

TM2356 - 27D Excavator Repair Engine Remove and Install

Engine Remove and Install



1. TS281-UN: Avoid High-Pressure Fluids

Disconnect negative battery cable.

2. Remove counterweight. [See Counterweight Remove and Install](#) . (Group 1749.)

3.



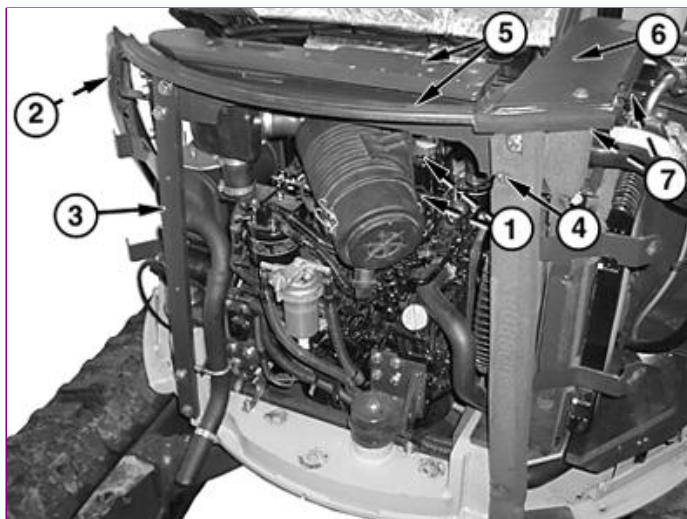
CAUTION:

Explosive release of fluids from pressurized cooling system can cause serious burns.

Shut off engine. Remove filler cap when cool to touch. Slowly loosen filler cap to first stop to relieve pressure, then remove.

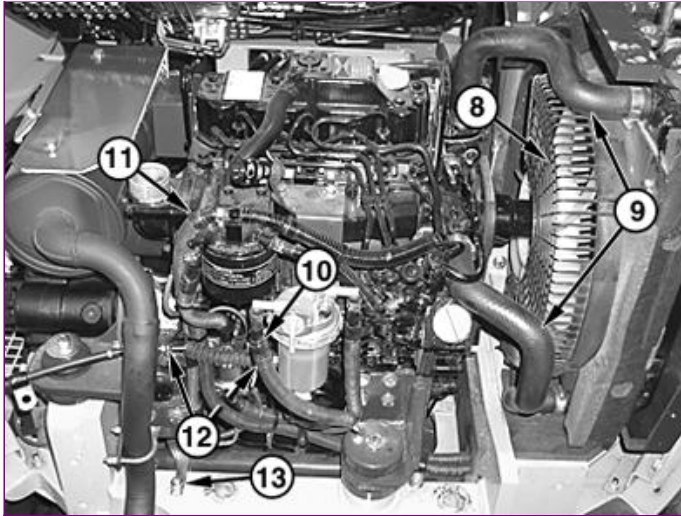
Drain coolant. [See Draining Cooling System](#) . (Operator's Manual.)

4. Drain hydraulic fluid. [See Changing Hydraulic Tank Oil and Cleaning Suction Screen](#) . (Operator's Manual.)
-



- 5.

T207062A-UN: Engine Frame



T207063A-UN: Coolant hoses

LEGEND:

- 1 - Cap Screw (2 used)
- 2 - Left-Side Frame Bracket
- 3 - Left-Rear Frame Bracket
- 4 - Right-Rear Frame Bracket
- 5 - Frame Cover
- 6 - Frame Cover
- 7 - Right-Side Frame Bracket
- 8 - Fan Guard
- 9 - Coolant Hoses
- 10 - Inlet Fuel Line
- 11 - Return Fuel Line
- 12 - Speed Control Cable
- 13 - Ground Strap

Remove two cap screws (1) holding air cleaner housing.

6. **NOTE:**

Note any shims that may accompany frame brackets for installation.

Remove frame brackets (2-4) and frame cover (5).

7. Remove right-side frame bracket (7).

8. Remove air cleaner assembly.

9. Remove coolant fan guard (8) and coolant hoses (9).

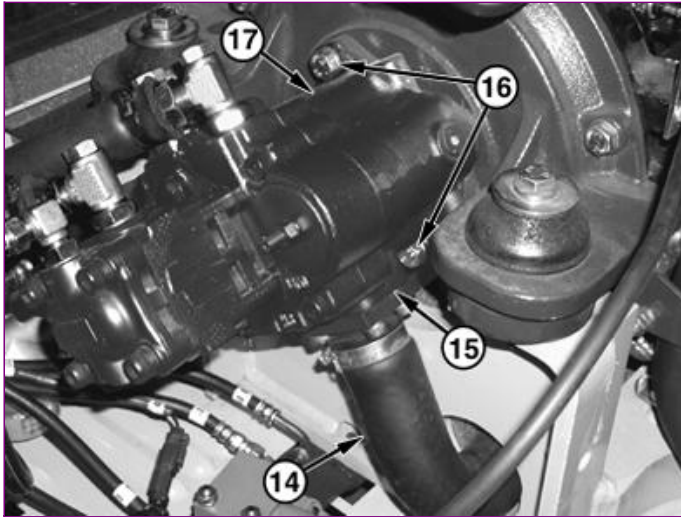
10. Remove radiator. [See Radiator Remove and Install \(S.N. —254999\)](#) or [see Radiator Remove and Install \(S.N. 255000—\)](#) . (Group 0510.)

11. Remove fan belt and fan.

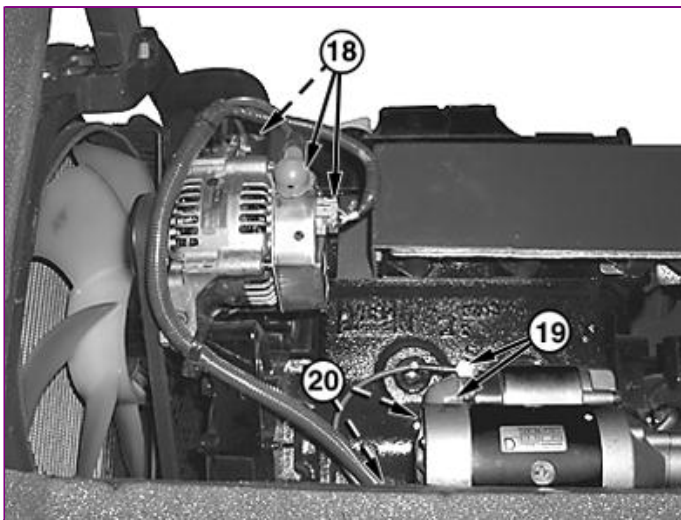
12. Disconnect the inlet (10) and return (11) fuel lines.

13. Disconnect speed control cable (12) from engine.

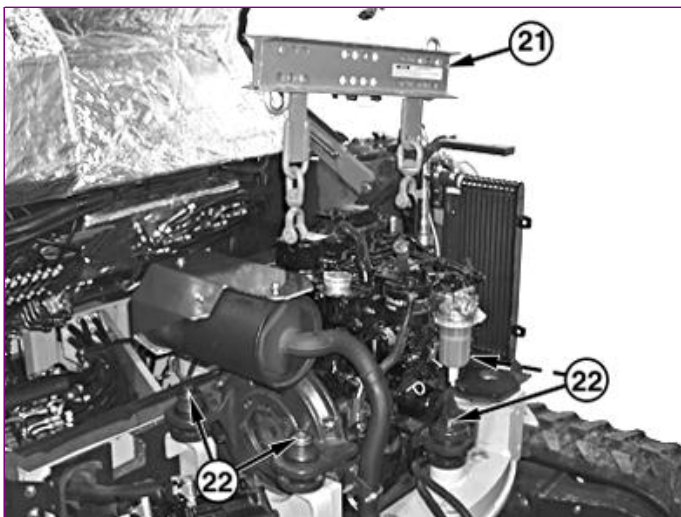
14. Disconnect ground strap (13).



15. T207064A-UN: Hydraulic pump



T207070A-UN: Starter



T207122A-UN: Sling and motor mounts

LEGEND:

- 14 - Hydraulic Pump Hose
- 15 - Inlet Flange
- 16 - Cap Screw (2 used)
- 17 - Hydraulic Pump
- 18 - Wire Harness-to-Alternator
- 19 - Wire Harness-to-Starter Motor
- 20 - Wire Harness Cap Screw (2 used)
- 21 - JDG23 Lifting Sling

22 - Engine Mount Cap Screw and Washer (4 used)

Disconnect hydraulic pump hose (14) and inlet flange (15).

16. Remove two cap screws (16) and pull hydraulic pump (17) away from engine until drive coupler is disengaged from flywheel and housing.
17. Disconnect wire harnesses from alternator (18) and starter motor (19).
18. Remove starter motor.
19. Remove two cap screws (20) and fasteners under starter motor securing wiring harness to engine block.
20. Disconnect wiring harnesses from fuel shut-off solenoid, switches, and sensors. Attach identification tags to wiring to aid installation. [See Engine Harness \(W10\) Component Location](#) . (Group 9015.)
21. _____



CAUTION:

Prevent possible injury from crushing. Heavy component, use appropriate lifting device.

Item	Measurement	Specification
Engine	Weight	199 kg 440 lb

IMPORTANT:

The recommended method for lifting the engine is using the JDG23 Lifting Sling. The lifting force must be at 90° to the lifting points.

Attach engine to a hoist using the JDG23 Lifting Sling (21).

22. Remove engine mount cap screws and washers (22).
23. Repair or replace parts as necessary.
24. Install engine using JDG23 Lifting Sling (21).
25. Install four engine mounts and cap screws (22). Tighten to specifications.

Item	Measurement	Specification
Engine Mount-to-Isolator Cap Screw	Torque	88 N·m 65 lb-ft

26. Align hydraulic pump splines to engine coupler. Tighten to specifications.

Item	Measurement	Specification
Hydraulic Pump-to-Flywheel Housing Cover Cap Screws	Torque	88 N·m 65 lb-ft

27. Connect inlet flange and hydraulic hose to pump. Tighten to specifications.

Item	Measurement	Specification
Inlet Flange-to-Hydraulic Pump	Torque	48 N·m 36 lb-ft

28. Fill hydraulic system.
29. Bleed hydraulic system. [See Bleed Hydraulic System](#) . (Operator's Manual.)
30. **NOTE:**

Before installing starter motor, install two cap screws and fasteners under starter, securing wiring harness to engine block.

Install starter motor.

31. Connect engine wire harness. [See Engine Harness \(W10\) Component Location](#) . (Group 9015.)
32. Connect speed control cable to engine.
33. Install ground strap to frame.
34. Install fan and fan belt.
35. Adjust fan belt tension. [See Inspect Fan Belt, Check and Adjust Tension](#) . (Operator's Manual.)
36. Install radiator. [See Radiator Remove and Install \(S.N. —254999\)](#) or [see Radiator Remove and Install \(S.N. 255000—\)](#) . (Group 0510.)
37. Fill radiator and reservoir with coolant. [See Cooling System Fill and Deaeration](#) . (Operator's Manual.)
38. Install air cleaner assembly.

39. **NOTE:**

Make note of any shims that were removed in the disassembly process, and place in same location of removal.

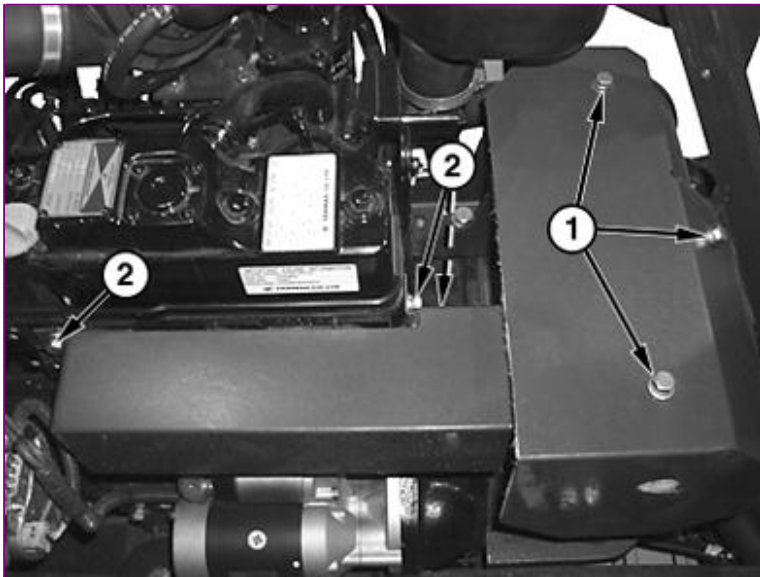
Attach frame brackets to frame.

40. Attach two cap screws from the upper frame bracket-to-air cleaner.
41. Bleed fuel system. [See Bleed Fuel System](#) . (Group 0560.)
42. Install counterweight. [See Counterweight Remove and Install](#) . (Group 1749.)
43. Connect the negative battery cable.

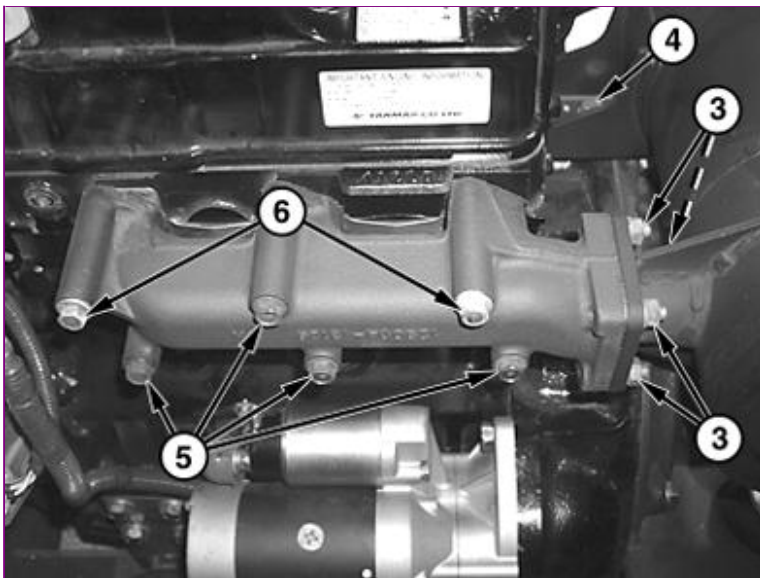
TM2356 - 27D Excavator Repair

Exhaust Manifold Remove and Install

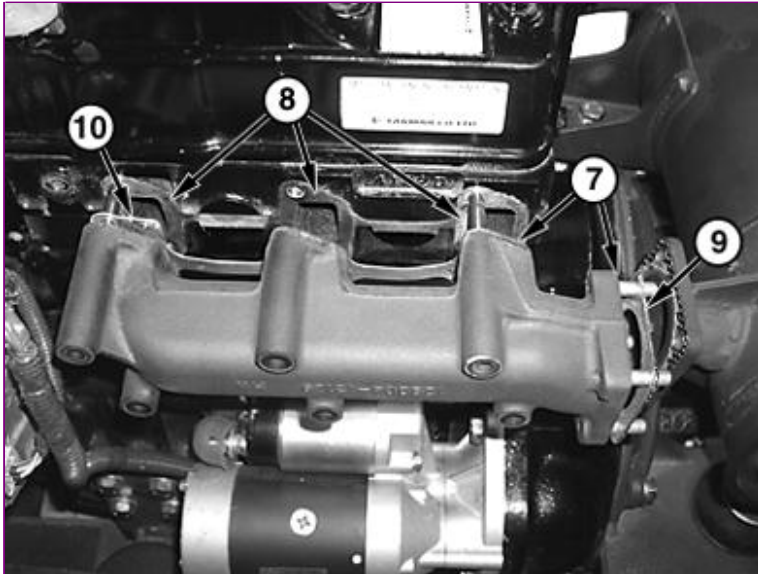
Exhaust Manifold Remove and Install



1. T207342A-UN: Heat Shield



T207343A-UN: Exhaust manifold



T207362A-UN: Gasket

LEGEND:

- 1 - Muffler Heat Shield Cap Screw (3 used)
- 2 - Exhaust Manifold Heat Shield Cap Screw (3 used)
- 3 - Muffler-to-Exhaust Manifold Nut (4 used)
- 4 - Muffler Bracket Cap Screw (1 used)
- 5 - Exhaust Manifold Cap Screw (4 used)
- 6 - Exhaust Manifold Nut (2 used)
- 7 - Exhaust Manifold
- 8 - Cylinder Head Mating Surface
- 9 - Muffler Gasket
- 10 - Exhaust Manifold Gasket

Tilt operator station. [See Tilting the Operator Station](#) . (Operator's Manual.)

2. Remove cap screws (1 and 2) and washers. Remove both heat shields.
3. Remove four muffler-to-exhaust manifold nuts (3) and washers.
4. Loosen muffler bracket cap screw (4).
5. Remove four exhaust manifold cap screws (5).
6. Remove two exhaust manifold nuts (6).
7. Clean all gasket material from exhaust manifold (7) and cylinder head mating surfaces (8).
8. Install muffler gasket (9) and exhaust manifold gasket (10).
9. Install exhaust manifold cap screws and nuts. Tighten to specifications.

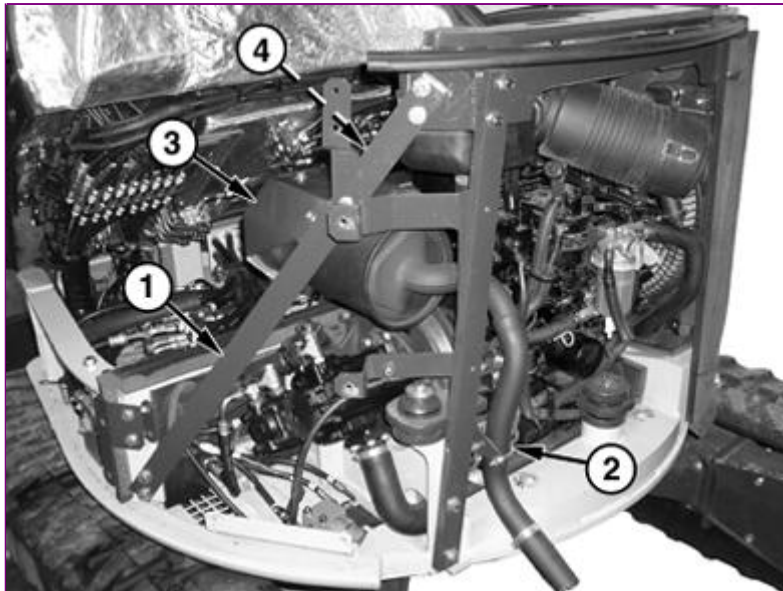
Item	Measurement	Specification
Exhaust Manifold-to-Cylinder Head Cap Screw and Nut	Torque	26 N·m 19 lb-ft

10. Install muffler-to-exhaust manifold nuts and muffler bracket cap screw.
11. Install exhaust manifold heat shield and muffler heat shield.

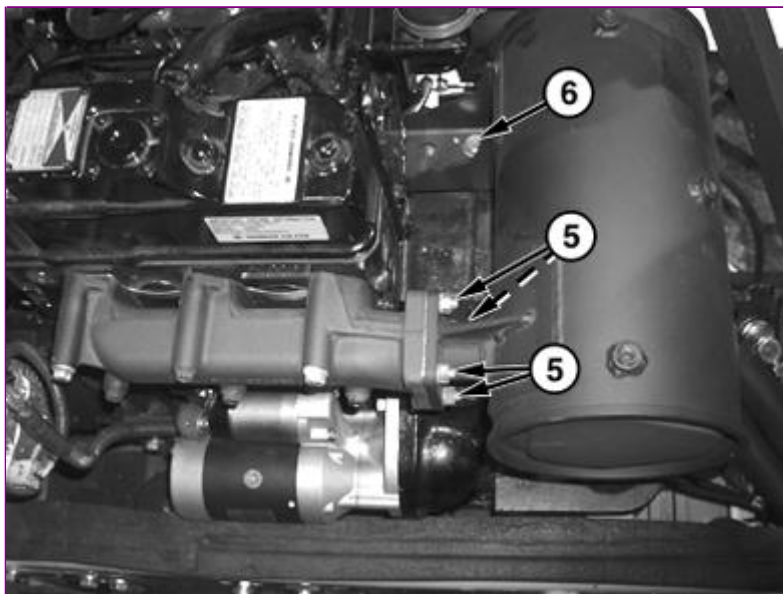
TM2356 - 27D Excavator Repair

Muffler Remove and Install

Muffler Remove and Install



1. T207371A-UN: Exhaust Pipe



T207372A-UN: Muffler

LEGEND:

- 1 - Frame Bracket
- 2 - Exhaust Pipe Clamp
- 3 - Muffer Heat Shield
- 4 - Exhaust Manifold Heat Shield
- 5 - Muffer-to-Exhaust Manifold Nut (4 used)
- 6 - Muffer Bracket Cap Screw

Park machine on level surface.

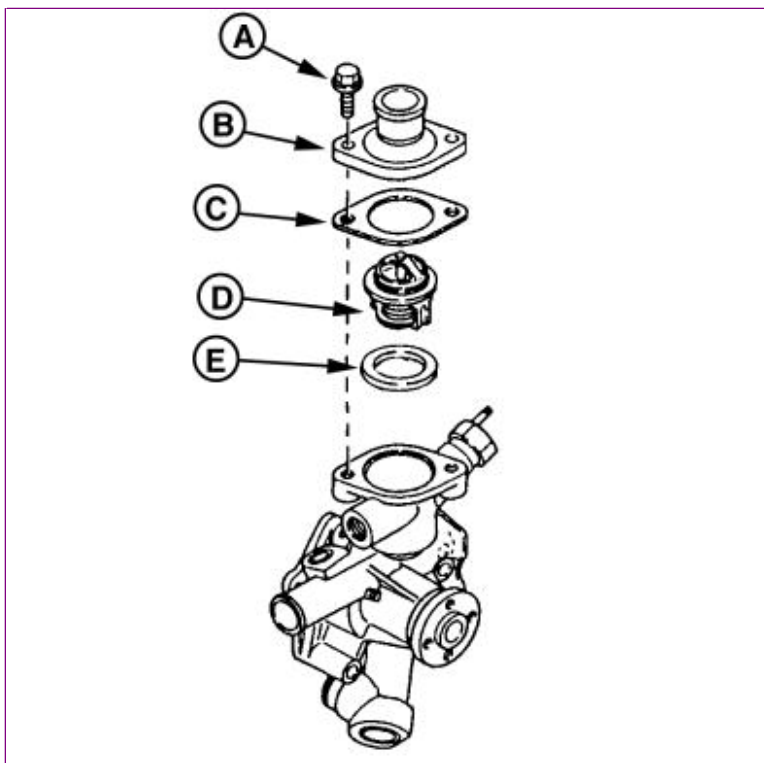
2. Remove counterweight. [See Counterweight Remove and Install](#) . (Group 1749.)
3. Remove left-side frame bracket (1).

4. Remove exhaust pipe clamp (2).
5. Remove heat shields to muffler (3) and exhaust manifold (4).
6. Remove four muffler-to-exhaust manifold nuts (5) and washers.
7. Remove muffler bracket cap screw (6) and remove muffler.
8. Install muffler gasket and muffler.
9. Install muffler bracket cap screw (6).
10. Install muffler-to-exhaust manifold nuts (5) and tighten.
11. Install heat shields to exhaust manifold (4) and muffler (3).
12. Install exhaust pipe clamp (2).
13. Install counterweight and left-side panels. [See Counterweight Remove and Install](#) . (Group 1749.)

TM2356 - 27D Excavator Repair

Thermostat Remove and Install

Thermostat Remove and Install



M82315A-UN: Thermostat

LEGEND:

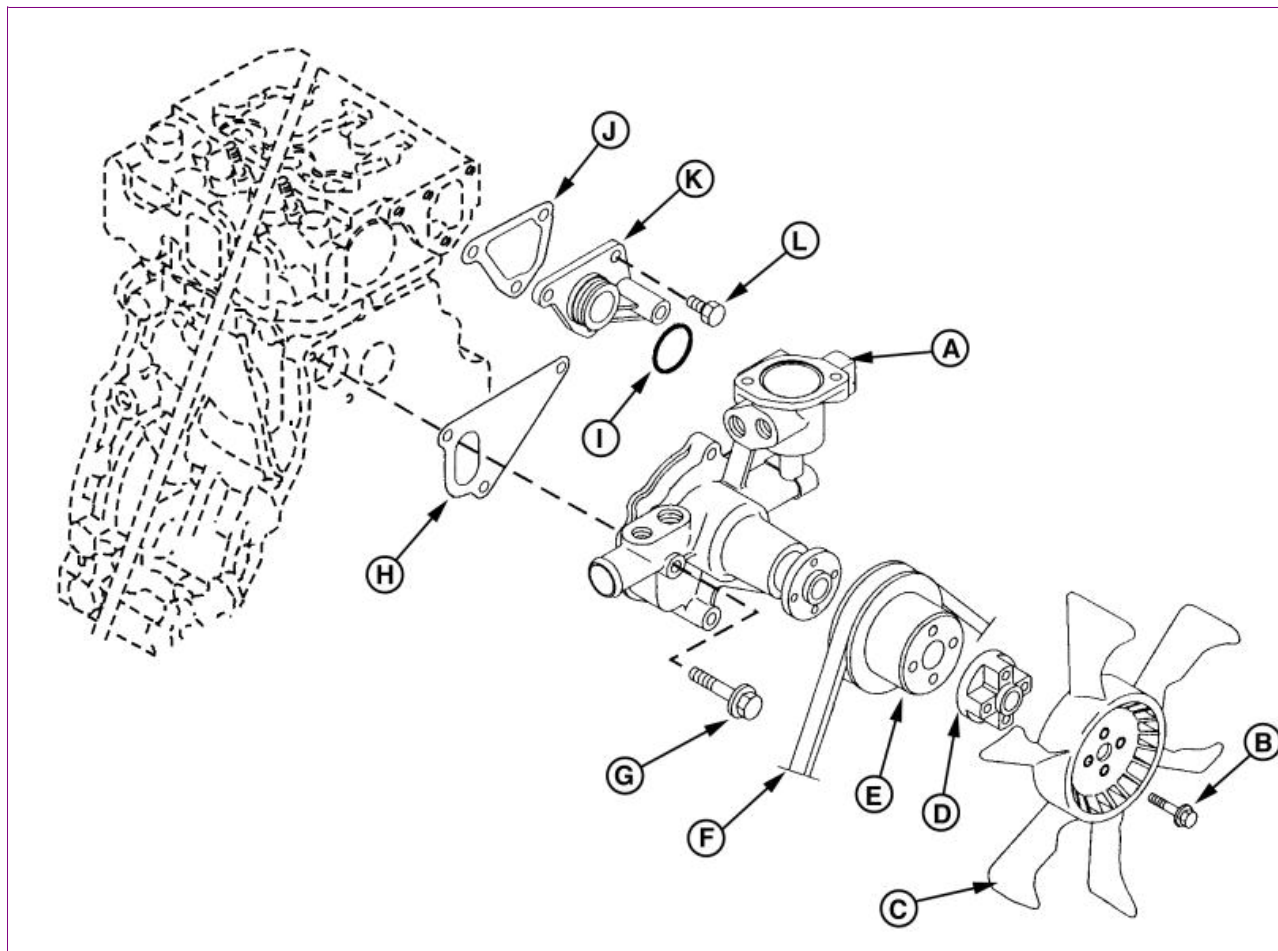
- A - Cap Screw
- B - Cover
- C - Cover Gasket
- D - Thermostat
- E - Gasket

1. Drain engine coolant. [See Draining Cooling System](#) . (Operator's Manual.)
2. Remove cap screws (A).
3. Remove cover (B), cover gasket (C), thermostat (D), and gasket (E).
4. Test thermostat. [See Engine Thermostat Test](#) . (Group 9010-25.)
5. At installation, replace gaskets.

Item	Measurement	Specification
Thermostat Cover Cap Screw	Torque	20 N·m 15 lb-ft

TM2356 - 27D Excavator Repair Water Pump Remove and Install

Water Pump Remove and Install



RG8583A-UN: Water Pump

LEGEND:

- A - Water Pump
- B - Fan-to-Water Pump Cap Screw (4 used)
- C - Fan
- D - Spacer
- E - Pulley
- F - Fan Belt
- G - Water Pump-to-Cylinder Head Cap Screw (4 used)
- H - Gasket
- I - O-Ring
- J - Gasket
- K - Ball Joint
- L - Cap Screw (3 used)

1. Remove radiator. [See Radiator Remove and Install](#) . (Group 0510.)
2. Remove thermostat and cover. [See Thermostat Remove and Install](#) . (Group 0400.)
3. Disconnect coolant temperature sensor leads.
4. Disconnect upper and lower radiator hoses.
5. Remove fan belt (F).
6. Remove cap screws (B), fan (C), spacer (D), and pulley (E).
7. Remove mounting cap screws (G), water pump (A), and gasket (H).
8. Remove cap screws (L), ball joint (K), gasket (J), and O-ring (I).
9. Installation is done in the reverse order of removal.

IMPORTANT:

At installation, replace all O-rings and copper washers.

Item	Measurement	Specification
Water Pump Mounting Cap Screws	Torque	26 N·m 230 lb-in.
Water Pump-to-Fan Mounting Cap Screws	Torque	11 N·m 97 lb-in.
Water Pump Plug	Torque	15 N·m 132 lb-in.

10. Adjust fan belt tension. [See Inspect Fan Belt, Check and Adjust Tension](#) . (Operator's Manual.)

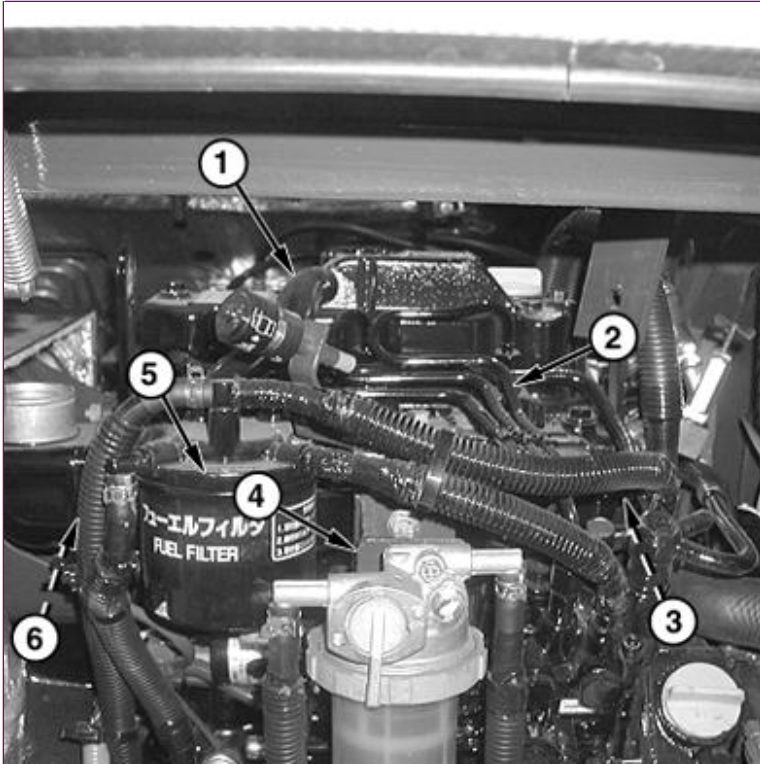
11. **IMPORTANT:**

Air must be expelled from cooling system when system is filled. Loosen coolant temperature sender or plug in thermostat housing to allow air to escape when filling system. Tighten sender or plug when all the air has been expelled.

Close drain valve and remove coolant temperature sender from engine. Fill radiator with proper coolant until coolant is present at temperature sender hole. Install temperature sender and continue to fill radiator to top of filler neck.

TM2356 - 27D Excavator Repair Intake Manifold Remove and Install

Intake Manifold Remove and Install



T217247A-UN: Intake Manifold

LEGEND:

- 1 - Breather Tube
- 2 - Fuel Injection Lines
- 3 - Intake Manifold Cap Screw (4 used)
- 4 - Fuel Filter Bracket
- 5 - Final Fuel Filter Housing
- 6 - Terminal Connection

1. Remove counterweight. [See Counterweight Remove and Install](#) . (Group 1749.)
2. Disconnect crankcase breather tube (1).
3. **IMPORTANT:**

Never steam clean or pour cold water on injection pump while the pump is running or warm. Doing so can damage the pump.

Clean the injection pump lines and area around the nozzles using a parts cleaning solvent or steam cleaner.

4. Loosen fuel injection line (2) connectors-to-nozzles slightly to release pressure in the fuel system.
5. Remove fuel injection lines.
6. Disconnect fuel filter bracket (4) from intake manifold.
7. Disconnect final fuel filter housing (5) from intake manifold.
8. Disconnect air intake heater terminal (6).

9. Remove intake manifold cap screws (3).
10. Remove intake manifold.
11. Clean cylinder head and intake manifold mounting surfaces.
12. Install intake manifold using new gasket.
13. Tighten cap screws to specification.

Item	Measurement	Specification
Intake Manifold Cap Screws	Torque	11 N·m 97 lb-in.

14. Connect air intake heater terminal.
15. Connect both fuel filters to intake manifold.
16. Install fuel injection lines.
17. Connect crankcase breather tube.



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