



Service Repair Manual

Model

228 SKID STEER LOADER

[Previous Screen](#)

Product: SKID STEER LOADER

Model: 228 SKID STEER LOADER 6BZ

Configuration: 216 226 228 Skid Steer Loader 6BZ00001-00699 (MACHINE) POWERED BY 3034 Engine

Disassembly and Assembly 3034 Engine for Caterpillar Built Machines

Media Number -SEN5013-08

Publication Date -01/11/2008

Date Updated -14/11/2008

i01606459

Governor - Assemble

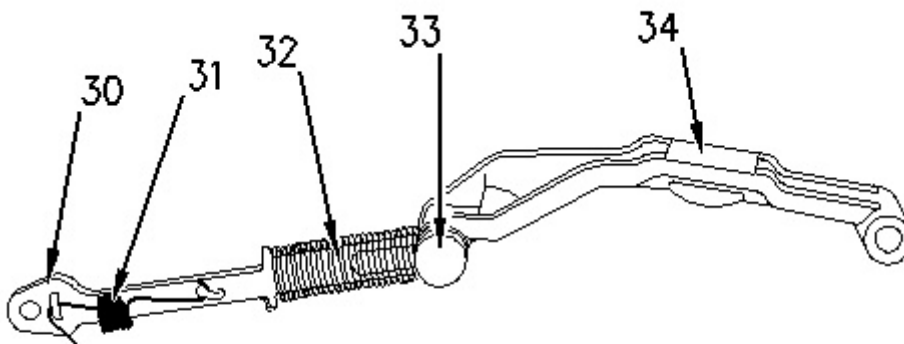
SMCS - 1264-016

Assembly Procedure

Note: The components for the governor assembly are located in the engine front housing.

Assemble the Linkage for the Fuel Injection Pump

Note: The linkage for the fuel injection pump contains two levers. One lever is for the governor control and the other lever is for the fuel control.



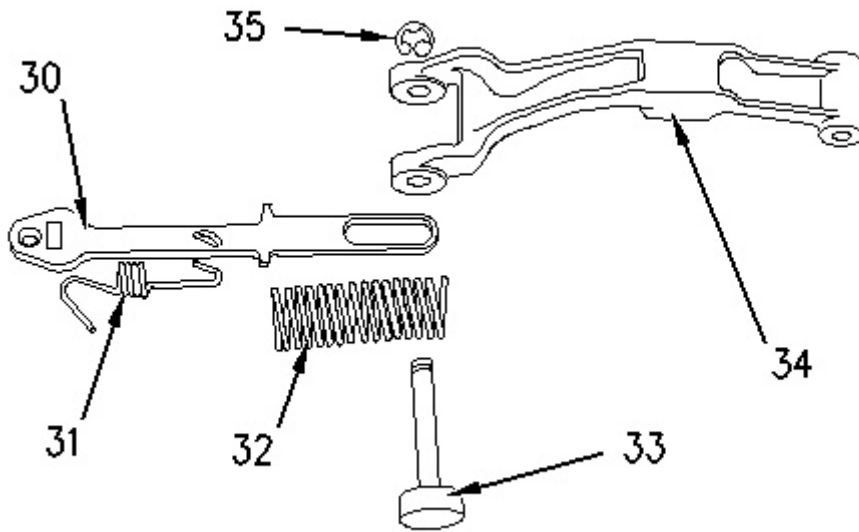


Illustration 2

g00658162

1. If the governor control lever was disassembled, then you must perform the following procedure in order to assemble the governor control lever.
 - a. Install spring (31) onto link (30) .
 - b. Install spring (32) onto link (30) and compress the spring.
 - c. While spring (32) is compressed, pin (33) is installed through link (30) into lever (34). After the pin is installed, release the spring tension.
 - d. Install circlip (35) onto the end of pin (33) .
-

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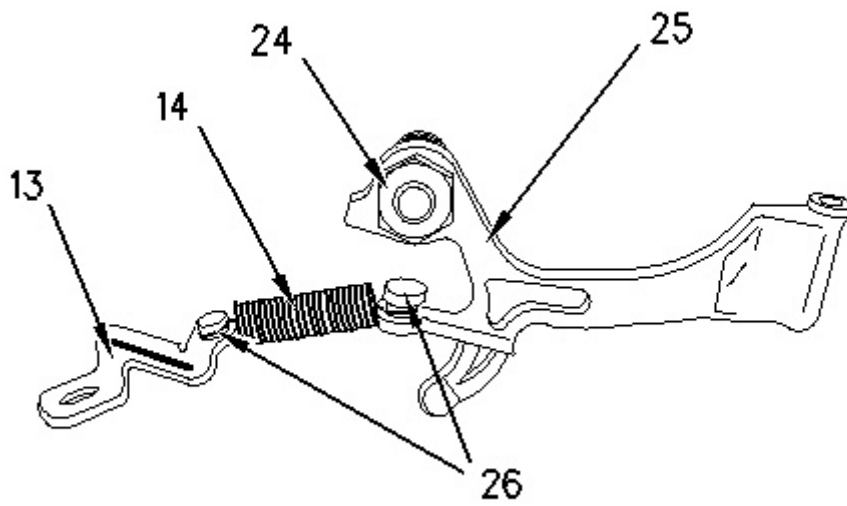


Illustration 3

g00658136

Fuel control lever

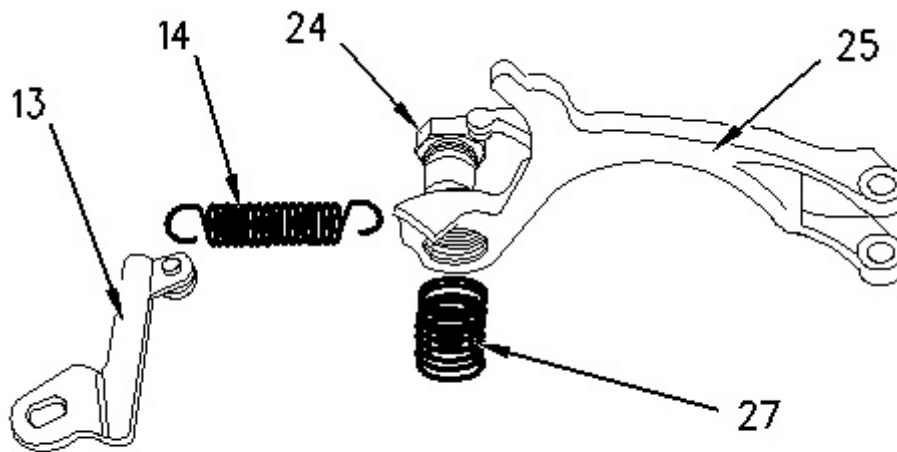


Illustration 4

g00658147

2. If the fuel control lever was disassembled, then you must perform the following procedure in order to assemble the fuel control lever.

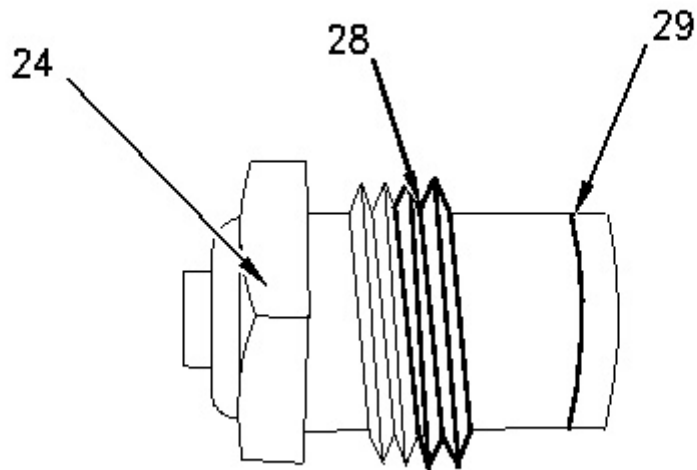
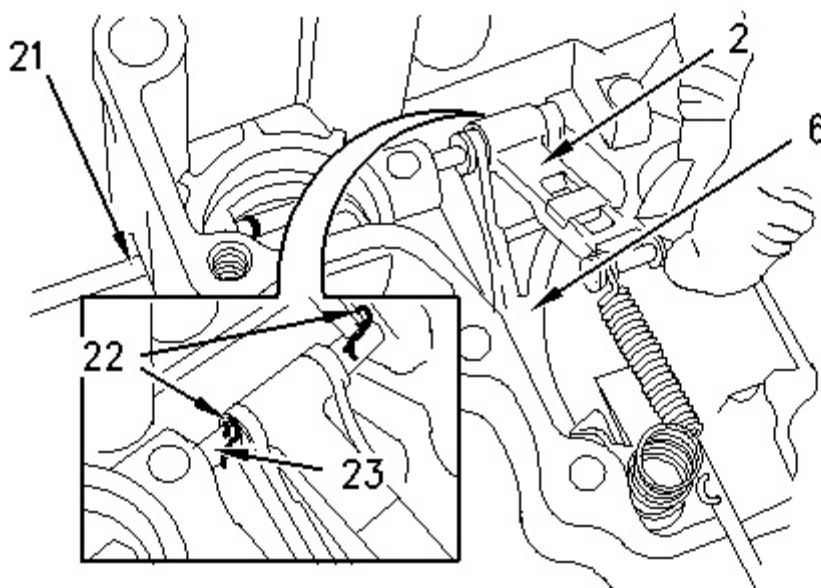


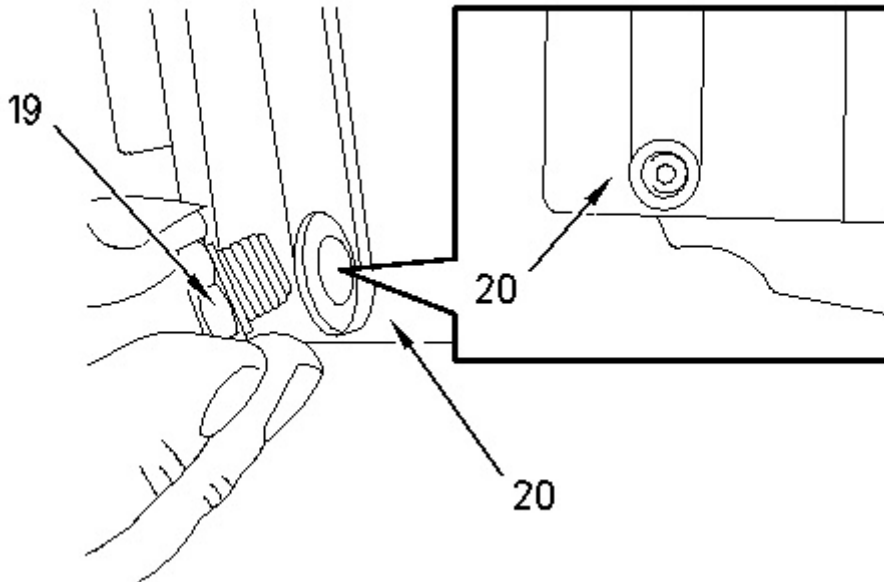
Illustration 5

g00658290

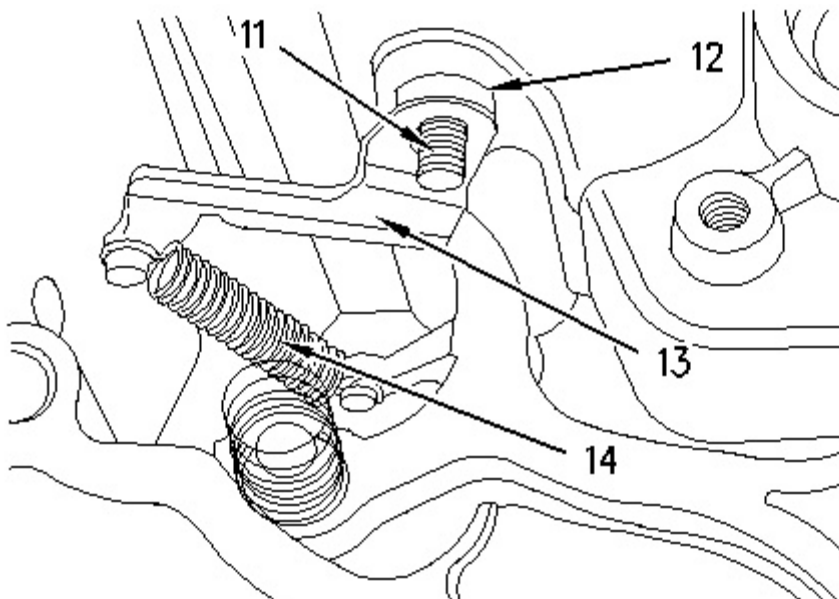
- a. Apply **9S-3263** Thread Lock Compound to the first two threads (28) of the Angleich unit (torque control) (24). Ensure that the thread lock compound does not enter the joint for the spring (29) .
- b. Install the Angleich unit (torque control) (24) into lever (25). Tighten the Angleich unit (torque control) to a torque of 15 N·m (133 lb in).
- c. Carefully install spring (27) on the Angleich unit (torque control) (24) .
Note: Ensure that the closed coils of the spring are installed toward the lever.
- d. Install spring (14) onto pin (26) that is located at the end of lever (25). Install spring (14) onto pin (26) that is located on the end of lever (13) .



3. Install the governor control lever (2) and install the fuel control lever (6) into position in the engine front housing.
4. Install the inner shaft (23) and then install the outer shaft (21). The outer shaft is installed over the inner shaft. The shafts keep the levers in position inside the engine front housing.
5. Insert the spring pins (22) that hold the levers in position on the shafts.



6. Install the brass plug (19) into the engine front housing (20) .

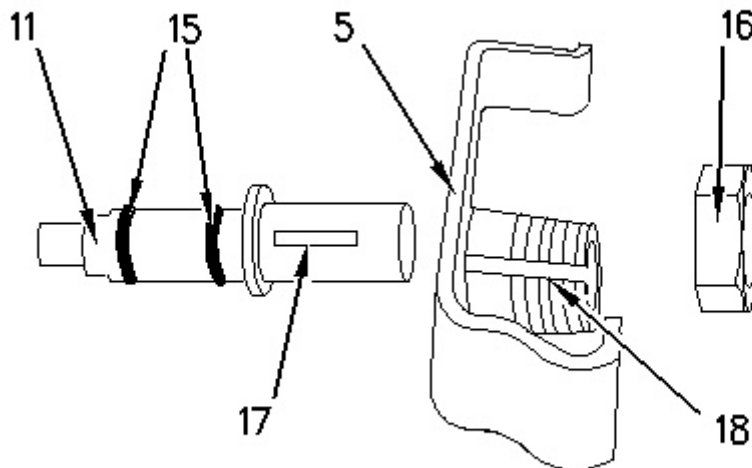


- Place the lever (13) in position on the shaft assembly (11) .

Note: Ensure that the spring (14) is connected to the pin that is located on the end of the lever (13) .

- Apply **9S-3263** Thread Lock Compound to the threads of the shaft (11). Ensure that the thread lock compound does not enter the bushing (12) .
- Install the following items (not shown) onto the shaft (11) in order to keep the lever (13) in position: flat washer, lock washer and nut. Tighten the nut to a torque of 10.5 N·m (8 lb ft).

Install the Speed Control Lever for the Engine



- If shaft assembly (11) was disassembled, install the following items onto the shaft assembly: O-rings (15), speed control lever (5) and nut (16) .

Note: Ensure that key (17) that is in shaft (11) is aligned with slot (18) that is in speed control lever (5) .

- Tighten nut (16) to a torque of 45 N·m (33 lb ft).

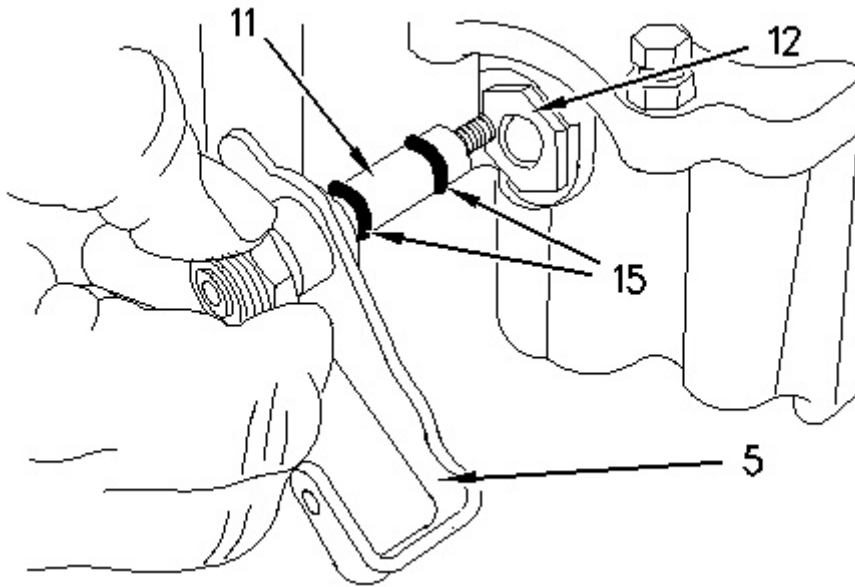


Illustration 10

g00658071

Note: Lubricate shaft assembly (11) and lubricate O-rings (15) with clean grease. This will ease the installation of the shaft assembly into the engine front housing.

3. Install shaft assembly (11) through bushing (12) into the engine front housing.

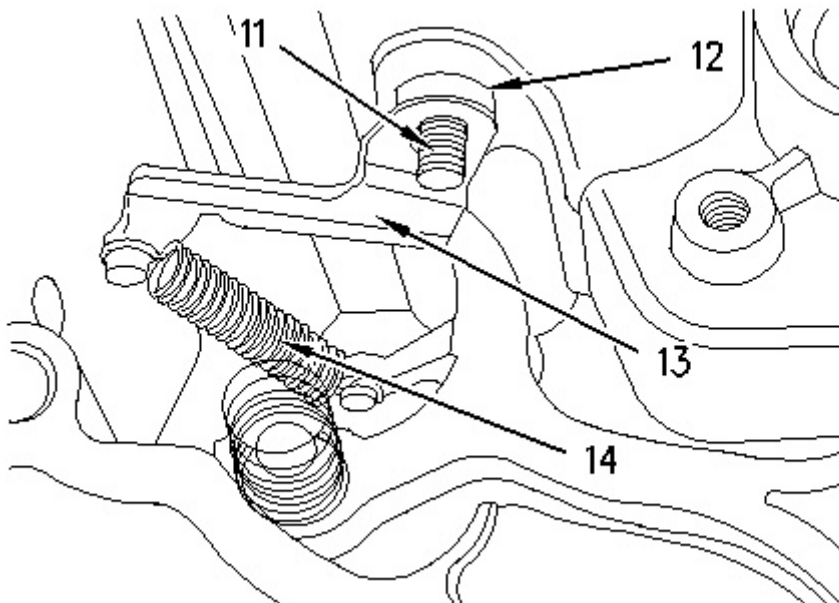


Illustration 11

g00658059

4. Place lever (13) in position on shaft assembly (11) .

Note: Ensure that spring (14) is connected to the pin that is located on the end of lever (13) .

5. Apply **9S-3263** Thread Lock Compound to the threads of shaft (11). Ensure that the thread lock compound does not enter bushing (12) .

6. Install the following items (not shown) on shaft (11) in order to secure lever (13) to the shaft: flat washer, lock washer and nut. Tighten the nut to a torque of 10.5 N·m (8 lb ft).

Installation of the Governor Weight Assembly

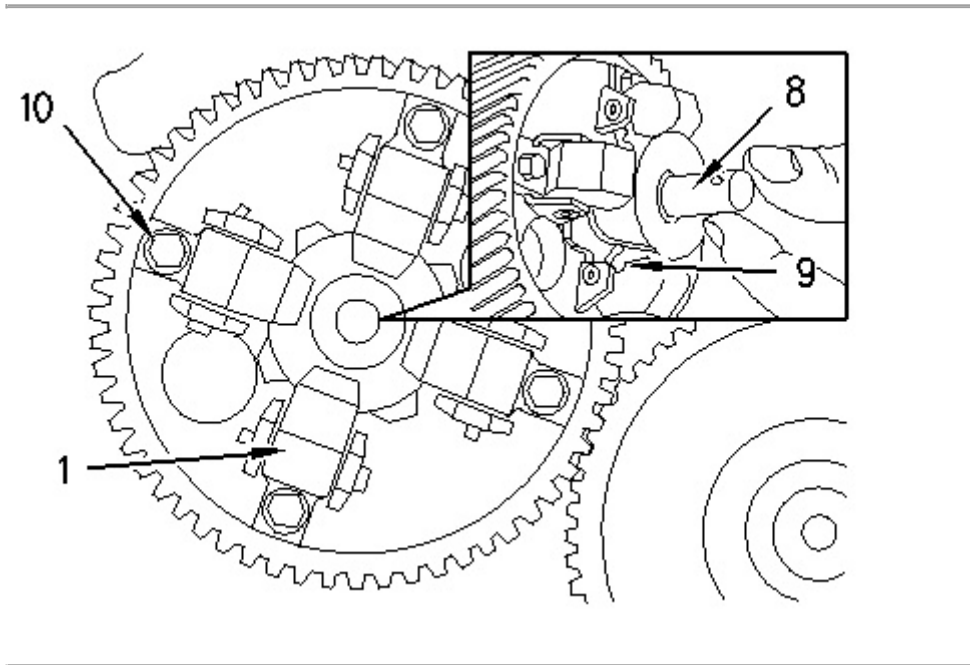


Illustration 12

g00658033

1. Place governor weight assembly (1) in position on the gear of the camshaft for the fuel injection pump.
 2. Install bolts (10) that secure governor weight assembly (1) in position.
 3. Tighten bolts (10) to a torque of 7 N·m (5 lb ft).
 4. Install thrust spacer (8) onto the end of the gear. Ensure that the flange of the thrust spacer is installed into the recess of each weight (9) .
-

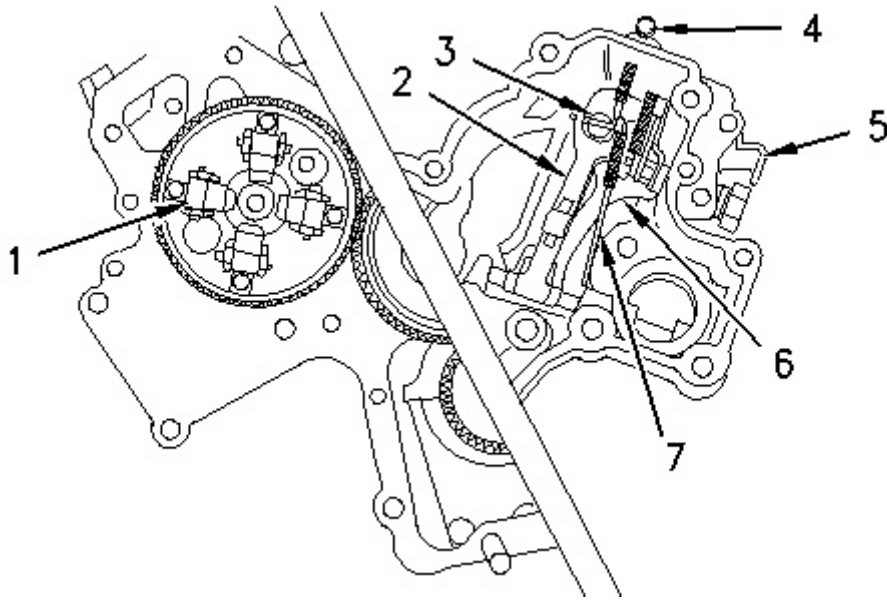


Illustration 13

g00658002

Governor components are located in the engine front housing.

The governor assembly consists of the following components:

- Governor weight assembly (1)
- Governor control lever (2)
- Angleich unit (torque control) (3)
- Adjustment screw for the maximum fuel setting (4)
- Speed control lever for the engine (5)
- Fuel control lever (6)
- Governor control linkage (7)

End By: Install the engine front housing. Refer to Disassembly and Assembly, "Housing (Front) - Assemble".

[Previous Screen](#)

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Configuration: 216 226 228 Skid Steer Loader 6BZ00001-00699 (MACHINE) POWERED BY 3034 Engine

Disassembly and Assembly 3034 Engine for Caterpillar Built Machines

Media Number -SEN5013-08

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i01354467

Fuel Injection Pump - Remove

SMCS - 1251-011

Removal Procedure

Start By:

- A. Remove the air inlet manifold. Refer to Disassembly and Assembly, "Inlet Manifold - Remove".
- B. Remove the fuel shutoff solenoid. Refer to Disassembly and Assembly, "Fuel Shutoff Solenoid - Remove and Install".

NOTICE

Keep all parts clean from contaminants.

Contaminants may cause rapid wear and shortened component life.

NOTICE

Care must be taken to ensure that fluids are contained during performance of inspection, maintenance, testing, adjusting and repair of the product. Be prepared to collect the fluid with suitable containers before opening any compartment or disassembling any component containing fluids.

Refer to Special Publication, NENG2500, "Caterpillar Tools and Shop Products Guide" for tools and supplies suitable to collect and contain fluids on Caterpillar products.

Dispose of all fluids according to local regulations and mandates.

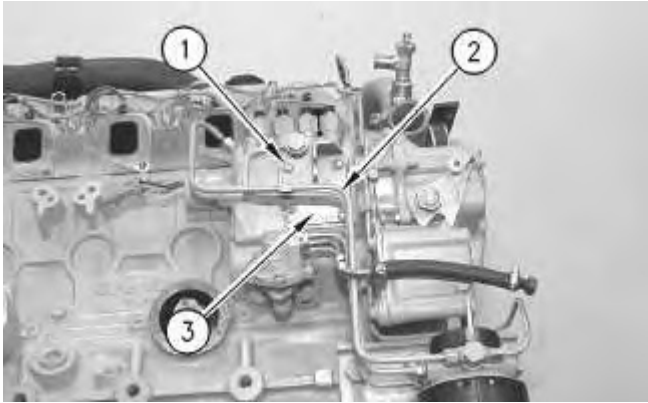


Illustration 1

g00599562

1. Remove fuel lines (2) from the engine. Immediately cap all openings or plug all openings in order to prevent contamination of the fuel system.
2. Remove bolts (1) and cover (3) from the engine.

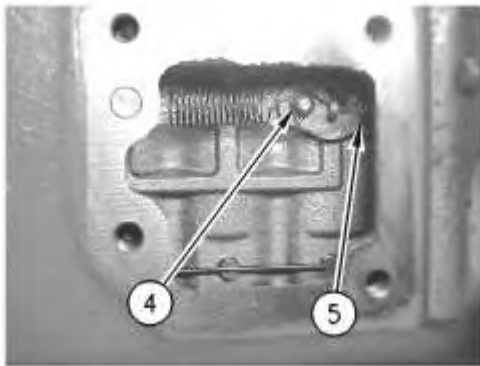


Illustration 2

g00720261

3. Disconnect spring (5) from the groove in pin (4) .
-

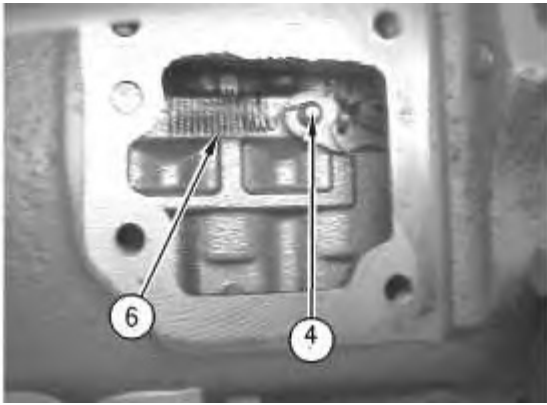


Illustration 3

g00720270

Note: Spring (6) may fall into the engine if the spring comes loose from pin (4) .

4. Disconnect spring (6) from the groove in pin (4) .

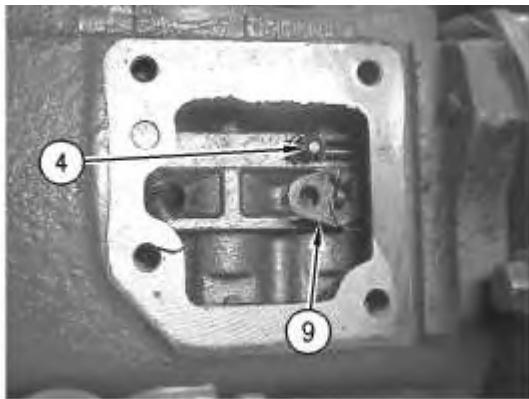


Illustration 4

g00720275

5. Disconnect governor control linkage (9) from pin (4) .

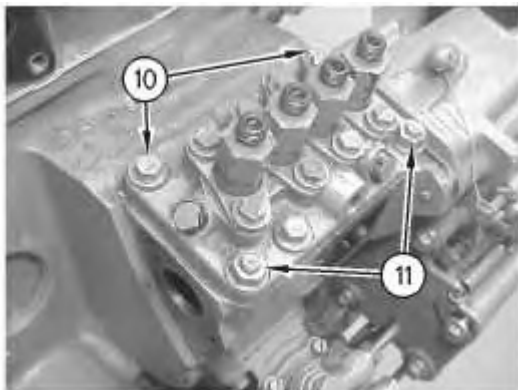


Illustration 5

g00720284

6. Remove bolts (10) and nuts (11) that secure the fuel injection pump to the engine.

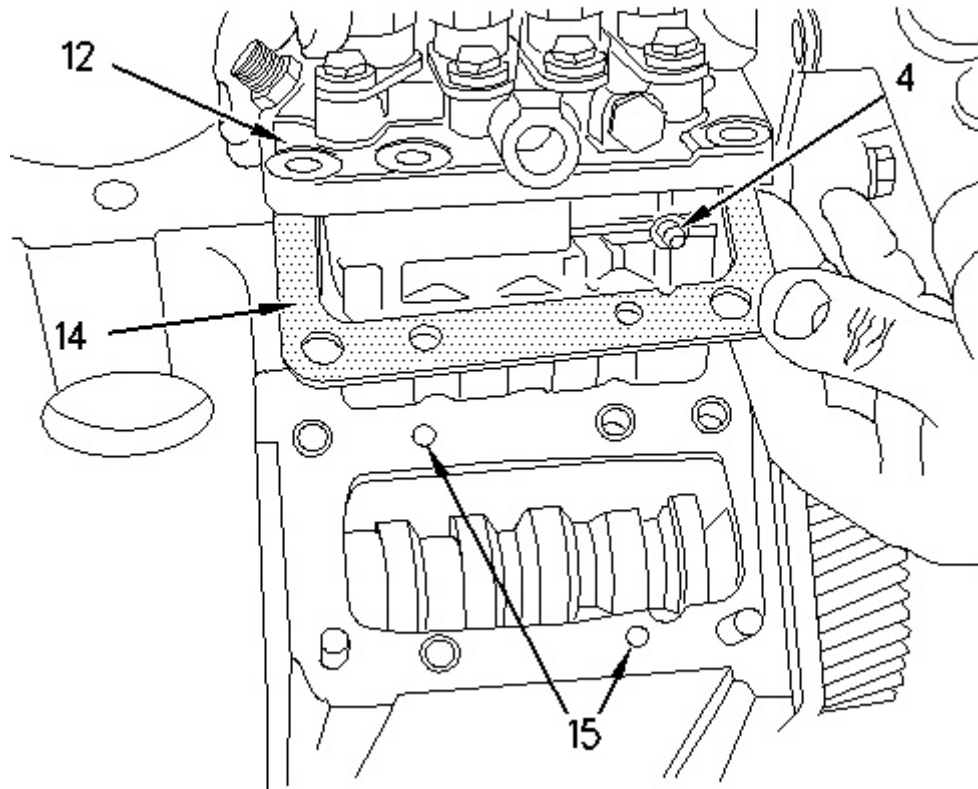


Illustration 6

g00720291

7. Remove fuel injection pump (12) from the engine.

Note: Record the thickness of each shim and the number of shims for reassembly. The fuel injection timing is determined by the shim pack thickness that is between the fuel injection pump and the mounting face on the cylinder block. For more information on the fuel injection pump, refer to the Specifications Module, "Fuel Injection Pump" topic.

8. Remove shims (14) from fuel injection pump (12) .
9. Inspect dowels (15) for damage. If the dowels are damaged, use new dowels for replacement.
10. Inspect pin (4) for wear or damage. If pin (4) is worn or damaged, use a new pin for replacement.
11. Cover the opening in the fuel injection pump housing for fuel injection pump (12) in order to prevent debris from falling into the engine.

[Previous Screen](#)

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Media Number -SEN5013-08

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i01354577

Fuel Injection Pump - Install

SMCS - 1251-012

Installation Procedure

NOTICE

Keep all parts clean from contaminants.

Contaminants may cause rapid wear and shortened component life.

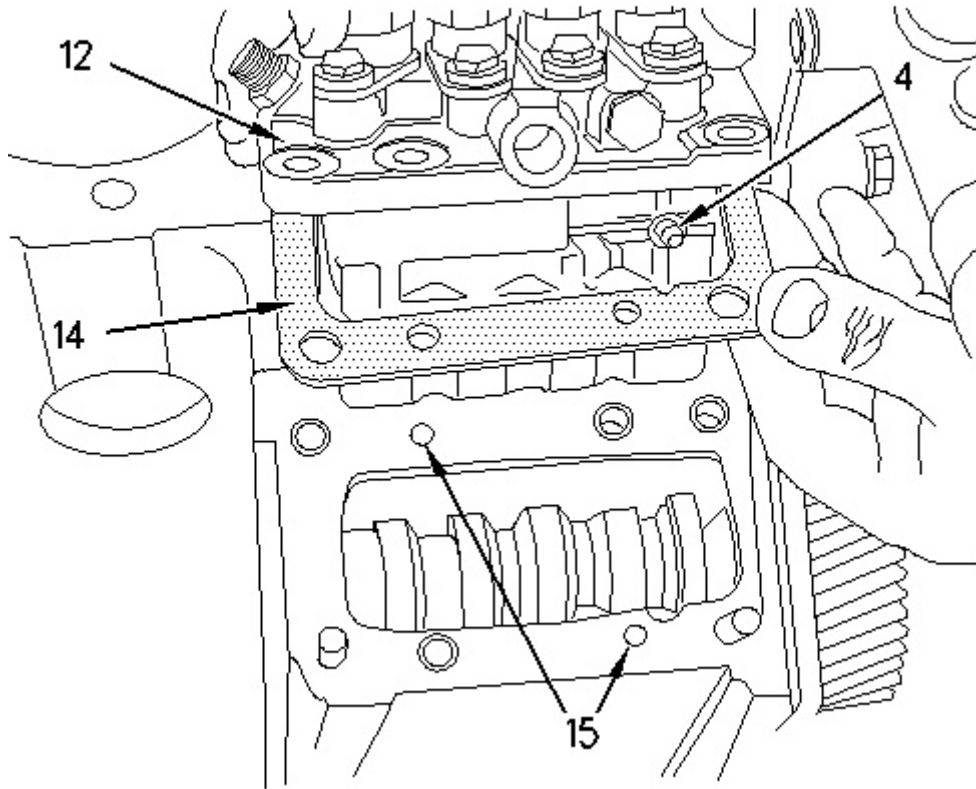
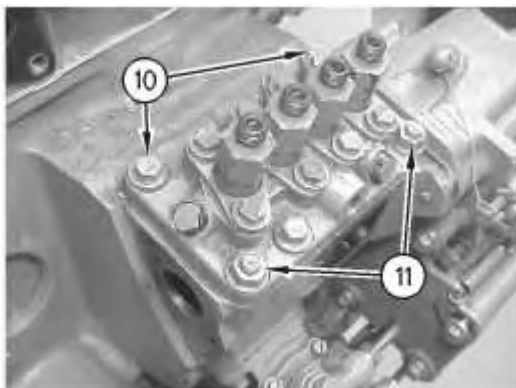


Illustration 1

g00720291

1. Make sure that the mating surface of the fuel injection pump housing and fuel injection pump (12) are clean and free from debris.
2. Position the correct number of shims (14) on the fuel injection pump housing. Refer to the Specifications Module, "Fuel Injection Pump" topic for more information.
3. Ensure that pin (4) is aligned with the notch in shims (14) and the notch in the cylinder block. Align dowels (15) with fuel injection pump (12). Put fuel injection pump (12) in position on the engine.



4. Install nuts (11) and bolts (10) that secure the fuel injection pump to the engine. Tighten nuts (11) and bolts (10) evenly to a torque of 22 N·m (16 lb ft).

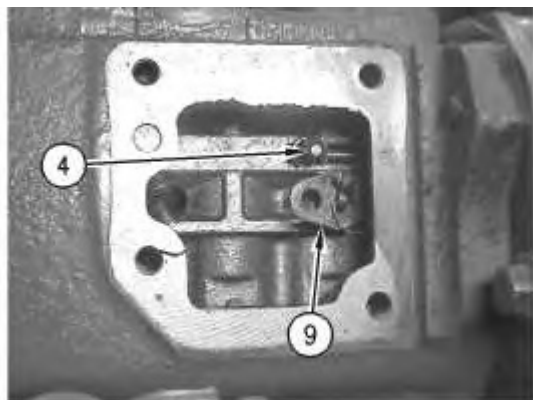


Illustration 3

g00720275

5. Install governor control linkage (9) onto pin (4) .

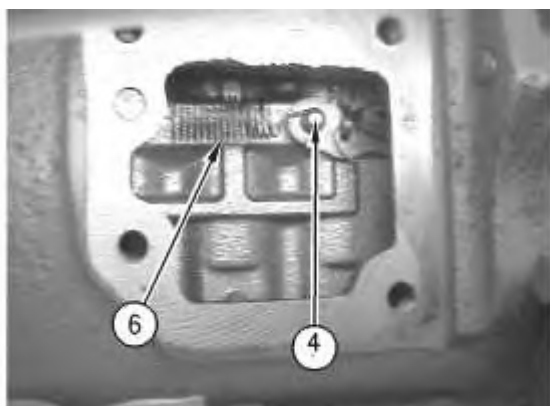


Illustration 4

g00720270

6. Install spring (6) in the groove in pin (4) .
-

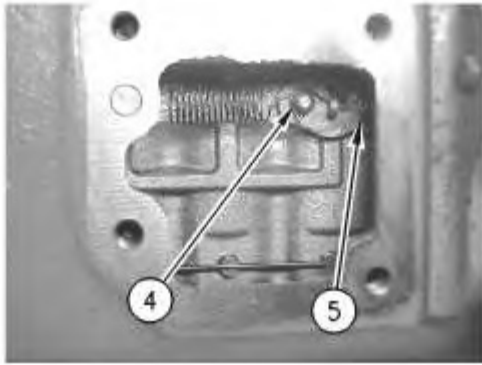


Illustration 5

g00720261

7. Install spring (5) into the groove in pin (4) .

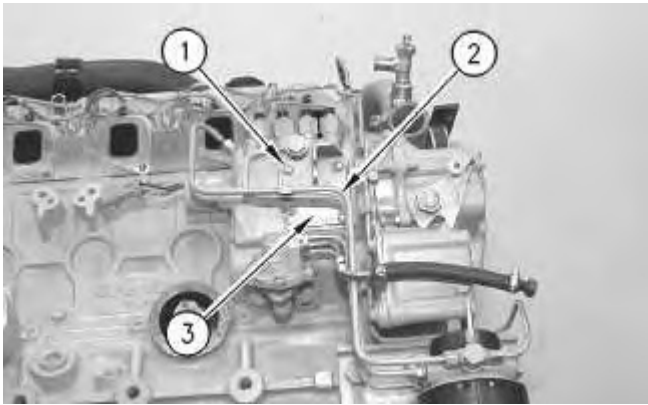


Illustration 6

g00599562

8. Clean the mating surface of plate (3) and the cylinder block.
9. Put plate (3) in position on the engine and install bolts (1).
10. Remove the caps and the plugs from fuel lines (2) and install the fuel lines on the engine.

End By:

- a. Install the fuel shutoff solenoid. Refer to Disassembly and Assembly, "Fuel Shutoff Solenoid - Remove and Install".
- b. Install the air inlet manifold. Refer to Disassembly and Assembly, " Inlet Manifold - Install".

[Previous Screen](#)

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Disassembly and Assembly 3034 Engine for Caterpillar Built Machines

Media Number -SEN5013-08

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i01365306

Turbocharger - Remove

SMCS - 1052-011

Removal Procedure

NOTICE

Keep all parts clean from contaminants.

Contaminants may cause rapid wear and shortened component life.

NOTICE

Care must be taken to ensure that fluids are contained during performance of inspection, maintenance, testing, adjusting and repair of the product. Be prepared to collect the fluid with suitable containers before opening any compartment or disassembling any component containing fluids.

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Dispose of all fluids according to local regulations and mandates.

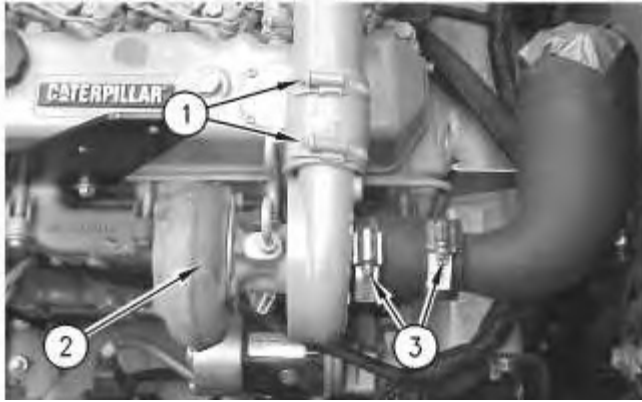


Illustration 1

g00596955

1. Loosen hose clamps (1) and (3). Slide the hoses away from turbocharger (2) .

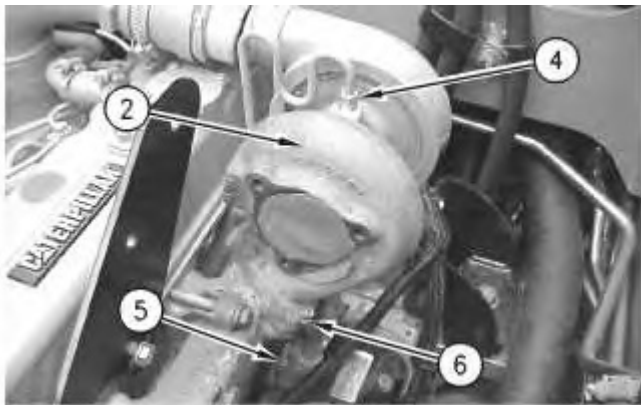


Illustration 2

g00597025

2. Remove oil line (4) from turbocharger (2). Immediately cap all openings or plug all openings in order to prevent contamination.
3. Loosen hose clamp (5) for the oil drain line.
4. Remove three nuts (6) that fasten turbocharger (2) to the exhaust manifold.

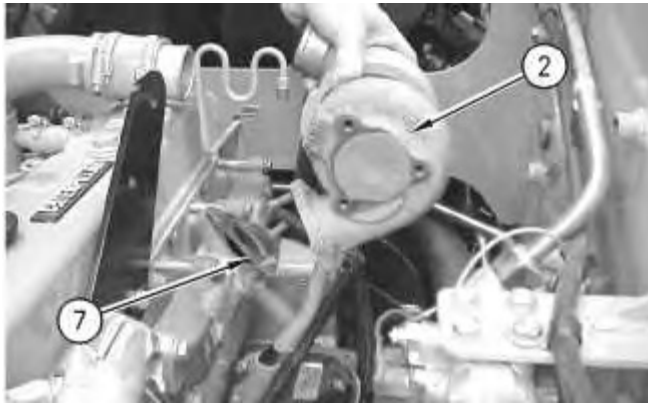


Illustration 3

g00597180

5. Remove turbocharger (2) and gasket (7) from the engine. Plug the hose for the oil drain line in order to prevent contamination. Inspect the condition of gasket (7). If gasket (7) is worn or damaged, replace the gasket.

[Previous Screen](#)

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i01130095

Turbocharger - Install

SMCS - 1052-012

Installation Procedure

NOTICE

Keep all parts clean from contaminants.

Contaminants may cause rapid wear and shortened component life.

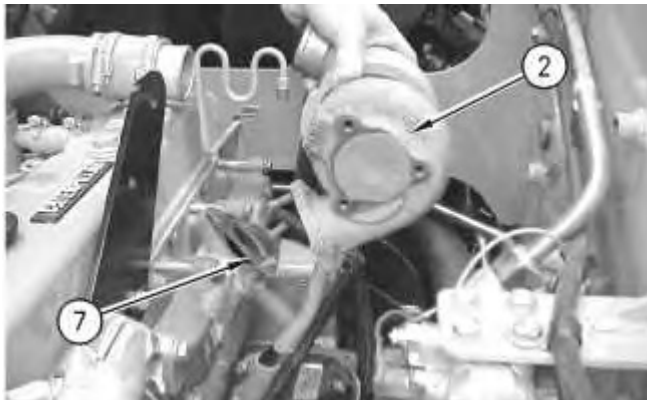


Illustration 1

g00597180

1. Put gasket (7) and turbocharger (2) in position on the exhaust manifold.
-

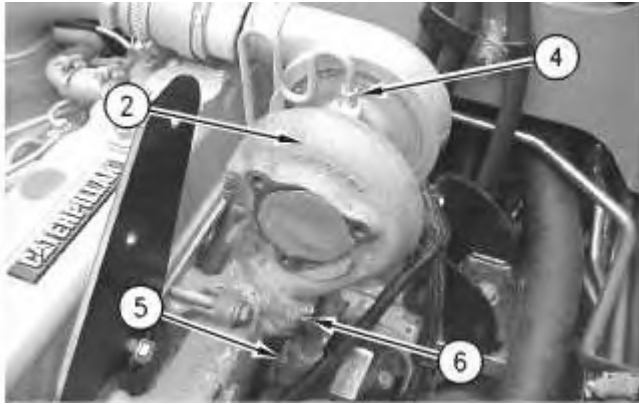


Illustration 2

g00597025

2. Install three nuts (6) that fasten turbocharger (2) to the exhaust manifold. Tighten the nuts to a torque of 22 N·m (16 lb ft).
3. Tighten hose clamp (5) for the oil drain line.
4. Connect oil line (4) to turbocharger (2) .

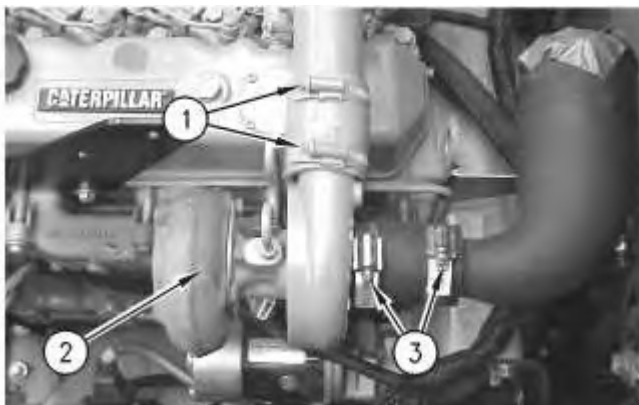


Illustration 3

g00596955

5. Slide the hoses toward turbocharger (2) and tighten hose clamps (3) and (1) .

[Previous Screen](#)

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i01099748

Exhaust Manifold - Remove and Install

SMCS - 1059-010

Removal Procedure

NOTICE

Keep all parts clean from contaminants.

Contaminants may cause rapid wear and shortened component life.

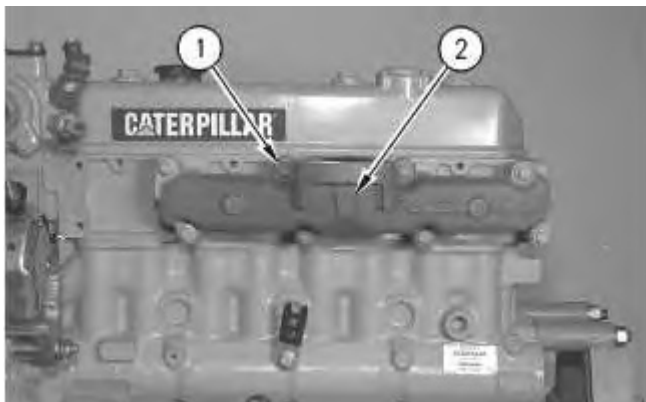


Illustration 1

g00578523

1. Remove eight bolts (1) from exhaust manifold (2) .
-



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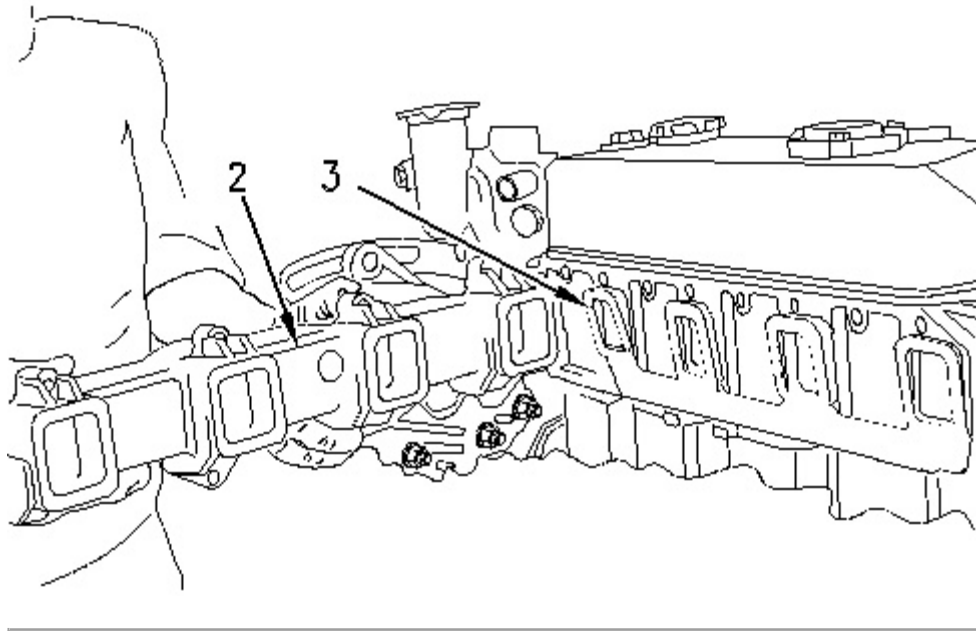


Illustration 2

g00578529

2. Remove exhaust manifold (2) and gasket (3) from the engine.

Installation Procedure

NOTICE

Keep all parts clean from contaminants.

Contaminants may cause rapid wear and shortened component life.

1. Make sure that the cylinder head and the exhaust manifold are clean and free of carbon and gasket material.
-

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