Illustration 3 g01108481

Turbocharger

(1) Air inlet

(2) Compressor housing

(3) Compressor wheel

(4) Bearing

(5) Oil Inlet port

(6) Bearing

(7) Turbine housing

(8) Turbine wheel

(9) Exhaust outlet

(10) Oil outlet port

(11) Exhaust inlet

The turbocharger is mounted to the exhaust manifold. All the exhaust gases flow from the exhaust manifold through the turbocharger. The exhaust gases then flow into turbine housing (7) through the exhaust inlet. These gases push the blades of the turbine wheel (8). The turbine wheel is connected by a shaft to the turbocharger compressor wheel (3). Therefore, the exhaust gases cause the two wheels to turn at very high speeds.

Clean air from the air cleaner is pulled through the air inlet (1) by the rotation of turbocharger compressor wheel (3). The action of the compressor wheel blades causes compression of the inlet air. Compressed air provides more power to the engine. Additional air is available to fill the combustion chamber after the inlet valve opens.

When the load on the engine increases, more fuel is injected into the cylinders. This creates more gases and hotter gases, which will cause the turbine to turn faster. Therefore, the turbocharger compressor wheel will turn faster.

As the compressor wheel turns faster, more air is forced into the engine. The increased air flow provides more power to the engine, because the engine can then burn additional fuel with greater efficiency.

The following conditions control the maximum rpm of the turbocharger:

- Fuel setting
- High idle speed setting
- Height above sea level

NOTICE

If the high idle rpm or the engine rating is higher than given in the Technical Marketing Information (TMI) for the height above sea level at which the engine is operated, there can be damage to engine or to

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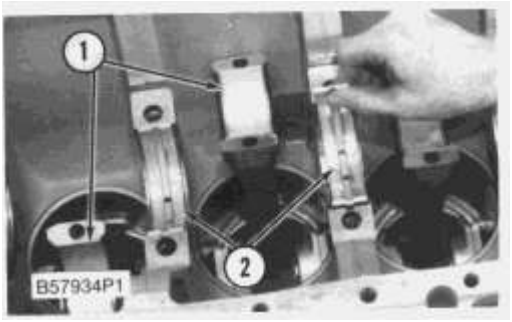
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1. Put the engine in position on Tool (A).

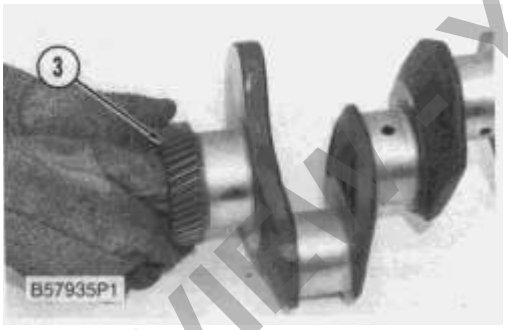
NOTE: Install the bearings dry when the clearance checks are made. Put clean engine oil on all the bearings for final assembly.

NOTICE

Make sure the upper and lower halves of the main bearings are installed so the bearing tabs fit into the notch in the cylinder block and main bearing caps.



2. If the bearings were removed from the engine, clean the bearing surfaces in the cylinder block and the connecting rods. Install the upper halves of connecting rod bearings (1) and main bearings (2).



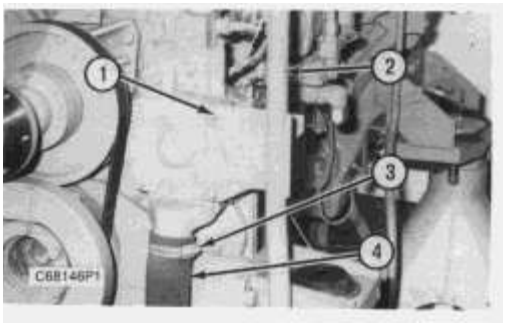
3. Heat crankshaft gear (3) to a maximum temperature of **316° C (600° F)**. Install the gear on the crankshaft.



4. Install Tool (B) on the ends of the crankshaft and fasten a hoist to it.

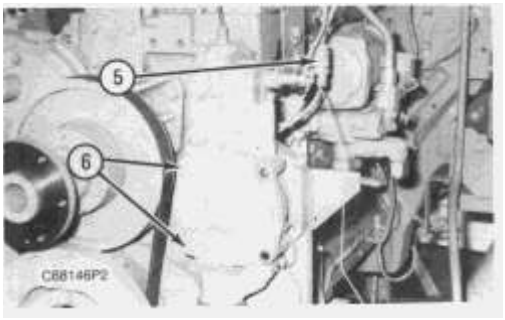
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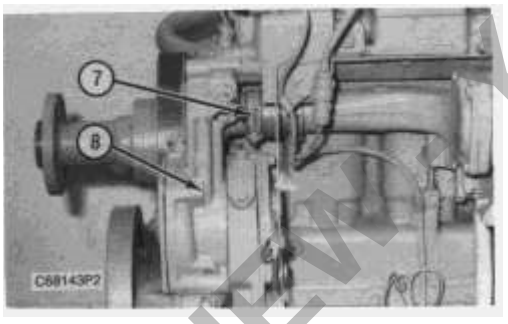
2. Remove two bolts (1) and breather tube assembly (2).

3. Loosen clamp (3), and disconnect hose assembly (4) from the water pump.



4. Disconnect electrical connector (5).

5. Remove two bolts (6) from the water pump.



6. Loosen clamp (7), and separate water pump (8) from the timing gear cover and the pump outlet pipe. Remove the O-ring seal from the water pump housing.

NOTE: The following steps are for the installation of the water pump.

7. Check the condition of the O-ring seal used in the water pump housing. If the seal is worn or damaged, use a new part for replacement. Install the O-ring seal in the water pump housing.

8. Put water pump (8) in position in the timing gear cover and pump outlet pipe.

9. Install two bolts (6), and tighten clamp (7).

10. Connect electrical connector (5).

11. Reinstall breather tube assembly (2) and two bolts (1) that hold it.

12. Reconnect hose assembly (4) to the water pump with clamp (3).

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1. In order to access the "Automatic Subscription" page, click the arrow next to "Subscriptions", and then click "Automatic Subscription" link (1) . The "Automatic Subscription" screen will appear.

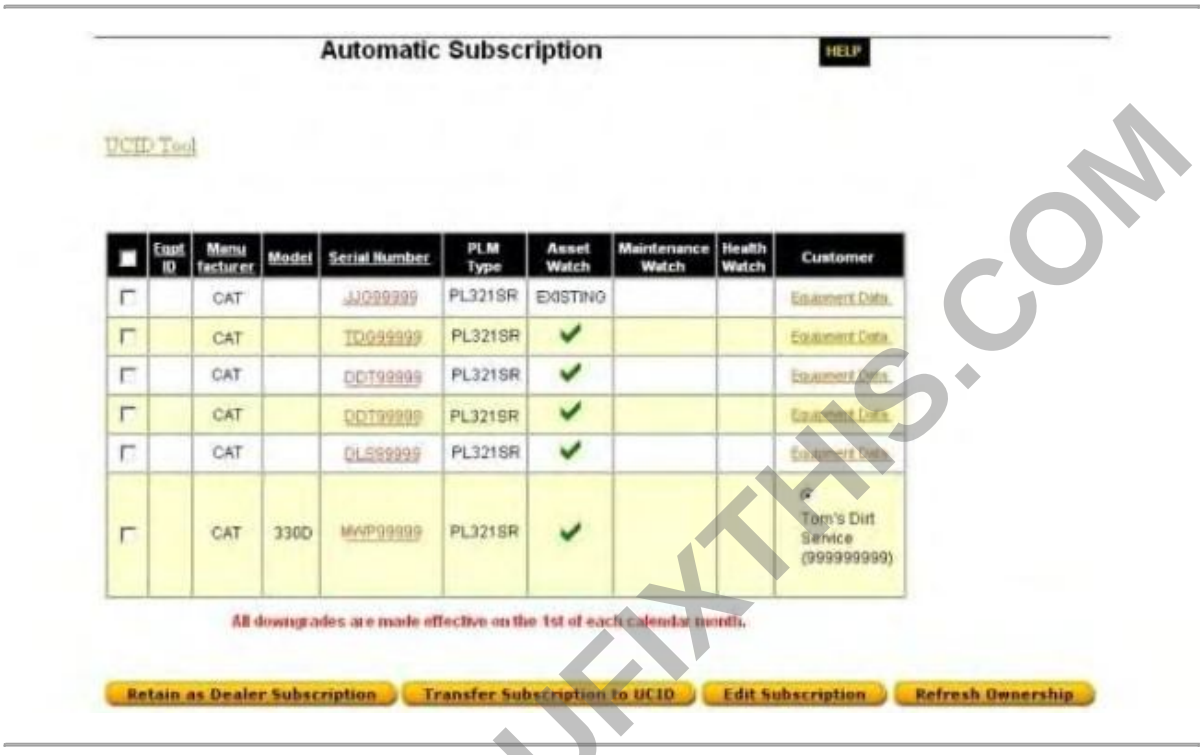


Illustration 2 g01700696

"Automatic Subscription" Screen

2. This screen displays a list of equipment with new, successful PLM registrations. In order to process a subscription, select the check box that corresponds to the piece of equipment that applies to the subscription. A green check mark will appear in the appropriate "Watch" column for the items that are appropriate for the PLM that has been installed and registered.

3. In order to accept the new subscription at the dealer level, click "Retain as Dealer Subscription".

4. In order to transfer the subscription to the customer or UCID, click "Transfer Subscription to UCID".

5. Click "Edit Subscription" in order to split the activations for the subscriptions between the dealer and the customer. This will also activate the Maintenance Watch subscription or the Health Watch subscription for either the dealer or the customer.

   If the customer information is not displayed, select the "Equipment Data" link. This link will alllow you to quickly access the equipment data in order to make the ownership association. After the equipment data updates are complete, select the "Refresh Ownership" button in order to display the new customer information.

   A link to Universal Customer ID Tool (UCID) is also provided at the top of the page for quick access in order to create the UCID for the customer.

   Note: If the customer id or UCID displayed in "Automatic Subscription" is not the correct customer, then exit "Automatic Subscription" and update the machine ownership in "Equipment Data". When "Automatic Subscription" is accessed again, the correct ownership will be displayed.

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3. Click the "Change Date Range" button. The "Fault Code History" table will be updated to using the new date range.

   Note: The history of the fault code that is viewed in the EquipmentManager software will display all faults that are reported by Product Link. A machine Electronic Control Module (ECM) will automatically erase a diagnostic code after 100 hours of operation if the diagnostic code does not reappear within that period of time. If the machine ECM erases a diagnostic code automatically, the history of the fault code that is displayed by the EquipmentManager software may not match the history that is displayed by Caterpillar Electronic Technician software.

"Service Information for Fault Codes (SIS Web)"

In order to view detailed information about a particular code, EquipmentManager software interfaces with Service Information System (SIS). The link to SIS will provide troubleshooting procedures in order to resolve fault codes. For this link to work, a valid subscription to SIS is required.

In order to obtain service information for specific fault codes, complete the following precedure:

1. On the "Fault Code History " screen, locate the "Fault Codes" column (4) . Click on the fault code in order to view the service information for the fault code. The "Service Information for Fault Codes" screen will now display the information for your specific fault code. The troubleshooting procedure for the selected fault code will appear if there is a proper link in SIS.

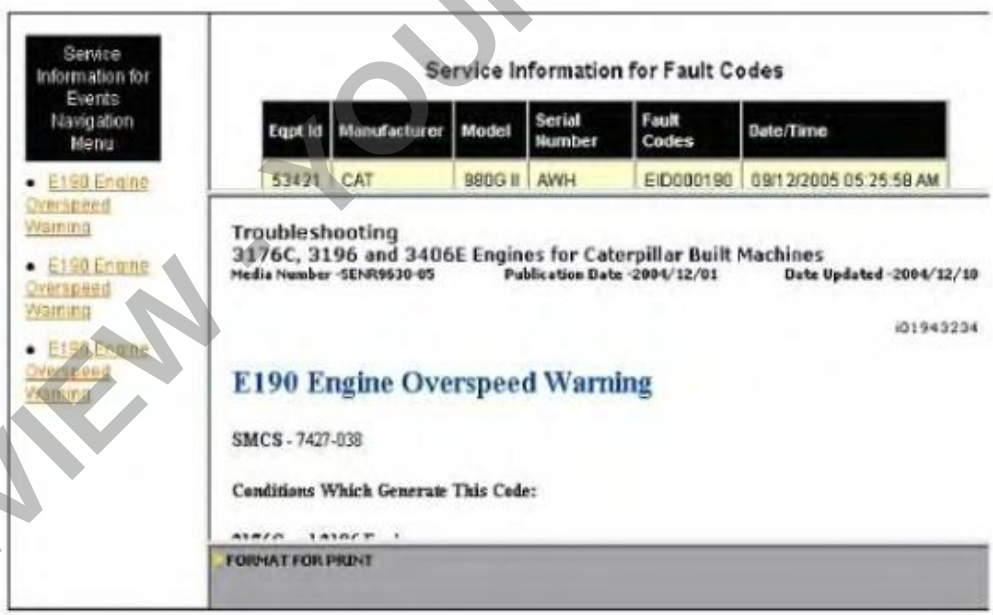


Illustration 3 g01253373

"Service Information for Fault Codes" troubleshooting

2. The "Service Information for Fault Codes" screen for troubleshooting will display fault codes in the left column. Click on the hyperlink that applies to your fault code. The "Service Information for Fault Codes" will appear. This screen will display information about your fault code.

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Testing and Adjusting
26SI Series Alternator
Media Number -RENR1252-01 **Publication Date -01/10/1999** **Date Updated -09/10/2001**

i01167035

T6 Residual Magnetism Restoration

SMCS - 1405-081

Reference: Service Magazine, SEBD1672 July 1986, "Brushless Alternators May Not Charge In Certain Conditions"

1. Start the engine and set the throttle to at least 75%.
2. Connect a voltmeter between the "B+" terminal and the alternator case ground.
3. If a wire is connected, disconnect the wire from the "R" terminal.

   Expected Result: The voltage does not change.

   Results:

   - YES - The voltage stays the same. Continue to Step 4.
   - NO - The voltage rises and the alternator begins charging. The wire to the "R" terminal is shorted. Repair the wiring or replace the wiring. Go to Troubleshooting, "Initial Troubleshooting Procedure" and retest the system.
4. Connect one end of a jumper wire to the "B+" terminal of the alternator.
5. Connect the other end of the jumper wire to the "R" terminal of the alternator for two seconds.

   Expected Result: The voltage output rises on the "B+" terminal.

   Results:

   - YES - The voltage output rises. The alternator is now charging. Go to Troubleshooting, "Initial Troubleshooting Procedure" and retest the system.
   - NO - The voltage output does not rise. Repair the alternator or replace the alternator.

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i01683015

Rectifier - Test

SMCS - 1405-038

The illustrations below show the N3 series alternator (35 amperes).

Negative Diode Check

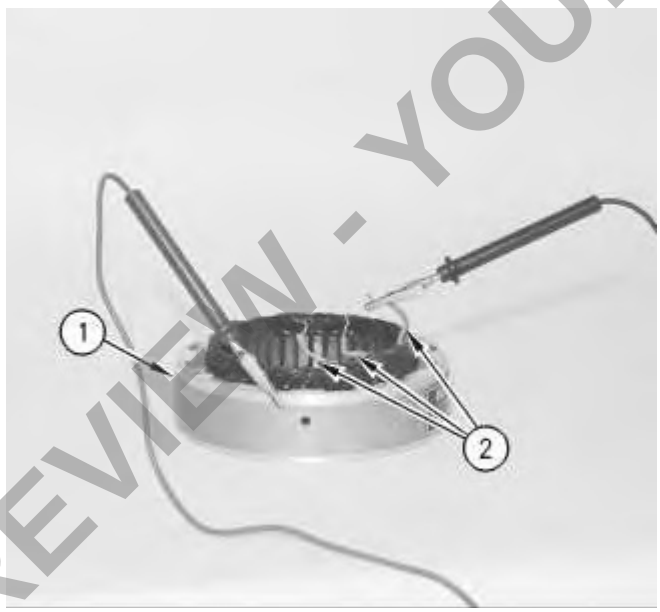


Illustration 1 g00869032

(1) stator

(2) stator leads

1. Disconnect all stator leads (2) from the rectifier.
2. Disconnect the lead for the capacitor from the "D+" terminal.

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Test Step 4. MEASURE THE VOLTAGE AT THE TERMINAL STRIP.

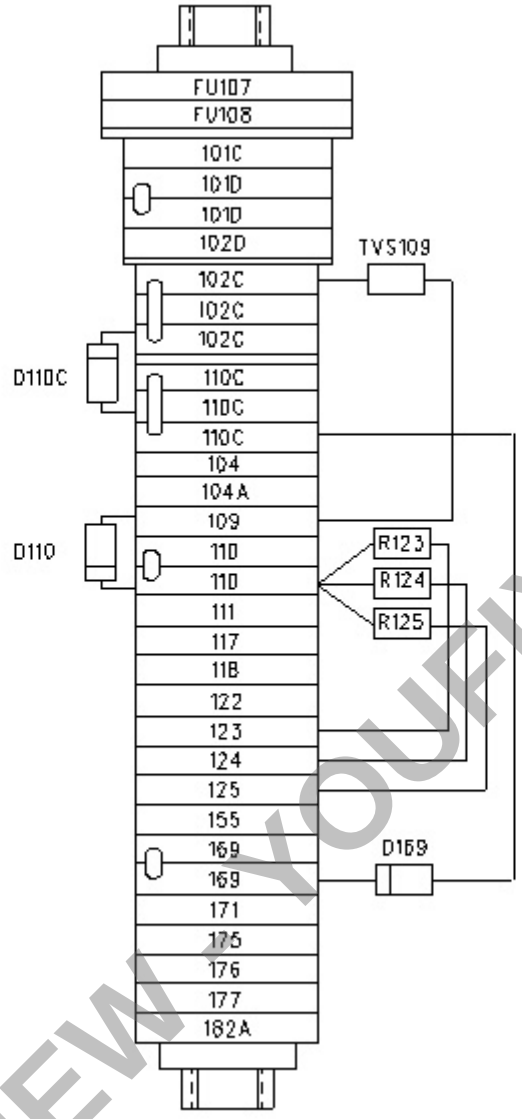


Illustration 3 g00786196

Terminal Strip

A. Reconnect the harness that was disconnected in the previous step.

B. Connect the positive lead of the multimeter to terminal 118 in the enclosure for the magnet controller. Depress the drop switch.

C. Measure the voltage.

Expected Result:

A voltage of 24 DCV is present when the drop switch is depressed.

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- Look for readings of high resistance during continuity checks. High resistance could indicate damage or corrosion in the circuit.
- Keep fingers and hands clear of test leads during all electrical checks in order to prevent false indications.

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Illustration 7 g00870539

12. Use the press to remove the rotor assembly from the drive end housing face.



Illustration 8 g00870541

13. Remove the spacer ring (13) .



Illustration 9 g00870558

14. Inspect the bearing inner race (14). Replace the bearing inner race (14), if the bearing inner race is worn, damaged, or the bearing has been replaced.

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Use this procedure to check the engine cylinders separately:

1. Run the engine at a speed that gives the maximum misfiring or rough running.

NOTICE

The fuel injection nozzles can be permanently damaged by twisting if only one wrench is used to loosen or tighten the fuel line nuts.

Use one wrench to hold the nozzle and another to loosen the nut.

---

2. Then, loosen a fuel line nut on the fuel injector nozzle for each cylinder one at a time. This will stop the flow of fuel to that engine cylinder.

   When a fuel line nut is loosened, the misfiring or rough running should increase.

3. Tighten the fuel line nut.

4. Repeat 1 through Step 3 with each engine cylinder in sequence until you discover a loosened fuel line that does NOT affect the engine's performance.

5. When you find the engine cylinder that does NOT affect the engine's performance, perform the following operations:

   a. Test the fuel injection pump for that cylinder.

   b. Test the fuel injector nozzle.

When an engine runs at low idle speed, the temperature of an exhaust manifold can indicate the condition of a fuel injector nozzle. A low temperature indicates that no fuel is reaching the cylinder. This can possibly signify that the fuel injector nozzle has a defect.

When an engine runs at low idle rpm and the temperature of an exhaust manifold is at an extra high temperature, too much fuel is probably flowing into the engine cylinder. This can also signify that the fuel injector nozzle has a defect.

The most common defects on fuel injector nozzles include the following defects:

- Plugging or blocking by carbon at the orifice of a fuel injector nozzle
- Orifice wear due to abrasive particles in the fuel
- Wear from a wire brush on the fuel injector nozzle's tip

Refer to Special Instruction, SEHS8149 for the procedure for checking the temperatures in the exhaust manifold port.

Fuel Injection Lines

Fuel from the Fuel Injection Pumps to the Fuel Injector Nozzles

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Illustration 24 g00459562

26. Put lever (60) in position, as shown. Install shaft (61) .

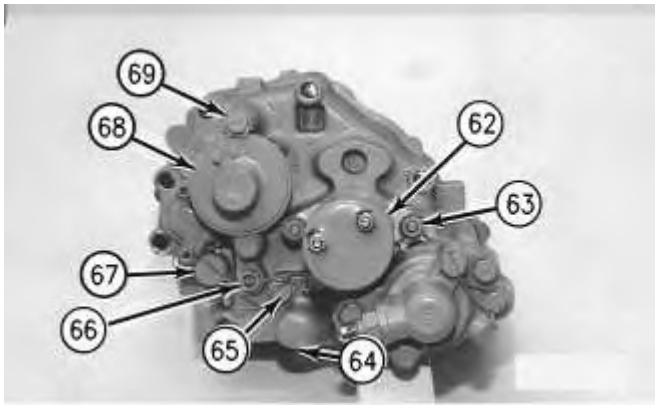


Illustration 25 g00459564

27. Put the gasket and shutoff solenoid (62) in position and install two bolts (63) .

28. Put the gasket and cover (64) in position and install two bolts (65) .

29. Install body (66) and contact (67) .

30. Put the O-ring seal on adapter (68) and put the coupling and adapter (68) in position. Install two bolts (69) .

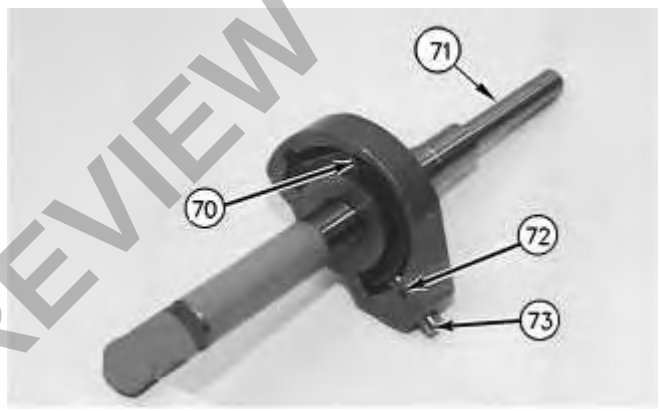
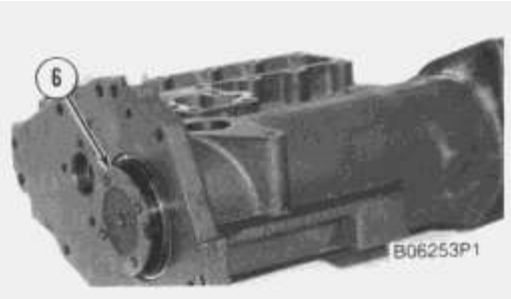


Illustration 26 g00459590

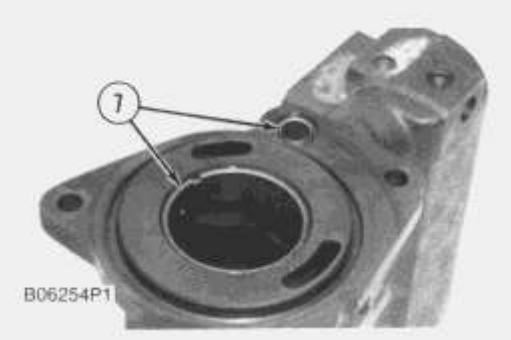
31. Install spring (70) in shaft assembly (71). Install pin (72) in shaft assembly (71). The tip of pin (72) should be engaged in the hole in spring (70). Install pin (73) in shaft assembly (71) in order to hold pin (72) in place.

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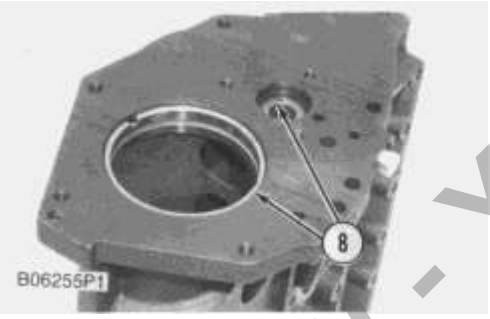
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6. Remove camshaft (6) from the fuel injection pump housing.



7. Remove bearings (7) from the drive end of the fuel injection pump housing.



8. Remove bearings (8) from the governor end of the fuel injection pump housing.

Assemble Fuel Injection Pump Housing

	Tools Needed	A	B	C
1P0510	Driver Group	1		
1P1860	Pliers		1	
6V2016	Plate Assembly*			1
S01594	Bolt [3/8" - 1 in. (25.4 mm) long]			2
6V4818	Driver			1

*Part of 6V4095 Pump And Governor Reconditioning Tool Group

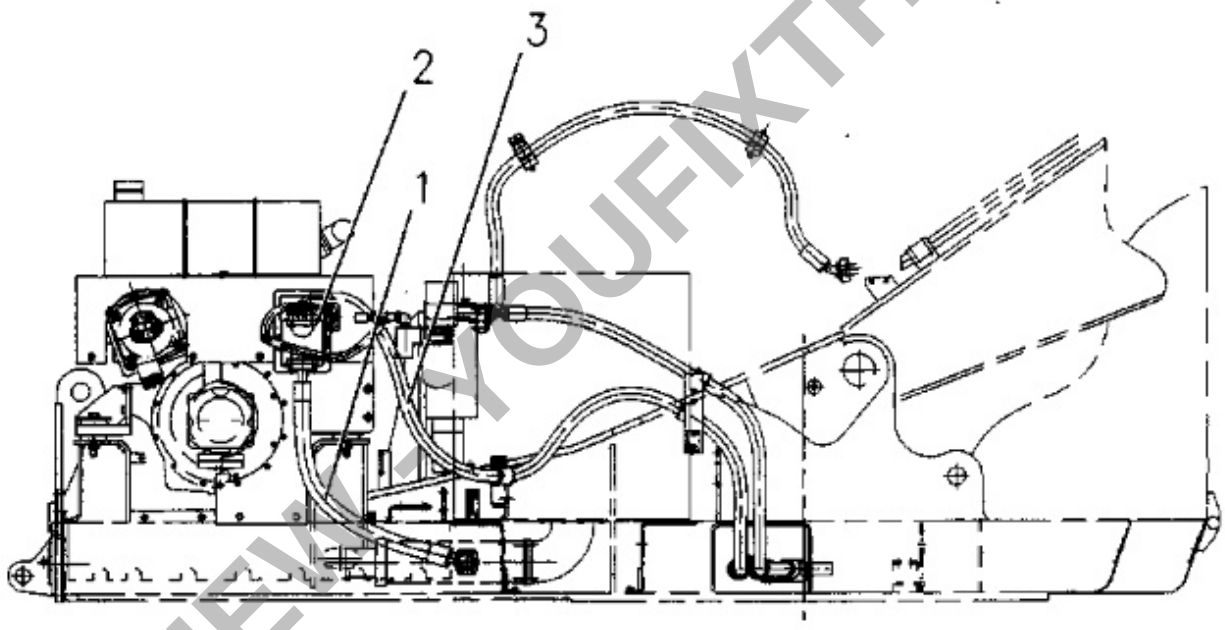
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System Operation

SMCS - 1273-010

Introduction



(1) Suction hose, (2) Hydraulic pump, (3) Supply hose to generator

NOTE: In order to activate the magnet circuit, the grapple/magnet switch (4) must be in the magnet position.

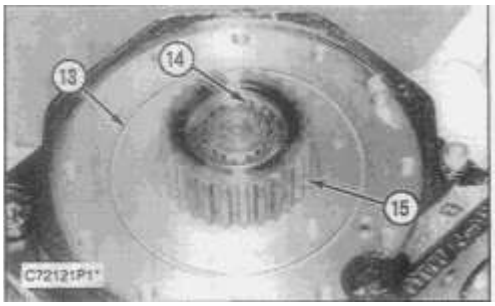
The DC generator is an electro-mechanical device which is designed to convert the mechanical energy into DC electrical energy.

The generator must be operated at the rated speed in order to develop the full rated voltage and power. For optimum performance, the speed must be maintained within a ± 50 RPM range.

The generator is a compound field-wound unit which is self regulated between zero and full load. The generated voltage is 230 volts at a constant speed of 1800 RPM when the magnet lift mode is on.

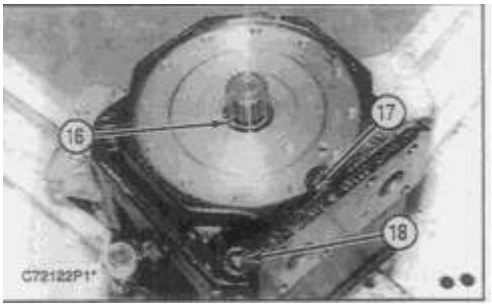
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12. Remove O-ring seal (13).

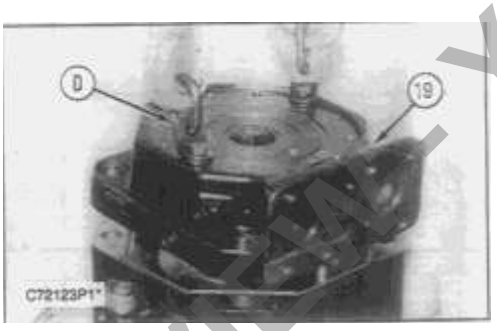
13. Using Tool (B), remove retaining ring (14). Remove gear (15).



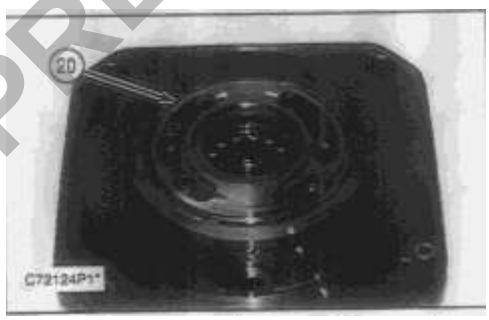
14. Using Tool (C), remove retaining ring (16).

15. Remove the nut and bushing (17) from the rod assembly.

16. Remove four socket head bolts (18) that hold the head assembly to the motor housing.



17. Fasten Tool (D) and a hoist to head assembly (19) as shown. Carefully remove the head assembly from the motor housing. The weight of the head assembly is **25 kg (55 lb)**.

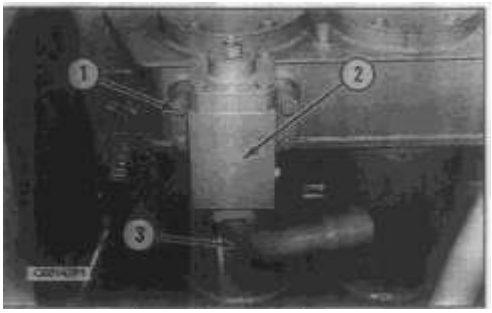


18. Remove thrust plate (20) from the head.

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h. The pressure in the hydraulic system has now been released. Lines and components can now be removed.



2. Disconnect hose assembly (3) from the bottom of the bypass check valve. Put a plug in the hose assembly to prevent oil loss and to keep dirt and debris out of the hydraulic system.

3. Remove four bolts (1) that hold bypass check valve (2) in position. Remove the bypass check valve.

NOTE: The following steps are for the installation of the bypass check valve.

4. Check the condition of the O-ring seal used in the end of hose assembly (3). If the seal is damaged, use a new part for replacement.

5. Install bypass check valve (2) in the reverse order of removal.

6. Check the oil level in the hydraulic oil tank. If necessary, fill the hydraulic oil tank to the correct level. Refer to the 350 & 350 L Excavators Operation & Maintenance Manual for the correct filling procedure.

Disassemble & Assemble Bypass Check Valve

Start By:

a. remove bypass check valve

1. Make sure the outside of the bypass check valve is thoroughly clean prior to disassembly.

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SENR61480059

Pilot Relief Valve

SMCS - 5072-010

Remove & Install Pilot Relief Valve

NOTE: The pilot relief valve is installed in the end of the pilot manifold. The pilot manifold is located behind the right rear access door.

WARNING

At operating temperature, the hydraulic oil tank is hot and under pressure. Hot oil can cause burns. To prevent possible personal injury, release the pressure in the implement hydraulic circuits (boom, stick and bucket) before any hydraulic lines or components are disconnected or removed.

1. Release the pressure in the hydraulic system as follows:

a. Fully retract the rod in the stick cylinder.

b. Adjust the position of the bucket so it will be flat on the ground when the boom is lowered.

c. Lower the boom until the bucket is flat on the ground.

d. Shut off the engine, and put the hydraulic activation control lever in the "Lock" position.

e. Move the control levers for the boom, bucket, stick and swing through their full travel strokes. This will relieve any pressure that may be present in the pilot system.

f. Slowly loosen the air breather cap on the hydraulic oil tank to release the pressure.

g. Tighten the air breather cap on the hydraulic oil tank.

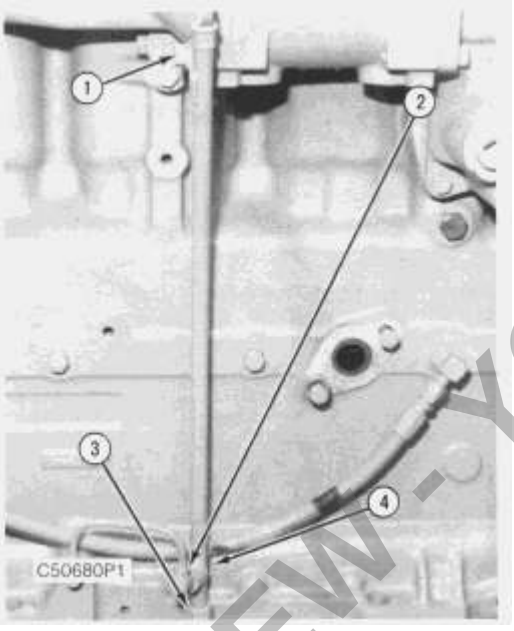
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Dipstick Assembly

SMCS - 1326-010

Remove & Install Dipstick Assembly



1. Remove bolt (1) and washer.

2. Disconnect tube (2).

3. Disconnect connector (3).

4. Remove dipstick assembly (4).

NOTE: For installation of the dipstick assembly, reverse the removal steps.

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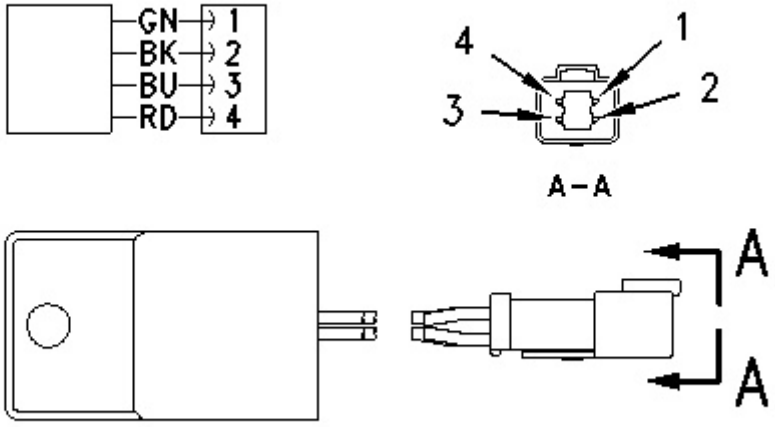


Illustration 1 g00754249

(1) Output (signal voltage)

(2) Chassis ground

(3) Compressor clutch

(4) Power supply

1. Separate the 4-pin connector from the wiring harness.
2. Set the **146-4080** Digital Multimeter to DC voltage. Connect the positive probe to pin (4) on the wiring harness and connect the negative probe to a suitable ground. The multimeter should read 24 volts.

   Note: If the voltage is below 18 volts or the voltage is above 32 volts the on delay timer assembly will not supply power to the compressor.
3. Set the **146-4080** Digital Multimeter to OHMS. Connect the positive probe to pin location (2) on the wiring harness and connect the negative probe to a suitable chassis ground. The multimeter will display OL if the ground is not present.
4. Set the **146-4080** Digital Multimeter OHMS. Connect the positive probe to pin location (1) on the wiring harness and connect the negative probe to a suitable chassis ground. If the multimeter displays OL one of the three switches are open. Check each of the switches if an open condition occurs.

   Note: There must be refrigerant in the air conditioning system in order to close both of the pressure switches.
5. In order to check that power is getting from the on delay timer assembly to the compressor clutch coil, reconnect the on delay timer assembly to the wiring harness. Set the **146-4080** Digital Multimeter to DC voltage. Remove the 2-pin connector from the compressor clutch coil. Connect the negative probe to a suitable chassis ground. Check each one of the two pins on the wiring harness for voltage. One of the two pins should supply 24 volts.

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		70 ± 11 N·m (52 ± 8 lb ft)
1	1 1/2	100 ± 15 N·m (74 ± 11 lb ft)
1 1/4	1 1/2	110 ± 17 N·m (81 ± 13 lb ft)
1 1/2	1 1/2	120 ± 18 N·m (89 ± 13 lb ft)
2	1 1/2	160 ± 24 N·m (118 ± 18 lb ft)

Note: Use 50 percent of the torque values from Table 1 when fitting, plug, or the port material is nonferrous.

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