# LOCTITE PRODUCT CHART

| Product | Color | Similar Products | Gap (In Inches) | Strength (Steel/Steel) | Working Temperature Range-Farenheit | Fixture/Full Cure (Steel/Steel) Time | Primer | Description |
|---|---|---|---|---|---|---|---|---|
| 518 | Red | 515 | 0.030 | 500psi | -65 to +300 | 1hr/24 hrs | 764 | Gasket Eliminator 518 for Aluminum |
| 542 | Brown | 569 | N/A | 132/92 in lbs | -65 to +300 | 2 hr/24 hrs | 747 | Hydraulic Sealant |
| 545 | Purple | | N/A | 25/20 in lbs | -65 to +300 | 4 hr/24 hrs | 747 | Low Strength Pneumatic/Hydraulic Sealant |
| 549 | Orange | 504 | 0.020 | 2500 psi | -65 to +300 | 2 hr/24 hrs | 747 | Instant Seal Plastic Gasket |
| 554 | Red | 277 | 0.015 | 240/240 in lbs | -65 to +300 | 2 to 4 hrs/24 hrs | 764 | Refrigerant Sealant |
| 567 | White | 592 | N/A | 500 psi | -65 to +400 | 4 hrs/24 hrs | 764 | Pipe Sealant for Stainless Steel |
| 568 | Orange | 277 | 0.015 | 2500 psi | -65 to +300 | 12 hrs/24 hrs | 764 | Plastic Gasket |
| 569 | Brown | 545 | 0.010 | 40/25 in lbs | -65 to +300 | 1 hr/24 hrs | 764 | Hydraulic Sealant |
| 570 | Brown | 592 | N/A | 25/40 in lbs | -65 to +300 | 6 hrs/72 hrs | 764 | Steam Sealant |
| 571 | Brown | 592 | 0.015 | 40/20 in lbs | -65 to +300 | 2 to 4 hrs/24 hrs | 764 | Pipe Sealant |
| 572 | White | 578.575 | N/A | 80/27 in lbs | -65 to +300 | 24 hrs/72 hrs | None | Gasketing |
| 592 | White | | 0.020 | 500 psi | -65 to +400 | 4 hrs/72 hrs | 736 | Pipe Sealant with Teflon |
| 593 | Black | | 0.250 | 400 psi | -95 to +400 | 30 min/24 hrs | N/A | RTV Silicone |
| 601 | Green | 609 | 0.005 | 3000 psi | -65 to +300 | 10 min/24 hrs | 764 | Current PIN #609 |
| 609 | Green | | 0.005 | 3000 psi | -65 to +300 | 10 min/24 hrs | 764 | General Purpose Retaining Compound |
| 620 | Green | 640 | 0.015 | 3000 psi | -65 to +450 | 30 min/24 hrs | 747 | High Temperature Retaining Compound |
| 635 | Green | 680 | 0.010 | 4000 psi | -65 to +300 | 1 hr/24 hrs | 747 | High Strength Retaining Compound |
| 638 | Green | 680 | 0.015 | 4100 psi | -65 to +300 | 10 min/24 hrs | 747 | High Strength Retaining Compound |
| 640 | Green | 620 | 0.007 | 3000 psi | -65 to +400 | 1 hr/24 hrs | 747 | High Temperature Retaining Compound |
| 660 | Silver | | 0.020 | 3000 psi | -65 to +300 | 20 min/24 hrs | 764 | Quick Metal |
| 675 | Green | 609 | 0.005 | 3000 psi | -65 to +300 | 20 min/24 hrs | 747 | General Purpose Retaining Compound |
| 680 | Green | 635 | 0.015 | 4000 psi | -65 to +300 | 10 min/24 hrs | 747 | High Strength Retaining Compound |
| 706 | Clear | 755 | N/A | N/A | N/A | N/A | N/A | Cleaning Solvent |
| 707 | Amber | | N/A | N/A | N/A | N/A | N/A | Activaltor for Structural Adhesives |
| 736 | Amber | | N/A | N/A | N/A | N/A | N/A | Primer NF |
| 738 | Amber | | N/A | N/A | N/A | N/A | N/A | Depend Activator |
| 747 | Yellow | N/A | N/A | N/A | N/A | N/A | N/A | Primer T |
| 751 | Clear | | N/A | N/A | N/A | N/A | N/A | Activator for Structural Adhesives |
| 755 | Clear | | N/A | N/A | N/A | N/A | N/A | Cleaning Solvent |
| 764 | Green | | N/A | N/A | N/A | N/A | N/A | Primer N |
| 767 | Silver | | N/A | N/A | -65 to +1600 | N/A | N/A | Anti-Seize Lubricant |

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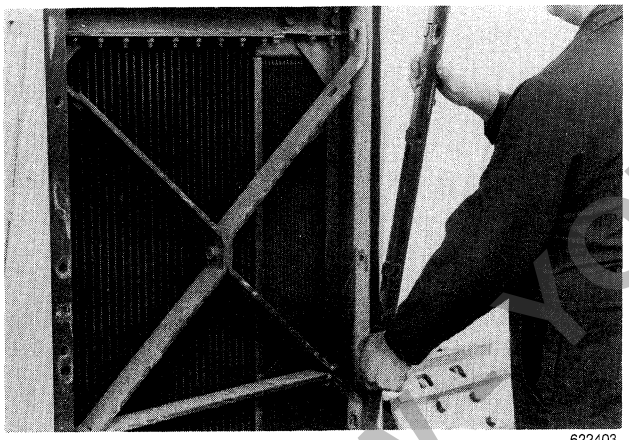
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18. Install the cross brace. Install the cap screws, lock washers, and flat washers that hold the cross brace to the right grille mount. Tighten the cap screws.



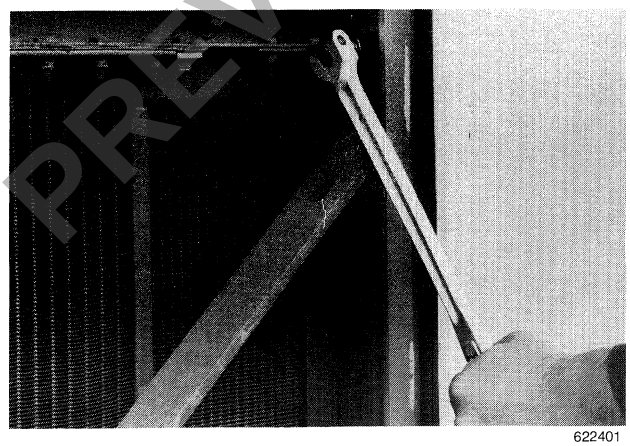
622405

19. Install the left grille mount.



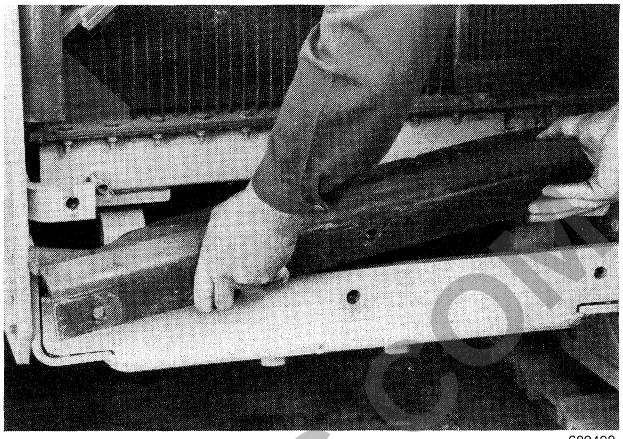
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20. Install the cap screws, lock washers, and flat washers that hold the cross brace to the left grille mount. Tighten the cap screws.



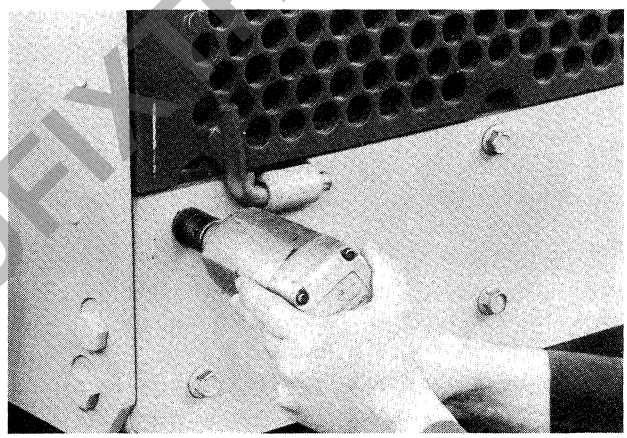
622401

21. Install the bottom bracket.



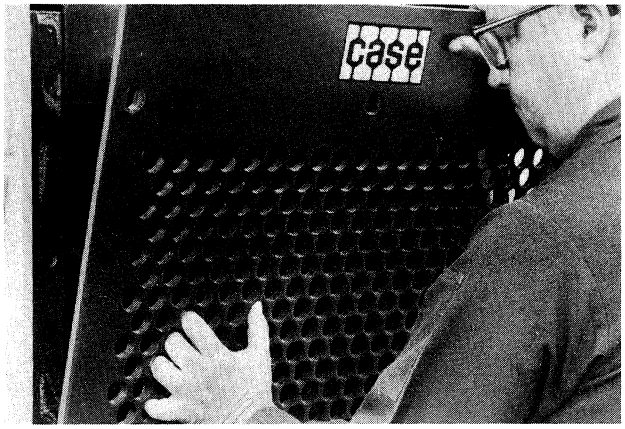
622409

22. Install the plate and the bottom half of the grille. Tighten the cap screws.



622334

23. Install the top half of the grille in place and install the cap screws.




622332

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# IDENTIFICATION MARKS

## Crankshaft

Letter N = Nitroc Hardened, crankshaft must be rehardened to a minimum hardness of 450 HV 0.2 rockwell any time the crankshaft has been reconditioned.

## Cylinder Block

Letter X = The cylinder block has been refaced and up to 0.25 mm has been removed. Use a thicker head gasket (two notches).

Letter XX = The cylinder block has been refaced and up to 0.50 mm has been removed. Use a thicker head gasket (three notches).

## Cylinder Head

Letter G = Thermostat passage in cylinder did not need to be machined.

Letter M = Thermostat passage in cylinder head was machined.

Letter V = Valve seats have been machined.

Letter X = The cylinders in the cylinder block have been bored oversize. Use this gasket for standard replacement and oversize cylinder holes (one notch).

Letter XX = The cylinder block has been refaced and up to 0.25 mm has been removed use a thicker head gasket (two notches).

Letter XXX = The cylinder block has been refaced and up to 0.50 mm has been removed. Use a thicker head gasket (three notches).

Numbers = RH rear corner of cylinder head indicates the amount of material removed from the cylinder head.

# ENGINE SPECIFICATION DETAILS

## Cylinder Block

| | Metric Value |
|---|---|
| Type | Non-Sleeved |
| Material | Cast Iron |
| ID of Cylinder | 102.00 to 102.04 mm |
| Maximum Service Limit | 102.116 mm |
| Cylinder Out of Round (Maximum) | 0.038 mm |
| Cylinder Taper (Maximum) | 0.076 mm |
| 0.5 mm Oversize Piston | |
| Machine Cylinder Bore to | 102.40 to 102.44 mm |
| Hone to (Finished Diameter) | 102.50 to 102.54 mm |
| 1.00 mm Oversize Piston | |
| Machine Cylinder Bore to | 102.90 to 102.94 mm |
| Hone to (Finished Diameter) | 103.00 to 103.04 mm |
| Warpage (Maximum) | 0.075 mm |
| Maximum Material Removal | 0.50 mm |

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# SPECIAL TORQUES

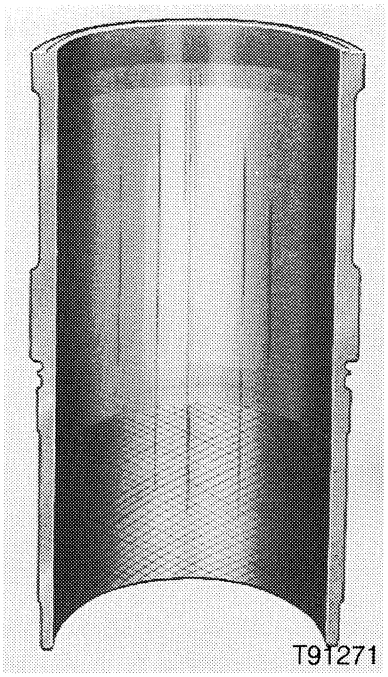
| | Metric Value |
|---|---|
| Alternator Bracket Bolts | 21 to 27 Nm |
| Belt Tensioner Bolt | 39 to 47 Nm |
| Belt Tensioner Bracket Bolt (Allen head) | 21 to 27 Nm |
| Cylinder Head Bolts (Short) | 90 Nm Plus 90 Degrees |
| Cylinder Head Bolts (Long) | 120 Nm Plus 90 Degrees |
| Exhaust Manifold Bolts | 39 to 47 Nm |
| Fan Belt Pulley Bracket Bolts | 23 to 25 Nm |
| Fan Belt Pulley Bolts | |
| 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 |
| Filter Inlet Fitting | 29 to 35 Nm |
| Fuel Filter Housing Nut | 29 to 35 Nm |
| Injector Cap Nut | 55 to 65 Nm |
| Injector Leak Off Fitting | 5 to 7 Nm |
| Intake Manifold Cover Bolts | 21 to 27 Nm |
| Lift Bracket Bolt (Rear) | 71 to 83 Nm |
| Rocker Arm Bracket Bolts | 21 to 27 Nm |
| Thermostat Housing Bolts | 21 to 27 Nm |
| Valve Cover Bolts | 21 to 27 Nm |

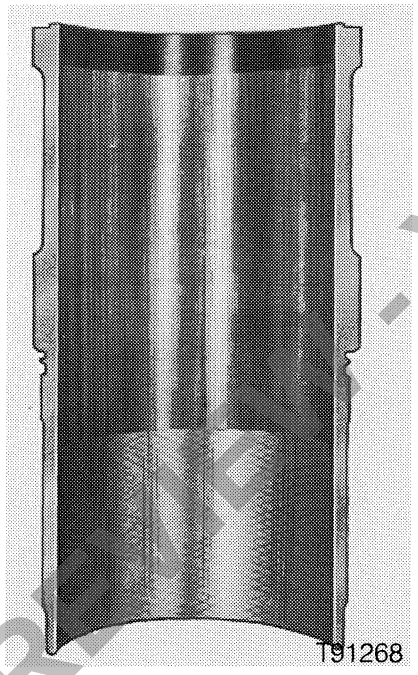
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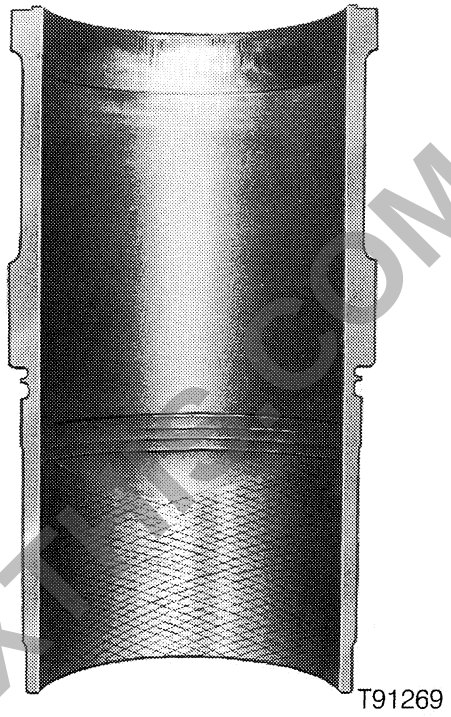
## Scoring on Cylinder Walls




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

## Dusted Cylinder




Too much area in the piston ring movement area shows a dusting failure.

A dusting failure will cause the following:

1. Lower area of piston wall will show wear.
2. Too much piston ring groove wear.
3. Too much piston ring side clearance.
4. Washed away areas of the piston ring lands where the aluminum will be gone.
5. Piston rings will have too much face contact and wear which can be seen as a reduction in radial width and increase in end gap.
6. Chrome piston rings will show wear through the face. The chrome will be worn off the face and base iron can be seen.
7. The cylinder heads can have smooth intake ports and worn valve guides.

All of these conditions are caused by dirt which is mixed with the intake air.

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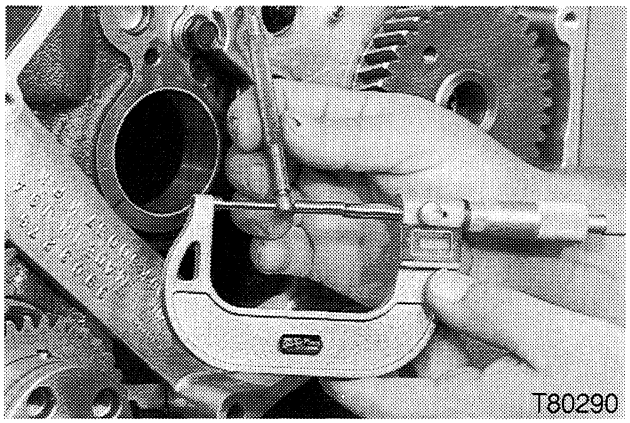
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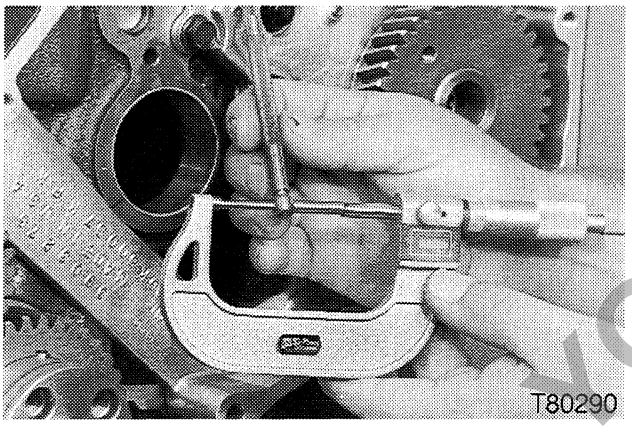
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STEP 268



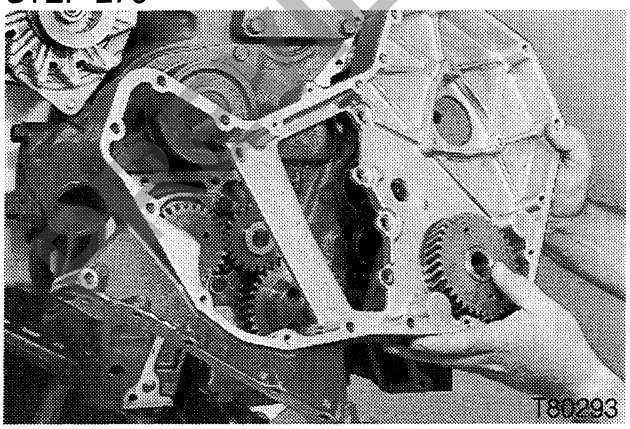

If the bushing diameter is more than 54.146 mm, the front camshaft bushing must be replaced.

STEP 269



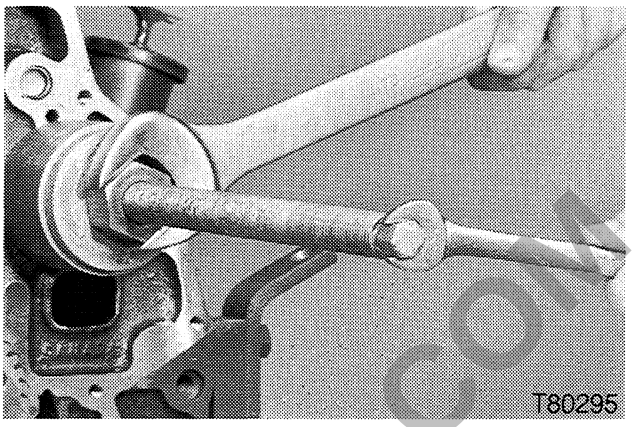

If the intermediate or the rear bores are more than 54.146 mm, disassemble the engine block and line bore the bores. See Section 2401 in the service manual for machining dimensions.

STEP 270



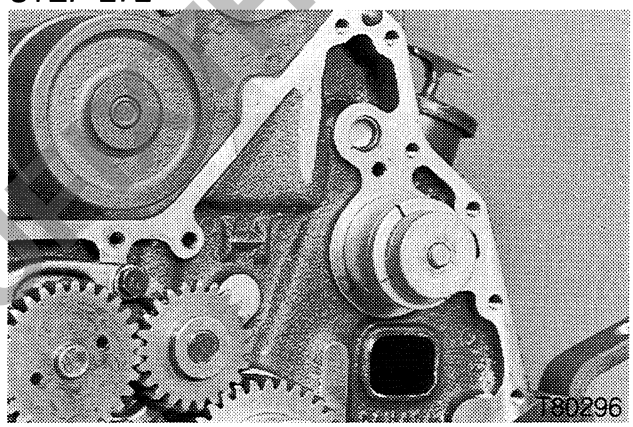

Remove the front housing bolts and the front housing.

STEP 271



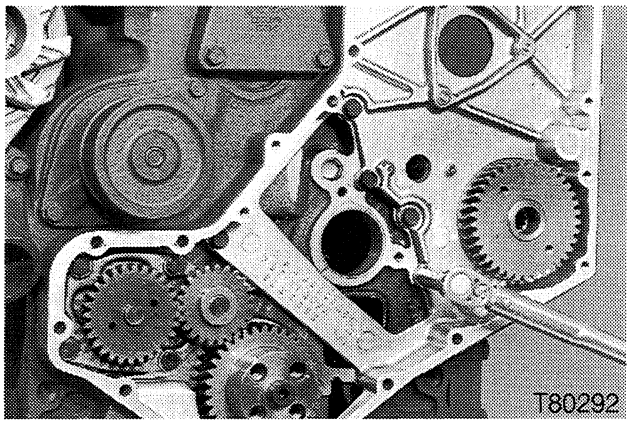

Put a bushing puller in the engine block and pull the bushing out of the cylinder block.

STEP 272




Install the bushing on the puller. Align the oil holes. Pull the bushing into the cylinder block until it is even with the housing.

STEP 273




Install the gasket housing and the housing bolts. Tighten the bolts to a torque of 21 to 27 Nm.



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# Section

# 2455

## COOLING SYSTEM

## Thermostat, Water Pump, Fan Pulley and Belt Tensioner

## 6-590 Diesel Engine



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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.*

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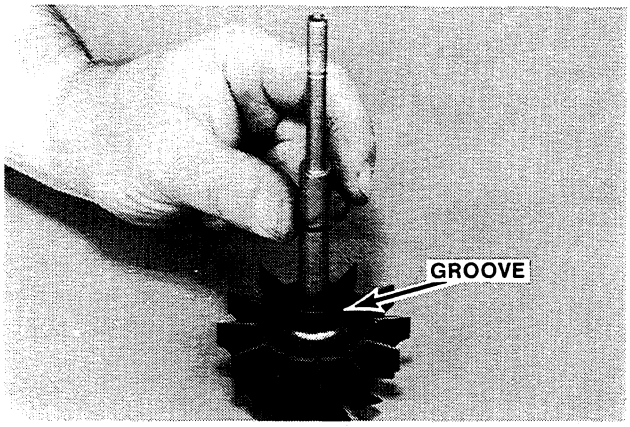
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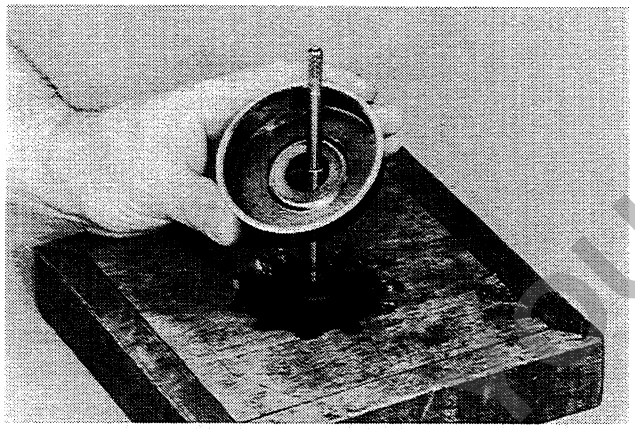
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**STEP 76**



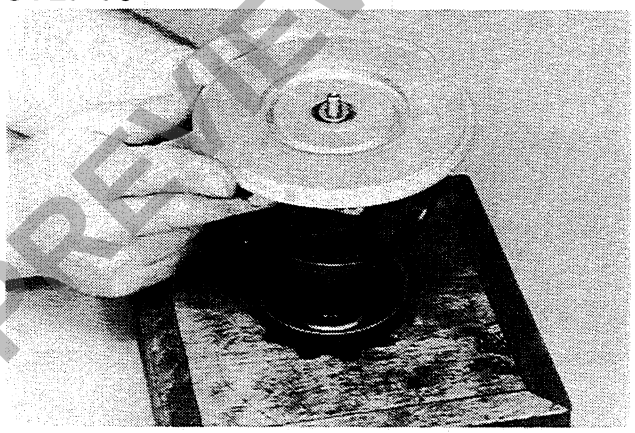

Install a new seal ring in the groove of the turbine wheel.

**STEP 77**



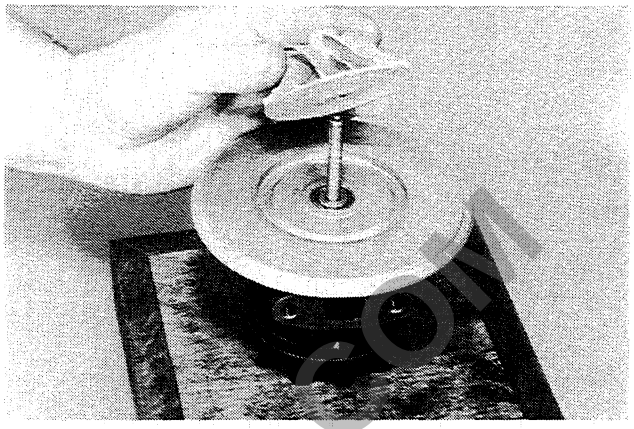
Install the turbine wheel in the fixture and install the heat shield on the turbine wheel.

**STEP 78**



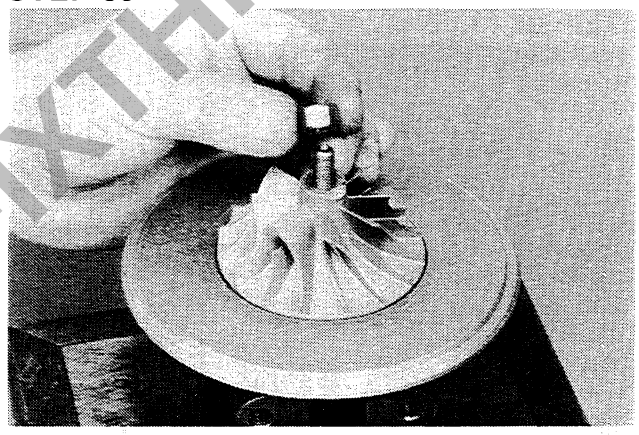
Install the center housing on the turbine shaft. Be careful not to damage the seal ring.

**STEP 79**



Install the compressor wheel on the turbine shaft.

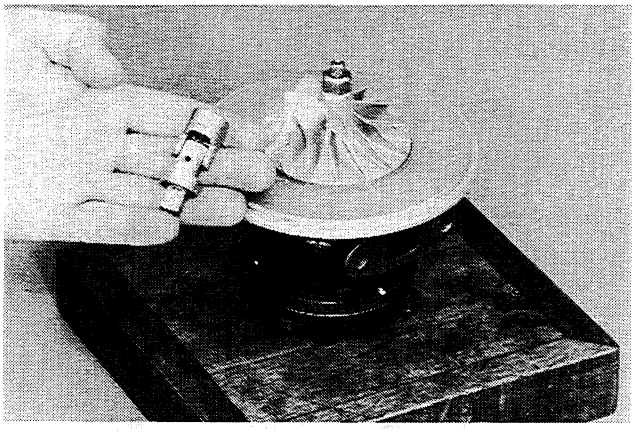
**STEP 80**



Install a new compressor wheel lock nut.

**NOTE:** *The compressor wheel lock nut is left hand thread.*

**STEP 81**



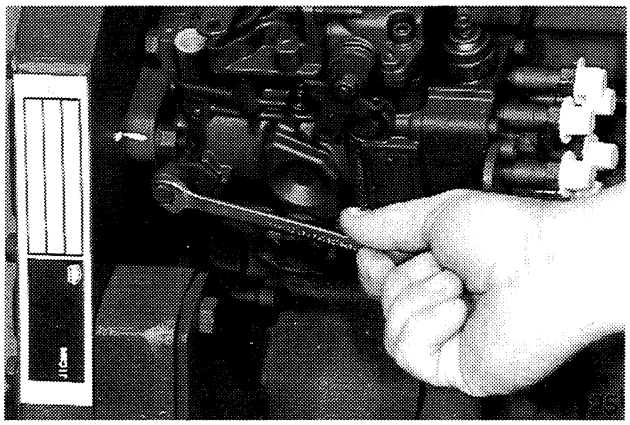
Use a double universal joint socket to tighten the lock nut on the compressor wheel. This procedure will stop the turbine shaft from bending.

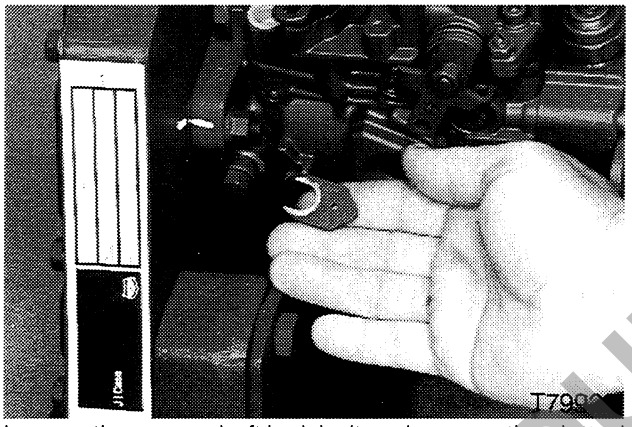
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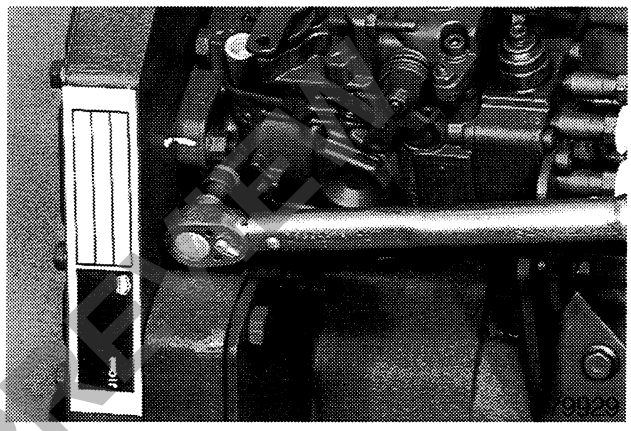
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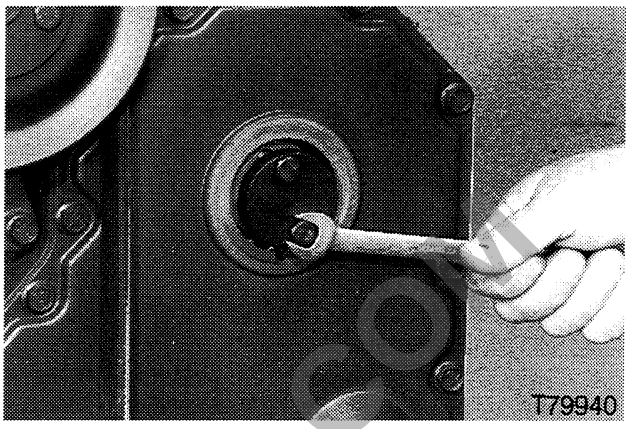
Loosen the pump shaft lock bolt and remove the slotted tab.

STEP 11



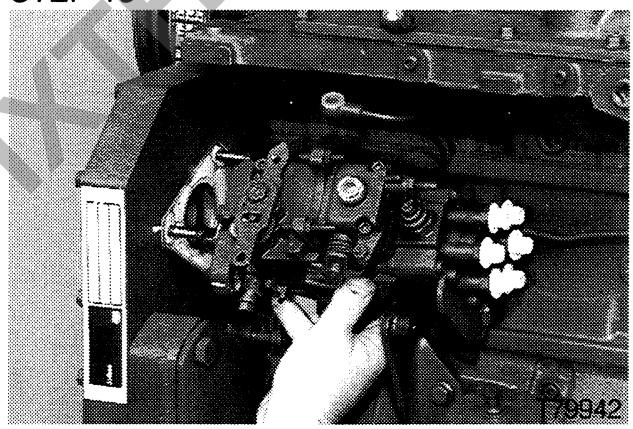
Tighten the pump shaft lock bolt to a torque of 30 Nm.

STEP 12



Install a gear puller and tighten the bolts until the gear is loose from the pump shaft.

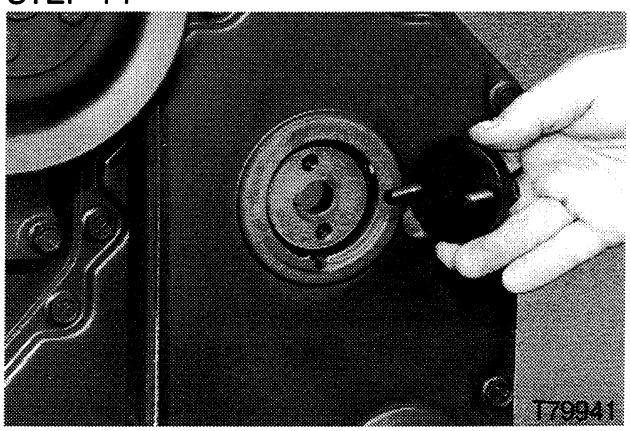
STEP 13



Carefully remove the injection pump nuts and the injection pump from the front housing.

IMPORTANT: *If the key for the injection pump shaft is not on the pump shaft when the pump is removed, the front cover must be removed to remove the pump shaft key.*

STEP 14



Remove the gear puller from the injection pump drive gear.



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# 4000

# REMOVAL AND INSTALLATION OF ELECTRICAL COMPONENTS

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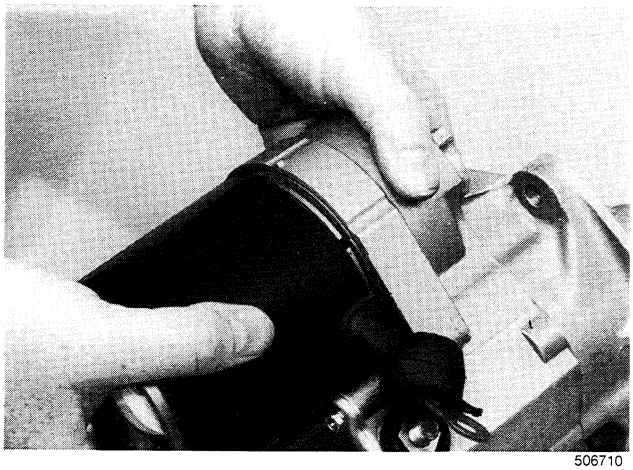
CASE CORPORATION

8-42850

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20. Install the field frame on the solenoid housing.



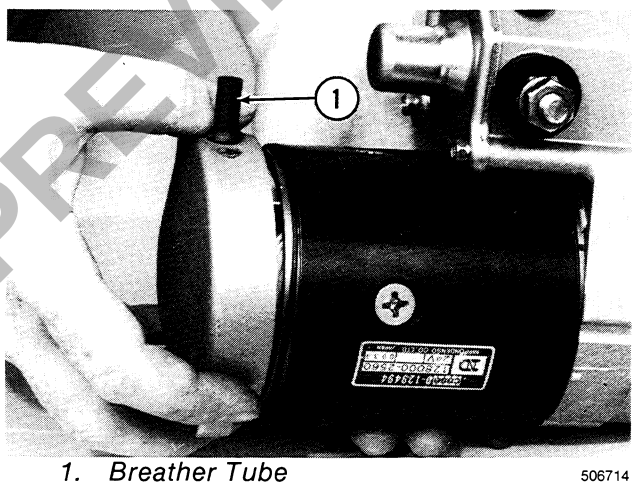
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21. Install a new O-ring on the field frame.



506712

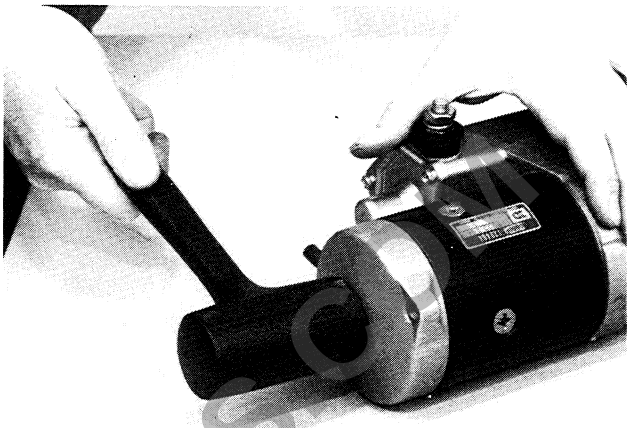
22. Install the cover on the armature and the field frame. Make sure the breather tube in the cover is toward the solenoid.




*1. Breather Tube*

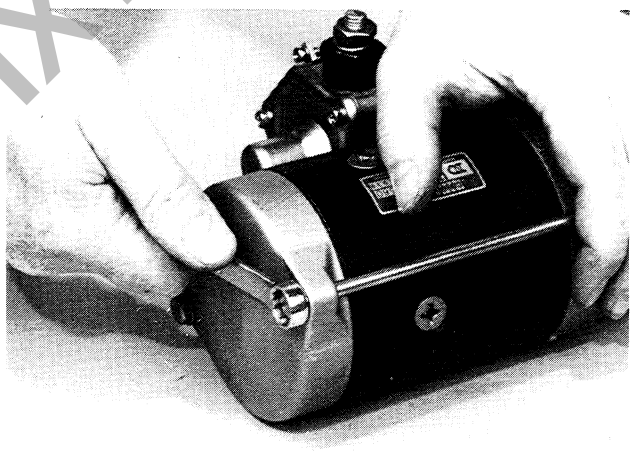
506714

23. If necessary, use a soft hammer to seat the cover on the field frame.



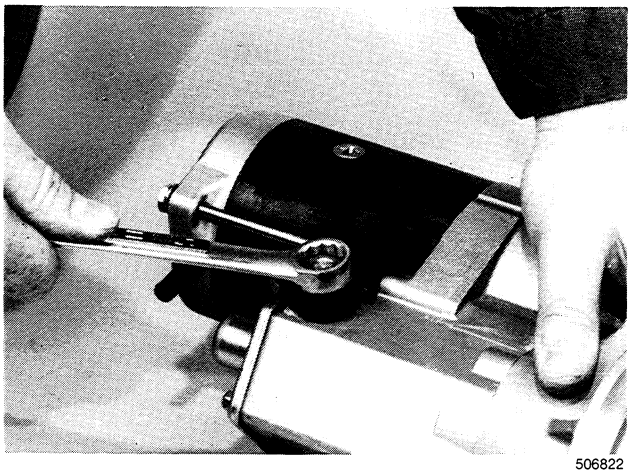
506818

24. Install the cap screws and lock washers for the cover.



506820

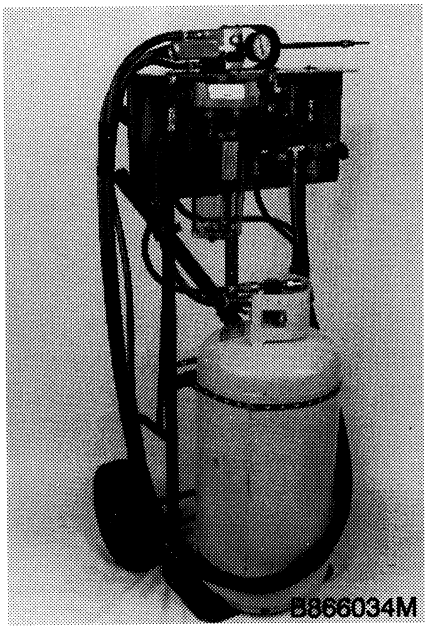
25. Install the cable, lock washer, and nut on the motor terminal and tighten the nut.



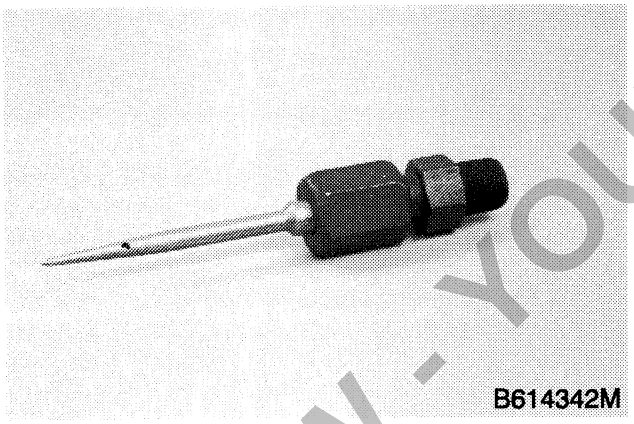
506822

26. Pull the boot over the motor terminal.

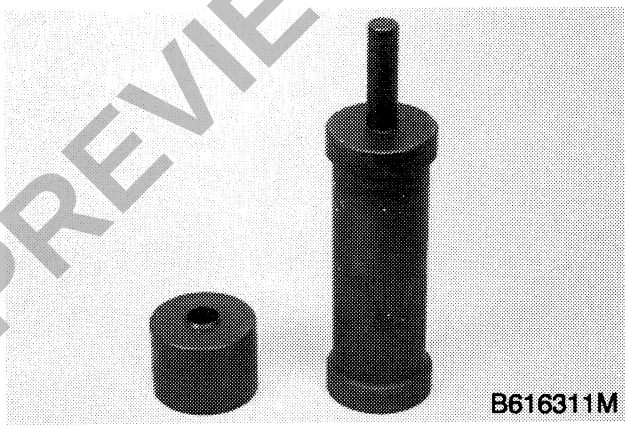
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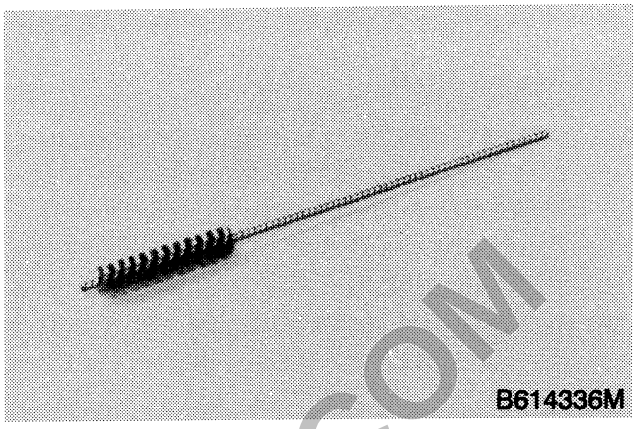

CAS-10762 Track Lubricator



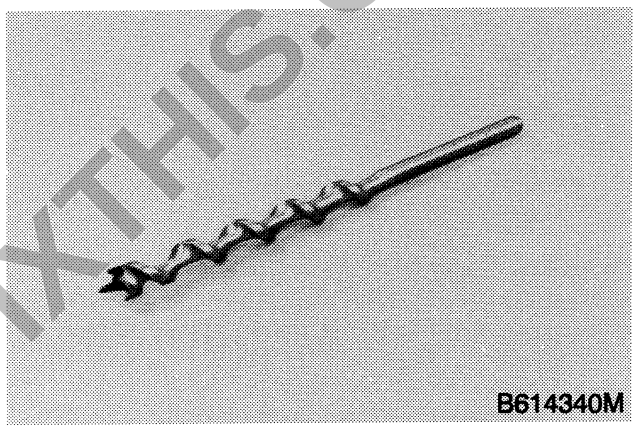

CAS-10762-1 Nozzle



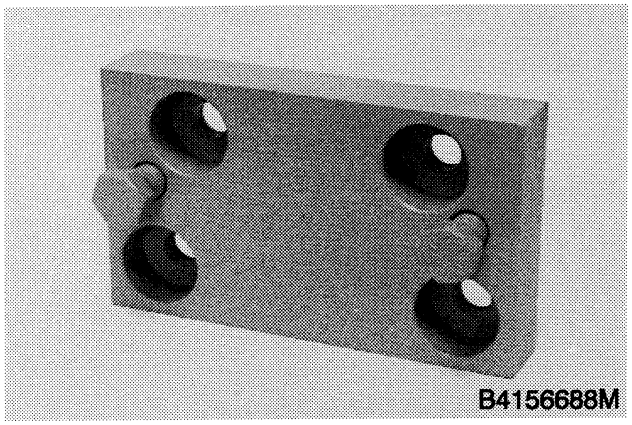

CAS-1851 Track Plug Installation Tool



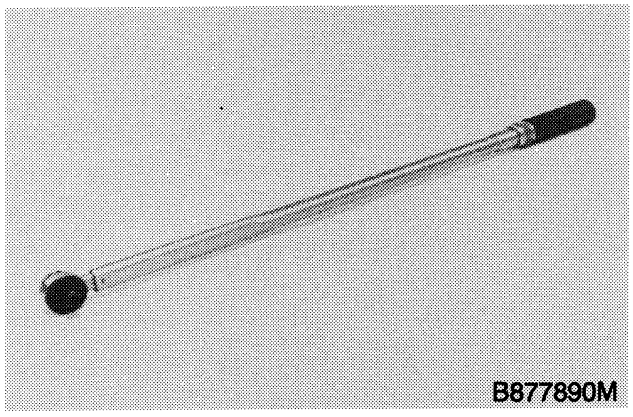

CAS-1853 Brush




1/2 Inch (12.5 mm) Diameter Wood Drill. Buy locally.




CAS-1849A Master Link Removal Plate



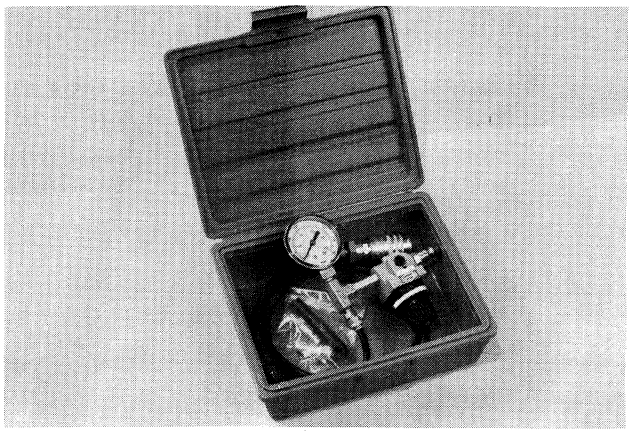

CAS-10037 Torque Wrench, 100 to 600 Pound-Feet

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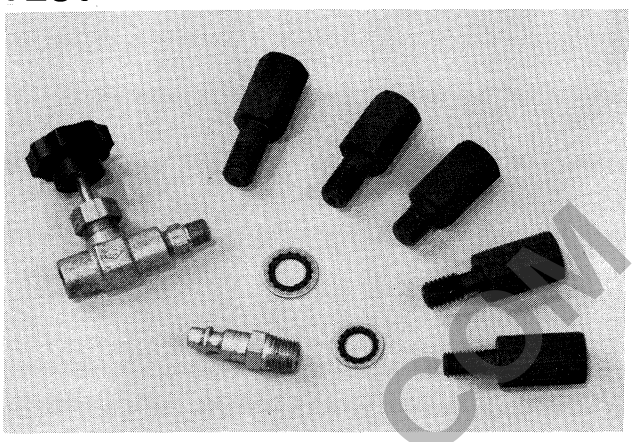


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# LEAKAGE TEST



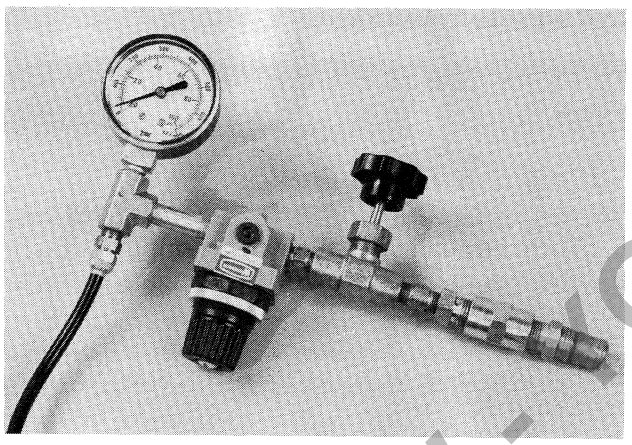
*CAS-1450* 407315



*CAS-1682* 407317

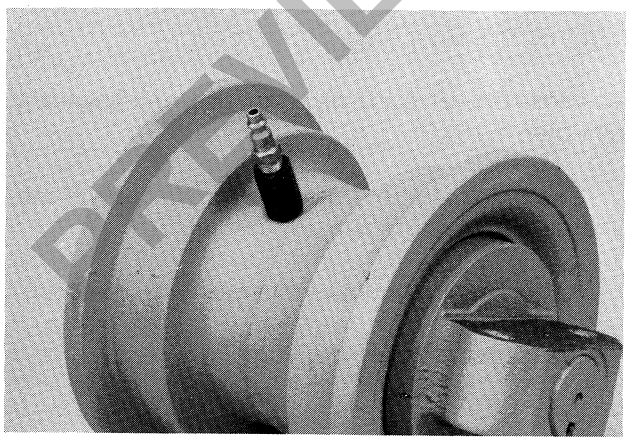
Equipment for Leakage Test

1. Connect the shutoff valve to the pressure regulator valve and a fitting for the air supply hose to the shutoff valve. Connect this assembly to an air hose.



407320

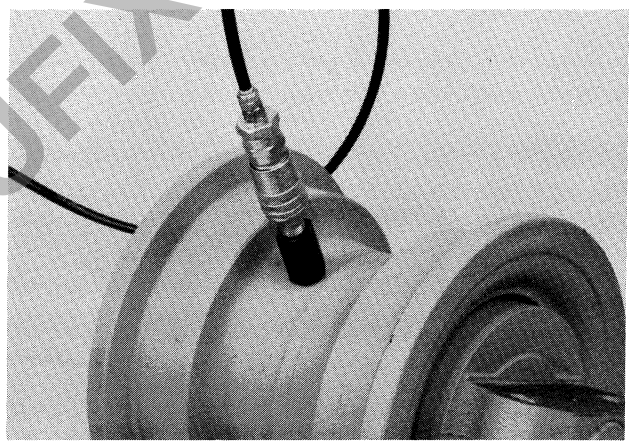
2. Install the adapter and quick disconnect fitting.



407322

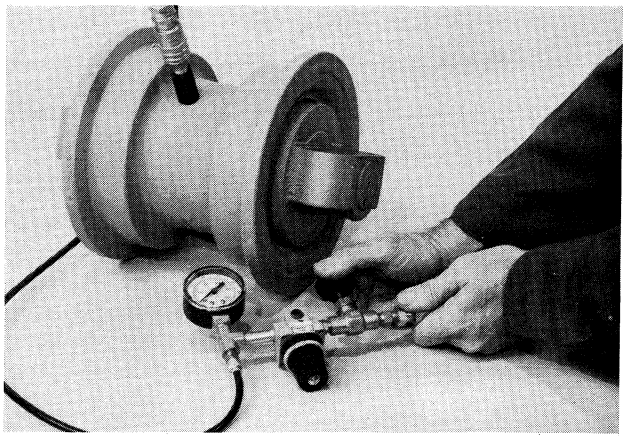
3. Turn the knob counterclockwise to close the pressure regulator valve.

4. Connect the line from the pressure gauge to the track roller.



407323

5. Make sure that the shutoff valve is open.



407324

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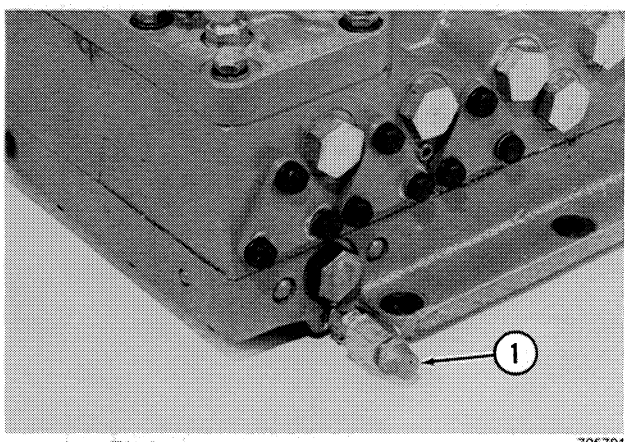
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# DISASSEMBLY

Remove all dirt and grease before beginning to disassemble the transmission control valve.

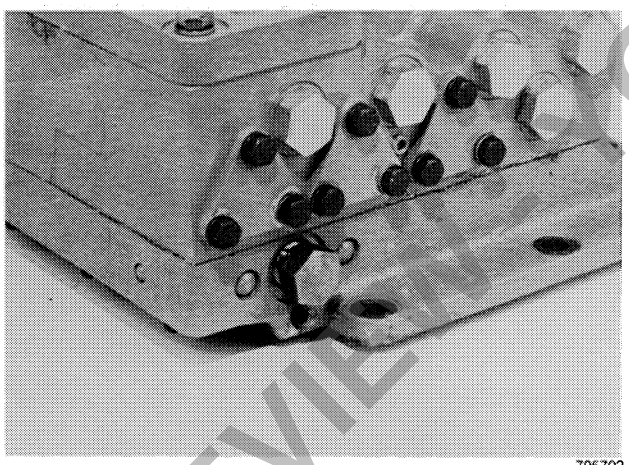
## Brake Equalizer Valve

1. Loosen and remove the fitting from the rear of the base.



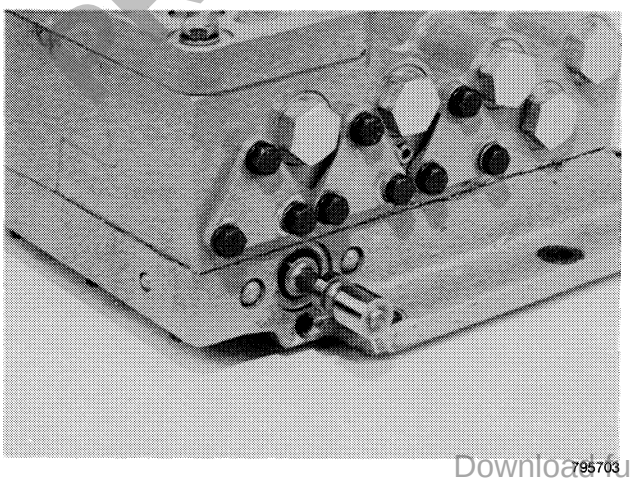

*1. Fitting* 795701

2. Loosen and remove the plug (hex head shown, Allen head used on some machines) from the base.



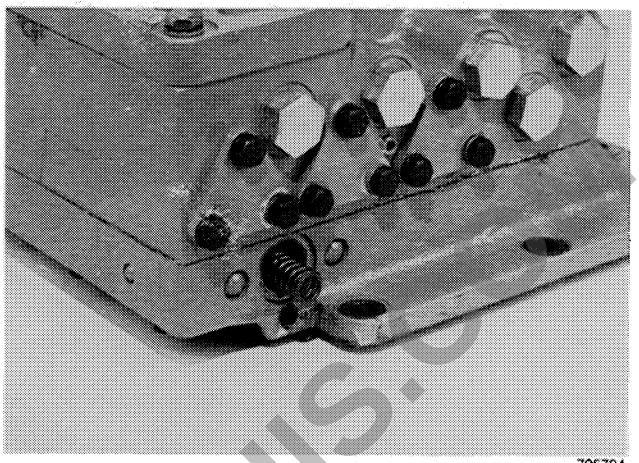
795702

3. Remove the brake equalizer spool.



795703

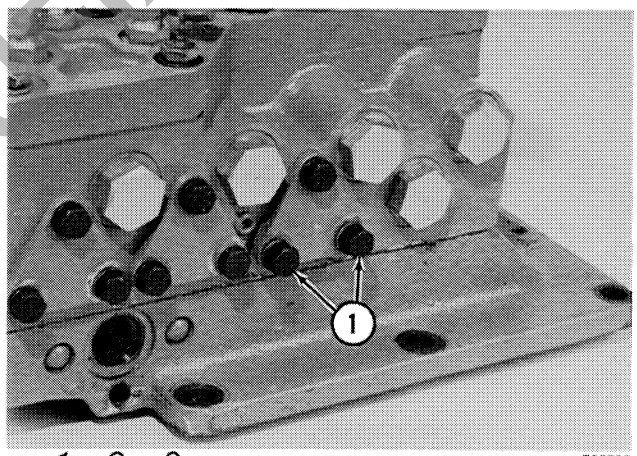
4. Remove the spring.



795704

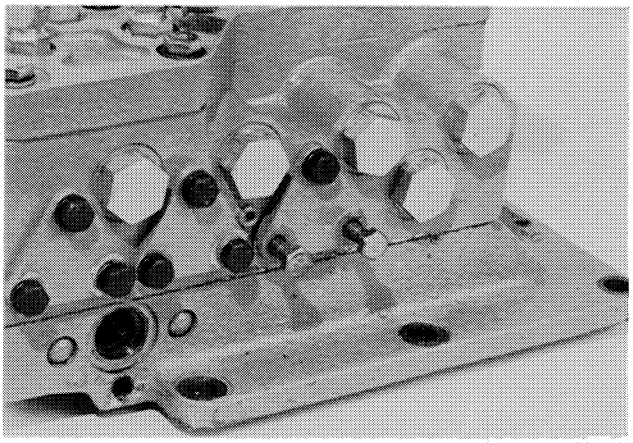
## Regulator Valve

1. Loosen and remove only the two bottom cap screws from the right retainer.




*1.. Cap Screws* 795705

2. The spring behind the retainer is highly compressed. Install two cap screws two inches (50 mm) long in bottom holes.



795706

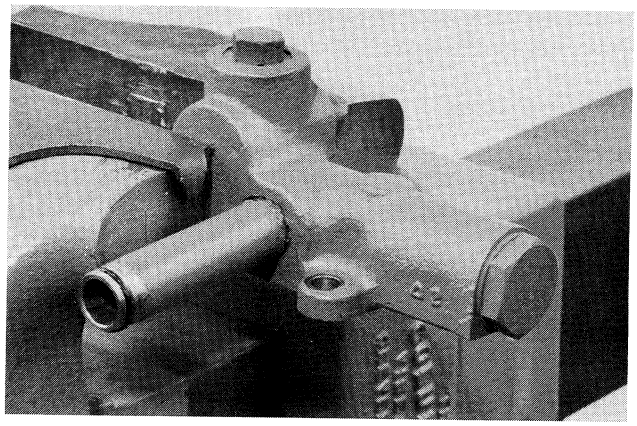
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# PRESSURE REGULATOR VALVE

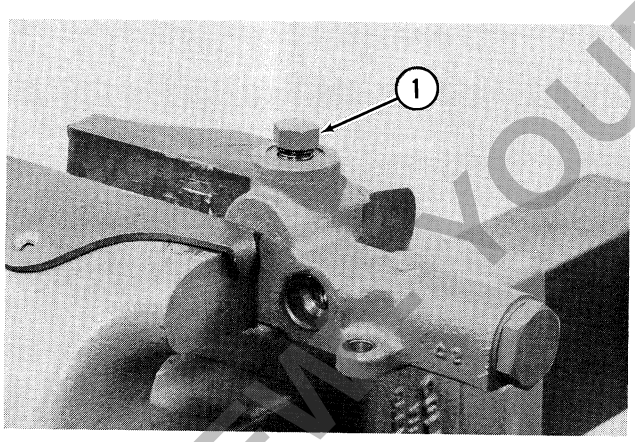
## Disassembly

1. Fasten the pressure regulator valve in a vise. Pull the tube out of the body.



916541

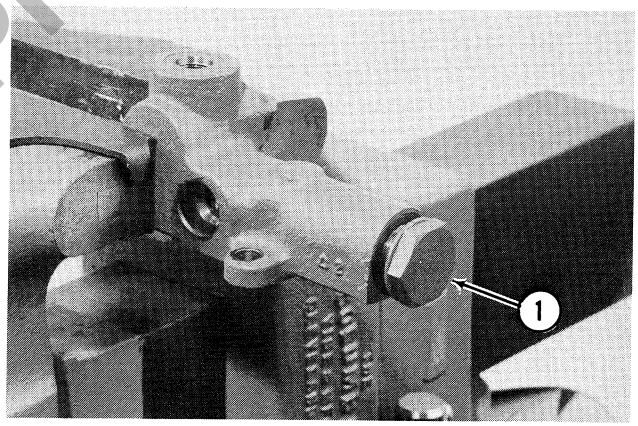
2. Loosen and remove the small plug.




*1. Small Plug*

916543

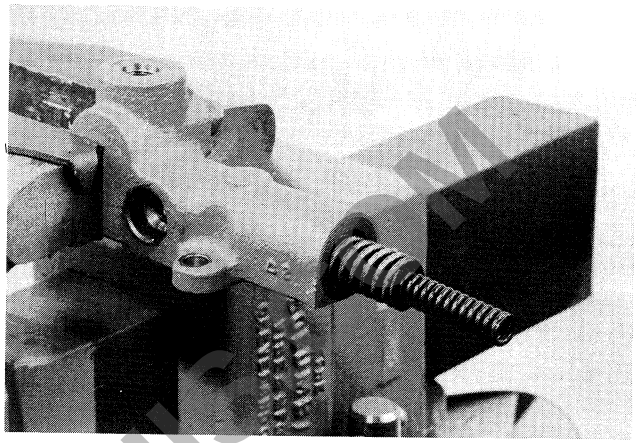
3. Loosen and remove the large plug. The tension of the springs will not be released until the plug is out of the body. Shims can be used between the plug and springs. Keep the shims together.




*1. Large Plug*

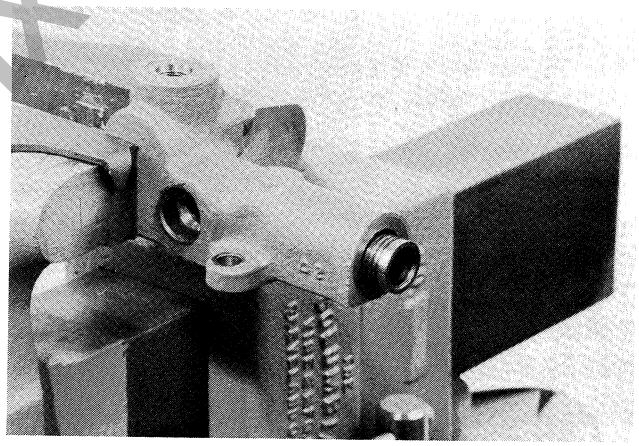
916544

4. Remove the springs from the body.



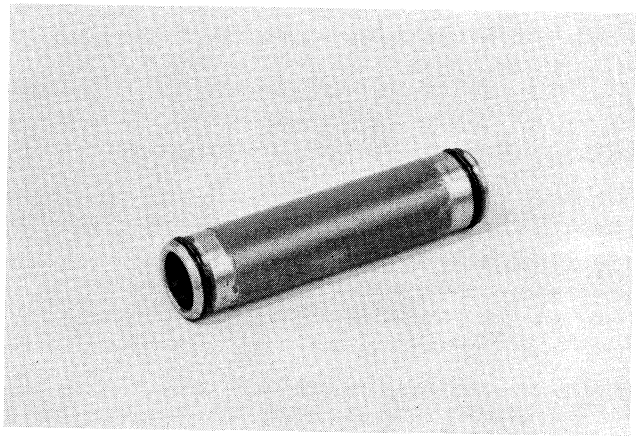
916501

5. Remove the poppet from the body.



916502

6. Remove the O-rings from the tube.



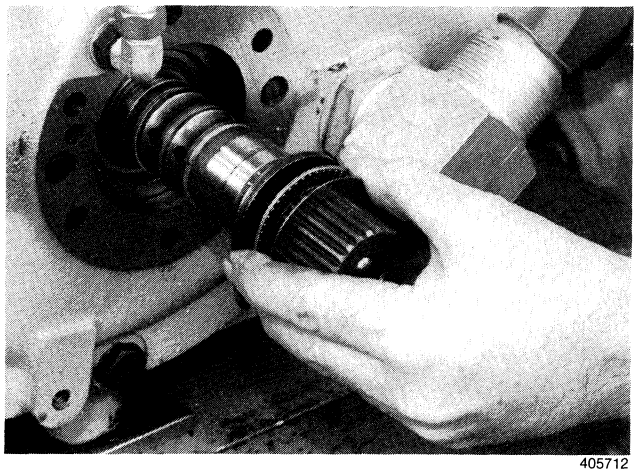
916918

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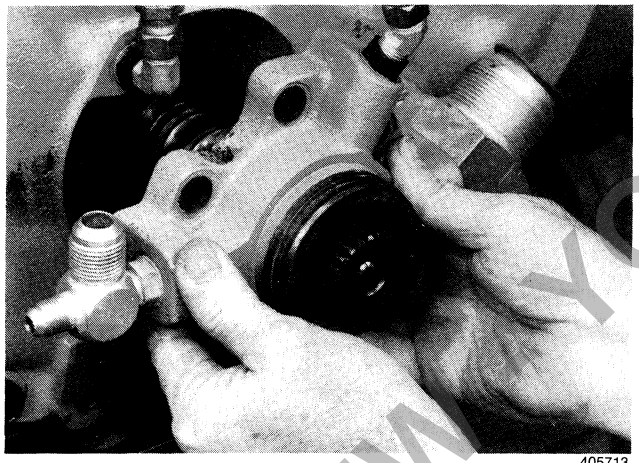
89. Check to see that the output shaft turns freely.

90. Install the thick thrust washer, thrust bearing and thin thrust washer.



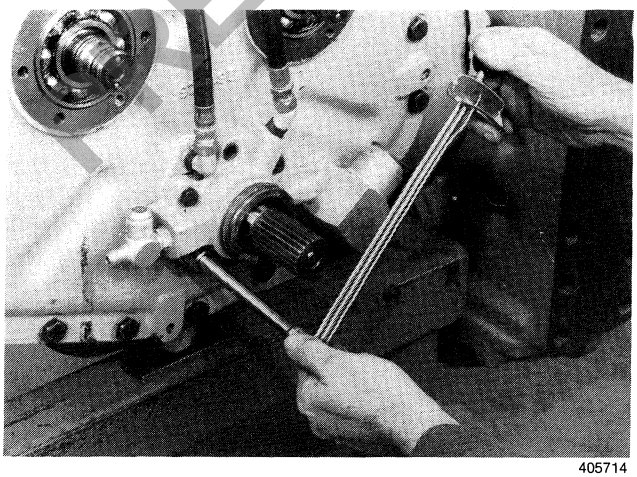
405712

91. Install the retainer.



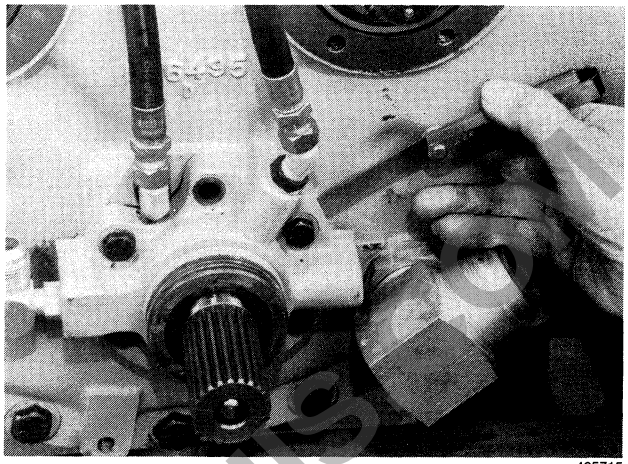
405713

92. Install and tighten the cap screws evenly to 60 pound-inches (6.7 N m, 0.7 kg/m). Then loosen and tighten the cap screws to 25 pound-inches (2.8 N m, 0.3 kg/m).



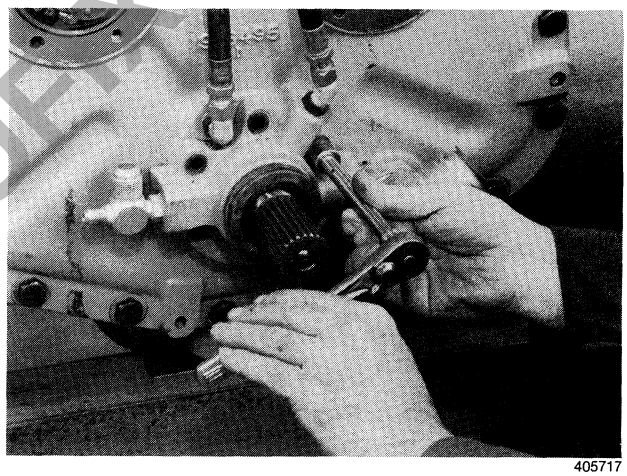
405714

93. Measure the space between the rear cover and the retainer with a feeler gauge. Measure space at the widest and narrowest opening.



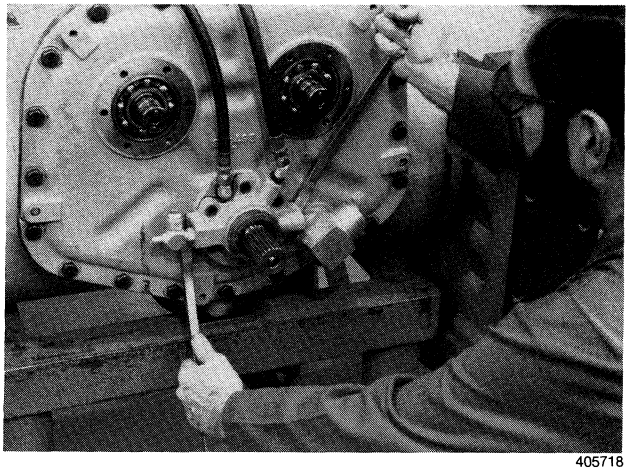
405715

94. Loosen and remove the cap screws that hold the retainer.



405717

95. Remove the retainer.

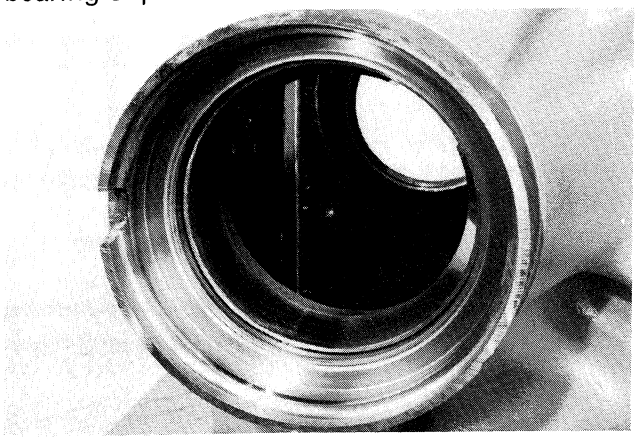


405718

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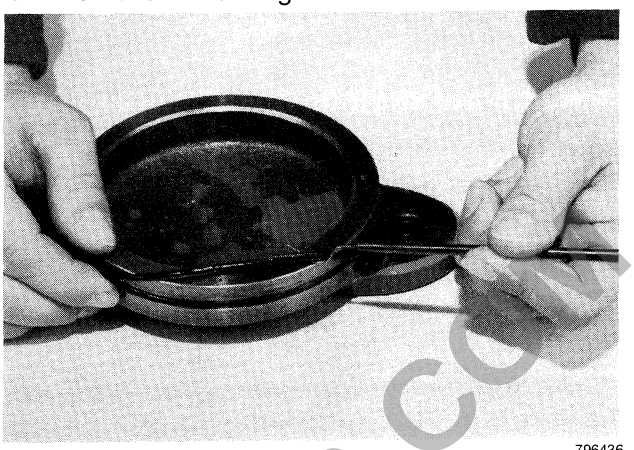
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33. Remove the bearing cups for the sprocket shaft only if inspection indicates the need for new parts. Use acceptable tools to remove and install the bearing cups.



796461

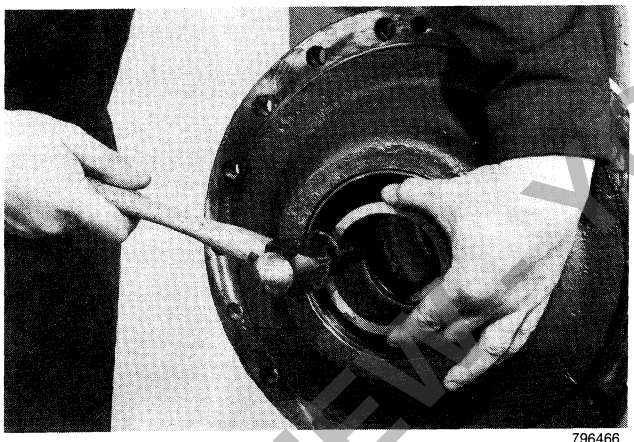
34. Remove the O-ring from each cover.



796436

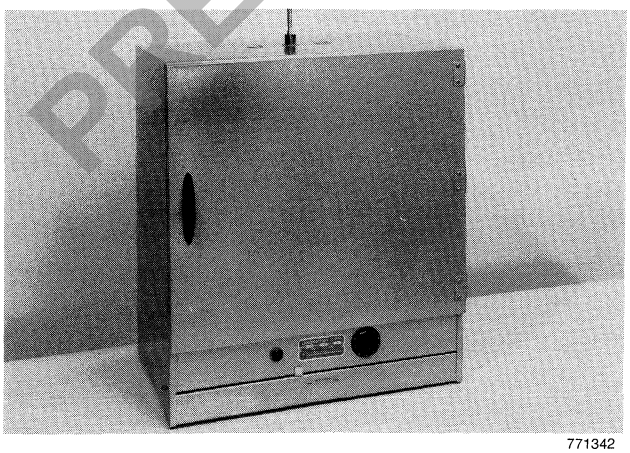
## ASSEMBLY

1. Start a new seal into the housing so that the lip of the seal is toward the inside. Use an acceptable driver and a hammer to drive the seal into the housing.



796466

2. Heat the bearings for the sprocket and pinion shafts to 250° F (121° C).



771342

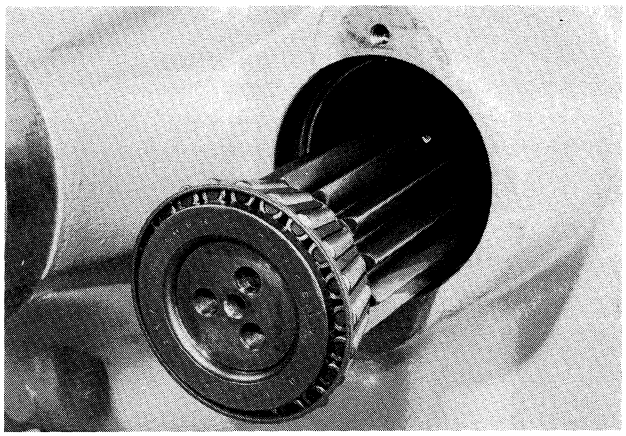
**WARNING:** *Use insulated gloves or mittens when working with hot parts.* *47-41A*

3. Remove the bearing that has the smallest ID from the oven. Install the bearing on the gear end of the pinion shaft as shown.



796469

4. Install the pinion shaft in the housing.



796459

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14. If the temperature of the oil is not as specified, run the engine at 2000 rpm (r/min) and close the pressure valve until the pressure gauge indicates 1000 psi (6894 kPa, 70 kg/cm²). Continue to run the engine until the temperature of the oil is as specified.

15. Check the output of the pump.

a. Keep the engine running at 2000 rpm (r/min).

b. Open the pressure valve all the way.

c. Write the reading on line 1 on the check sheet.

d. With the engine running at 2000 rpm (r/min), close the pressure valve until the pressure gauge indicates 2000 psi (13 789 kPa, 140 kg/cm²).

e. Write the reading of the flow gauge for each pressure on lines 2, on the check sheet.

16. Decrease the engine speed and stop the engine.

17. If additional testing is not required, disconnect the hoses and remove the fittings, and install the tube.

## Understanding the Results of the Test

1. If the output at 0 psi (kPa, kg/cm²) is less than 38 U.S. gpm (143 L/min):

a. There is an air leak or restriction between the reservoir and pump.

b. The pump is badly worn.

c. The pump is badly damaged.

2. If the output at 0 psi (kPa, kg/cm²) is 38 U.S. gpm (143 L/min) or more, there are no problems between the reservoir and pump. A damaged or worn pump can still have a flow of 38 U.S. gpm (143 L/min) or more.

3. Loss of output at 2000 psi (13 798 kPa, 140 kg/cm²) shows that the pump is worn or damaged. Use the efficiency of the pump to make a judgment as to whether it must be repaired or replaced.

4. The efficiency of the pump is found by dividing the flow at 2000 psi (13 789 kPa, 140 kg/cm²) by the flow at 0 psi (kPa, kg/cm²).

Example:

Line 1 - 38 U.S. gpm (144 L/min)

Line 2 - 32 U.S. gpm (121 L/min)

```
      .84                    .84
38 ) 32.00            144 ) 121.00
     30 9                   115 2
      1 60                   58 0
      1 72                   57 6
```

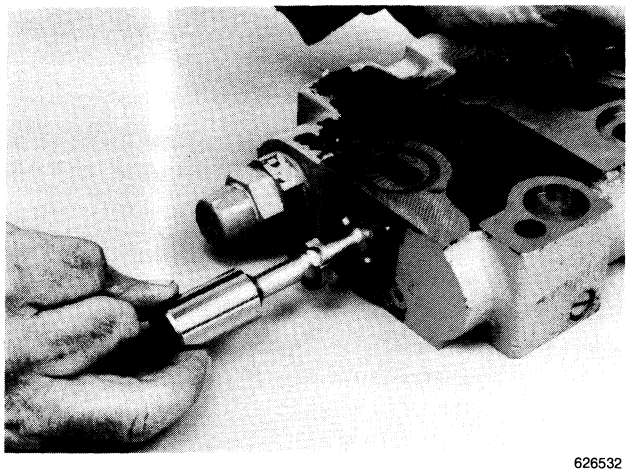
.84 = 84% efficient .84 = 84% efficient

5. If the efficiency of the pump is less than 75% it is recommended that the pump be repaired or replaced.

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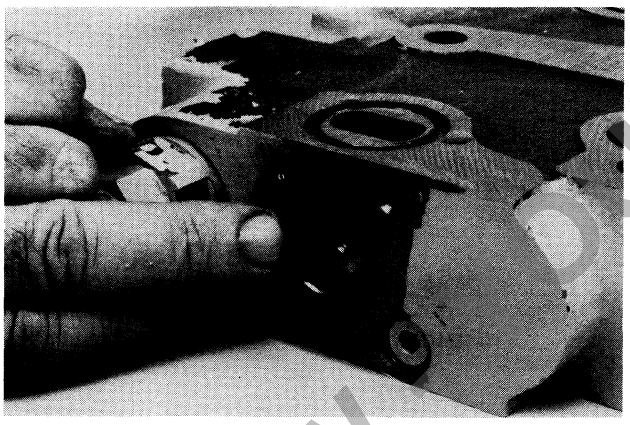
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19. Install the spool into the bore. Then push the spool into the bore until the groove for the O-ring can be seen.



626532

20. Install a new O-ring in the groove.



626534

21. Apply 242 Loctite to the threads in the spool.




626536

22. Assemble the centering spring, spring seats, detent stud and flat washer.



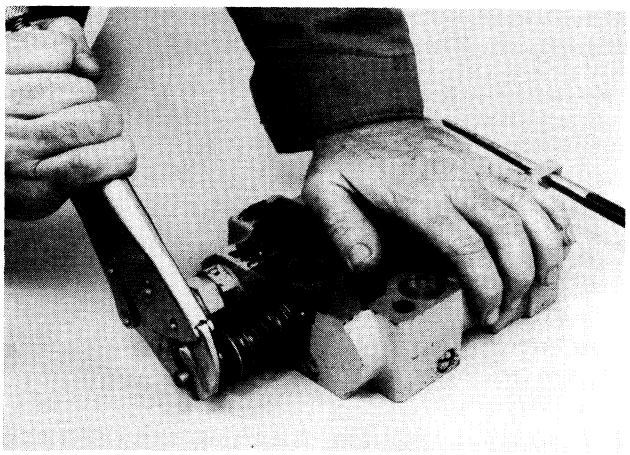
626538

23. Compress the centering spring and start the detent stud into the spool.



626540

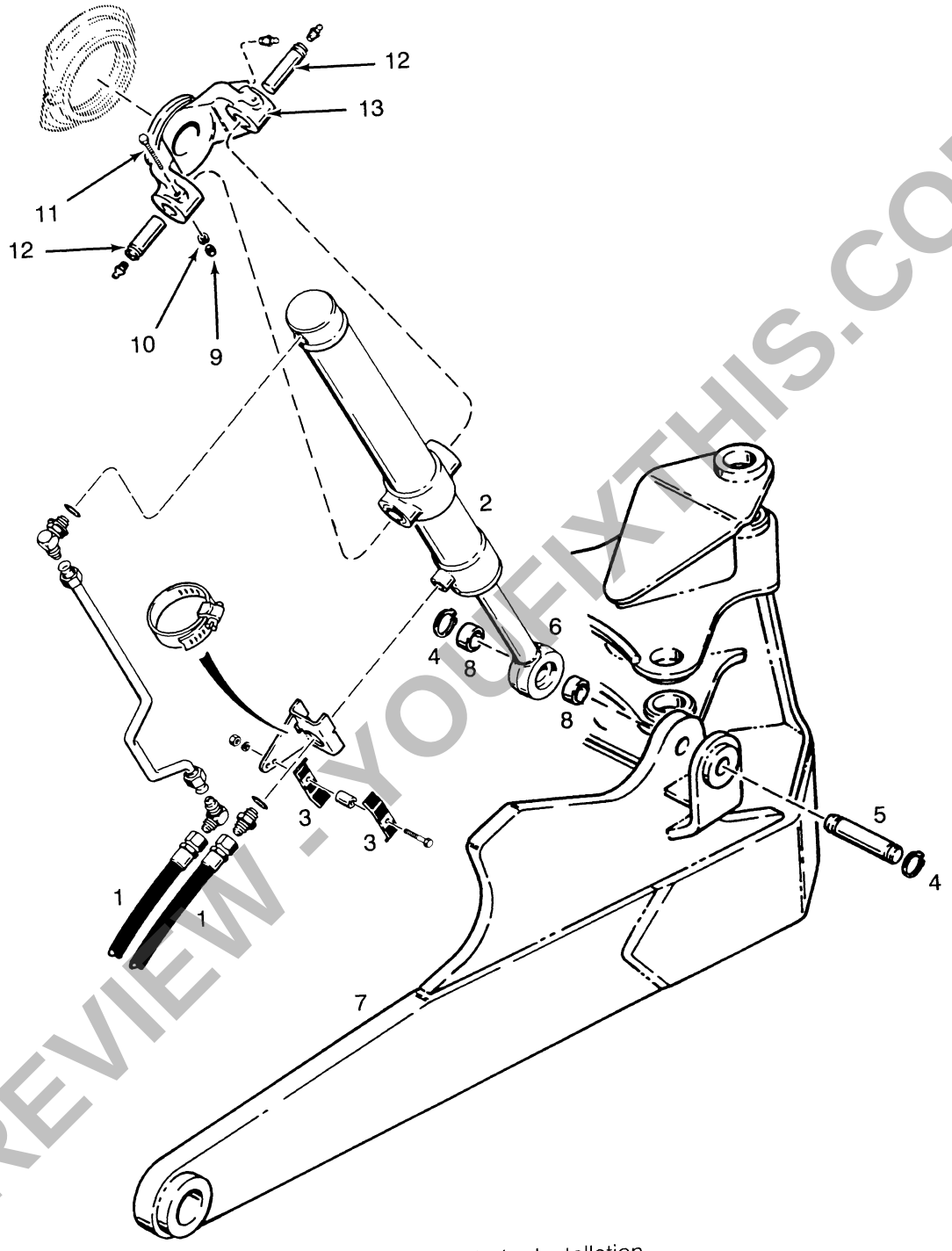
24. Prevent the spool from turning and tighten the detent stud.



626542

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Lift Cylinder Installation

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# 9003

# AIR CONDITIONING SYSTEM

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CASE CORPORATION

Bur 8-10940

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Issued March 1989

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## Installing the Blade

1. Use the same procedure to connect the lifting equipment to the blade for installation that was used for removal.

2. Move the blade into alignment with the push beams.

3. Install an outside pivot pin that fastens the blade to the push beam. The pivot pin must be installed so the groove in the pivot pin is to the inside.

4. Install the flat washer, cap screw, and lock washer that hold the pivot pin.

5. Tighten the cap screw.

6. Install the inside pivot pin.

7. Install the snap ring to hold the pivot pin.

8. Repeat steps 3 through 7 to install the blade to the other push beam.

9. Disconnect the chain or sling from the left side of the blade.

10. Loosen and remove the flat washer, cap screw, and lock washer that hold the pivot pin for the chain or sling at the left side of the blade.

11. Remove the pivot pin.

12. Connect the lifting equipment to the right side of the blade to hold the blade in place.

13. Install the strut to the blade.

    a. The thrust washer must be installed to the outside of the strut.

    b. Hold the strut and thrust washer in alignment with the blade.

    c. Start the pivot pin into the blade so the groove is to the inside.

    d. Drive the pivot pin into the blade so that the flat washer can be installed in the groove.

    e. Install the flat washer, cap screw, and lock washer that hold the pivot pin.

    f. Tighten the cap screw.

14. Disconnect and remove the lifting equipment from the right side of the blade.

15. Loosen and remove the flat washer, cap screw, and lock washer that hold the pivot pin for the chain or sling at the right side of the blade.

16. Remove the pivot pin.

17. Install the tilt cylinder to the blade.

    a. The thrust washer must be installed to the outside of the tilt cylinder.

    b. Hold the tilt cylinder and thrust washer in alignment with the blade.

    c. Start the pivot pin into the blade so the groove is to the inside.

    d. Drive the pivot pin into the blade so that the flat washer can be installed in the groove.

    e. Install the flat washer, cap screw, and lock washer that hold the pivot pin.

    f. Tighten the cap screw.

18. Remove the plugs from the hoses and caps from the fittings for the tilt cylinder.

19. Connect the top hose to the top fitting in the tilt cylinder.

20. Connect the other hose to the tube fitting.

21. Install the clamp, spacer, bolt, lock washer, and nut that fasten the hoses for the tilt cylinder to the blade.

22. Remove the plugs from the hoses to the tubes at the center of the blade.

23. Remove the caps from the tubes at the center of the blade.

24. Connect the left hose to the left tube fitting at the center of the blade.

25. Connect the other hose.

26. Hold the piston eye of a lift cylinder and a spacer in alignment with the blade.

27. Start the pivot pin into the blade, spacer, and the piston rod eye.



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# REMOVAL OF ROPS CAB

1. If the machine is equipped with a brush guard:

   a. Fasten acceptable lifting equipment to the brush guard:

   b. Loosen and remove the self-locking nuts, flat washers, bolts, and clamps that fasten the wire harness for the lamps to the rear of the brush guard.

   c. Disconnect the wires for the lamps.

   d. Loosen and remove the self-locking nuts and bolts that fasten the brush guard to the ROPS cab.

   e. Tilt the brush guard forward and use a support to hold the brush guard.

2. If the ROPS cab is equipped with a heater:

   a. Loosen and remove the radiator cap.

   b. Loosen and remove the cap screws that hold the side cover for the equipment control valve and remove the side cover.

   c. Have a drain pan available. Loosen the top hose clamps and disconnect the hoses from the fittings. If equipped with air conditioning, the heater hoses are two rear hoses.

   d. Install caps on the fittings in the bottom hoses. Install plugs in the top hoses.

3. If the ROPS cab is equipped with air conditioning:

   a. Discharge the air conditioning system according to instructions in Section 9003.

   b. Loosen and remove the cap screws that hold the side cover for the equipment control valve and remove the side cover.

   c. Disconnect the top connector for the low pressure switch in the hose.

   d. Loosen the top hose clamps and disconnect the hoses from the fittings. If equipped with a heater the air conditioning hoses are the two front hoses.

3. If the ROPS cab is equipped with air conditioning:

   a. Discharge the air conditioning system according to instructions in Section 9003.

   b. Loosen and remove the cap screws that hold the side cover for the equipment control valve and remove the side cover.

   c. Disconnect the top connector for the low pressure switch in the hose.

   d. Loosen the top hose clamps and disconnect the hoses from the fittings. If equipped with a heater, the air conditioning hoses are the two front hoses.

   e. Install caps on the fittings in the bottom hoses. Install plugs in the top hoses.

4. Loosen and remove the cap screws, lock washers, and spacers that hold the parking brake lever to the cover for the fuel tank. Put the parking brake lever out of the way.

5. Loosen and remove the knobs from the auxiliary controls levers for the equipment control valve.

6. Use a U shape driver against the bottom of the knob on the loader or blade control lever and drive the knob off the control lever.

7. Loosen and remove the cap screws that hold the boots for the control levers.

8. Remove the retainers and boots.

9. Loosen and remove the cap screws that hold the front cover for the control levers and remove the front cover.

10. If the machine is equipped with a winch:

    a. Loosen and remove the cap screws that hold the side cover for the equipment control valve and and remove the side cover.

    b. Loosen and remove the nuts and lock washers from the bolts that hold the control stand in position. Then remove the bolts.

    c. Remove the nut and lock washer that fastens the cable to the pin in the winch control lever.

    d. Loosen a lock nut on the housing of the winch control cable.

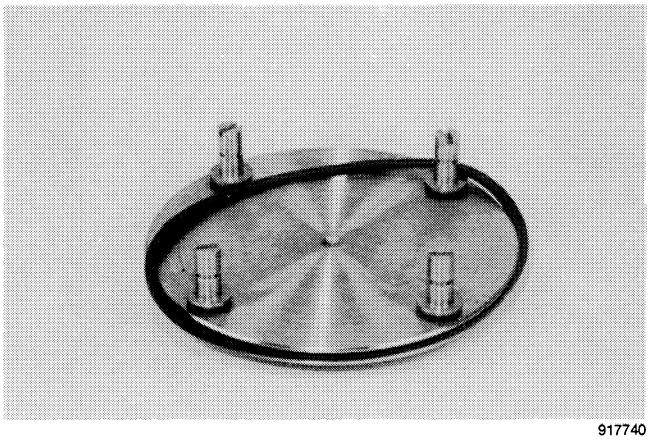
    e. Remove the winch control cable from the control stand.

    f. Repeat steps c through e for the other cable.

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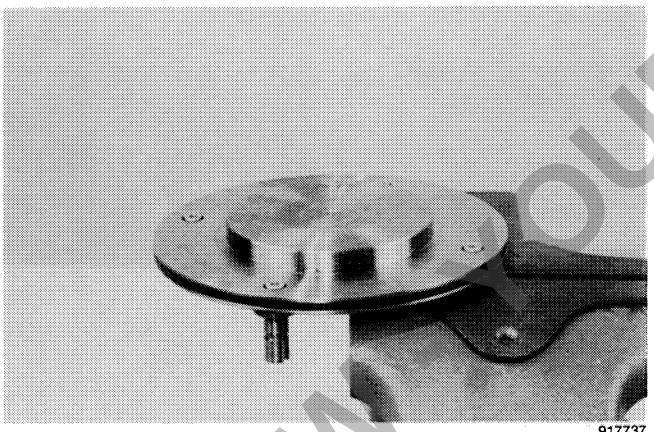
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11. Remove the seal from the groove in the piston.



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12. Fasten each plunger in vise that has soft jaws so that the Allen head screws can be loosened and removed. The plungers must be removed to prevent damage to the O-rings when the plungers are installed.



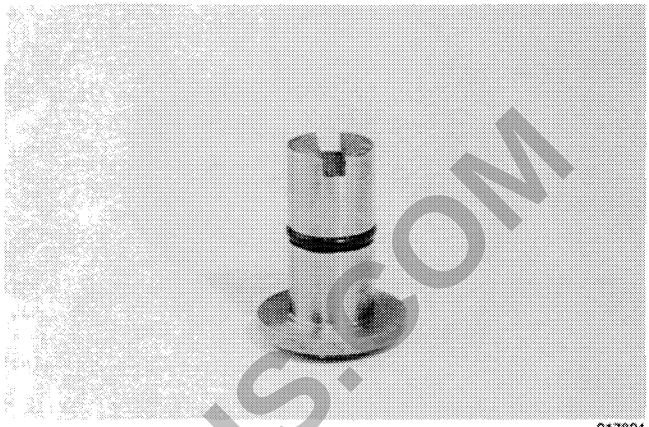
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## Inspection

1. Discard the O-rings and seal for the piston.
2. Clean all parts in cleaning solvent.
3. Look for damage and wear on the thrust ring and pressure ring.
4. Check the metal discs with a straightedge to make sure the metal discs are flat.
5. If the friction discs are smooth or almost smooth, use new parts during assembly.
6. Check the hub and housing for wear and damage.

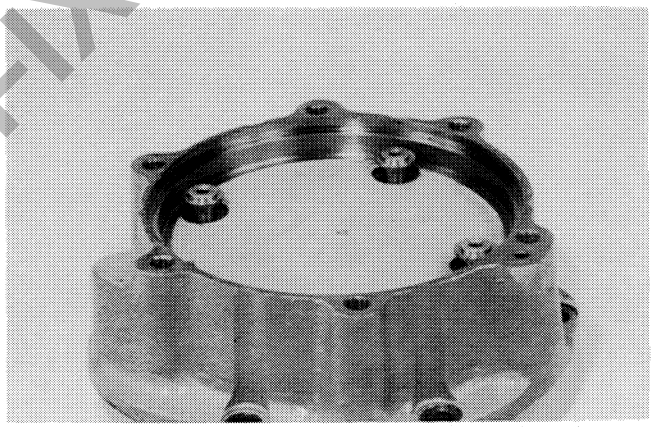
## Assembly

1. Install a new O-ring on each plunger.



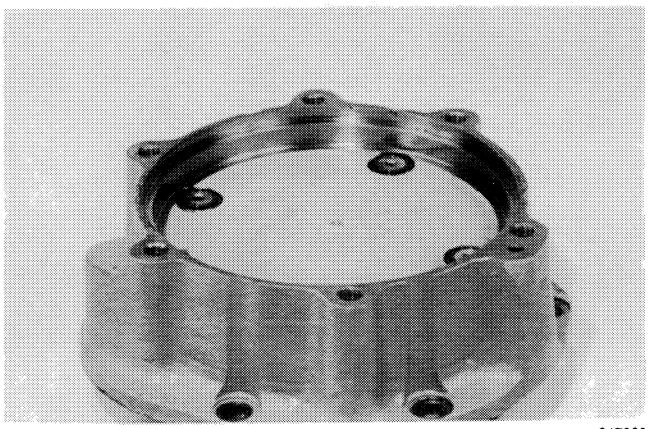
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2. Put clean oil on the O-rings and bores for the plungers. Start the plungers into the bores in the housing.



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3. Push the plungers all the way into housing. Put a new O-ring on top of each plunger.



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