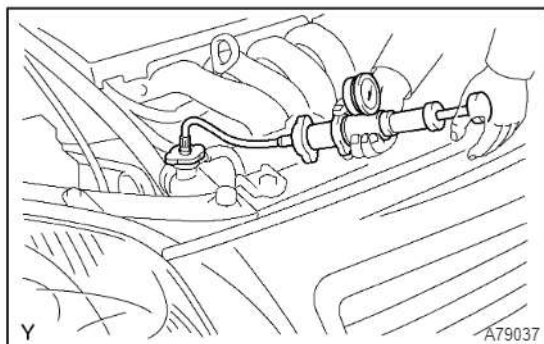


COOLING SYSTEM (1ZZ-FE/3ZZ-FE)(From February, 2004)

ON-VEHICLE INSPECTION



1. INSPECT COOLING SYSTEM FOR LEAKS

CAUTION:

To avoid the danger of being burned, do not remove the radiator cap while the engine and radiator are still hot. Thermal expansion will cause hot engine coolant and steam to blow out from the radiator.

- Remove the radiator support opening cover.
- Remove the engine room cover side.
- Fill the radiator with coolant, then attach a radiator cap tester.
- Warm up the engine.
- Pump it to 118 kPa (1.2 kgf/cm², 17.1 psi), then check that the pressure does not drop.

If the pressure drops, check the hoses, radiator and water pump for leaks. If there are no signs or traces of external coolant leaks, check the heater core, cylinder block and head.

- Reinstall the engine room cover side.
- Reinstall the radiator support opening cover.

2. CHECK ENGINE COOLANT LEVEL AT RESERVOIR

- The engine coolant level should be between the "LOW" and "FULL" lines when the engine is cold.

HINT:

If low, check for leaks and add "Toyota Super Long Life Coolant" or similar high quality ethylene glycol based non-silicate, non-amine, non-nitrite, and non-borate coolant with long-life hybrid organic acid technology up to the "FULL" line.

3. CHECK ENGINE COOLANT QUALITY

- Remove the radiator cap.

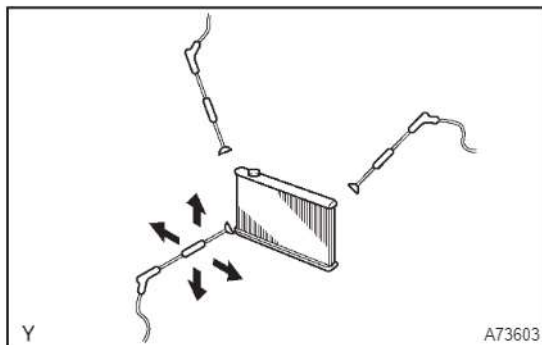
CAUTION:

To avoid the danger of being burned, do not remove the radiator cap while the engine and radiator are still hot. Thermal expansion will cause hot engine coolant and steam to blow out from the radiator.

- Check around the radiator cap and radiator filler hole for any excessive deposits of rust or scale. The coolant should be free from oil.

If excessively dirty, replace the coolant.

- Reinstall the radiator cap.



4. INSPECT FINS BLOCKAGE

- (a) If the fins are clogged, wash them with water or a steam cleaner, then dry with compressed air.

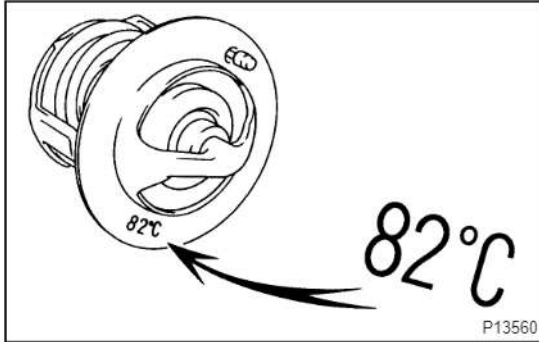
NOTICE:

- If the distance between the steam cleaner and the core is too close, there is a possibility of damaging the fins, so keep the following injection distance.

Injection Pressure kPa (kgf/cm ² , psi)	Injection Distance mm (in.)
2,942 to 4,903 (30 to 50, 427 to 711)	300 (11.811)
4,903 to 7,845 (50 to 80, 711 to 1,138)	500 (19.685)

- If the fins are bent, straighten them with a screwdriver or pliers.
- Be careful not to expose the electronic components to water.

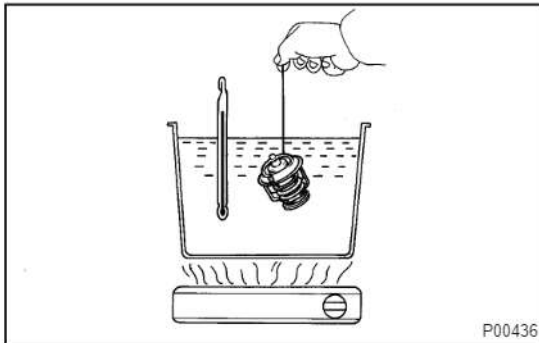
INSPECTION



1. INSPECT THERMOSTAT

HINT:

The valve opening temperature is inscribed on the thermostat.



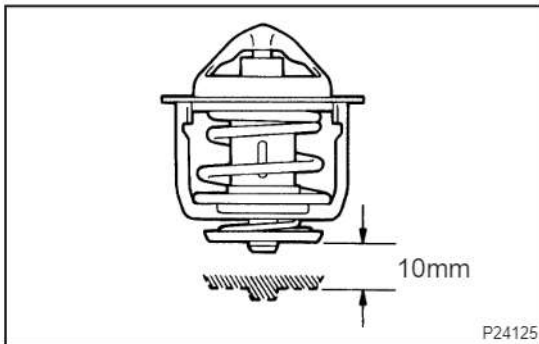
(a) Immerse the thermostat in water, then gradually heat the water.

(b) Check the valve opening temperature.

Valve opening temperature:

80 to 84°C (176 to 183°F)

If the valve opening temperature is not as specified, replace the thermostat.



(c) Inspect the valve lift.

Valve lift: 10 mm (0.39 in.) or more at 95°C (203°F)

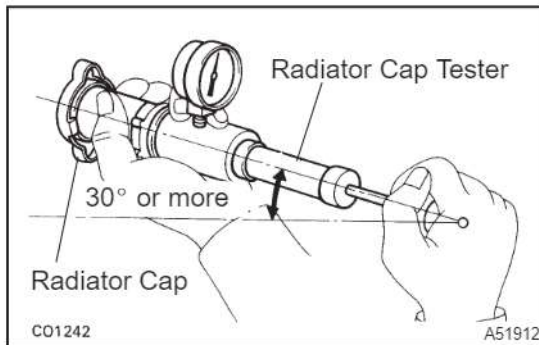
If the valve lift is not as specified, replace the thermostat.

(d) Check that the valve is fully closed when the thermostat is at low temperatures (below 77°C (171°F)).

If not fully closed, replace the thermostat.

2. INSPECT RADIATOR CAP SUB-ASSY**NOTICE:**

- If the radiator cap is contaminated, rinse it with water.
- Before using a radiator cap tester, wet the relief valve and the pressure valve with engine coolant or water.
- When performing the following steps (a) and (b), keep the tester at an angle of over 30° or more above the horizontal.



- (a) Using a radiator cap tester, slowly pump the tester, then check that air is coming from the vacuum valve.

Pumping speed: 1 push / 3 seconds or more

NOTICE:

Push the pump at a constant speed.

If air is not coming from the vacuum valve, replace the radiator cap.

- (b) Pump the tester, then measure the relief valve opening pressure.

Pumping speed: 1 push within 1 second

NOTICE:

The above pumping speed is for the first pumping only (in order to close the vacuum valve). After the first pumping, the pumping speed can be reduced.

Standard opening pressure:

74 to 103 kPa (0.75 to 1.05 kgf/cm², 10.7 to 14.9 psi)

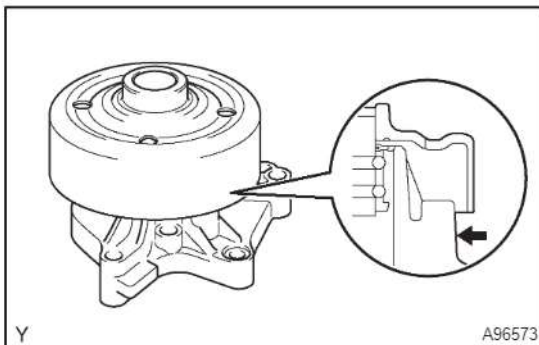
Minimum opening pressure:

59 kPa (0.6 kgf/cm², 8.6 psi)

If the opening pressure is less than minimum, replace the radiator cap.

HINT:

Use the tester's maximum reading as the opening pressure.

**3. INSPECT WATER PUMP ASSY**

- (a) Check the area of the water pump assembly indicated in the illustration for traces of coolant leakage.

If leakage is found, replace the water pump.

ENGINE COOLANT (1ZZ-FE/3ZZ-FE)(From February, 2004)

REPLACEMENT

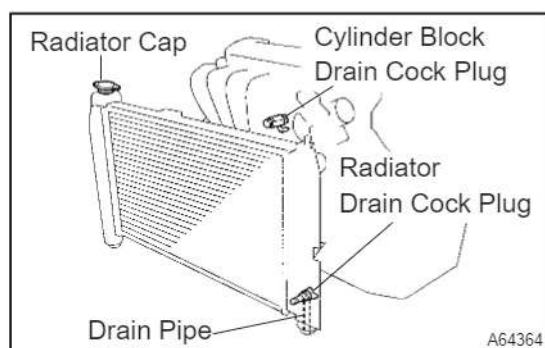
160M11-02

1. DRAIN ENGINE COOLANT

CAUTION:

To avoid the danger of being burned, do not remove the radiator cap while the engine and radiator are still hot. Thermal expansion will cause hot engine coolant and steam to blow out from the radiator.

- (a) Remove the radiator cap.



- (b) Loosen the radiator drain cock plug and cylinder block drain cock plug, and drain engine coolant.
 (c) Close the radiator drain cock plug.
 (d) Close the cylinder block drain plug.

Torque: 13 N·m (130 kgf·cm, 9 ft·lbf) for engine

2. ADD ENGINE COOLANT

- (a) Tighten the radiator drain plug, then pour coolant into radiator until it overflows.

Capacity:

Transmission Type	Steering	Coolant Capacity [liters (US gts, Imp. gts)]
M/T	LHD	5.8 (6.1, 5.1)
M/T	RHD	5.9 (6.2, 5.2)
A/T	LHD	5.7 (6.0, 5.0)
A/T	RHD	5.8 (6.1, 5.1)

HINT:

- Improper coolants may damage the engine cooling system.
- Use only "Toyota Super Long Life Coolant" or similar high quality ethylene glycol based non-silicate, non-amine, non-nitrite, and non-borate coolant with long-life hybrid organic acid technology (coolant with long-life hybrid organic acid technology consists of the combination of low phosphates and organic acids).
- New Toyota vehicles are filled with Toyota Super Long Life Coolant. When replacing the coolant, Toyota Super Long Life Coolant is recommended.
- Observe the coolant level inside the radiator by pressing the inlet and outlet radiator hoses several times by hand. If the coolant level goes down, add the coolant.

NOTICE:

Do not use plain water alone.

- (b) Tighten the radiator cap.
 (c) Pour engine coolant into the reservoir tank until it reaches the full line.

(d) Warm up the engine until the thermostat valve begins to open.

HINT:

Press the radiator inlet and outlet hose several times by hand while warming up the engine.

(e) Stop the engine and wait until the coolant temperature gets cold. Then remove the radiator cap to check the coolant level.

- If the level goes down, perform the procedures from (a) through (e) again.
- If the level does not go down, fill the reservoir tank with engine coolant.

3. CHECK FOR ENGINE COOLANT LEAKS (See page 16-1)