

ENGINE TUNING

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1 ENGINE COOLANT

WARNING

- Never open the radiator cap when the engine is still hot. Failure to observe this caution will cause you to get scalded.
- The inside of the radiator is under a pressurized condition when the cooling water is hot. Therefore, if the radiator cap should be removed, the cooling water will blow off, possibly causing injuries such as scald.

CAUTION

- As regards water to be used as cooling water, use soft water which does not contain salts of minerals, calcium, magnesium, and so forth.
- Here, the coolant refers to the mixture of water and antifreeze of a reliable brand that has been mixed in accordance with the instructions of the antifreeze manufacturer.

ET-COL-Z-Z-00002

1-2 INSPECTION

1-2-1 CHECK OF ENGINE COOLANT LEVEL

1. Check to see if the engine coolant level is between the Low and Full of the reserve tank.
2. If the engine coolant level is near the low or below the low level, add the coolant up to the full level.

NOTE

- If no engine coolant is present in the reserve tank or the coolant level is very low, check for water leakage, using a radiator cap tester.

1-2-2 CHECK OF ENGINE COOLANT LEAKAGE

1. Start the engine. Check to see if the leakage is presented from the radiator, water pump, radiator hoses and/or heater hoses while the engine runs at idle speed. Check to see if the no leakage is presented using the radiator cap tester while applying a pressure after the engine has been stopped.

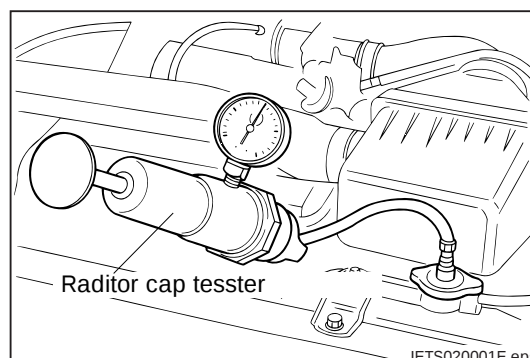
WARNING

- If the radiator cap should be removed, be very careful not to blow out the hot engine coolant.

SPECIFIED VALUE: 122.7 kPa

TOOL: Radiator cap tester

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ET-COL-C-L-00002

1-2-3 CHECK OF ENGINE COOLANT QUALITY

1. Check to see if the engine coolant is dirty.

Check the concentration of the engine coolant, using concentration checker.

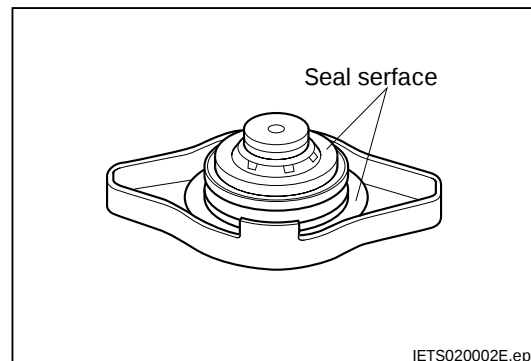
NOTE

- Change the engine coolant if it is excessively dirty.
- Here, the engine coolant refers to the mixture of water and antifreeze of a reliable brand that has been mixed in accordance with the instructions of the antifreeze manufacturer.

ET-COL-C-Q-00002

1-2-4 RADIATOR CAP

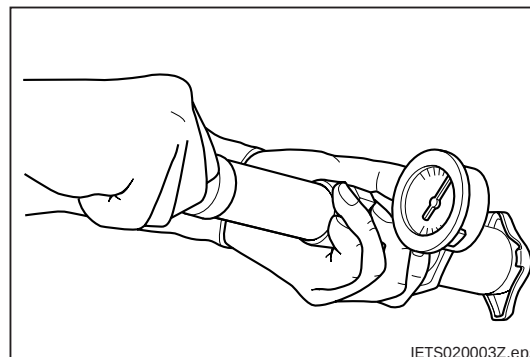
1. Remove the radiator cap and check it for the damage and dart at the seal packing portion. And also, check the valve at vacuum side is functioning properly lifting it with your fingers.



2. Check the radiator cap by means of a radiator cap tester to see if the relief valve opens at the specified pressure.
SPECIFIED VALUE: 108.0 ± 14.7 kPa

NOTE

- Apply the water to the seal portion of the radiator cap, when the radiator cap should be adapted to the radiator cap tester.



1-3 CHANGE ENGINE COOLANT

1-3-1 CLEANING OF ENGINE COOLANT CIRCUIT

1. Drain the engine coolant.
2. Fill the water and warm up the engine.
3. Stop the engine and drain the water.
4. Repeat the above steps 1. through 3. two or three times.

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1-3-2 DRAIN ENGINE COOLANT

1. Remove the radiator cap.
2. Drain the engine coolant by removing the drain plug located at the lower side of the radiator.
3. Install the drain plug to the radiator and tighten it.

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1-3-3 FILL ENGINE COOLANT

1. Fill the radiator with the engine coolant in accordance with the instructions of the manufacturer of the antifreeze solution and warm up the engine.
2. While the engine is warming up, check to see if the leakage is presented.
3. Cool down the engine after the engine has been warmed up.
Fill the engine coolant if the engine coolant level is low by checking it.

Engine type				
K3-VET	Reserve tank LOW/FULL		0.25/0.9 ℓ	
	Total capacity	Automatic	4.3 ℓ	This figure includes the heater capacity, but not the reserve tank capacity.
K3-VE	Reserve tank LOW/FULL		0.25/0.9 ℓ	
	Total capacity	Manual	4.1 ℓ	This figure includes the heater capacity, but not the reserve tank capacity.
		Automatic	4.0 ℓ	
EJ-DE EJ-VE	Reserve tank LOW/FULL		0.25/0.45 ℓ	
	Total capacity	Manual	3.0 ℓ	This figure includes the heater capacity, but not the reserve tank capacity.
		Automatic	2.9 ℓ	

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ET-COL-R-R-00003

2 ENGINE OIL

2-1 INSPECTION

2-1-1 CHECK OF ENGINE OIL QUALITY

1. Pull out the oil level gauge.
2. Check the engine oil for deterioration, ingress of water, discoloring or dilution.
If oil quality is poor, change the engine oil.

NOTE

- Use API grade SH or higher multi-grade viscosity, fuel efficient oil.

ET-EGO-C-C-00002

2-2 CHANGE OF ENGINE OIL

WARNING

- Never touch the cylinder block, exhaust manifold and/or the engine oil. Failure to observe this caution will cause you get scalded.
- Operate the engine in a well-ventilated area to avoid the damage of carbon monoxide.
- Protect your eyes by wearing safety goggles.

	Engine type	Capacity <i>ℓ</i>
Engine oil	K3-VET/K3-VE	With oil filter: 3.6 Without oil filter: 3.3
	EJ-DE/EJ-VE	With oil filter: 2.3 Without oil filter: 2.1

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3 SPARK PLUG

3-1 INSPECTION

3-1-1 MEASUREMENT OF ELECTRODE GAP

- 1. Measure the electrode gap, using the plug gap gauge.
If the electrode gap is not within the specifications, adjust the gap by bending the base of the ground electrode, being careful not to touch the tip.

	K3-VET	
Manufacturer	DENSO	NGK
Type	PK20PTR-S9	BKUR6EKPA
Electrode gap (mm)	0.8 - 0.9	←
Width across flats (mm)	16	←

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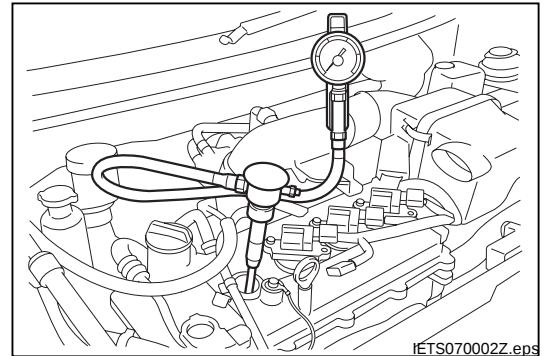
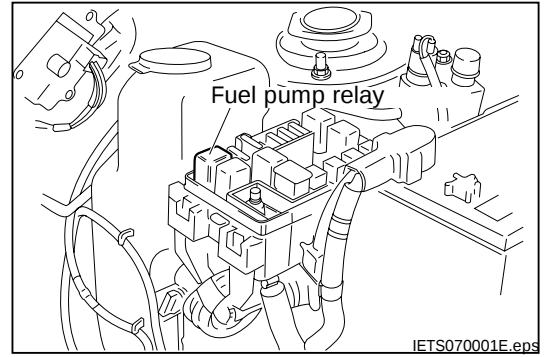
CAUTION

- All four plugs should be the same heat range and be once manufactured by the same manufacturer.

4 COMPRESSION PRESSURE

4-1 INSPECTION

1. Warm up the engine thoroughly.
Stop the engine and remove all ignition coils and spark plugs.
2. Remove the fuel pump relay.
3. Insert a compression gauge into the spark plug hole.
Depress the accelerator pedal fully.
While cranking the engine, measure the compression pressure.



SPECIFIED VALUE: Compression pressure
(330rpm, difference between cylinders: Not to exceed 147 kPa)

	Specified Value (kpa)	Limit (kpa)
K3-VET	1196	902

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NOTE

- Be sure to use a fully-charged battery. Also the measurement should be performed in the shortest possible length of time.

ET-CMP-C-Z-00003