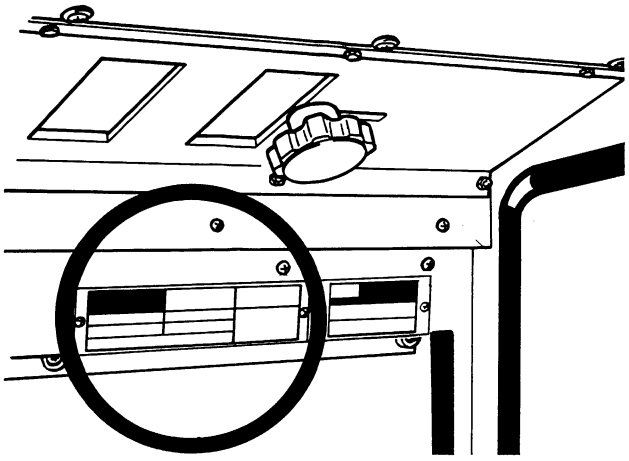
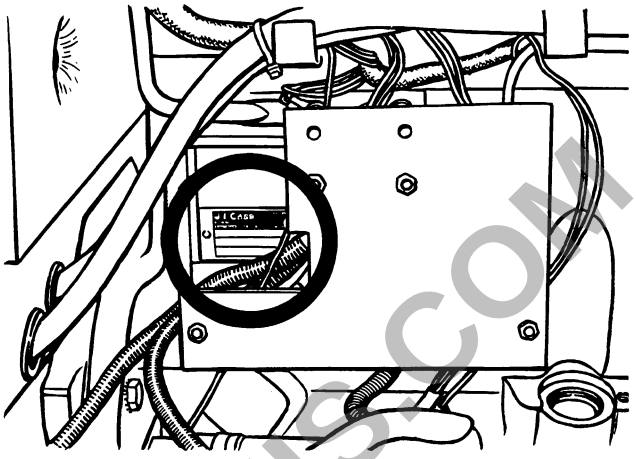
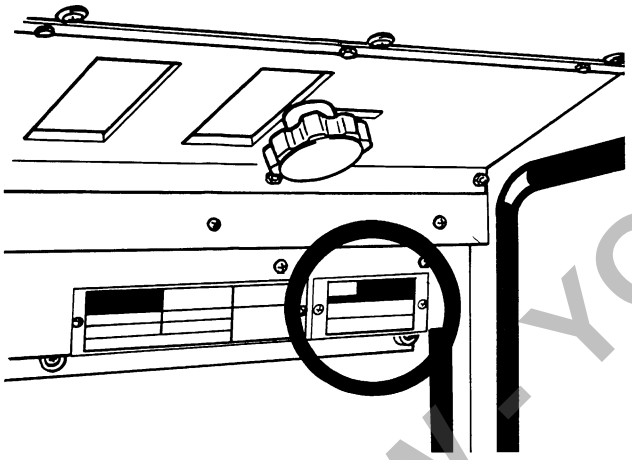
SERIAL NUMBERS



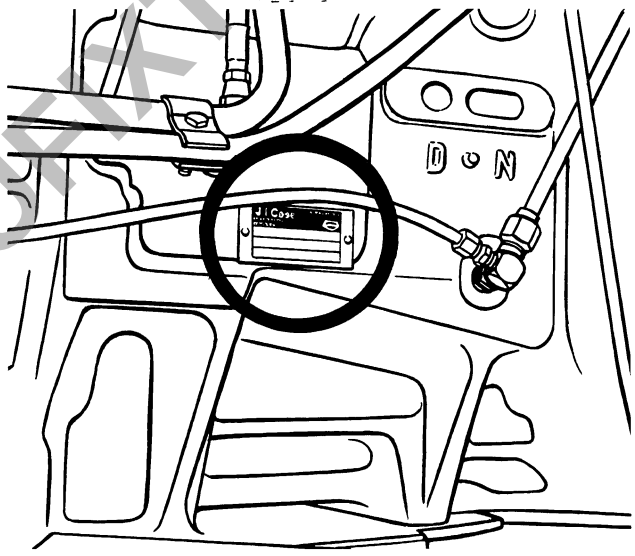
CAB SERIAL NUMBER PLATE



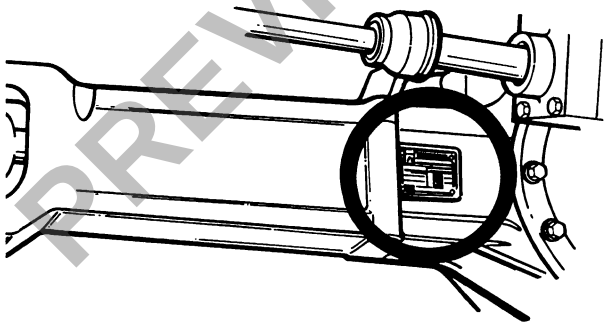
ENGINE SERIAL NUMBER PLATE



MODEL AND PRODUCT IDENTIFICATION NUMBER PLATE



TRANSMISSION SERIAL NUMBER PLATE



AXLE SERIAL NUMBER

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ENGINE NOISE

LOW AND HIGH RPM

1. Engine Timing Not Correct.

Combustion will not occur in the cylinder at the correct moment (degrees BTDC) if the engine timing is not correct. This can cause the fuel not to burn efficiently and will cause a loss in engine power and serious damage to the engine. Check for correct engine timing.

2. A Loose Flywheel (Low RPM).

A loose flywheel will make a noise at low engine speed. The noise will sound like a loose connecting rod. The noise will go away when the engine speed increases. Replace a flywheel that is worn.

3. Combustion Of Fuel In The Cylinder Not Controlled.

Combustion of the fuel can be too early, too rapid or not even. The result is a loud noise which can burn the piston and cause too much wear in the top ring groove. The piston rings can break or the rings can become stationary. There will be a loss of power in the engine because the engine can not send the sudden release of energy to the crankshaft, evenly. The following are causes of combustion that is not controlled:

A. a fuel mixture that is low in combustible components.
B. engine timing not correct.
C. using fuel that is not correct.
D. lugging the engine.
E. the cooling system does not work correctly.
F. too much carbon deposits on the pistons and on the cylinder heads.
G. the fuel injection pump does not work correctly.

4. Worn Connecting Rod Bearing.

A bad bearing on the connecting rod will cause a noise. The noise will get louder as the engine RPM increases. The noise in the bad cylinder will decrease or stop if the fuel injector line that goes to the bad cylinder is disconnected. Remove the oil pan from the engine and measure the bearing clearance by using Plastigage.

5. Main Crankshaft Bearings Worn.

A worn main bearing will cause a noise and will cause the engine vibration to increase. The noise and the vibration will increase as the engine RPM increases. The noise will decrease or stop if the fuel injector line that goes to the bad cylinder is disconnected. The engine vibration will continue. Remove the oil pan from the engine and measure the main bearing clearance by using Plastigage. Main bearings that are worn will cause too much oil clearance and low oil pressure.

6. Scoring Of Pistons And Sleeves.

Scoring occurs when small metal particles are removed from the surfaces of the pistons and sleeves. Scoring decreases lubrication which causes an increase in heat. The heat will cause the scoring in an area to increase. Scoring can be caused by:

A. lubrication and cooling system not working correctly.
B. engine timing not correct.
C. fuel not burning efficiently.
D. lugging the engine.
E. putting an overload on the engine.
F. parts not assembled correctly.
G. not following the run-in procedure correctly.

Remove the piston assemblies and inspect the parts.

7. Piston Ring Installation Not Correct Or Broken Rings.

The following errors are made when installing rings:

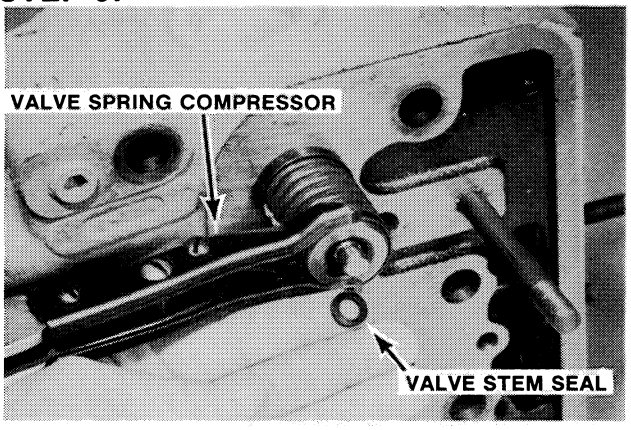
A. the wrong size rings are used.
B. the wrong side of the ring is facing up.
C. the butt ends of the expander in the three piece oil control ring go over each other or the expander is cut to shorten the expander.

Read the instructions carefully before installing the piston rings. Damage to the rings can cause scoring of the pistons and sleeves and can cause the engine to use oil.

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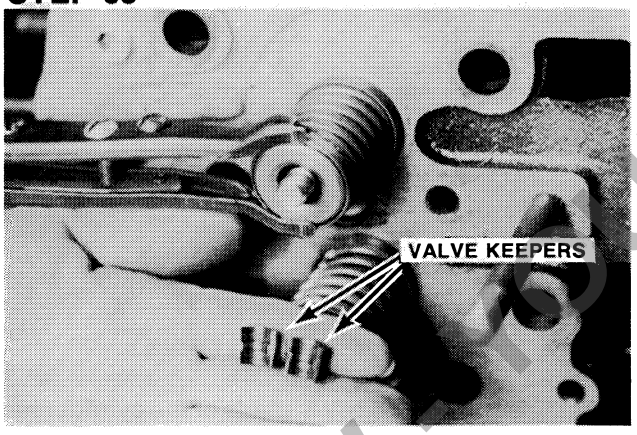
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STEP 67



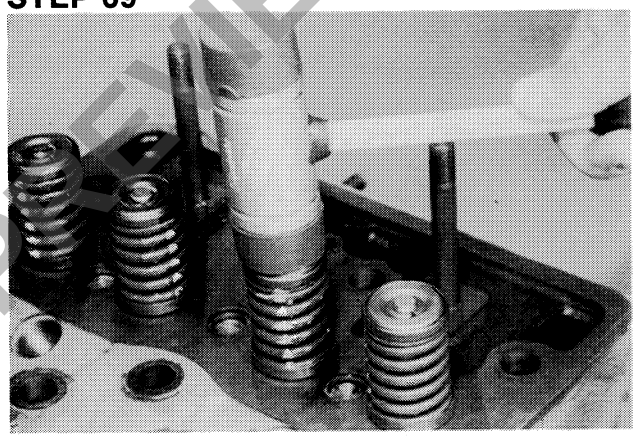
Push down the valve springs with a spring compressor. Install a new valve seal in the lower valve stem groove.

STEP 68



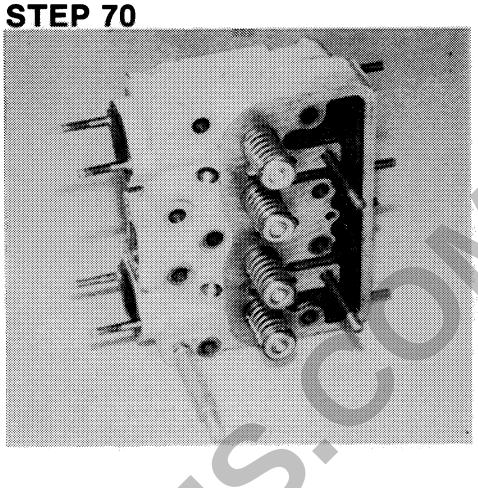
Install the valve keepers in the upper valve stem groove.

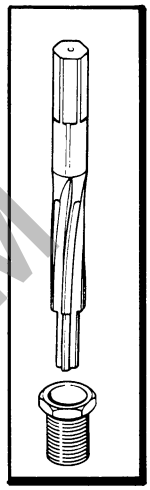
STEP 69



Hit the end of the valve stems with a soft hammer to seat the valve keepers.

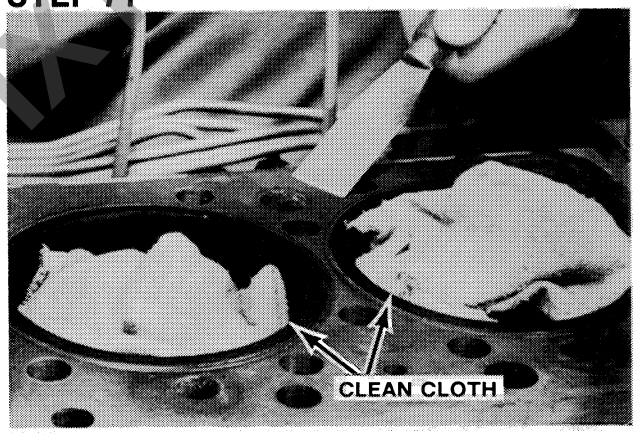
STEP 70





Before installing the cylinder heads to the block,clean the injector bores. Use a reamer and adjusting nut (CAS-1411).

STEP 71

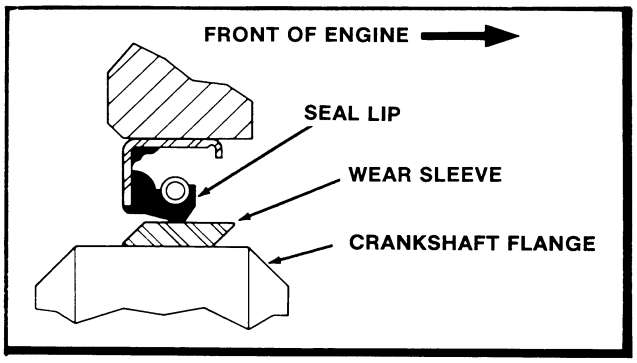


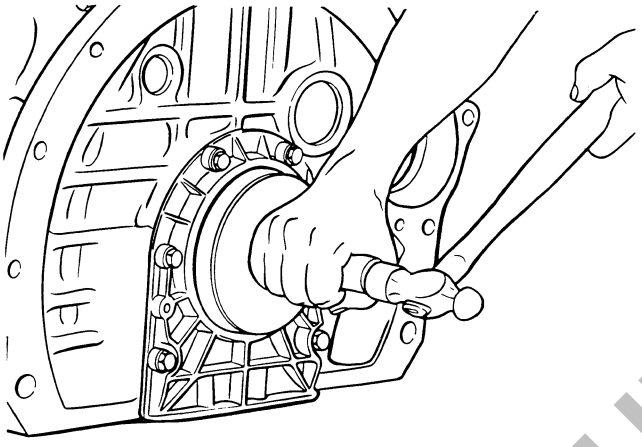
Clean the cylinder block and head contact surfaces. Cover the pistons with a clean cloth when cleaning the block.

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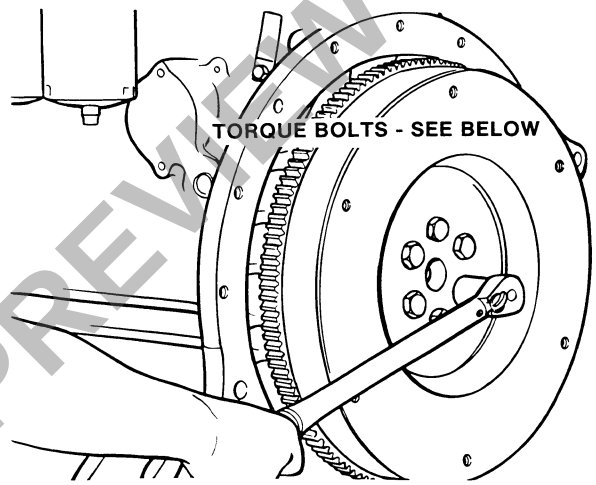
STEP 30





Use a seal and sleeve locating tool (CAS-1087) to push the seal in the carrier. This tool will correctly position the seal on top of the wear sleeve. See the inset.

STEP 31

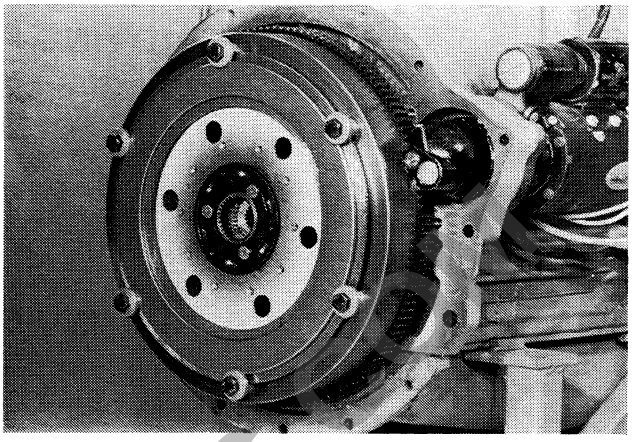


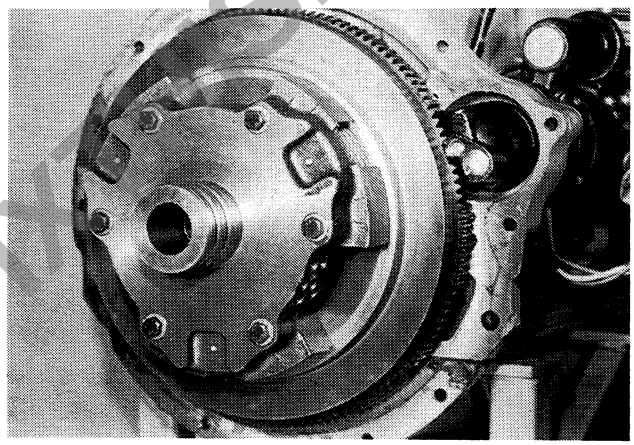
Install the flywheel. Tighten the retaining bolts, see below:

Without hardened washers - 180 to 190 ft. lbs.
(244 to 258 Nm)(24.4 to 25.8 kgm)

With hardened washers - 230 to 250 ft. lbs.
(312 to 339 Nm)(31.2 to 33.9 kgm)

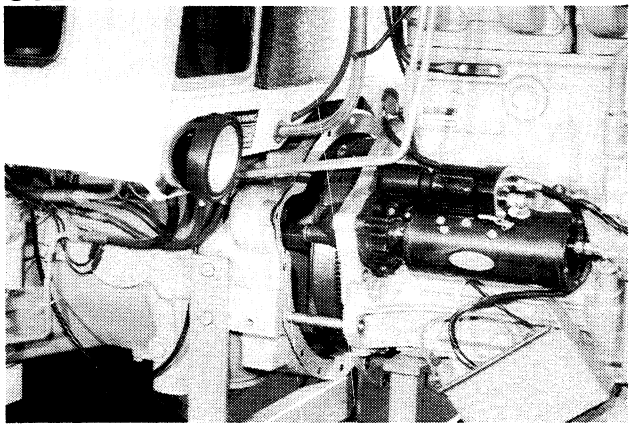
STEP 32





Install the torque limiter or the master clutch on the flywheel. See Section 6220, 6320 or 6420 in this Service Manual for installation.

STEP 33

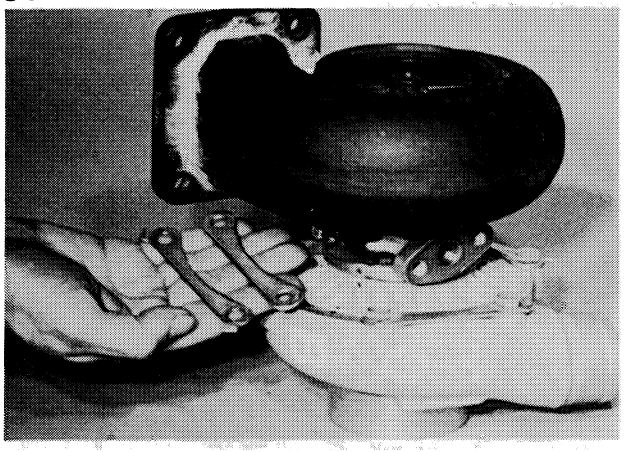


Connect the engine to the torque tube. See Section 2210 of the Service Manual for the connection.

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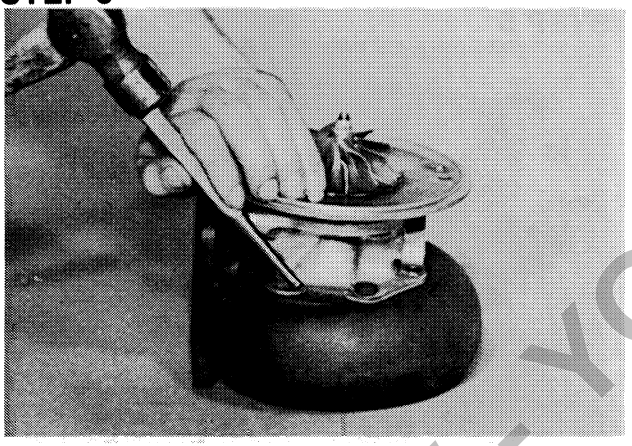
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STEP 7



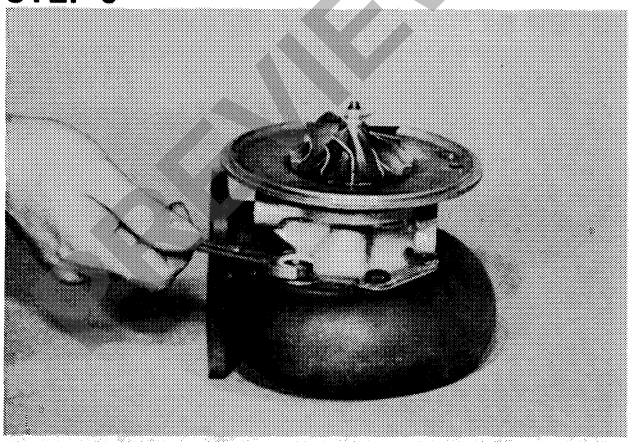
Remove the compressor housing lock plates and clamp plates. Lift the the assembly from the compressor housing.

STEP 8



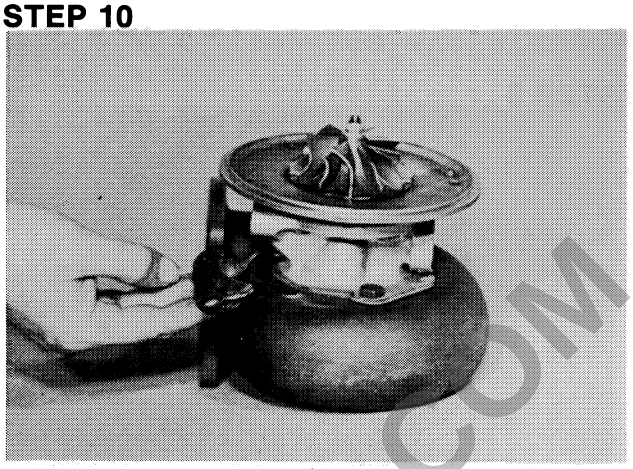
Make the tabs straight on the lock plate.

STEP 9



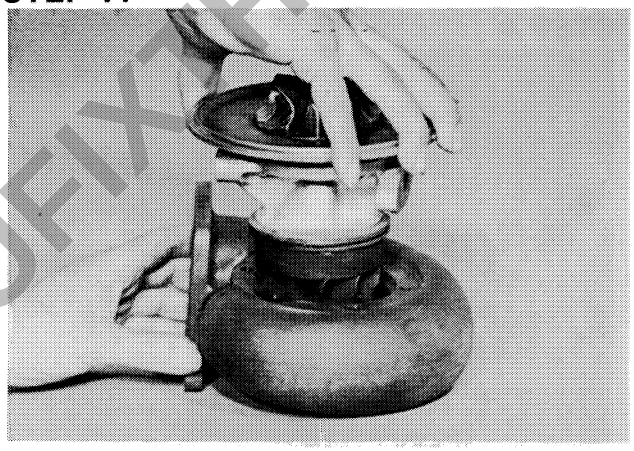
Remove the turbine housing retaining bolts.

STEP 10



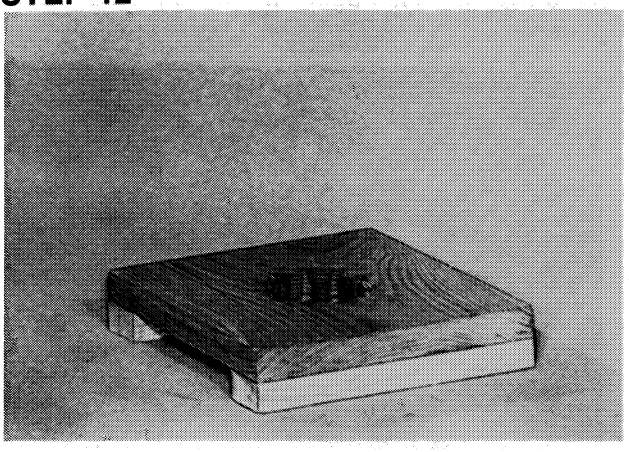
Remove the turbine housing lock plates and clamp plates.

STEP 11



Lift the center housing assembly from the turbine housing.

STEP 12



Holding fixture. See Special Tools Which Must Be Made, Page 3.

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Section

3210

FUEL SYSTEM AND FILTERS

Written In *Clear And Simple English*

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CASE CORPORATION

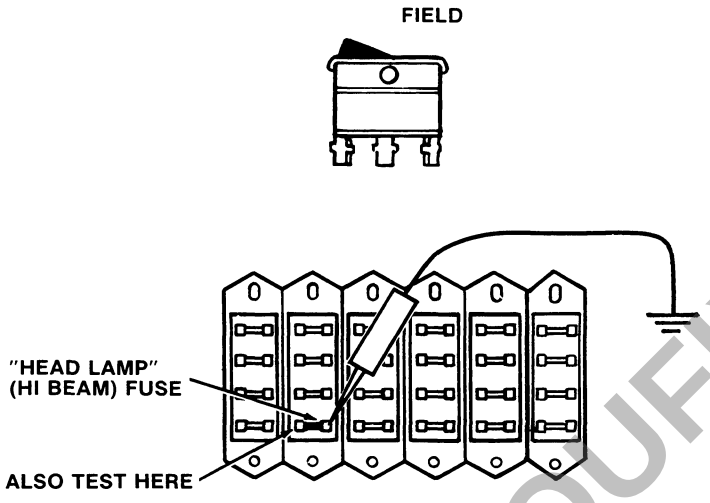
Rac 8-20220

Printed in U.S.A.
August, 1978

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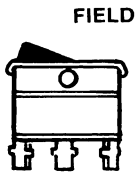
STEP 4D

PROCEDURE	RESULT
Check "HEAD LAMP (HI BEAM)" fuse in the fuse panel: a. Move the lamp switch to the "FIELD" position. b. Connect one wire of a 12 volt test lamp to a good ground. c. Connect the other test lamp wire to one side of the "HI BEAM" fuse in the fuse panel. Check for test lamp illumination. d. Move the test lamp wire connected to the fuse in part "c" to the other side of the fuse. Check for test lamp illumination.	a. Test lamp does not illuminate in either part "c" or part "d" of the procedure: Repair the light green wire No. 42C and **Go back to Step 1A** b. Test lamp illuminates in both parts "c" and "d" of the procedure: Repair the firewall connector or light green wire No. 42D and **Go back to Step 1A** c. Test lamp illuminates only in part "c" or only in part "d", but not both: Replace the fuse with a fuse of the same ampere rating and **Go back to Step 1A**



STEP 4E

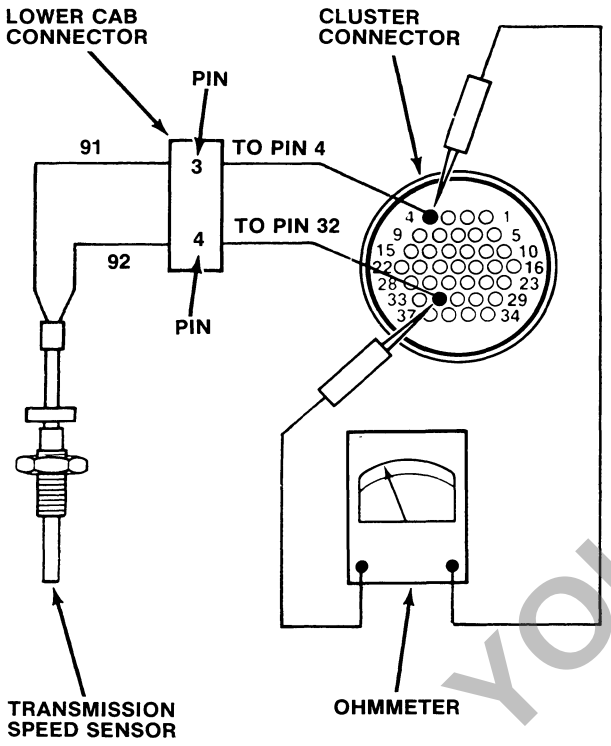
PROCEDURE	RESULT
a. Move the lamp switch to the "FIELD" position. b. Check for upper cab flood lamp illumination.	a. All front flood lamps do not illuminate: **Continue to Step 5A** b. All rear flood lamps do not illuminate: **Continue to Step 6A** c. Front and rear inner flood lamps do not illuminate: Repair upper cab connector with dark blue/white wire NO. 44D and **Go back to Step 1A** d. Front and rear outer flood lamps do not illuminate: Repair upper cab connector with dark blue wire No. 44A and **Go back to Step 1A**



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PROCEDURES	RESULTS
E. Connect the wires to the transmission speed sensor. Turn the key switch OFF. Disconnect the connector at the digital instrument cluster. Use an ohmmeter to check the resistance between pin 4 and pin 32 in the connector.	E. The resistance must be 1.2K ohms. If the reading is not correct, there is a short or open in circuit 91 or 92. Repair as required. Go Back to A If the reading is correct, replace the digital instrument cluster. Go Back to A

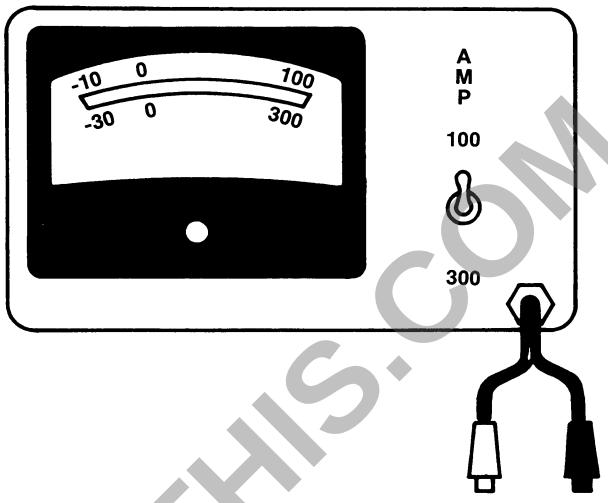


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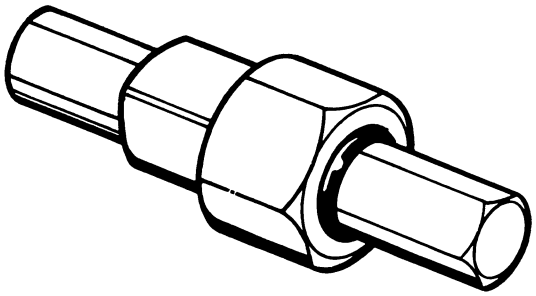
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SPECIAL TOOLS

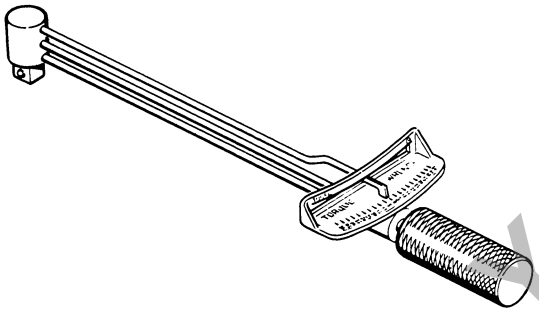
AMMETER



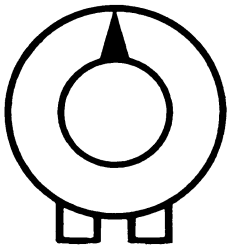
CAS-1375 PULLEY NUT TOOL



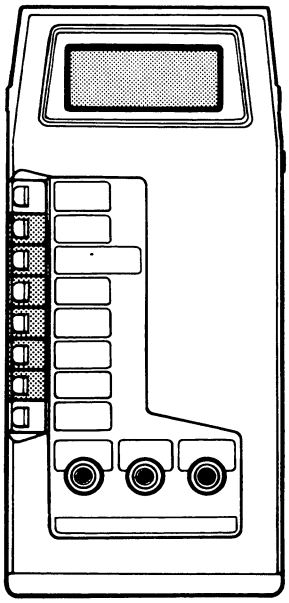
LB FT TORQUE WRENCH



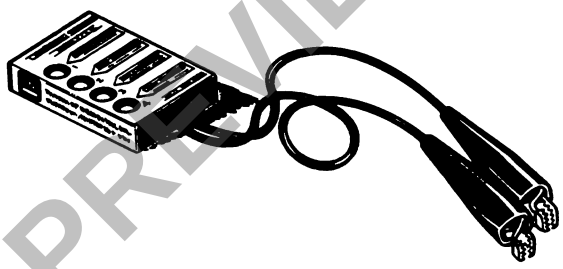
CARBON PILE (100 WATT, 1 OHM) VARIABLE RESISTOR)



CAS-1559 DIGITAL MULTIMETER



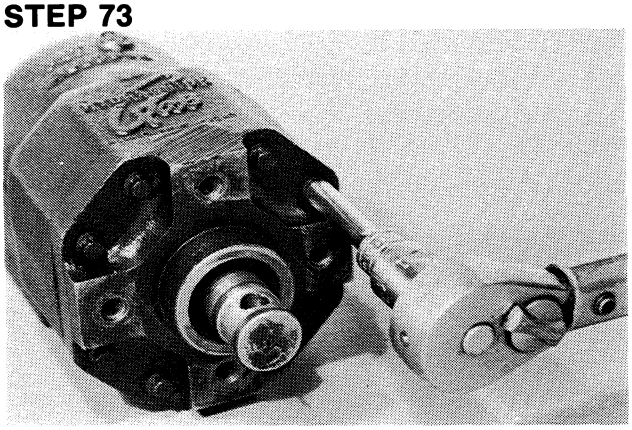
CAS-10344 CHARGING SYSTEM ANALYZER



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STEP 73



Install and tighten the capscrews.

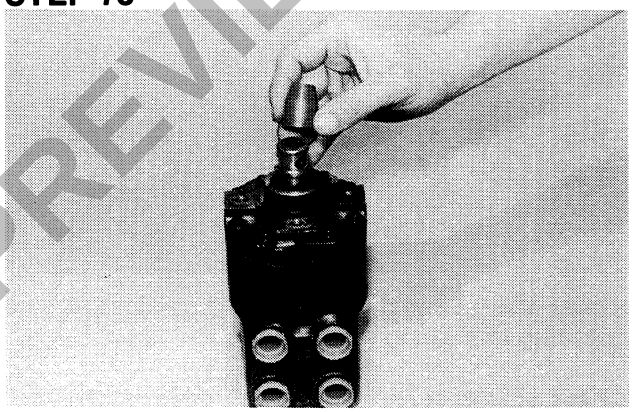
STEP 74



The CAS-1426 Seal Tool Kit is available from Service tools.

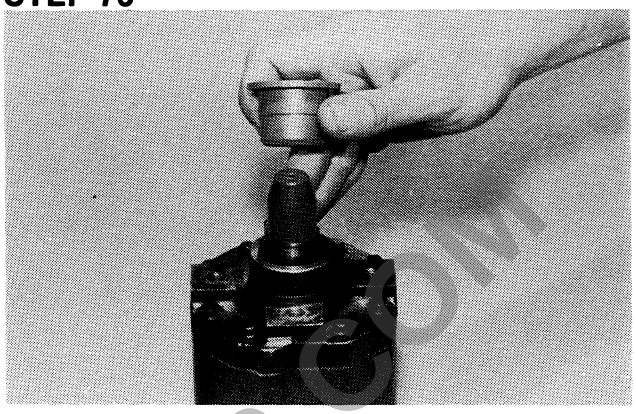
Service Tools
P.O. Box 314
Owatonna, Minnesota 55060

STEP 75



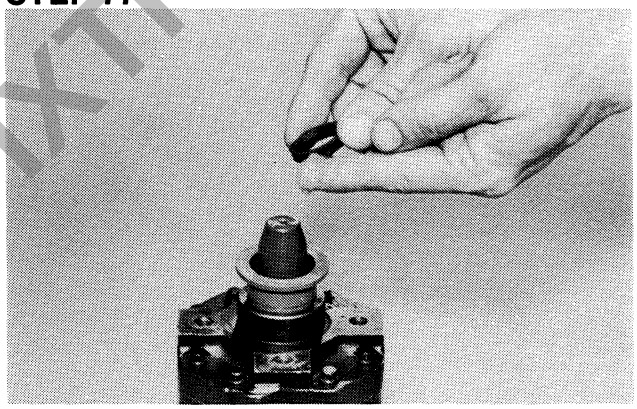
Clean the input shaft and the seal bore in the pump cover. Foreign material on the shaft or in the pump cover bore will cause a leak in the new seal. Put the protective seal over the end of the pump shaft.

STEP 76



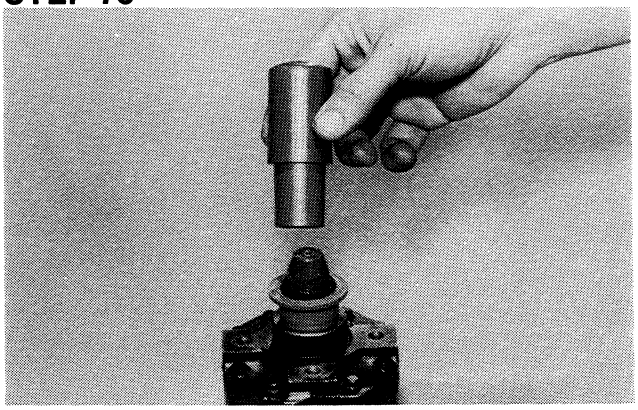
Put the seal compressor ring over the pump shaft and into the upper bore in the pump cover.

STEP 77



Put lubrication on a new inner shaft seal. Use white petroleum jelly. Install the inner shaft seal over the protective seal. The lip of the inner shaft seal must be down.

STEP 78

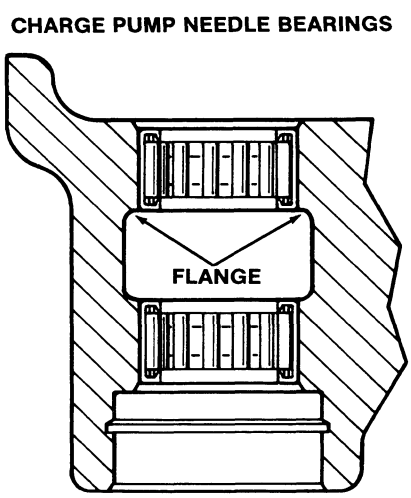


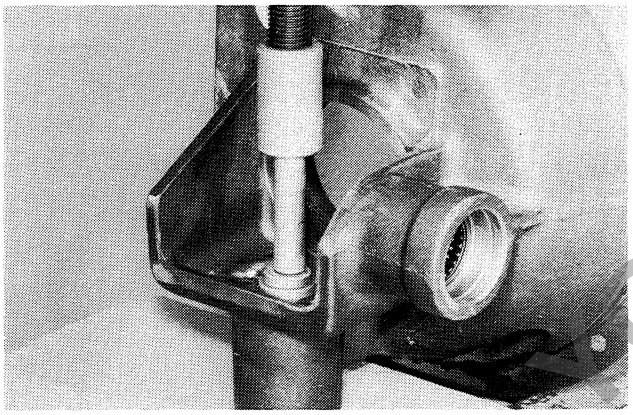
Use the seal driver to press the inner shaft seal into the pump cover. The seal driver will position the inner shaft seal to the correct depth.

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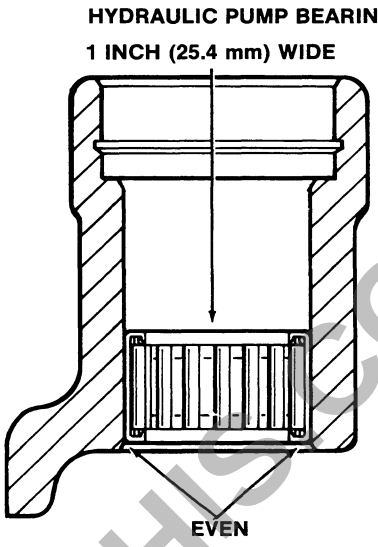
STEP 22

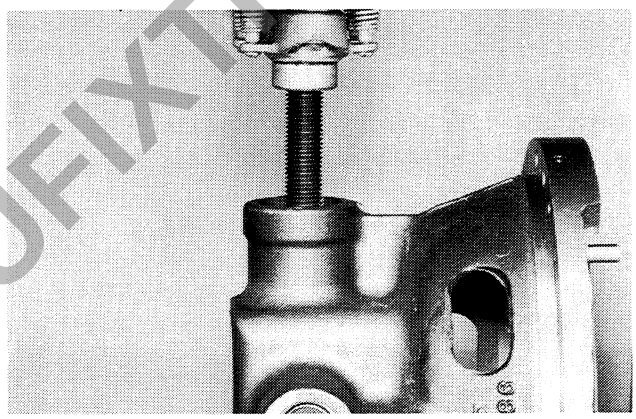




Press the inner needle bearing into the housing until it is even with the housing flange.

STEP 23



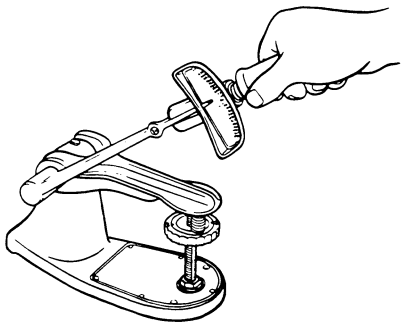


Press the inner bearing into the housing until it is even with the bottom of the housing.

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STEP 86

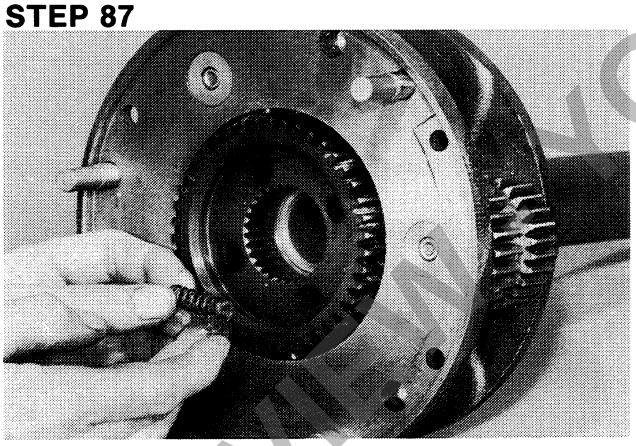


Check the sun gear compression spring, with a spring compression tester. The springs must have these specifications.

Sun Gear Compression Spring Specifications:

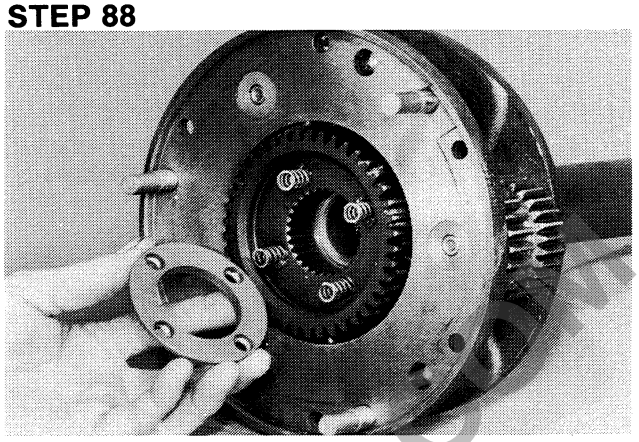
Free Length	1.25 inch (31.75 mm)
Outside Diameter	0.420 inch (10.668 mm)
Wire Diameter	0.055 inch (1.397 mm)
Number of Coils	10
Compress to 0.80 inch (20.32 mm)	16 lbs (71N)

STEP 87



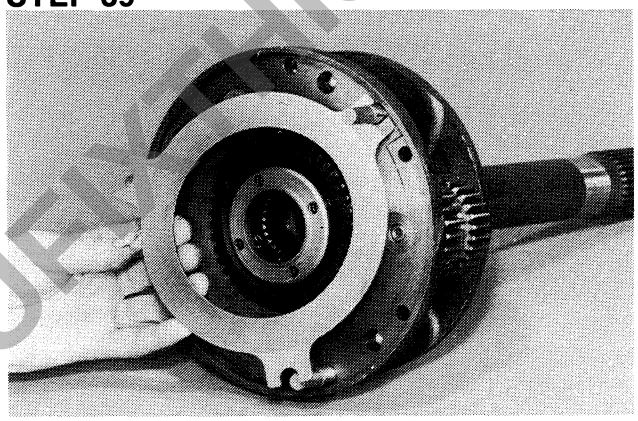
Put grease on the compression springs and install the springs in the sun gear.

STEP 88



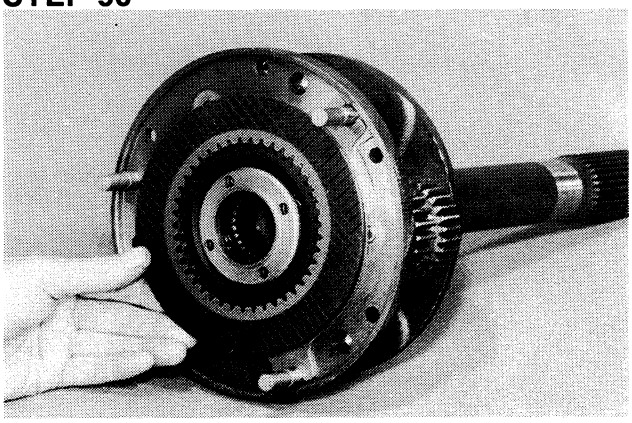
Install the spring cover.

STEP 89



Install a steel clutch plate.

STEP 90

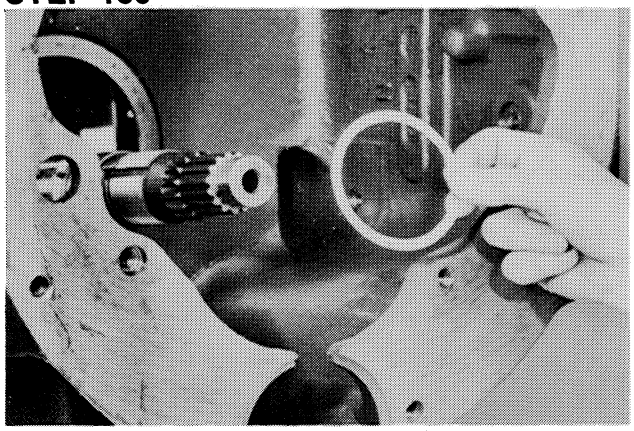


Install a friction plate on the sun gear.

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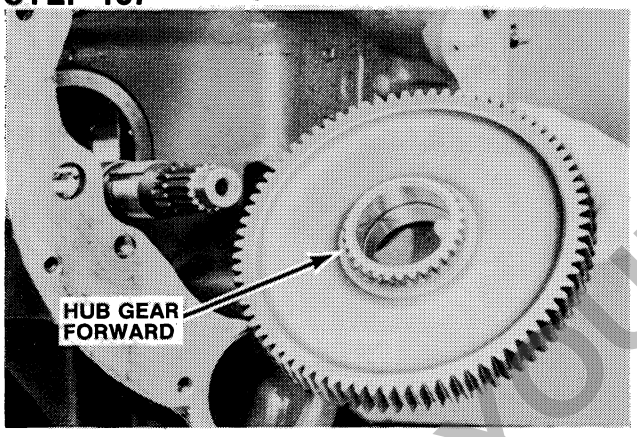
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STEP 136



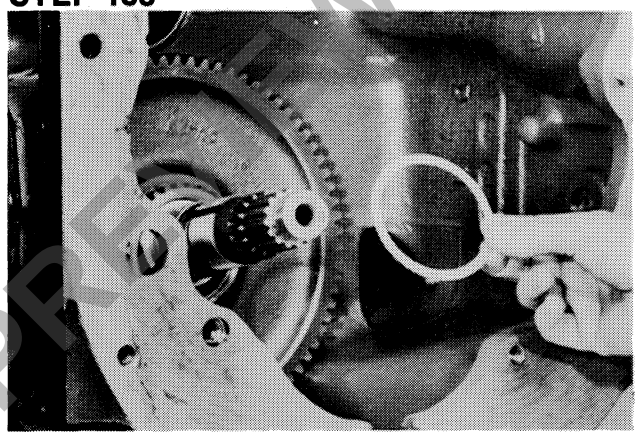
Install the thrust washer for the first gear.

STEP 137



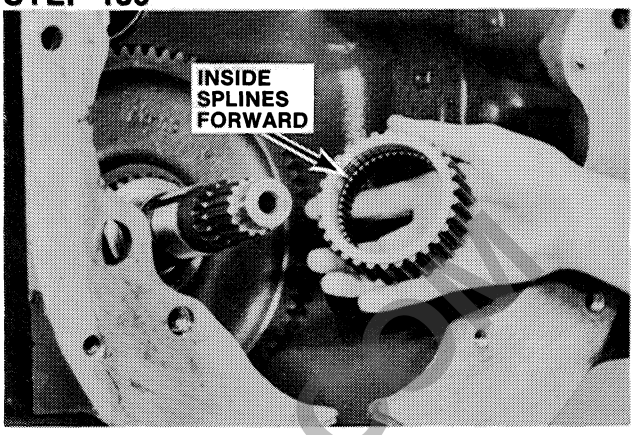
Install the first gear with the hub gear toward the front of the tractor.

STEP 138



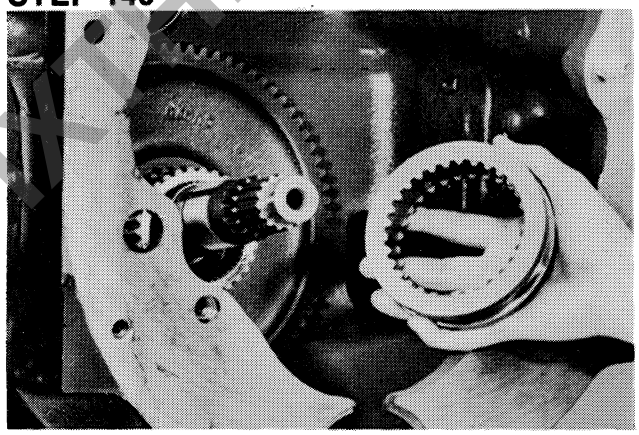
Install the thrust washer.

STEP 139



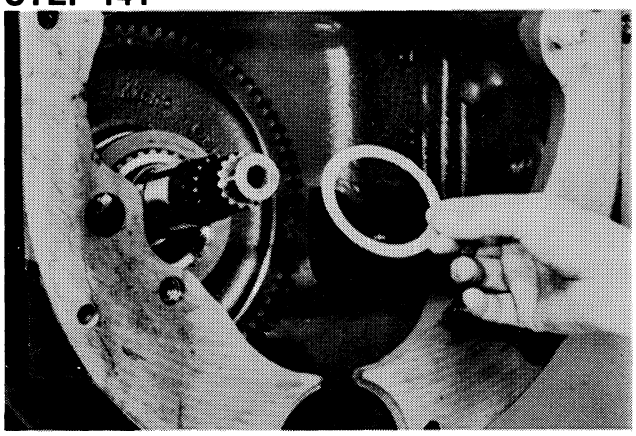
Install the first and second gear hub with the inside splines toward the front of the tractor.

STEP 140



Install the shift collar for first and second gear.

STEP 141

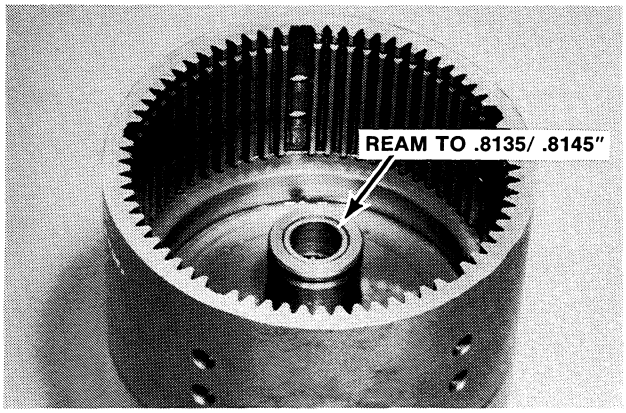


Install the thrust washer.

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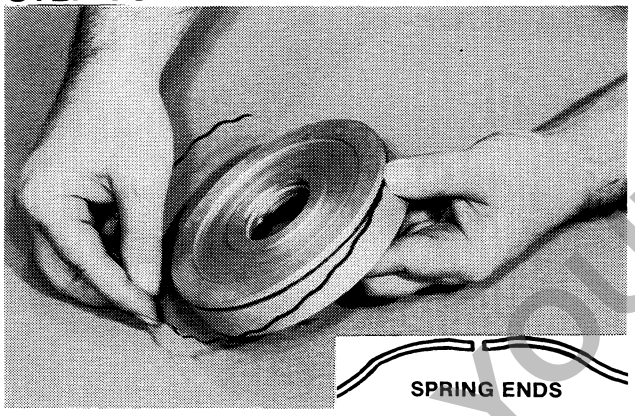
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STEP 75



Ream new bushing to .8135/.8145" (20.66 to 20.68 mm).

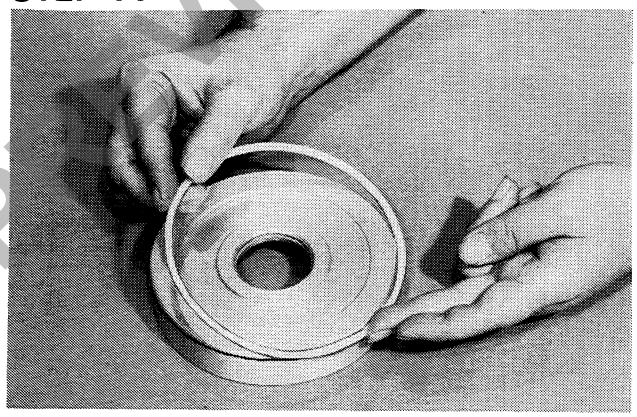
STEP 76



Install the outer wave spring in the groove of the clutch piston.

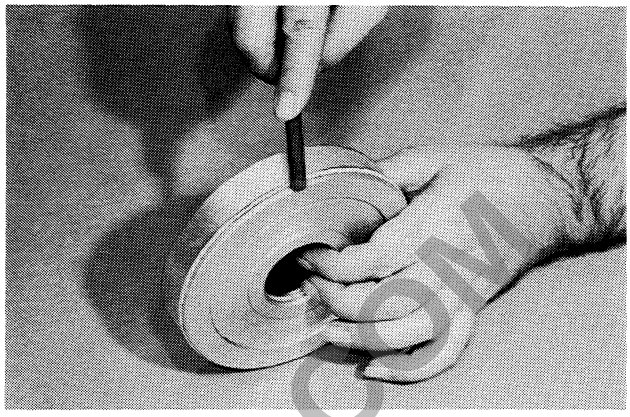
NOTE: *Spring ends must be towards the clutch piston. Spring ends must not contact each other when installed in the groove of the clutch piston.*

STEP 77



Install the teflon seal on top of the outer wave spring.

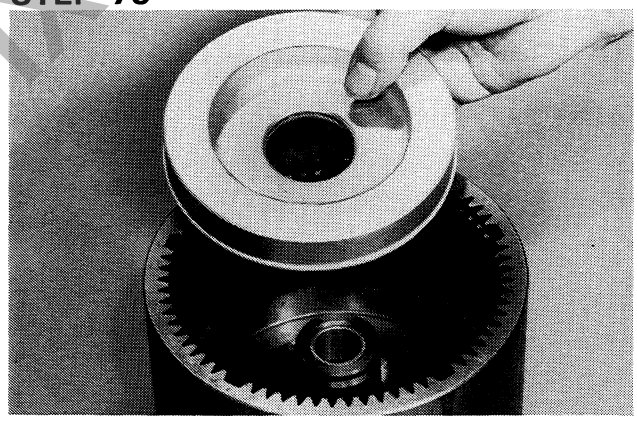
STEP 78



Use a smooth wood dowel or round plastic pencil to press teflon seal down in the groove of the clutch piston.

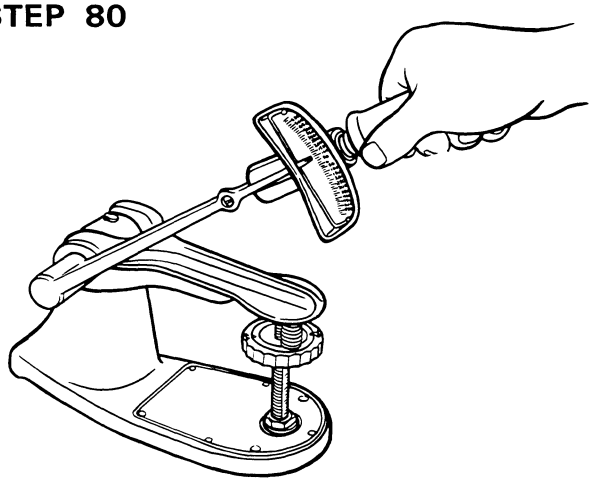
NOTE: *Install the inner wave spring and teflon seal following Steps 76 through 78.*

STEP 79



Apply TFD oil free of dirt to the clutch piston. Install the clutch piston (flat side down) in the clutch carrier.

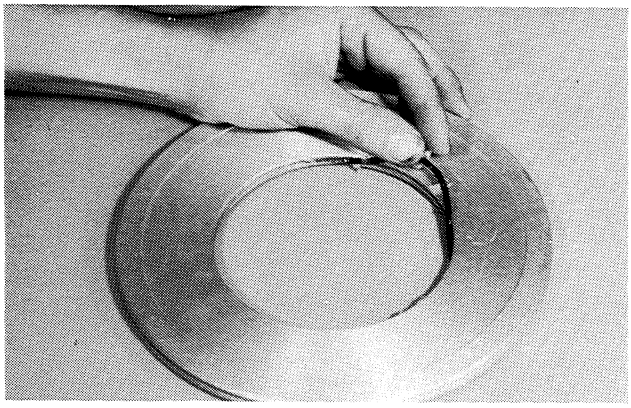
STEP 80



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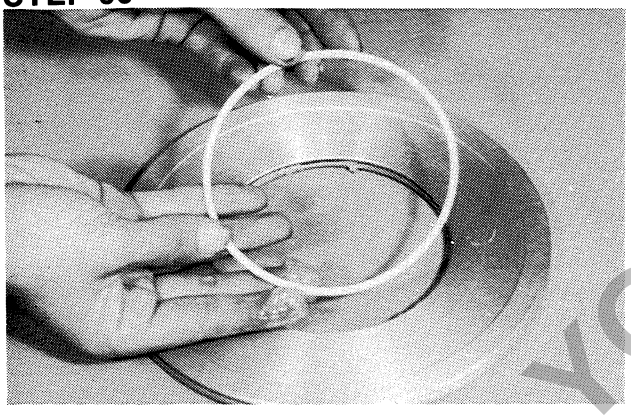
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STEP 98



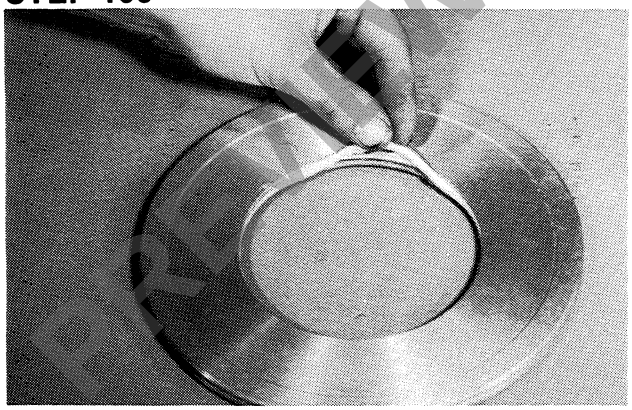
Install the inner o-ring in the inside groove of the piston.

STEP 99



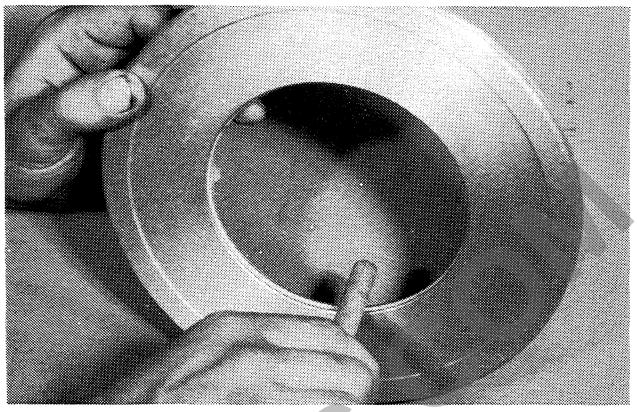
Put petroleum jelly on the new piston inner seal.

STEP 100



Install the new inner seal in the inside groove of the piston.

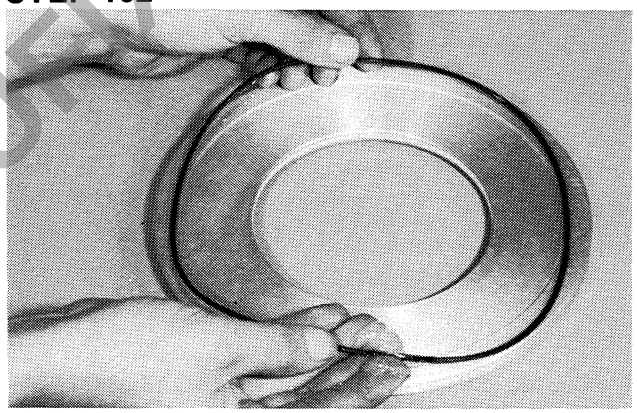
STEP 101



To fit the seals in position, use a smooth wood dowel or round plastic pencil.

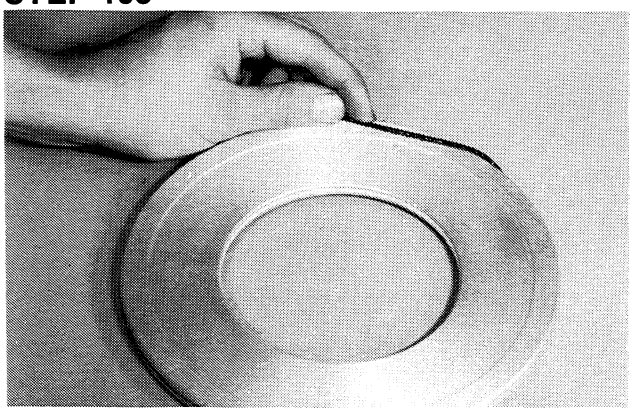
IMPORTANT: *To prevent damage to the inner seal, do not use hand tools or sharp tools for installing.*

STEP 102



Put petroleum jelly on the new piston outer o-ring.

STEP 103



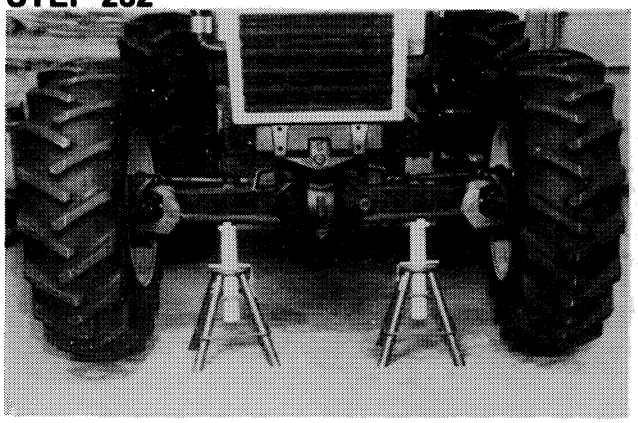
Install the new piston outer o-ring in the outside groove of the piston.

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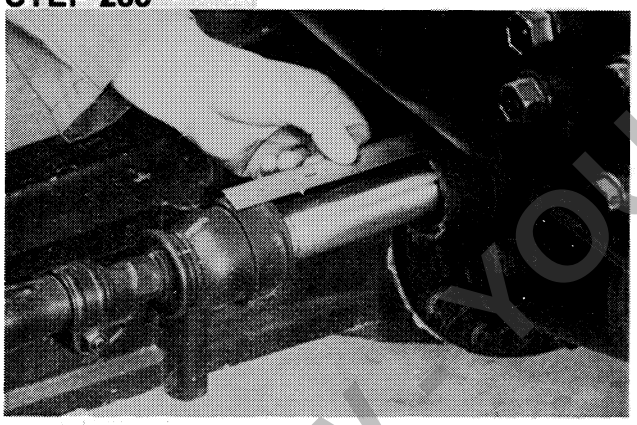
ADJUSTING THE TOE-IN OF THE FRONT WHEELS

STEP 232



Install jack stands under the front axle to raise the wheels off the floor. Put blocks in front of and behind the rear wheels.

STEP 233



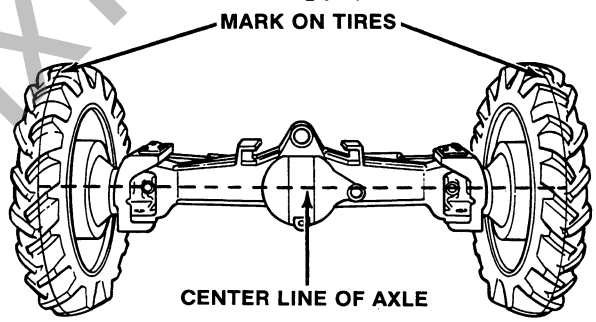
Put the front wheels in the straight forward position. Make sure that the steering cylinder is centered. Measure the cylinder rod on each side of the tractor. Measure from the edge of the cylinder rod guide to the face of the ball joints. Both measurements must be the same. Adjust the position of the front wheels until the cylinder rod measurements are the same.

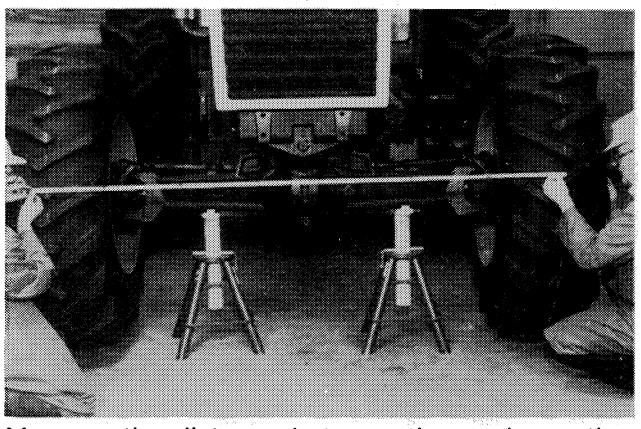
STEP 234



Install a fixed point against the tire. Rotate the tires against the fixed point until there is a mark on the tires, all around the circumference of the tires.

STEP 235



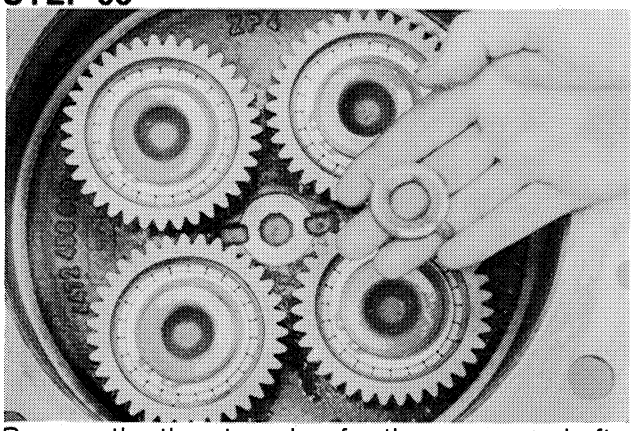


Measure the distance between the marks on the tires on a plane parallel to the center line of the axle. Measure again, 180 degrees from the first measurement. The front and rear measurements must be equal or the front measurement must be 4.763 mm less than the rear measurement. See Steps 236 through 241 if the toe-in is not correct.

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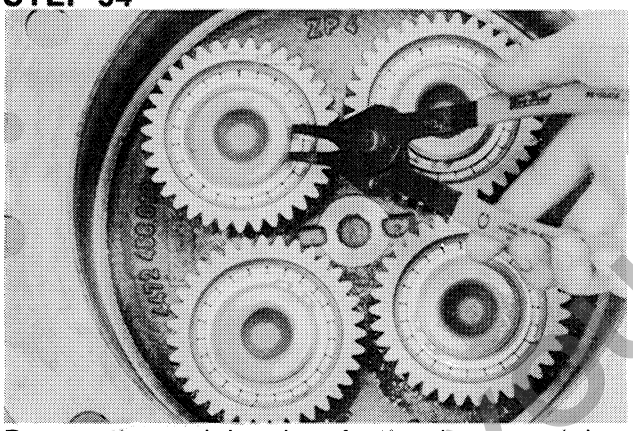
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STEP 93



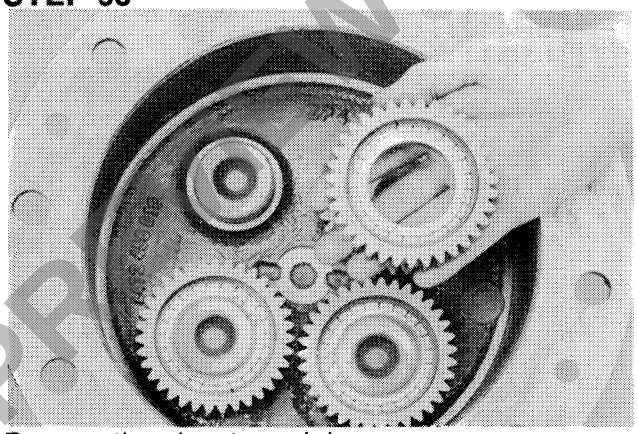
Remove the thrust washer for the sun gear shaft.

STEP 94



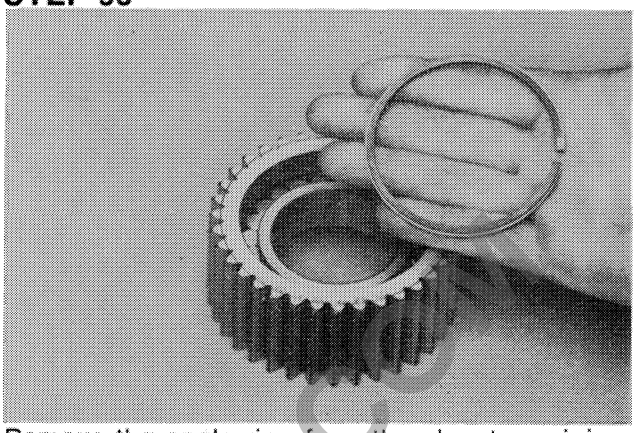
Remove the retaining rings for the planetary pinion gears.

STEP 95



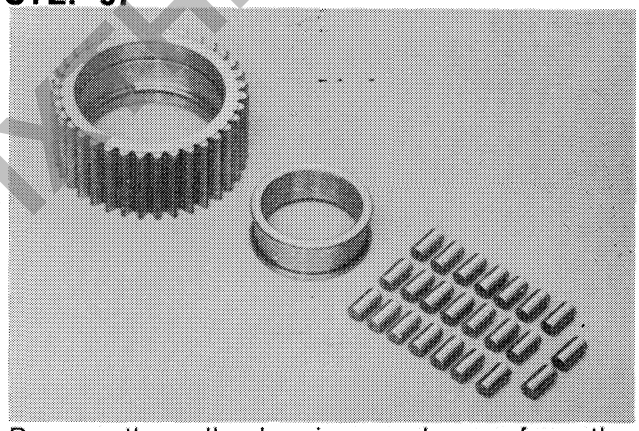
Remove the planetary pinion gears.

STEP 96



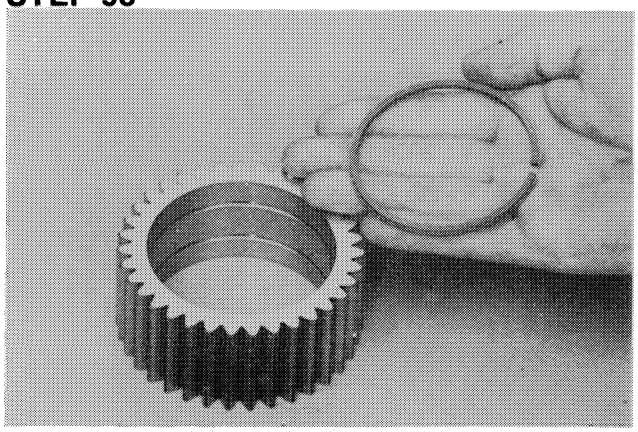
Remove the angle ring from the planetary pinion gears.

STEP 97



Remove the roller bearings and cage from the gear.

STEP 98

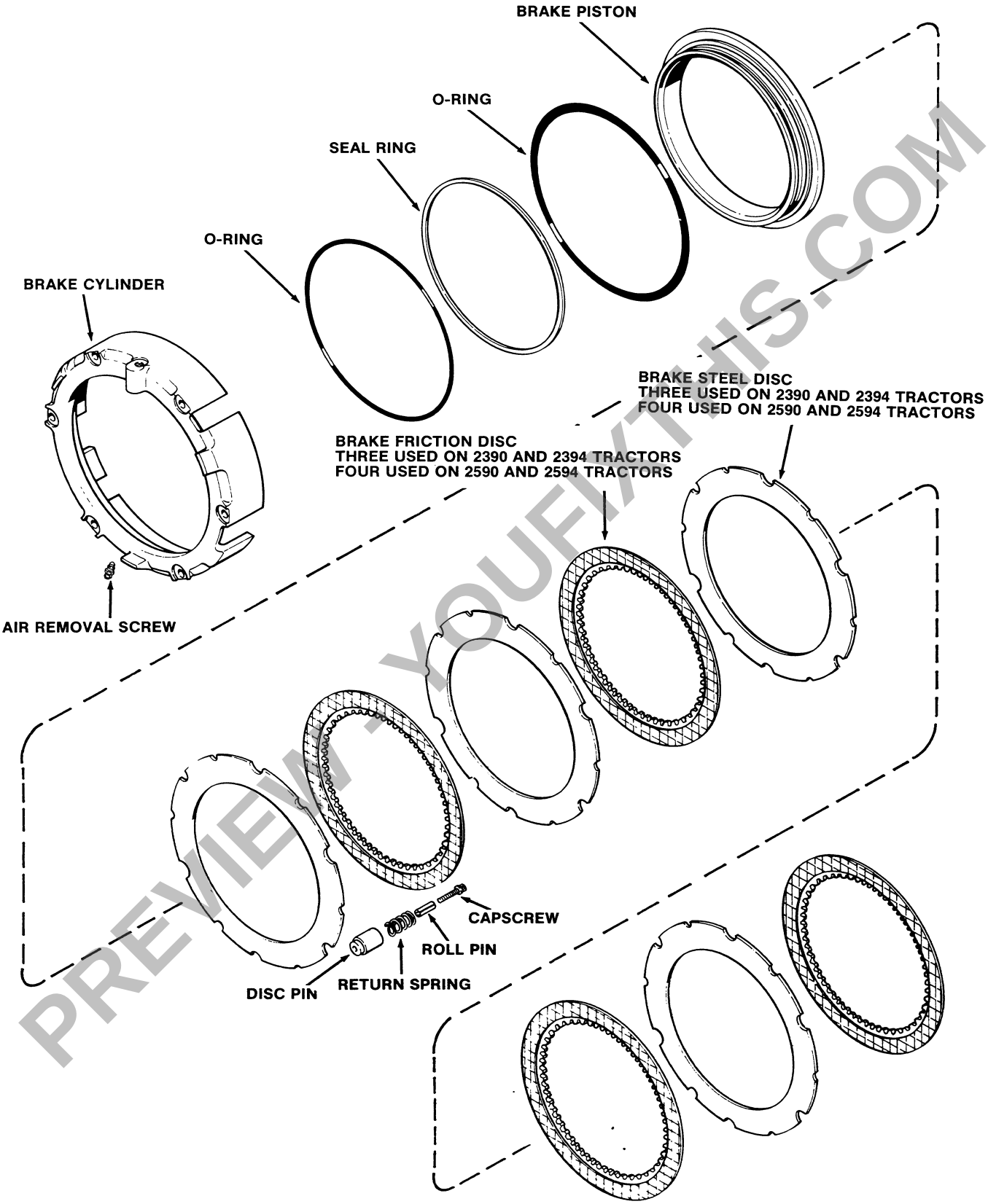


Remove the other angle ring from the gear.

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Brake Cylinder Assembly



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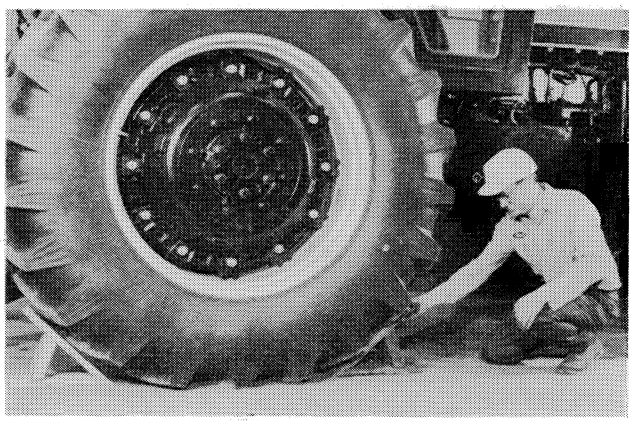
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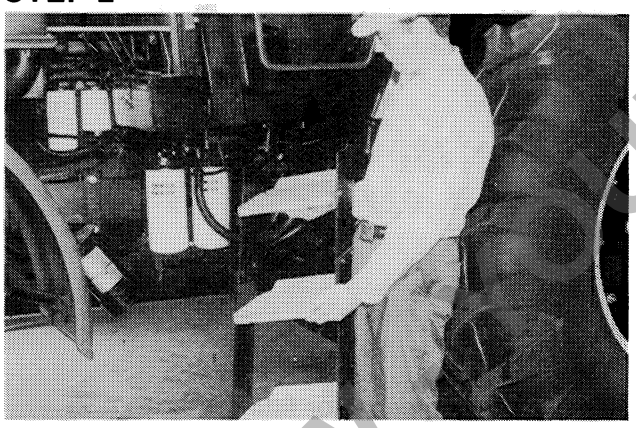
REMOVING THE REMOTE HYDRAULIC VALVES
(With or Without 3rd Circuit Load Check)

STEP 1



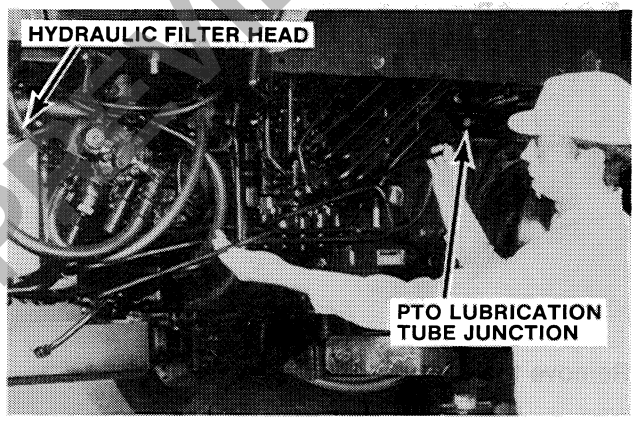
Put the tractor in PARK. Put blocks in front of and behind the wheels.

STEP 2



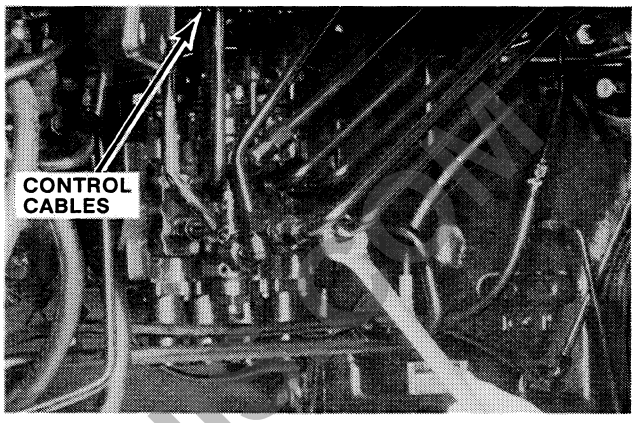
Remove the mounting bolts for the step assembly and remove the step assembly.

STEP 3



Disconnect the PTO lubrication tube from the hydraulic filter head. Separate the PTO lubrication tube at the junction and remove the PTO lubrication tube.

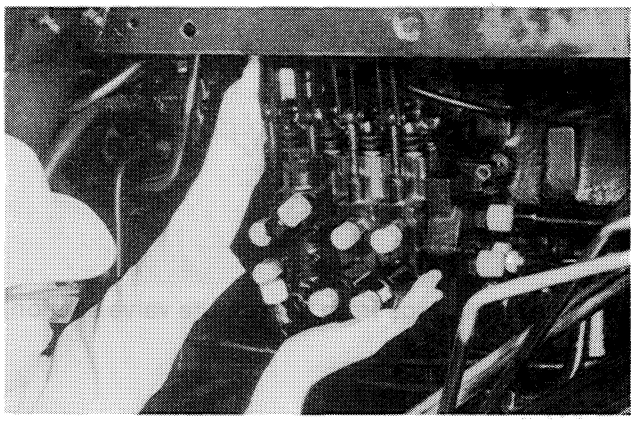
STEP 4



Disconnect the remote coupler tubes and control cables from the remote valve assembly.

NOTE: *Always put caps and plugs on the fittings and tube ends when disconnecting hydraulic components.*

STEP 5



Remove the mounting bolts that hold the remote valve assembly to the tractor. Remove the remote valve assembly from the tractor.

NOTE: *Remove tube clamps from the remote coupler tubes as necessary to move the tubes away from the remove valve assembly.*

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SPECIAL TOOLS 3

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TEST FIXTURE 45

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SPECIFICATIONS

	U.S. Value	Metric Value
Lower Follow up Rod	8.50 inch	216 mm
Control Valve Spool Travel	0.007 to 0.015 inch	0.178 to 0.381 mm
Draft Arms Travel at Top of Lift	1-1/2 to 2 inch	38.1 to 50.8 mm
Hitch Hand Lever Pull	12 to 15 lbs	53 to 67Nm (5.3 to 67 kgm)
Sensing Hand Lever Pull	3 to 7 lbs	13 to 31 Nm (1.3 to 3.1 kgm)

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SAFETY PROCEDURES

THIS SAFETY ALERT SYMBOL INDICATES IMPORTANT SAFETY MESSAGES IN THIS MANUAL. WHEN YOU SEE THIS SYMBOL, CAREFULLY READ THE MESSAGE THAT FOLLOWS AND BE ALERT TO THE POSSIBILITY OF PERSONAL INJURY OR DEATH.

Refrigerant R-12 has the most stability, is the most safe and easiest to work with of the refrigerants now in use in air conditioner systems. Because Refrigerant R-12 has a low boiling point (-21.7°F) (-30°C), Refrigerant R-12 is the best material for removing large amounts of heat from the ambient air.

To prevent possible personal injury, safety procedures must be followed when working with Refrigerant R-12.

WARNING *Always wear safety goggles when working with liquid refrigerant. Liquid refrigerant in your eyes could cause blindness.*

1. Always wear safety goggles when doing any service work near an air conditioner system. Liquid refrigerant in the eyes can cause serious injury. If you get refrigerant near your eyes, wash the eyes immediately with mineral oil as an absorber for the refrigerant then, flush your eyes with a weak solution of boric acid. See a physician immediately.

CAUTION *Never touch liquid refrigerant, since even a drop on your skin will cause severe and painful frostbite.*

2. A drop of liquid refrigerant on your skin will cause frostbite. When it is necessary to release pressure from the air conditioner system, open the fittings carefully and slowly. If you get refrigerant on your skin, your skin must be treated for frostbite or see a physician.

CAUTION *Do not steam clean any air conditioning system parts while the system is charged. The heat will cause the refrigerant to rise to a pressure that could cause the system to explode.*

3. Keep refrigerant containers in correct, up position. Always keep refrigerant containers out of the sun and away from any heat. Pressure in a container will increase with heat.

4. If you are going to weld or steam clean near the air conditioner system, always remove refrigerant from the system.

5. Always check the temperature and pressure of the air conditioner system when you test the system.

WARNING *Never discharge the air conditioning system in a closed building. Proper ventilation is required under all circumstances, since refrigerant lacks the oxygen you need to breathe.*

6. Good ventilation in the service area is needed when you work on the air conditioner system. Refrigerant is not toxic but, too much refrigerant in a small area can make it difficult to get enough air because the refrigerant does not have oxygen. Always discharge refrigerant into an exhaust system or through an open window or door.

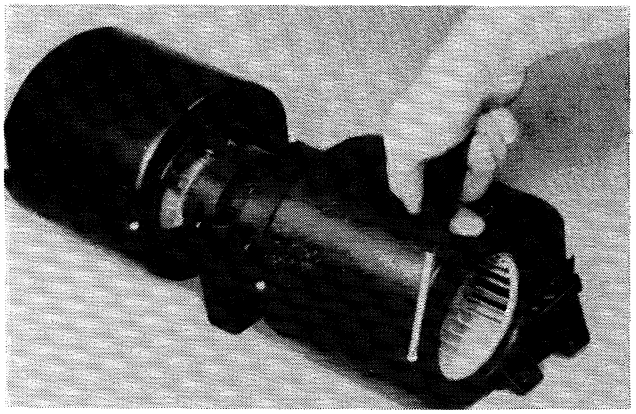
DANGER *When refrigerant comes in contact with an open flame, it forms phosgene gas, never breathe these fumes.*

7. At all normal temperatures, Refrigerant R-12 is not toxic. When Refrigerant R-12 comes in contact with an open flame, phosgene gas forms. There is danger with this gas. Never discharge a refrigerant system near an open flame. When the flame type leak finding tool is used to check for leaks, never permit the fumes to enter your body.

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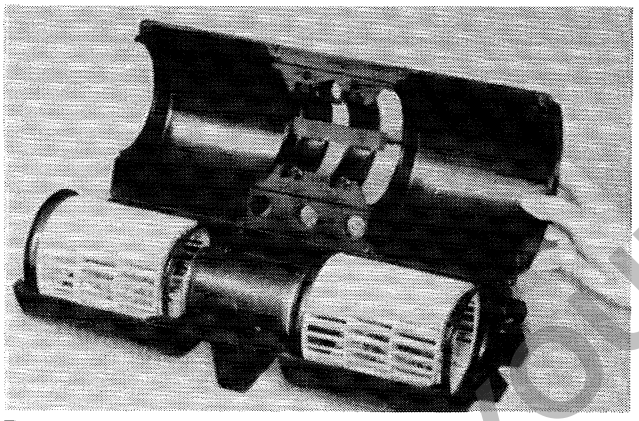
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STEP 18



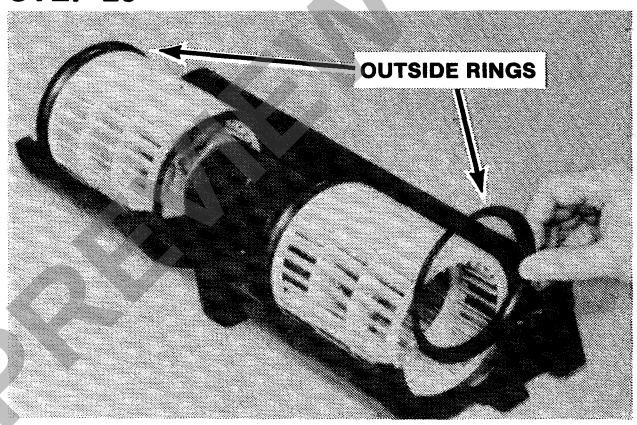
Remove the blower housing screws.

STEP 19



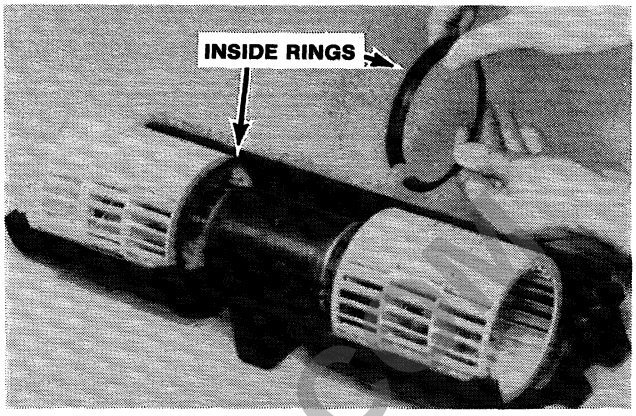
Remove the blower housing from the mounting base.

STEP 20



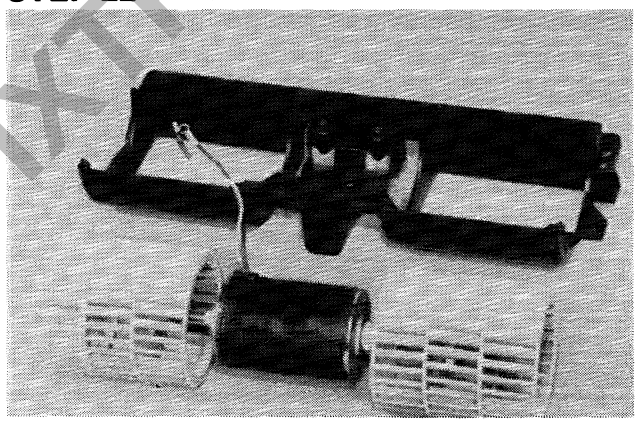
Remove the outside rings from the grooves in the mounting base.

STEP 21



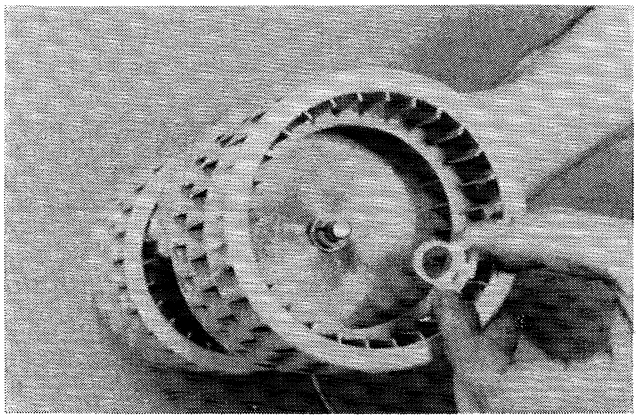
Remove the inside rings from the grooves in the mounting base and carefully separate the rings to clear the motor shaft.

STEP 22



Remove the motor and fans from the blower mounting base.

STEP 23



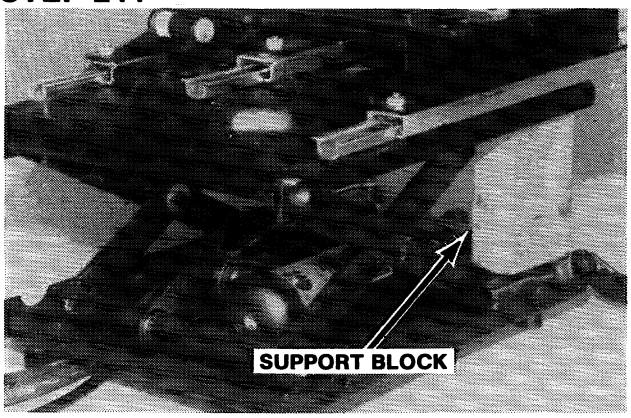
Remove the fans to motor shaft clamps and remove the fans.

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Charging the Nitrogen Accumulator

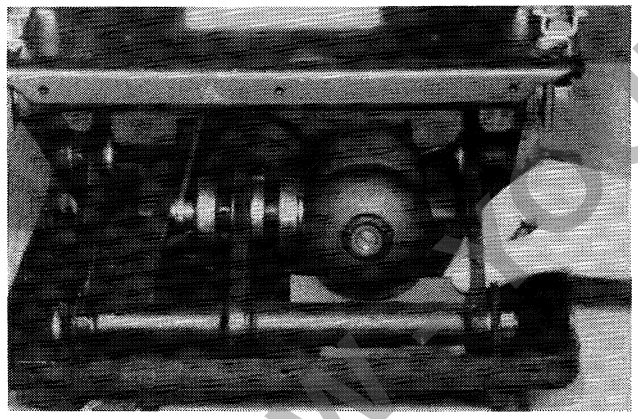
STEP 244



Lift the operators seat by the bottom seat cushion and secure in an extended position.

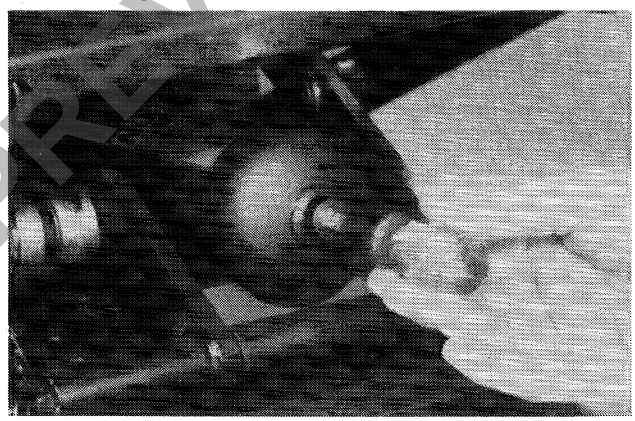
NOTE: *The seat boot has been removed for photographic purposes.*

STEP 245



Support the accumulator to clear the suspension arm assembly.

STEP 246



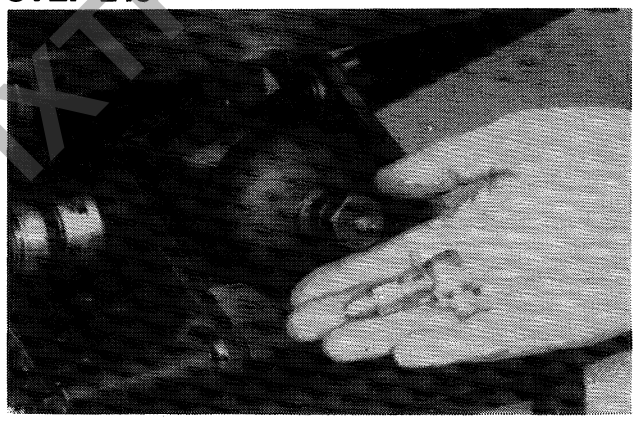
Remove the dust cap from the end of the accumulator.

STEP 247



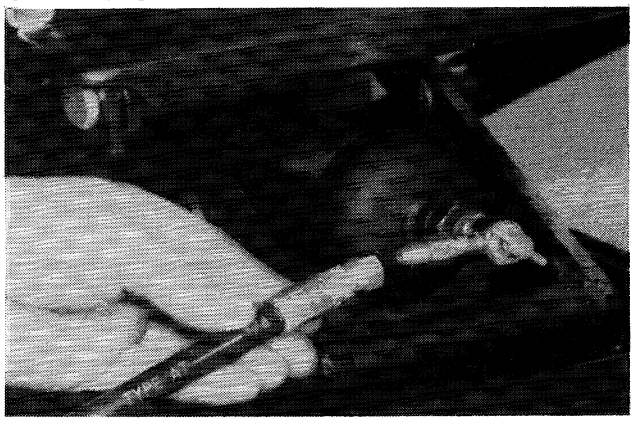
Install the valve adapter on the accumulator.

STEP 248



Install the valve on the adapter.

STEP 249



Install the high pressure hose between the valve and the nitrogen pressure regulator valve. Charge the accumulator to 90 PSI.

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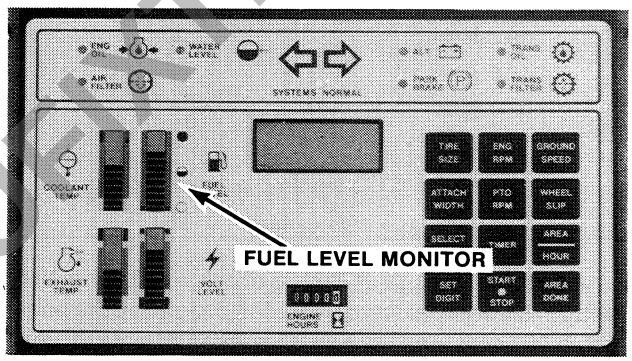
Fuel Level LCD Function

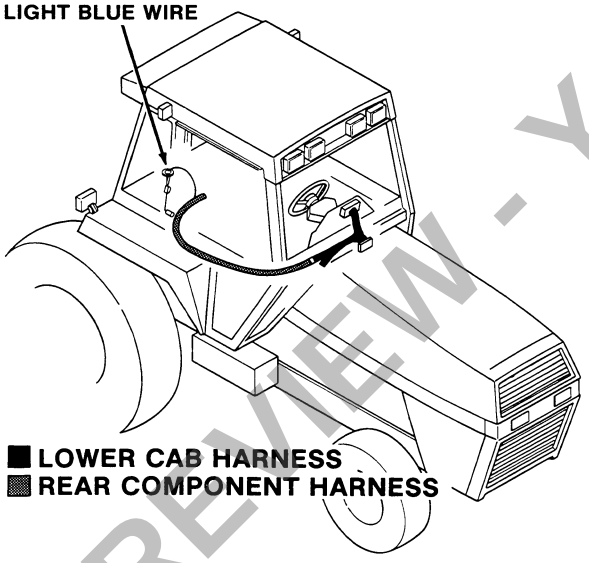
A float mechanism, which is a variable resistor is the sensor for the Fuel Level bar graph. This variable resistor floats in the fuel tank. The two columns below compare the energized segments of the Fuel Level bar graph with the resistance to ground of the float mechanism. As the fuel in the tank decreases, the float mechanism resistance to ground decreases and the number of energized bar graph segments decrease.

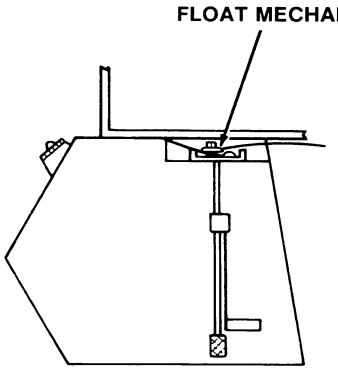
The float mechanism is connected to cluster connector PIN 14. As the float mechanism resistance to ground changes, the signal on PIN 14 changes. When the signal varies, different segments on the Fuel Level bar graph energize.

With a full tank of fuel, all 12 bar graph segments are energized. The float mechanism resistance to ground will be about 81 ohms. When the fuel decreases to a half tank, only 6 segments are energized. The float mechanism resistance will have decreased to about 37 ohms. As soon as bar graph segment 2 goes out, a 3 second alarm sounds and segment 1 flashes ON and OFF until fuel is added.

APPROXIMATE FLOAT MECHANISM RESISTANCE	BAR GRAPH ENERGIZED SEGMENTS
81 ohms	12
74 ohms	11
67 ohms	10
59 ohms	9
52 ohms	8
45 ohms	7
37 ohms	6
30 ohms	5
23 ohms	4
15 ohms	3
8 ohms	2
0 ohms	1







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