

2005 ENGINE**Cooling - RAV4****COOLANT****INSPECTION****1. CHECK ENGINE COOLANT LEVEL AT RADIATOR RESERVOIR**

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

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. Do not use plain water alone.

2. CHECK ENGINE COOLANT QUALITY

- a. Remove the radiator cap from the water outlet.

CAUTION: To avoid the danger of being burned, do not remove the radiator cap while the engine and radiator are still hot, as fluid and steam can be blown out under pressure.

- b. There should not be any excessive deposits of rust or scale around the radiator cap or water outlet filler hole, and the coolant should be free from oil.

If excessively dirty, clean the coolant passages and replace the coolant.

- c. Reinstall the radiator cap.

REPLACEMENT

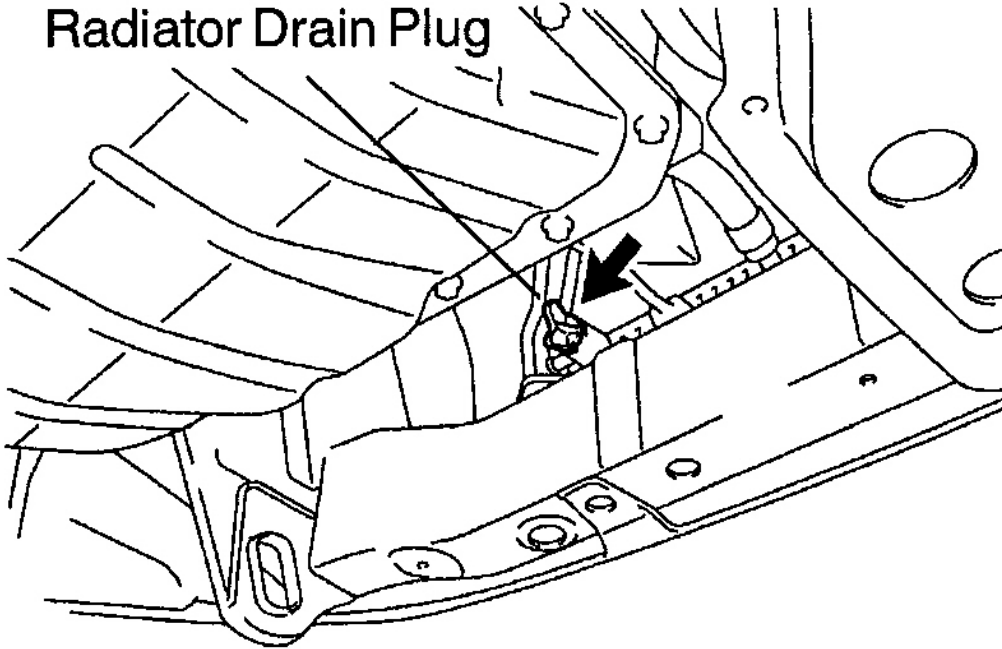
CAUTION: To avoid the danger of being burned, do not remove the radiator cap while the engine and radiator are still hot, as fluid and steam can be blown out under pressure.

1. DRAIN ENGINE COOLANT

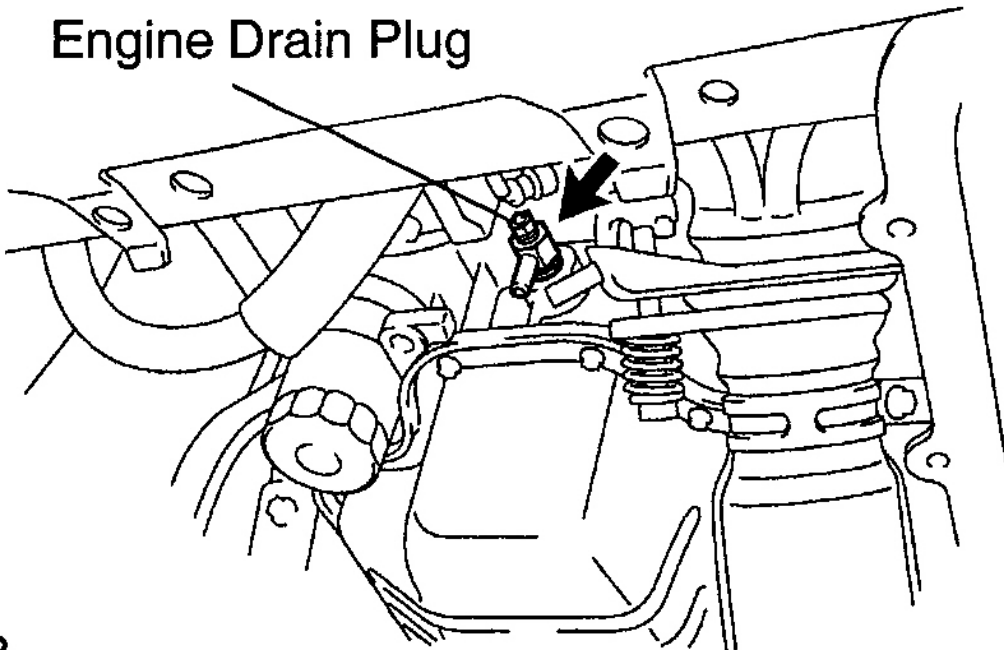
- a. Remove the radiator cap.
- b. Loosen the radiator drain plug (on the left side of the radiator lower tank) and engine drain plug, and drain the coolant.
- c. Close the drain plugs.

Torque: 5.0 N.m (51 kgf.cm, 44 in.lbf) for engine

Radiator Drain Plug



Engine Drain Plug



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2. FILL ENGINE COOLANT

- a. Slowly fill the system with coolant.
 - Use of improper coolants may damage engine cooling system.
 - Only use "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.
 - 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.

NOTE:

- Do not use an alcohol type coolant or plain water alone.
- The coolant should be mixed with plain water (preferably demineralized water or distilled water).

Capacity (w/Heater):

M/T AND A/T SPECIFICATION

M/T	6.6 liters (7.0 US qts, 5.8 Imp. qts)
A/T	6.8 liters (7.2 US qts, 6.0 Imp. qts)

- b. Reinstall the radiator cap.
- c. Start the engine, and bleed the cooling system.
- d. Refill the radiator reservoir with coolant until it reaches the "FULL" line.

3. CHECK ENGINE COOLANT FOR LEAKS

4. CHECK ENGINE COOLANT SPECIFIC GRAVITY CORRECTLY

WATER PUMP

ON-VEHICLE INSPECTION

NOTE: Be sure to do checking when the engine coolant is charged.

INSPECT WATER PUMP

- a. Remove the drive belt (see **CHARGING**).
- b. Turn the pulley, and check that the water pump bearing moves smoothly and quietly.

If necessary, replace the water pump.

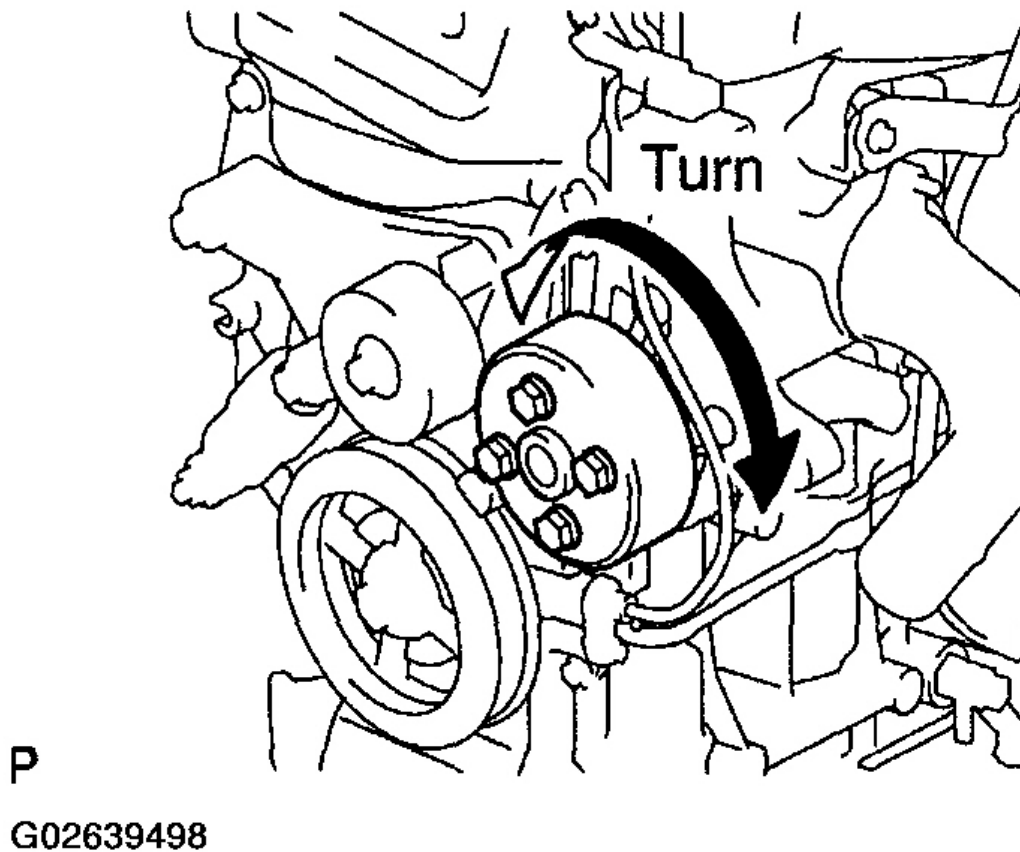


Fig. 2: Checking Water Pump Bearing Condition
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- c. Remove the water pump pulley (see **REMOVAL**).
- d. Visually check the inlet hole and drain hole for coolant leakage.

If leakage is found, replace the water pump.

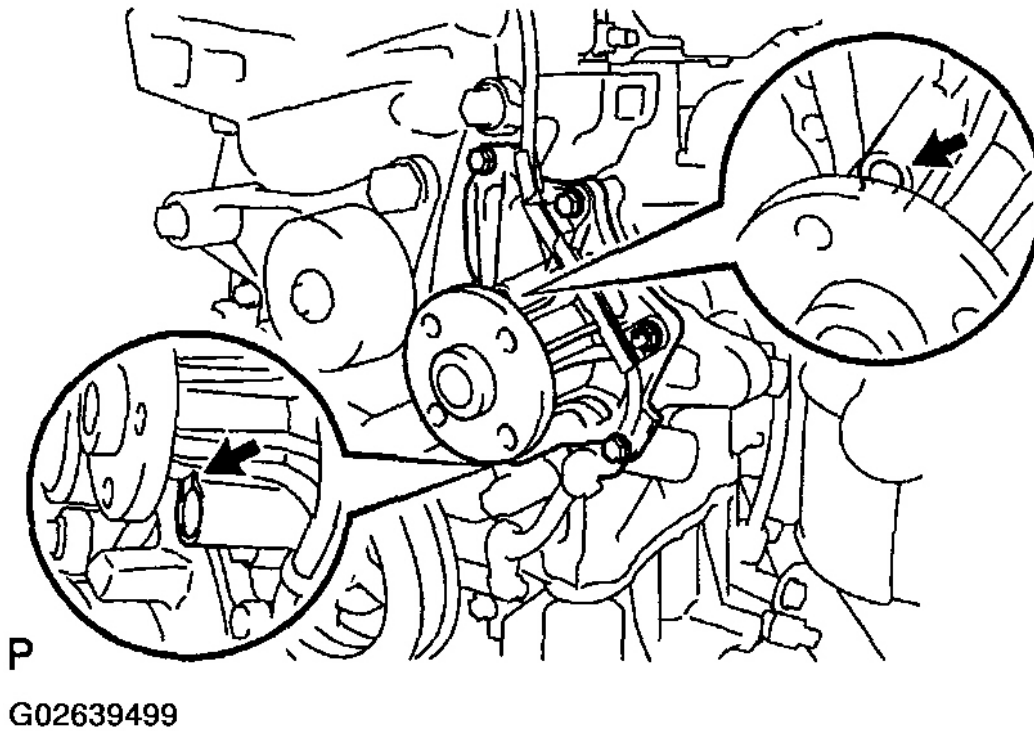


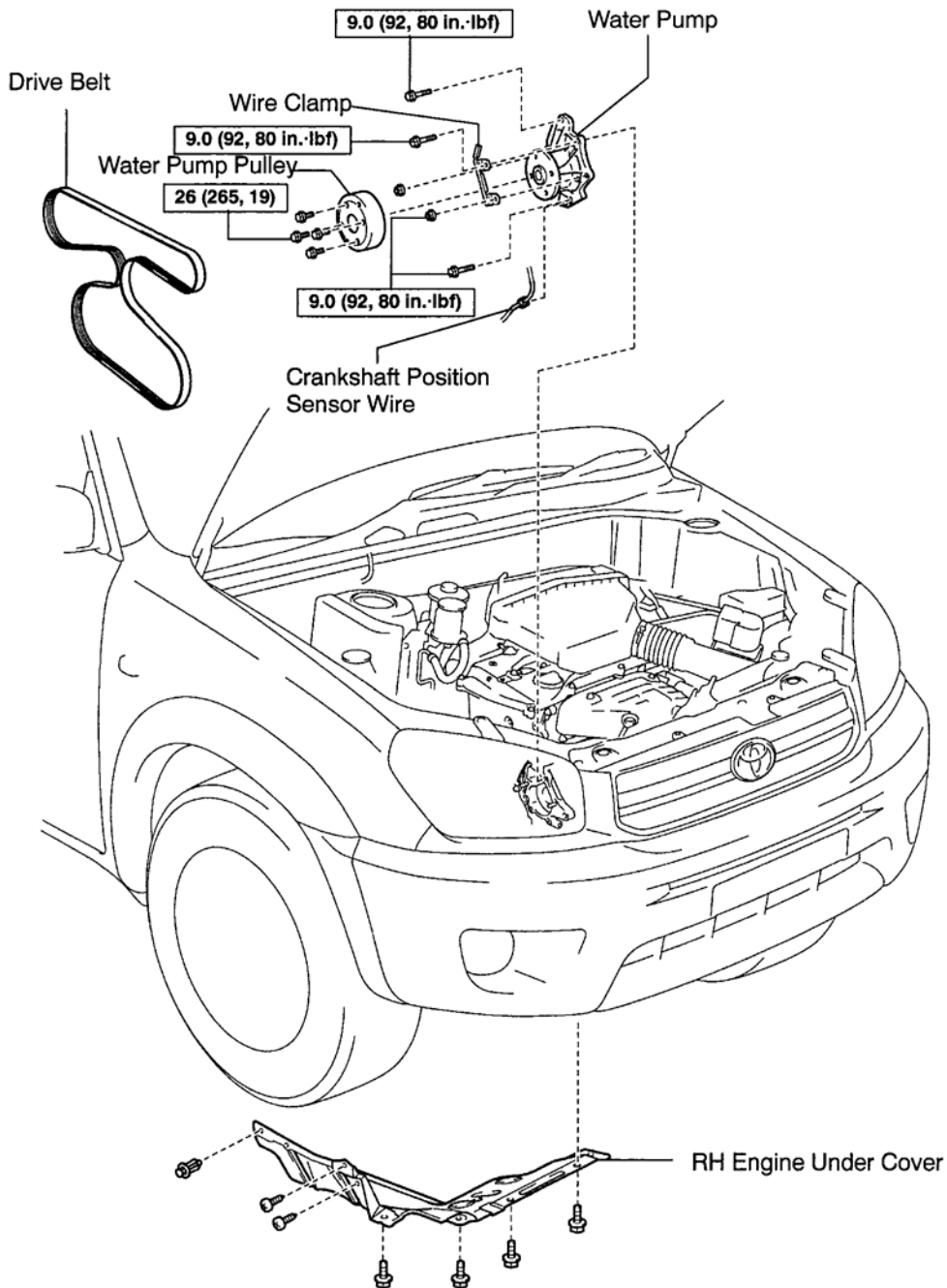
Fig. 3: Inspecting Inlet Hole & Drain Hole For Coolant Leakage
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- e. Reinstall the water pump pulley (see **INSTALLATION**).
- f. Reinstall the drive belt (see **CHARGING**).

COMPONENTS

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N·m (kgf·cm, ft·lbf) : Specified torque

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Fig. 4: Identifying Water Pump Components & Torque Specifications
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

REMOVAL

1. **DRAIN ENGINE COOLANT** (See REPLACEMENT)

2. **REMOVE DRIVE BELT** (See CHARGING)

3. **REMOVE WATER PUMP**

- a. Using SST, remove the 4 bolts and pump pulley.

SST 09960-10010 (09962-01000, 09963-00600)

- b. Disconnect the crankshaft position sensor wire clamp from the water pump.
c. Disconnect the crankshaft position sensor wire from the clamp on the water pump.

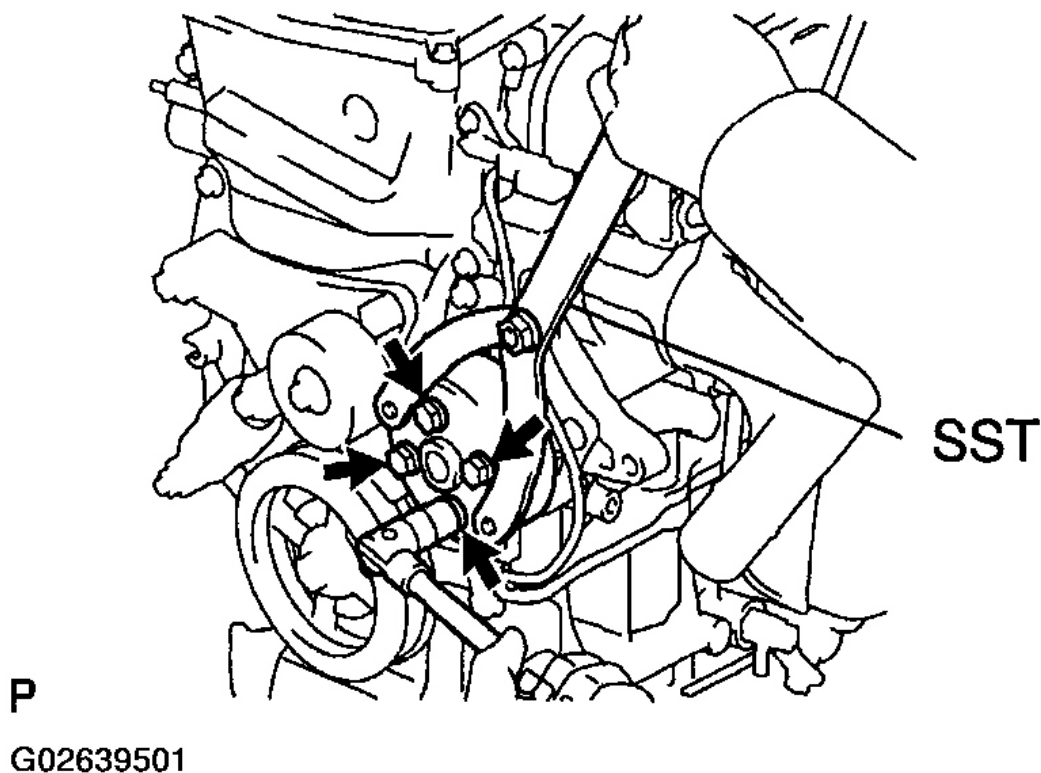


Fig. 5: Removing Water Pump Pulley

Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- d. Remove the 4 bolts, 2 nuts, wire clamp and water pump.

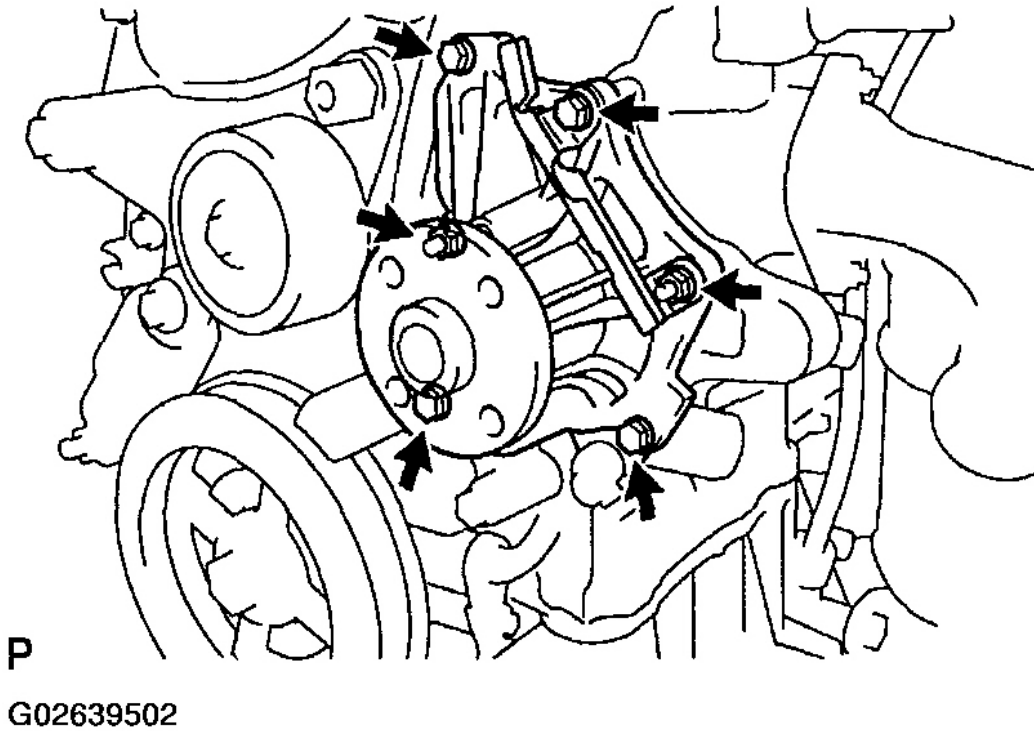


Fig. 6: Removing Water Pump

Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- e. Using a screwdriver, pry between the water pump and cylinder block, and remove the water pump.

NOTE: Be careful not to damage the contact surface of the water pump and cylinder block.

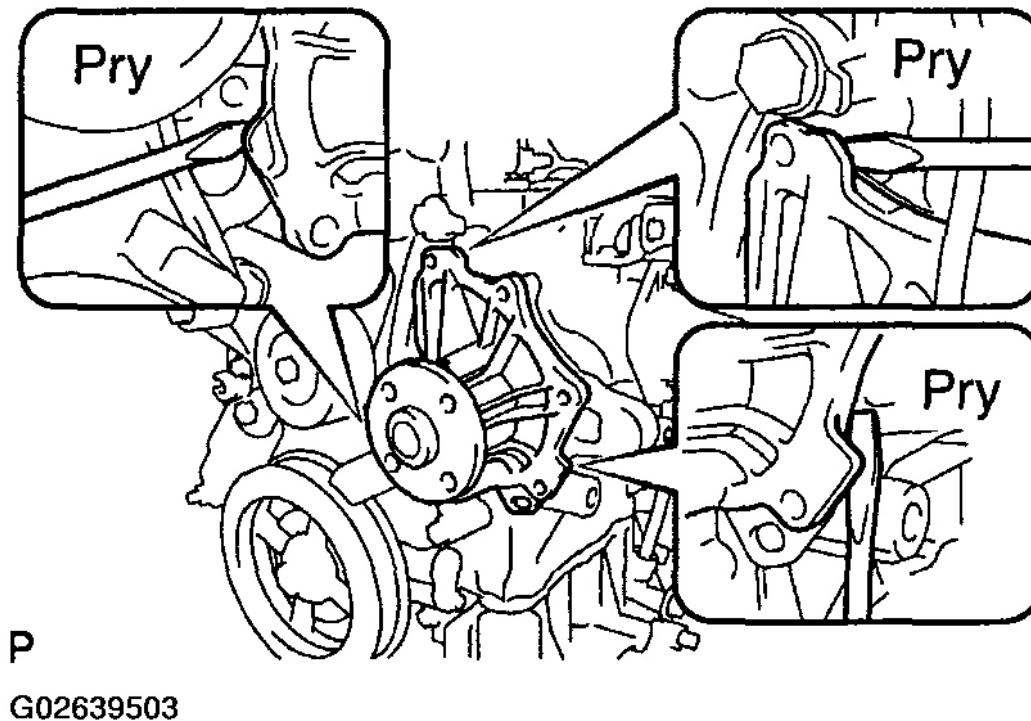


Fig. 7: Prying Screwdriver Between Water Pump & Cylinder Block
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

INSTALLATION

1. INSTALL WATER PUMP

- a. Remove any old packing (FIPG) material and be careful not to drop any oil on the contacting surfaces of the water pump and cylinder block.
 - Using a razor blade and gasket scraper, remove all the old packing (FIPG) materials from the gasket surfaces and sealing grooves.
 - Thoroughly clean all components to remove all the loose material.
 - Using a non-residue solvent, clean both sealing surfaces.
- b. Apply seal packing to the water pump as shown.

Seal packing: Part No. 08826-00100 or equivalent

- Install a nozzle that has been cut to a 2.2 to 2.5 mm (0.09 to 0.10 in.) opening.
- Parts must be assembled within 5 minutes of application. Otherwise the material must be removed and reapplied.
- Immediately remove the nozzle from the tube and reinstall cap.

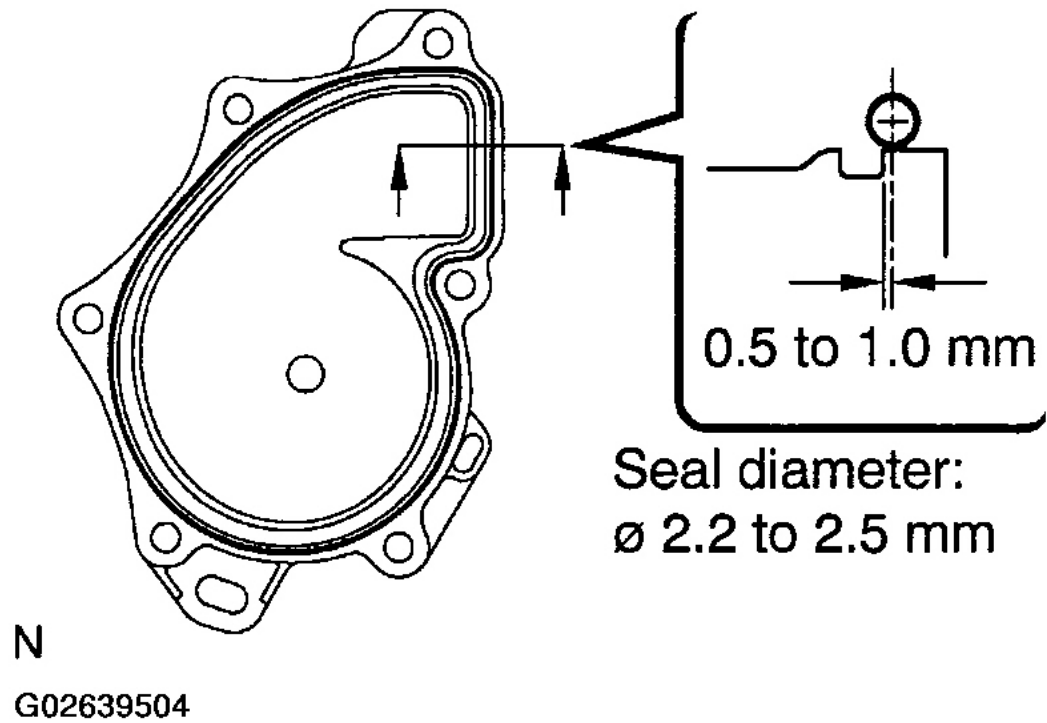


Fig. 8: Applying Seal Packing To Water Pump
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- c. Install the water pump and wire clamp with the 4 bolts and 2 nuts.

Torque: 9.0 N.m (92 kgf.cm, 80 in.lbf)

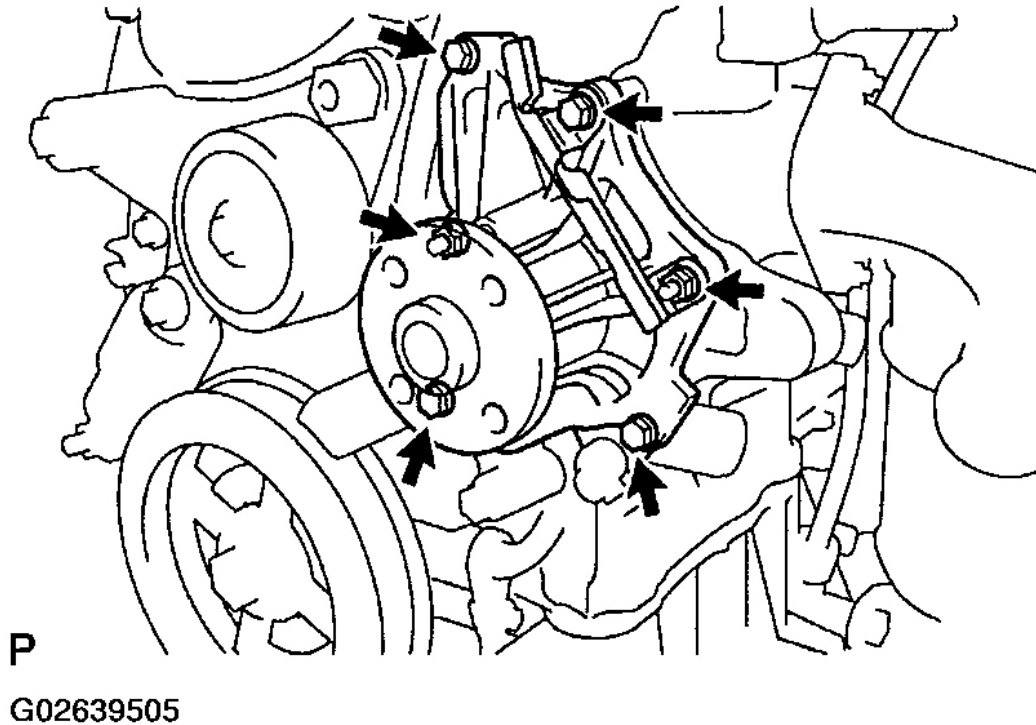


Fig. 9: Installing Water Pump & Wire Clamp

Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- d. Install the crankshaft position sensor wire harness clamp to the water pump.
- e. Install the crankshaft position sensor wire to the wire clamp on the water pump.
- f. Using SST, install the pump pulley with the 4 bolts.

SST 09960-10010 (09962-01000, 09963-00600)

Torque: 26 N.m (265 kgf.cm, 19 ft.lbf)

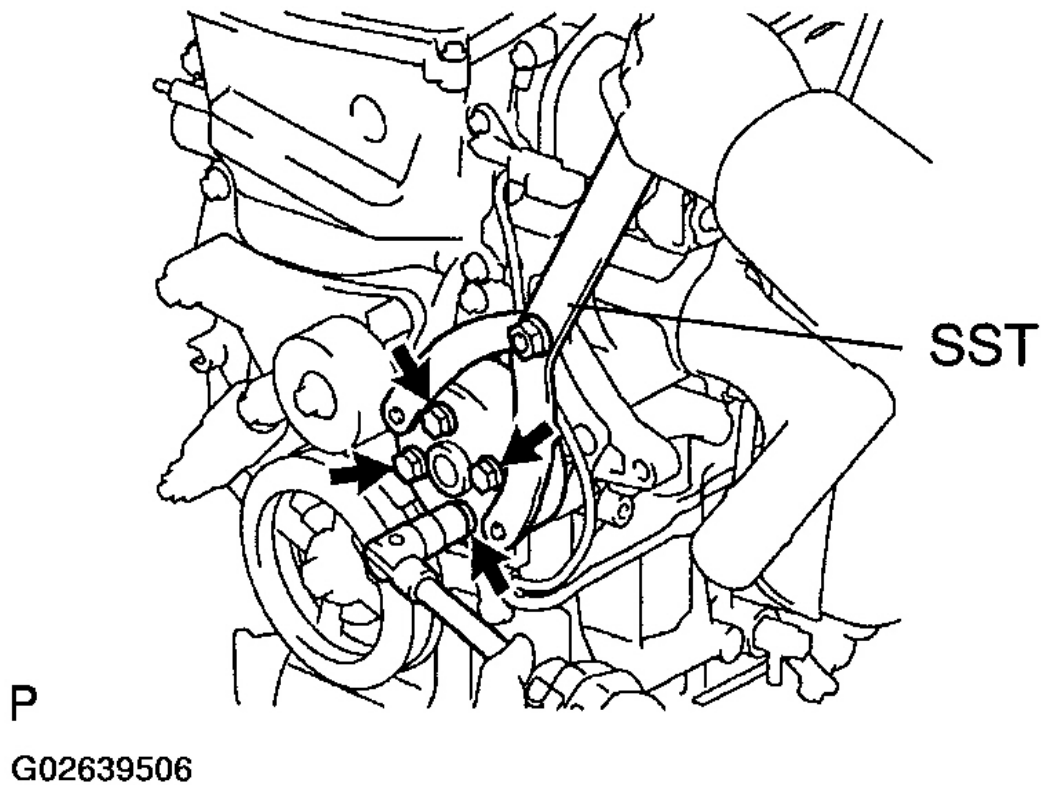


Fig. 10: Installing Pump Pulley

Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

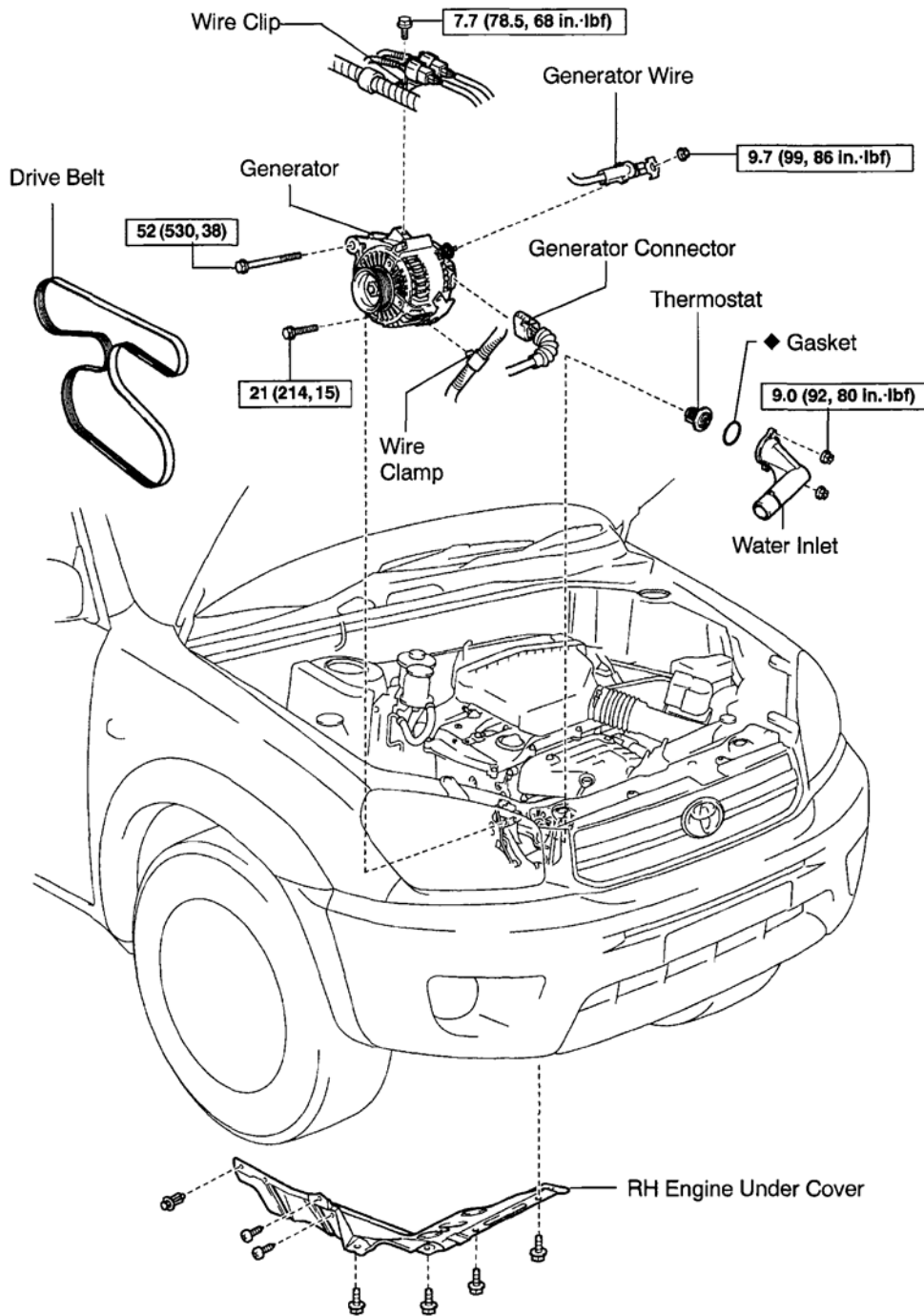
2. **INSTALL DRIVE BELT (See CHARGING)**
3. **FILL WITH ENGINE COOLANT**
4. **START ENGINE AND CHECK FOR COOLANT LEAKS**
5. **RECHECK ENGINE COOLANT LEVEL**

THERMOSTAT

COMPONENTS

2005 Toyota RAV4

2005 ENGINE Cooling - RAV4



N·m (kgf·cm, ft·lbf) : Specified torque

◆ Non-reusable part

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Fig. 11: Exploded View Of Thermostat Components & Torque Specifications
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

REMOVAL

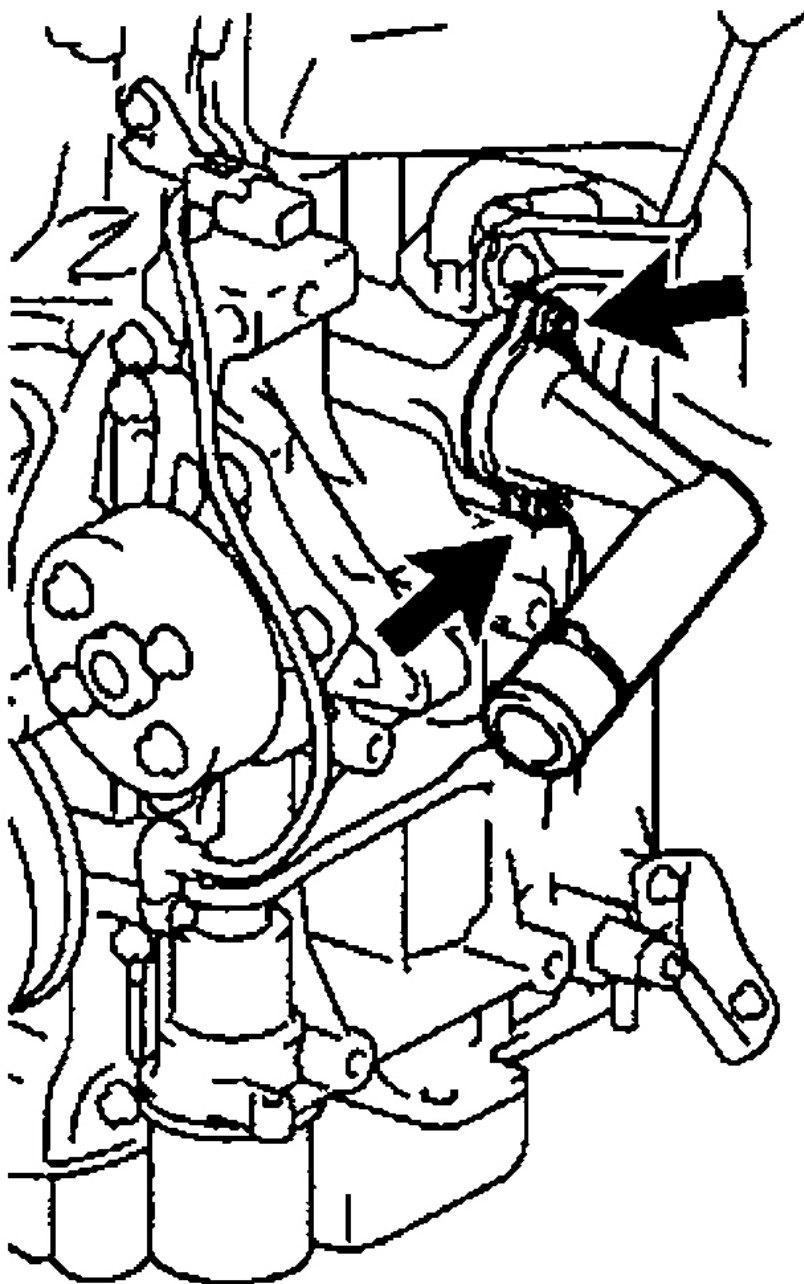
2005 Toyota RAV4

2005 ENGINE Cooling - RAV4

HINT:

Removal of the thermostat would have an adverse effect, causing a lowering of cooling efficiency. Do not remove the thermostat, even if the engine tends to overheat.

1. **DRAIN ENGINE COOLANT (See REPLACEMENT)**
2. **REMOVE DRIVE BELT (See CHARGING)**
3. **REMOVE GENERATOR (See REMOVAL)**
4. **REMOVE WATER INLET AND THERMOSTAT**
 - a. Remove the 2 nuts and water inlet.
 - b. Remove the thermostat.
 - c. Remove the gasket from the thermostat.



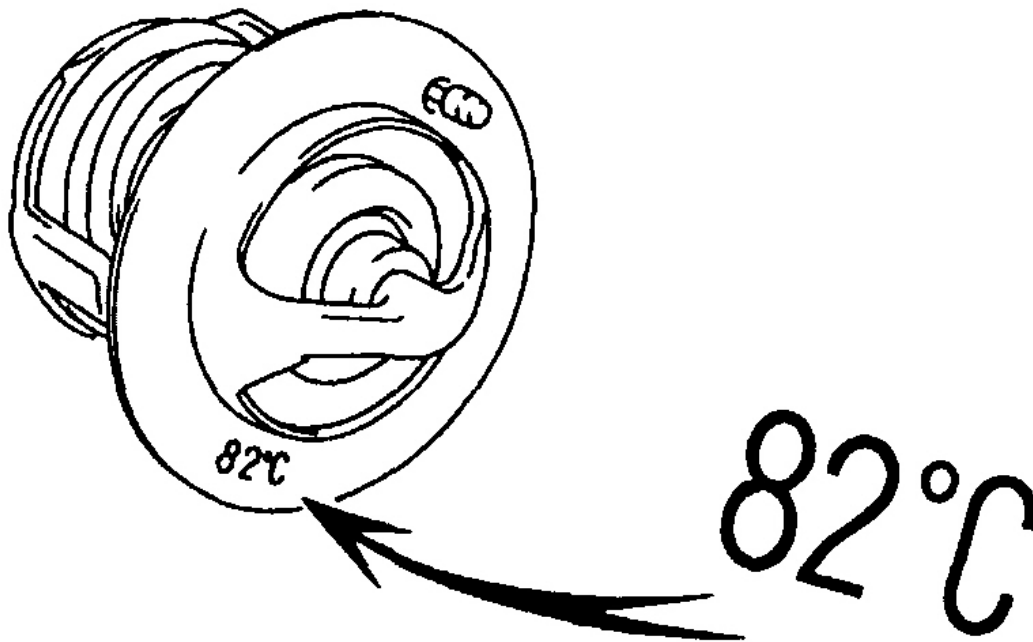
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Fig. 12: Removing Water Inlet Housing
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

INSPECT THERMOSTAT

HINT:

The thermostat is numbered with the valve opening temperature.



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Fig. 13: Inspecting Thermostat Valve Opening Temperature
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- Immerse the thermostat in water and gradually heat the water.
- Check the valve opening temperature.

Valve opening temperature: 80 to 84° C (176 to 183.2° F)

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

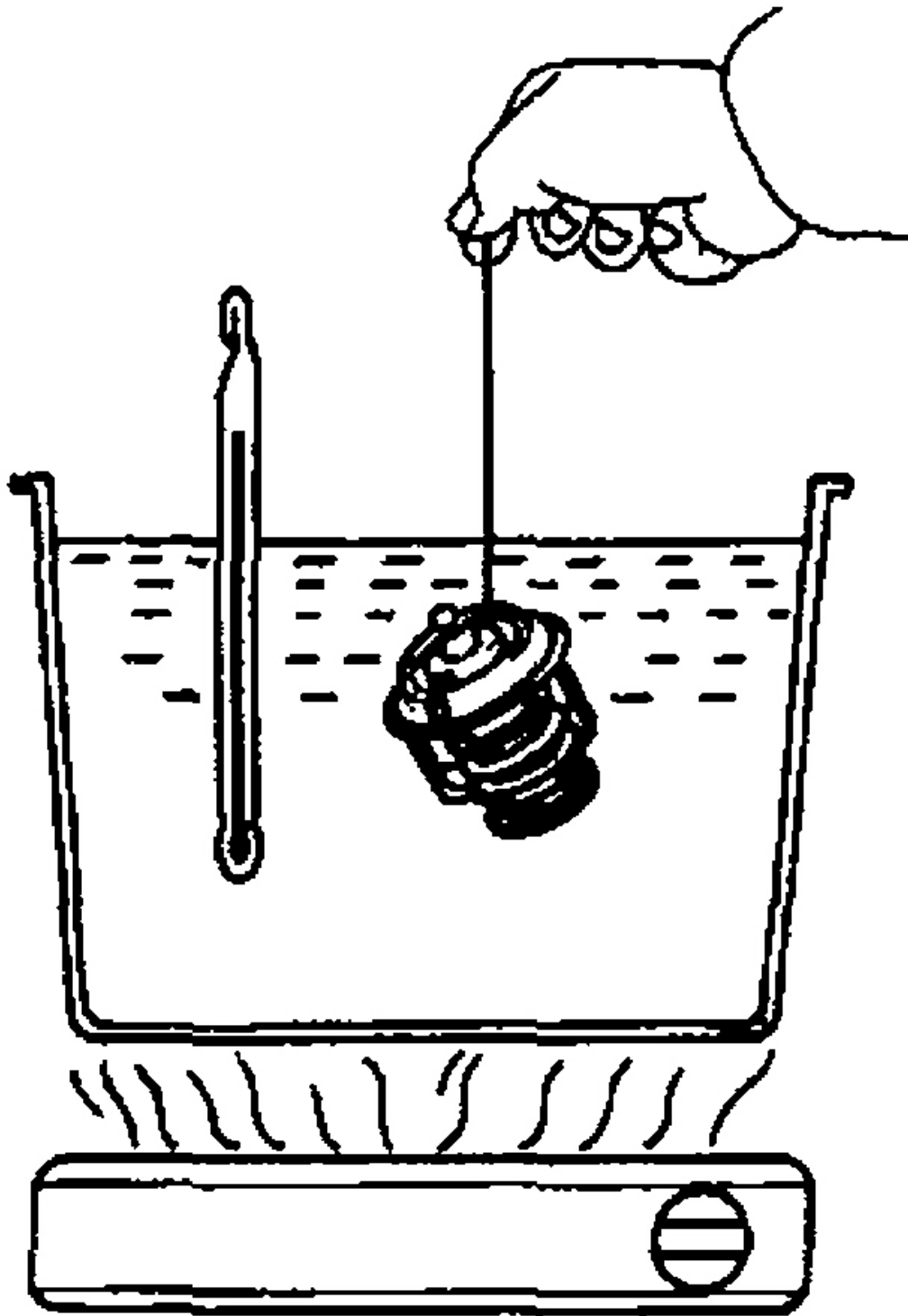


Fig. 14: Checking Valve Opening Temperature

Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

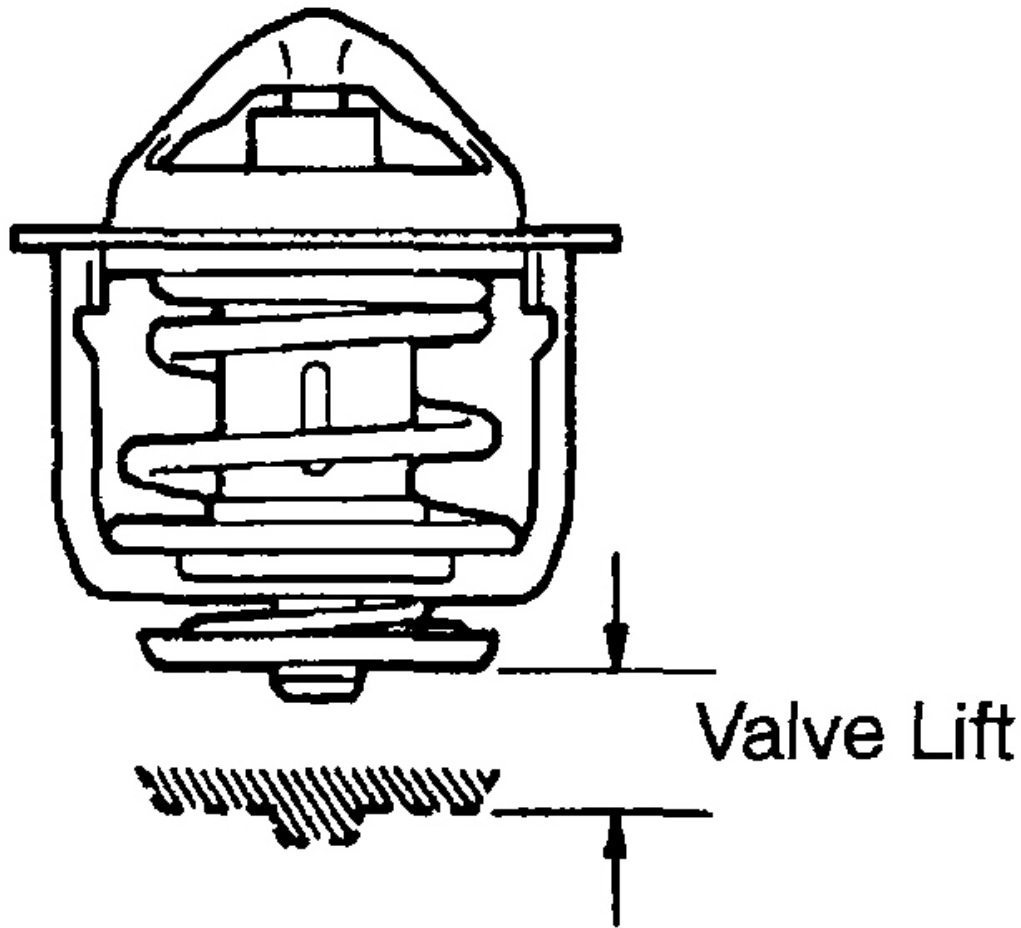
- c. Check the valve lift.

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 temperature (below 40°C (104°F)).

If not closed, replace the thermostat.



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Fig. 15: Checking Valve Lift

Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

INSTALLATION

1. PLACE THERMOSTAT IN CYLINDER BLOCK

- Install a new gasket to the thermostat.
- Install the thermostat with the jiggle valve upward.

HINT:

The jiggle valve may be set within 10° of either side of the prescribed position.

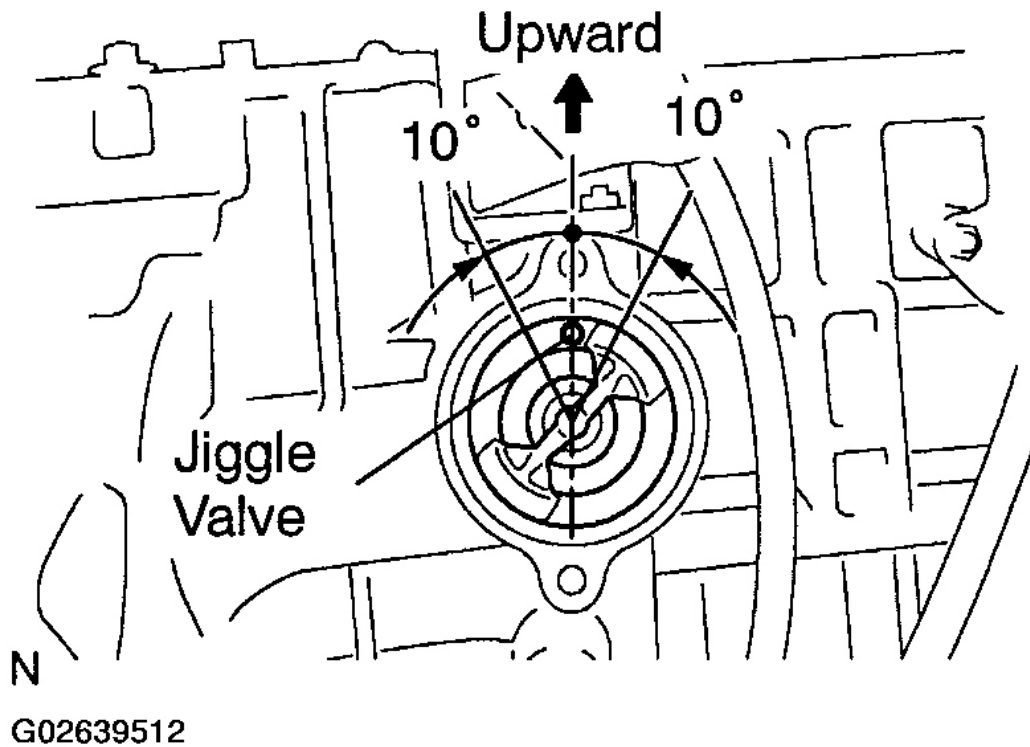
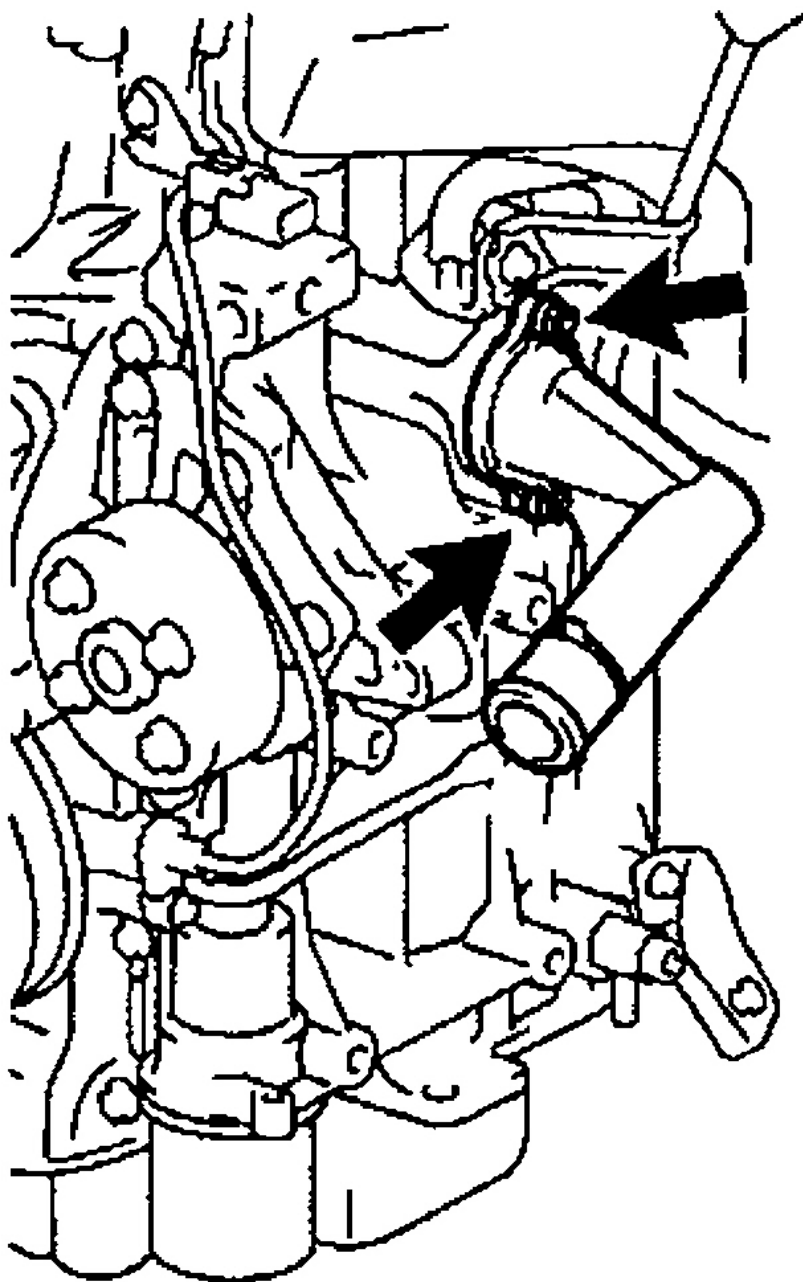


Fig. 16: Identifying Jiggle Valve Installed Position
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

2. INSTALL WATER INLET

Install the water inlet with the 2 nuts.

Torque: 9.0 N.m (92 kgf.cm, 80 in.lbf)



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Fig. 17: Installing Water Inlet Housing

Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

3. INSTALL GENERATOR (See INSTALLATION)

- 4. INSTALL DRIVE BELT (See CHARGING)
- 5. FILL WITH ENGINE COOLANT (See REPLACEMENT)
- 6. START ENGINE AND CHECK FOR LEAKS
- 7. RECHECK ENGINE COOLANT LEVEL

RADIATOR

ON-VEHICLE CLEANING

INSPECT FINS FOR BLOCKAGE

If fins are clogged, wash them with water or a steam cleaner and dry with compressed air.

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

INJECTION PRESSURE AND INJECTION DISTANCE SPECIFICATION

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

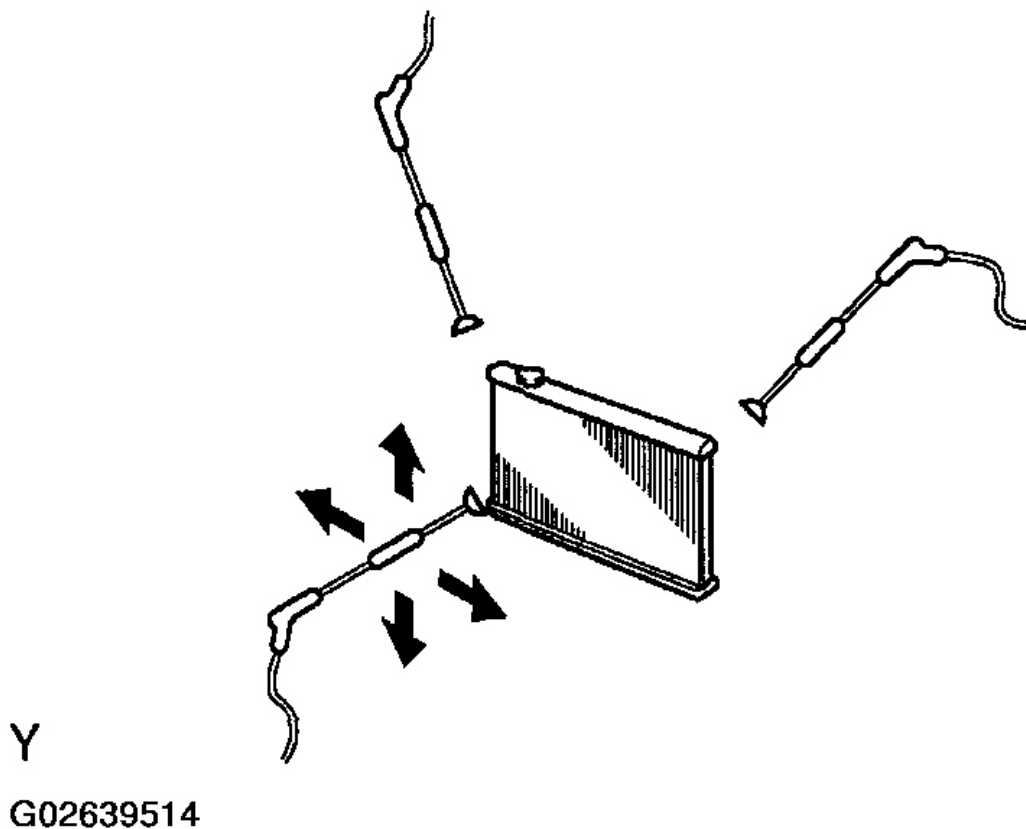


Fig. 18: Cleaning Radiator

Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- If the fins are bent, straighten them with a screwdriver or pliers.
- Never apply water directly onto the electronic components.

ON-VEHICLE INSPECTION

1. REMOVE RADIATOR CAP

CAUTION: To avoid the danger of being burned, do not remove the radiator cap while the engine and radiator are still hot, as fluid and steam can be blown out under pressure.

2. INSPECT RADIATOR CAP

NOTE:

2005 Toyota RAV4

2005 ENGINE Cooling - RAV4

- If the radiator cap has contaminations, always rinse it with water.
 - Before using a radiator cap tester, wet the relief valve and pressure valve with engine coolant or water.
 - When performing steps (a) and (b) below, keep the radiator cap tester at an angle of over 30° above the horizontal.
- a. Using a radiator cap tester, slowly pump the tester and check that air is coming from the vacuum valve.

Pump speed: 1 push/(3 seconds or more)

NOTE: Push the pump at a constant speed.

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

- b. Pump the tester and measure the relief valve opening pressure.

Pump speed: 1 push within 1 second

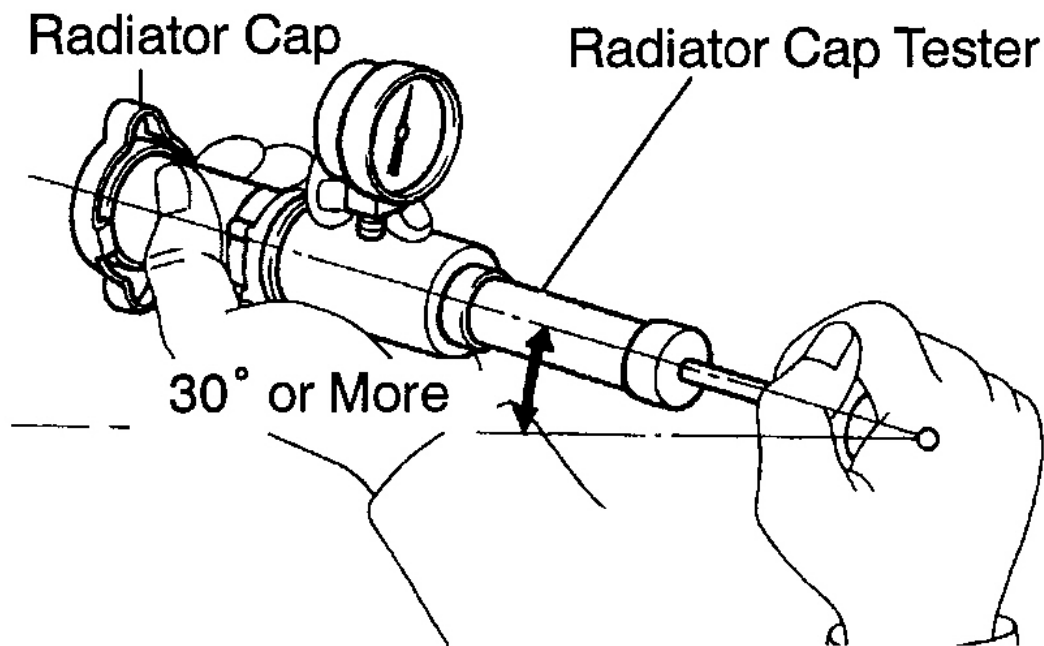
NOTE: This pump speed is for the first pump only (in order to close the vacuum valve). After this, the pump speed can be reduced.

Standard opening pressure: 93 to 123 kPa (0.95 to 1.25 kgf/cm² , 13.5 to 17.8 psi)

Minimum opening pressure: 78 kPa (0.8 kgf/cm² , 11.4 psi)

HINT:

Use the tester's maximum reading as the opening pressure. If the opening pressure is less than minimum, replace the radiator cap.



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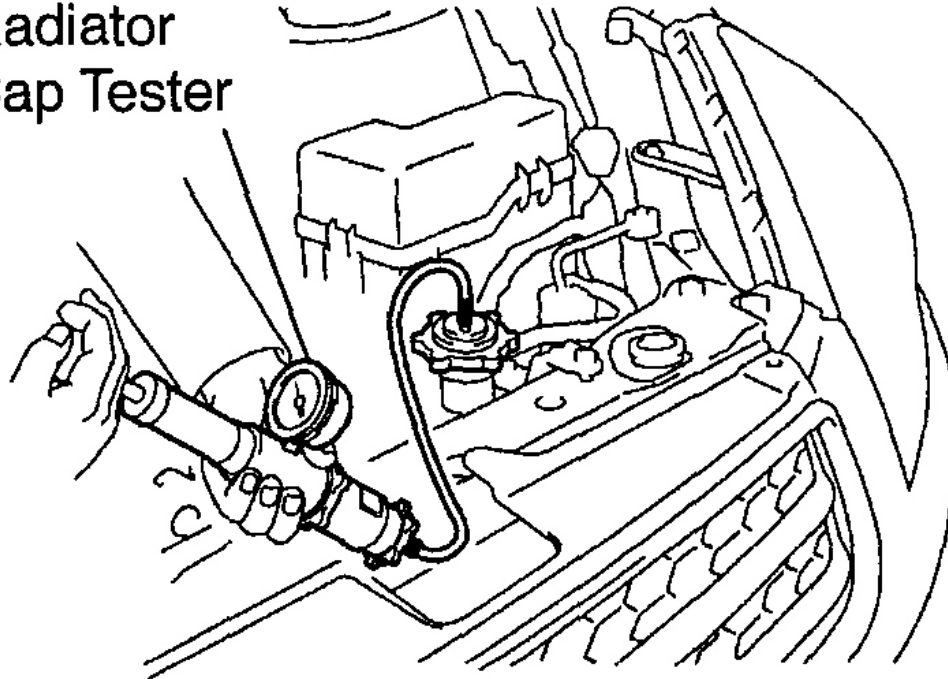
Fig. 19: Identifying Radiator Cap Tester
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

3. INSPECT COOLING SYSTEM FOR LEAKS

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

If the pressure drops, check the hoses, radiator or water pump for leaks. If no external leaks are found, check the heater core, cylinder block and head.

Radiator Cap Tester



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Fig. 20: Attaching Radiator Cap Tester

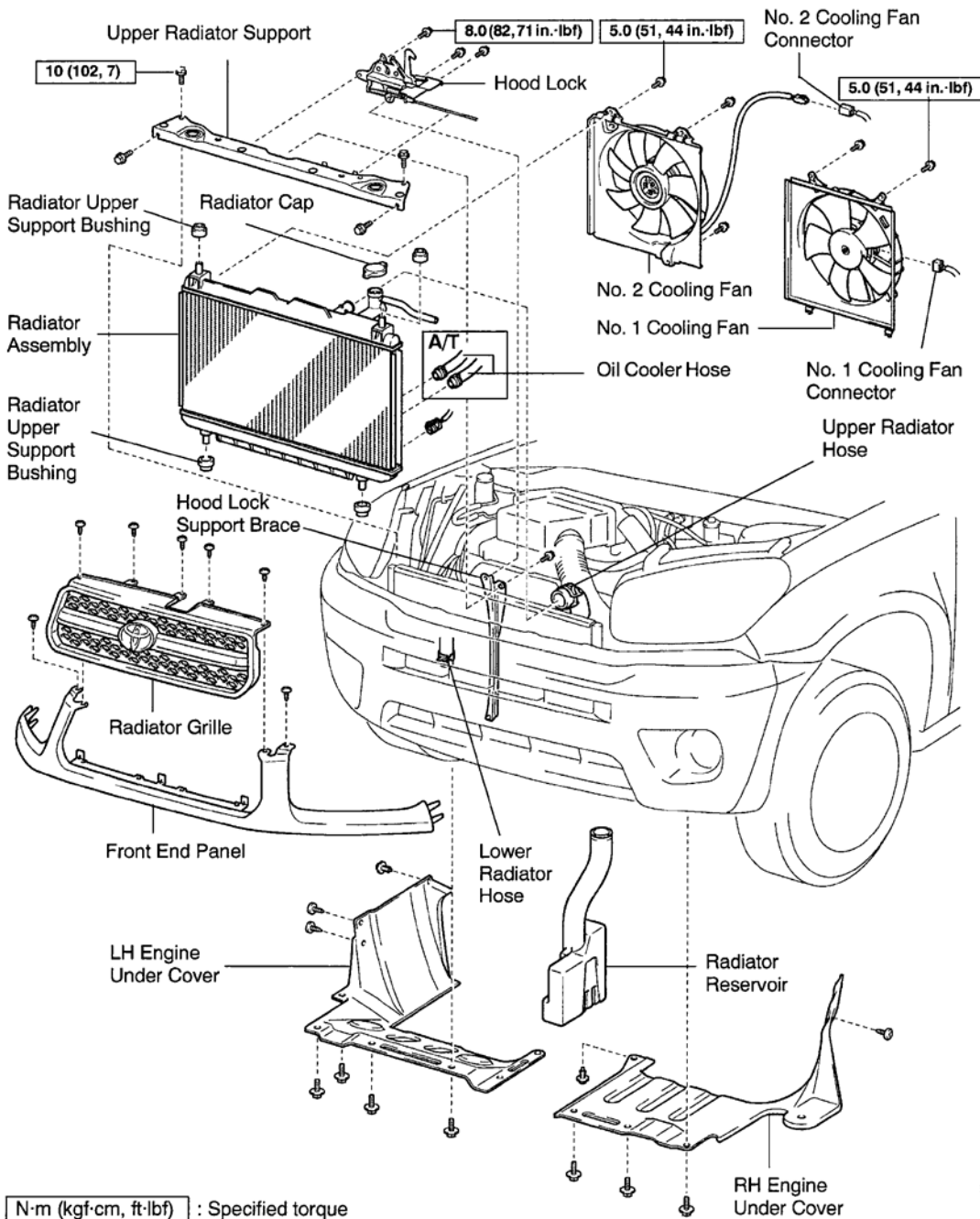
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

4. REINSTALL RADIATOR CAP

COMPONENTS

2005 Toyota RAV4

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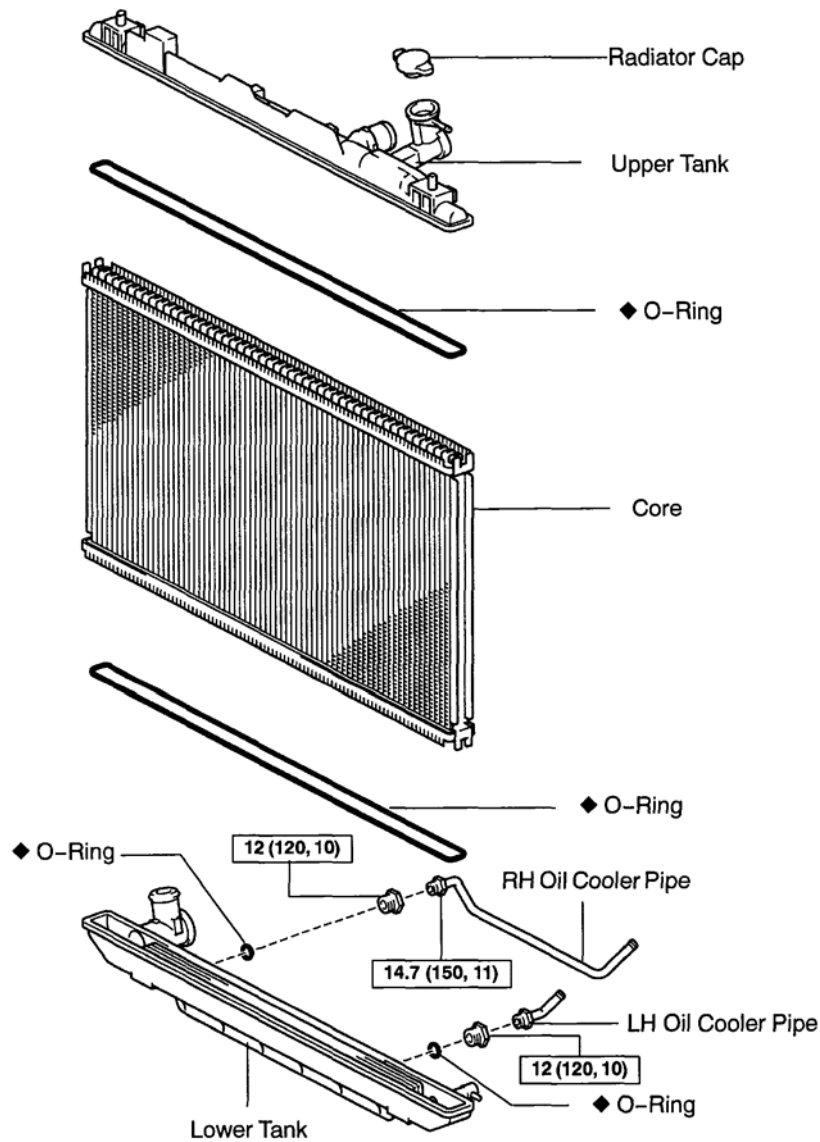


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Fig. 21: Exploded View Of Radiator Components & Torque Specifications (1 Of 2)
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

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2005 ENGINE Cooling - RAV4



N·m (kgf·cm, ft·lbf) : Specified torque

◆ Non-reusable part

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Fig. 22: Exploded View Of Radiator Components & Torque Specifications (2 Of 2)
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

REMOVAL

1. DRAIN ENGINE COOLANT
2. REMOVE RADIATOR GRILLE

Remove the 5 screws, 2 clips and radiator grille.

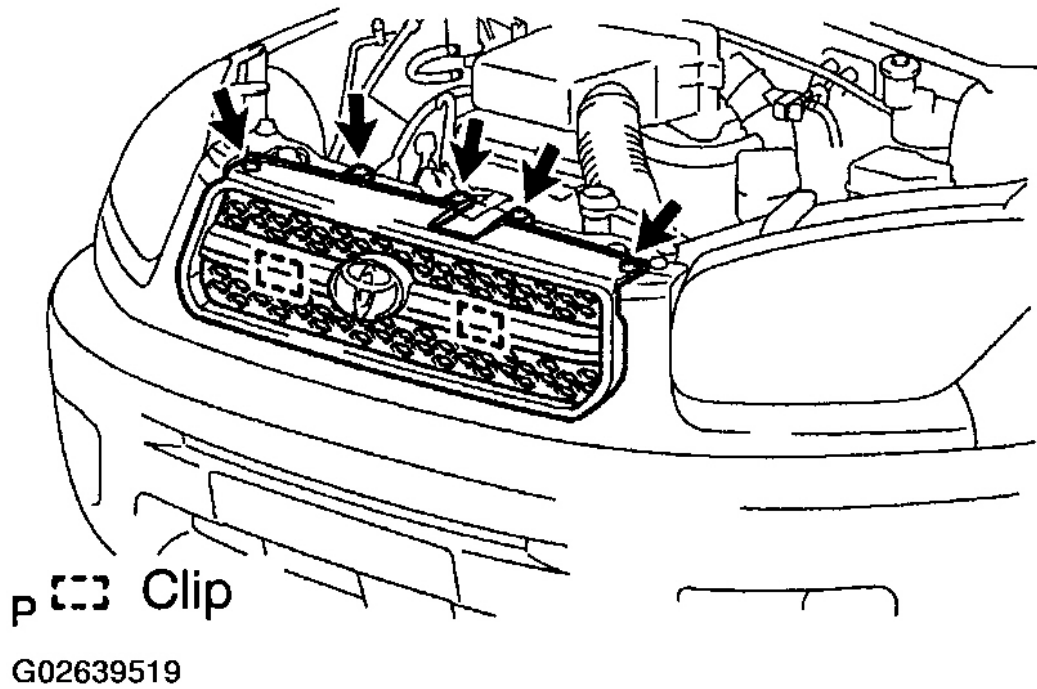
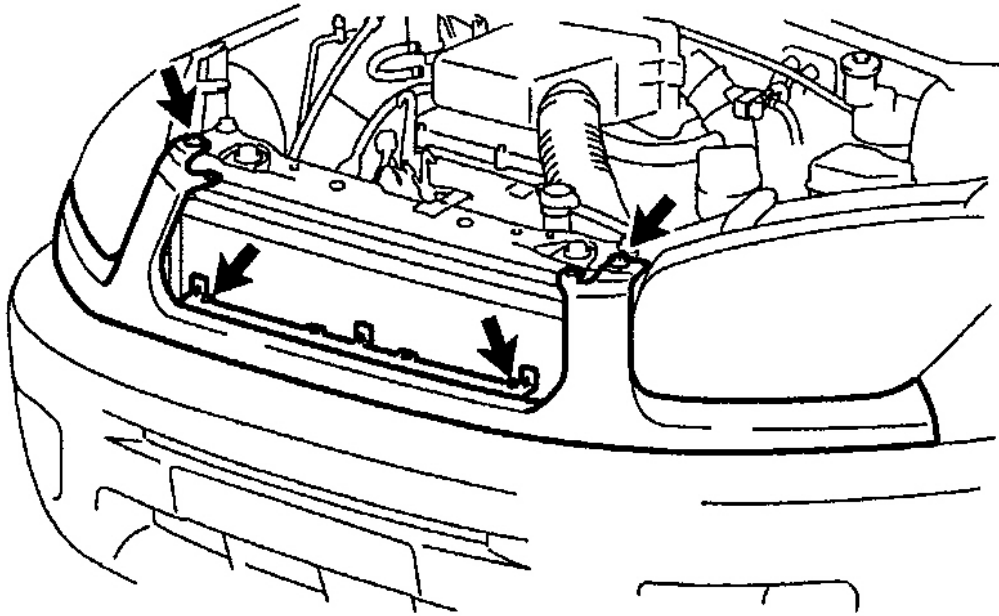


Fig. 23: Removing Radiator Grille
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

3. REMOVE FRONT END PANEL

Remove the 4 screws and front end panel.



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Fig. 24: Removing Front End Panel

Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

4. DISCONNECT HOOD LOCK

- a. Remove the 3 bolts, and disconnect the hood lock.
- b. Disconnect the wire from the clamp.

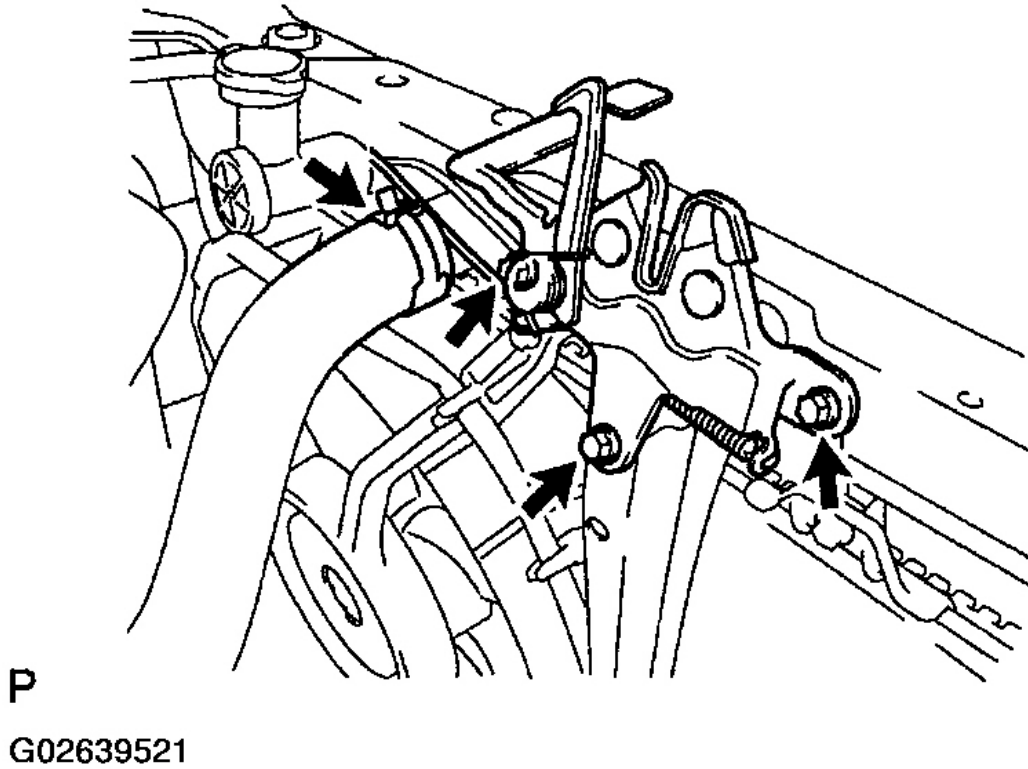


Fig. 25: Disconnecting Hood Lock & Upper Radiator Hose
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

5. **DISCONNECT UPPER RADIATOR HOSE**
6. **REMOVE UPPER RADIATOR SUPPORT**

Remove the 5 bolts and radiator support.

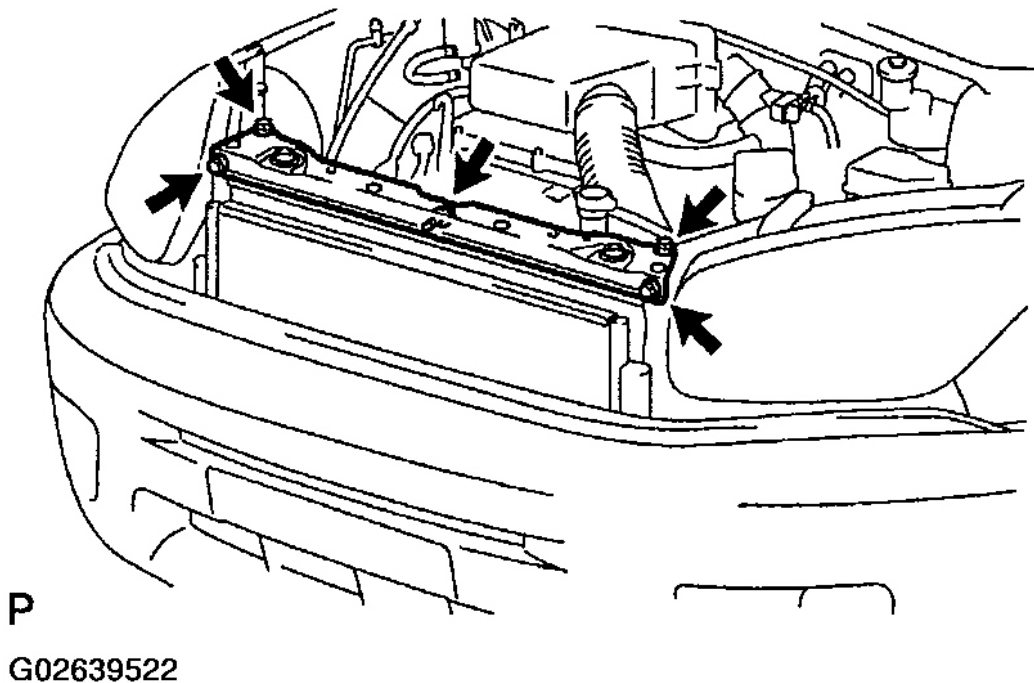


Fig. 26: Removing Radiator Support

Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

7. **REMOVE LH ENGINE UNDER COVER**
8. **REMOVE RADIATOR RESERVOIR**
9. **REMOVE NO. 1 AND NO. 2 COOLING FANS (See REMOVAL)**
10. **A/T: DISCONNECT OIL 2 HOSES**

Disconnect the 2 oil cooler hoses from the radiator.

11. **DISCONNECT LOWER RADIATOR HOSE**
12. **REMOVE RADIATOR**
13. **REMOVE UPPER AND LOWER RADIATOR SUPPORTS FROM RADIATOR**

DISASSEMBLY

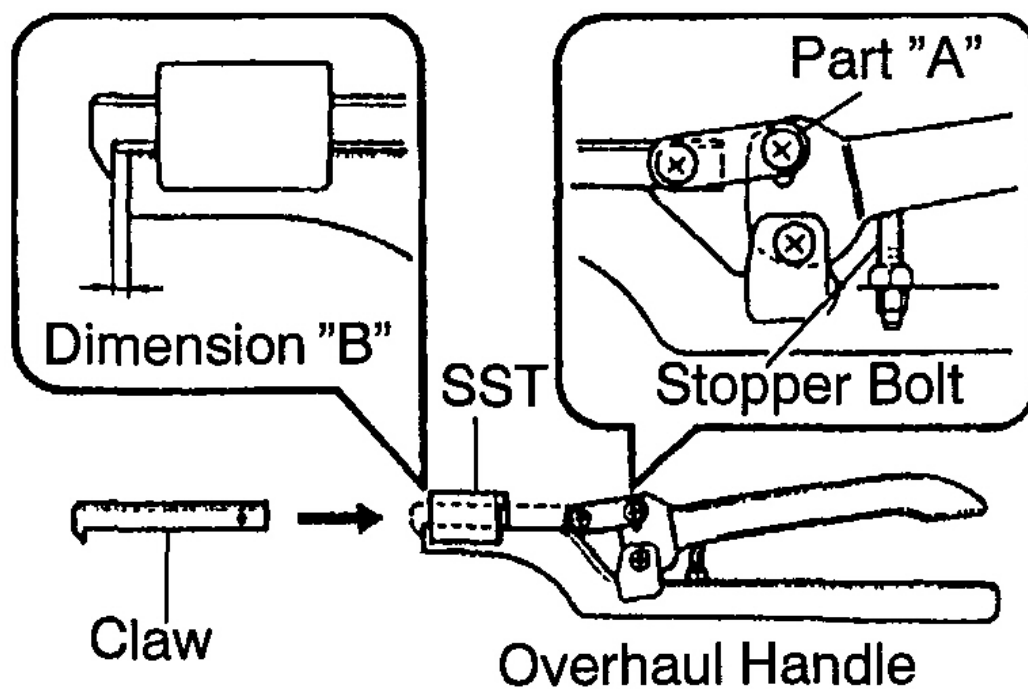
1. **REMOVE DRAIN PLUG**
 - a. Remove the drain plug.
 - b. Remove the O-ring.
2. **ASSEMBLE SST**

SST 09230-01010

- a. Install the claw to the overhaul handle, inserting it in the hole in part "A" as shown.
- b. While gripping the handle, adjust the stopper bolt so that dimension "B" is as shown.

Dimension: 0.2 to 0.3 mm (0.008 to 0.012 in.)

NOTE: If the stopper bolt is not adjusted, the claw may be damaged.



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Fig. 27: Identifying Claw Stopper Bolt

Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

3. UNCAULK LOCK PLATES

Using SST to release the caulking, grip the handle until stopped by the stopper bolt.

SST 09230-01010

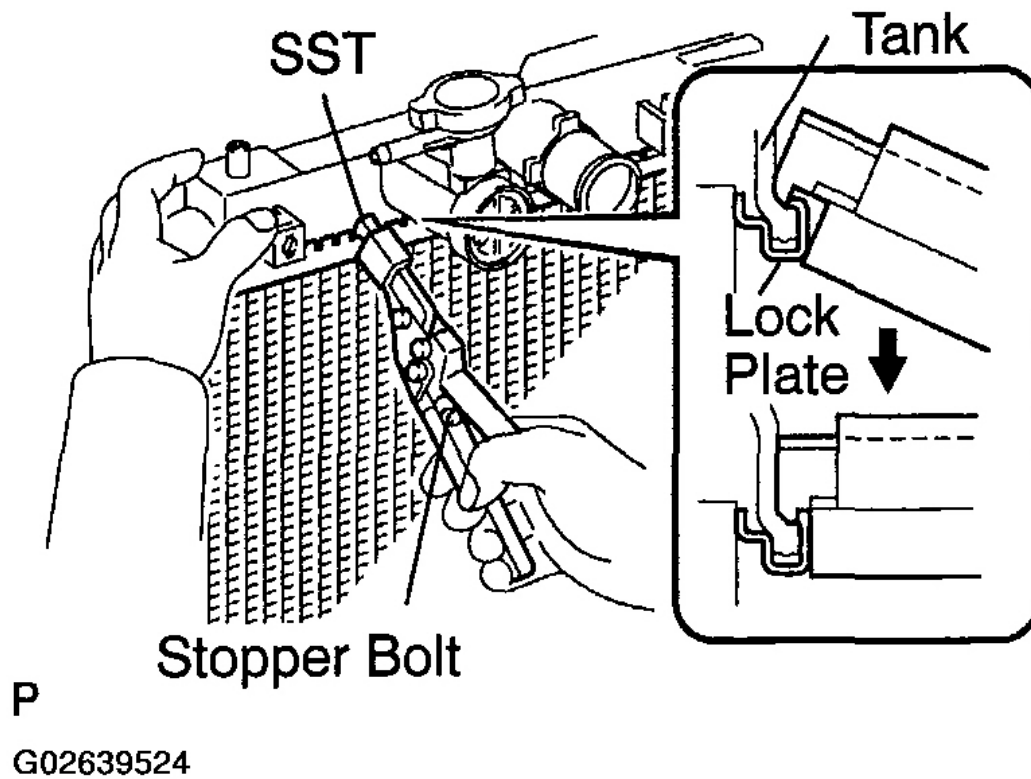


Fig. 28: Releasing Caulking

Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

4. REMOVE TANKS AND O-RINGS

- Lightly tap the bracket of the radiator (or radiator hose inlet or outlet) with a soft-faced hammer, and remove the tank.
- Remove the O-ring.

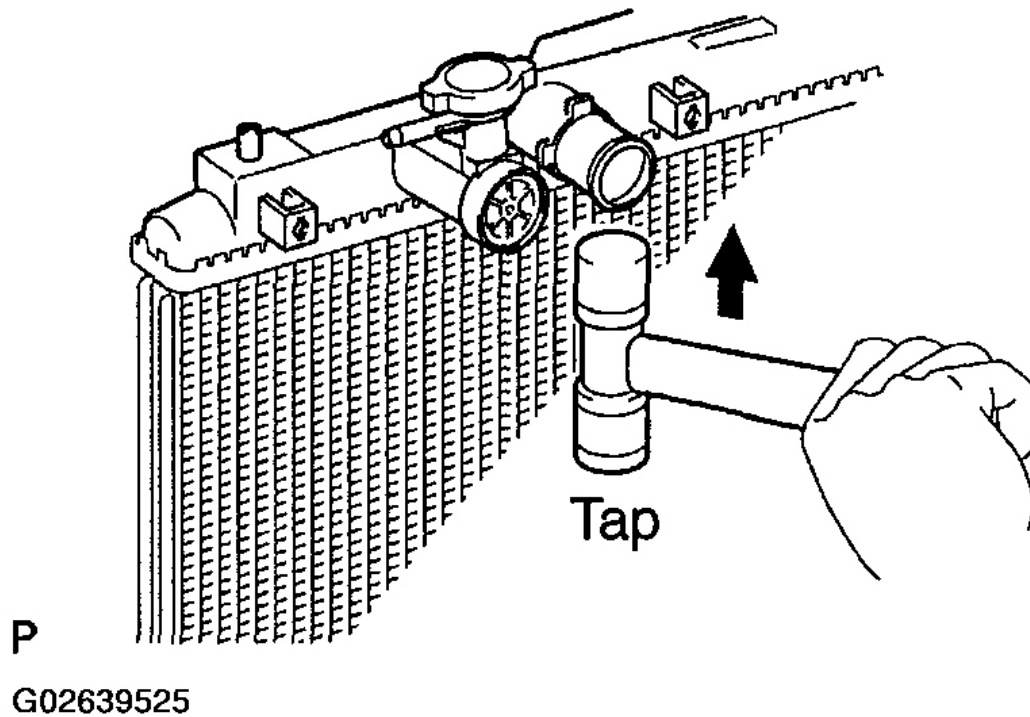


Fig. 29: Removing Tanks & O-Rings

Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

5. A/T: REMOVE OIL COOLER PIPES FROM LOWER TANK

- a. Remove the 2 cooler pipes
- b. Loosen the 2 nuts, and remove the 2 pipes.
- c. Remove the 2 nuts.
- d. Remove the 2 O-rings from the oil cooler.

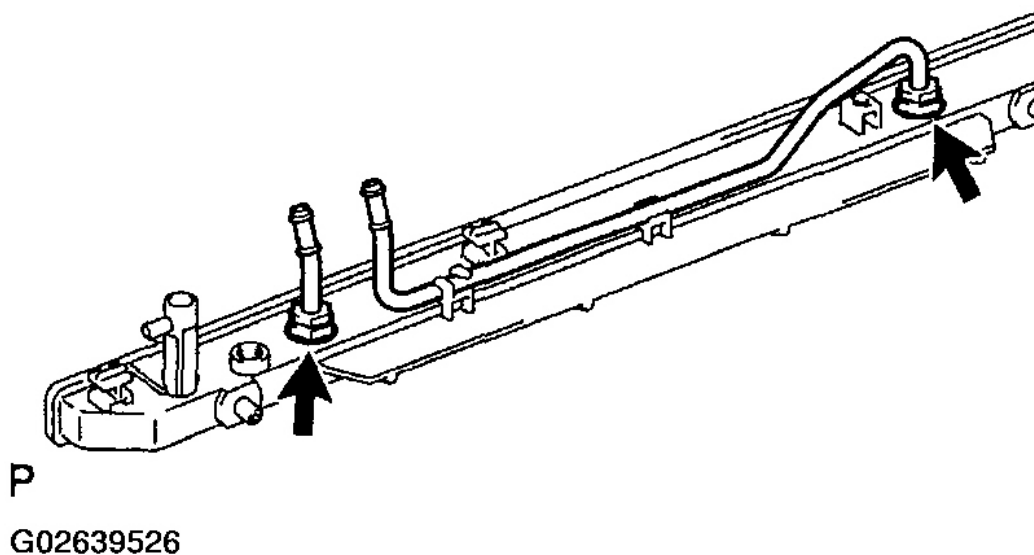


Fig. 30: Removing Oil Cooler Pipes From Lower Tank
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

REASSEMBLY

1. A/T: INSTALL OIL COOLER PIPES TO LOWER TANK

- Install 2 new O-rings to the oil cooler.
- Install the 2 nuts.

Torque: 12 N.m (122 kgf.cm, 9 ft.lbf)

- Install the LH cooler pipe in the direction indicated. See **Fig. 31**.

Torque: 14.7 N.m (150 kgf.cm, 11 ft.lbf)

- Install the RH cooler pipe.

Torque: 14.7 N.m (150 kgf.cm, 11 ft.lbf)

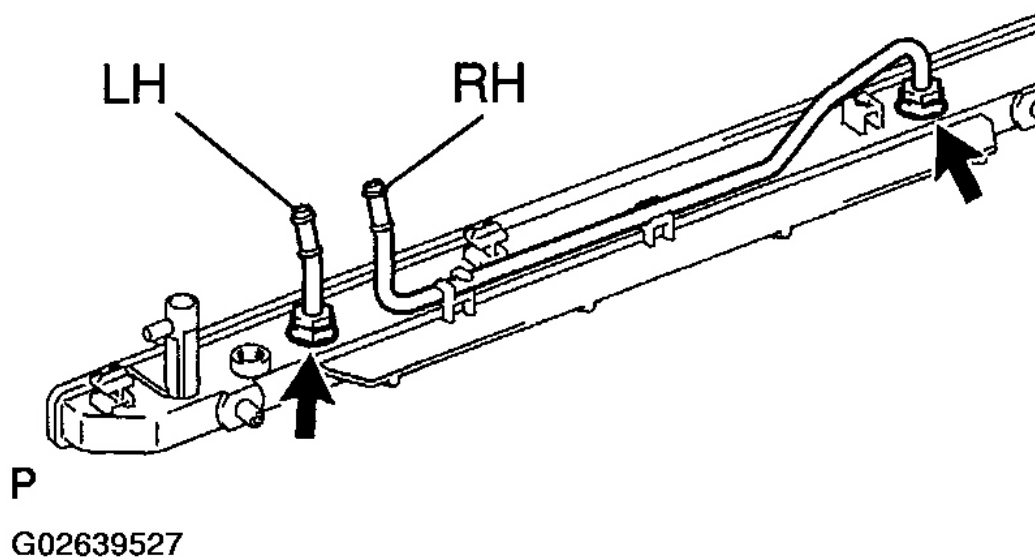


Fig. 31: Installing Oil Cooler Pipes To Lower Tank
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

2. INSPECT LOCK PLATE FOR DAMAGE

HINT:

- If the sides of the lock plate groove are deformed, reassembly of the tank will be impossible.
Therefore, first correct any deformation with pliers or similar object.
- Water leakage will result if the bottom of the lock plate groove is damaged or dented. Repair or replace if necessary.

NOTE: The radiator can only be recaulked 2 times. After the 2nd time, the radiator core must be replaced.

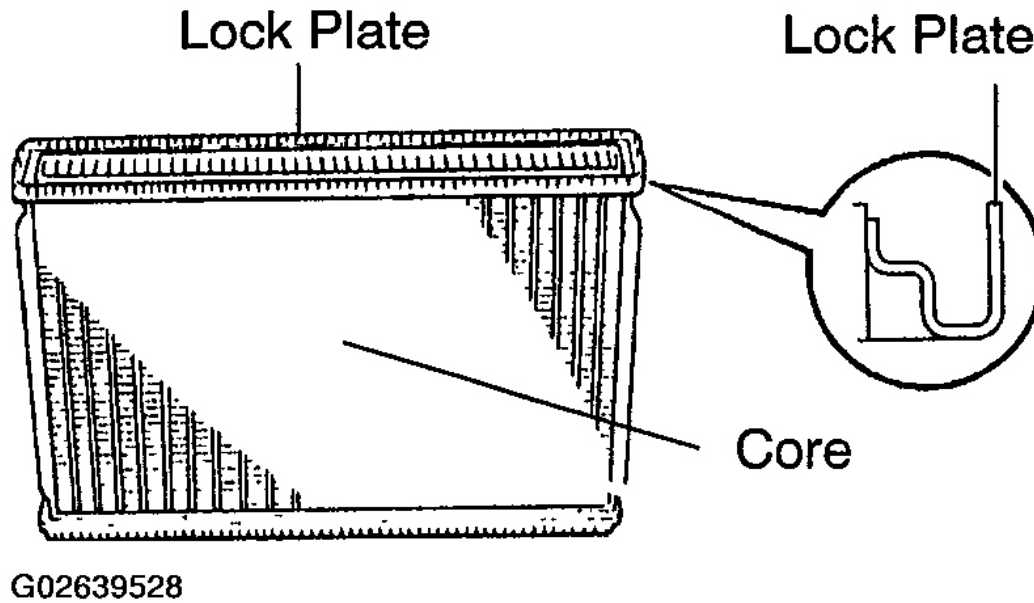


Fig. 32: Inspecting Lock Plate For Damage

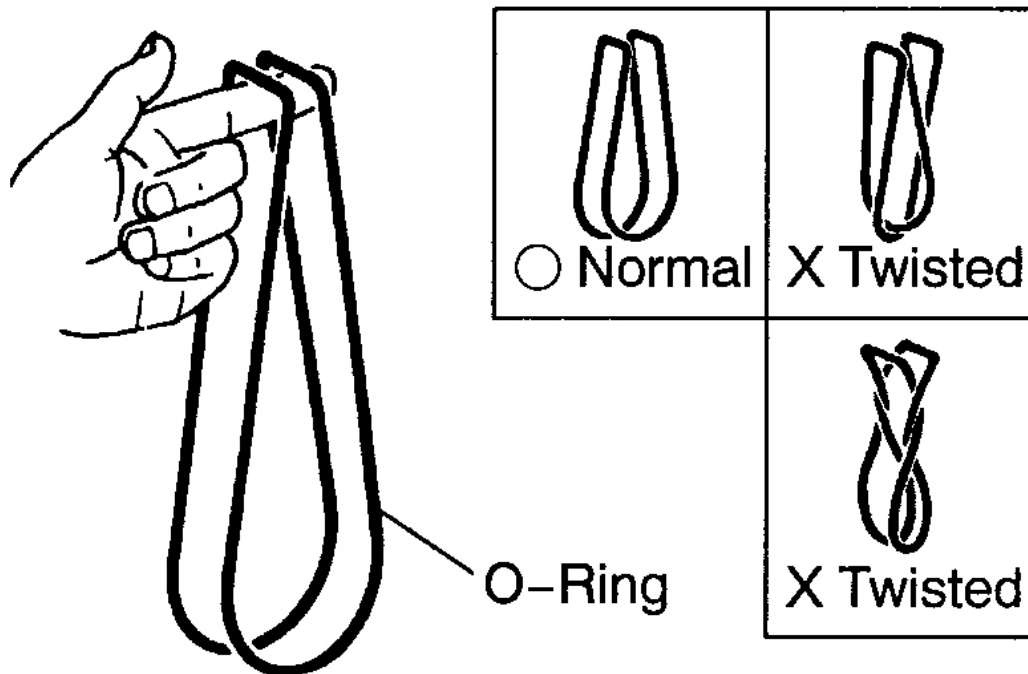
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

3. INSTALL NEW O-RINGS AND TANKS

- a. After checking that there are no foreign objects in the lock plate groove, install a new O-ring without twisting it.

HINT:

When cleaning the lock plate groove, lightly rub it with sand paper without scratching it.



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Fig. 33: Installing New O-Rings

Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- b. Install the tank without damaging the O-ring.
- c. Tap the lock plate with a soft-faced hammer so that there is no gap between the lock plate and the tank.

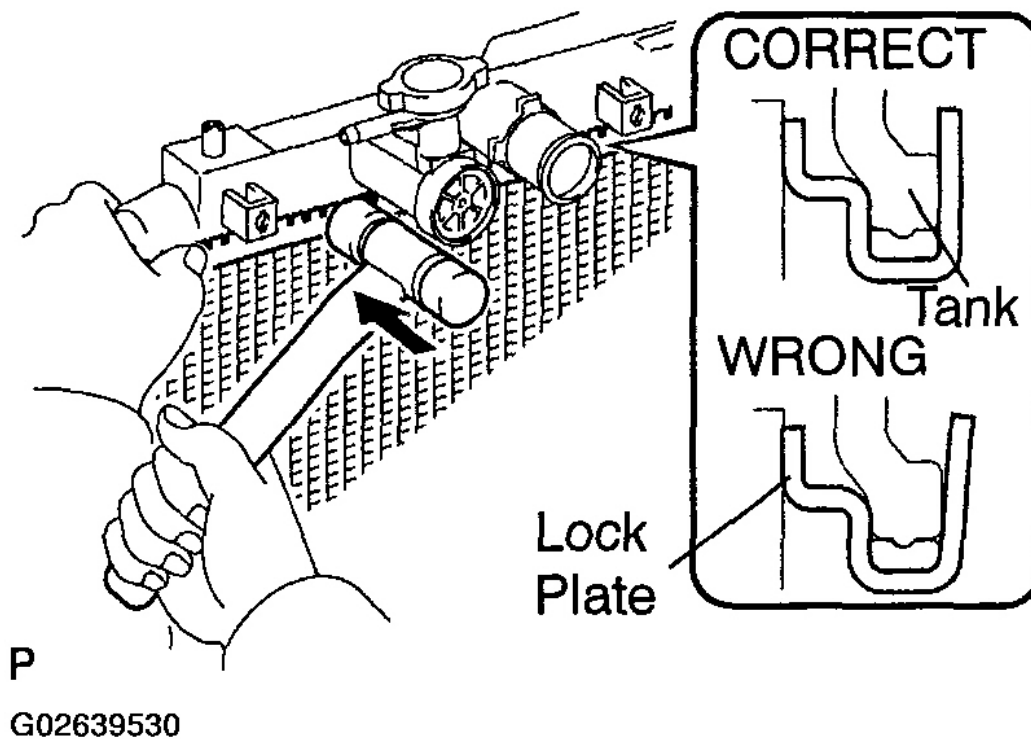


Fig. 34: Tapping Lock Plate With Soft-Faced Hammer
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

4. ASSEMBLE SST

SST 09230-01010, 09231-14010

- Install the punch assembly to the overhaul handle, inserting it in the hole in part "A" as shown.
- While gripping the handle, adjust the stopper bolt so that dimension "B" is as shown.

Dimension: 8.4 mm (0.331 in)

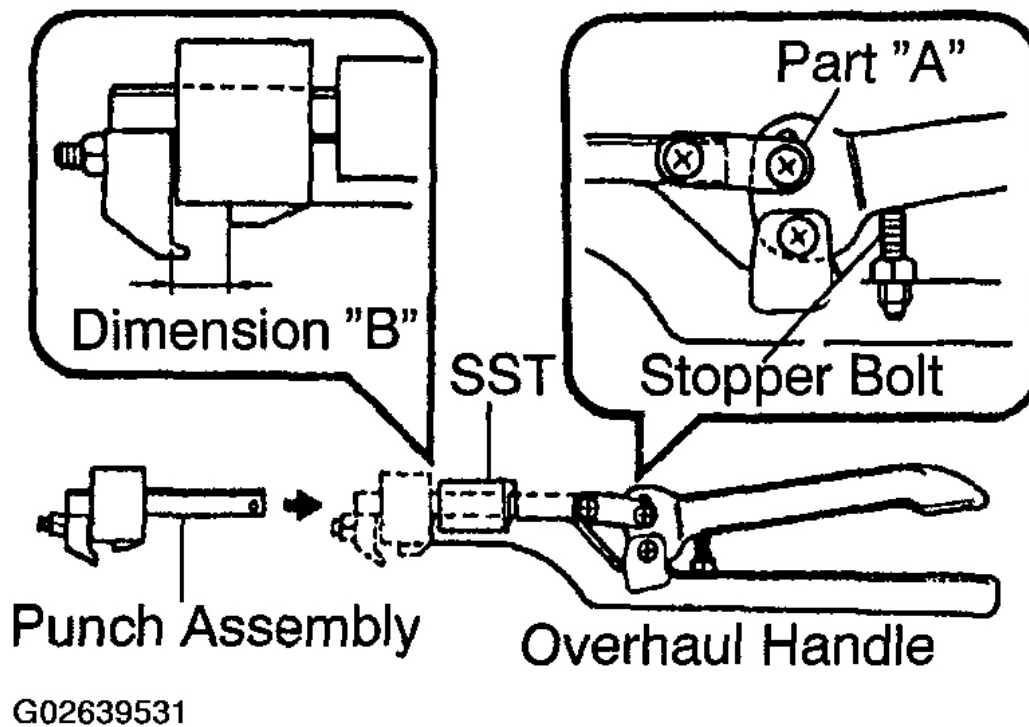
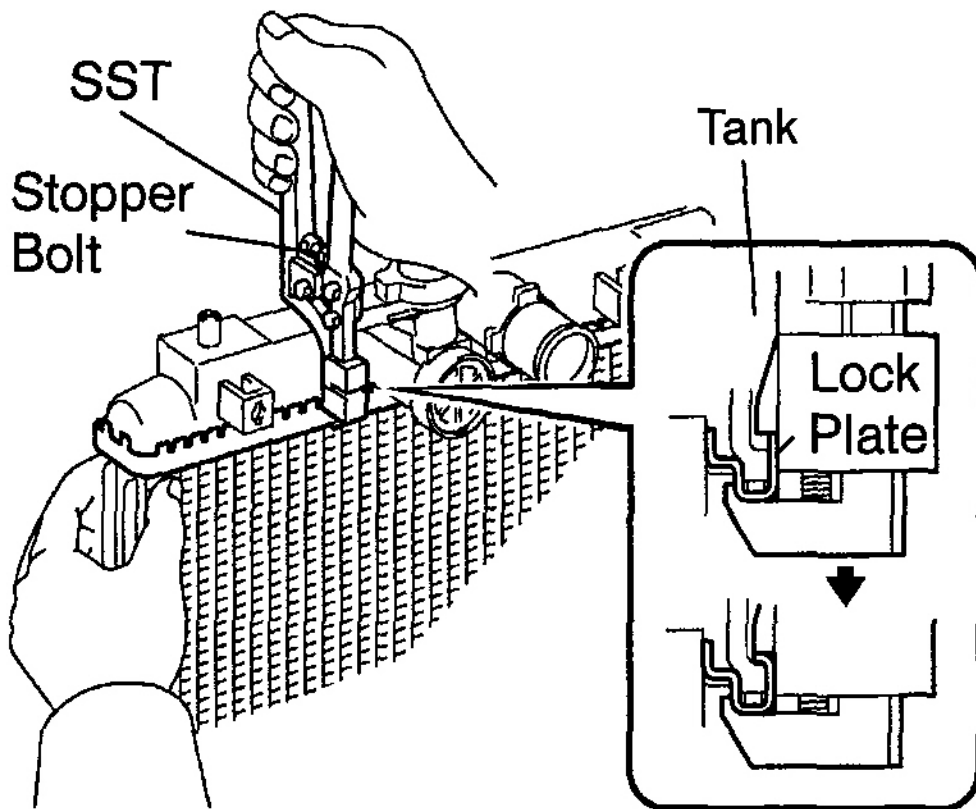
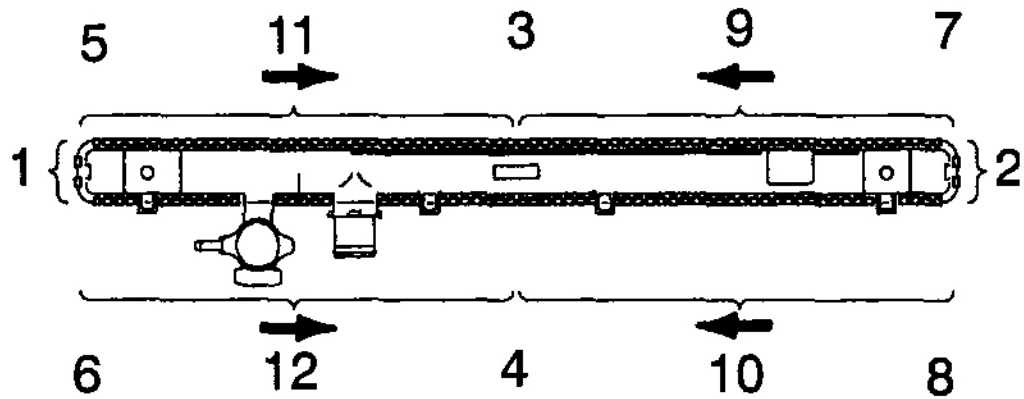


Fig. 35: Installing Punch Assembly To Overhaul Handle
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

5. CAULK LOCK PLATE

- Lightly press SST against the lock plate in the order shown in the illustration. After repeating this a few times, fully caulk the lock plate by gripping the handle until stopped by the stopper plate.

SST 09230-01010



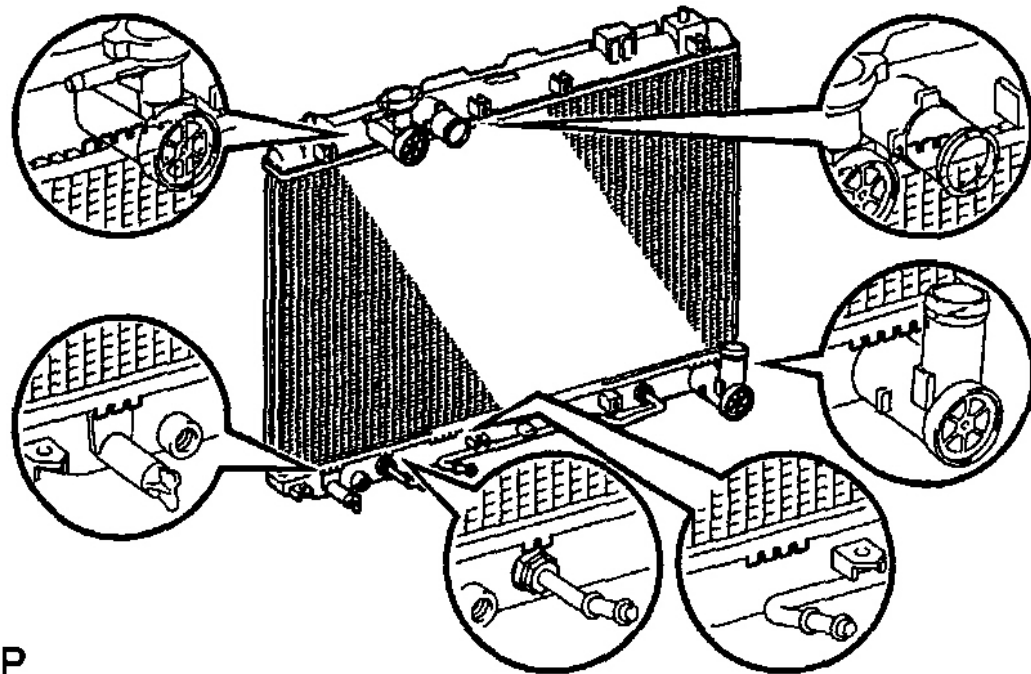
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Fig. 36: Pressing SST Against Lock Plate
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

HINT:

- Do not tap the areas protruding around the pipes, bracket or tank ribs.



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Fig. 37: Avoiding Tapping Areas Protruding Around Pipes, Brackets Or Tank Ribs
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- The points shown in the illustration and oil cooler near here (A/T) cannot be tapped with the SST. Use pliers or similar objects and be careful not to damage the core plates.

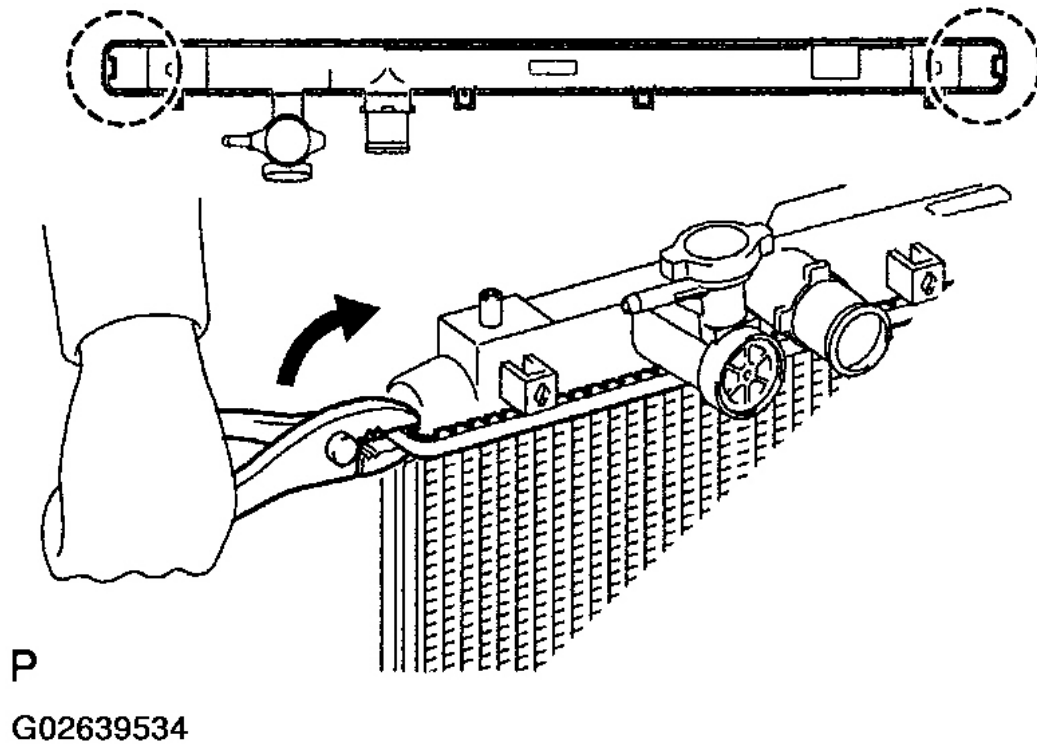


Fig. 38: Area Indicated Cannot Be Tapped With SST
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- b. Check the lock plate height (H) after completing the caulking.

Plate height (H): 8.45 to 8.85 mm (0.3327 to 0.3484 in.)

If not within the specified height, adjust the stopper bolt of the handle again and caulk again.

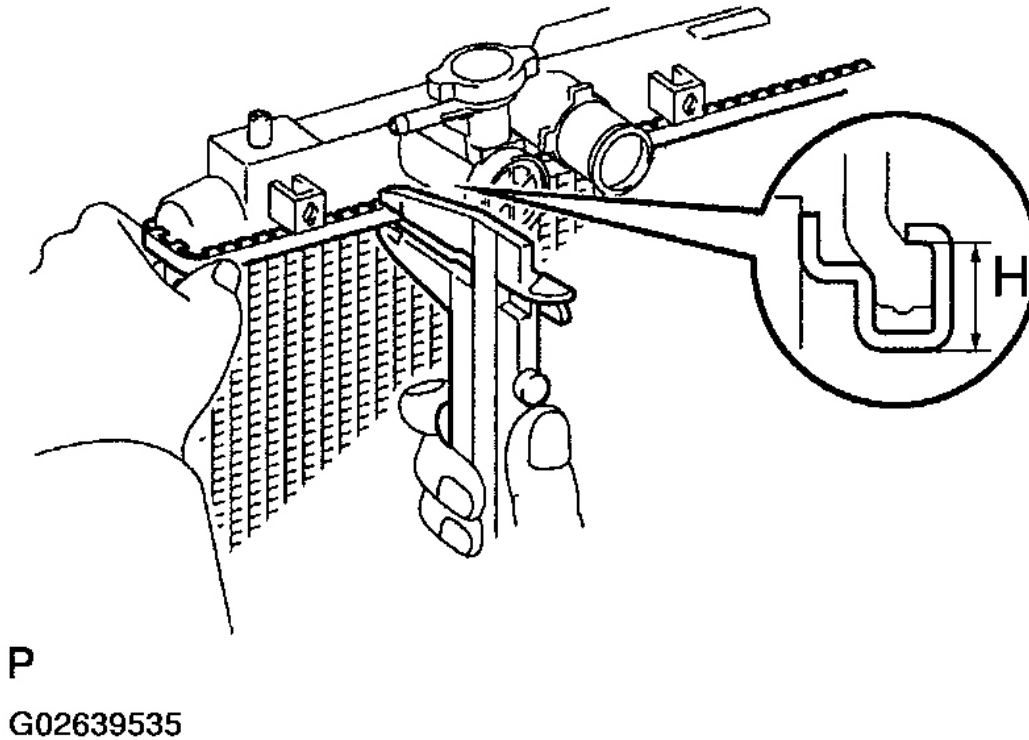


Fig. 39: Checking Lock Plate Height

Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

6. INSTALL DRAIN PLUG

- a. Install a new O-ring to the drain plug.
- b. Install the drain plug.

7. INSPECT FOR WATER LEAKS

- a. Tighten the drain plug.
- b. Plug the inlet and outlet pipes of the radiator with SST.

SST 09230-01010

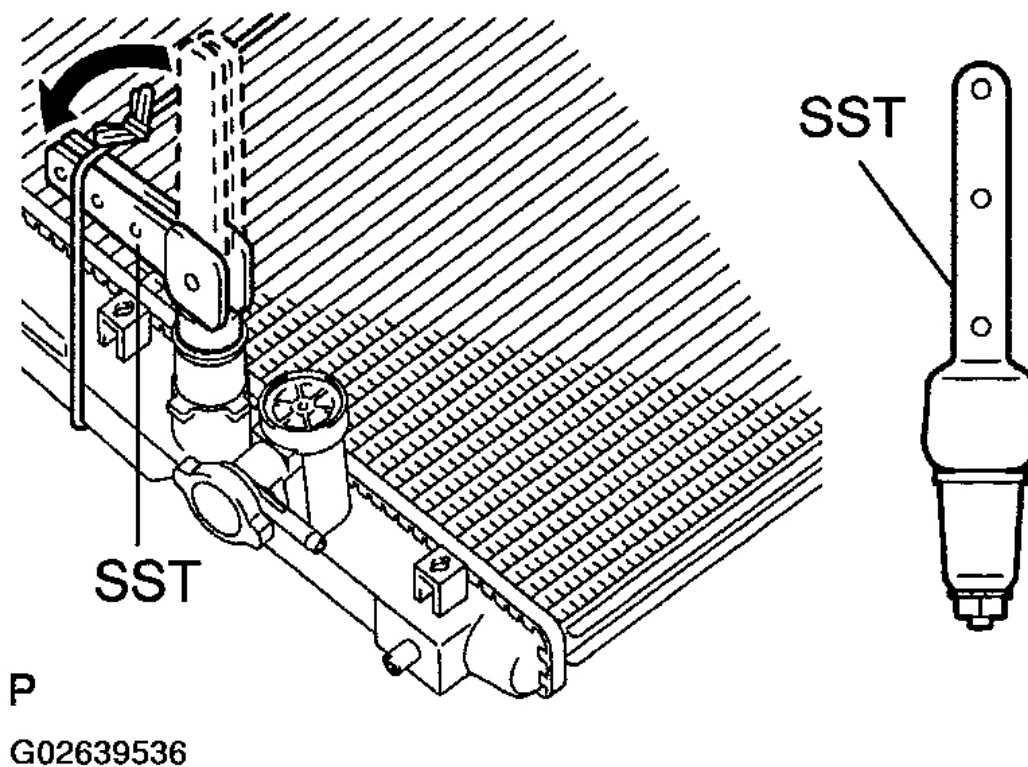


Fig. 40: Plugging Inlet & Outlet Pipes Of Radiator With SST
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- c. Using a radiator cap tester, apply pressure to the radiator.

Test pressure: 177 kPa (1.8 kgf/cm² , 26 psi)

- d. Submerge the radiator in water.
- e. Inspect for leaks.

HINT:

On radiators with resin tanks, there is a clearance between the tank and lock plate where a minute amount of air will remain, giving the appearance of an air leak when the radiator is submerged in water. Therefore, before doing the water leak test, first swish the radiator around in the water until all air bubbles disappear.

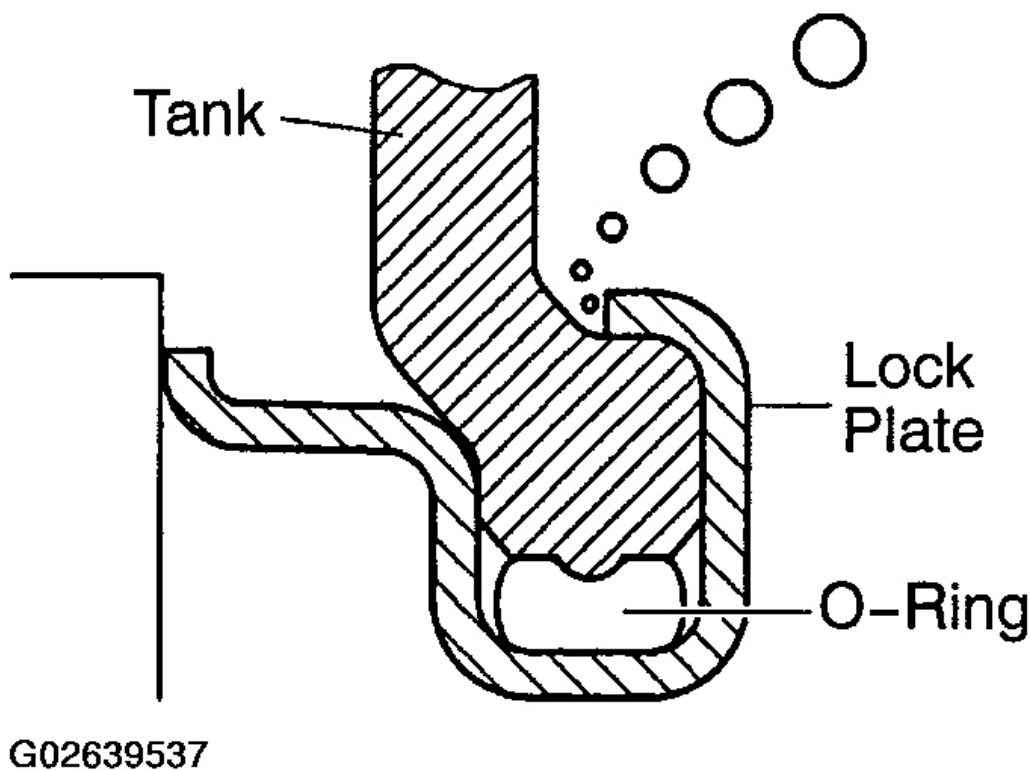


Fig. 41: Inspecting Radiators For Leaks

Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

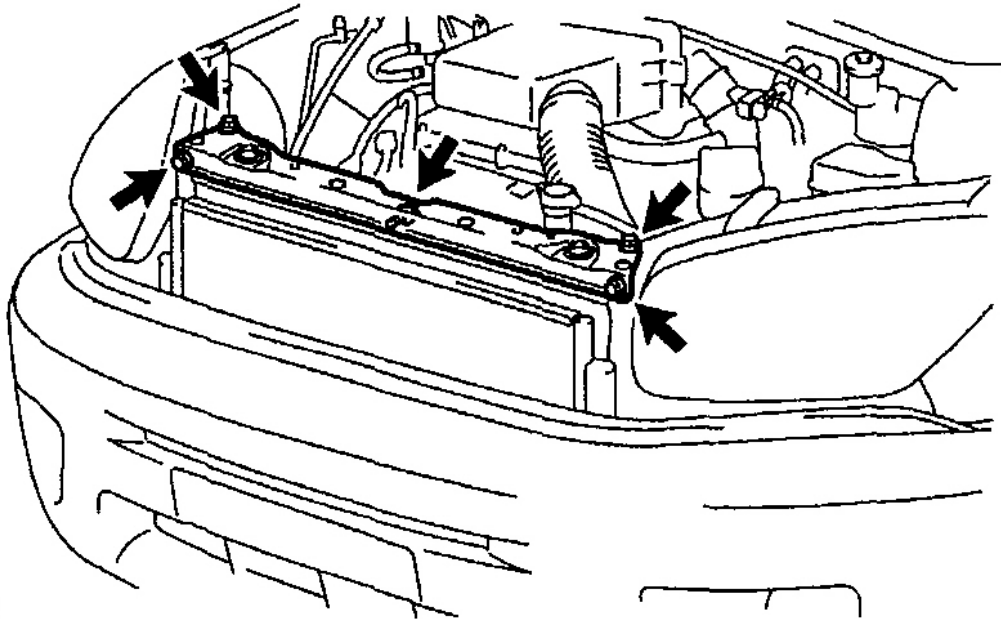
INSTALLATION

1. **INSTALL UPPER AND LOWER RADIATOR SUPPORTS TO RADIATOR**
2. **INSTALL RADIATOR**
3. **CONNECT LOWER RADIATOR HOSE**
4. **A/T: CONNECT 2 HOSES**

Connect the 2 oil cooler hoses to the radiator.

5. **INSTALL NO. 1 AND NO. 2 COOLING FANS (See INSTALLATION)**
6. **INSTALL RADIATOR RESERVOIR**
7. **INSTALL RH ENGINE UNDER COVER**
8. **INSTALL UPPER RADIATOR SUPPORT**

Install the radiator upper support with the 5 bolts.



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Fig. 42: Installing Upper Radiator Support

Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

9. **CONNECT UPPER RADIATOR HOSE**
10. **CONNECT HOOD LOCK**
 - a. Install the hood lock with the 3 bolts.
 - b. Install the wire from the clamps.

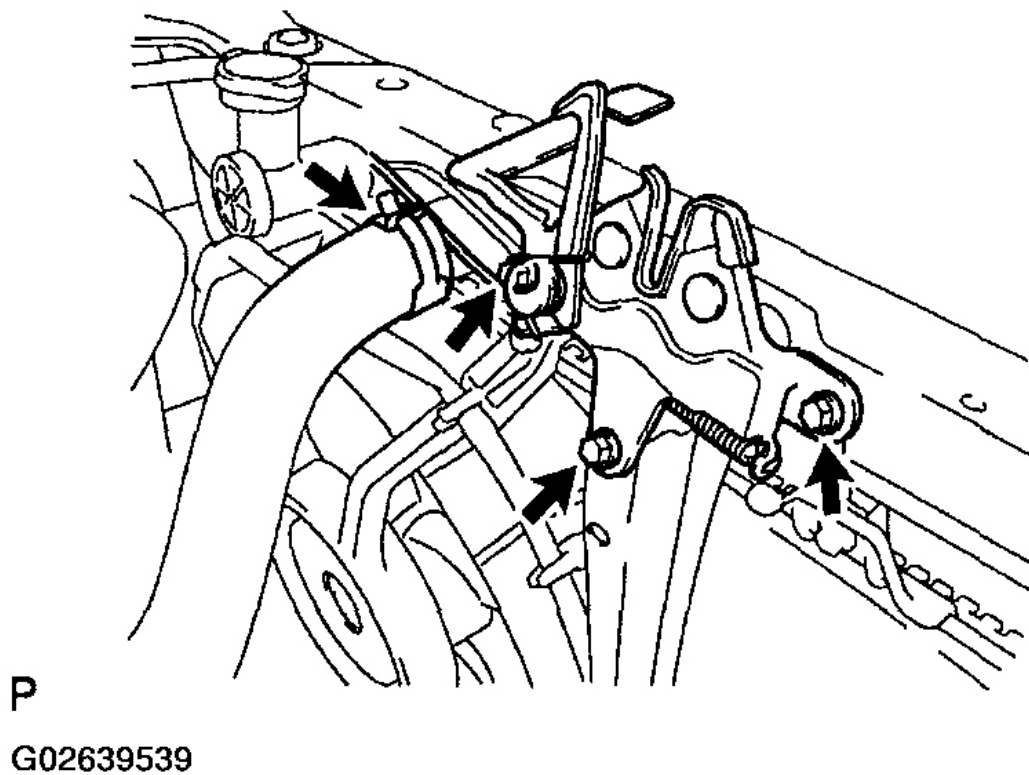
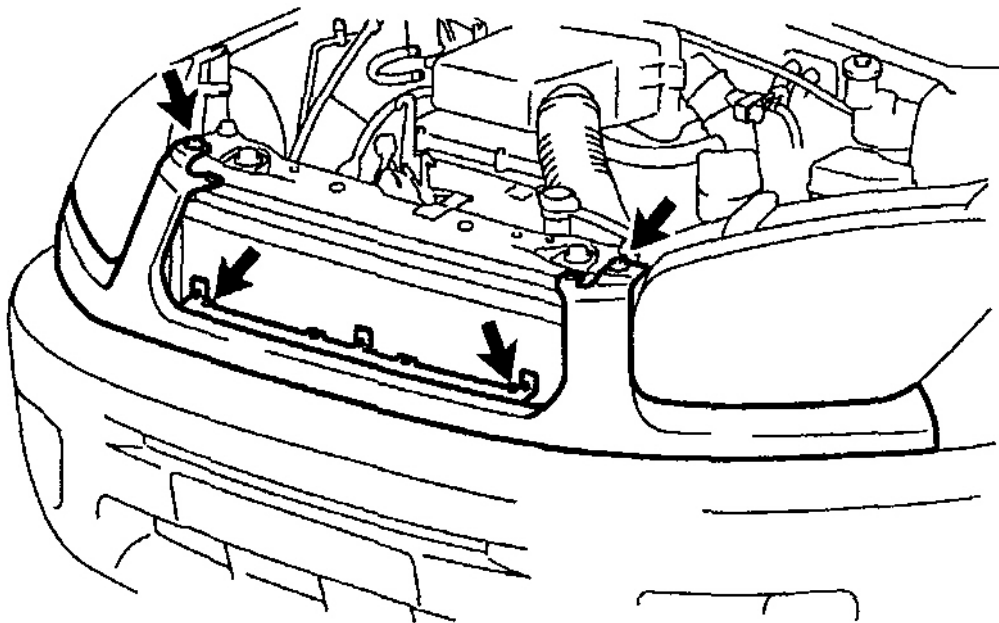


Fig. 43: Installing Hood Lock

Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

11. INSTALL FRONT END PANEL

Install the front end panel with the 4 screws.



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Fig. 44: Installing Front End Panel

Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

12. INSTALL RADIATOR GRILLE

Install the radiator grille with the 4 screws and 2 clips.

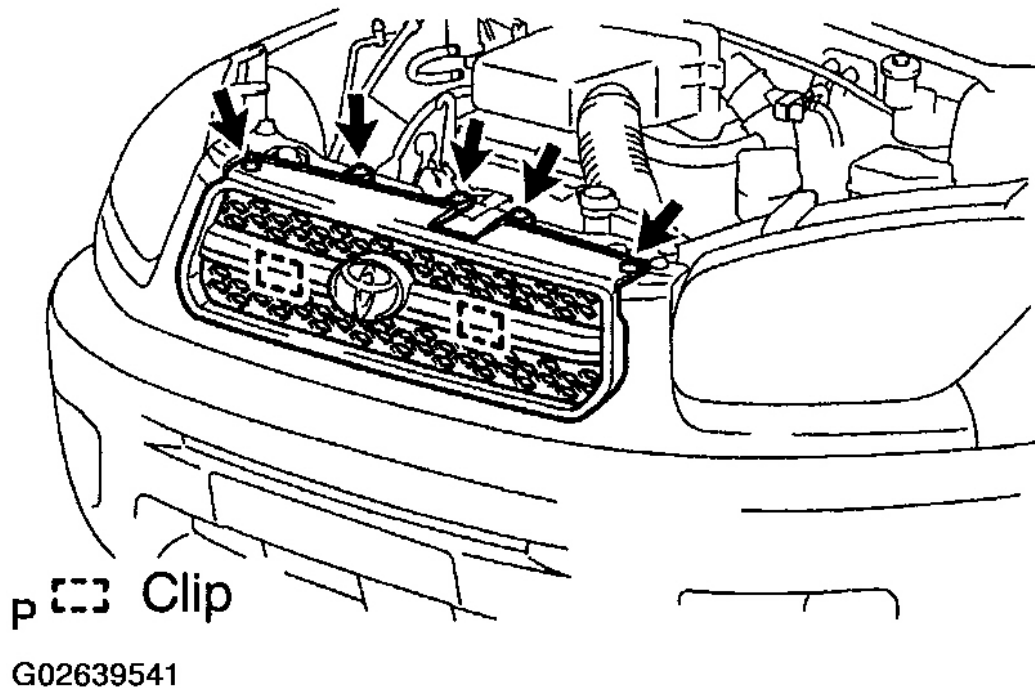


Fig. 45: Installing Radiator Grille

Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

13. FILL WITH ENGINE COOLANT
14. START ENGINE AND CHECK FOR COOLANT LEAKS

ELECTRIC COOLING FAN

ON-VEHICLE INSPECTION

1. CHECK COOLING FAN OPERATION WITH LOW TEMPERATURE [(Below 83°C (181°F))]
 - a. Turn the ignition switch ON.
 - b. Check that the cooling fan stops.

If not, check the cooling fan relay (see **COOLING FAN RELAY**) and ECT switch (see **ENGINE COOLANT TEMPERATURE (ECT) SWITCH**), and check for a separated connector or severed wire between the cooling fan relay and ECT switch.

2. CHECK COOLING FAN OPERATION WITH HIGH TEMPERATURE [Above 93°C (199°F)]
 - a. Start the engine, and raise coolant temperature to above 93°C (199°F).
 - b. Check that the cooling fan rotates.

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If not, check the cooling fan relay (see **COOLING FAN RELAY**), cooling fan, and ECT switch or check the ECT switch (see **ENGINE COOLANT TEMPERATURE (ECT) SWITCH**).

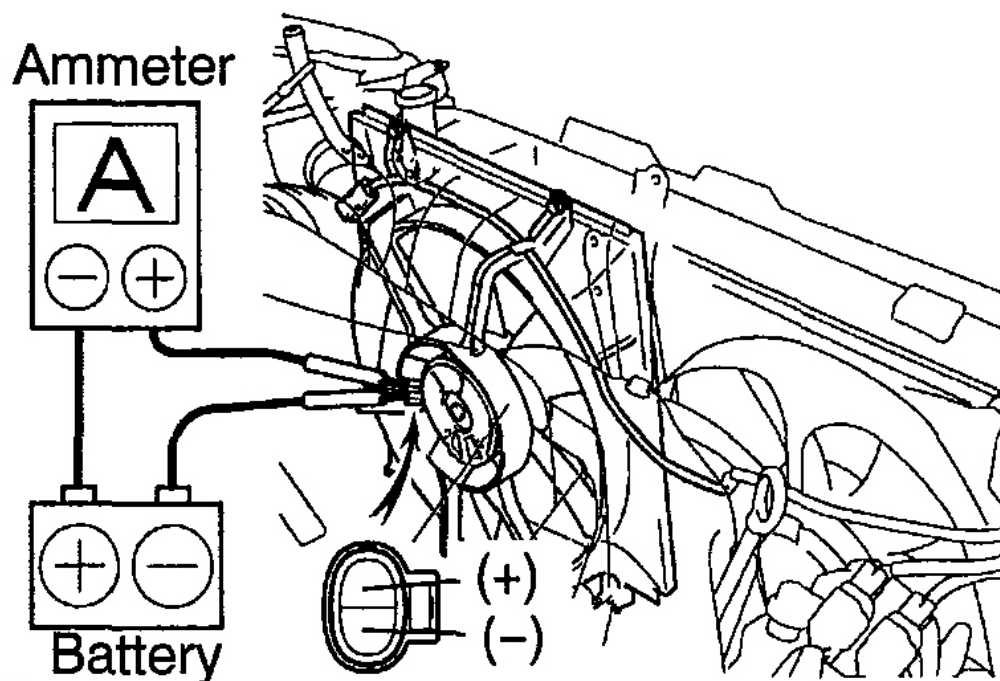
3. INSPECT COOLING FANS

- a. Disconnect the cooling fan connector.
- b. Connect battery and ammeter to the connector.
- c. Check that the cooling fan rotates smoothly, and check the reading on the ammeter.

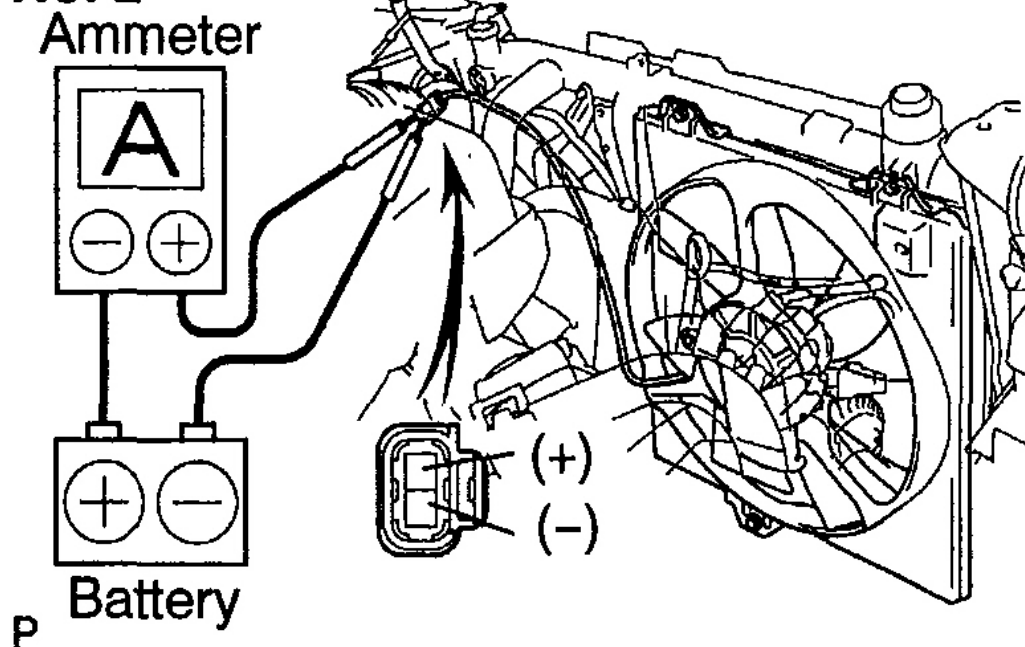
Standard amperage: 4.9 to 8.5 A at 20°C (68°F)

- d. Reconnect the cooling fan connector.

No. 1



No. 2



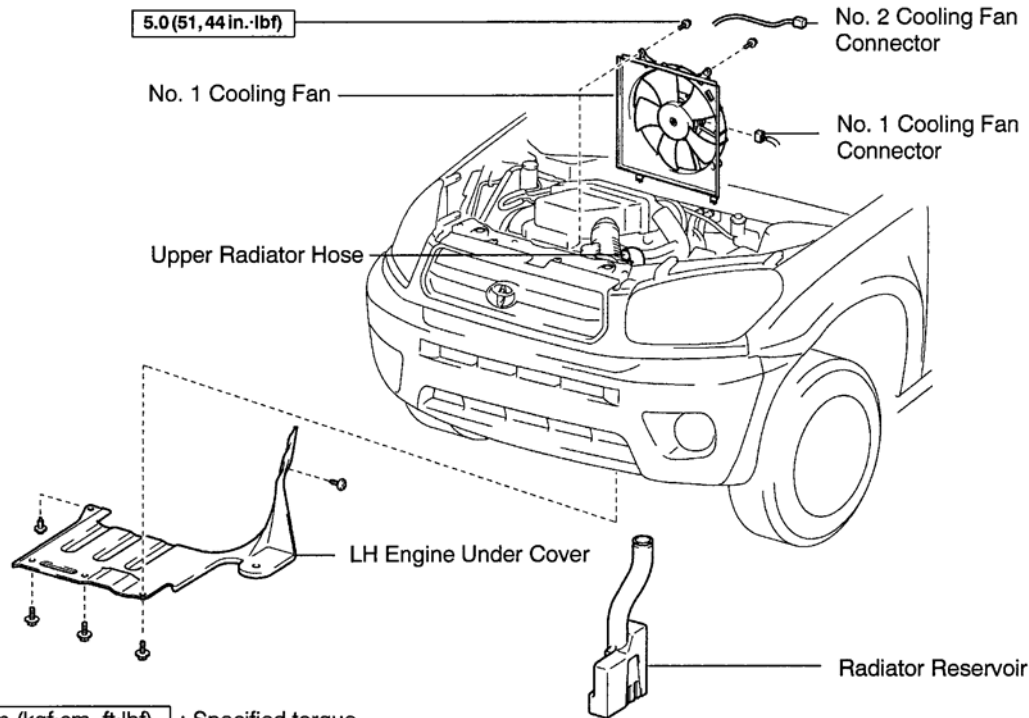
2005 Toyota RAV4

2005 ENGINE Cooling - RAV4

Fig. 46: Connecting Battery & Ammeter To Connector
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

COMPONENTS

No. 1 Cooling Fan



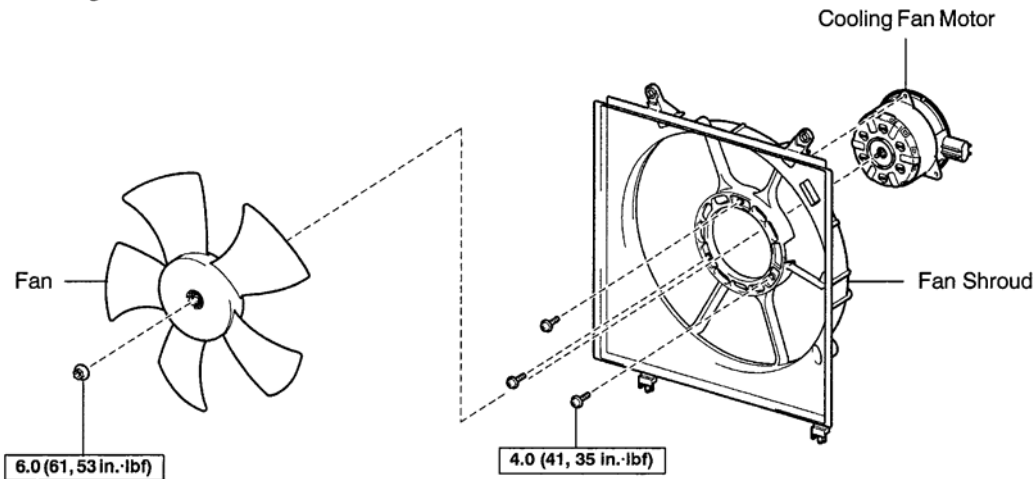
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Fig. 47: Exploded View Of Electric Cooling Fan Components & Torque Specifications (1 Of 4)
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

2005 Toyota RAV4

2005 ENGINE Cooling - RAV4

No. 1 Cooling Fan

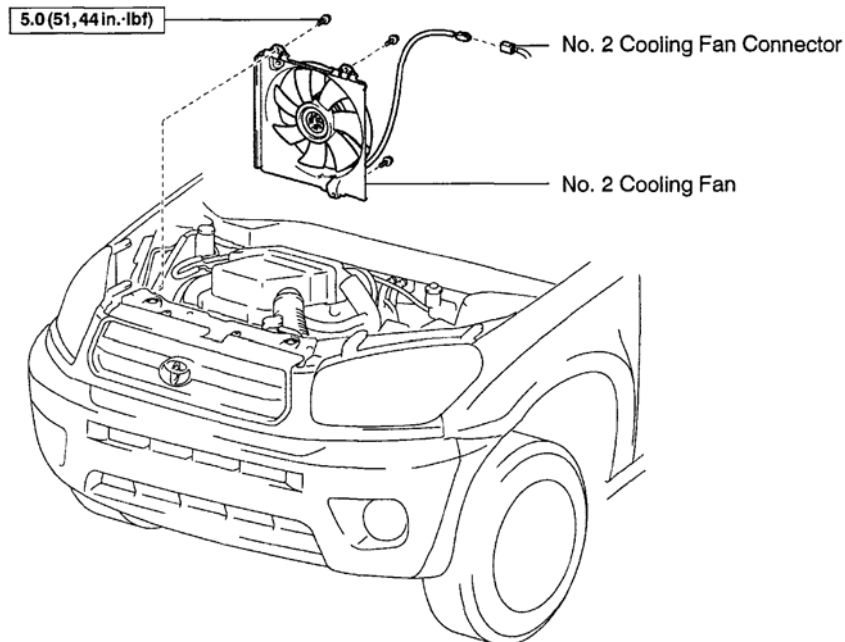


$\text{N}\cdot\text{m}$ (kgf·cm, ft·lbf) : Specified torque

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Fig. 48: Exploded View Of Electric Cooling Fan Components & Torque Specifications (2 Of 4)
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

No. 2 Cooling Fan



$\text{N}\cdot\text{m}$ (kgf·cm, ft·lbf) : Specified torque

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Fig. 49: Exploded View Of Electric Cooling Fan Components & Torque Specifications (3 Of 4)

Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

No. 2 Cooling Fan

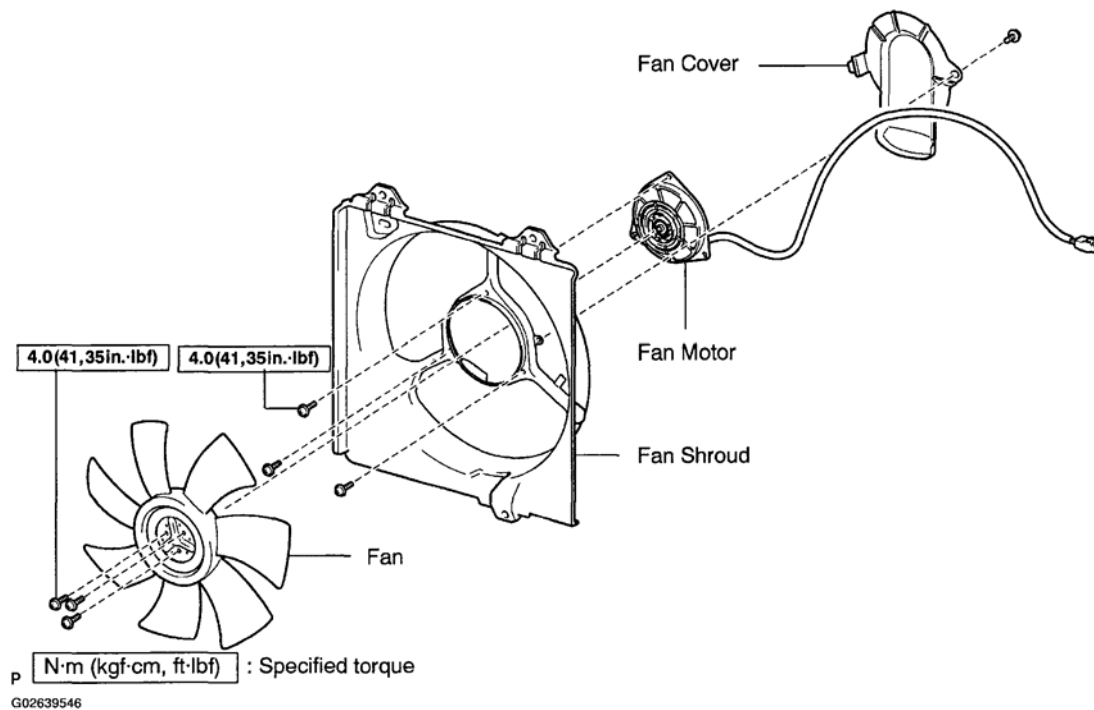


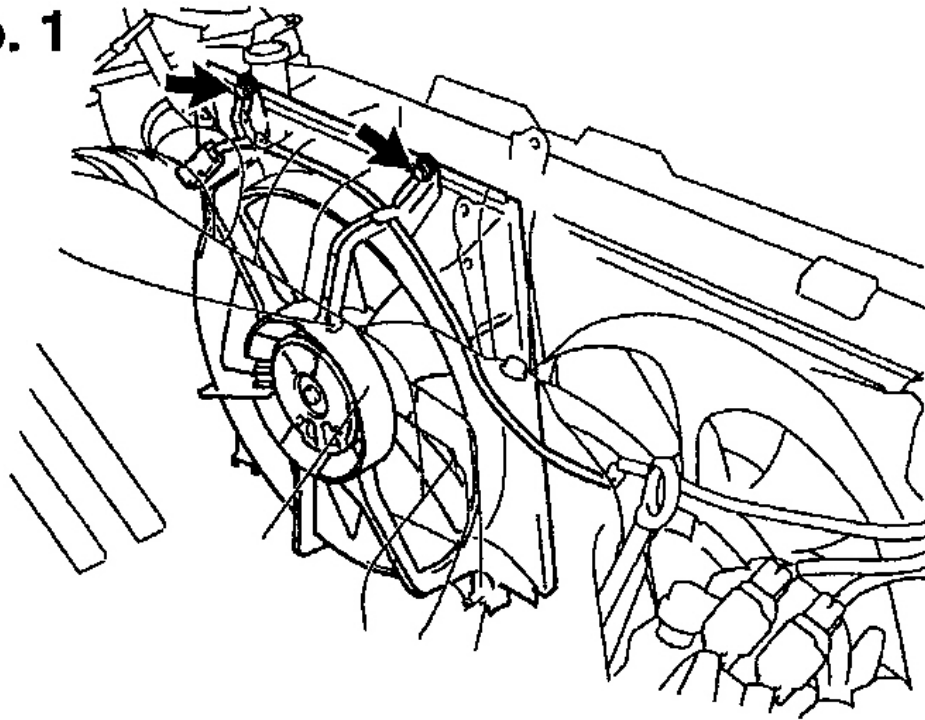
Fig. 50: Exploded View Of Electric Cooling Fan Components & Torque Specifications (4 Of 4)
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

REMOVAL

1. REMOVE NO. 1 COOLING FAN

- a. Remove the LH engine under cover.
- b. Disconnect the upper radiator hose.
- c. Remove the radiator reservoir.
- d. Disconnect the No. 1 cooling fan connector.
- e. Disconnect the No. 2 cooling fan connector.
- f. Remove the 2 bolts and No. 1 cooling fan assembly.

No. 1



P

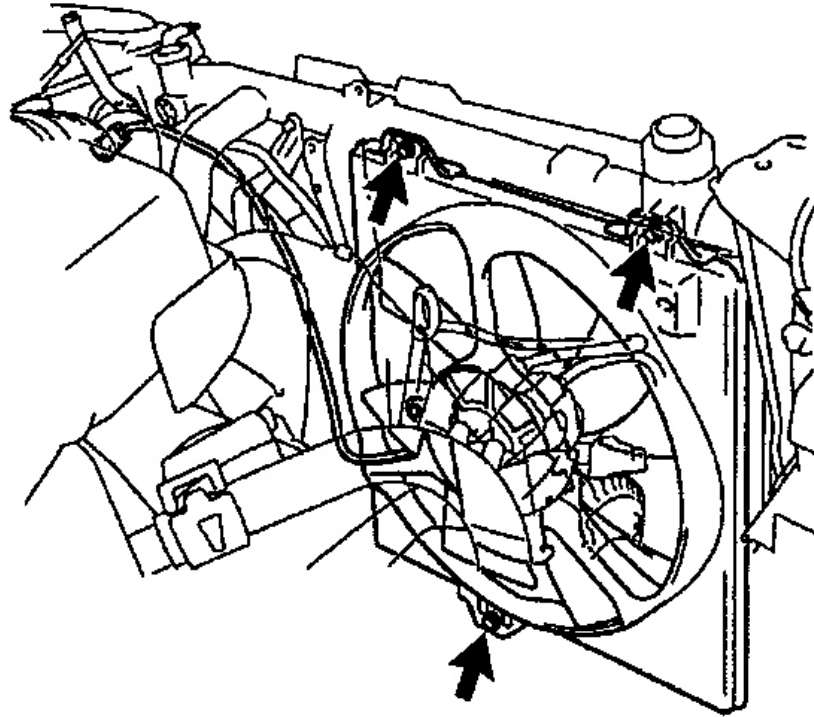
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Fig. 51: Removing No. 1 Cooling Fan Assembly
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

2. REMOVE NO. 2 COOLING FAN

- a. Disconnect the No. 2 cooling fan connector.
- b. Remove the 3 bolts and No. 2 cooling fan.

No. 2



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Fig. 52: Removing No. 2 Cooling Fan Assembly
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

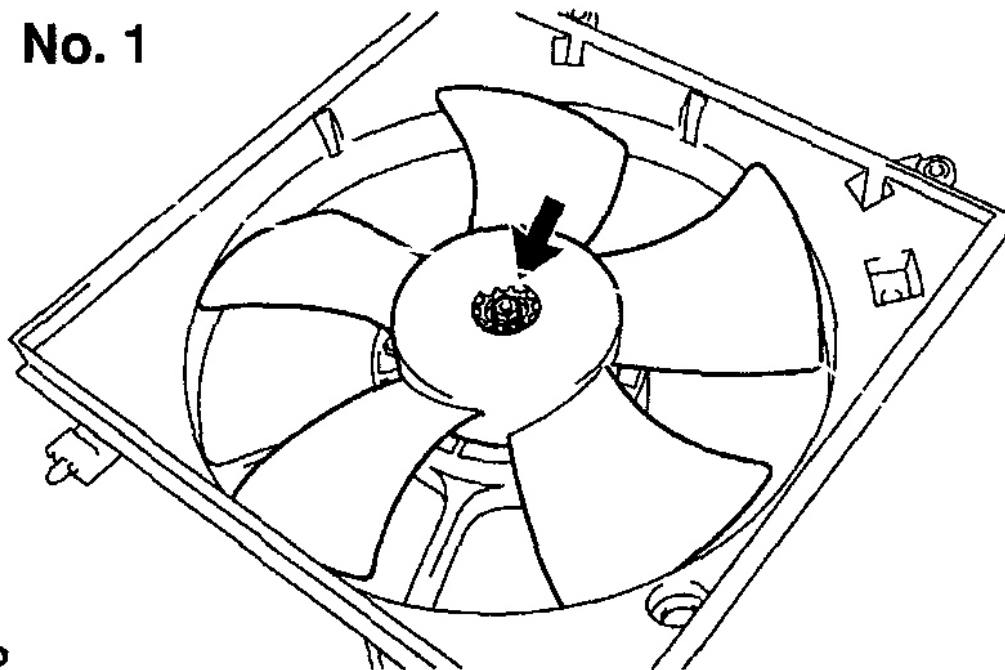
DIASSEMBLY

1. REMOVE FAN

- a. No. 1 cooling fan:

Remove the nut and fan.

No. 1



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Fig. 53: Removing No. 1 Cooling Fan Blade

Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- b. No. 2 cooling fan:

Remove the 3 screws and fan.

No. 2

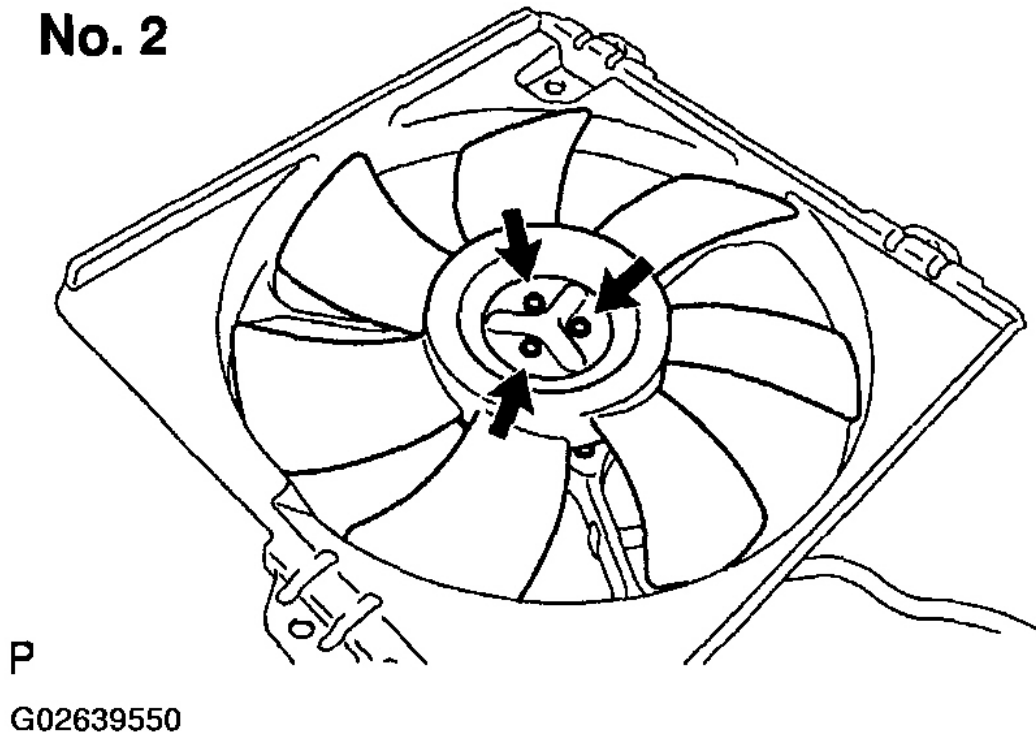


Fig. 54: Removing No. 2 Cooling Fan Blade
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

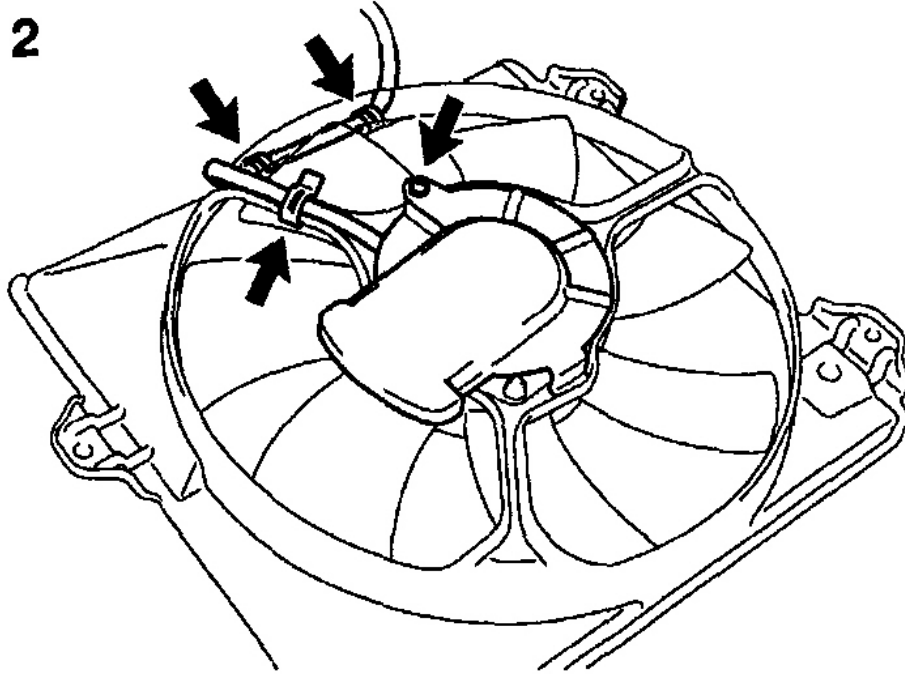
- c. No. 2 cooling fan:

Disconnect the lead wire and connector holder from the fan shroud.

2. No. 2 cooling fan: REMOVE FAN MOTOR COVER

Remove the screw and fan motor cover.

No. 2



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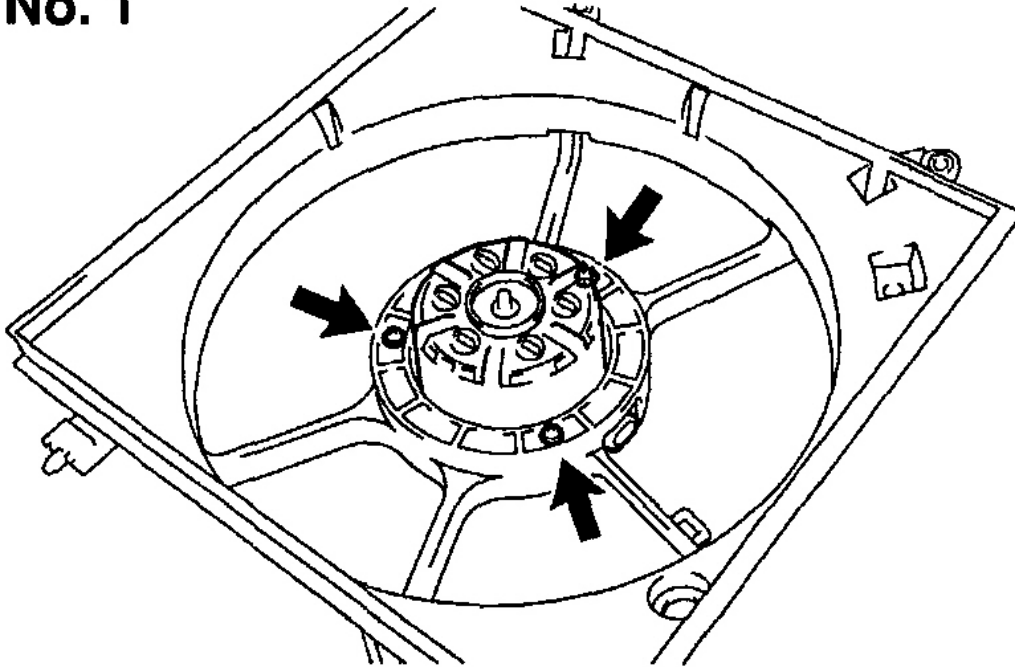
Fig. 55: Removing Fan Motor Cover

Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

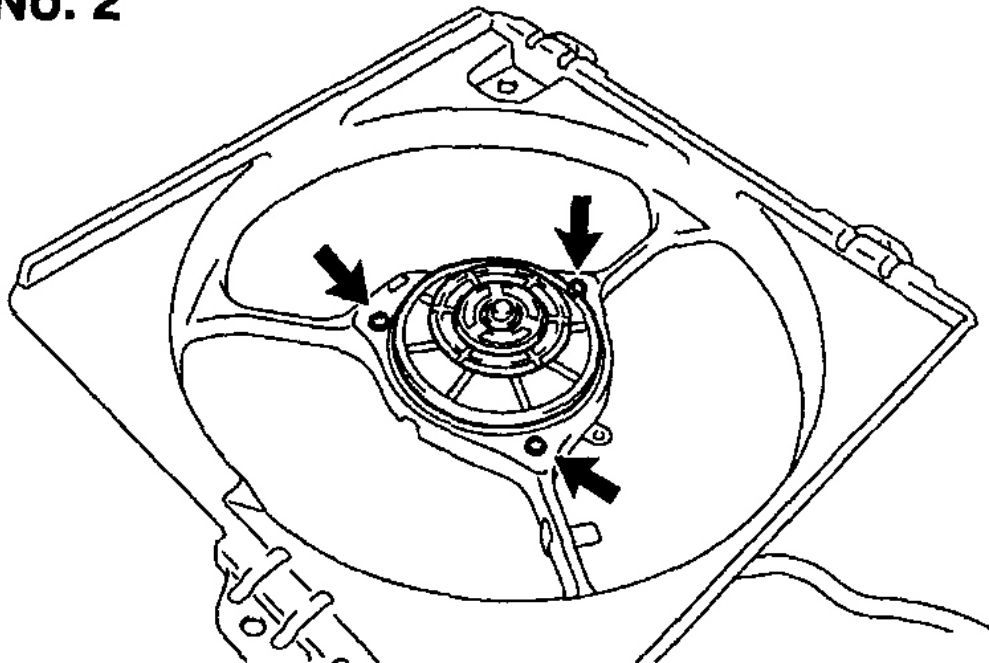
3. REMOVE FAN MOTOR

Remove the 3 screws and fan motor.

No. 1



No. 2



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Fig. 56: Removing Fan Motor

Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

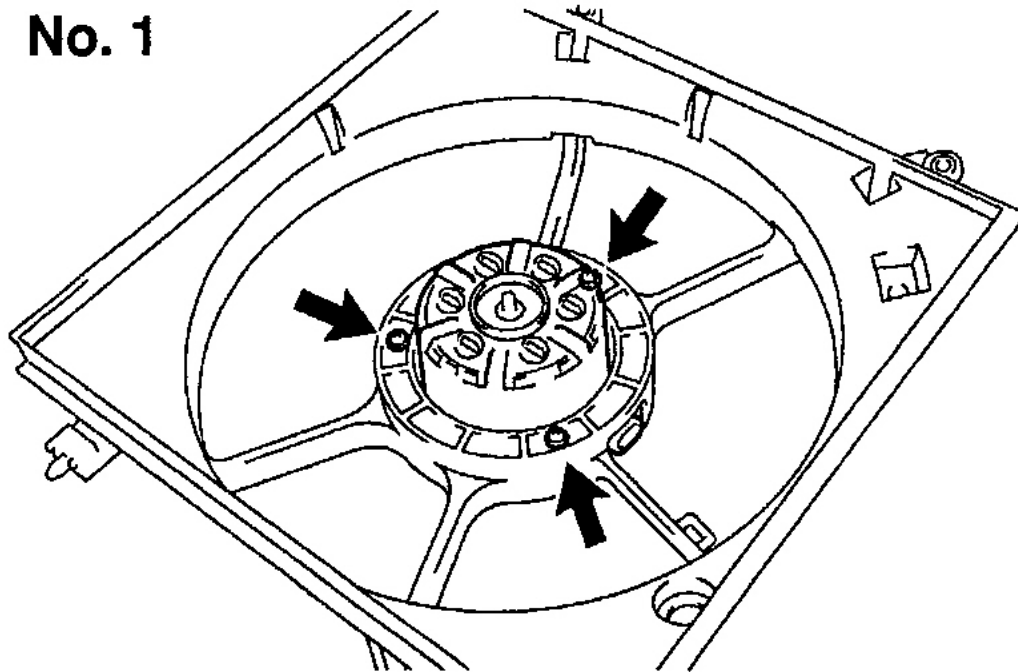
REASSEMBLY

1. INSTALL COOLING FAN MOTOR

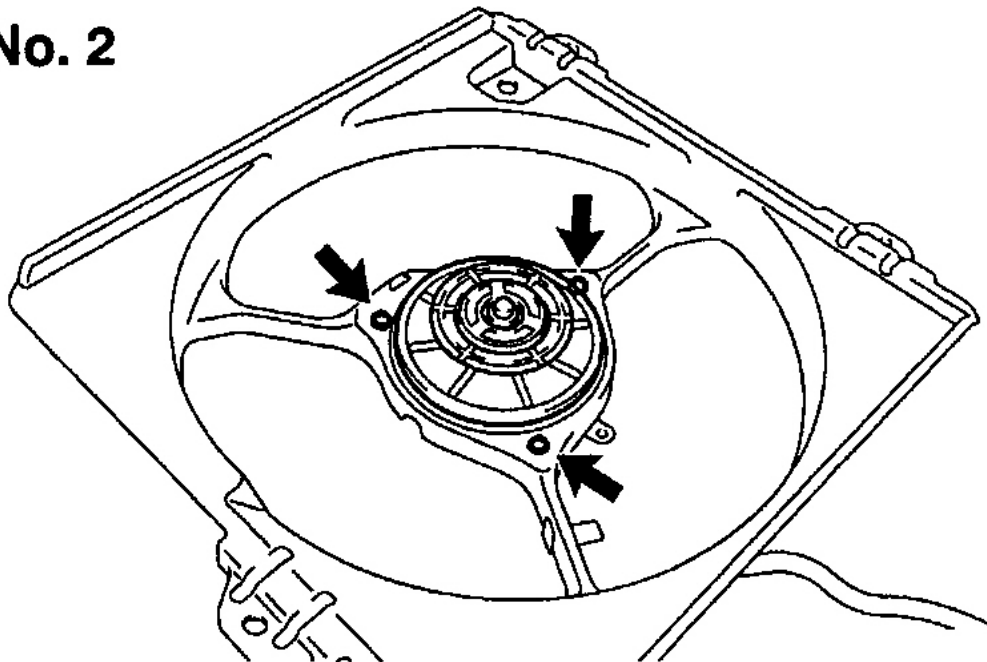
- a. Install the fan motor with the 3 screws.

Torque: 4.0 N.m (41 kgf.cm, 35 in.lbf)

No. 1



No. 2



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Fig. 57: Installing Fan Motor

Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- b. No. 2 cooling fan:

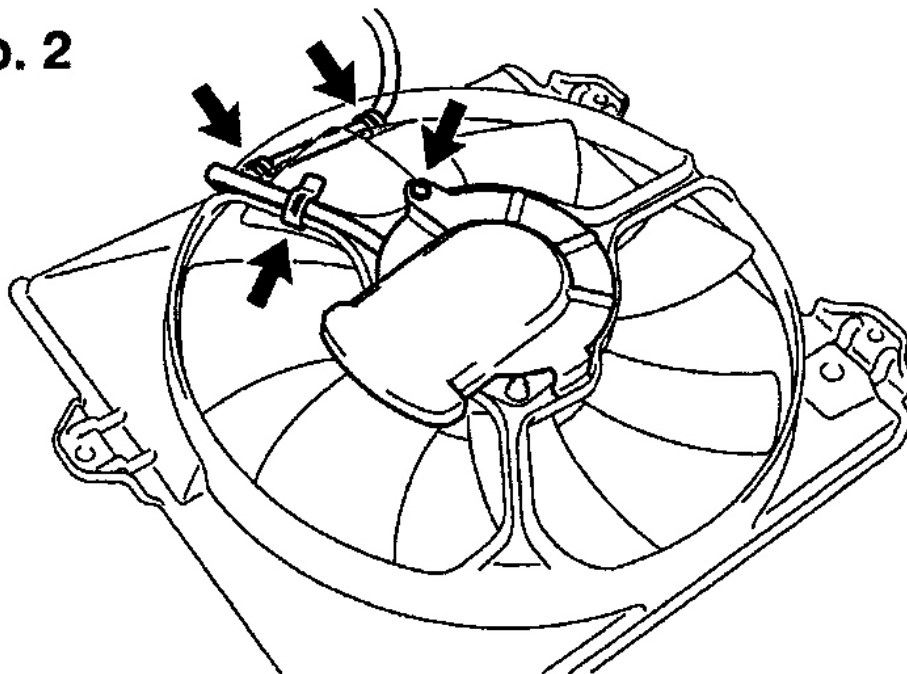
Install the lead wire and connector holder to the fan shroud.

2. No. 2 Cooling fan: INSTALL FAN MOTOR COVER

Install the fan motor cover with the screw.

Torque: 4.0 N.m (41 kgf.cm, 35 in.lbf)

No. 2



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Fig. 58: Installing Fan Motor Cover

Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

3. INSTALL FAN

- a. No. 1 cooling fan:

Install the fan with the nut.

Torque: 6.0 N.m (61 kgf.cm, 55 in.lbf)

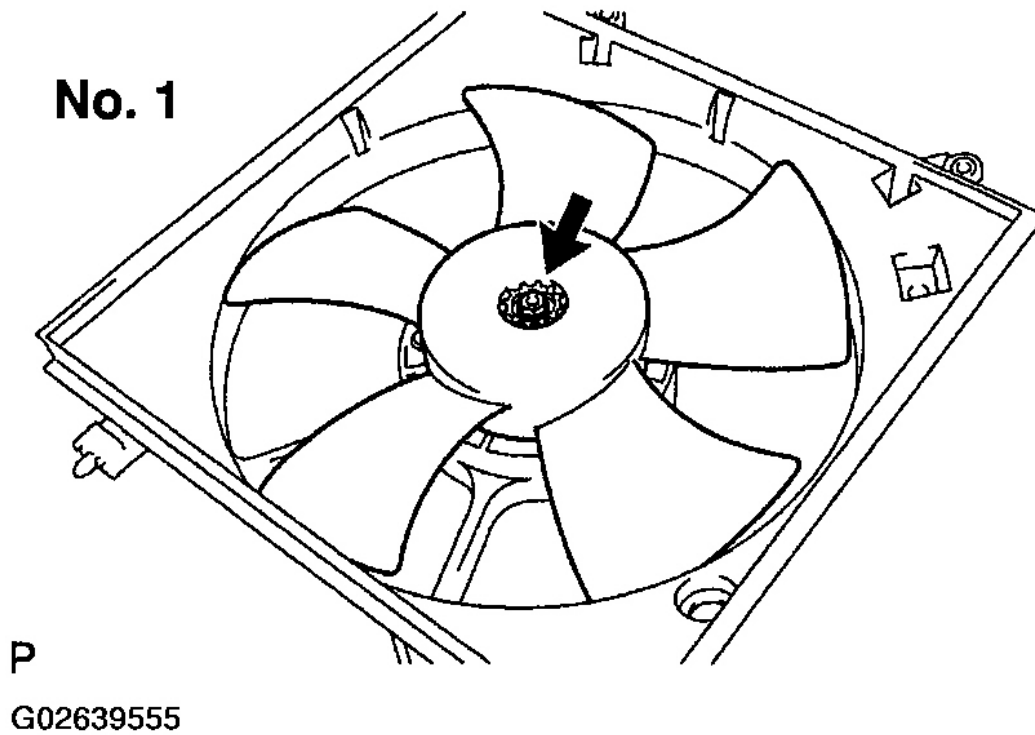


Fig. 59: Installing No. 1 Fan Blade

Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- b. No. 2 cooling fan:

Install the fan with the 3 screws.

Torque: 4.0 N.m (41 kgf.cm, 35 in.lbf)

No. 2

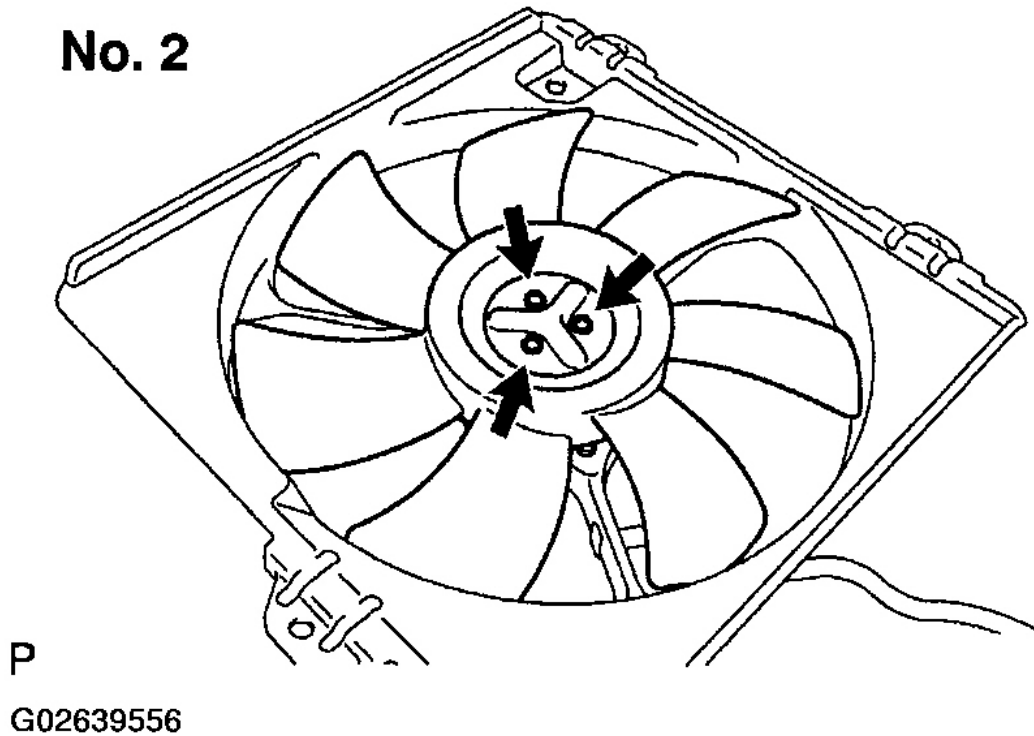


Fig. 60: Installing No. 2 Fan Blade

Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

INSTALLATION

1. INSTALL NO. 1 COOLING FAN

- a. Install the No. 1 cooling fan with the 2 bolts.

Torque: 5.0 N.m (51 kgf.cm, 45 in.lbf)

- b. Connect the No. 1 cooling fan connector.
- c. Install the radiator reservoir.
- d. Connect the upper radiator hose.
- e. Install the LH engine under cover.

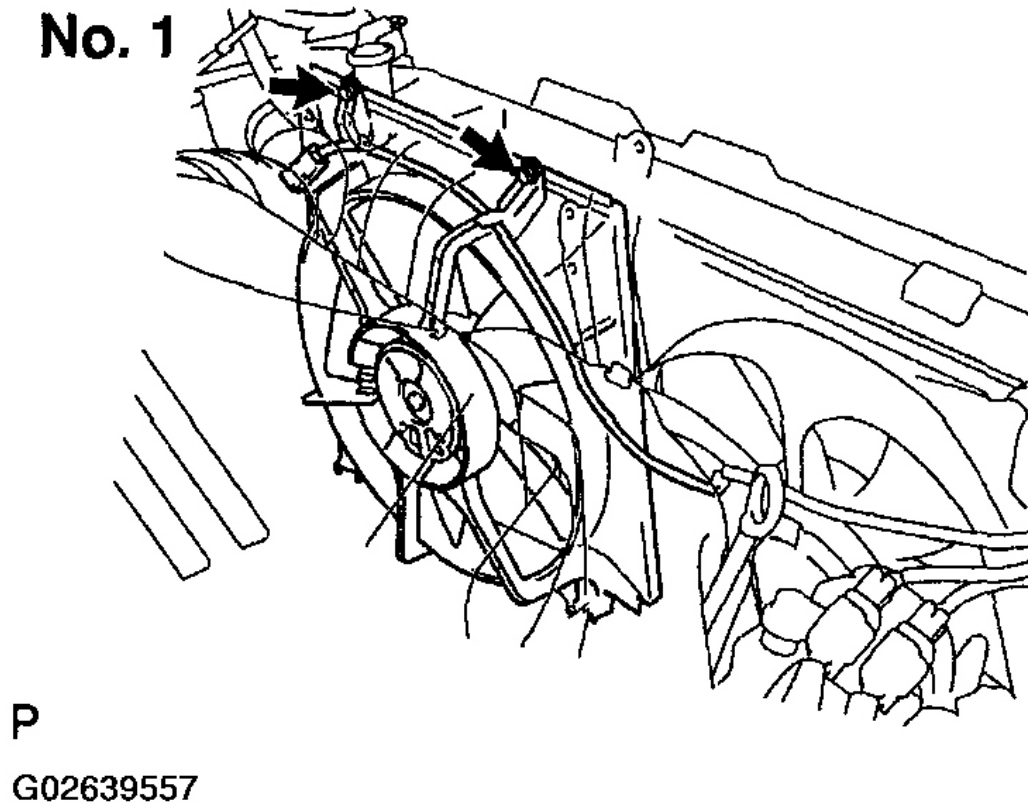


Fig. 61: Installing No. 1 Cooling Fan Assembly
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

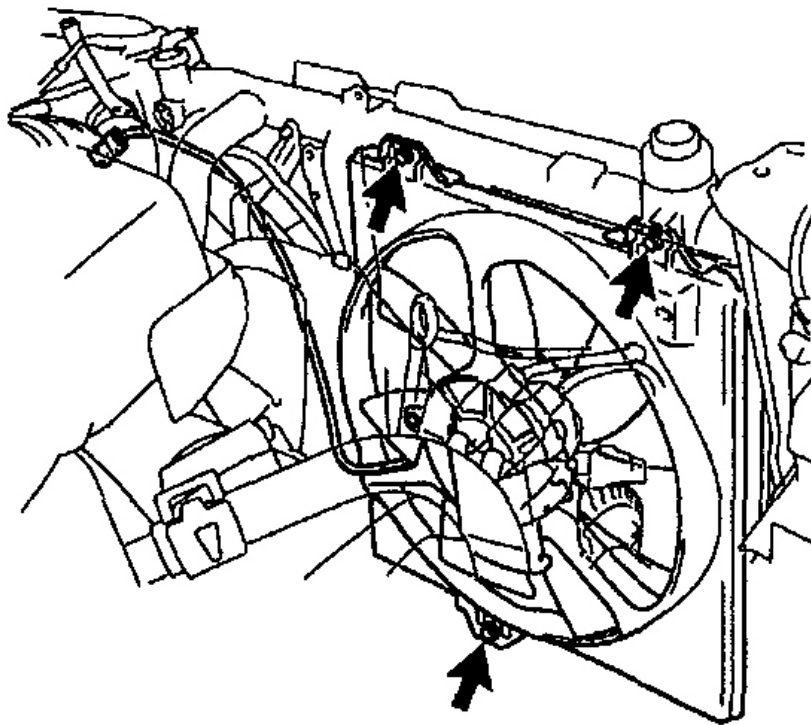
2. INSTALL NO. 2 COOLING FAN

- a. Install the No. 2 cooling fan with the 3 bolts.

Torque: 5.0 N.m (51 kgf.cm, 45 in.lbf)

- b. Connect the No. 2 cooling fan connector.

No. 2



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Fig. 62: Installing No. 2 Cooling Fan Assembly
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

ENGINE COOLANT TEMPERATURE (ECT) SWITCH

INSPECTION

- 1. DRAIN ENGINE COOLANT**
- 2. REMOVE ECT SWITCH**
- 3. INSPECT ECT SWITCH**

- a. Using an ohmmeter, check that there is continuity between the terminals when the coolant temperature is above 93°C (199°F).

If there is no continuity, replace the switch.

- b. Using an ohmmeter, check that there is no continuity between the terminals when the coolant

temperature is below 83°C (181°F).

If there is continuity, replace the switch.

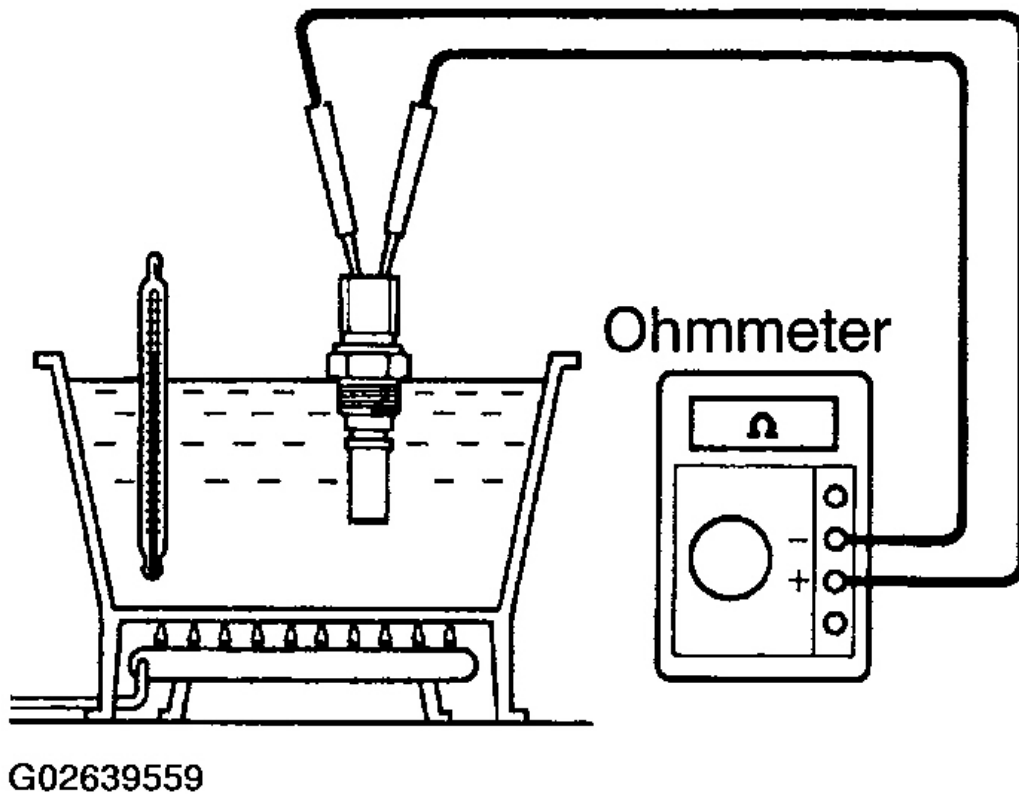


Fig. 63: Inspecting ECT Switch

Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

4. REINSTALL ECT SWITCH

Torque: 7.4 N.m (75 kgf.cm, 65 in.lbf)

5. REFILL WITH ENGINE COOLANT

6. START ENGINE AND CHECK FOR COOLANT LEAKS

COOLING FAN RELAY

INSPECTION

1. INSPECT NO. 1 COOLING FAN RELAY

- a. Remove the No. 1 cooling fan relay (Marking: FAN NO. 1).

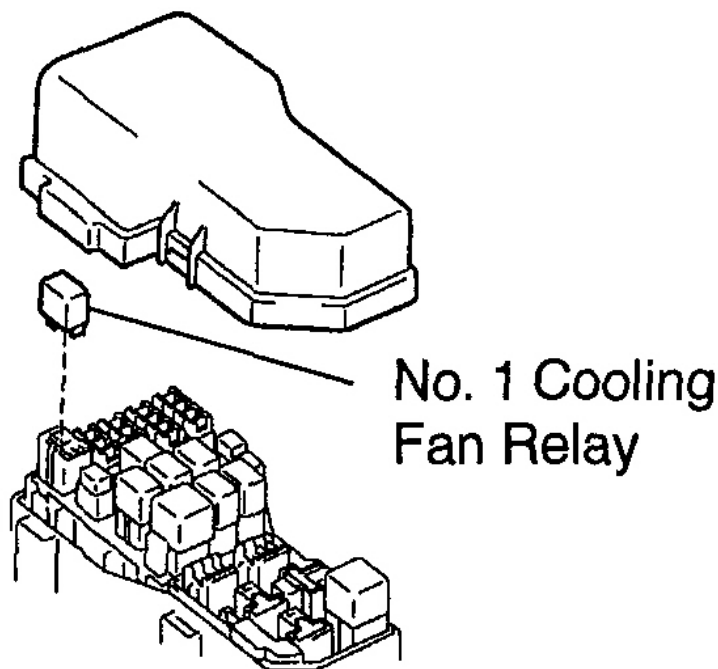
**P****G02639560**

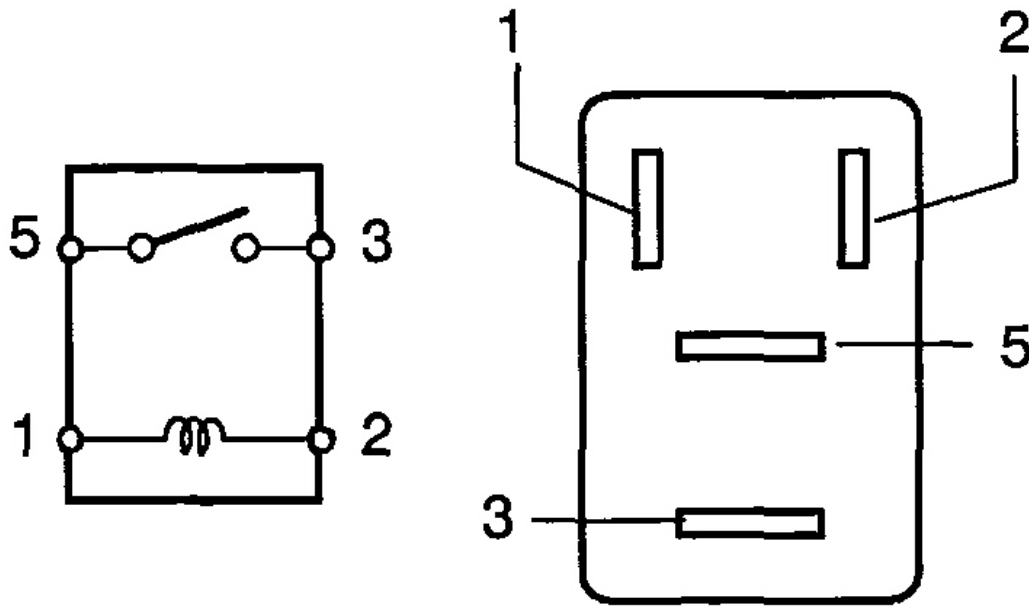
Fig. 64: Identifying Location Of No. 1 Cooling Fan Relay
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- b. Check the resistance of the cooling fan relay.

Standard:**SPECIFIED CONDITION CHART**

Tester Condition	Specified Condition
3 - 5	10 kohm or higher
3 - 5	Below 1 ohm (when battery voltage is applied to terminals 1 and 2)

If the result is not as specified, replace the relay.



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Fig. 65: Identifying No. 1 Cooling Fan Relay Terminals
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

2. INSPECT NO. 2 COOLING FAN RELAY

- a. Remove the No. 2 cooling fan relay (Marking: FAN NO. 2).

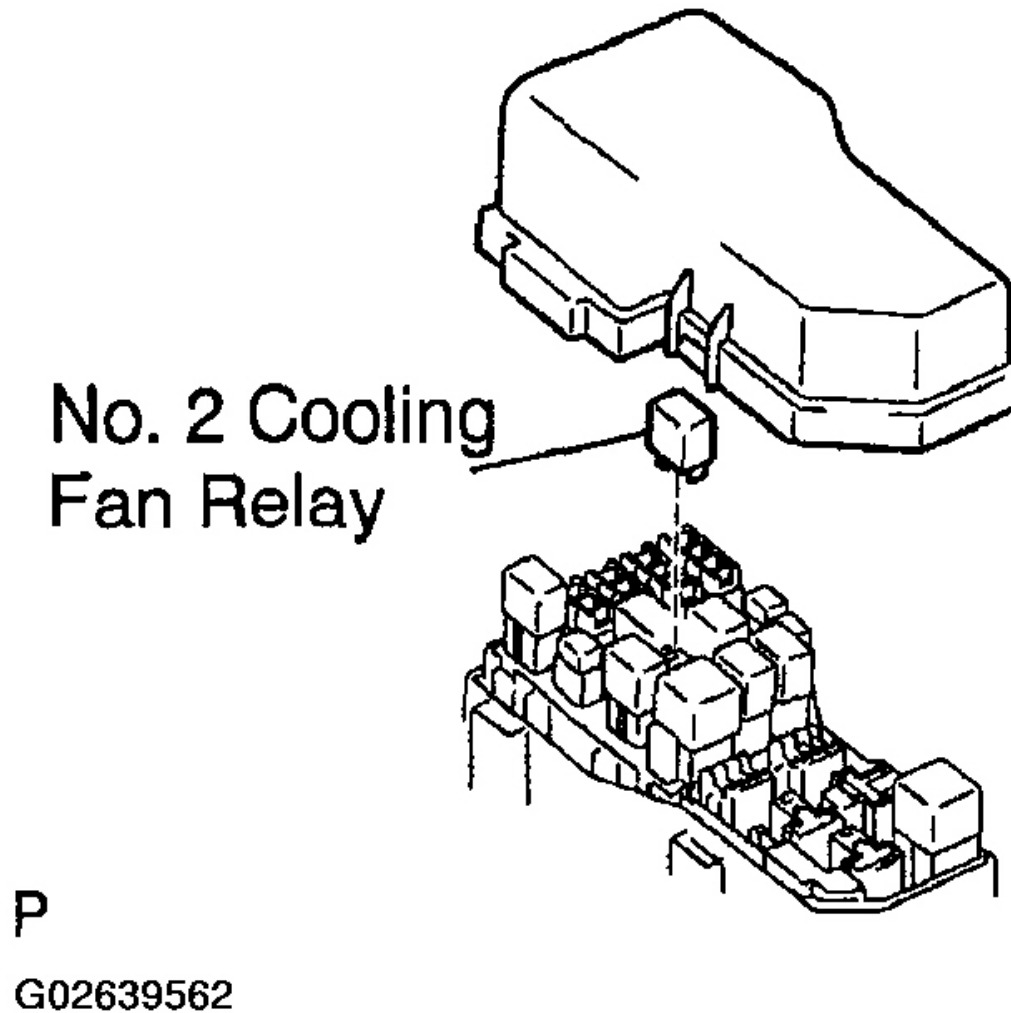


Fig. 66: Identifying Location Of No. 2 Cooling Fan Relay
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- b. Check the resistance of the No. 2 cooling fan relay.

Standard:

SPECIFIED CONDITION CHART

Tester Connection	Specified Condition
3 - 4	Below 1 ohm
3 - 5	10 kohm or higher

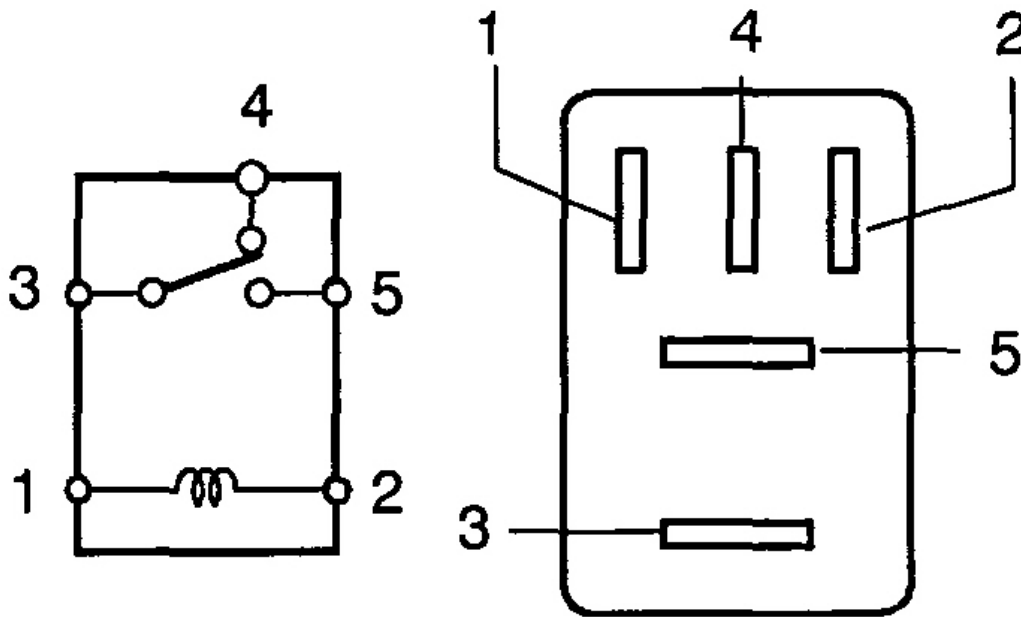
2005 Toyota RAV4

2005 ENGINE Cooling - RAV4

3 - 5

Below 1 ohm (when battery voltage is applied to terminals 1 and 2)

If the result is not as specified, replace the relay.



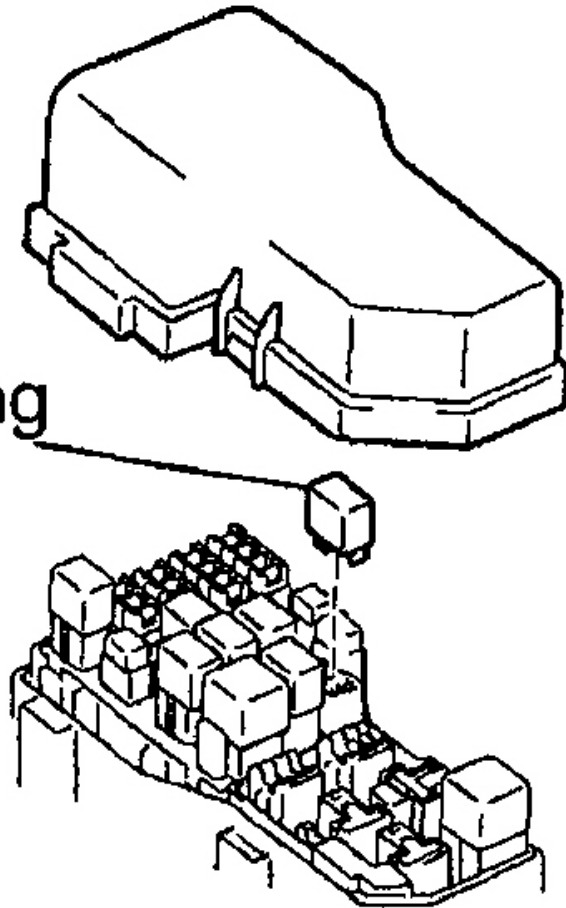
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Fig. 67: Identifying No. 2 Cooling Fan Relay Terminals
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

3. INSPECT NO. 3 COOLING FAN RELAY

- a. Remove the No. 3 cooling fan relay (Marking: FAN NO. 3)

No. 3 Cooling Fan relay



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Fig. 68: Identifying Location Of No. 3 Cooling Fan Relay
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- b. Check the resistance of the No. 3 cooling fan relay.

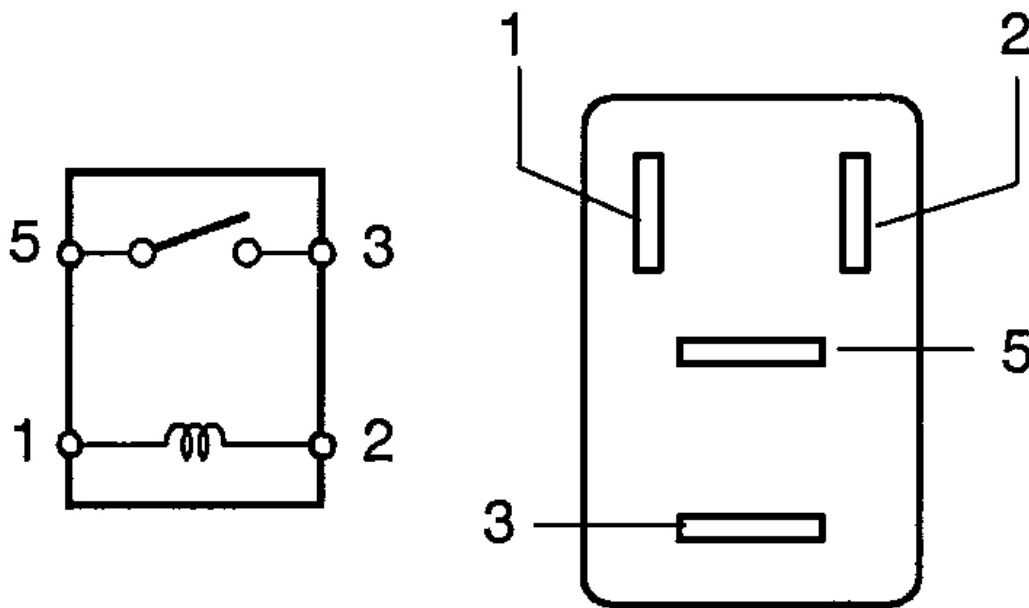
Standard:

SPECIFIED CONDITION CHART

Tester Condition	Specified Condition
3 - 5	10 kohm or higher
3 - 5	Below 1 ohm (when battery voltage is applied to terminals 1 and 2)

If the result is not as specified, replace the relay.

- c. Reinstall the No. 3 cooling fan relay.



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Fig. 69: Identifying No. 3 Cooling Fan Relay Terminals
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.