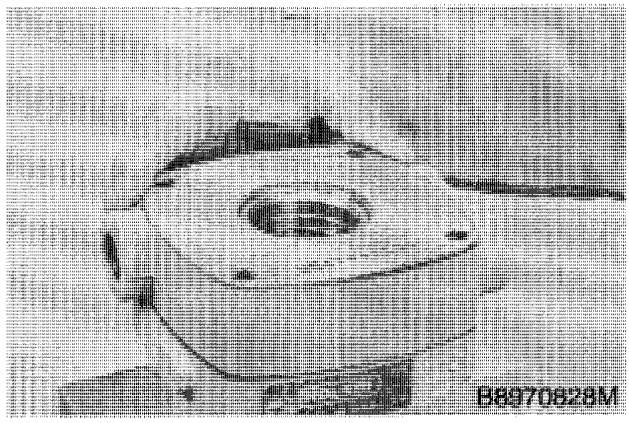
Install a new gasket on the top of the crankcase.

STEP 90



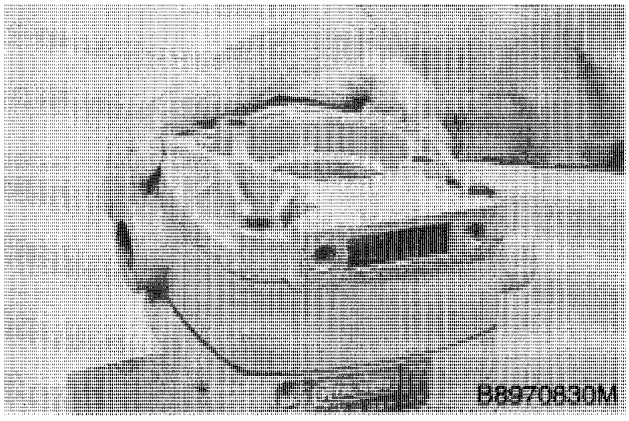
Install the housing.

STEP 91



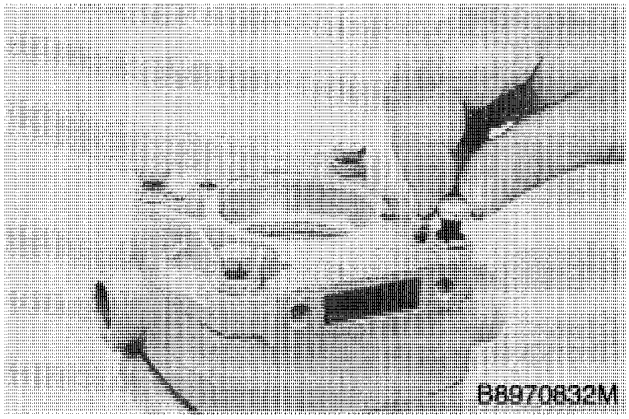
Install a new gasket on top of the housing.

STEP 92



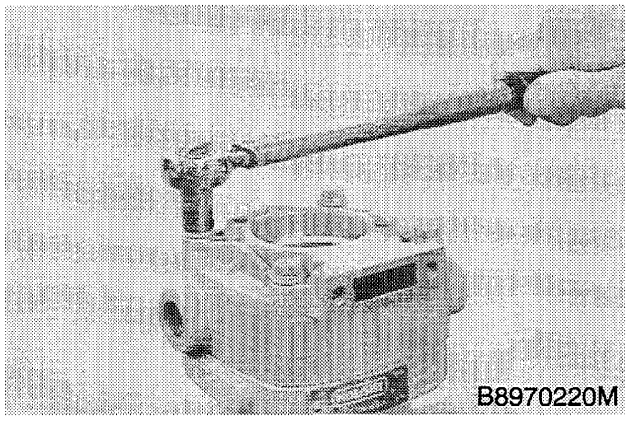
Install the cover.

STEP 93



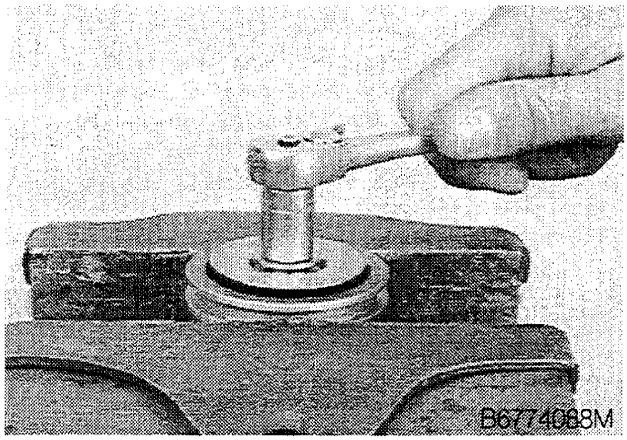
Install the cap screws, lock washers, and flat washers that fasten the cover to the housing.

STEP 94



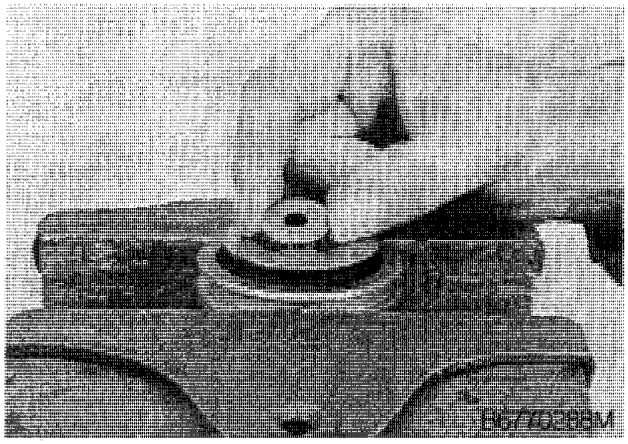
Tighten the cap screws evenly to 240 pound-inches (27 Nm).

STEP 13



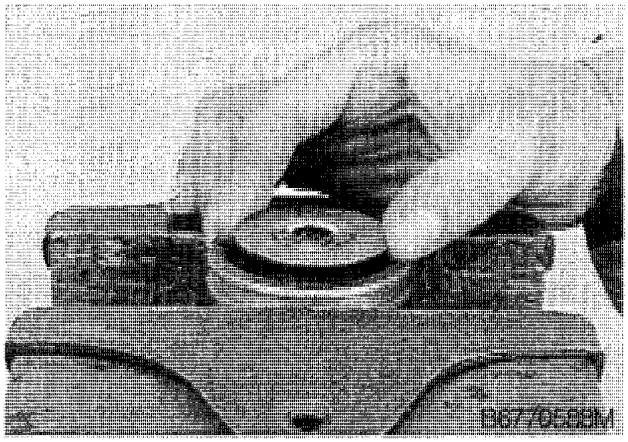
Loosen and remove the cap screw from the piston.

STEP 14



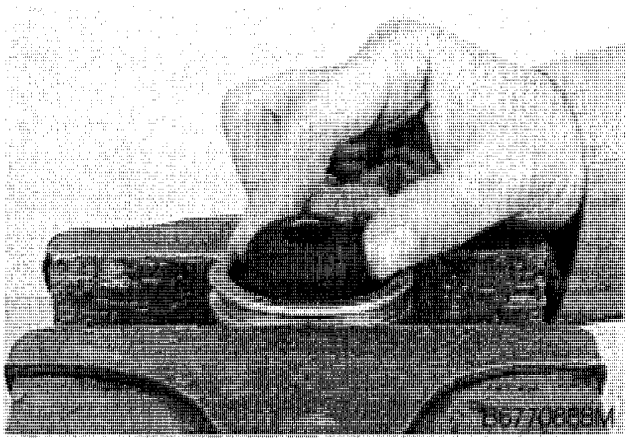
Remove the washer.

STEP 15



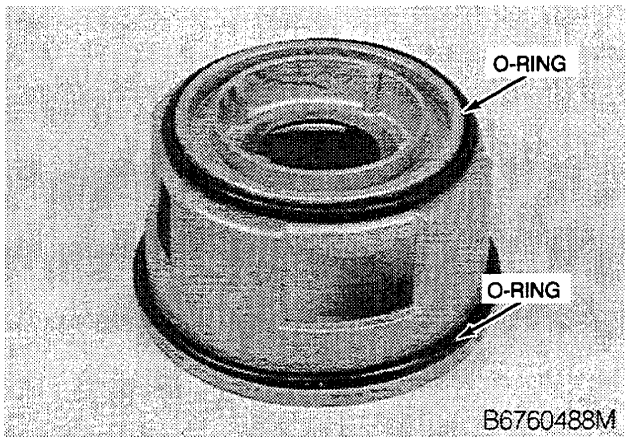
Remove the retainer.

STEP 16



Remove the diaphragm.

STEP 17

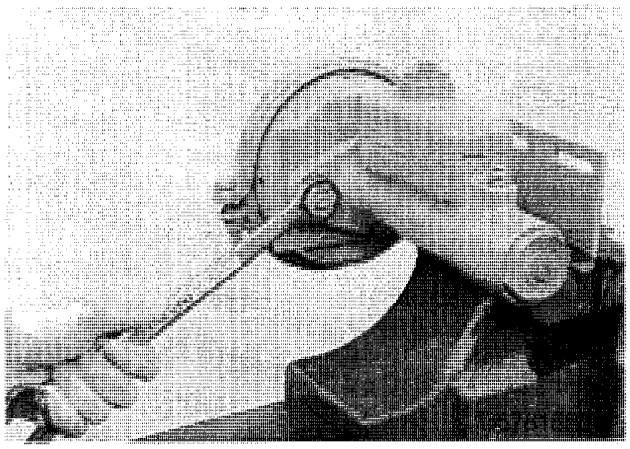


Remove the O-rings from the spring retainer.

MASTER CYLINDER

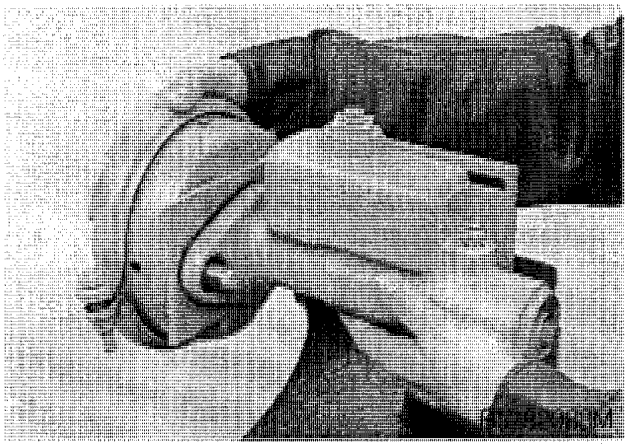
Disassembly

STEP 21



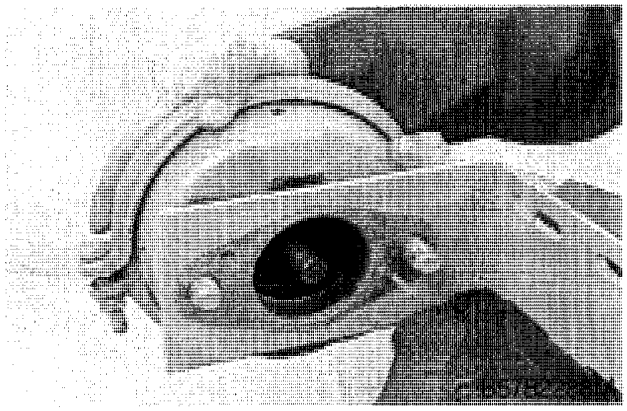
Fasten the mounting bracket in a vise. Loosen and remove the nuts and lock washers that fasten the air chamber to the mounting bracket and the master cylinder.

STEP 22



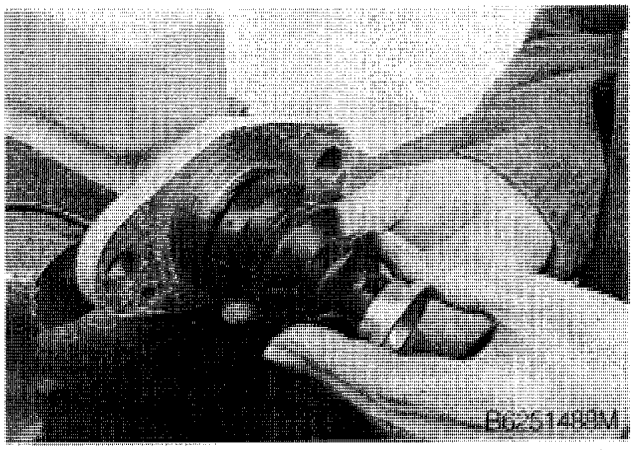
Hold the air chamber in place and remove the master cylinder.

STEP 23



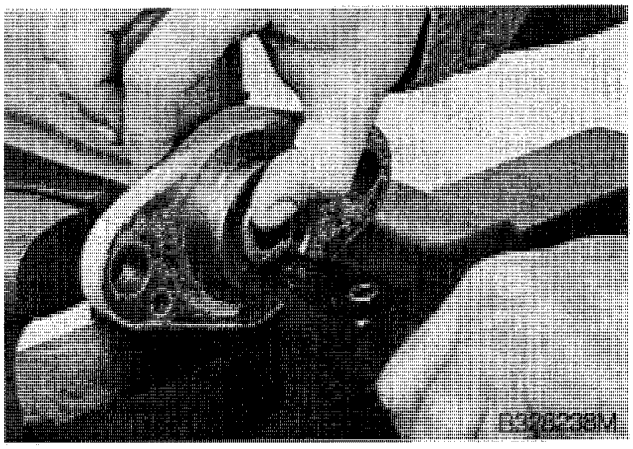
Remove the air chamber from the mounting bracket.

STEP 24



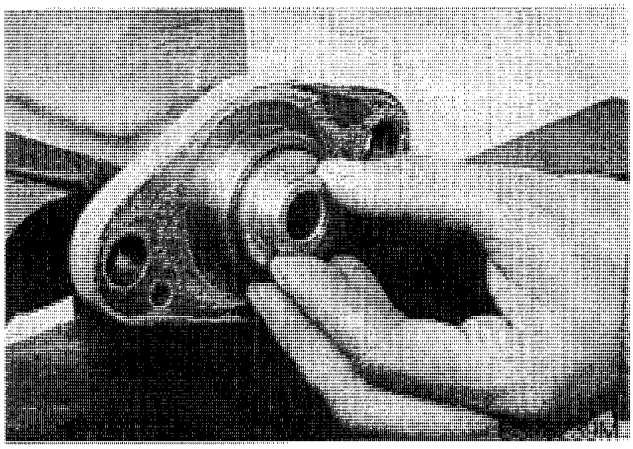
Remove the mounting bracket from the vise. Fasten the master cylinder in the vise. Remove the boot from the master cylinder.

STEP 25



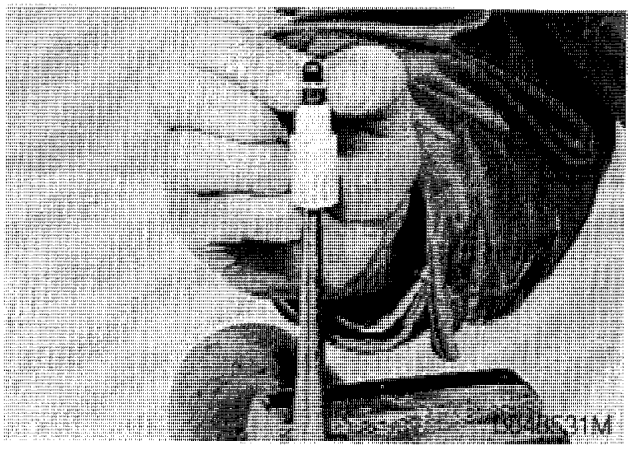
Hold the spacer in place and remove the snap ring.

STEP 26



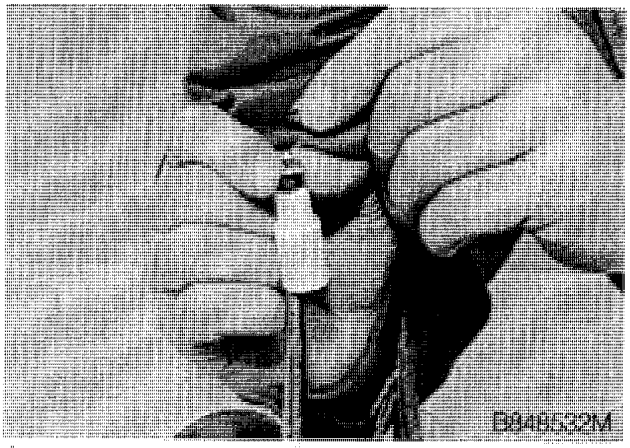
Remove the spacer.

STEP 33



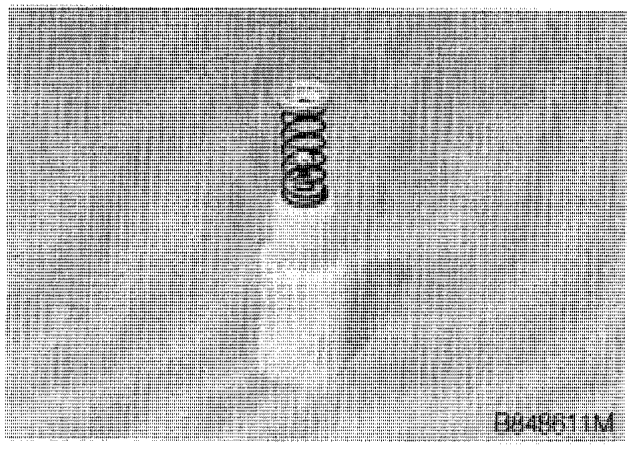
Fasten in a vise, a punch that will fit in the bore for the plug in the piston and put the piston on the punch.

STEP 34



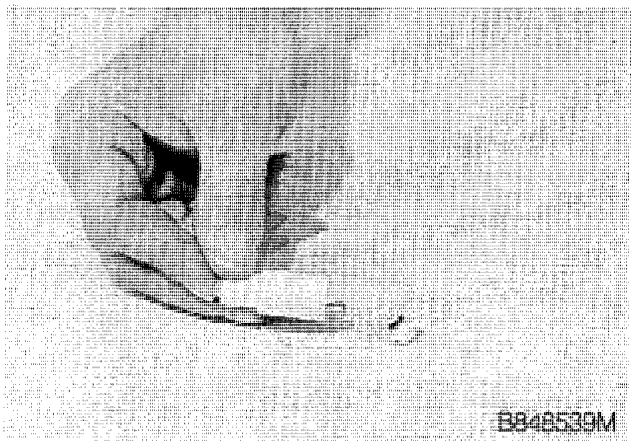
Compress the spring and remove the valve.

STEP 35



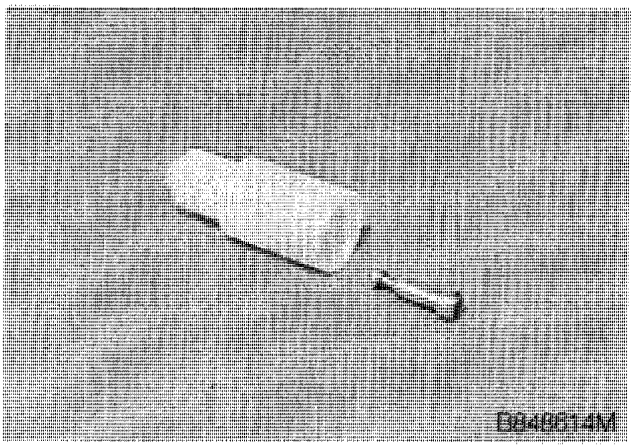
Remove the valve retainer and spring.

STEP 36



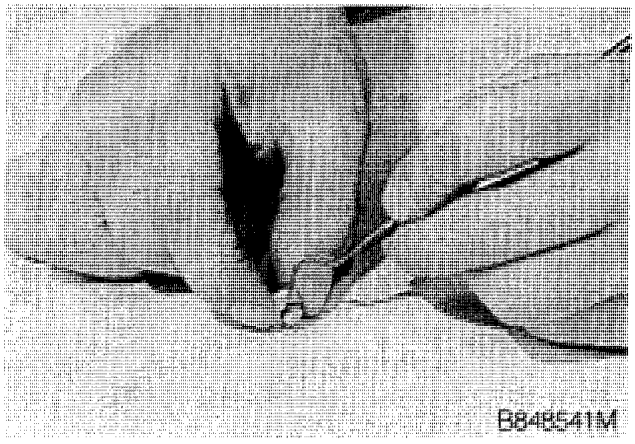
Push the valve stem against the plug to remove the plug.

STEP 37



Remove the valve stem.

STEP 38



Remove the O-ring from the plug.

Section

7009

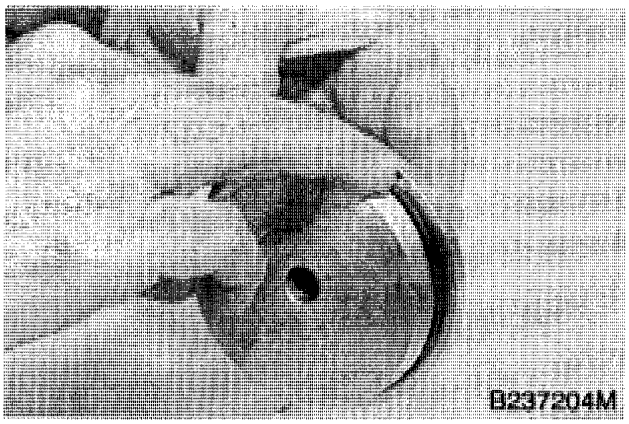
DISC BRAKES
GOODYEAR

CASE CORPORATION

Bur 8-13431

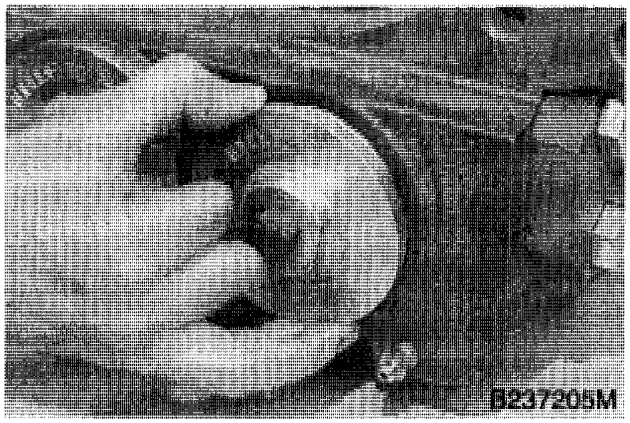
Printed in U.S.A.
Issued March 1991

STEP 49



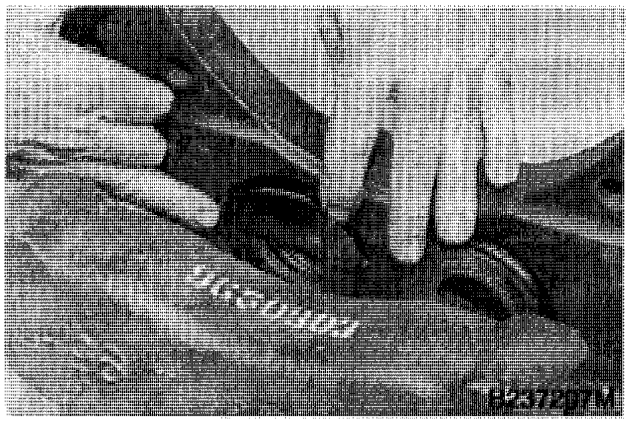
Lubricate the O-rings with clean brake fluid.

STEP 50



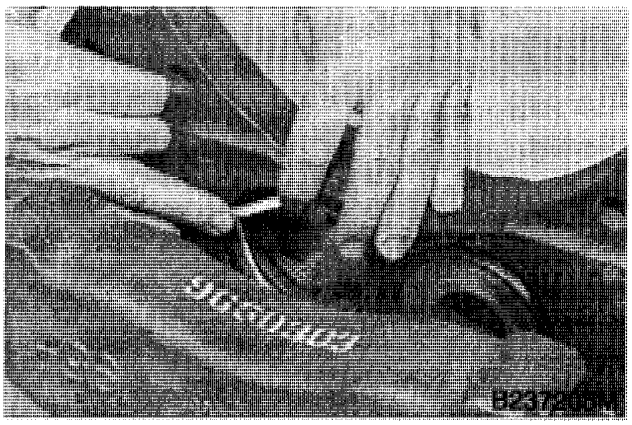
Install the covers.

STEP 51



Install a new O-ring in the outer groove in each open cylinder.

STEP 52



Install a new backup ring in the inner groove in the cylinder.

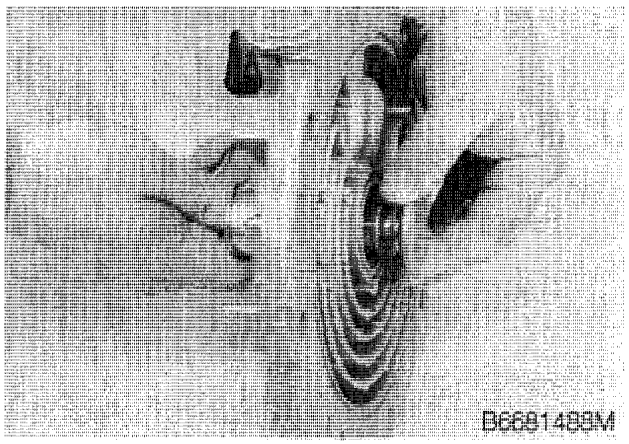
STEP 53

Install a new boot in the inner groove in the cylinder. Lubricate the pistons, O-rings, backup rings and boots with clean brake fluid.

STEP 54

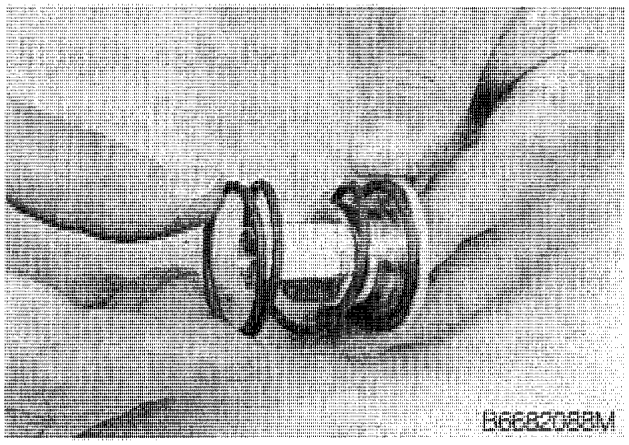
Install the pistons.

STEP 15



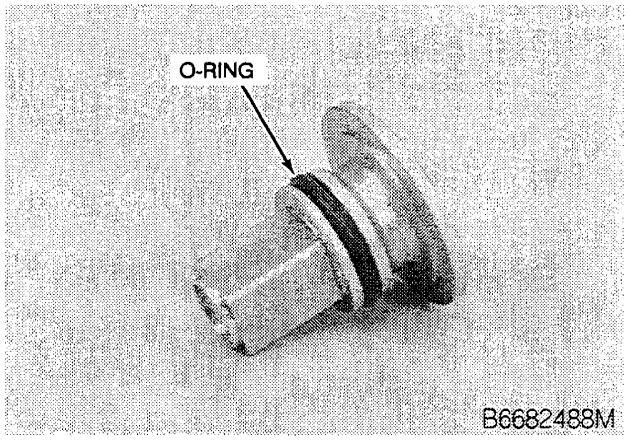
Remove the piston and the spring.

STEP 16



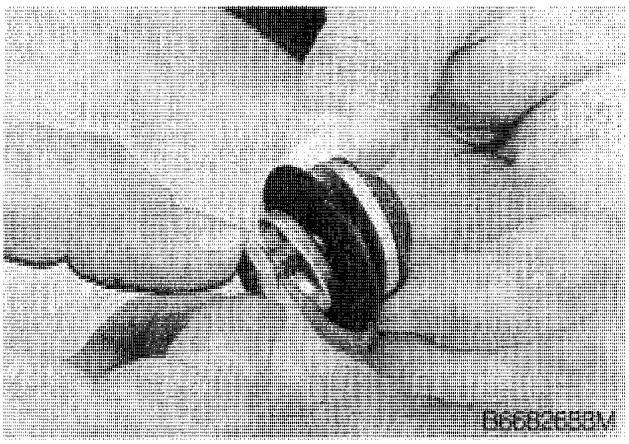
Remove the spring from the piston.

STEP 17



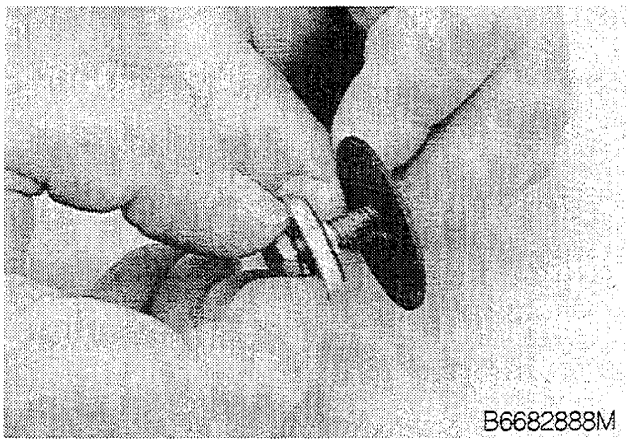
Remove the O-ring from the piston. Discard the O-ring.

STEP 18



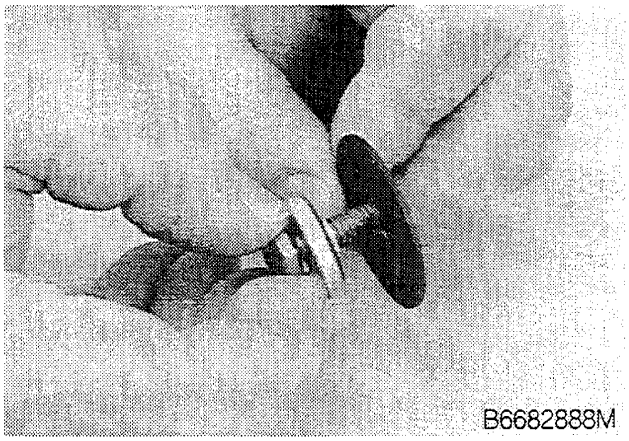
Remove the discharge valve.

STEP 19



Remove the exhaust diaphragm.

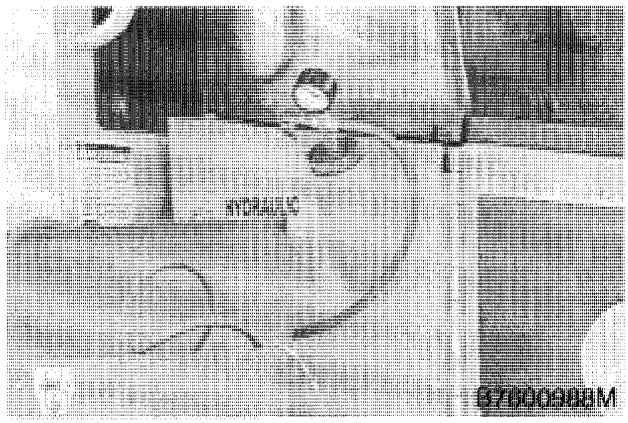
STEP 20



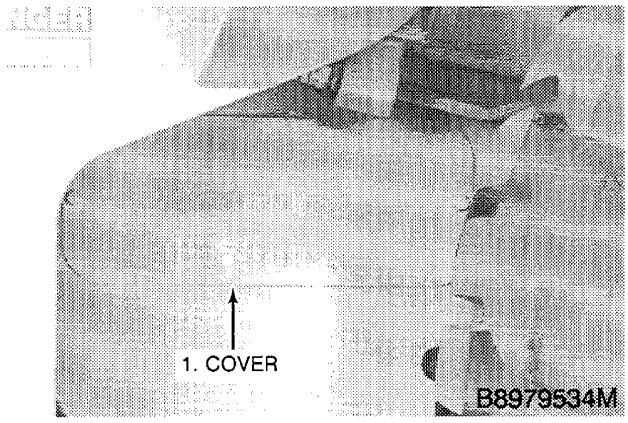
Install a new exhaust diaphragm.

3. Loosen the filler cap in the reservoir to release the air in the reservoir.

4. Connect a vacuum pump to the reservoir.

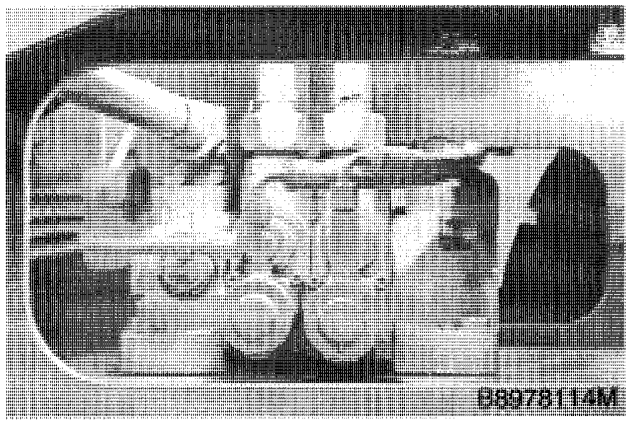


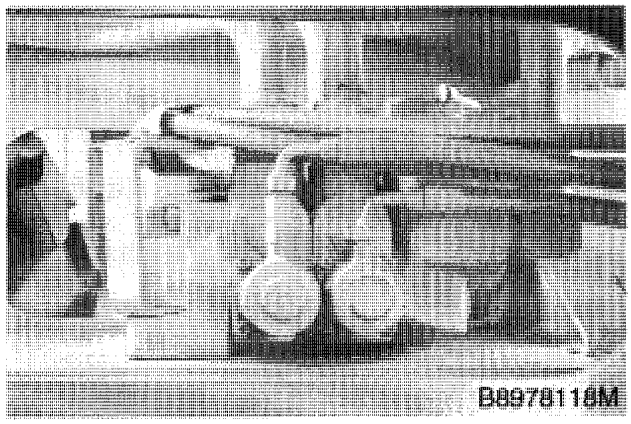
5. Loosen and remove the cap screws and hardened washers that fasten the access covers to each side of the front frame. Remove the access covers.



6. Put identification tags on the hoses and tubes that are connected to the loader control valve.

7. Start the vacuum pump. Disconnect the hoses and tubes from the loader control valve. Install a plug in each hose and tube and a cap on each fitting.





8. Stop the vacuum pump.

9. Loosen and remove the self-locking nuts, flat washers, hardened flat washers and bolts that fasten the loader control valve to the front frame. The left front bolt fastens a support bracket for the hoses to the loader control valve.

10. Have another person help you at this time. Remove the loader control valve from the front frame.

TABLE OF CONTENTS

SPECIFICATIONS

Pump output

Primary pump (rear) ..... 47.3 gpm at 2200 rpm at 2000 psi (179 L/min at 2200 r/min at 13 790 kPa, 138 bar)

Secondary pump (front) ..... 30.3 gpm at 2200 rpm at 2000 psi (115 L/min at 2200 r/min at 13 790 kPa, 138 bar)

Main relief valve pressure setting

without auxiliary steering ..... 2735 to 2885 psi (18 858 to 19 892 kPa, 189 to 199 bar)

with auxiliary steering ..... 2860 to 2960 psi (19 720 to 20 409 kPa, 197 to 204 bar)

Steering relief valve pressure setting ..... See Section 5002

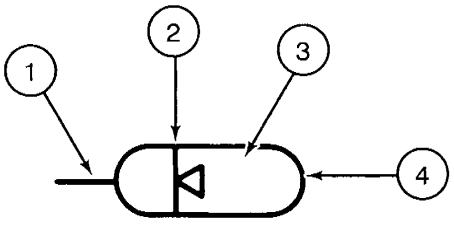
Hand pump pressure setting for circuit relief valves ..... 3100 psi (21 374 kPa, 214 bar)

Accumulator pressure ..... 300 to 325 psi (2068 to 2241 kPa, 21 to 22 bar)

Pressure reducing valve pressure setting ..... 525 to 575 psi (3620 to 3965 kPa, 36 to 40 bar)

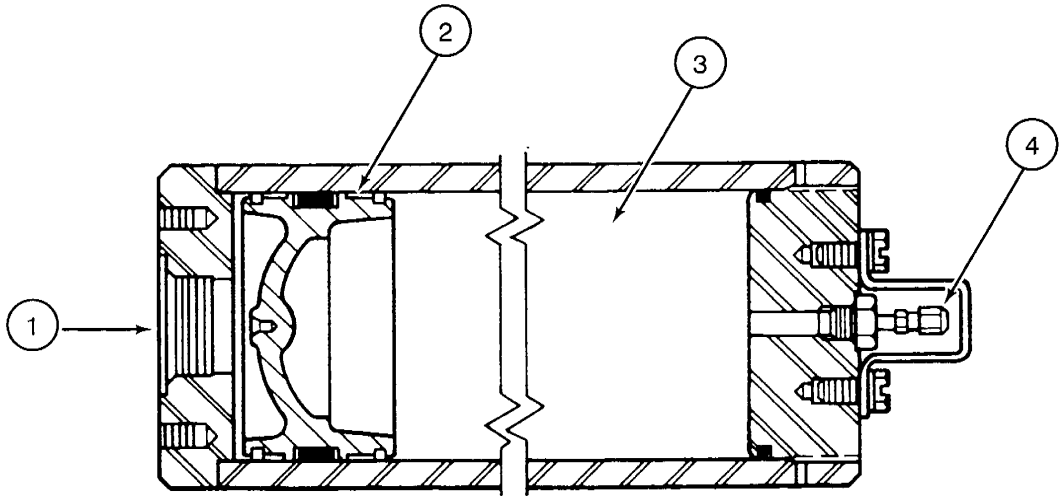
Pressure setting of unloading valve ..... 2100 to 2300 psi (14 479 to 15 858 kPa, 145 to 158 bar) at full throttle

4 ACCUMULATOR



1. *Inlet/Outlet*
2. *Piston*
3. *Nitrogen*
4. *Charging Valve*

Charged with Nitrogen



B1938A88J

HYDRAULIC SCHEMATIC
(Late Production)

DIRECTION OF FLOW
Shows the direction of oil flow through the system.

PILOT PRESSURE
Pressure used to control another component in the system.

CROSSOVER LINES

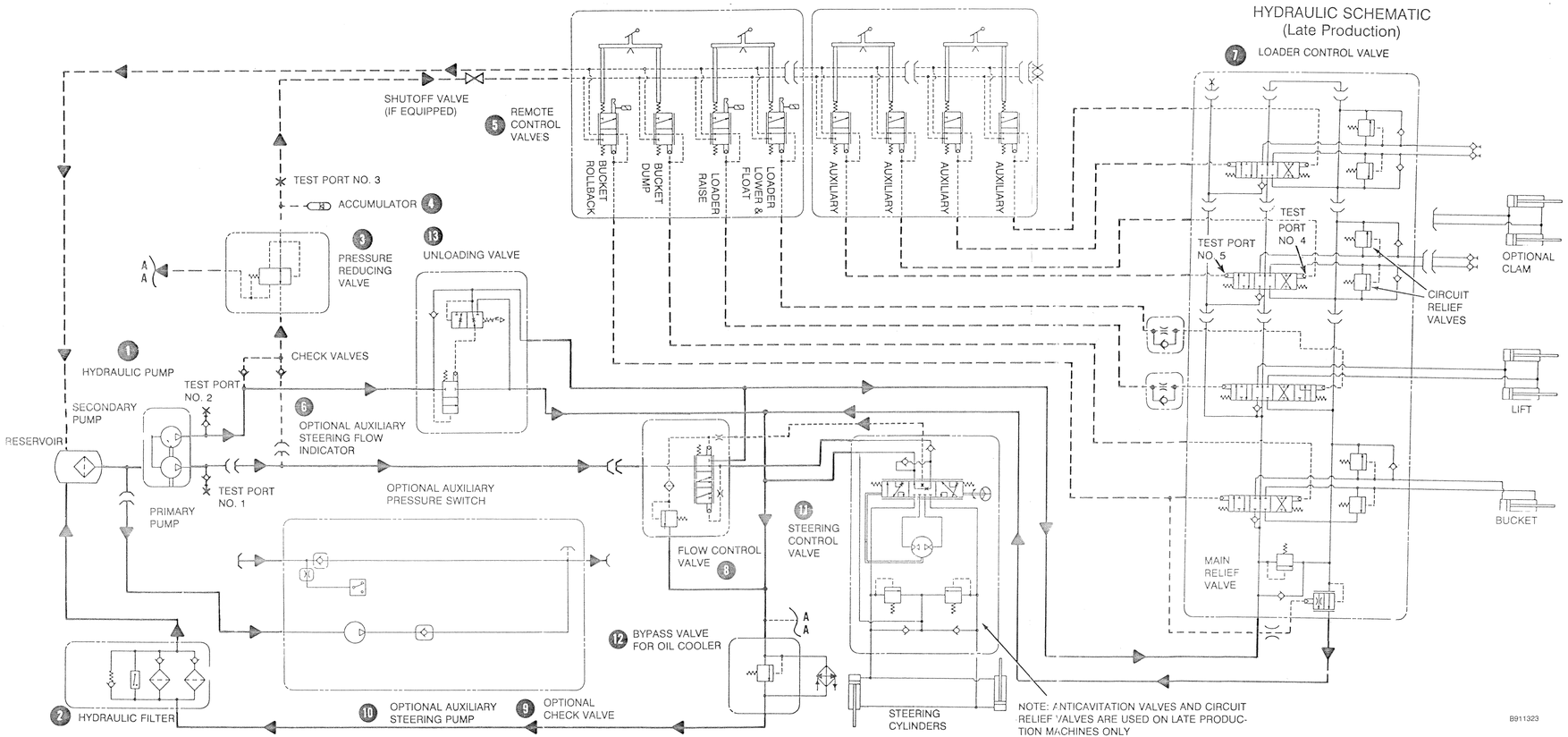
CONNECTING LINES

SCREEN OR FILTER

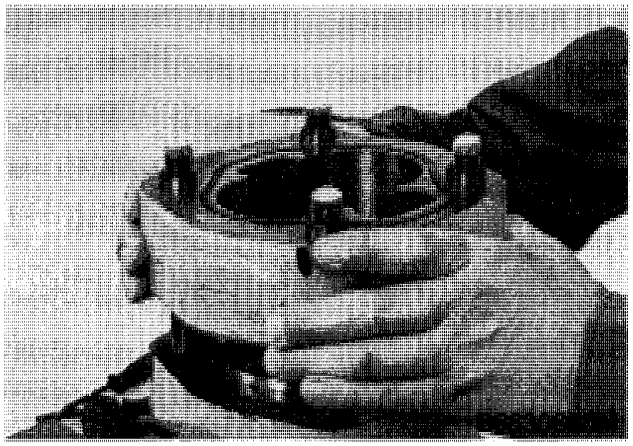
OIL COOLER

CHECK VALVE
Allows oil flow in one direction only.

CYLINDER
Double acting.

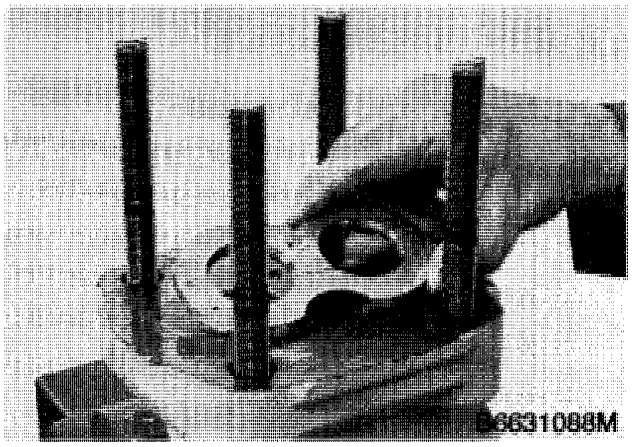


STEP 19



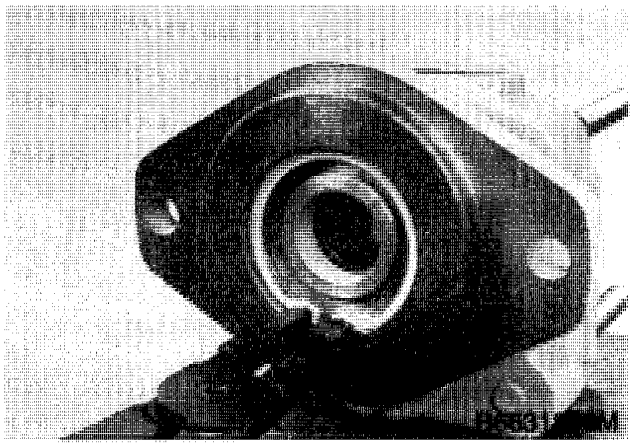
Remove the gear housing.

STEP 20



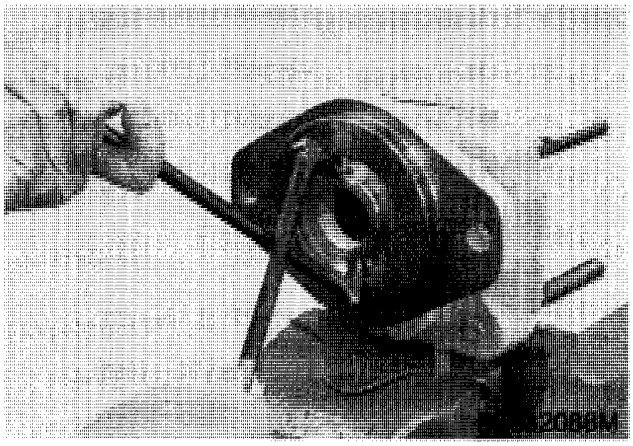
Remove the thrust plate.

STEP 21



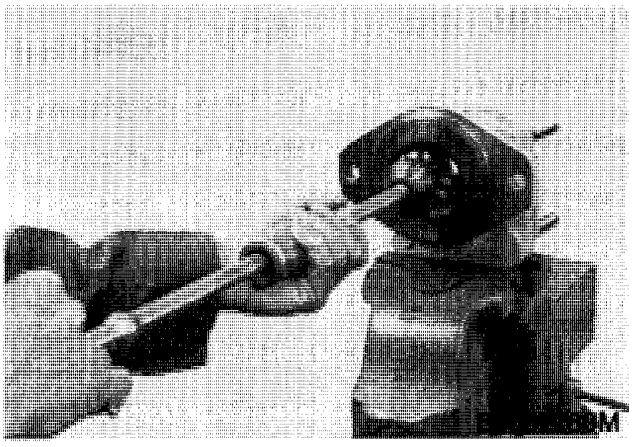
Remove the snap ring from the drive end cover.

STEP 22



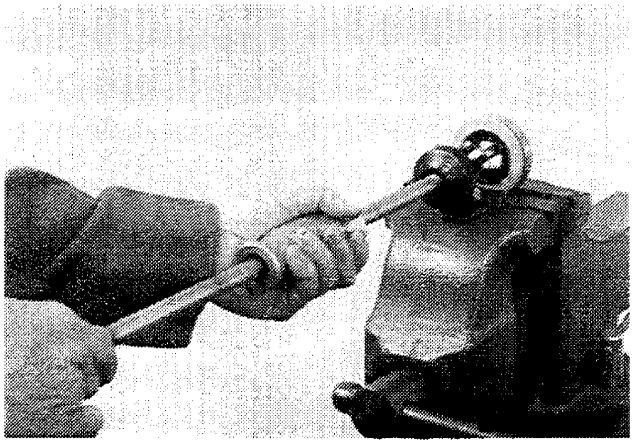
Remove the seal retainer.

STEP 23



Remove the seal from the drive end cover.

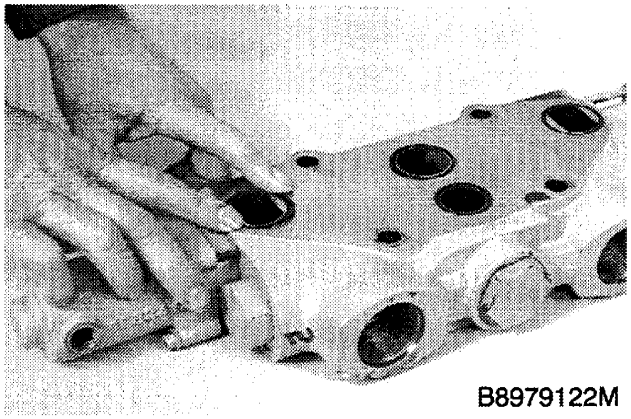
STEP 24



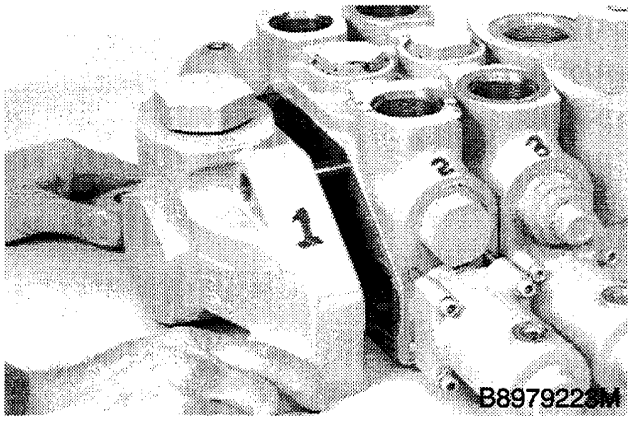
Remove the seal from the seal retainer.

ASSEMBLING THE VALVE SECTIONS

STEP 6

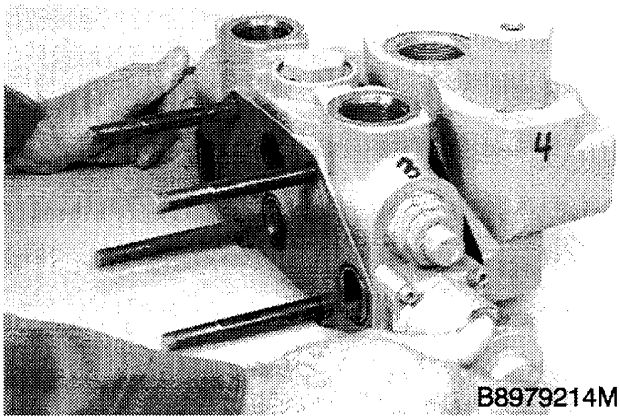


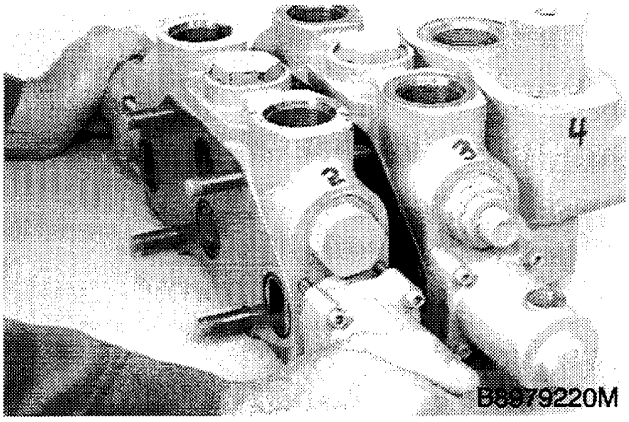
Install new O-rings in the grooves in each section.



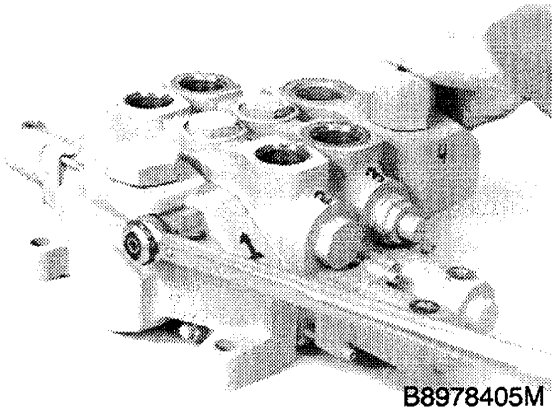
Install the valve sections on the studs in the correct sequence.

STEP 7





STEP 8



Tighten the nuts to 60 to 65 pound-feet (81 to 88 Nm).

Inspection

Clean all parts in cleaning solvent.

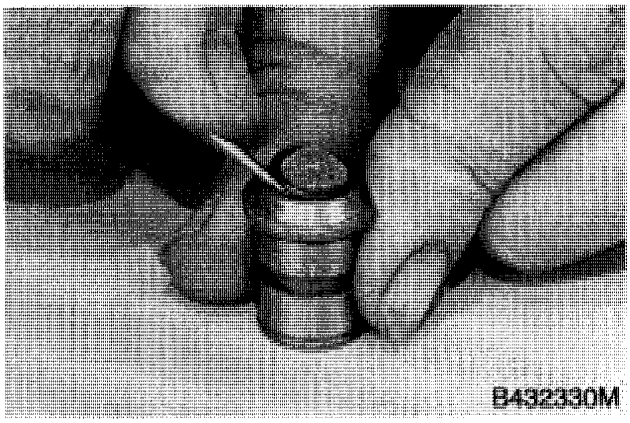
Inspect the spool for wear and damage. Inspect the springs for damage to the threads and inspect the threads in the ends of the spool for damage.

Inspect the spool bores for wear and damage. Inspect all machined surfaces for wear and damage.

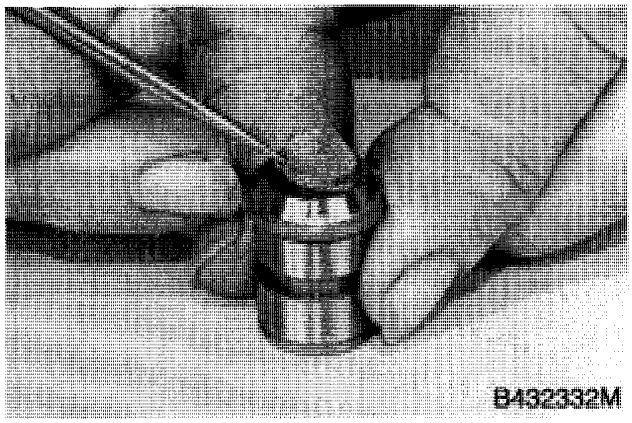
Inspect the poppet and poppet seat for wear and damage. Inspect the spring for the poppet for damage.

STEP 109

If necessary, remove the screen from the poppet.

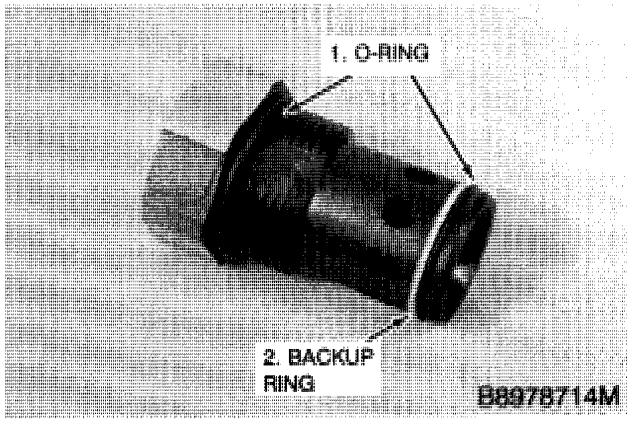


a. Carefully remove the retaining ring.



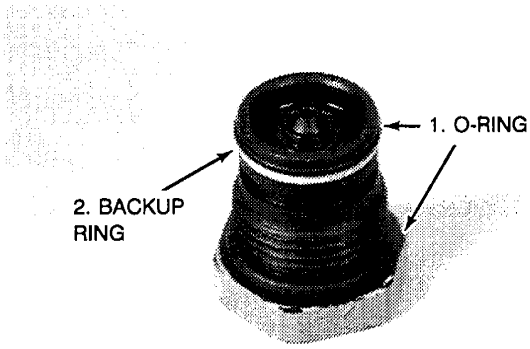
b. Remove and discard the screen.

STEP 110



Remove and discard the O-rings and backup ring from the body.

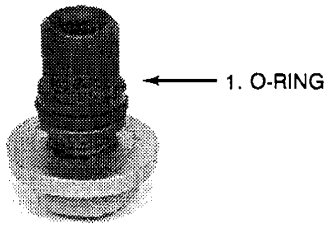
STEP 111



B8978722M

Remove and discard the O-rings and backup ring from the adapter.

STEP 112



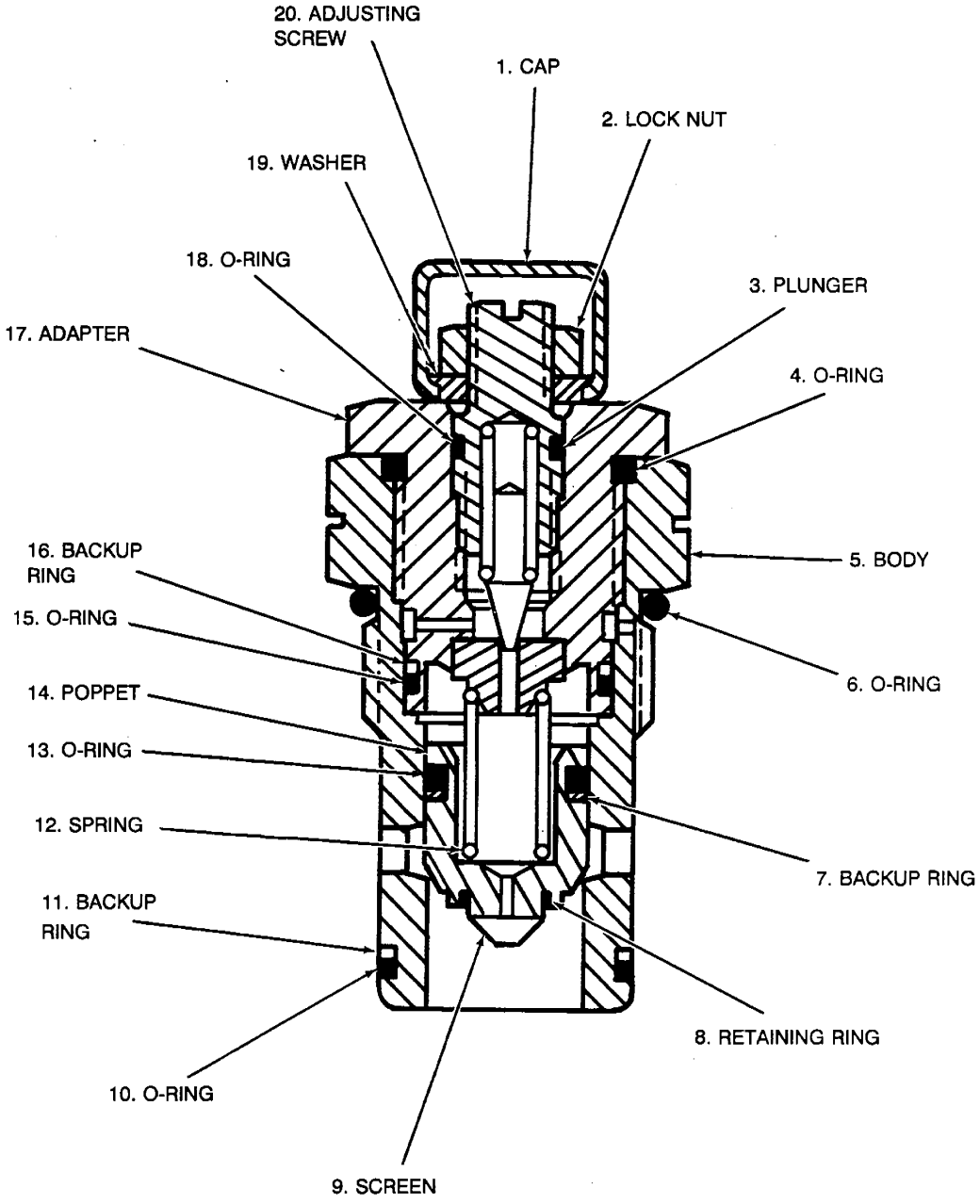
B6930688M

Remove and discard the O-ring from the adjusting screw.

Inspection

Clean all parts in cleaning solvent.

Inspect the spacer, poppet, screen, sleeve, and retaining ring for wear and damage. Inspect the plunger and seat for wear and damage. Inspect the springs for damage. Inspect all machined surfaces for wear and damage. Use new parts as required.



Circuit Relief Valve, Cross Section View

BUCKET AND LIFT CYLINDERS

Disassembly

Clean the outside of the cylinder. If the hoses were removed with the cylinder, remove the hoses from the cylinder.

1. Fasten the tube (1) in an acceptable repair stand or other holding equipment. Do not damage the tube (1).

2. Loosen and remove the cap screws (2) and hardened washers (19) from the gland (3) and the tube (1).

3. Pull the piston rod (4) straight out of the tube (1) to prevent damage to the tube (1).

4. Fasten the piston rod eye or yoke in a vise and put a support under the piston rod (4) near the piston (8). Put a shop cloth between the support and the piston rod (4) to prevent damage to the piston rod (4).

5. Remove the retaining ring (12) that fastens the pin (11) in the piston (8) and piston rod (4).

6. Remove the pin (11) from the piston (8) and piston rod (4).

7. Turn the piston (8) off the piston rod (4) and remove the piston (8).

8. Remove the gland (3) from the piston rod (4).

9. Remove the seal (6) from the OD of the piston (8). On lift cylinders, there is also a backup ring (7). If you are disassembling a lift cylinder, remove this backup ring (7).

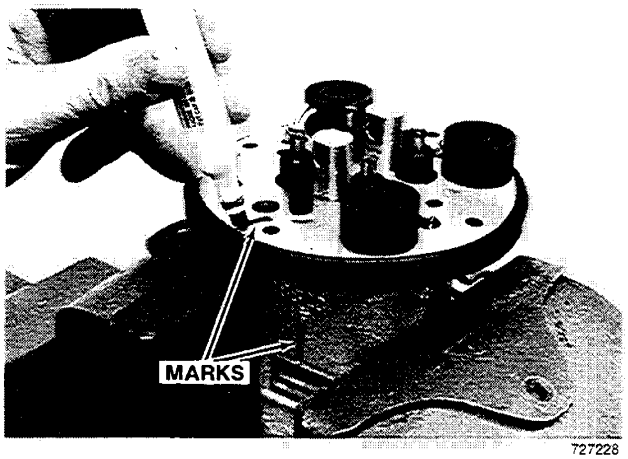
10. Remove the wear ring (5) from the OD of the piston (8).

11. Remove the backup rings (9) and the O-ring (10) from the ID of the piston (8).

12. Remove the O-ring (17), backup ring (16), wiper (13), wide seal (14), narrow seal (15), and bushing (18) from the gland (3).

13. See Inspection on page 3.

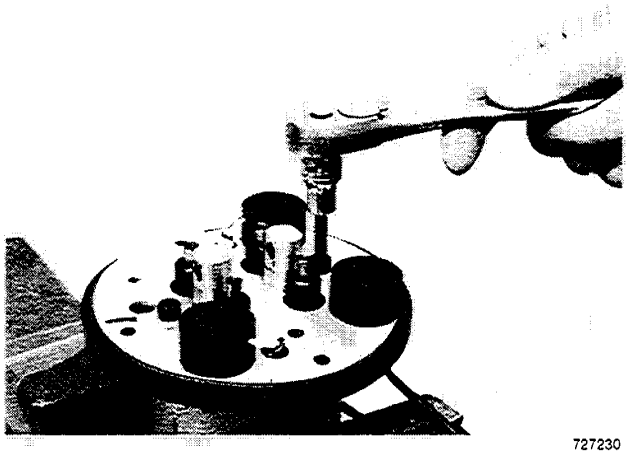
STEP 7



727228

Make marks on the body and plate.

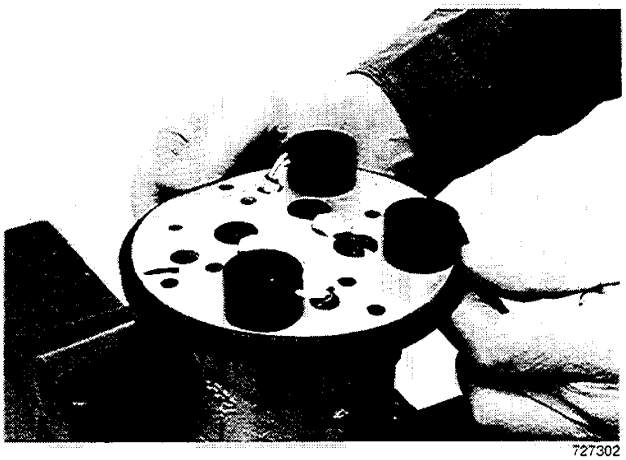
STEP 8



727230

Loosen and remove the two Allen screws that fasten the plates to the body.

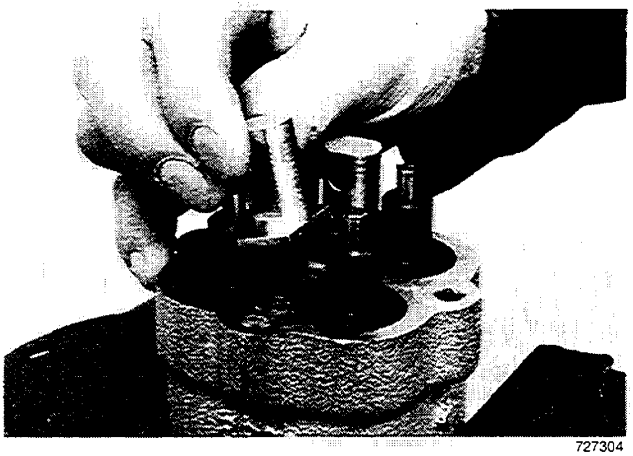
STEP 9



727302

Remove the plates from the body.

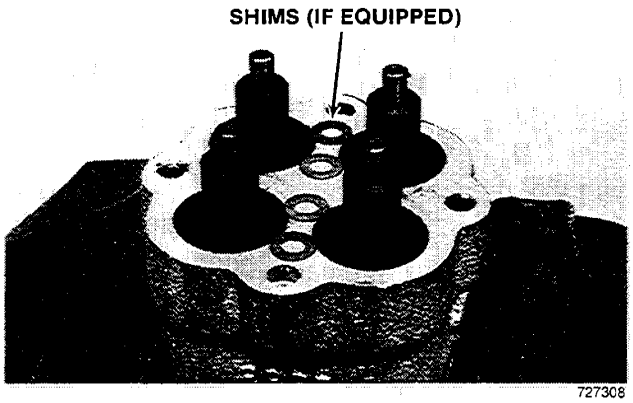
STEP 10



727304

Remove the posts from the body.

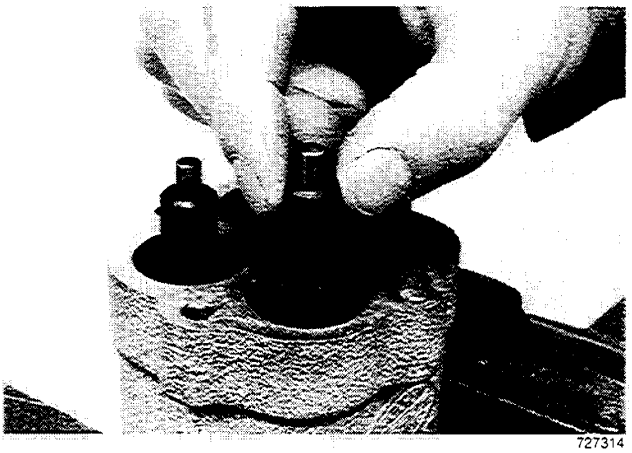
STEP 11



727308

Some control valves use shims between the body and posts. If equipped, remove the shims from the body.

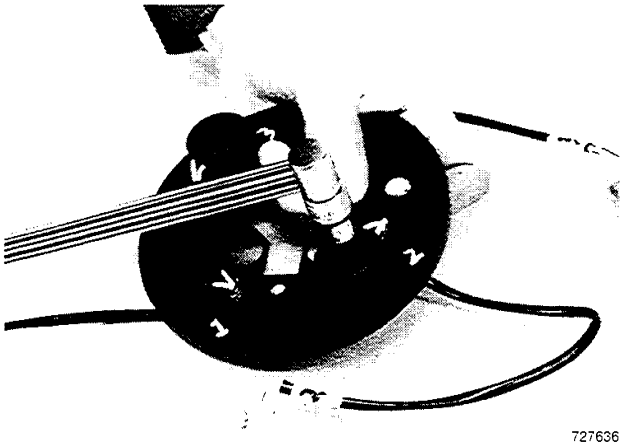
STEP 12



727314

Remove the plunger assembly.

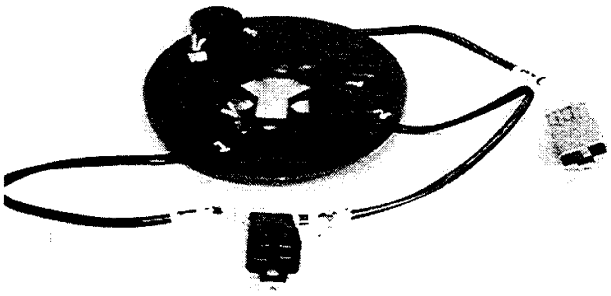
STEP 62



727636

Install the Allen screw and nut to fasten the coil to the plate. Tighten the Allen screw to 20 to 25 pound-inches (2.2 to 2.8 Nm).

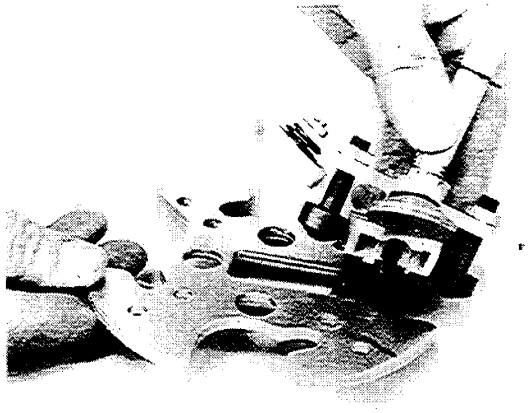
STEP 63



727624

Bend the side of each terminal out and install the terminals into the connectors as shown above.

STEP 64



727614

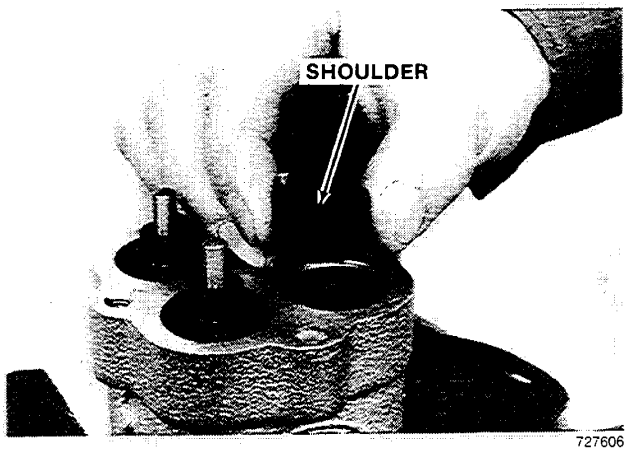
Install the lever assembly in the metal plate.

STEP 65

727612

Install the metal plate and lever assembly on the plastic plate with the marks aligned.

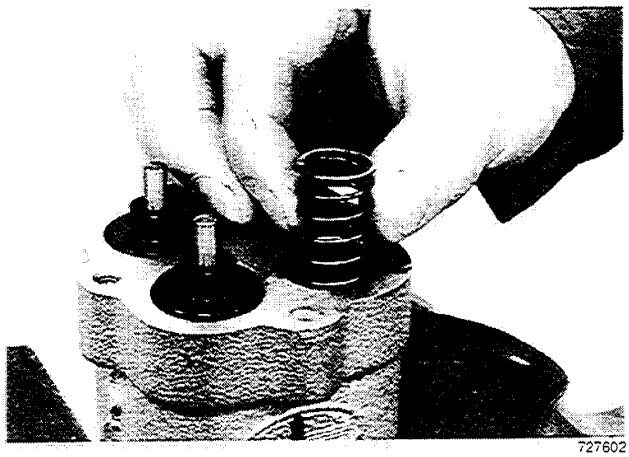
STEP 66



727606

Install the sleeve in the body. The shoulder in the I.D. of the sleeve must be down.

STEP 67



727602

Install the spring.

ACCUMULATOR

The accumulator must be discharged before the accumulator is disassembled.

Discharging the Accumulator

1. Fasten the accumulator in a vise with soft jaws. Be careful not to damage the tube (1).

2. Loosen and remove the cap screws (2) and the protection bracket (3) from the gland (4).

3. Loosen and remove the cap (5) from the valve (6).

NOTE: *The pressure in the accumulator can be approximately 325 psi (2241 kPa, 22.4 bar). Make sure that the valve (6) end of the accumulator is away from you when discharging the accumulator.*

4. Use a small punch to push the valve core (7) in. Hold the valve core (7) in until all pressure is removed from the accumulator.

Disassembly

1. Use the gland wrench to slowly loosen and remove the gland (4) from the tube (1).

2. Use a punch and push the piston (8) from the tube (1).

3. Remove the gland seal (10) from the gland (4).

4. Fasten the gland (4) in a vise with soft jaws. Be careful not to damage the gland (4).

5. Loosen and remove the valve core (7) from the valve (6).

6. Loosen and remove the valve (6) from the gland (4).

7. Remove the O-ring (9) from the valve (6).

8. Remove the wear rings (11 and 12) from the piston (8).

9. Remove the piston seal (13) from the piston (8).

Inspection

1. Discard the O-ring (9), gland seal (10), wear rings (11 and 12), and the piston seal (13).

2. Clean all parts in cleaning solvent.

3. Illuminate the inside of the tube (1). Inspect the inside of the tube (1) for deep grooves and other damage. If there is damage to the tube (1), a new tube (1) must be used. Remove small scratches inside the tube (1) with emery cloth of medium grit. Use the emery cloth with a rotary motion.

4. Inspect the piston (8) for wear or damage that can cause nitrogen or oil leakage. Use a new piston (8) as required.

5. Inspect the gland (4) for wear or damage that can cause nitrogen leakage. Use a new gland (4) as required.

6. Inspect the valve (6) for wear or damage that can cause nitrogen leakage. Use a new valve (6) as required.

7. Inspect the valve core (7) for wear or damage that can cause nitrogen leakage. Use a new valve core (7) as required.

Assembly

1. Install a new piston seal (13) on the piston (8).

2. Install new wear rings (11 and 12) on the piston (8).

3. Lubricate the bore in the tube (1), the wear rings (11 and 12), and the piston seal (13) on the piston (8) with clean oil.

4. Push the piston (8) straight into the tube (1).

5. Fasten the valve (6) in a vise with soft jaws.

6. Install the valve core (7) in the valve (6). Tighten the valve core (7) to 1.5 to 2.0 pound-inches (0.170 to 0.226 Nm).

7. Install the cap (5) on the valve (6).

8. Install a new O-ring (9) on the valve (6).

9. Lubricate the O-ring (5) on the valve (6) with clean oil.

10. Install the valve (6) in the gland (4). Tighten the valve (6) to 65 to 75 pound-feet (88 to 102 Nm).

11. Install a new gland seal (10) on the gland (4).

12. Lubricate the gland seal (10) on the gland (4) with clean oil. Apply antisieze compound to the threads on the gland (4).

Blower and Compressor Clutch Check

Compressor Clutch

1. If there is electrical system voltage to the clutch, see Section 9004 and replace the clutch.

Low and High Pressure Switches

1. See Section 4001 and check the high and low pressure switches.

Blower Fuse (10 Ampere)

1. Check for damaged blower fuse.

Blower Switch

1. Check switch operation. Switch must give three different blower speeds: Low, Medium, and High.
2. Check for loose connections or broken wires. Repair or replace as necessary.
3. Check resistor board.

Blower Motor

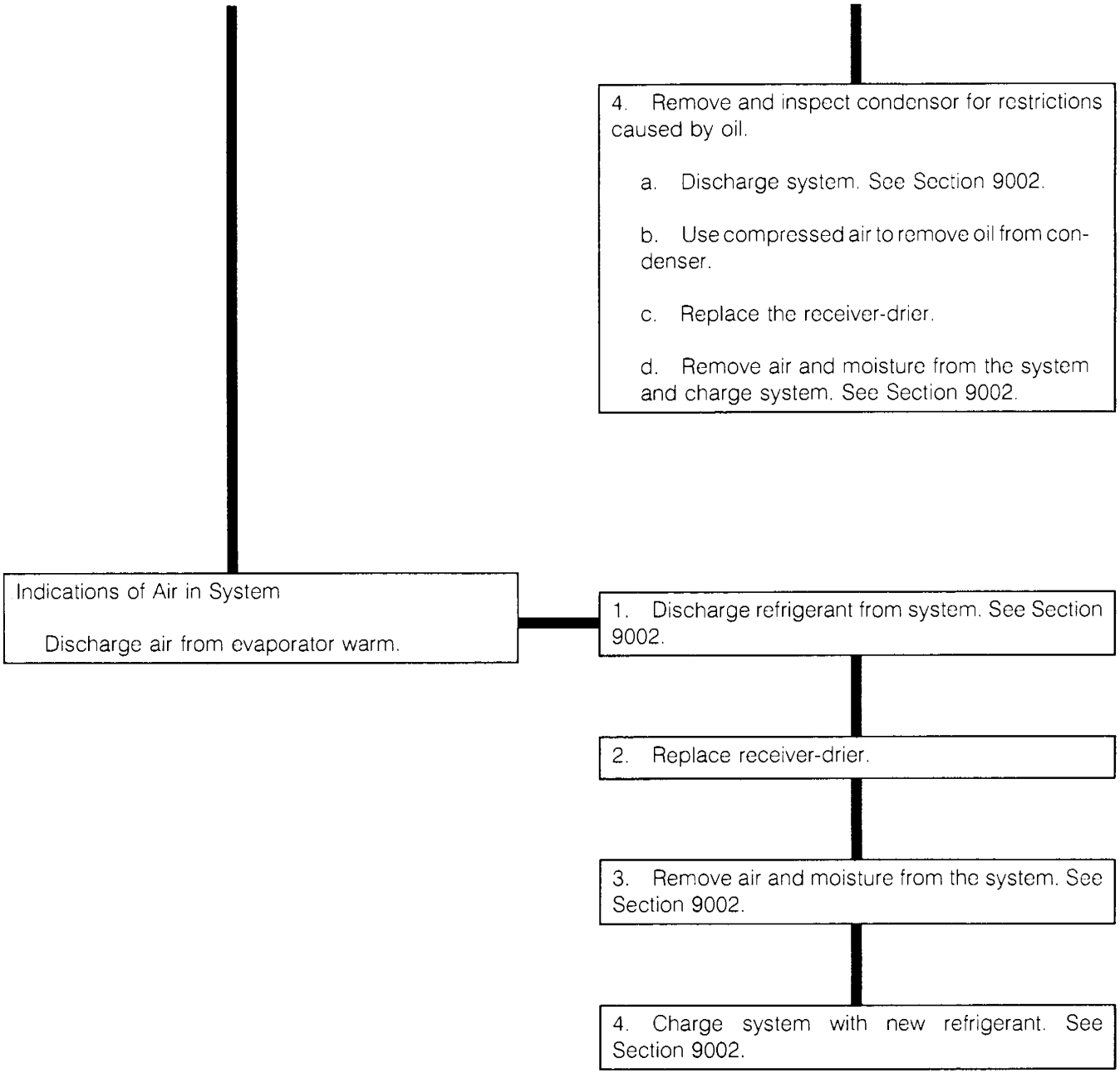
1. Check wiring to blower motor. Repair or replace as necessary.
2. Check motor ground wire. Make sure motor ground wire is making good contact with mounting bracket.

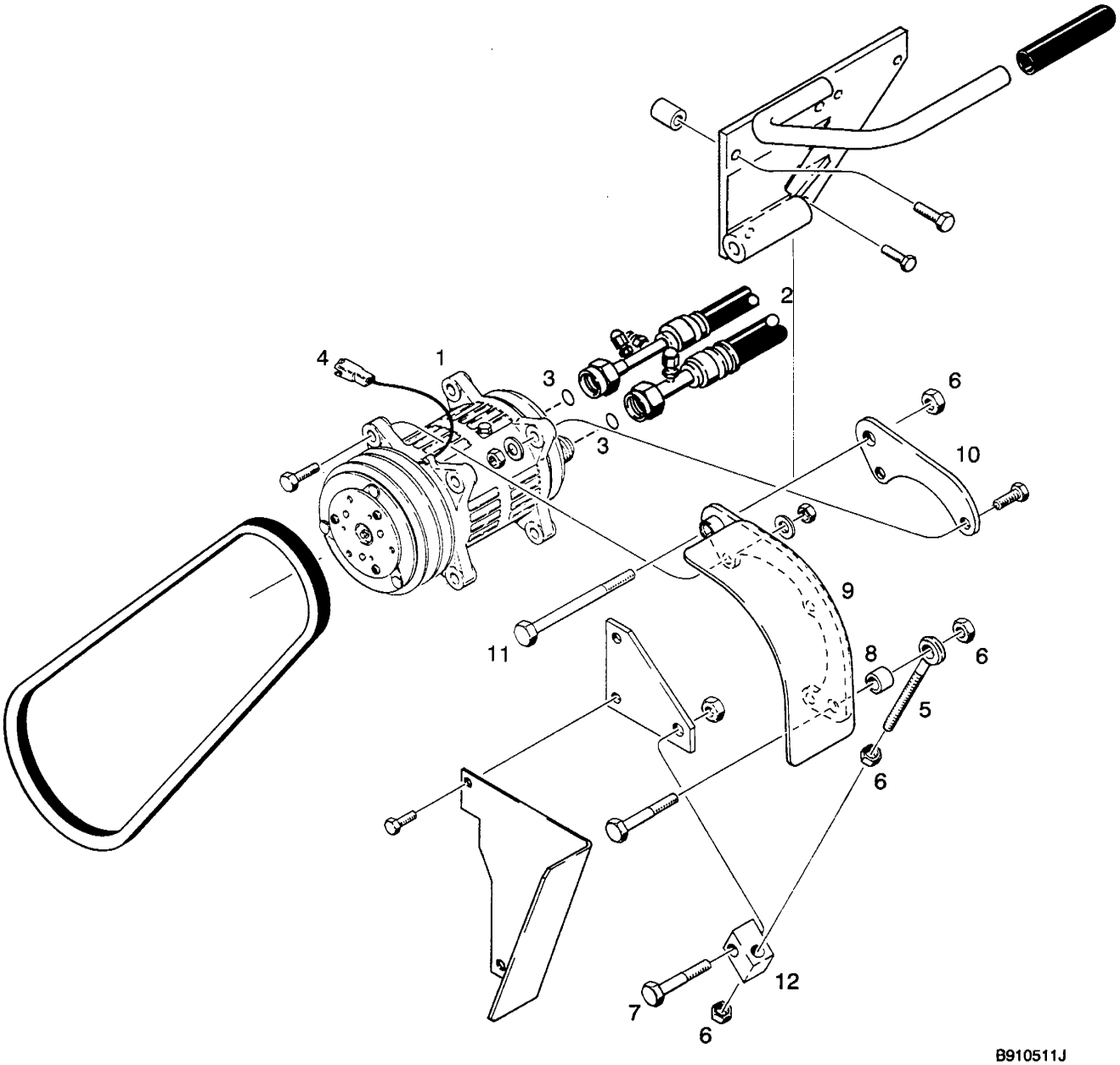
Temperature Control Switch

1. Turn switch to maximum cold. Compressor clutch must engage.

   NOTE: *Blower must be operating, since electrical power to temperature control switch is received from blower switch.*
2. Turn the blower off. Disconnect the wires from the temperature control. Using an ohmmeter, check continuity between switch termnals. If continuity is not present when switch is on maximum cold, replace switch.

Indications of a Problem in Condensor Operation (Continued)





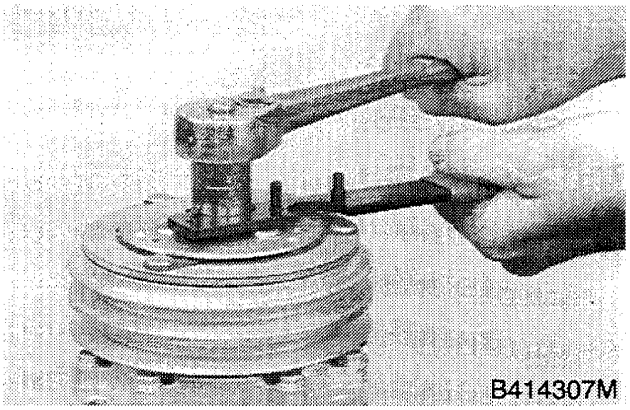
1. Compressor	*5. Adjusting Rod*	*9. Rear Bracket*
2. Hose	*6. Nut*	*10. Front Bracket*
3. O-ring	*7. Bolt*	*11. Pivot Bolt*
4. Wire	*8. Spacer*	*12. Adjusting Block*

Compressor

REPLACING THE COIL OR CLUTCH ASSEMBLY

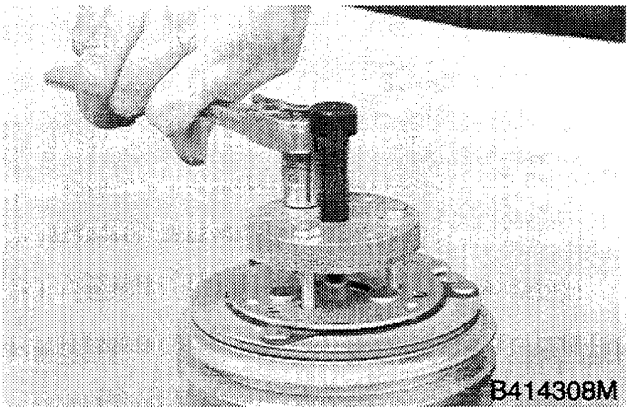
NOTE: *Special tools are from kit CAS-10747 shown on page 3.*

STEP 1



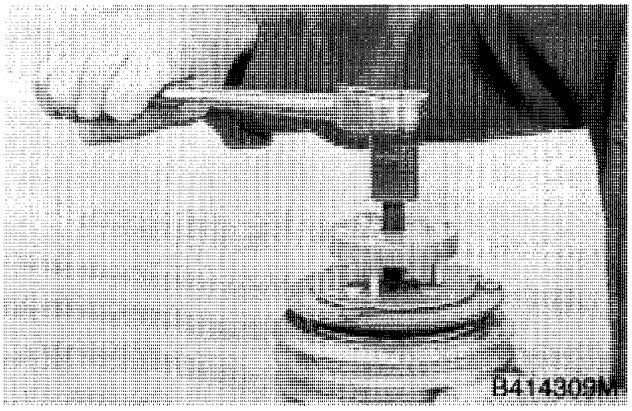
Fasten the compressor in a vise. Loosen and remove the three cap screws and lock washers from the cover on the clutch. Remove the cover. Loosen and remove the nut that holds the clutch plate.

STEP 2



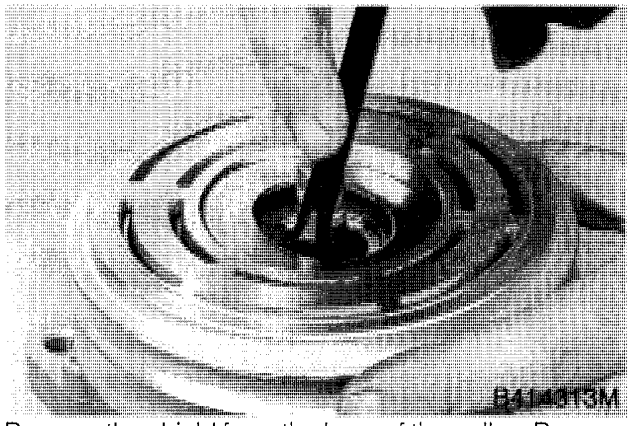
Install the puller for the clutch plate.

STEP 3



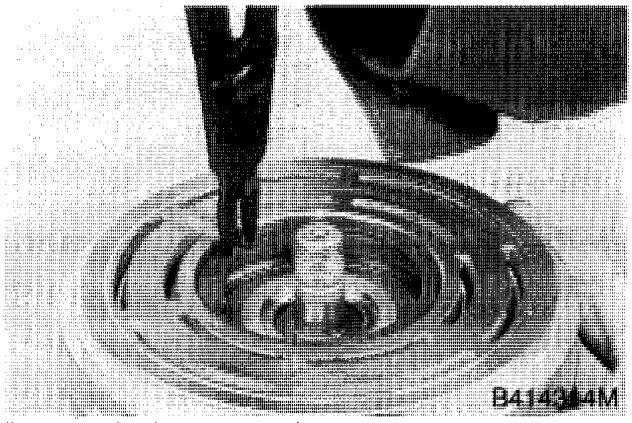
Remove the clutch plate.

STEP 4



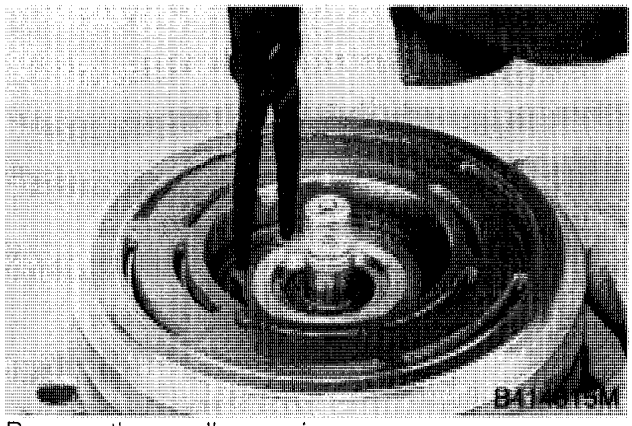
Remove the shield from the bore of the pulley. Remove the Woodruff Key.

STEP 5



Remove the large snap ring.

STEP 6



Remove the small snap ring.

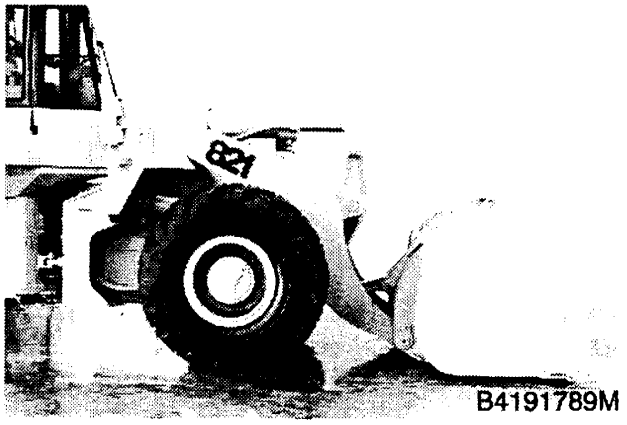
Section

9005

LOADER

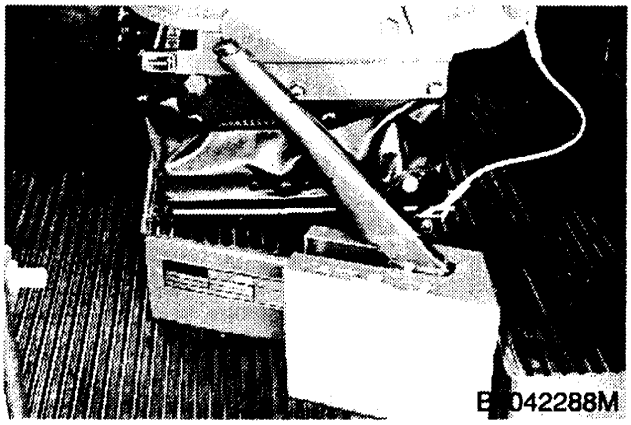
BUCKET HEIGHT CONTROL ADJUSTMENT

STEP 28



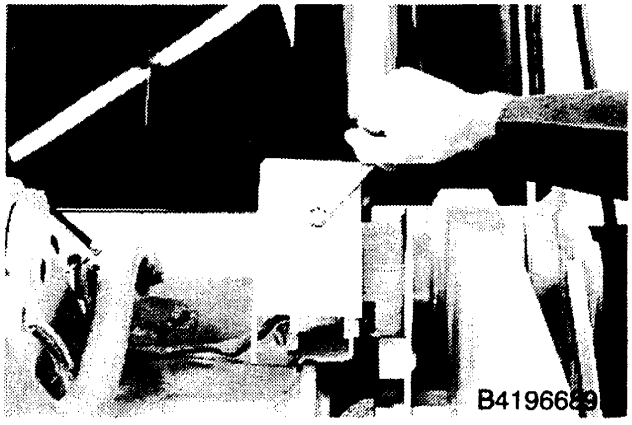
Park the machine on a level surface and lower the loader frame so the bucket is flat on the floor.

STEP 29



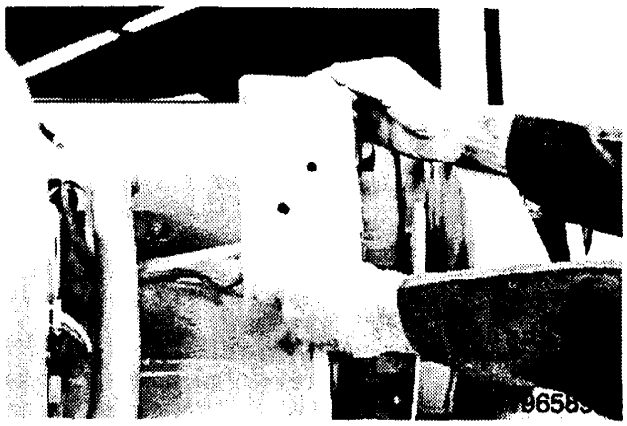
Stop the engine and apply the parking brake.

STEP 30



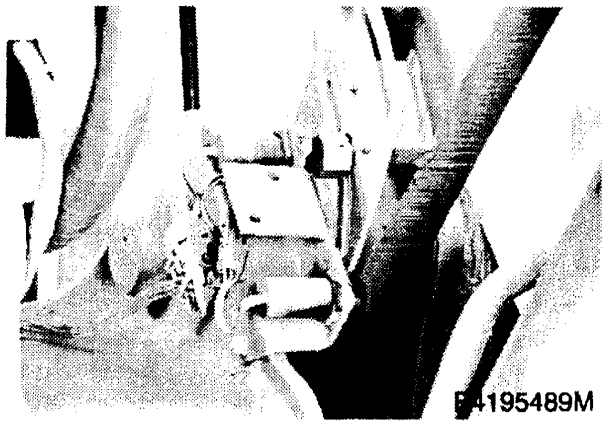
Loosen and remove the screws and hardened washers that fasten the cover.

STEP 31



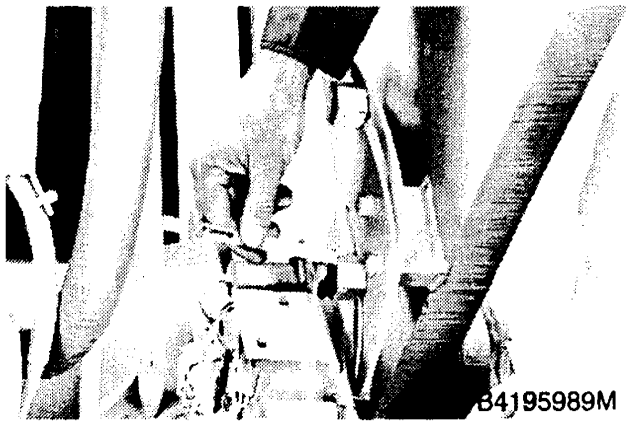
Remove the cover.

STEP 32



Start the engine and raise the loader frame until the rear actuator is even with the bucket height control switch. Stop the engine. Connect a chain hoist to the cross-member of the loader frame.

STEP 33



Loosen the nuts for the switch and adjust the nuts so there is 1/8 to 3/16 inch (3.2 to 5.0 mm) clearance between the switch and the actuator Hold the switch in position and tighten the nuts