

Cooling System

Removal and Installation of Water Pump Assembly

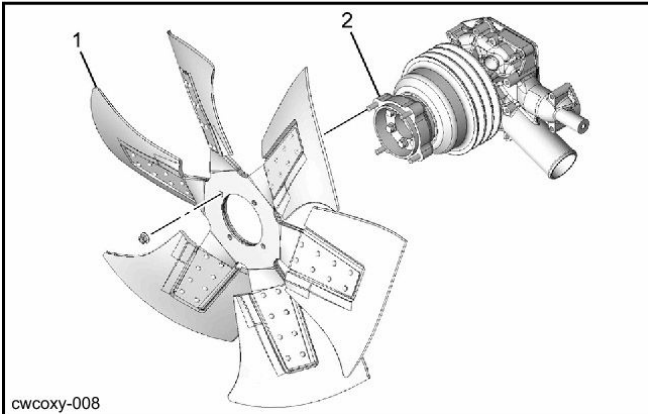
Water pump assembly Removal

1. Battery ground cable Disconnect
 - 1) Disengage the battery ground cable from the battery.
2. Coolant Drain
 - 1) Drain the coolant from the radiator.

⚠ CAUTION

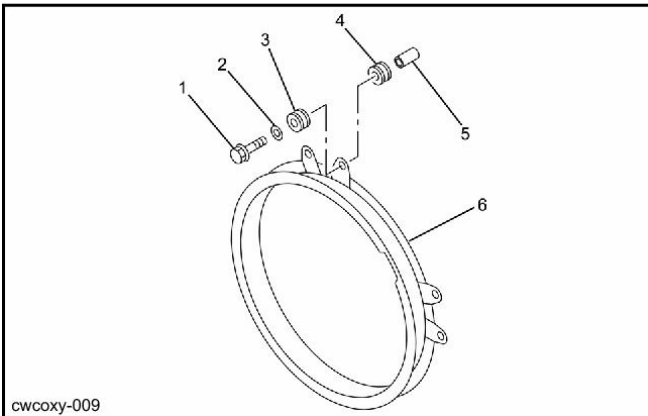
- After the coolant is discharged, make sure to tighten the drain plug.

3. Cooling fan Removal
 - 1) Remove the cooling fan from the adapter.



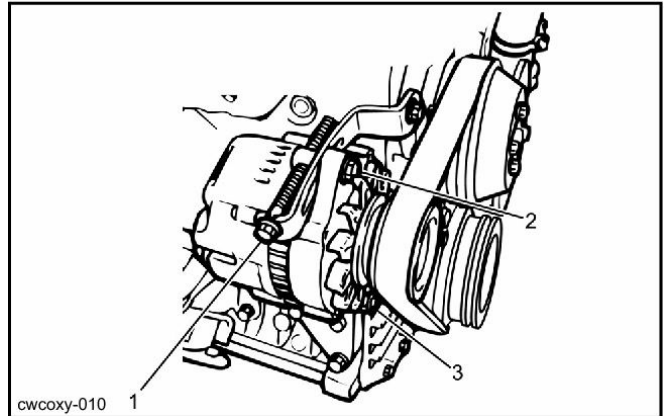
1	Cooling fan
2	Adapter

4. Fan guide Removal
 - 1) Remove the fan guide from the fan guide bracket.



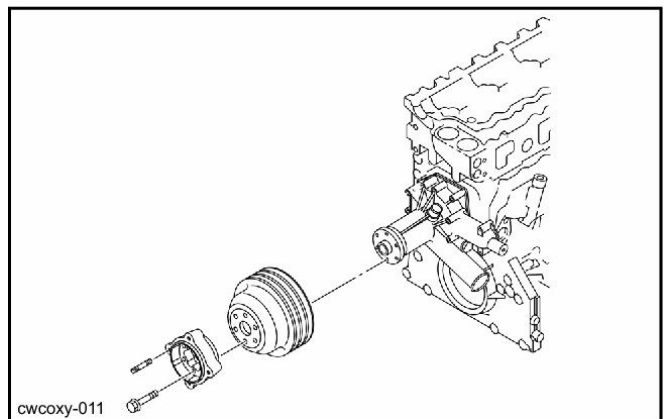
1	Bolt
2	Washer
3	Rubber mount
4	Rubber mount
5	Guide tube
6	Fan guide

- 2) Remove the fan guide bracket from the engine assembly.
5. Drive belt Removal
 - 1) Remove the drive belt from the engine assembly.

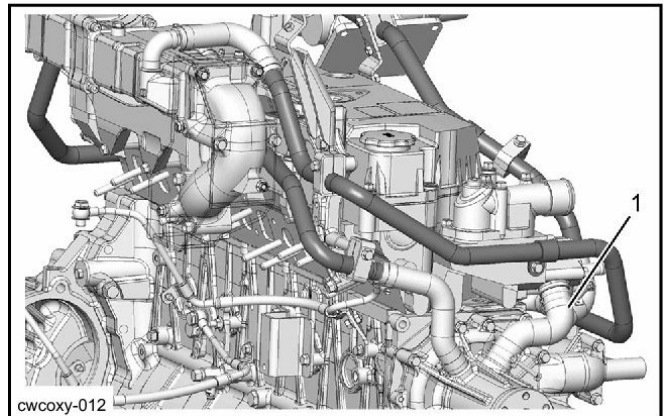


1	Adjust bolt
2	Fixing bolt
3	Fixing bolt

6. Water pump assembly Removal
 - 1) Remove the fan pulley from the water pump assembly.



- 2) Remove the water bypass hose from the water pump assembly and the water duct.



1	Water bypass hose
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- 3) Remove the water hose from the EGR cooler water pipe and the water pump assembly.
- 4) Remove the water pump assembly from the gear case cover cover.

Water pump assembly Installation

1. Water pump assembly Installation

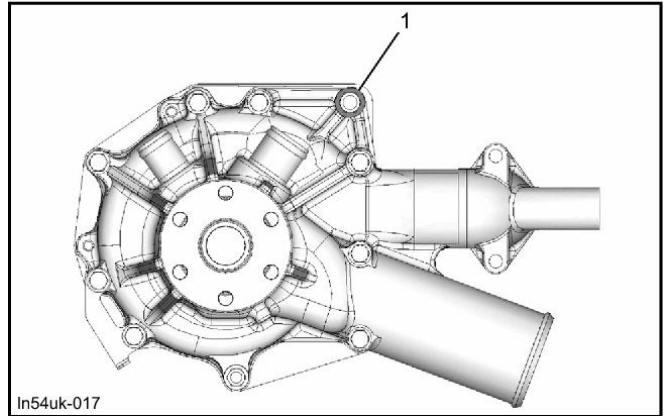
- 1) Install the water pump assembly to the gear case cover cover.

⚠ CAUTION

- Use new gaskets.

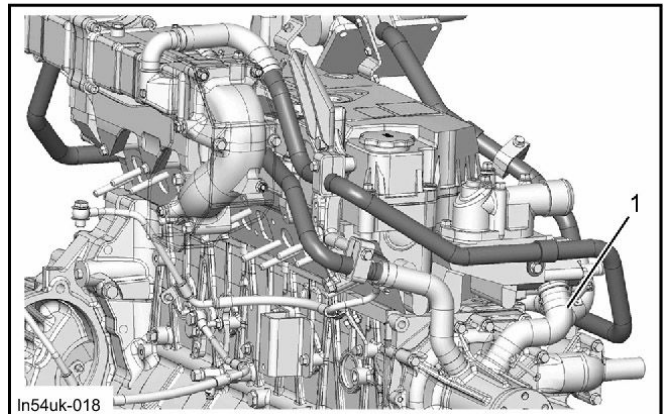
Tightening torque : 39 N· m {4.0 kgf· m / 28.8 lb· ft} Nut in the diagram

Tightening torque : 20 N· m {2.0 kgf· m / 14.8 lb· ft}



1	Nut
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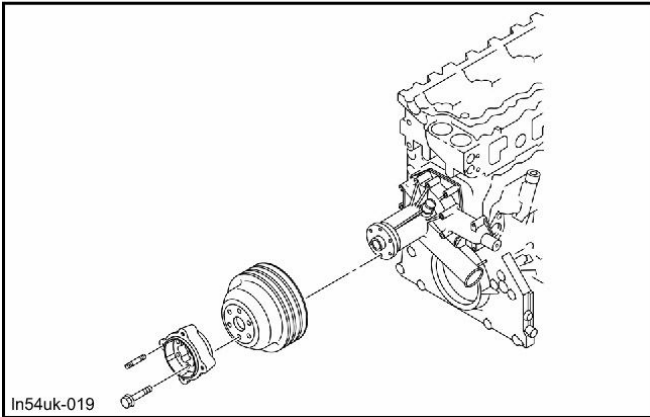
- 2) Install the water hose to the EGR cooler water pipe and the water pump assembly.
- 3) Install the water bypass hose to the water pump assembly and the water duct.



1	Water bypass hose
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- 4) Install the fan pulley to the water pump assembly.
Tightening torque : 52 N· m {5.3 kgf· m / 38.4 lb· ft}



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2. Drive belt Installation

- 1) Install the drive belt to the engine assembly.

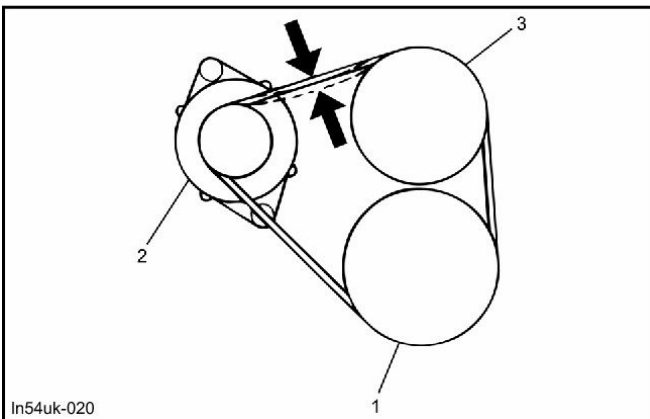
3. Drive belt Adjustment

- 1) Press the drive belt.

ANNOTATION:

- Measure the amount of drive belt flex by pressing on the point indicated by the arrow in the diagram with the specified pressure.

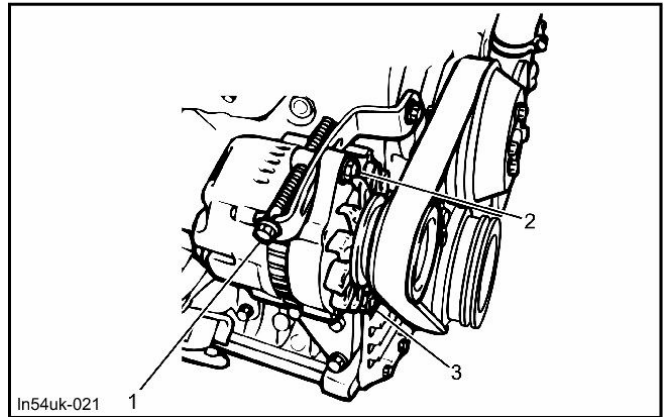
Standard value : 98.0 N {10.0 kg / 22 lb}
Specified value : 5.5 - 7.5 mm {0.2165 - 0.2953 in} Amount of flex



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1	Crankshaft pulley
2	Generator
3	Fan pulley

- 2) Adjust the drive belt to standard value using the adjust bolt.
Tightening torque : 75 N· m {7.6 kgf· m / 55.3 lb· ft} Nut of the adjust plate
Tightening torque : 126 N· m {12.8 kgf· m / 92.9 lb· ft} Bolt of the bracket side

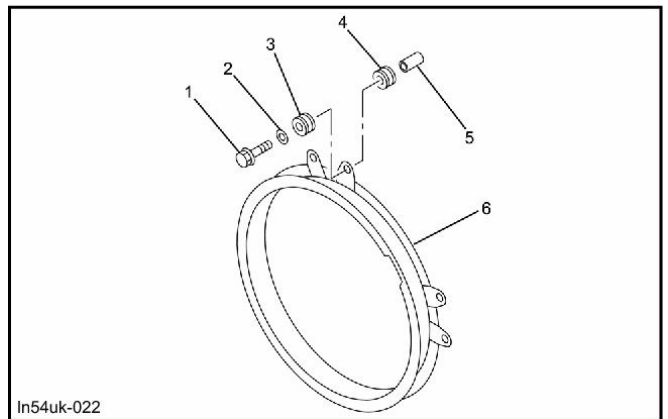


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1	Adjust bolt
2	Adjust plate side nut
3	Bracket side bolt

4. Fan guide Installation

- 1) Install the fan guide bracket to the engine assembly.
Tightening torque : 40 N· m {4.1 kgf· m / 29.5 lb· ft}
- 2) Install the fan guide to the fan guide bracket.
Tightening torque : 30 N· m {3.1 kgf· m / 22.1 lb· ft}



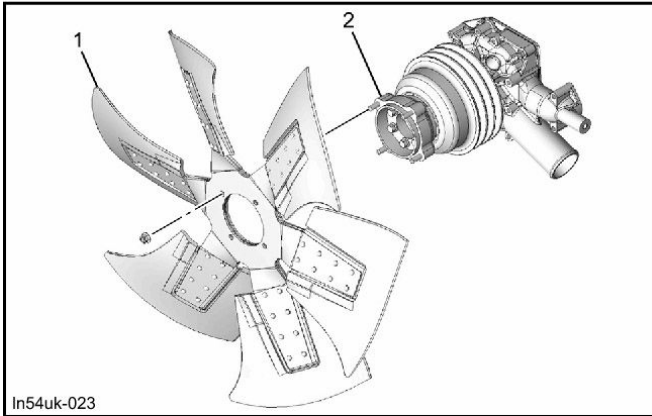
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1	Bolt
2	Washer
3	Rubber mount
4	Rubber mount
5	Guide tube
6	Fan guide

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5. Cooling fan Installation

- 1) Install the cooling fan to the adapter.



1	Cooling fan
2	Adapter

Tightening torque : 52 N· m {5.3 kgf· m / 38.4 lb· ft}

6. Coolant Filling

- 1) Loosen the valve using a wrench.
- 2) Replenish the coolant with the radiator.

⚠ CAUTION

- Be careful not to let coolant overflow splash on the exhaust system parts.
- Coolant overflow should be wiped off.

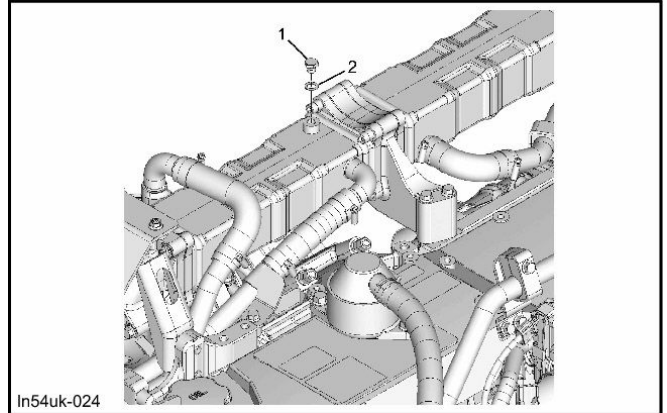
- 3) Tighten the valve using a wrench.

⚠ CAUTION

- Use new gaskets.

Tightening torque : 22 N· m {2.2 kgf· m / 16 lb· ft}

- 4) Replenish the coolant with the radiator.



1	Valve
2	Gasket

7. Battery ground cable Connect

- 1) Connect the battery ground cable to the battery.

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Water pump assembly Inspection

1. Water pump assembly Inspection

- 1) Inspect the water pump assembly.

ANNOTATION:

- Cracks and damage on the water pump body
- Cracks and corrosion on the impeller
- Water leak from the seal unit

CAUTION

- If any abnormality is found in the inspection, replace the water pump assembly.

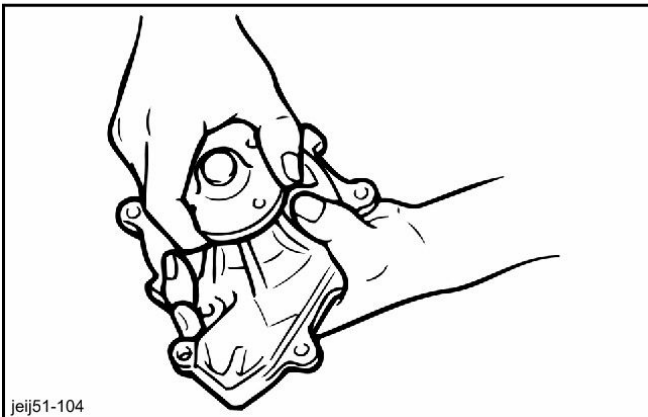
- 2) Inspect the bearing unit.

ANNOTATION:

- Rotate the fan while pushing the fan center to the radius direction and inspect for any significant looseness or abnormal sounds.

CAUTION

- If any abnormality is found in the inspection, replace the water pump assembly.



Removal and Installation of Thermostat

Thermostat Removal

1. Battery ground cable Disconnect

- 1) Disengage the battery ground cable from the battery.

2. Coolant Drain

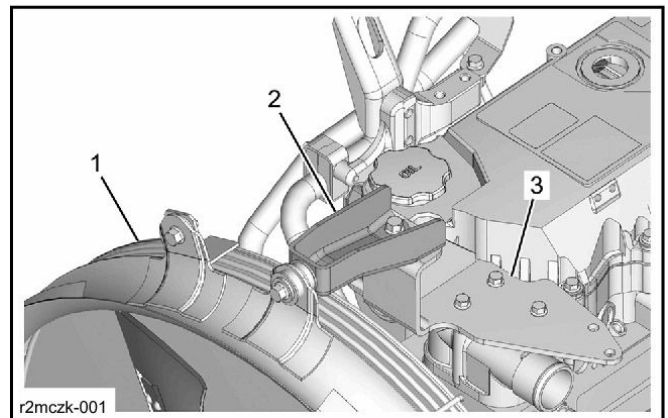
- 1) Drain the coolant from the radiator.

CAUTION

- After the coolant is discharged, make sure to tighten the drain plug.

3. Thermostat Removal

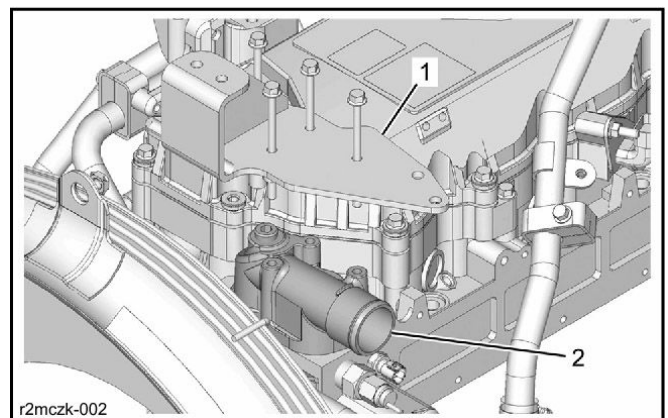
- 1) Remove the fan guide stay from the fan guide and the fan guide bracket.



1	Fan guide
2	Fan guide stay
3	Fan guide bracket

- 2) Disengage the radiator upper hose from the water outlet pipe.

- 3) Remove the water outlet pipe from the cylinder head assembly.



1	Fan guide bracket
2	Water outlet pipe

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- 4) Remove the thermostat from the cylinder head assembly.
- 5) Remove the gasket from the thermostat.

Thermostat Installation

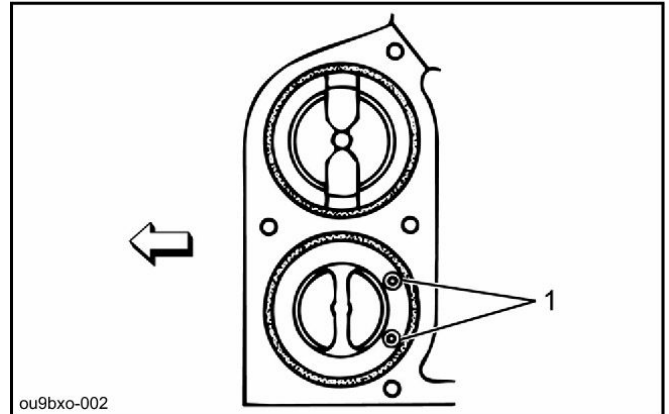
1. Thermostat Installation

- 1) Install the gasket to the thermostat.

⚠ CAUTION

- Use new gaskets.

- 2) Install the thermostat to the cylinder head assembly.

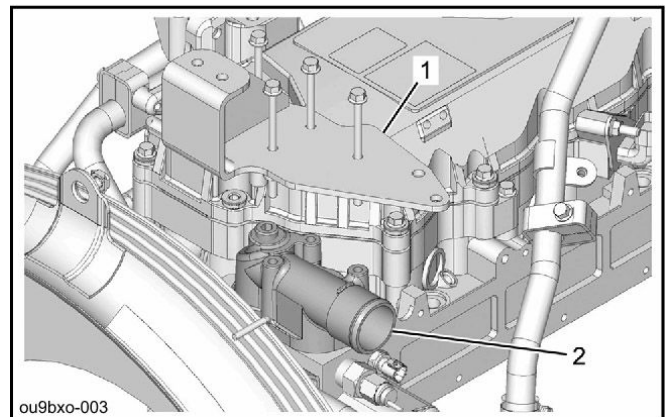


1	Jiggle valve position
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⚠ CAUTION

- Be careful not to mistake the assembly position and direction.

- 3) Install the water outlet pipe to the cylinder head assembly.
Tightening torque : 25 N·m {2.5 kgf·m / 18.4 lb·ft}

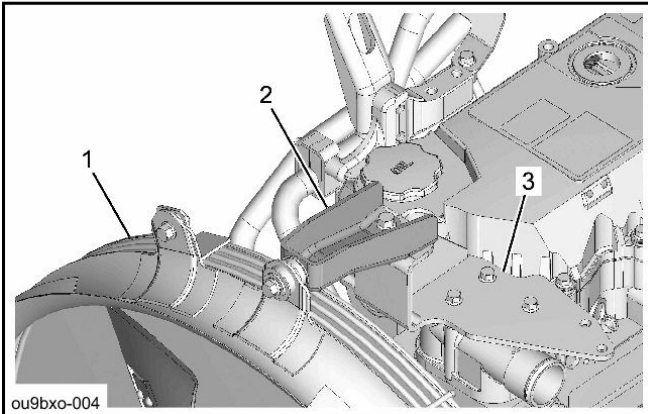


1	Fan guide bracket
2	Water outlet pipe

- 4) Connect the radiator upper hose to the water outlet pipe.
- 5) Install the fan guide stay to the fan guide bracket.
Tightening torque : 40 N·m {4.1 kgf·m / 29.5 lb·ft}

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- 6) Install the fan guide stay to the fan guide.
Tightening torque : 30 N· m {3.1 kgf· m / 22.1 lb· ft}



1	Fan guide
2	Fan guide stay
3	Fan guide bracket

2. Coolant Filling

- 1) Loosen the valve using a wrench.
- 2) Replenish the coolant with the radiator.

⚠ CAUTION

- Be careful not to let coolant overflow splash on the exhaust system parts.
- Coolant overflow should be wiped off.

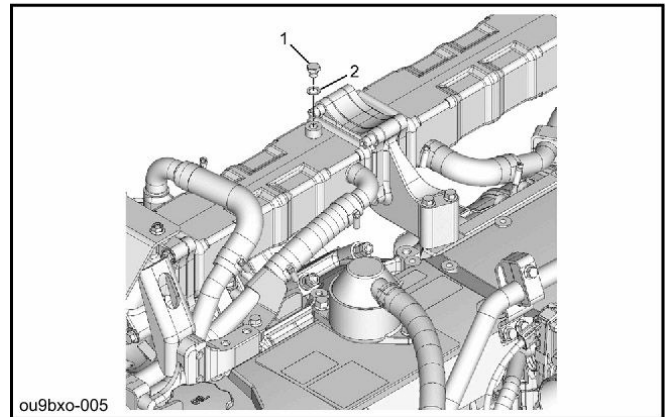
- 3) Tighten the valve using a wrench.

⚠ CAUTION

- Use new gaskets.

Tightening torque : 22 N· m {2.2 kgf· m / 16 lb· ft}

- 4) Replenish the coolant with the radiator.



1	Valve
2	Gasket

3. Battery ground cable Connect

- 1) Connect the battery ground cable to the battery.

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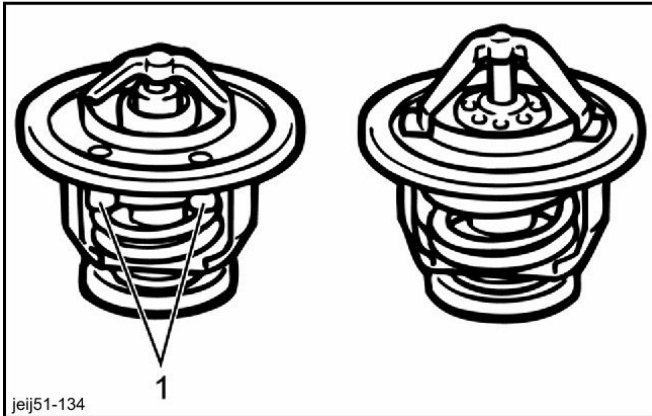
Thermostat Inspection

1. Thermostat Inspection

1) Inspect the thermostat.

ANNOTATION:

- Inspect the pellet, spring, shaft, jiggle valve, and crimped sections for damage.



1	Jiggle valve
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2) Prepare the container.

ANNOTATION:

- Put water and the thermostat into a heatable container.

3) Raise the water temperature.

ANNOTATION:

- In order to equalize the water temperature in the container, stir well.

CAUTION

- Do not heat the thermostat directly.

4) Measure the water temperature using the thermometer.

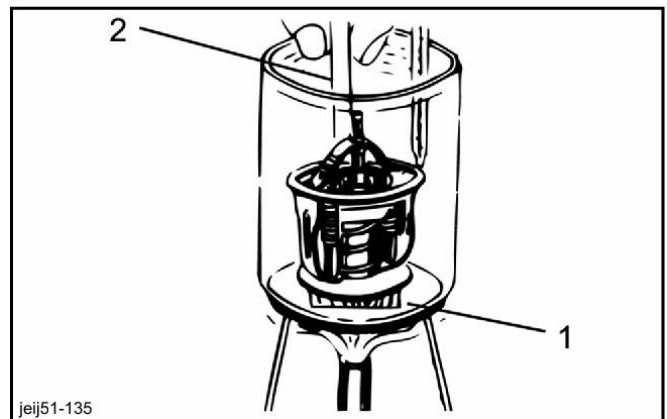
ANNOTATION:

- Measure open valve temperature of the thermostat.

Valve opening temperature : 80 - 84 °C { 176 - 183 °F }

Temperature when fully open : 90.0 °C { 194 °F }

Lift amount : 8.0 mm { 0.3150 in }



1	Piece of wood
2	Stirring rod

Cooling System

Coolant Inspection

1. Coolant Inspection

⚠ WARNING

- If the coolant temperature is high, do not perform the inspection.
- When removing the cap, be careful as the coolant will burst out if the coolant temperature is high.

⚠ CAUTION

- Be sure to use long life coolant which is specified or recommended by Isuzu.
- Using at an unspecified concentration may result in freezing due to decreased anti-freezing performance.
- Use a coolant concentration appropriate for the usage environment.

ANNOTATION:

- Before using, dilute the specified long life coolant to the specified concentration with soft tap water.

Area where the equipment is used	LLC concentration
General area; Area where the lowest temperature is higher than (-12) degrees.	: 30 %
Cold area; Area where the lowest temperature is (-30) degrees.	: 50 %
Area where temperature drop to (-30) degrees.	: 55 %

- 1) Inspect the radiator reverse tank.

ANNOTATION:

- If coolant level is MIN or less, add it until it reaches MAX.

⚠ CAUTION

- When adding coolant, use coolant appropriate for the usage environment.

Volume of coolant : 16.0 L {4.2 US gal}

- 2) Inspect the water leak using the radiator cap tester.

Inspection pressure : 200.0 kPa {2.04 kgf/cm² / 29 psi}

ANNOTATION:

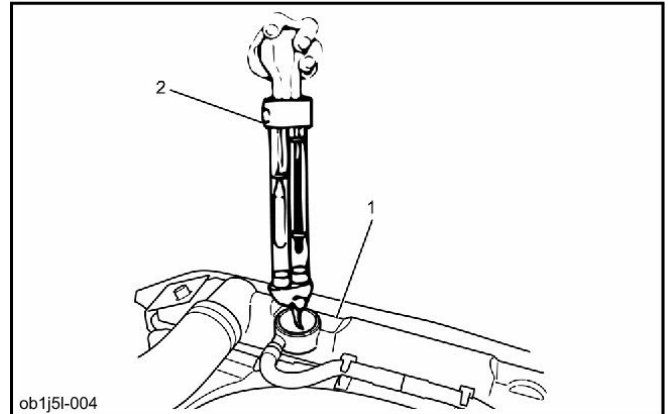
- Inspection locations
- Radiator assembly
- Water pump assembly
- Radiator hose
- Heater hose

- 3) Measure the specific gravity using the hydrometer.

Engine coolant temperature : 0 - 50 °C {32 - 122 °F} For inspection

ANNOTATION:

- Use a container that is deeper than the length of the hydrometer.

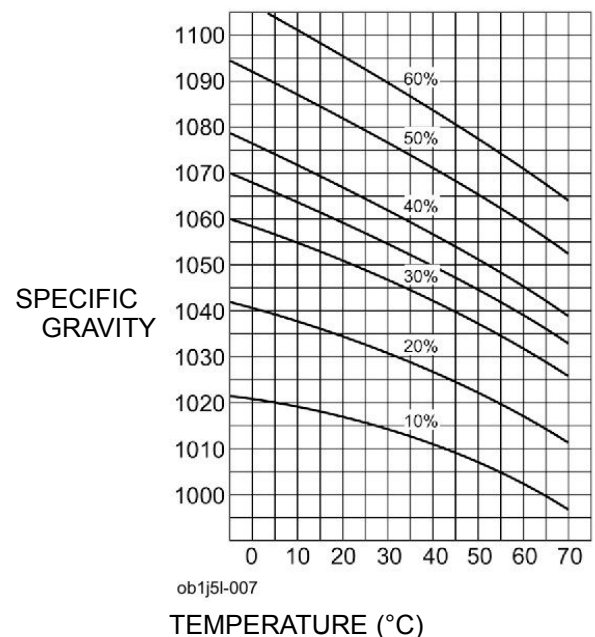


1	Radiator
2	Hydrometer

- 4) Measure the temperature using the thermometer.

Engine coolant temperature : 0 - 50 °C {32 - 122 °F} For inspection

- 5) Calculate the concentration from the measured value.



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ANNOTATION:

- Measuring the coolant concentration using a coolant scope is also possible.