

Product: WHEEL LOADER

Model: 970F WHEEL LOADER 7PL

Configuration: 970F WHEEL LOADER 7PL00001-00195 (MACHINE) POWERED BY 3306 ENGINE

Disassembly and Assembly 3306 VEHICULAR ENGINE FOR 966D WHEEL LOADER

Media Number -SEN2149-00

Publication Date -01/04/1981

Date Updated -11/10/2001

Timing Gears And Plate

SMCS - 1162-11; 1162-12; 1206

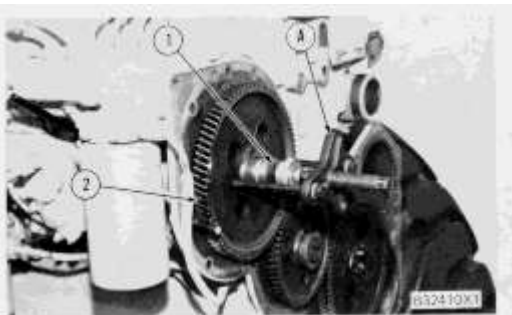
Remove Timing Gears And Plate

	Tools Needed	A	B	C
8S2264	Puller Group	1		
8B7560	Step Plate	1		
1B3680	Bolt, (3/8" -24 NF x 3 3/4 long)	2		
5M2894	Flat Washer (3/8 in.)	2		
1P510	Driver Group		1	
4B4281	Flat Washer			4

start by:

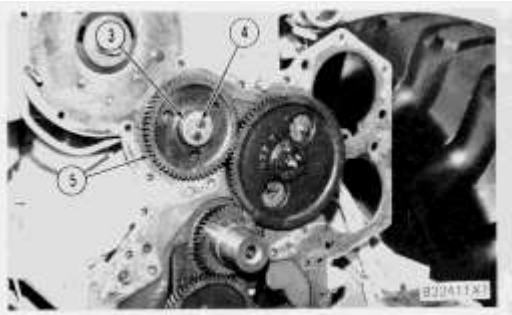
a) remove timing gear cover

1. Put the engine in correct timing. See REMOVE FUEL INJECTION PUMP HOUSING AND GOVERNOR for this procedure.

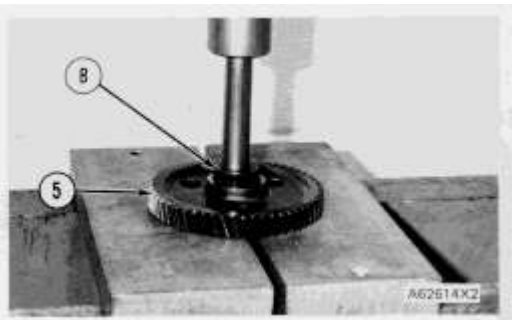


2. Remove bolt (1) and the washer that holds gear (2) in place.

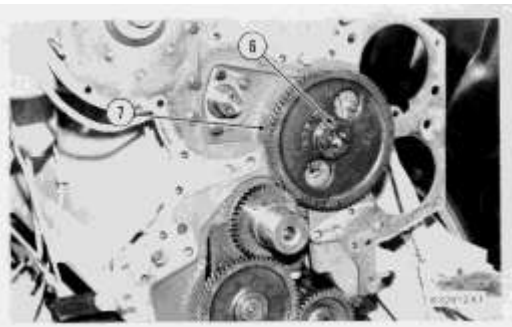
3. Install tooling (C) and bolt (1) to hold the sleeve on the end of the fuel injection pump camshaft.
4. Install tooling (A) on gear (2) and tighten the center bolt of tooling (A) until the gear is loosened.
5. Remove tooling (A), bolt (1), tooling (C) and the gear.



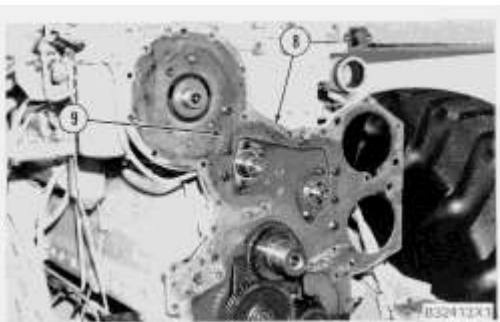
6. Remove bolts (4), plate (3) and idler gear (5).



7. Inspect the bearing in idler gear (5) for wear or damage. If a replacement of the bearing is needed, use tool group (B) and a press to remove it from the gear as shown.



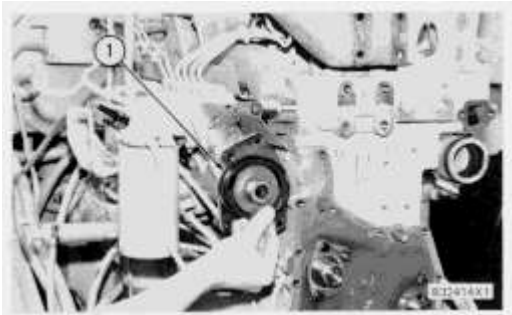
8. Remove bolts (6) and camshaft gear (7) from the camshaft.



9. Bend locks (9) away from the bolts.
10. Remove the bolts, locks (9) and plate (8) from the cylinder block.
11. Remove the old gasket material from the cylinder block and plate (8).

Install Timing Gears And Plate

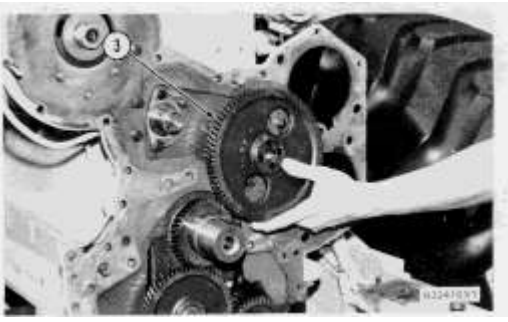
Tools Needed		A	B	C
1P510	Driver Group	1		
5P8675	Extension Handle		1	
5P3520	Spanner Wrench		1	
9S7352	Torque Wrench			1



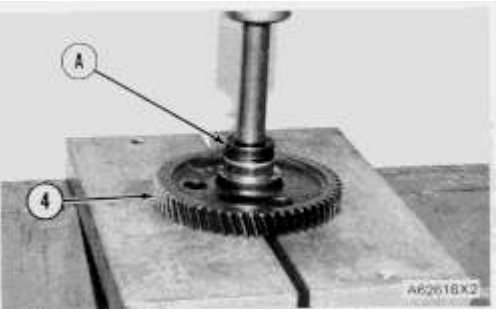
1. Make sure O-ring seal (1) is in place on the fuel pump housing.
2. Clean the old gasket from the contact surfaces of the timing gear plate and cylinder block. Install a new gasket on the cylinder block. Cut the gasket even with the bottom face of the cylinder block. Put 5H2471 Gasket Cement on the bottom of the gasket where the gasket makes contact with the gasket for the oil pan.



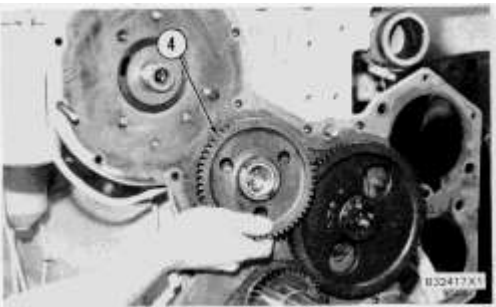
3. Put timing gear plate (2) in position on the cylinder block and install the locks and six bolts that hold the plate in place.



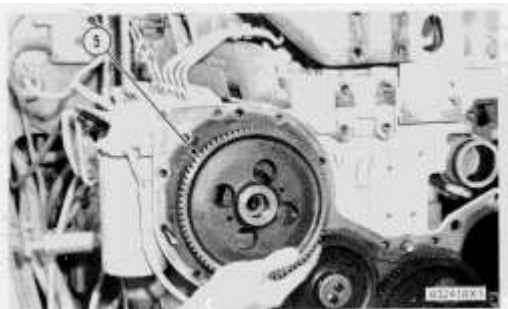
4. Install camshaft gear (3) with the "C" mark on the camshaft gear in alignment with the "C" mark on the crankshaft gear. Install the washers and bolts that hold the gear in place.



5. Install the bearing in idler gear (4) with tool group (A) and a press. The end of the bearing must be 1.52 mm (.060 in. below the face of the gear hub.



6. Put idler gear (4) in position. Install the plate and bolts.



7. Put fuel injection pump drive gear (5) in position on the fuel injection pump.

8. Install the bolt and the washer as shown to hold the timing gear to the camshaft. Install the washer with the larger outside diameter toward the bolt head. Tighten the bolt finger tight only.



TYPICAL EXAMPLE

9. Install tooling (B) in the holes of the fuel injection pump drive gear as shown. Put a torque of approximately 68 N·m (50 lb.ft. on the pump drive gear in a clockwise direction (as seen from the front of the engine). With the clockwise torque on the pump drive use tooling (C) to tighten the bolt to a torque of 270 ± 25 N·m (199 ± 18 lb.ft.).

10. For correct timing of the fuel injection pump and engine, see INSTALL FUEL INJECTION PUMP HOUSING AND GOVERNOR.

end by:

a) install timing gear cover

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Fuel Injection Lines

SMCS - 1252-11; 1252-12

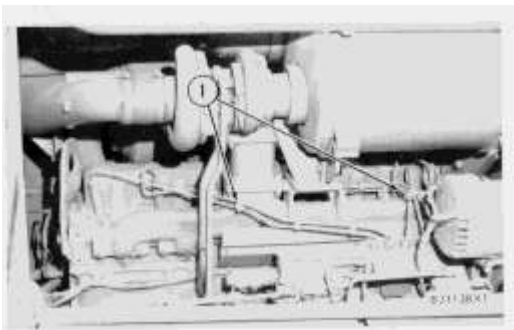
Remove Fuel Injection Lines

1. Put the fuel valves at the fuel tank in the "CLOSED" position.
2. Disconnect the fuel injection lines at the fuel injection pump housing. Put protection caps on the lines and pumps to keep dirt and foreign material out of the fuel system.

NOTICE

Two wrenches must be used when the fuel lines are loosened or tightened to prevent damage to the nozzles.

3. Disconnect the fuel injection lines from the fuel injection valves. Put protection caps on the lines and valves.



4. Remove fuel injection lines (1).

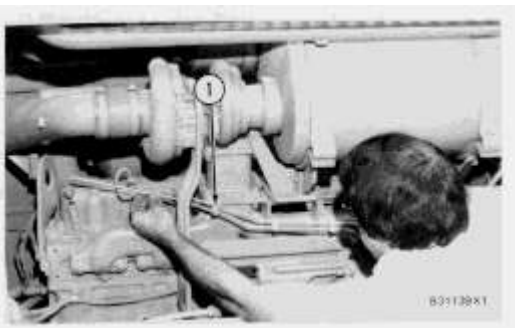
Install Fuel Injection Lines

Tools Needed		A
5P144	Socket	1

1. Make sure the fuel injection lines are clean and dry.

NOTICE

Two wrenches must be used when the fuel lines are loosened or tightened to prevent damage to the nozzles.



2. Put fuel injection lines (1) in position and connect them to the fuel injection pumps and valves.
 3. Remove (bleed) air from the fuel system.
 4. Tighten the nuts on the fuel injection lines with tool (A) to a torque of 40 ± 7 N·m (30 ± 5 lb.ft.).
 5. Put the fuel valves at the fuel tank in the "OPEN" position.
-

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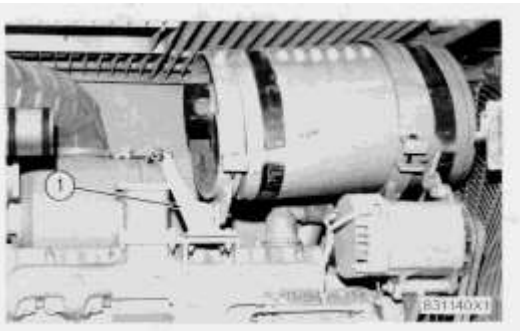
Exhaust Manifold

SMCS - 1059-11; 1059-12

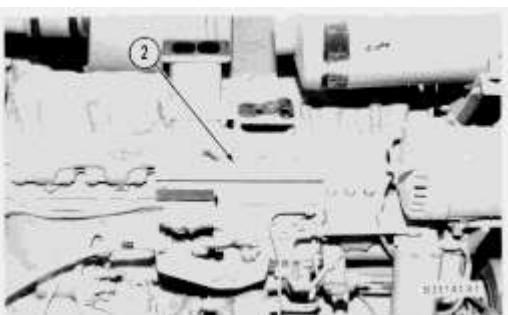
Remove Exhaust Manifold

start by:

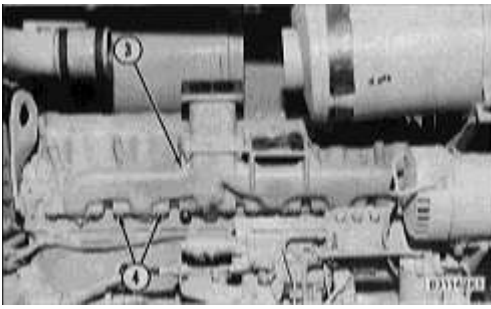
- a) remove turbocharger
- b) remove fuel injection lines



1. Remove the bolts and bracket (1) from the manifold.



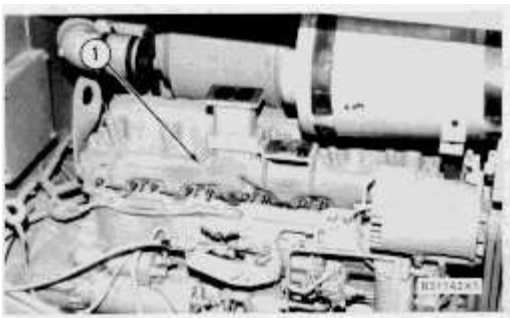
2. Remove heat shield (2) and the spacers.



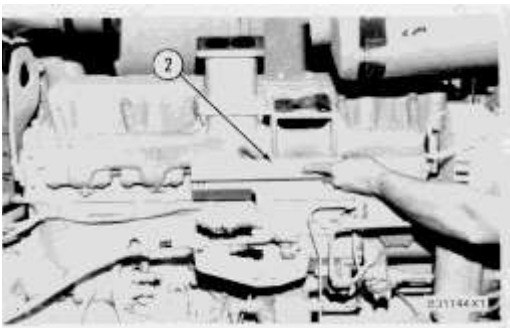
3. Remove nuts (4) and the washers that hold the exhaust manifold to the cylinder head.
4. Remove exhaust manifold (3) and the gaskets.

Install Exhaust Manifold

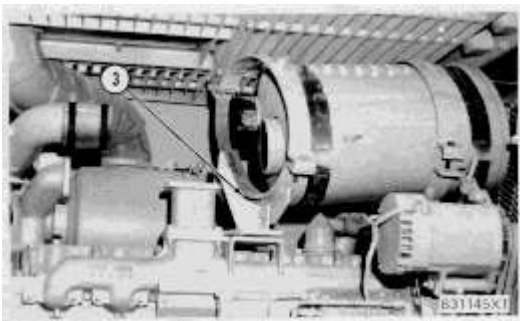
1. Install the exhaust gasket on the exhaust manifold studs. Put 5P3931 Anti-Seize Compound on the threads of the exhaust manifold studs.



2. Install exhaust manifold (1). Install the washers and nuts that hold the exhaust manifold in place.



3. Install the spacers and heat shield (2).



4. Install bracket (3) and the bolts that hold it in place.

end by:

a) install fuel injection lines

b) install turbocharger

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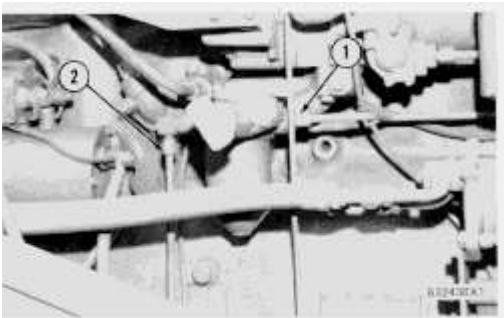
Date Updated -11/10/2001

Fuel Priming And Primary Filter Pump Group

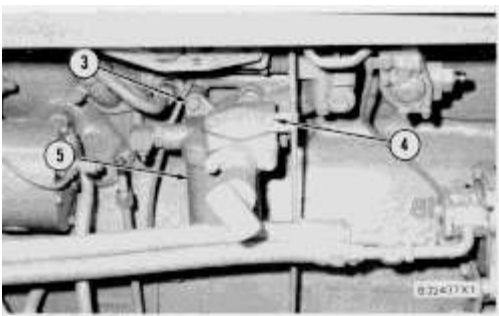
SMCS - 1258-15; 1258-16; 1258-11; 1258-12; 1260

Remove Fuel Priming And Primary Filter Pump Group

1. Turn the fuel supply valves at the fuel tank to the "CLOSED" position.

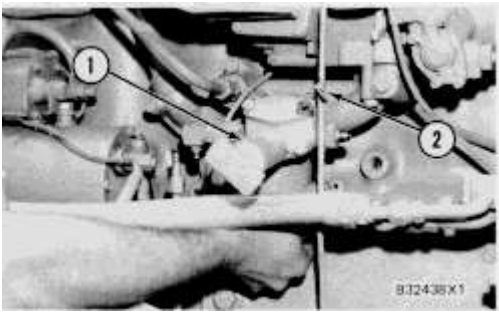


2. Disconnect fuel lines (1) and (2) from the fuel filter base.

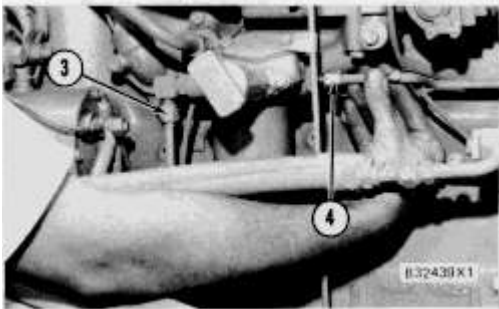


3. Remove bolt (4) and the clip that holds the fuel line in place.
4. Remove bolts (3) and fuel filter base assembly (5).

Install Fuel Priming And Primary Filter Pump Group



1. Put fuel filter base assembly (1) in position and install the bolts.
2. Install clip (2) that holds the fuel line in place.



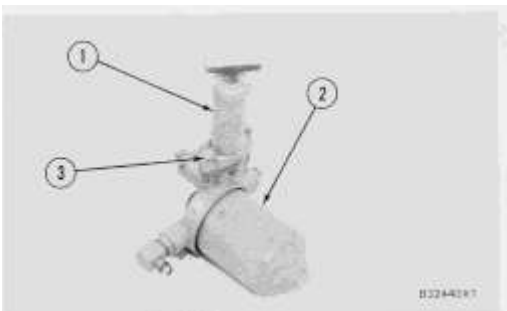
3. Connect fuel lines (3) and (4) to the fuel base.
4. Turn the fuel supply valves at the fuel tank to the "OPEN" position.

Disassemble Fuel Priming And Primary Filter Pump Group

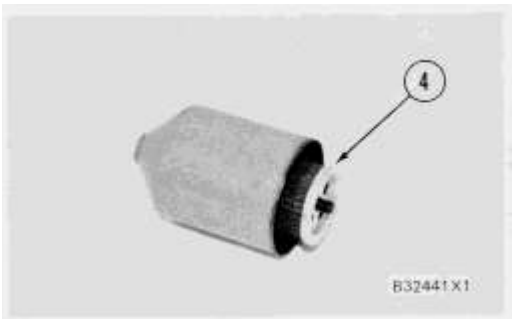
Tools Needed		A
1P1855	Snap Ring Pliers	1

start by:

- a) remove fuel priming and primary filter pump group



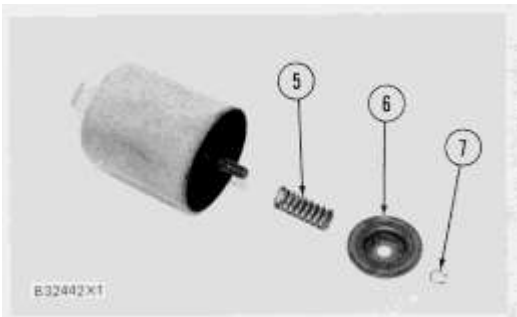
1. Remove two bolts (3) and priming pump (1) from the filter base.
2. Remove case assembly (2) from the filter base.



3. Remove element assembly (4) from the case.

NOTICE

Spring (5) is held in compression behind retainer (6).

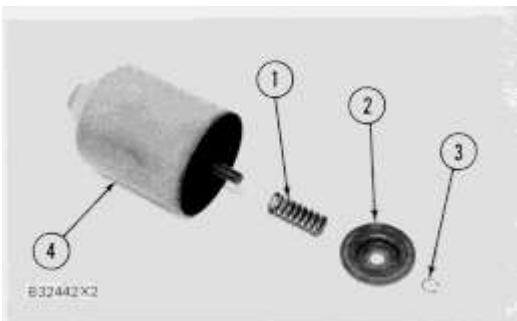


4. Use tooling (A) to remove snap ring (7) from the shaft.

5. Remove retainer (6) and spring (5) from the shaft.

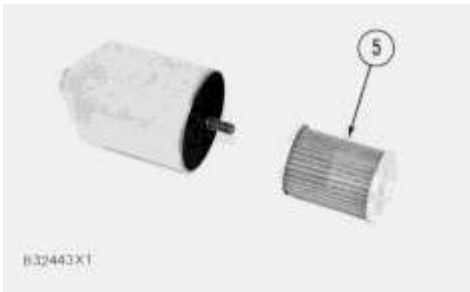
Assemble Fuel Priming And Primary Filter Pump Group

Tools Needed		A
1P1855	Snap Ring Pliers	1

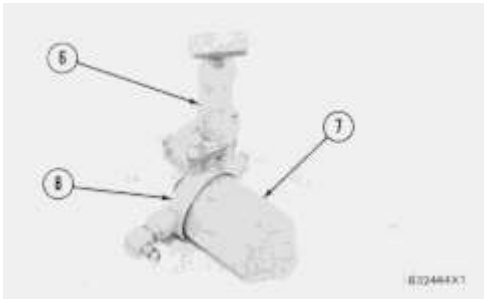


1. Put spring (1) and retainer (2) in place in case (4).

2. Use tooling (A) to install snap ring (3).



3. Put element assembly (5) in position in the case.



4. Install case assembly (7) on filter base (8).

5. Put priming pump (6) in position on the filter base and install bolts.

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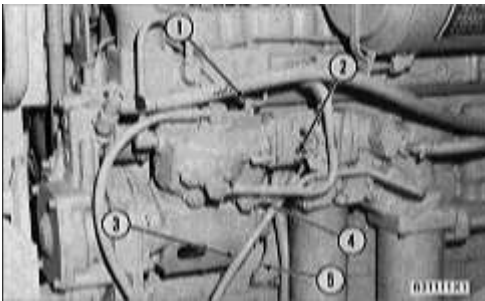
Date Updated -11/10/2001

Air Compressor

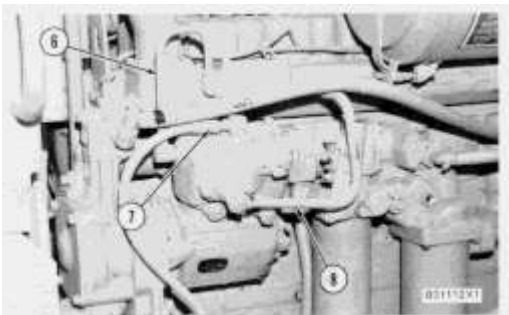
SMCS - 1065-11; 1065-12

Remove Air Compressor

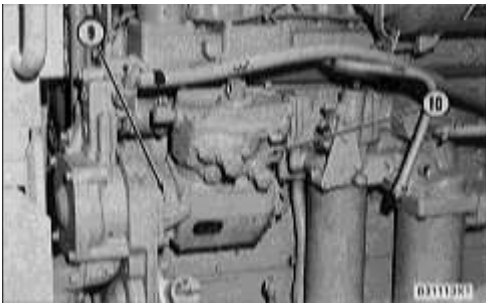
1. Drain the coolant from the radiator.



2. Remove clip (1) and the wire from the compressor.
3. Remove tube assemblies (2), (4) and (5) from the air compressor.
4. Disconnect hose assembly (3) at the air compressor governor.



5. Remove tube assemblies (6) and (8) from the air compressor.
6. Disconnect hose assembly (7) from the head of the compressor.

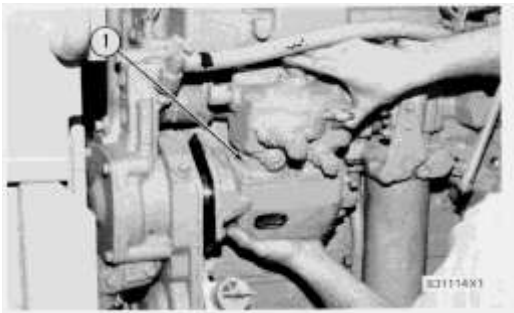


7. Remove five bolts (9) and air compressor (10) from the engine. The weight of the air compressor is 22 kg (48 lb.).

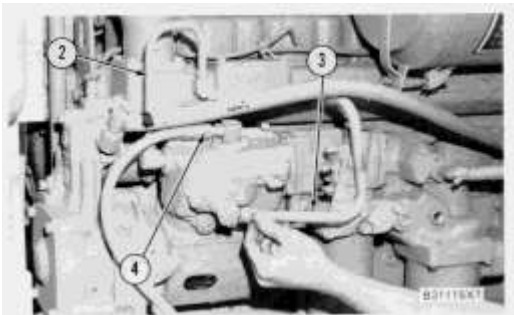
8. If a replacement of the bearing for the air compressor drive is needed, see WATER PUMP DISASSEMBLY AND ASSEMBLY.

9. For AIR COMPRESSOR DISASSEMBLY AND ASSEMBLY, see Form No. SENR7594-01.

Install Air Compressor

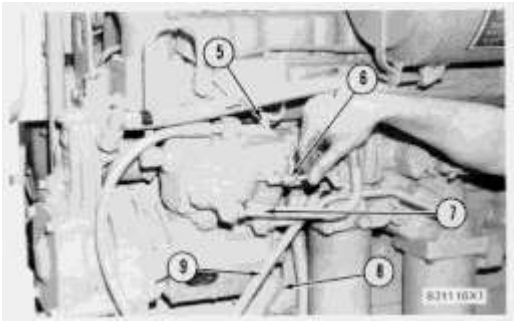


1. Put the gasket in place and install air compressor (1). Install the bolts that hold the air compressor to the engine.



2. Install tube assemblies (2) and (3) on the compressor head.

3. Connect hose assembly (4) to the air compressor.



4. Install clip (5) and the wire.
 5. Connect hose assembly (9) to the air compressor.
 6. Install tube assemblies (6), (7) and (8).
 7. Fill the radiator to the correct level with coolant.
-

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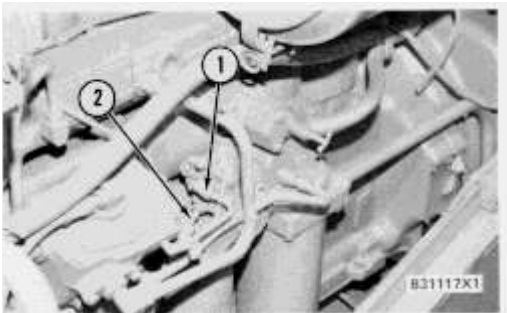
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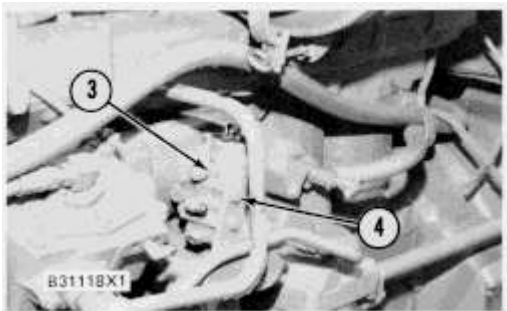
Air Compressor Governor

SMCS - 1065-11; 1065-12

Remove Air Compressor Governor

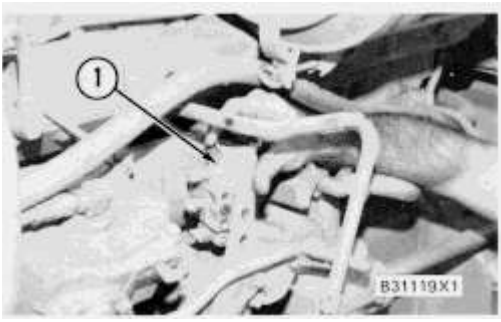


1. Remove two tube assemblies (1) and (2) from the air compressor governor.

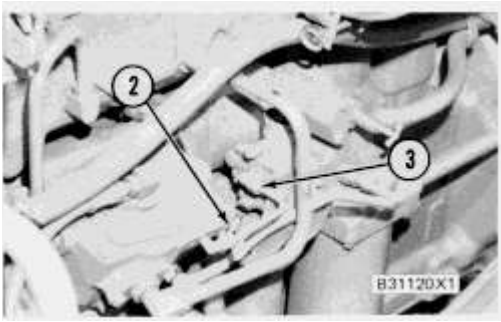


2. Remove two bolts (4). Remove air compressor governor (3) from the bracket.

Install Air Compressor Governor



1. Put governor (1) in position and install the two bolts that hold it to the bracket.



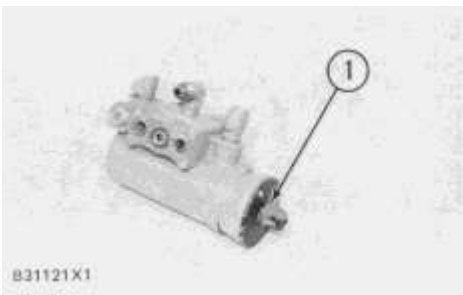
2. Install tube assemblies (2) and (3) on the governor.

Disassemble Air Compressor Governor

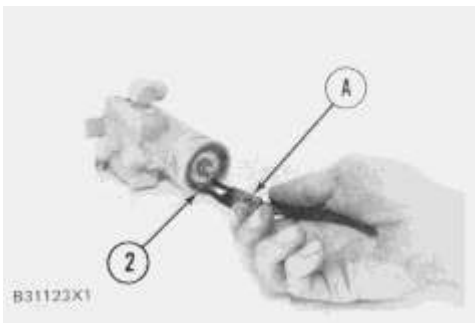
Tools Needed		A
1P1857	Snap Ring Pliers	1

start by:

a) remove air compressor governor



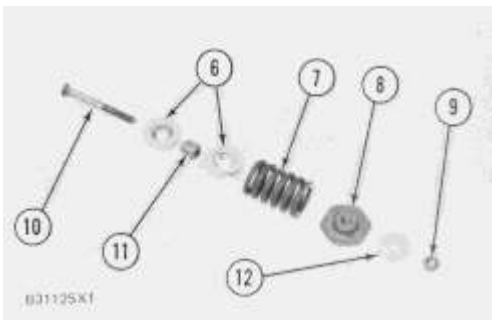
1. Remove cover (1) from the governor.



2. Remove snap ring (2) with tooling (A).

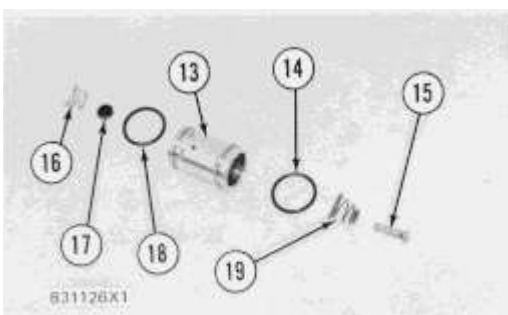


3. Remove spring assembly (5) and piston assembly (4) from the governor housing (3).



4. Remove jam nut (9), washer (12), nut (8), spring (7), retainers (6) and spacer (11) from bolt (10).

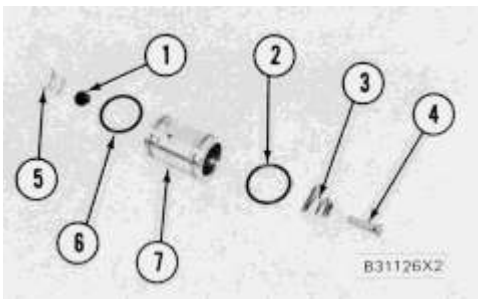
5. Remove O-ring seals (14) and (18) from piston (13).



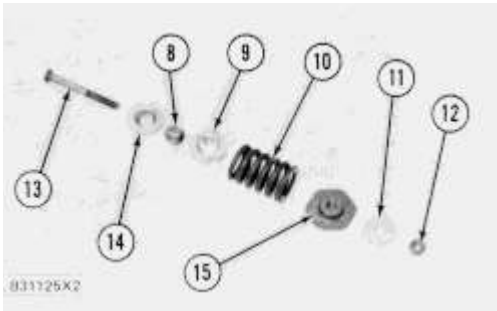
6. Remove pin (15), spring (19), retainer (17) and spring (16) from the piston.

Assemble Air Compressor Governor

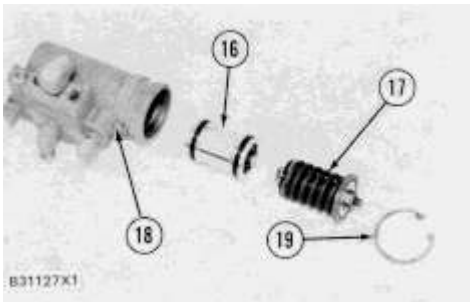
1. Check all parts for wear or damage. Make replacements if necessary.



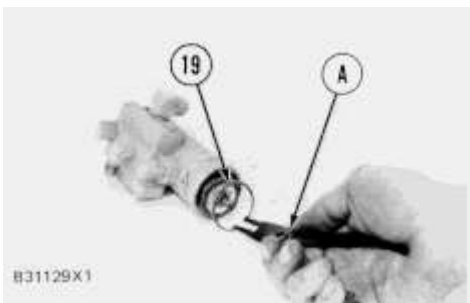
2. Put O-ring seals (2) and (6) in position on piston (7).
3. Install retainer (1), spring (5), spring (3) and pin (4) in the piston.



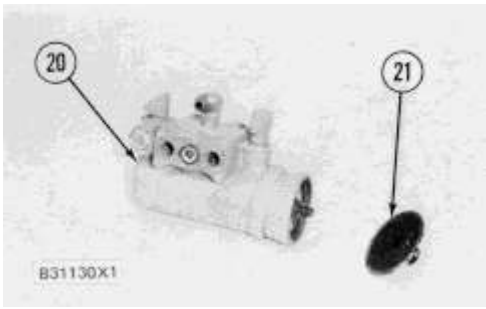
4. Install retainer (14), spacer (8), retainer (9), spring (11), nut (15), washer (11) and jam nut (12) on bolt (13).



5. Put piston assembly (16) and spring assembly (17) in position in housing (18).



6. Use tooling (A) to install snap ring (19).



7. Install cover (21) on governor assembly (20).

end by:

a) install air compressor governor

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