DIESEL ENGINE REMOVAL AND INSTALLATION

DANGER

Before doing any maintenance or service work on the tractor or the header you must:

Put all controls in NEUTRAL.
Apply the parking brake.
Lower the header to the floor.
Center and lock the steering wheel.
Stop the engine.
Make sure all moving parts have stopped.

Removal

NOTE: Fasten identification tags to all of the wires during removal.

1. Park the machine on a level surface and lower the header to the floor.

2. Stop the engine and apply the parking brake. Make sure the steering wheel is centered and locked.

3. Close the fuel shutoff in the sediment bowl on the bottom of the fuel tank.

4. Disconnect the cable clamps from the negative battery post of both batteries.

5. If the tractor is a hay tractor, open the right side cover of the engine compartment. Connect lifting equipment to the right side cover. Disconnect the support strut. Remove the pivot bolts from the three hinges. Remove the right side cover.

6. If the tractor is a grain tractor, remove the drive shield from below the hood on the right side of the tractor.

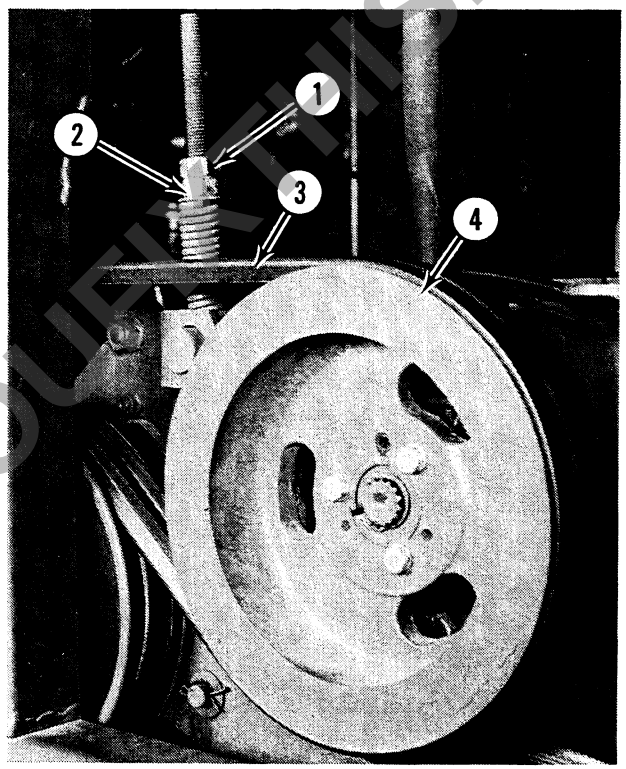
7. Loosen the clamps and remove the air cleaner hose from the intake manifold and the air cleaner. Put a cover over the opening in the intake manifold.

8. Remove the precleaner.

9. Loosen the clamp that fastens the exhaust pipe to the muffler. Remove the exhaust pipe.

10. Connect lifting equipment to the hood. Remove the cap screws from the hood. Remove the hood.

11. Loosen the lock nut on the adjustment linkage. Turn the adjusting nut until the drive belt for the tandem pump is loose. Remove the drive belt from the sheave on the engine.



82TR-87002-4

1. Lock Nut
2. Adjusting Nut
3. Drive Belt
4. Sheave

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8820 and 8830 Windrower Tractor

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CASE CORPORATION

Rac 8-98071

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Issued July 1992

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SAFETY RULES

The manufacturer of this product is concerned about your safety and is committed to the prevention of accidents. A major factor in prevention of accidents is safe and proper use of the equipment. Be sure you or anyone who does any maintenance or service work on this machine reads and understands this manual prior to doing any maintenance or service work on this machine.

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.

Read and understand all operating instructions and precautions before attempting to operate or service the machine.

Caution others, especially children, about climbing on the machine or being too close while machine is operating.

Emphasize the importance of safety when working around and operating the machine.

Always remain seated and have seat belt fastened while operating machine.

Make sure all safety shields are in place before operating the machine.

Any time the engine is running and the parking brake is disengaged, the machine will turn if the steering wheel is moved, even though the travel control lever is in neutral.

Place all control levers in neutral. Engage parking brake control lever, center and lock steering wheel, and shut off engine before:

1. **Leaving the operator's seat**
2. **Refueling**
3. **Lubricating**
4. **Cleaning the reel or hay conditioner**
5. **Adjusting the machine**

Never stand behind tractor while the header is running.

Do not ride on the machine at any time.

Never carry riders.

Never operate machine at high speeds in crowded places.

Never suddenly reverse wheels to stop or backup.

Always lower header to ground when parking.

Always apply parking brake when parking.

Always travel with header as low as possible.

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Section 1001

INTRODUCTION

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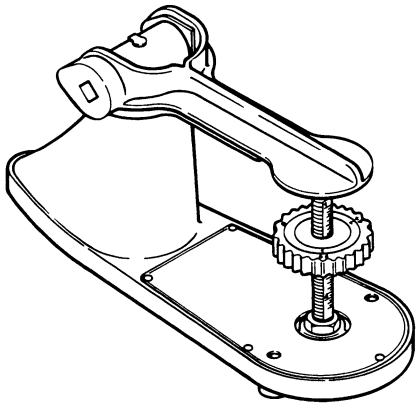
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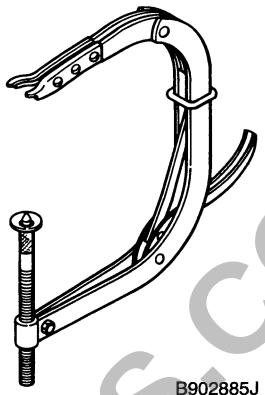
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SPECIAL TOOLS



B902882J

CAS-1357 Valve Spring Tester
This tool is first used on page 32.



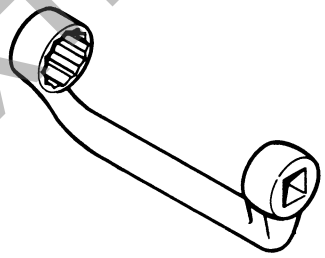
B902885J

CAS-10240 Valve Spring Compressor
This tool is first used on page 16.



B902883J

CAS-1694 Injector Bore Cleaner (For 9 mm injectors)
CAS-2155 Injector Bore Cleaner (For 7 mm injectors)
This tool is first used on page 33.



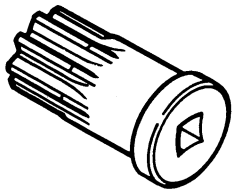
B90288

CAS-1066A Head Bolt Wrench
This tool is first used on page 45.



B902884J

CAS-1743 Valve Guide Reamer
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B902887J

CAS-1690 Engine Rotating Tool
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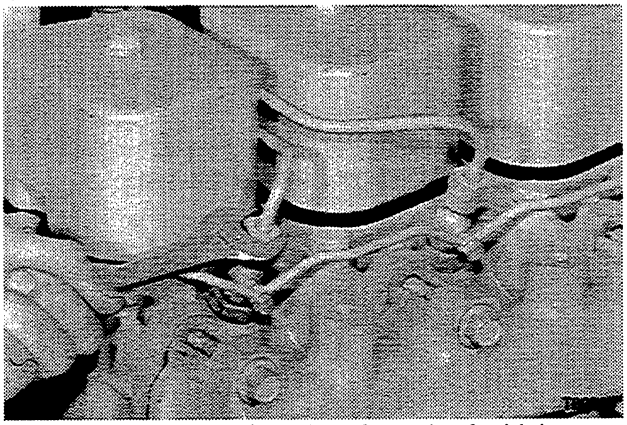
FUEL INJECTION PUMP

Removal

STEP 1

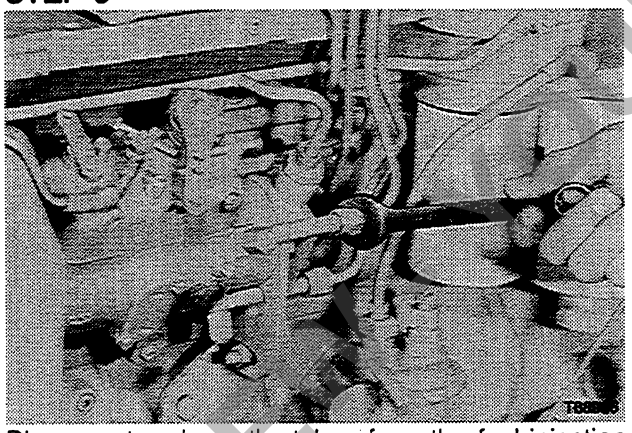
Clean the area around the fuel injection pump.

STEP 2



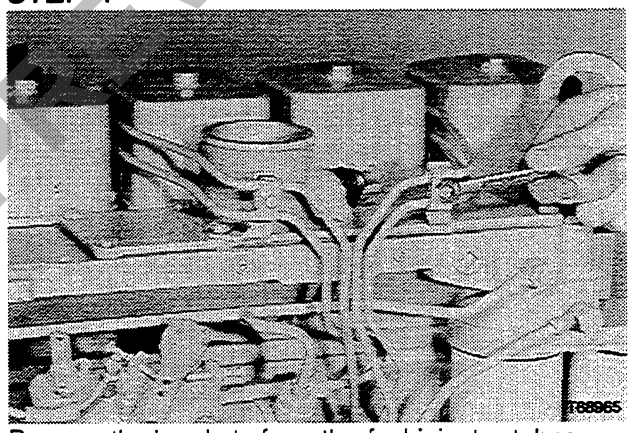
Disconnect and cap the tubes from the fuel injectors.

STEP 3



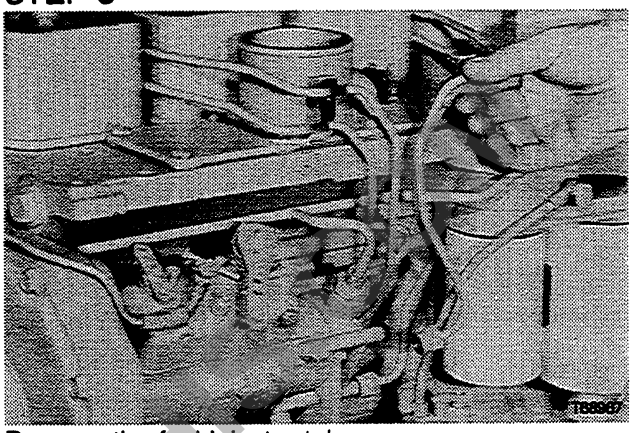
Disconnect and cap the tubes from the fuel injection pump.

STEP 4



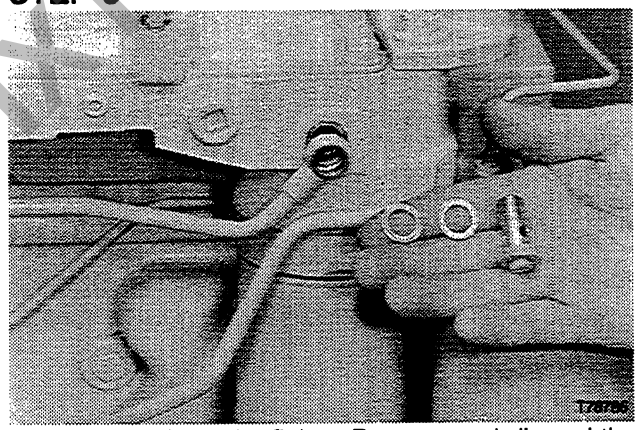
Remove the brackets from the fuel injector tubes.

STEP 5



Remove the fuel injector tubes.

STEP 6



Remove the fuel inlet fitting. Remove and discard the sealing washers.

STEP 7

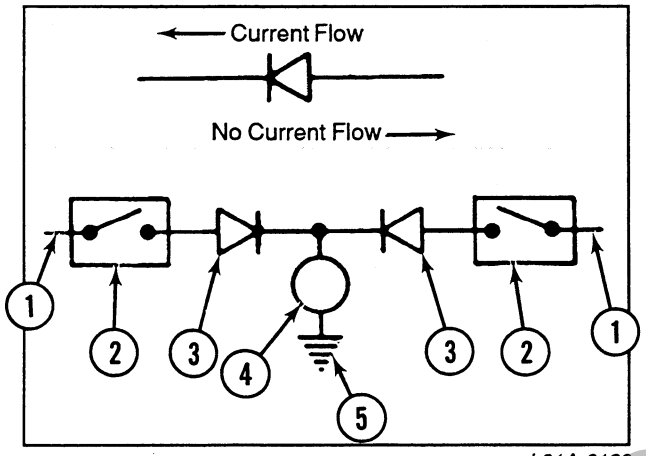


Disconnect and cap the fuel inlet tube from the injection pump. Remove the tube.

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Diode Check

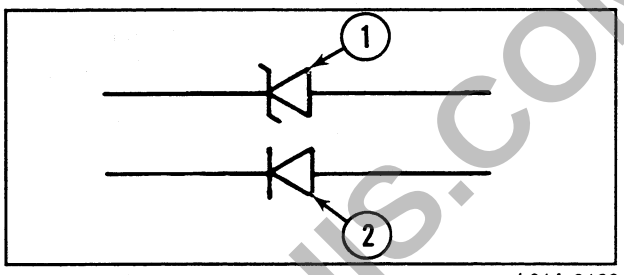
Diodes are used to control the direction of flow of current. A diode lets current flow in only one direction. For example, several switches can be connected through diodes to one warning buzzer. When the contacts in one of the switches closes, current from the switch flows through the diode to actuate the warning buzzer. The diodes in the other circuits prevent current from flowing from the warning buzzer to the other switches. By using diodes, one warning buzzer can be used for more than one switch.



L91A-0128

1. To Power Supply
2. Switch
3. Diode
4. Warning Buzzer
5. Ground

NOTE: Silicon diodes are used in most applications. Zener diodes are used in some special applications. The symbol for a Zener diode is shown below. If the wiring schematic shows the symbol for a Zener diode, special test equipment for Zener diodes must be used. The test procedures for Zener diodes are not included in this manual. See the instructions of the test equipment manufacturer for testing a Zener diode.



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1. Symbol for Zener Diode
2. Symbol for Silicon Diode

If a diode tester is not available, a test lamp used for checking continuity can be used to test a diode. A test lamp can be made using a battery, a bulb, and two test leads. Touch the two leads of the test lamp to each other to check the test lamp. If the test lamp does not illuminate, repair the test lamp.

NOTE: The illumination of the test lamp will not be as bright when testing the diode.

Disconnect the power from the diode. Connect the leads of the test lamp to the two leads of the diode. This test will check for current flow in one direction. Reverse the leads of the test lamp. This test will check for current flow in the opposite direction.

The test lamp must illuminate only during one of the two tests, indicating that current can flow in only one direction. If the test lamp illuminates during both tests, current can flow in both directions. Replace the diode. If the test lamp does not illuminate during either test, current cannot flow in either direction. Replace the diode.

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Bevel Gear Replacement

Removal

1. Park the machine on a level surface and lower the header to the floor.

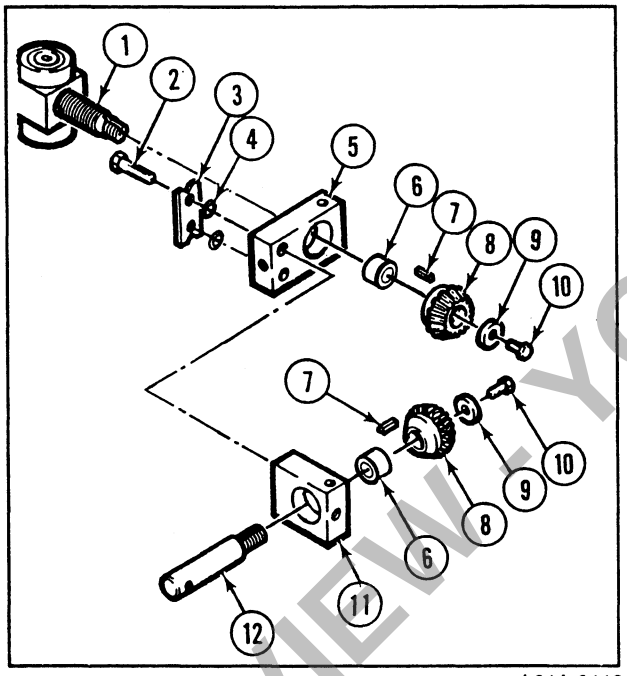
2. Stop the engine and apply the parking brake. Make sure the steering wheel is centered and locked.

3. Put blocks in front of and behind all four wheels.

4. Remove the steering shaft assembly. See Steering Shaft Assembly Removal and Installation in this section.

5. Remove the cover from the gear set.

6. Remove the cap screw and flat washer that fastens the bevel gear to the steering shaft.



L91A-0113

STEERING SHAFT BEVEL GEARS

1. Steering Shaft
2. Cap Screw
3. Locking Plate
4. Flat Washer
5. Side Bearing Housing
6. Trunnion Bearing
7. Key
8. Bevel Gear
9. Flat Washer
10. Cap Screw
11. Front Bearing Housing
12. Input Shaft

7. Remove the bevel gear and the key from the steering shaft.

8. Remove the gear assembly from the steering shaft.

9. Remove the cap screw and flat washer that fastens the bevel gear to the input shaft.

10. Remove the bevel gear and the key from the input shaft.

11. Remove the gear assembly from the input shaft.

12. Straighten the corners of the locking plate on the bearing housing.

13. Remove the cap screws, locking plate, and the flat washers and separate the bearing housings.

14. Press the bearings from the bearing housings.

15. Apply clean oil to the outside of the new bearings. Press the bearings into the bearing housings. Make sure the bearings are seated against the shoulders in the bores.

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SPECIFICATIONS

Manufacturer .....Vickers Model .....Series 19

DRIVE BELT

⚠ DANGER

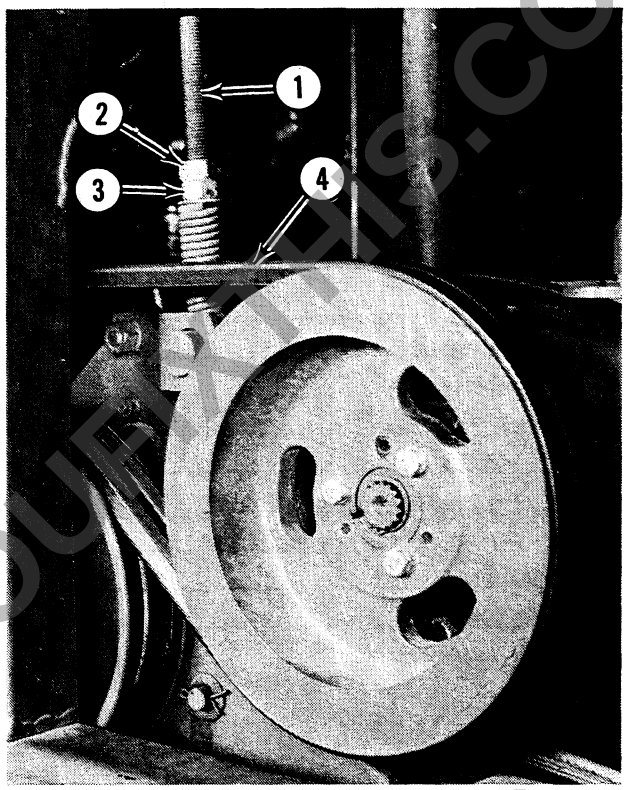
Before doing any maintenance or service work on the tractor or the header you must:

Put all controls in NEUTRAL.
Apply the parking brake.
Lower the header to the floor.
Center and lock the steering wheel.
Stop the engine.
Make sure all moving parts have stopped.

Drive Belt Replacement

Loosen the lock nut on the adjustment link. Turn the adjusting nut until the drive belt is loose. Remove the drive belt from the sheaves. Install the new drive belt on the sheaves. See Drive belt adjustment in this section and adjust the drive belt.

NOTE: If the tractor has a gasoline engine, the compressor drive belt for the air conditioning compressor must be removed from the engine. See Section 9000 for removal and installation of the compressor drive belt.



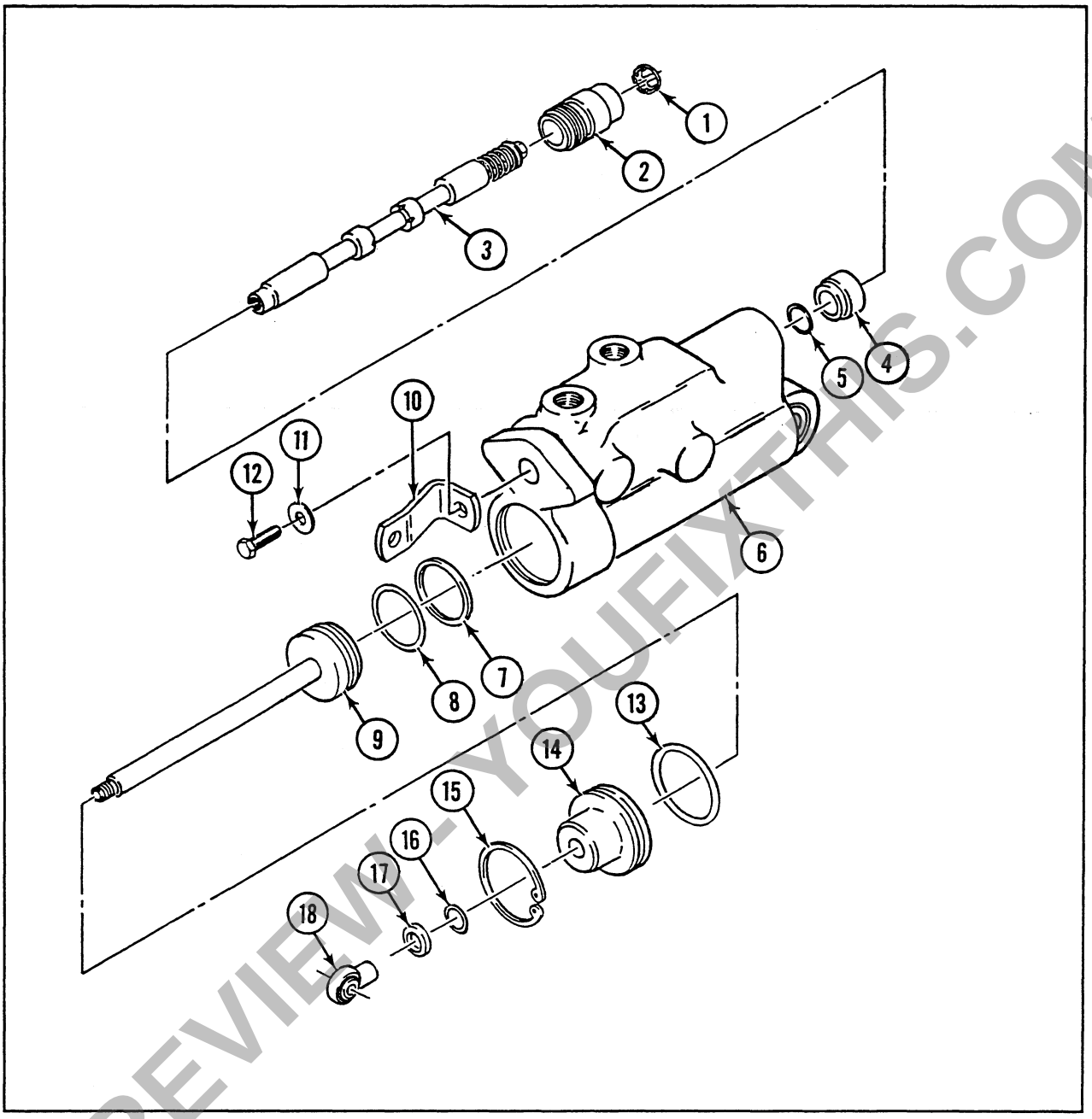
82TR-87002-4

1. Adjustment Link
2. Lock Nut
3. Adjusting Nut
4. Drive Belt

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Disassembly



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SERVO CONTROL VALVE

1. Button Insert
2. Cap
3. Spool Assembly
4. Bushing
5. O-ring
6. Body
7. Backup Ring
8. O-ring
9. Piston and Rod Assembly
10. Angle
11. Flat washer
12. Cap Screw
13. O-ring
14. Bearing
15. Retaining Ring
16. O-ring
17. Wiper Seal
18. Ball Joint

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⚠ DANGER

Before doing any maintenance or service work on the tractor or the header you must:

Put all controls in NEUTRAL.
Apply the parking brake.
Lower the header to the floor.
Center and lock the steering wheel.
Stop the engine.
Make sure all moving parts have stopped.

Removal

NOTE: The procedure is the same for the brake assembly and brake disc on either ground drive motor.

1. Park the machine on a level surface and lower the header to the floor.

2. Stop the engine and apply the parking brake. Make sure the steering wheel is centered and locked.

3. Put blocks in front of and in back of all four tires.

4. Disconnect the return spring for the brake assembly.

5. Remove the cotter pin and the clevis pin that fasten the cable to the brake assembly.

6. Remove the self-locking nuts that fasten the brake assembly to the ground drive motor.

7. Remove the snap ring from the shaft of the ground drive motor.

8. Remove the brake assembly and the brake disc from the shaft.

Disassembly and Assembly

1. Remove one of the bolts from the brake assembly.

2. Remove the old brake pads.

3. Inspect the actuating lever and the stator for wear and replace if necessary.

4. Install the new brake pads.

5. Install the bolt and the self-locking nut. Tighten the self-locking nut until you cannot turn the bolt with your fingers.

Installation

1. Install the brake disc in the brake assembly. The wide side of the hub in the brake disc must be away from the actuating lever.

2. Install the brake assembly and the brake disc on the ground drive motor.

3. Install the self-locking nuts.

4. Install the snap ring on the shaft.

5. Align the clevis with the actuating lever and install the clevis pin and the cotter pin.

6. Connect the return spring.

7. Adjust the parking brake. See Parking Brake Adjustment in this section.

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GENERAL INFORMATION

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

1. When you drain the hydraulic oil or disconnect a line.
2. When you disassemble hydraulic components.
3. From normal wear of the components.
4. From damaged components.

The best way to remove contamination from the hydraulic system is to use the portable filter. See Cleaning the Hydraulic System beginning on page 8005-8.

TYPES OF CONTAMINATION

There are two types of contamination, microscopic and visible. Microscopic contamination occurs when very fine particles of foreign material are in suspension in the hydraulic oil. These particles are too small to see or feel. Microscopic contamination can be found by the identification of the problems the microscopic contamination causes, or by testing in a laboratory. Examples of problems caused by microscopic contamination include the following:

1. Cylinder rod seals leak.
2. Control valve spools do not return to NEUTRAL.
3. The hydraulic system has a high operating temperature.
4. Rapid wear of components.

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

1. Particles of metal or dirt in the oil.
2. Air in the oil.
3. Odor of burned oil.
4. Water in the oil.

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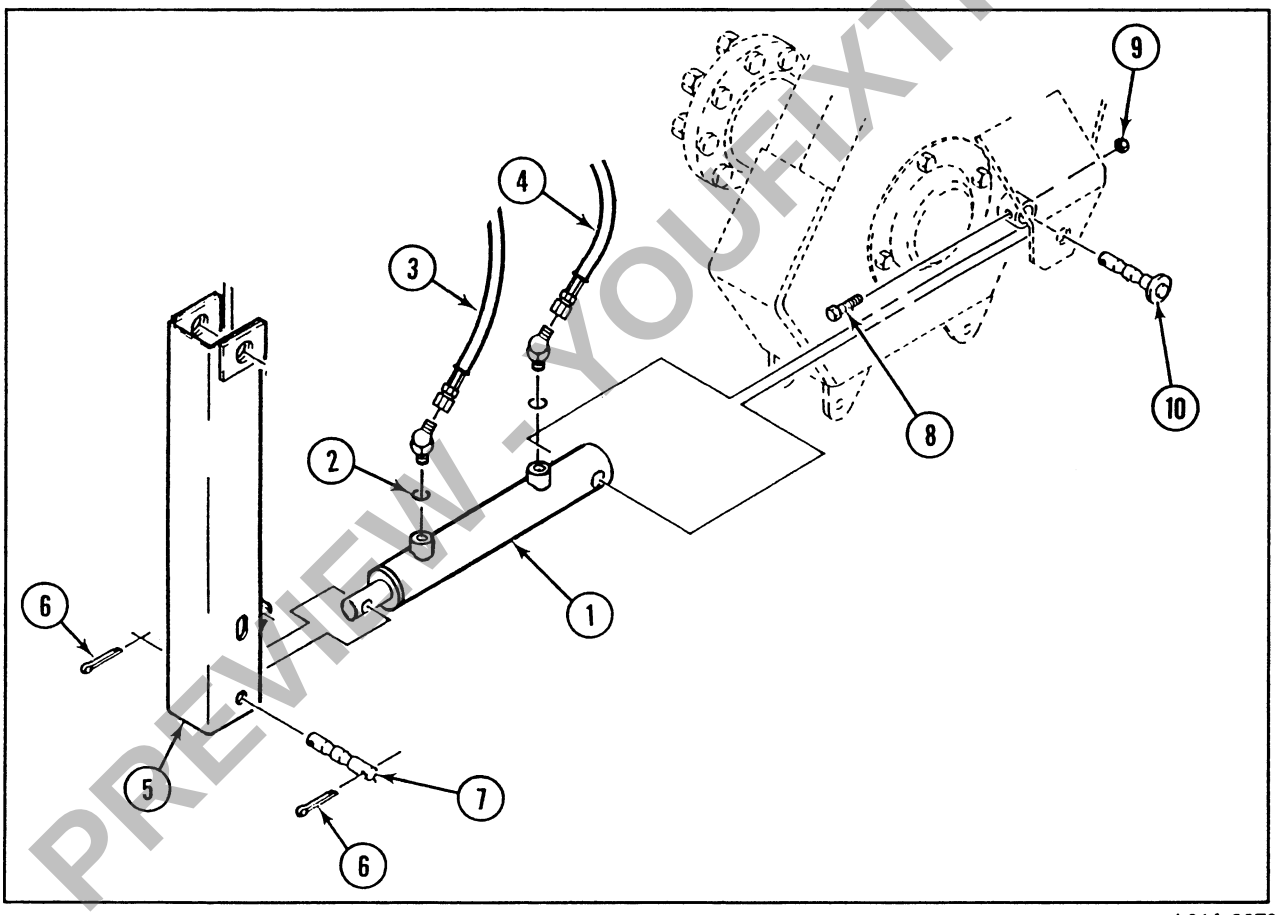
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HEADER LIFT CYLINDERS - GRAIN TRACTOR

⚠ DANGER

Before doing any maintenance or service work on the tractor or the header you must:

Put all controls in NEUTRAL.
Apply the parking brake.
Lower the header to the floor.
Center and lock the steering wheel.
Stop the engine.
Make sure all moving parts have stopped.



L91A-0079

HEADER LIFT CYLINDER - GRAIN TRACTOR

1. Header Lift Cylinder
2. O-Ring
3. Hose to Bypass Valve
4. Hose to Header and Reel Lift Valve
5. Channel
6. Cotter Pin
7. Pivot Pin
8. Bolt
9. Nut
10. Pivot Pin

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REPLACING THE HEATER CORE

⚠ DANGER

Before doing any maintenance or service work on the tractor or the header you must:

Put all controls in NEUTRAL.
Apply the parking brake.
Lower the header to the floor.
Center and lock the steering wheel.
Stop the engine.
Make sure all moving parts have stopped.

1. Park the machine on a level surface and lower the header to the floor.

2. Stop the engine and apply the parking brake. Make sure the steering wheel is centered and locked.

3. Turn the heater control knob all the way to HOTTER.

4. Slowly remove the cap from the radiator to relieve the pressure in the cooling system.

5. Hold the cover and remove the screws from the cover. Remove the cover.

6. Remove the drain hoses from the drain pan.

7. Hold the strap at the rear of the drain pan and remove the screws from the strap.

8. Remove the strap and the drain pan.

9. Remove the screw from the right end of the heater core and loosen the screw at the left end.

10. Lower the heater core.

11. Fasten identification tags on the hoses at the heater core.

12. Loosen the clamps and slowly remove the hoses from the heater core. Remove the heater core.

13. Install the hoses on the new heater core and tighten the clamps.

14. Install the hoses on the heater core and tighten the camps.

15. Slide the left end of the new heater core onto the screw. Install the screw at the right end of the heater core and tight both of the screws.

16. Put the drain pan in position and install the strap and screws.

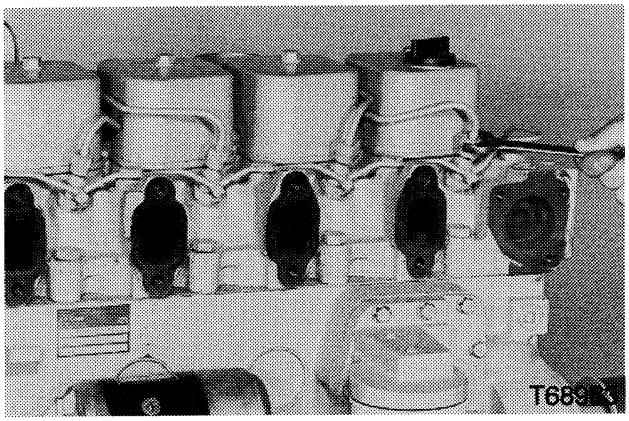
17. Install the drain hoses on the drain pan.

18. Put the cover in position and install the screws.

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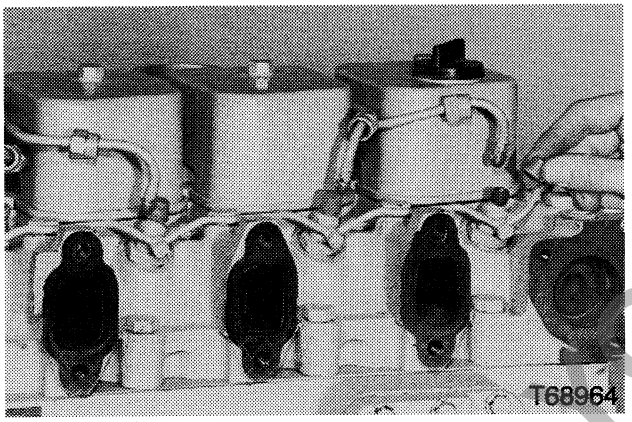
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STEP 19



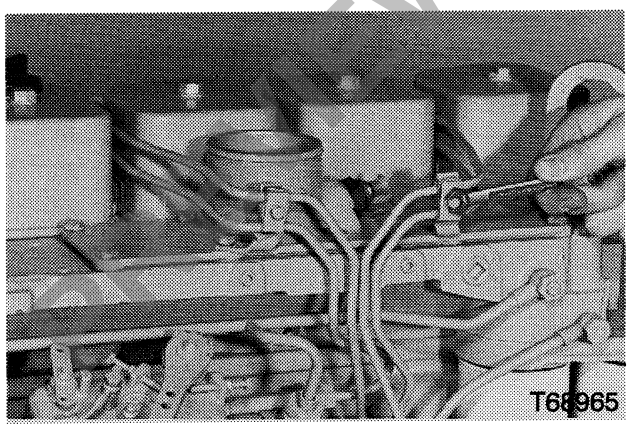
Disconnect the fuel supply line from the injectors.

STEP 20



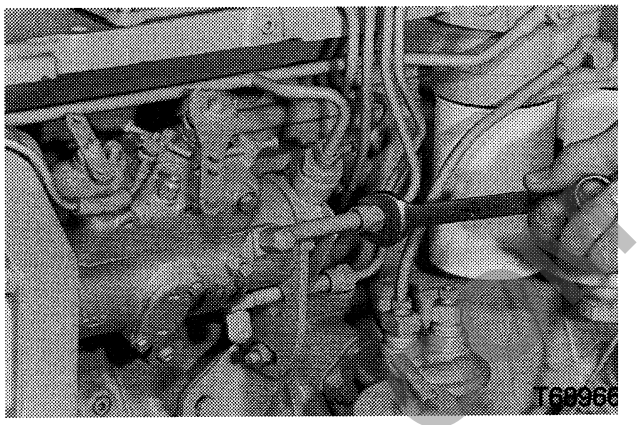
Install a protective cover over each injector inlet and the injection lines.

STEP 21



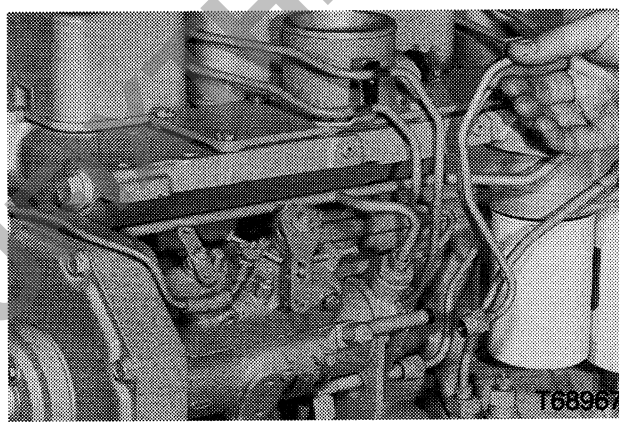
Remove the bolts and clamps that hold the fuel lines.

STEP 22



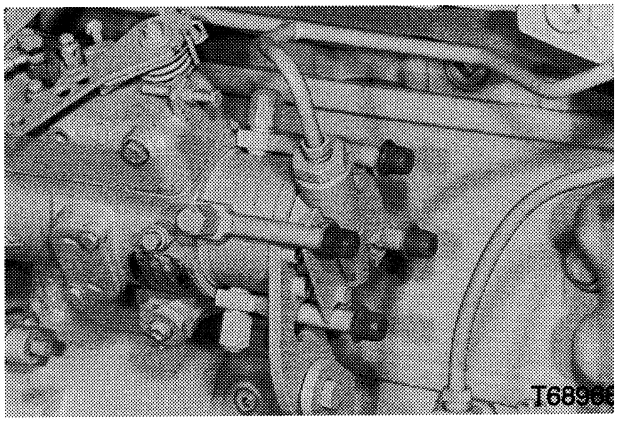
Disconnect the fuel line from the fuel injection pump

STEP 23



Remove the fuel lines.

STEP 24

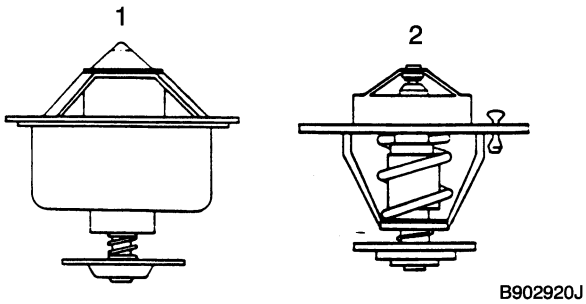


Install protective covers on the injection pump outle lines and the injection lines.

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THERMOSTAT SERVICE

STEP 177

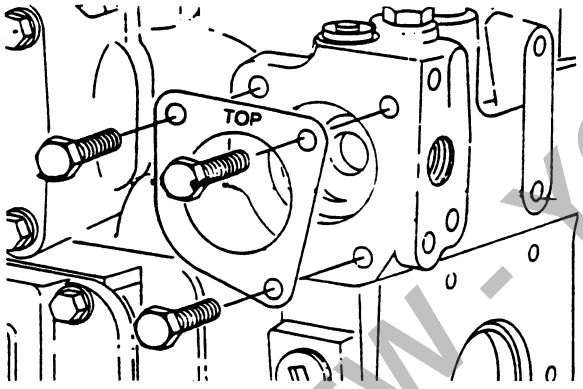


B902920J

1. New Thermostat
2. Old Thermostat

A new thermostat has been released for use in your engine. If you removed an old thermostat from your engine, do the following steps to install a new thermostat.

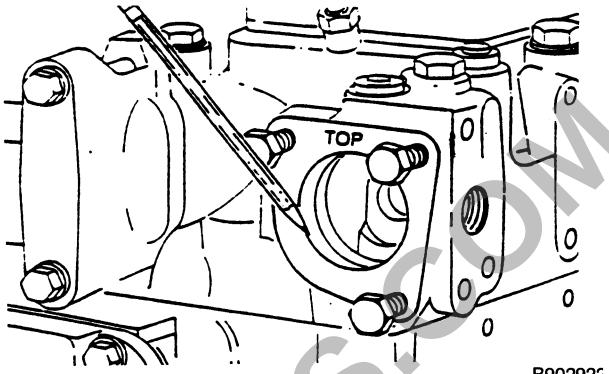
STEP 178



B902921J

Install the template that comes with the new thermostat kit.

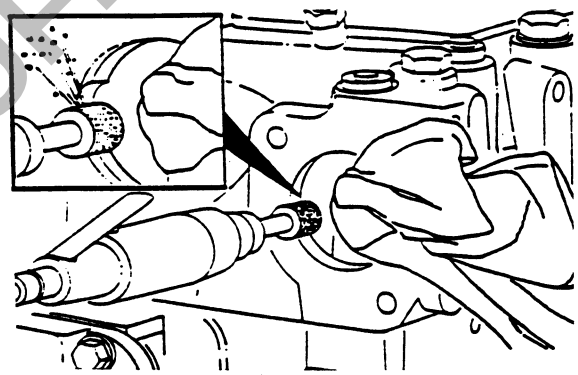
STEP 179



B902922

If the cylinder head coolant passage is smaller than th ID of the template, the coolant passage will have to b made larger. Mark the ID of the template on the cylinde head.

STEP 180



B902923

Remove the template. Use a shop cloth in the coolar passage to keep metal shavings out of the engine. Us a rotary grinder to remove the material.

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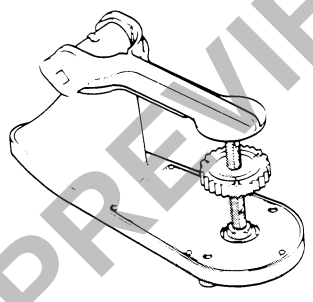
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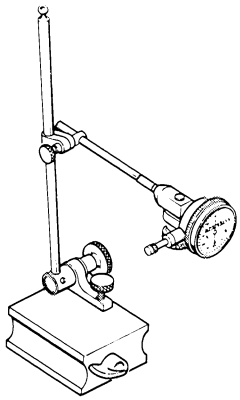
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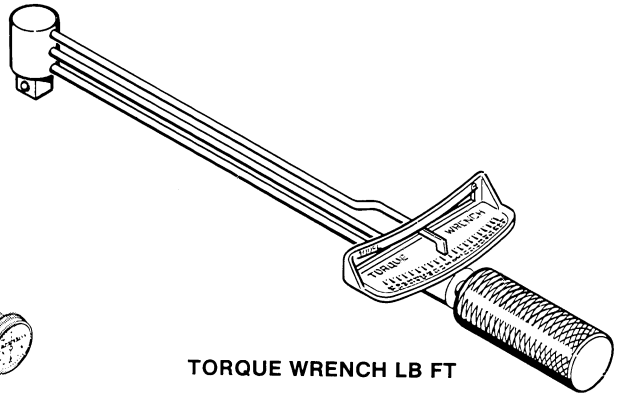
SPECIAL TOOLS



CAS-1357 VALVE SPRING TESTER



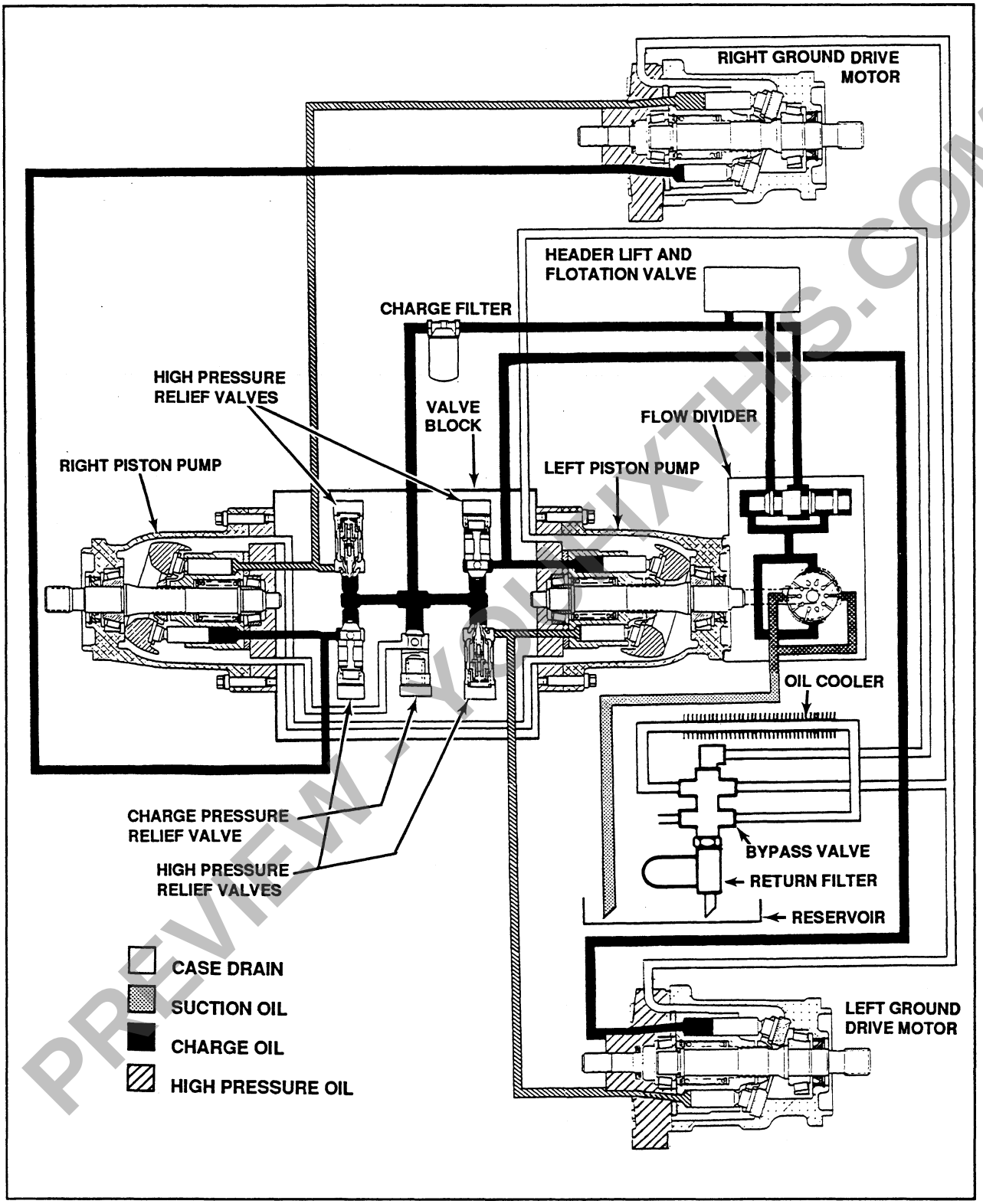
CAS-10066A DIAL INDICATOR



TORQUE WRENCH LB FT

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Operation



L91A -0012

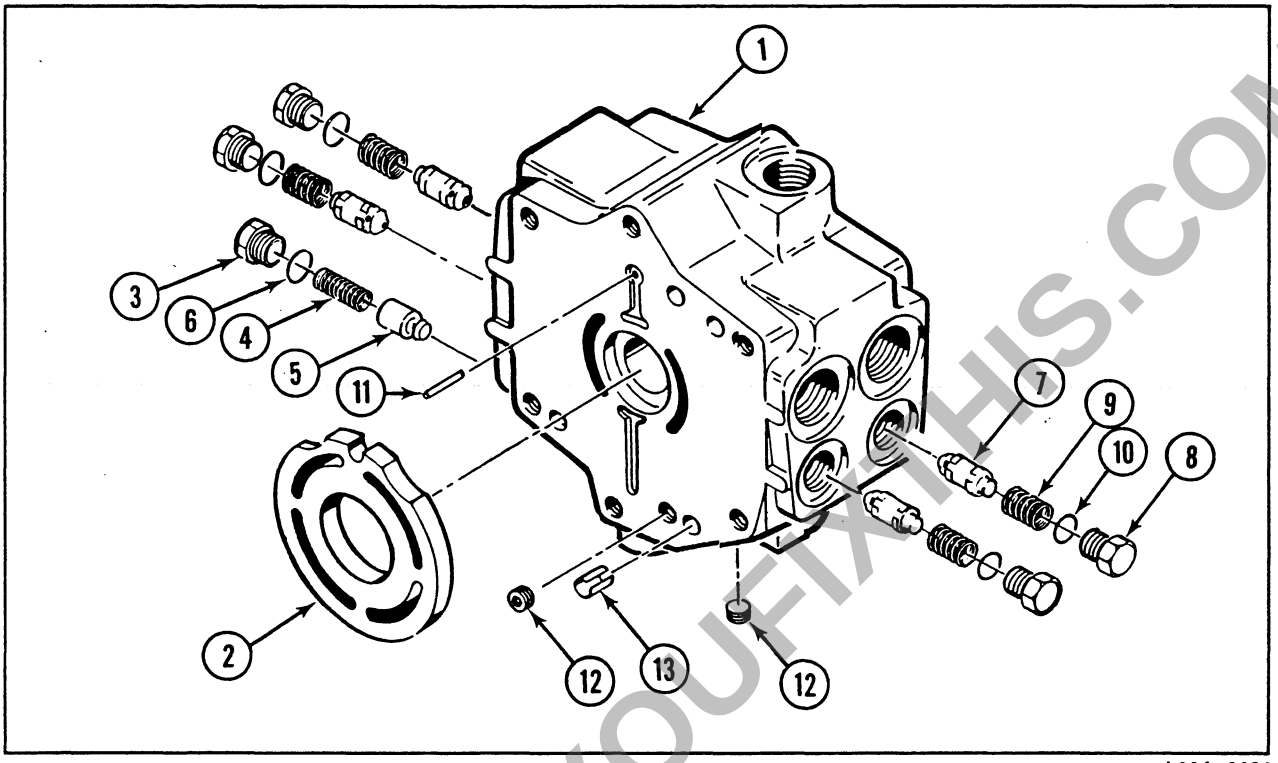
GROUND DRIVE CIRCUIT

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VALVE BLOCK

Disassembly



L90A -0232

VALVE BLOCK

1. Valve Block
2. Wear Plate
3. Plug
4. Spring
5. Poppet - For Charge Pressure Relief Valve
6. O-ring
7. High Pressure Relief Valve
8. Plug
9. Spring
10. O-ring
11. Dowel Pin
12. Small Plug
13. Roll Pin

1. Remove the piston pump from the valve block (1). See Removing and Installing a Piston Pump on the Valve Block in this section.

2. If a wear plate (2) is on the valve block (1), remove the wear plate (2) from the valve block (1). Put the wear plate (2) with the correct piston pump.

NOTE: The wear plates in the two piston pumps are not identical. Make sure the wear plates stay with the correct piston pump.

3. Remove the plug (3), the spring (4), and the poppet (5) from the valve block (1). Fasten an identification tag on plug (3), the spring (4), and the poppet (5). The parts must be installed in the original opening at installation.

4. Remove and discard the O-ring (6) from the plug (3).

5. There are four high pressure relief valves (7) in the valve block (1). The four high pressure relief valves (7) are interchangeable. Remove the plugs (8), the springs (9), and the high pressure relief valves (7) from the valve block (1).

6. Remove and discard the O-rings (10) from the plugs (3).

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Section 9000

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