

ENGINE

Engine Cooling System [2GR-FE] (Service Information) - Sienna

COOLANT

REPLACEMENT

REPLACEMENT

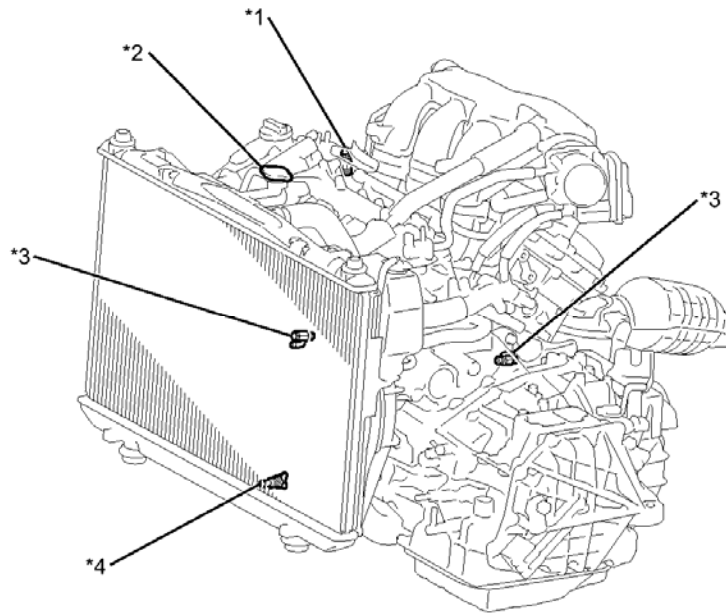
1. **REMOVE V-BANK COVER SUB-ASSEMBLY** . Refer to **REMOVAL - Step 24**
2. **REMOVE NO. 1 ENGINE UNDER COVER** . Refer to **REMOVAL - Step 4**
3. **DRAIN ENGINE COOLANT**
 - a. Loosen the radiator drain cock plug and drain the coolant.

WARNING: Do not remove the radiator cap, cylinder block drain cock plugs and radiator drain cock plug while the engine and radiator are still hot. Pressurized, hot engine coolant and steam may be released and cause serious burns.

HINT:

Collect the coolant in a container and dispose of it according to the regulations in your area.

- b. Remove the radiator cap from the radiator assembly.
- c. Loosen the 2 cylinder block drain cock plugs.



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Fig. 1: Identifying Radiator Drain Cock Plug, Cap Sub-Assembly, Air Drain Cock Plug & Cylinder Block Drain Cock Plug

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

TEXT IN ILLUSTRATION

*1	Air Drain Cock Plug	*2	Radiator Cap Sub- assembly
*3	Cylinder Block Drain Cock Plug	*4	Radiator Drain Cock Plug

4. ADD ENGINE COOLANT

- a. Tighten the radiator drain cock plug by hand.
- b. Tighten the 2 cylinder block drain cock plugs.

Torque: 13 N*m (130 kgf*cm, 9 ft.*lbf)

- c. Remove the radiator cap.
- d. Loosen the air drain cock plug on the water inlet housing.
- e. Add TOYOTA Super Long Life Coolant (SLLC) to the radiator inlet opening until coolant overflows from the air drain cock hole. Then tighten the air drain cock plug to the water inlet housing.

Torque: 13 N*m (130 kgf*cm, 9 ft.*lbf)

- f. Slowly fill the radiator with TOYOTA Super Long Life Coolant (SLLC).

STANDARD CAPACITY

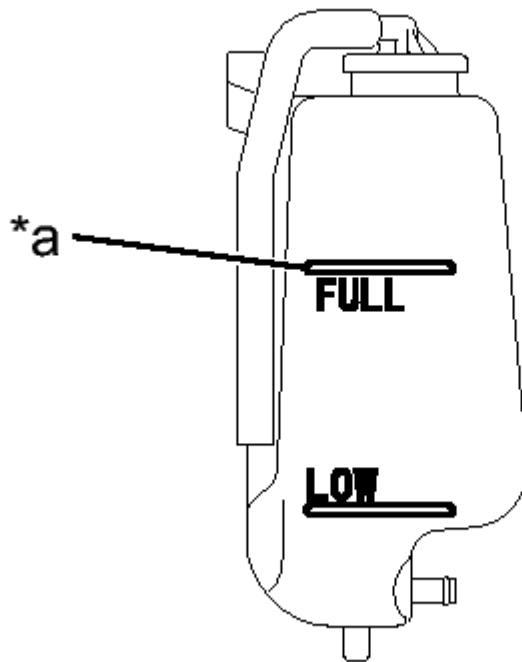
Item	Capacity
Engine coolant (w/o Towing package)	10.4 liters (11.0 US qts, 9.2 Imp. qts)
Engine coolant (w/ Towing package)	11.1 liters (11.7 US qts, 9.8 Imp. qts)

HINT:

- TOYOTA vehicles are filled with TOYOTA SLLC at the factory. In order to avoid damage to the engine cooling system and other technical problems, only use TOYOTA SLLC or similar high quality ethylene glycol based non-silicate, non-amine, non-nitrite, non-borate coolant with long-life hybrid organic acid technology (coolant with long-life hybrid organic acid technology is a combination of low phosphates and organic acids).
- Contact your TOYOTA dealer for further details.

NOTE: Never use water as a substitute for engine coolant.

- g. Tighten the air drain plug.
- h. Slowly pour coolant into the radiator reservoir tank until it reaches the FULL line.



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Fig. 2: Identifying Radiator Coolant Reservoir Tank FULL Line
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

TEXT IN ILLUSTRATION

*a	FULL
	Line

- i. Install the radiator cap.
- j. Squeeze the No. 1 and No. 2 radiator hoses several times by hand, and then check the level of the coolant.

If the coolant level is low, add coolant.

- k. Bleed air from the cooling system.
 1. Warm up the engine until the thermostat opens. While the thermostat is open, circulate the coolant for several minutes.

HINT:

The thermostat open timing can be confirmed by squeezing the No. 2 radiator hose by hand, and checking when the engine coolant starts to flow inside the hose.

2. Maintain the engine speed at 2500 to 3000 RPM.
3. Squeeze the inlet and No. 1 and No. 2 radiator hoses several times by hand to bleed air.

WARNING: When squeezing the radiator hoses:

- Wear protective gloves.
- Be careful as the radiator hoses are hot.
- Keep your hands away from the cooling fans.

NOTE:

- Make sure that the radiator reservoir still has some coolant in it.
- If the coolant temperature gauge indicates an excessive temperature, turn off the engine and let it cool.
- If there is not enough coolant, the engine may overheat or be seriously damaged.
- If the radiator reservoir does not have enough coolant, perform the following: 1) stop the engine, 2) wait until the coolant has cooled down, and 3) add coolant until the reservoir is filled to the FULL line.

l. Stop the engine and wait until the engine coolant cools down.

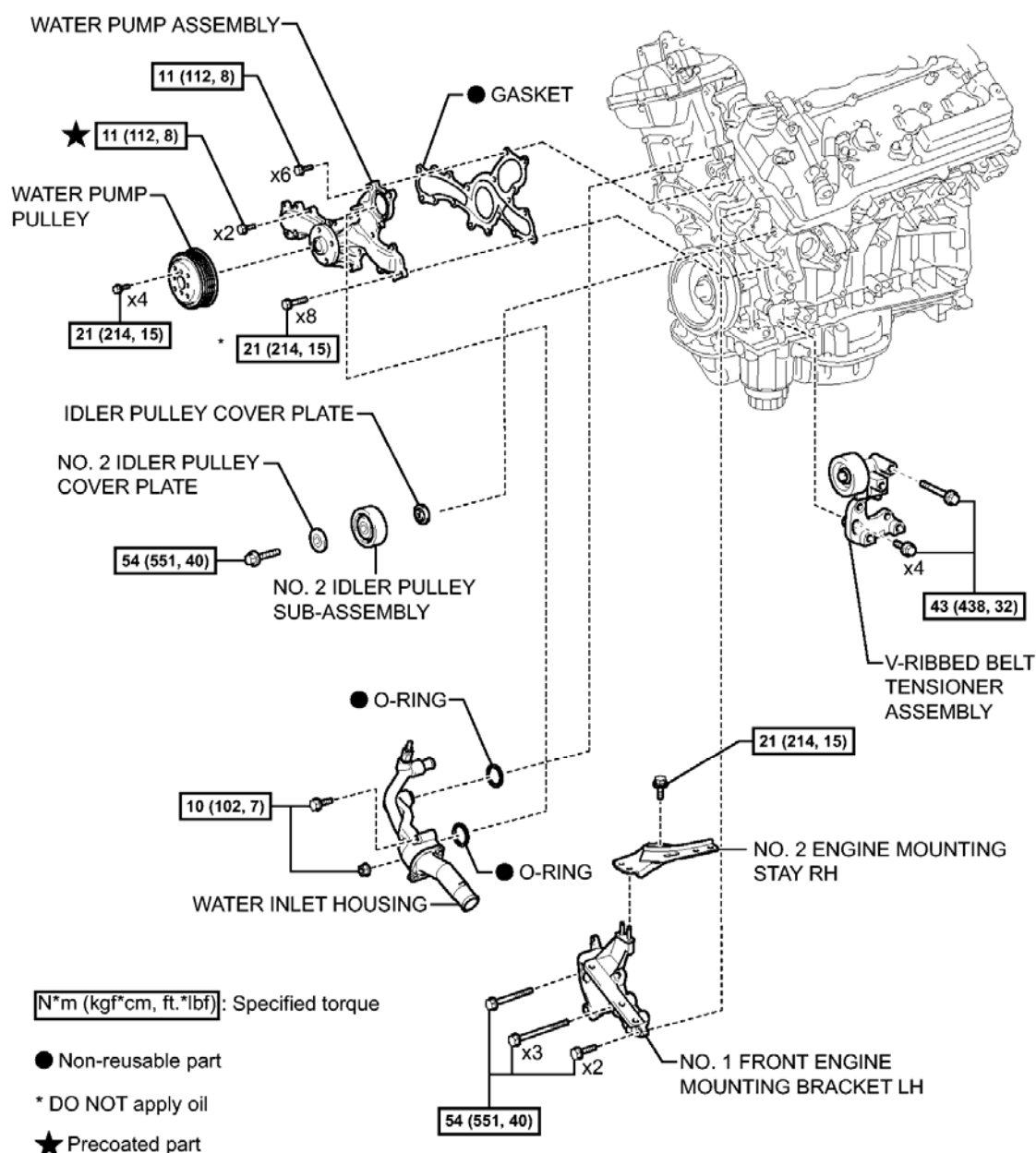
m. Add engine coolant to the FULL line on the radiator reservoir.

5. **INSPECT FOR COOLANT LEAK** . Refer to **ON-VEHICLE INSPECTION - Step 1**
6. **INSTALL NO. 1 ENGINE UNDER COVER** . Refer to **INSTALLATION - Step 16**
7. **INSTALL V-BANK COVER SUB-ASSEMBLY** . Refer to **INSTALLATION - Step 95**

WATER PUMP

COMPONENTS

ILLUSTRATION



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Fig. 3: Water Pump Replacement Components With Torque Specifications
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

ON-VEHICLE INSPECTION

ON-VEHICLE INSPECTION

1. REMOVE V-RIBBED BELT

Refer to **REMOVAL**

2. INSPECT WATER PUMP ASSEMBLY

- a. Turn the pulley, and check that the water pump bearing moves smoothly and noiselessly.

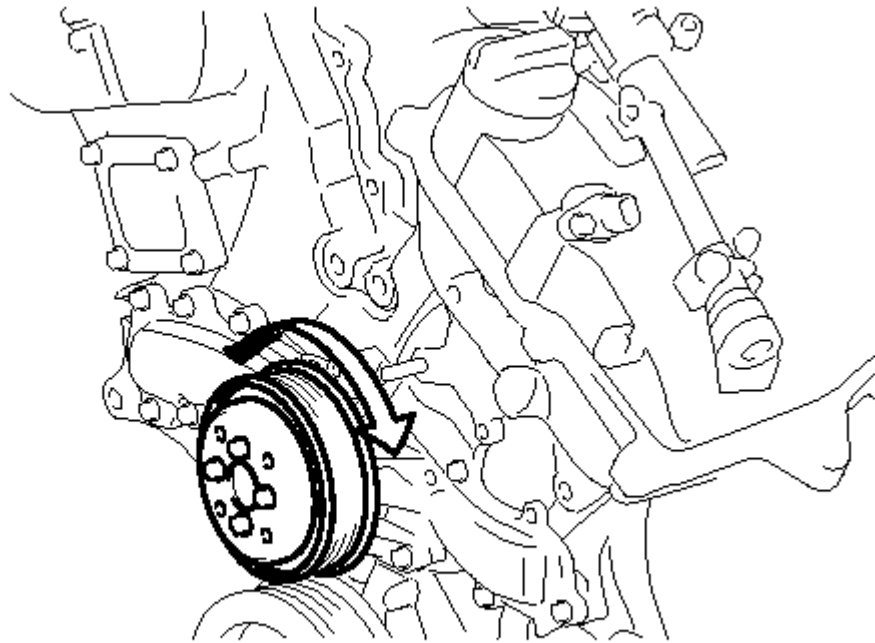


Fig. 4: Inspecting Water Pump Assembly
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

If the bearing does not move smoothly and noiselessly, replace the water pump.

3. INSTALL V-RIBBED BELT

Refer to **INSTALLATION**

REMOVAL

REMOVAL

1. REMOVE ENGINE ASSEMBLY WITH TRANSAXLE ASSEMBLY

Refer to **REMOVAL**

2. INSTALL ENGINE ON ENGINE STAND . Refer to REMOVAL - Step 1

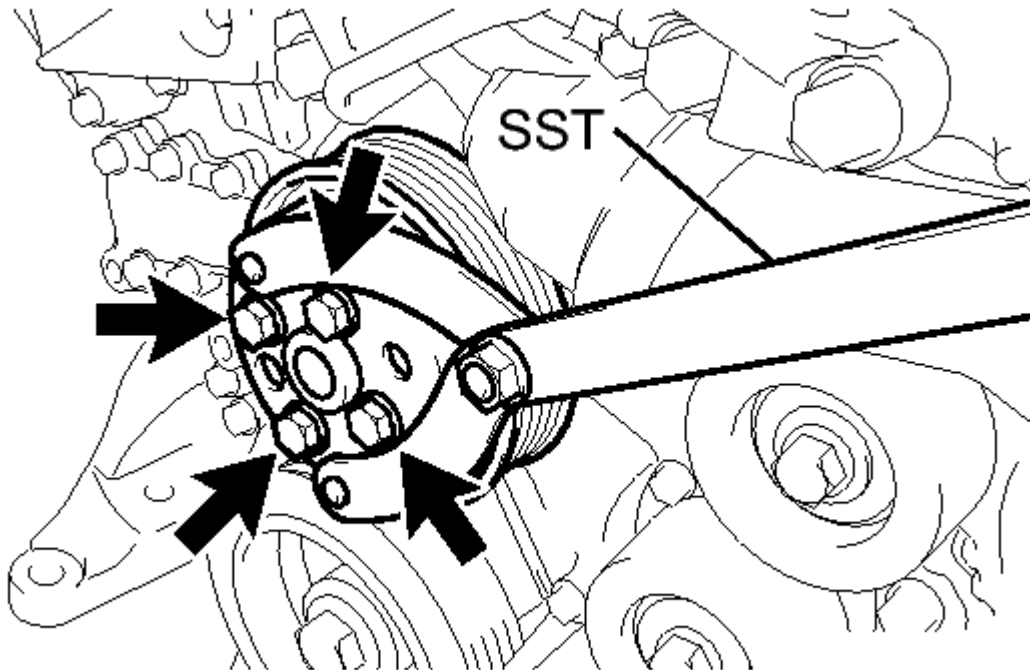
3. REMOVE ENGINE HANGER . Refer to REMOVAL - Step 2

4. REMOVE NO. 2 ENGINE MOUNTING STAY RH . Refer to REMOVAL - Step 7

5. REMOVE NO. 1 FRONT ENGINE MOUNTING BRACKET LH . Refer to DISASSEMBLY - Step

17

6. **REMOVE NO. 2 IDLER PULLEY SUB-ASSEMBLY** . Refer to **REMOVAL - Step 18**
7. **REMOVE V-RIBBED BELT TENSIONER ASSEMBLY** . Refer to **REMOVAL - Step 15**
8. **REMOVE WATER INLET HOUSING** . Refer to **DISASSEMBLY - Step 18**
9. **REMOVE WATER PUMP PULLEY**
 - a. Using SST, hold the water pump pulley.



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Fig. 5: Identifying Water Pump Pulley, Bolts & SST
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- SST: 09960-10010
09962-01000
09963-00500

- b. Remove the 4 bolts and water pump pulley.
10. **REMOVE WATER PUMP ASSEMBLY**
 - a. Remove the 16 bolts, water pump assembly and water pump gasket.

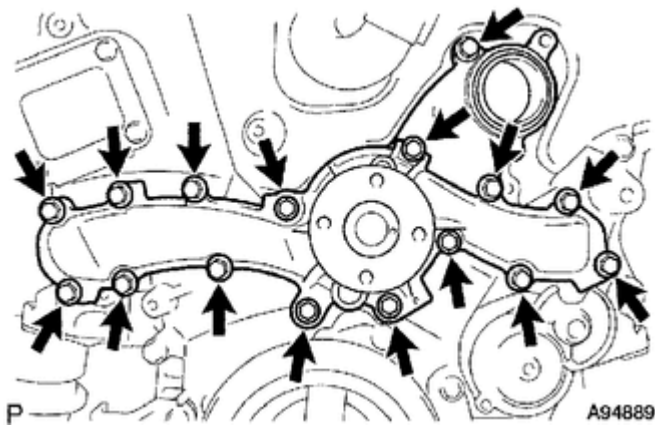


Fig. 6: Identifying Water Pump Assembly Bolts
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

INSTALLATION

INSTALLATION

1. INSTALL WATER PUMP ASSEMBLY

- a. Install a new water pump gasket and the water pump assembly with the 16 bolts.

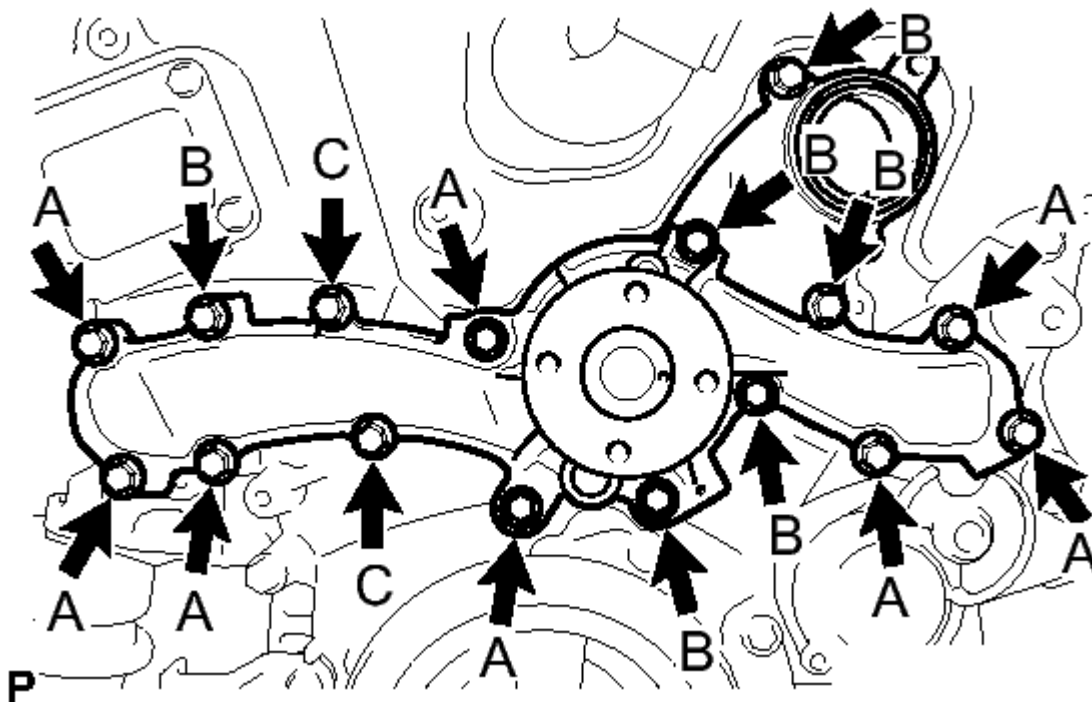


Fig. 7: Identifying Water Pump Assembly And Bolts
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

Bolt A

Torque: 21 N*m (214 kgf*cm, 15 ft.*lbf)

Bolts B and C

Torque: 11 N*m (112 kgf*cm, 8 ft.*lbf)

NOTE:

- Make sure that there is no oil on the threads of bolts A.
- Be sure to replace 2 bolts C with new ones or reuse them after applying adhesive 1344.

Adhesive

Toyota Genuine Adhesive 1344, Three Bond 1344 or equivalent

2. INSTALL WATER PUMP PULLEY

- Temporarily install the water pump pulley with the 4 bolts.
- Using SST, hold the water pump pulley.

- **SST: 09960-10010**

09962-01000

09963-00500

- Tighten the 4 bolts.

Torque: 21 N*m (214 kgf*cm, 15 ft.*lbf)

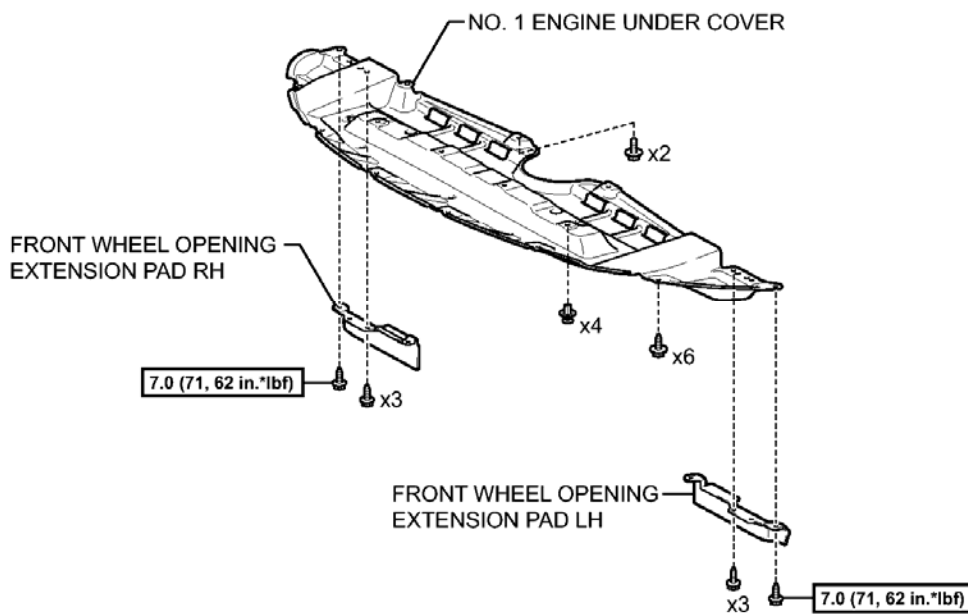
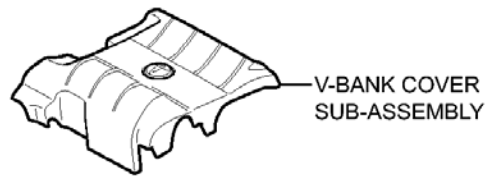
- 3. INSTALL WATER INLET HOUSING** . Refer to **REASSEMBLY - Step 34**
- 4. INSTALL V-RIBBED BELT TENSIONER ASSEMBLY** . Refer to **INSTALLATION - Step 9**
- 5. INSTALL NO. 2 IDLER PULLEY SUB-ASSEMBLY** . Refer to **INSTALLATION - Step 7**
- 6. INSTALL NO. 1 FRONT ENGINE MOUNTING BRACKET LH** . Refer to **REASSEMBLY - Step 35**
- 7. INSTALL NO. 2 ENGINE MOUNTING STAY RH** . Refer to **INSTALLATION - Step 17**
- 8. INSTALL ENGINE HANGER** . Refer to **INSTALLATION - Step 22**
- 9. REMOVE ENGINE STAND**
- 10. INSTALL ENGINE ASSEMBLY WITH TRANSAXLE**

Refer to **INSTALLATION**

THERMOSTAT

COMPONENTS

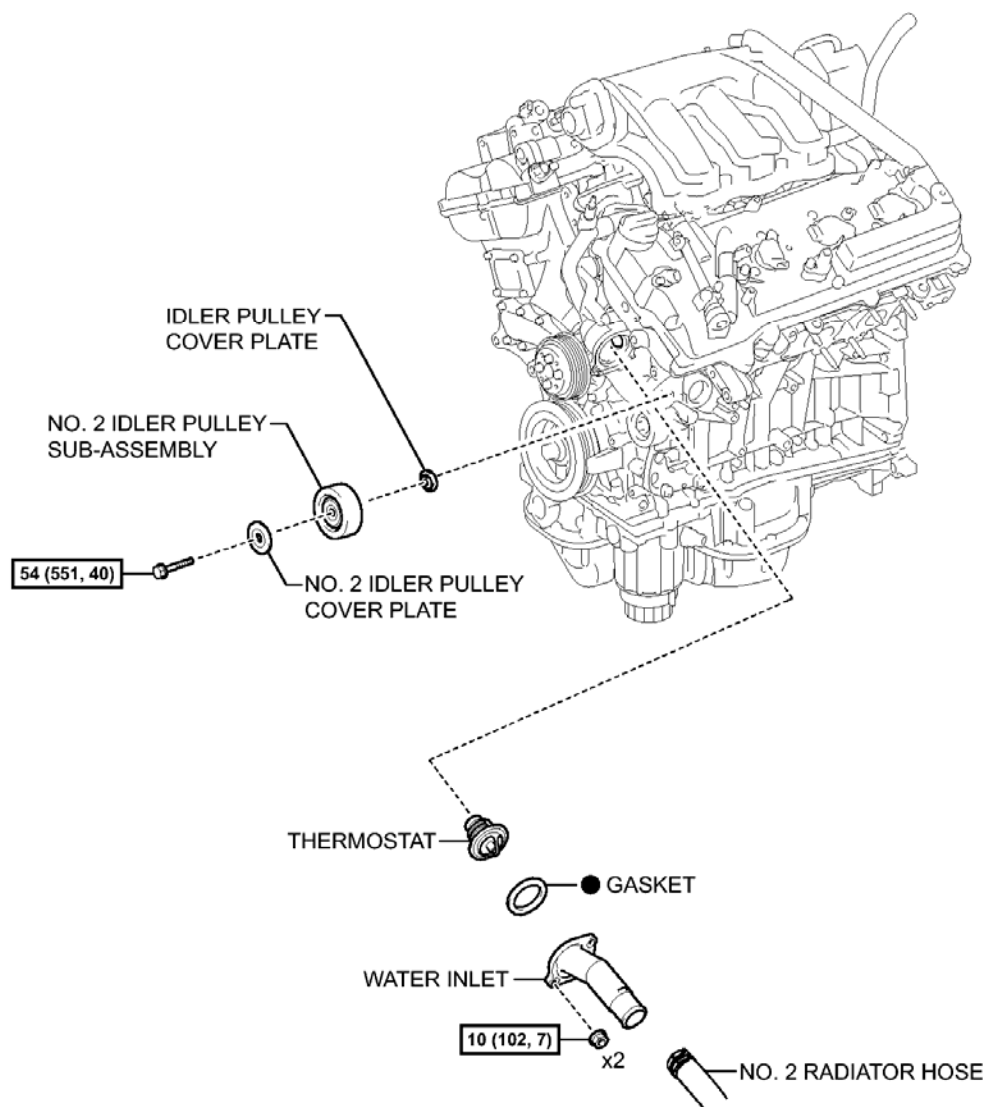
ILLUSTRATION



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

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Fig. 8: Thermostat Replacement Components With Torque Specifications (1 of 2)
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

ILLUSTRATION



54 (551, 40): Specified torque

● Non-reusable part

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Fig. 9: Thermostat Replacement Components With Torque Specifications (2 of 2)
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

REMOVAL

REMOVAL

1. REMOVE NO. 1 ENGINE UNDER COVER . Refer to **REMOVAL - Step 4**

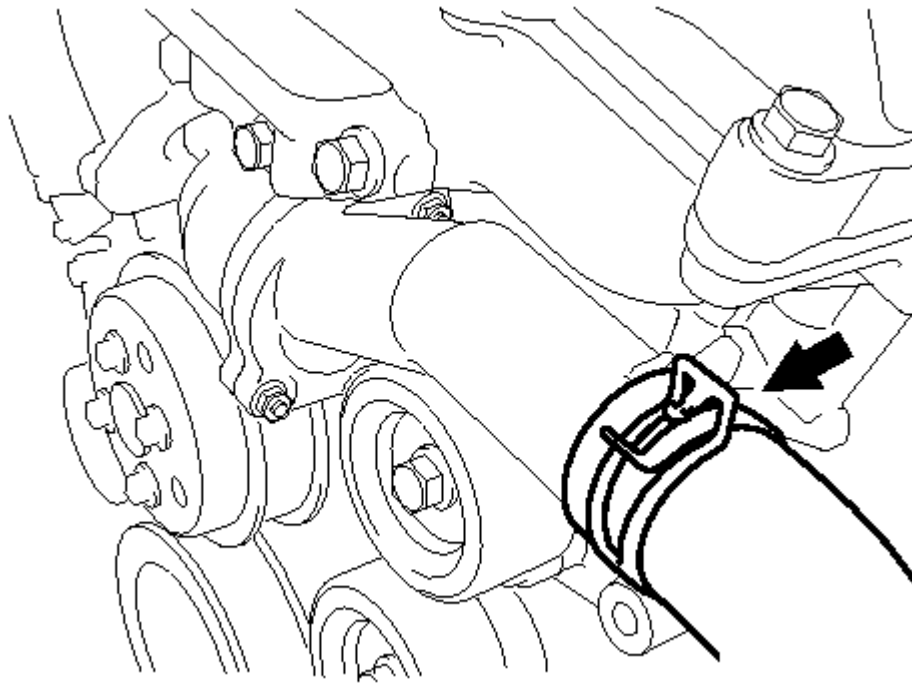
2. **DRAIN ENGINE COOLANT** See step 3
3. **REMOVE FRONT BUMPER COVER**

Refer to **REMOVAL**

4. **REMOVE V-RIBBED BELT**

Refer to **REMOVAL**

5. **REMOVE V-BANK COVER SUB-ASSEMBLY** . Refer to **REMOVAL - Step 24**
6. **DISCONNECT NO. 2 RADIATOR HOSE**
 - a. Disconnect the No. 2 radiator hose from the water inlet.



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Fig. 10: Identifying Radiator Hose

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

7. **REMOVE NO. 2 IDLER PULLEY SUB-ASSEMBLY** . Refer to **REMOVAL - Step 18**
8. **REMOVE WATER INLET**
 - a. Remove the 2 nuts and water inlet.

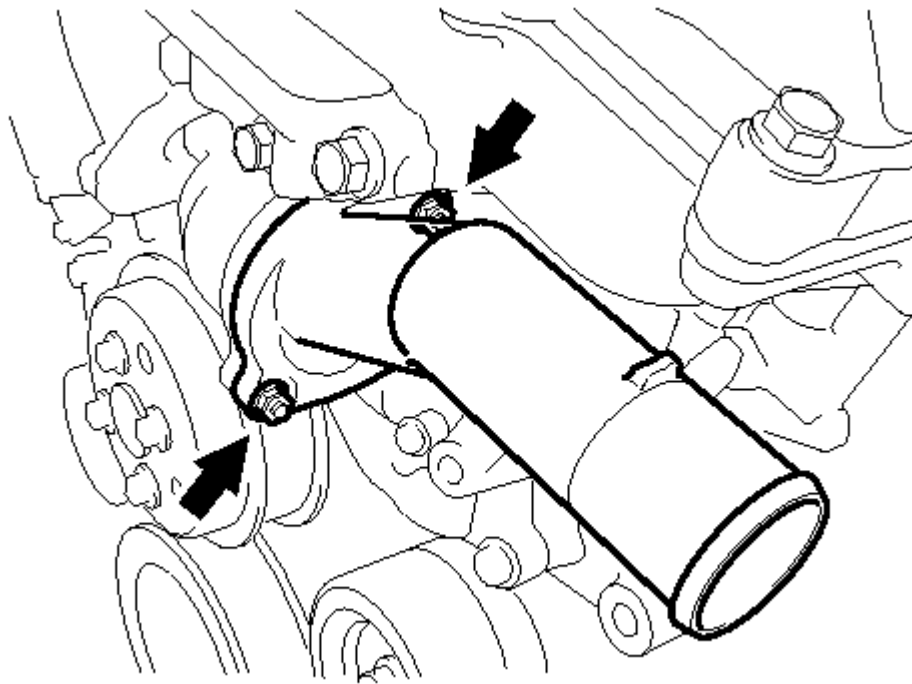


Fig. 11: Identifying Water Inlet And Nuts
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

9. REMOVE THERMOSTAT

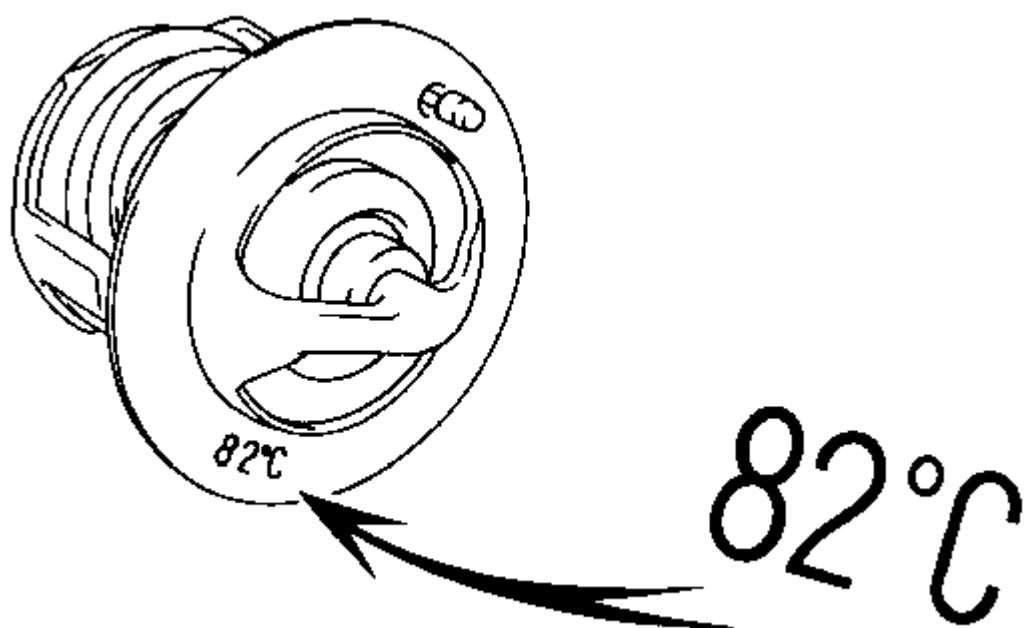
- a. Remove the thermostat from the water inlet housing.
- b. Remove the gasket from the thermostat.

INSPECTION

INSPECTION

1. INSPECT THERMOSTAT

- a. Inspect the thermostat.



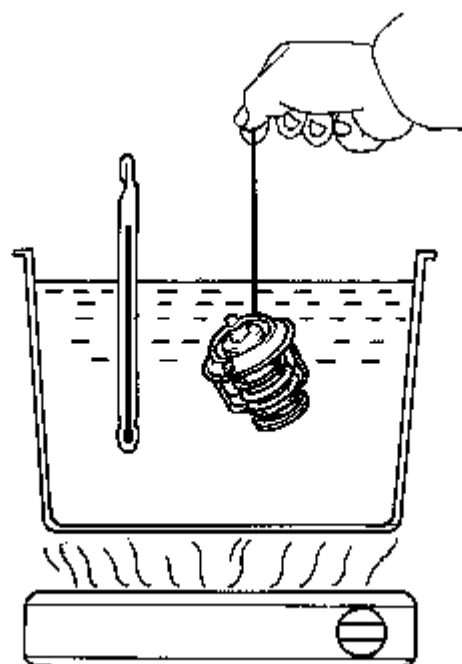
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Fig. 12: Identifying Temperature Mark On Thermostat
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

HINT:

The valve opening temperature is inscribed on the thermostat.

- b. Immerse the thermostat in water and gradually heat the water.



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

- c. Check the valve opening temperature.

Standard valve opening temperature

80 to 84°C (176 to 183°F)

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

- d. Check the valve lift.

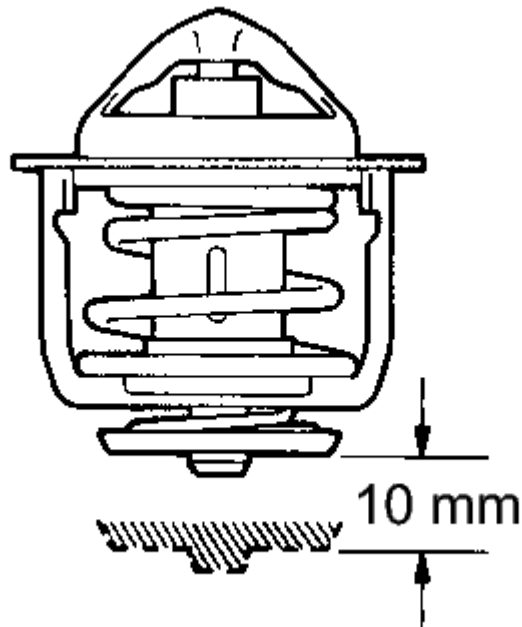


Fig. 14: Checking Valve Lift
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

Standard valve lift

10 mm (0.394 in.) or more at 95°C (203°F)

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

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

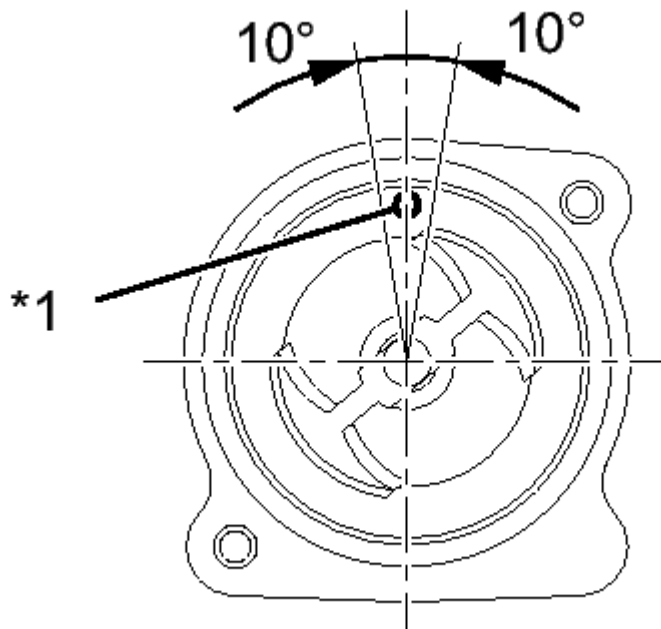
If it is not fully closed, replace the thermostat.

INSTALLATION

INSTALLATION

1. INSTALL THERMOSTAT

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



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Fig. 15: Identifying Thermostat

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

TEXT IN ILLUSTRATION

*1	Jiggle Valve
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HINT:

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

2. INSTALL WATER INLET

- Install the water inlet with the 2 nuts.

Torque: 10 N*m (102 kgf*cm, 7 ft.*lbf)

3. INSTALL NO. 2 IDLER PULLEY SUB-ASSEMBLY . Refer to INSTALLATION - Step 7

4. CONNECT NO. 2 RADIATOR HOSE

- Connect the No. 2 radiator hose to the water inlet.

5. INSTALL V-RIBBED BELT

Refer to **INSTALLATION**

6. **ADD ENGINE COOLANT** See step 4
7. **WARM UP ENGINE**
8. **INSPECT FOR COOLANT LEAK** . Refer to **ON-VEHICLE INSPECTION - Step 1**
9. **INSTALL V-BANK COVER SUB-ASSEMBLY** . Refer to **INSTALLATION - Step 95**
10. **INSTALL FRONT BUMPER COVER**

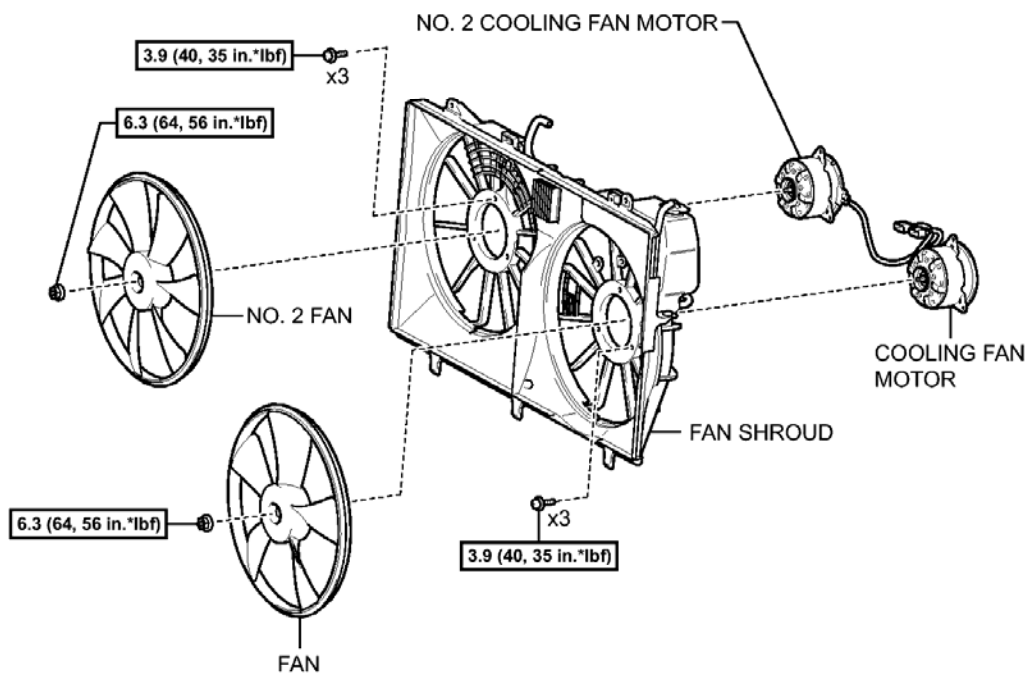
Refer to **INSTALLATION**

11. **INSTALL NO. 1 ENGINE UNDER COVER** . Refer to **INSTALLATION - Step 16**

COOLING FAN MOTOR

COMPONENTS

ILLUSTRATION



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

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Fig. 16: Cooling Fan Motor Replacement Components With Torque Specifications
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

ON-VEHICLE INSPECTION

ON-VEHICLE INSPECTION

1. INSPECT COOLING FAN MOTOR

- a. Check that the motor operates smoothly when the battery is connected to the cooling fan motor connector.

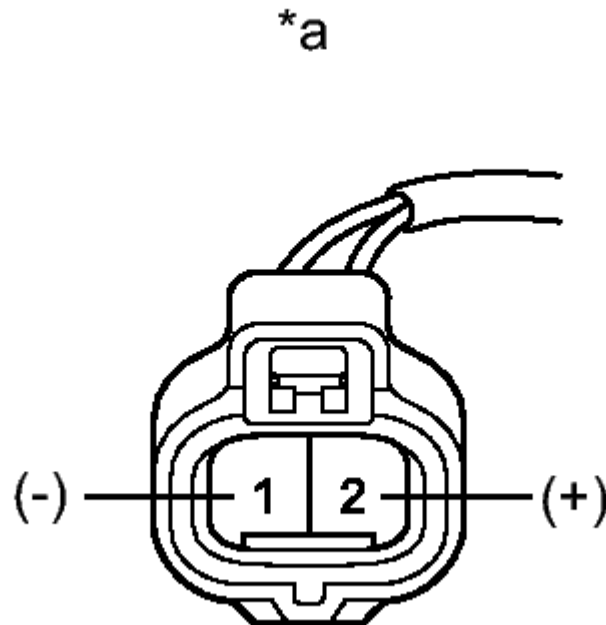


Fig. 17: Cooling Fan Motor Wire Harness Connector End View
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

TEXT IN ILLUSTRATION

*a	Front view of wire harness connector (to Cooling Fan ECU)
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If the motor does not operate smoothly, replace the cooling fan motor.

- b. Connect the pickup of a clamp-on ammeter over one of the two wires for the cooling fan motor.
- c. Measure the current while the motor is operating.

Standard Current

Item	Condition	Specified Condition

Cooling fan motor (w/o Towing package)	20°C (68° F)	11.8 to 14.8 A at 12 V
Cooling fan motor (w/ Towing package)	20°C (68° F)	14.1 to 17.9 A at 12 V

If the result is not as specified, replace the cooling fan motor.

2. INSPECT NO. 2 COOLING FAN MOTOR

- Check that the motor operates smoothly when the battery is connected to the No. 2 cooling fan motor connector.

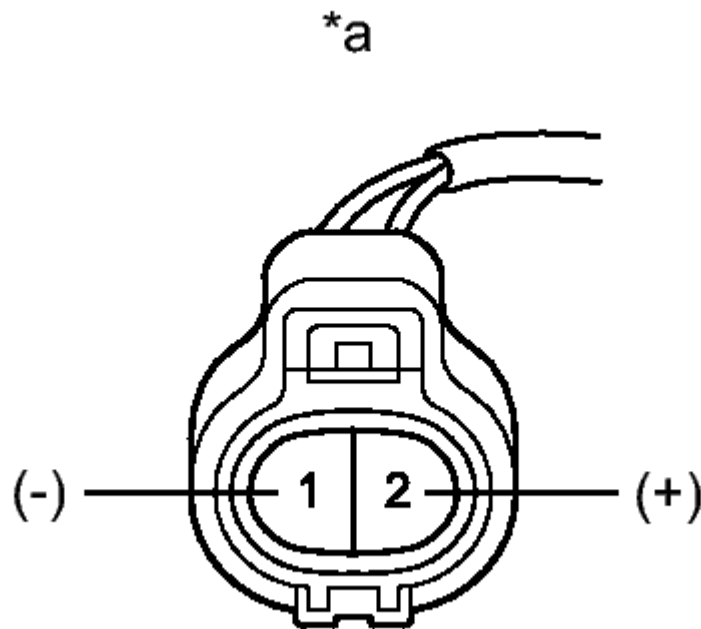


Fig. 18: No. 2 Cooling Fan Motor Wire Harness Connector End View
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

TEXT IN ILLUSTRATION

Front view of wire harness

*a	connector (to Cooling Fan ECU)
----	--

If the motor does not operate smoothly, replace the No. 2 cooling fan motor.

- b. Connect the pickup of a clamp-on ammeter over one of the two wires for the No. 2 cooling fan motor.
- c. Measure the current while the motor is operating.

Standard Current

Item	Condition	Specified Condition
Cooling fan motor (w/o Towing package)	20°C (68° F)	8.4 to 10.4 A at 12 V
Cooling fan motor (w/ Towing package)	20°C (68° F)	13.6 to 17.6 A at 12 V

If the result is not as specified, replace the No. 2 cooling fan motor.

REMOVAL

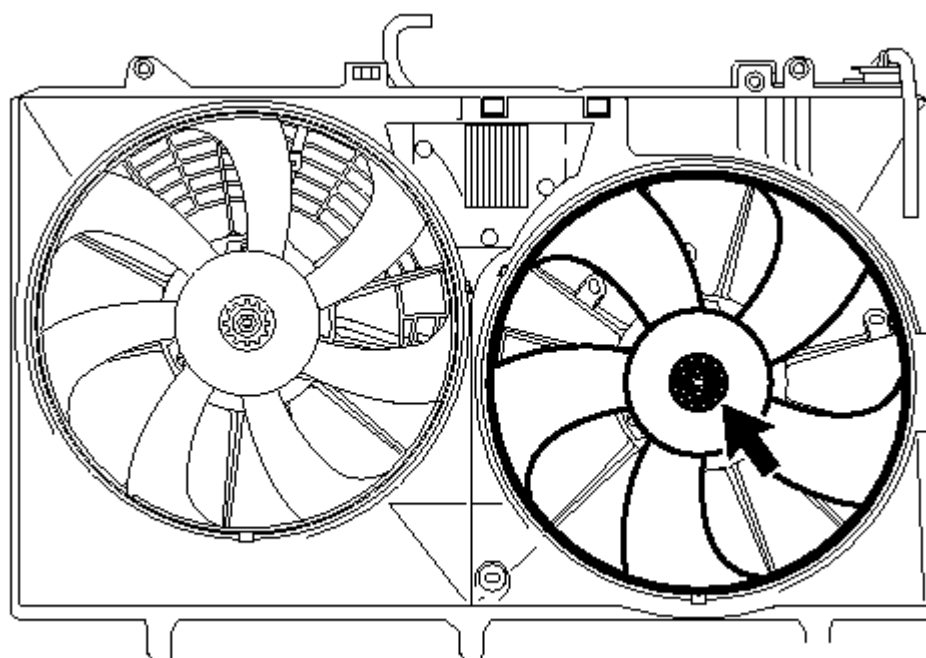
REMOVAL

1. REMOVE RADIATOR ASSEMBLY AND FAN ASSEMBLY WITH MOTOR

Refer to **REMOVAL**

2. REMOVE FAN

- a. Remove the nut and fan.

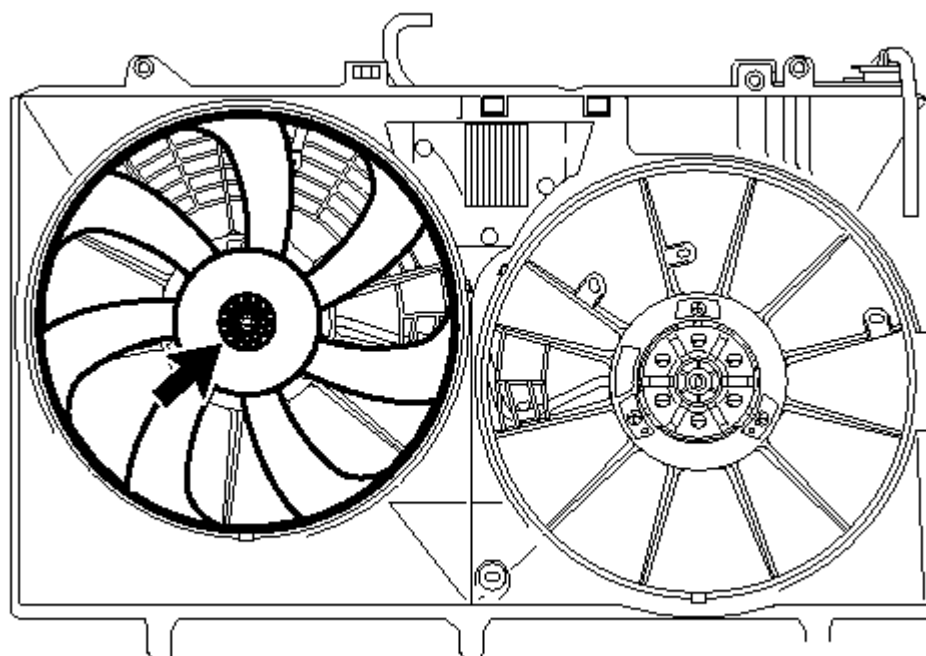


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Fig. 19: Identifying Radiator/Motor Assembly Fan & Nut
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

3. REMOVE NO. 2 FAN

- a. Remove the nut and No. 2 fan.



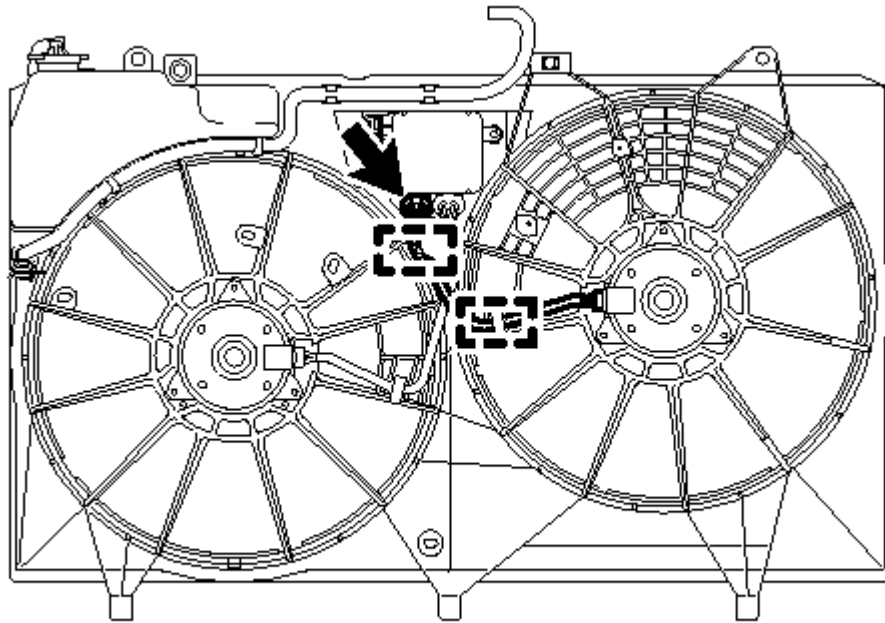
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Fig. 20: Identifying No. 2 Radiator/Motor Assembly Fan & Nut

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

4. REMOVE NO. 2 COOLING FAN MOTOR

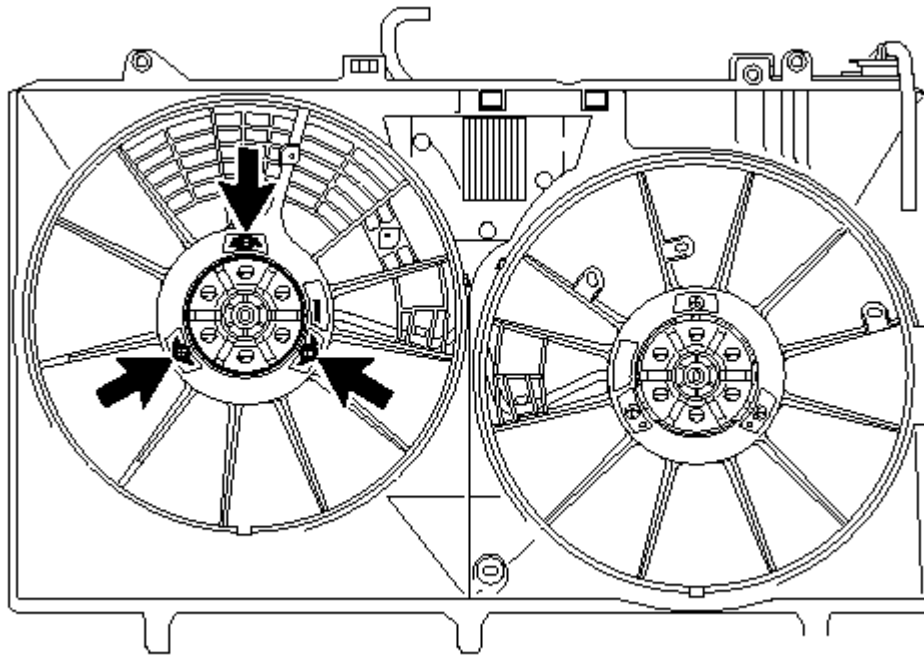
- a. Disconnect the No. 2 cooling fan motor connector and 2 clamps.



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Fig. 21: Identifying No. 2 Cooling Fan Motor Connector & Clamps
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- b. Remove the 3 screws and No. 2 cooling fan motor.

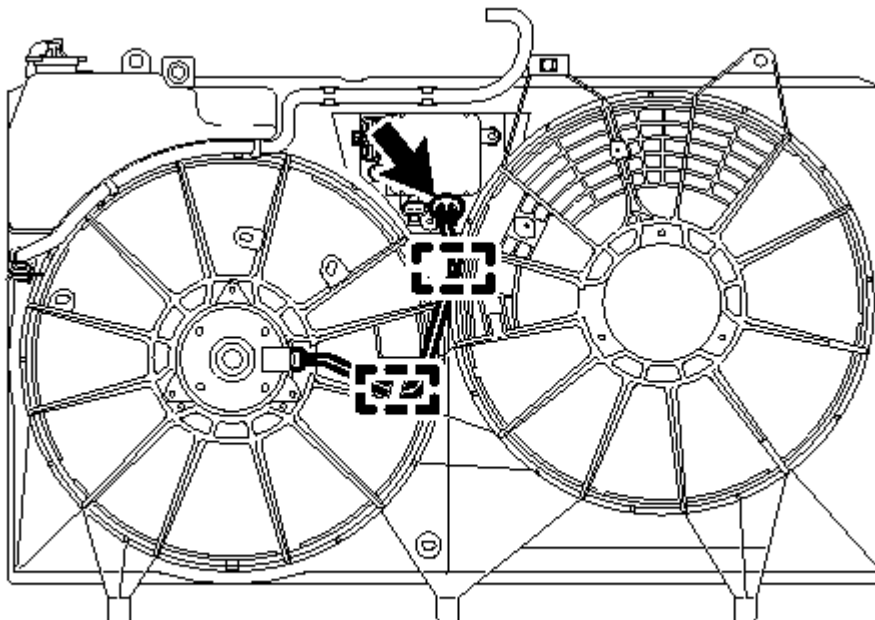


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Fig. 22: Identifying No. 2 Cooling Fan Motor & Screws
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

5. REMOVE COOLING FAN MOTOR

- a. Disconnect the cooling fan motor connector and 2 clamps.

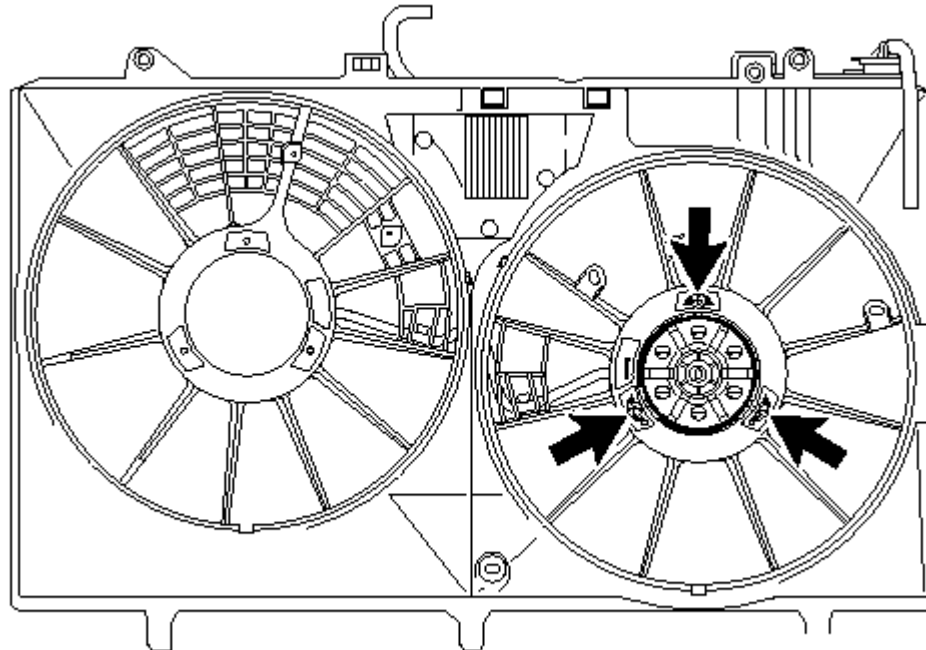


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Fig. 23: Identifying Cooling Fan Motor Connector & Clamps

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

- b. Remove the 3 screws and cooling fan motor.



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Fig. 24: Identifying Cooling Fan Motor & Screws

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

INSTALLATION

INSTALLATION

1. INSTALL COOLING FAN MOTOR

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

Torque: 3.9 N*m (40 kgf*cm, 35 in.*lbf)

- b. Connect the cooling fan motor connector and 2 clamps.

2. INSTALL NO. 2 COOLING FAN MOTOR

- a. Install the No. 2 cooling fan motor with the 3 screws.

Torque: 3.9 N*m (40 kgf*cm, 35 in.*lbf)

- b. Connect the No. 2 cooling fan motor connector and 2 clamps.

3. INSTALL NO. 2 FAN

- a. Install the No. 2 fan with the nut.

Torque: 6.3 N*m (64 kgf*cm, 56 in.*lbf)

4. INSTALL FAN

- a. Install the fan with the nut.

Torque: 6.3 N*m (64 kgf*cm, 56 in.*lbf)

5. INSTALL RADIATOR ASSEMBLY AND FAN ASSEMBLY WITH MOTOR

Refer to INSTALLATION

COOLING FAN ECU

ON-VEHICLE INSPECTION

ON-VEHICLE INSPECTION

1. INSPECT COOLING FAN ECU

- a. Put the vehicle in the following conditions:
 1. Turn the ignition switch off.
 2. The coolant temperature is less than 95°C (203°F).
 3. The battery voltage is between 9 and 14 V.
 4. The A/C switch is off.
- b. Clamp the 400 A probe of an ammeter over the M+ wire of each cooling fan motor.
- c. Turn the ignition switch to ON and wait for approximately 10 seconds. Check that the fan stops.
- d. Start the engine. Check that the fan is stopped with the engine idling.

HINT:

- Make sure that the radiator engine coolant temperature is less than 95°C (203°F).
 - Make sure that the A/C switch is off.
- e. Check that the fan operates when the A/C switch is turned on (MAX COOL and the magnetic clutch is operating).

Standard Current

Item	Specified Condition
Cooling fan motor	4 to 20 A
No. 2 cooling fan	4 to 20 A

motor	
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HINT:

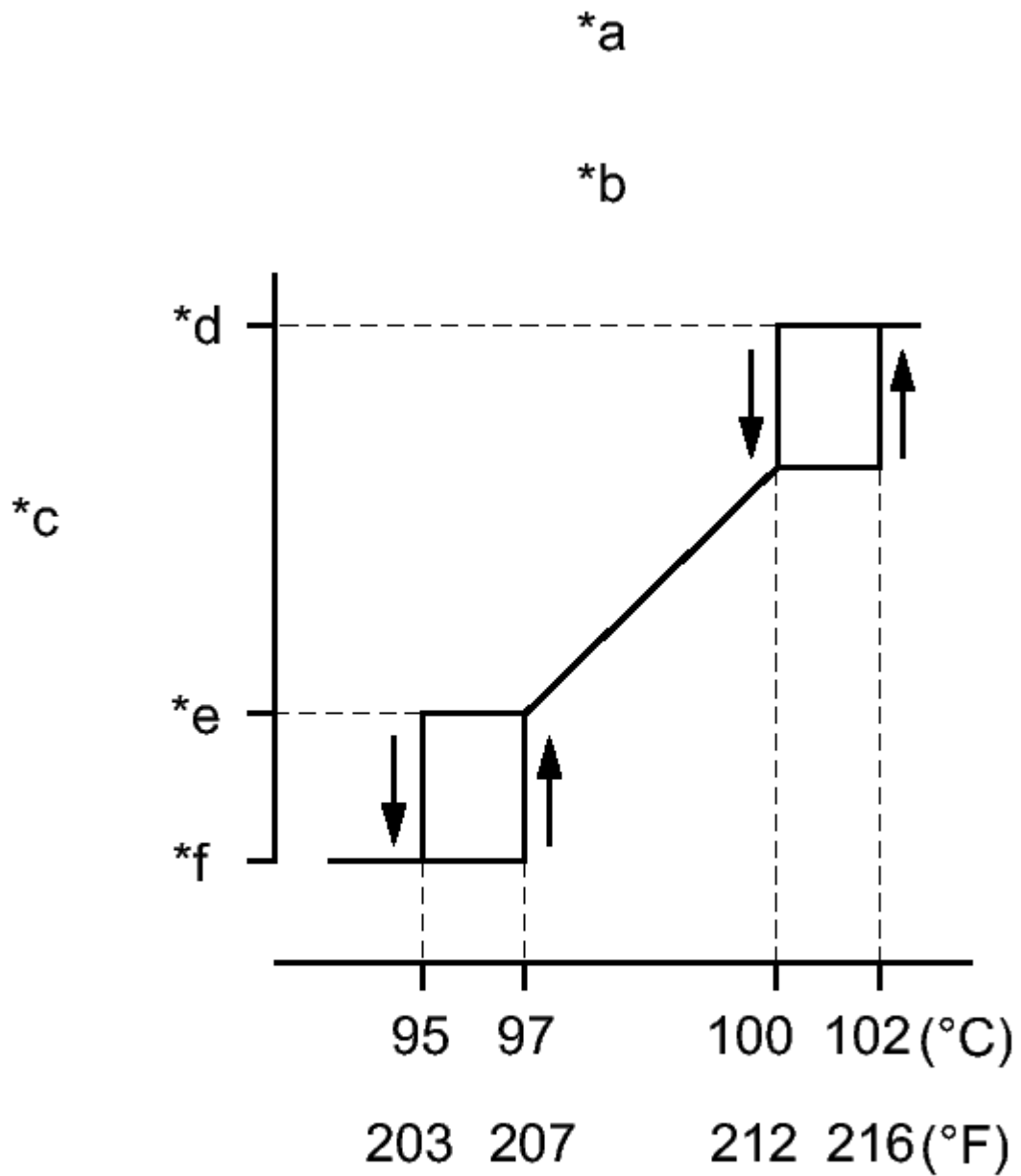
The coolant temperature is less than 95°C (203°F).

- f. Check that the fan operates when the engine coolant temperature sensor connector is disconnected.

Standard Current

Item	Specified Condition
Cooling fan motor	4 to 20 A
No. 2 cooling fan motor	4 to 20 A

- g. After the engine is warmed up, check that the fan operates as shown in the illustration.



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Fig. 25: Identifying Coolant Operating Temperature
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

TEXT IN ILLUSTRATION

Operating

*a	Diagram
*b	A/C OFF
*c	Fan Speed
*d	HI
*e	LO
*f	OFF

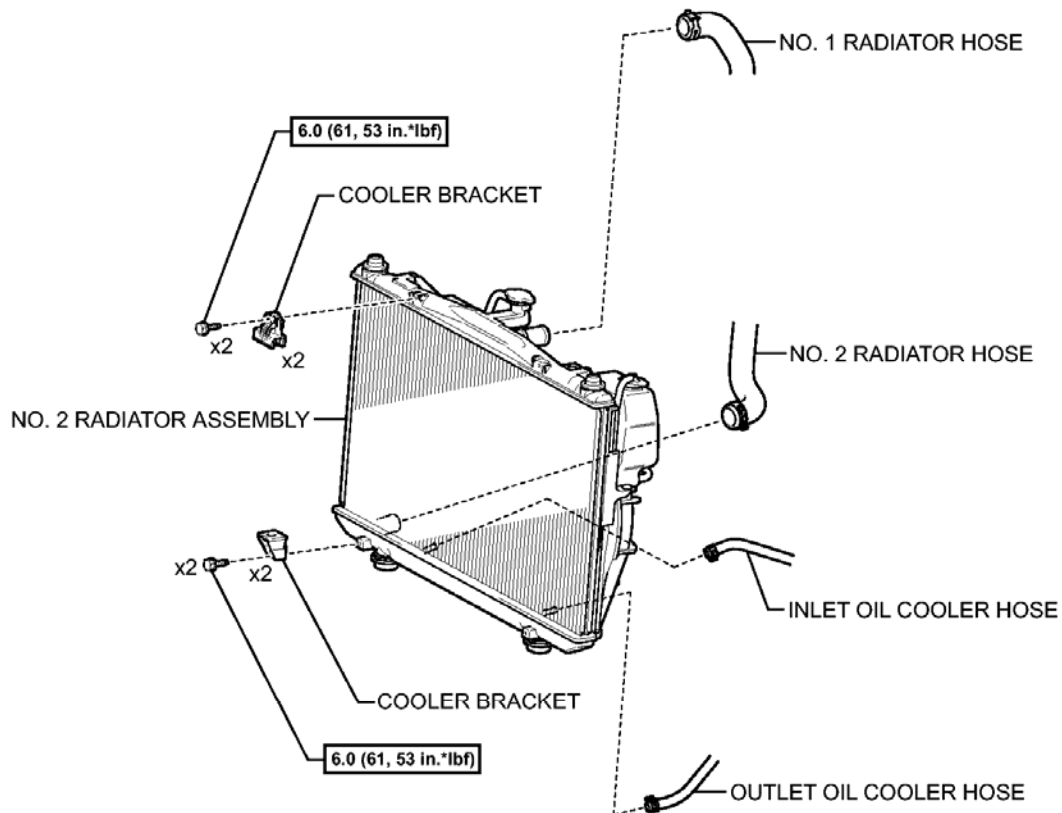
HINT:

- The coolant temperature at which the fan starts operating is approximately 97°C (207°F).
- This system can also be checked using the Techstream.
- Enter the following menus: Powertrain / Engine / Data List / Coolant Temp.

RADIATOR

COMPONENTS

ILLUSTRATION

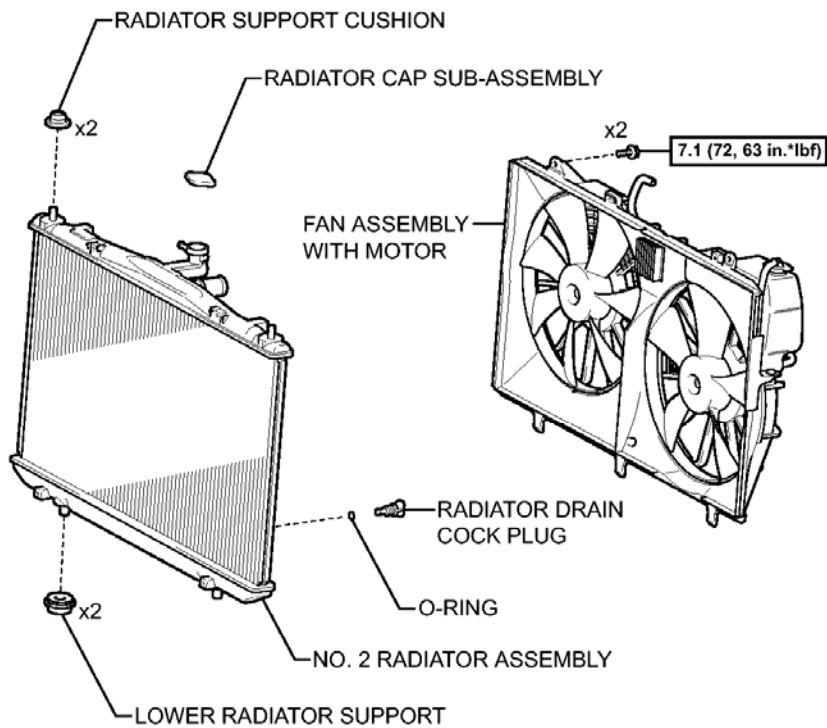


$\boxed{\text{N*m (kgf*cm, ft.*lbf)}}$: Specified torque

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Fig. 27: Radiator Replacement Components With Torque Specifications (2 of 3)
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

ILLUSTRATION



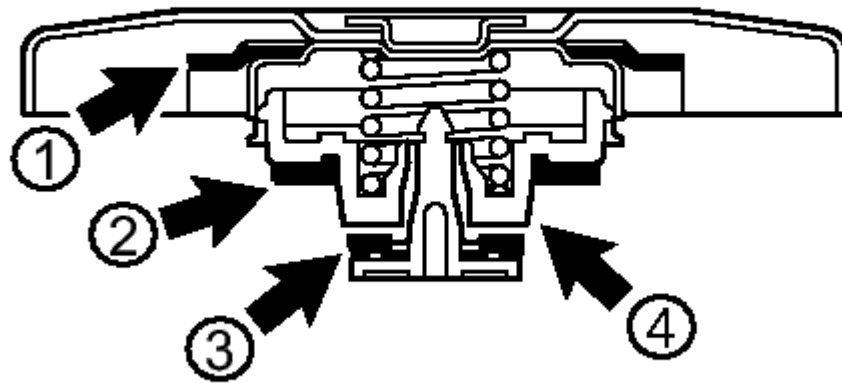
[N*m (kgf*cm, ft.*lbf)]: Specified torque

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Fig. 28: Radiator Replacement Components With Torque Specifications (3 of 3)
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

ON-VEHICLE INSPECTION

ON-VEHICLE INSPECTION

1. **CHECK RADIATOR CAP SUB-ASSEMBLY**
 - a. Measure the valve opening pressure.

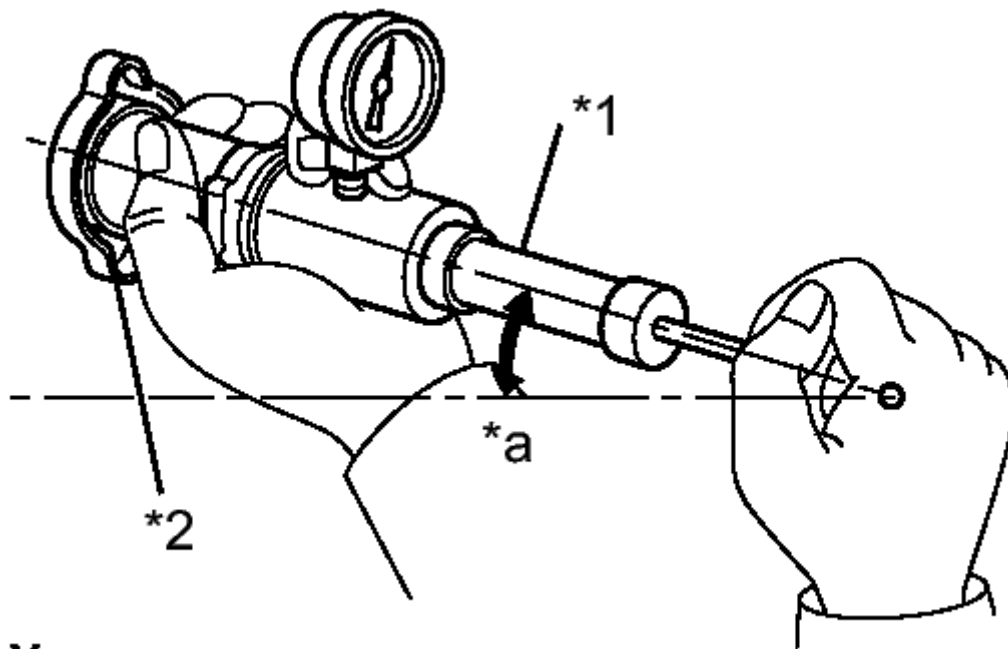


Y

Fig. 29: Identifying Rubber Packing 1, 2, 3 And 4

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

1. If there are water stains or foreign matter on rubber packing 1, 2 or 3, clean the part(s) with water and finger scouring.
2. Check that rubber packing 1, 2 and 3 are not deformed, cracked or swollen.
3. Check that 3 and 4 are not stuck together.
4. Apply engine coolant to rubber packing 2 and 3 before using the radiator cap tester.
5. When using the cap tester, tilt it to 30° or more above the horizontal.



Y

Fig. 30: Checking Radiator Cap Sub-Assembly With Cap Tester
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

TEXT IN ILLUSTRATION

*1	Radiator Cap Tester
*2	Radiator Cap
*a	30° or more

6. Pump the cap tester several times, and check the maximum pressure*.

Pump speed

1 pump per second

*: Even if the cap cannot maintain the maximum pressure, it is not a defect.

Judgment Criterion

Item	Specified Condition
Standard value	93 to 123 kPa (1.0 to 1.3

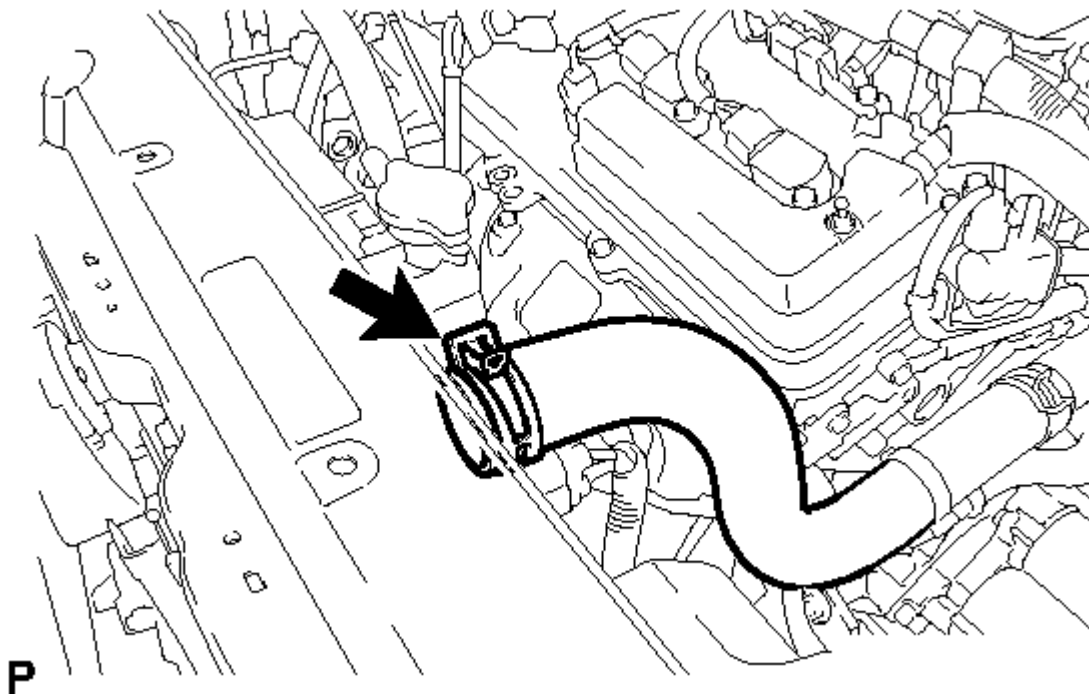
(for brand-new cap)	kgf/cm ² , 13.5 to 17.8 psi)
Minimum standard value (for used cap)	79 kPa (0.8 kgf/cm ² , 11.4 psi)

If the measured maximum pressure is less than the minimum standard value, replace the radiator cap sub-assembly.

REMOVAL

REMOVAL

1. **REMOVE NO. 1 ENGINE UNDER COVER** . Refer to **REMOVAL - Step 4**
2. **DRAIN ENGINE COOLANT** See step 3
3. **REMOVE AIR CLEANER INLET COVER ASSEMBLY SEAL** . Refer to **REMOVAL - Step 25**
4. **REMOVE RADIATOR GRILLE SUB-ASSEMBLY** . Refer to **REMOVAL - Step 3**
5. **DISCONNECT NO. 1 RADIATOR HOSE**
 - a. Loosen the clamp and disconnect the No. 1 radiator hose from the radiator.



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Fig. 31: Identifying No. 1 Radiator Hose Clamp

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

6. DISCONNECT NO. 2 RADIATOR HOSE

- a. Loosen the clamp and disconnect the No. 2 radiator hose from the radiator.

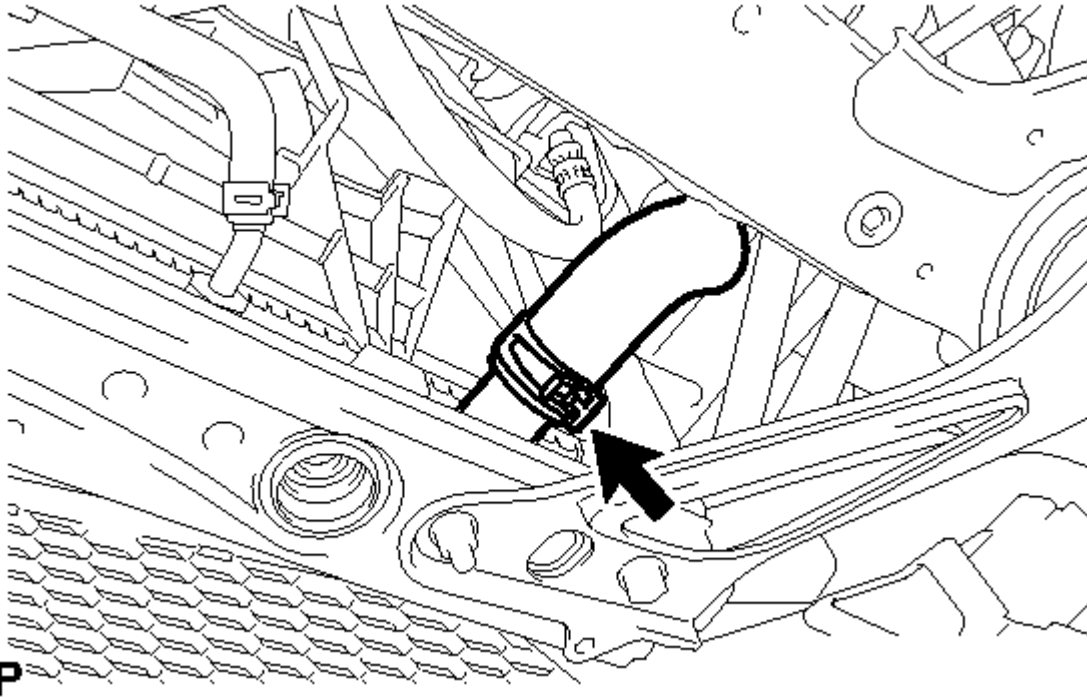


Fig. 32: Identifying No. 2 Radiator Hose Clamp
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

7. DISCONNECT INLET OIL COOLER HOSE

- a. Loosen the clamp and disconnect the inlet oil cooler hose and clamp from the radiator.

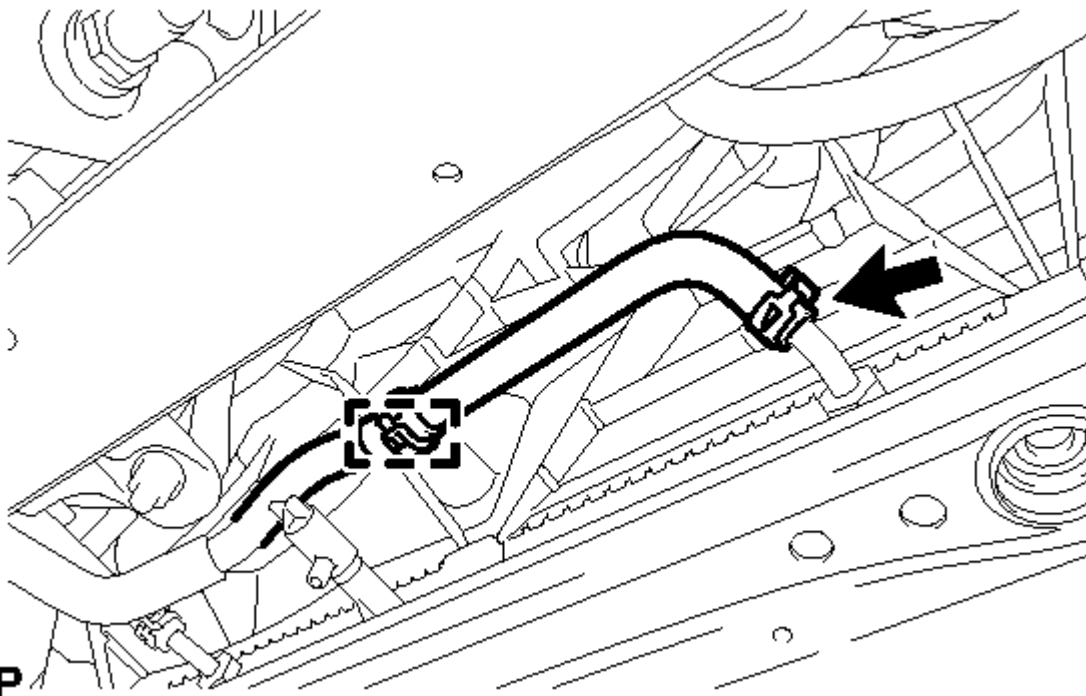


Fig. 33: Identifying Inlet Oil Cooler Hose & Clamp
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

8. DISCONNECT OUTLET OIL COOLER HOSE

- a. Loosen the clamp and disconnect the outlet oil cooler hose.

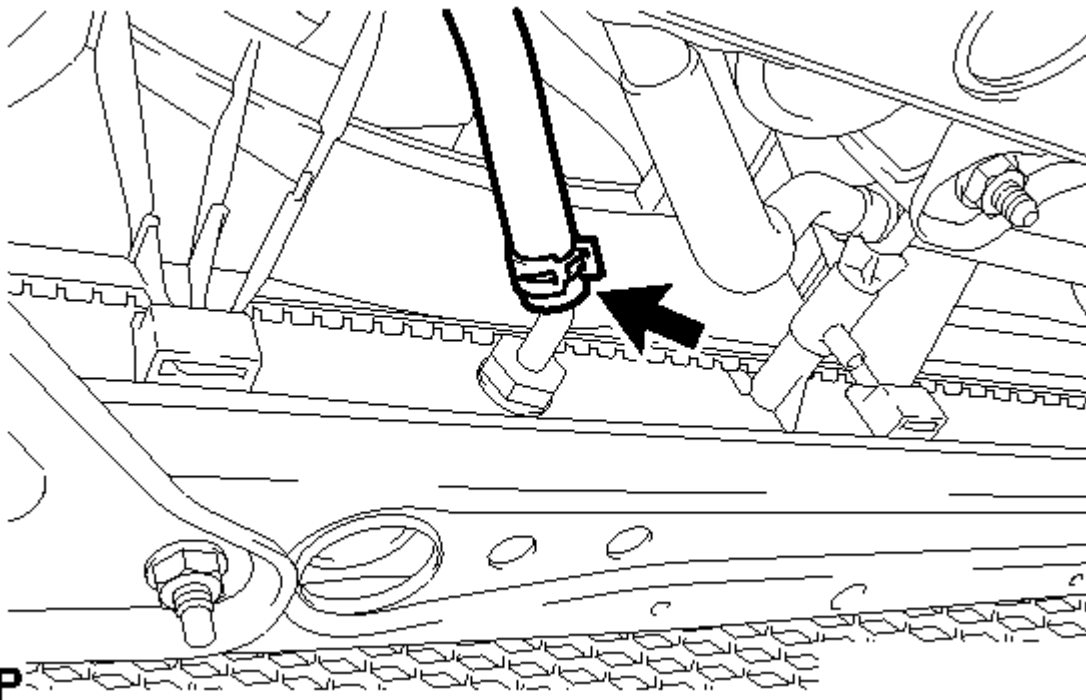


Fig. 34: Identifying Outlet Oil Cooler Hose & Clamp

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

9. **REMOVE MILLIMETER WAVE RADAR SENSOR (w/ Dynamic Radar Cruise Control System) .**
Refer to **REMOVAL - Step 2**
10. **REMOVE HOOD LOCK NUT CAP .** Refer to **REMOVAL - Step 5**
11. **REMOVE HOOD LOCK ASSEMBLY .** Refer to **REMOVAL - Step 6**
12. **REMOVE UPPER RADIATOR SUPPORT SUB-ASSEMBLY**
 - a. Disconnect the clamp of the hood lock control cable.

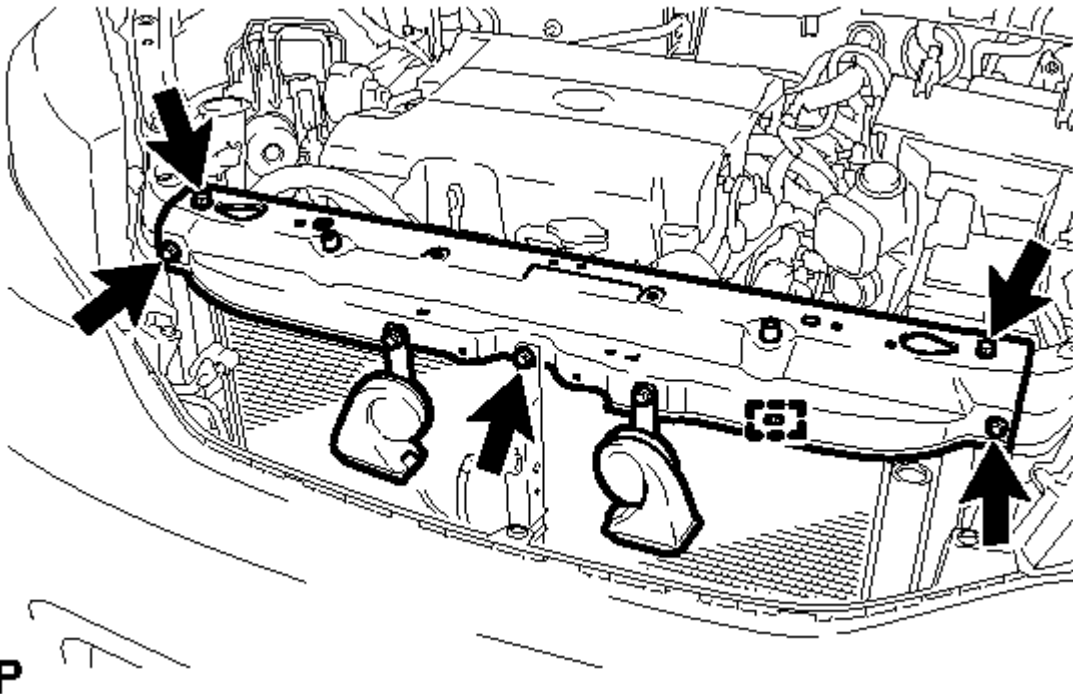
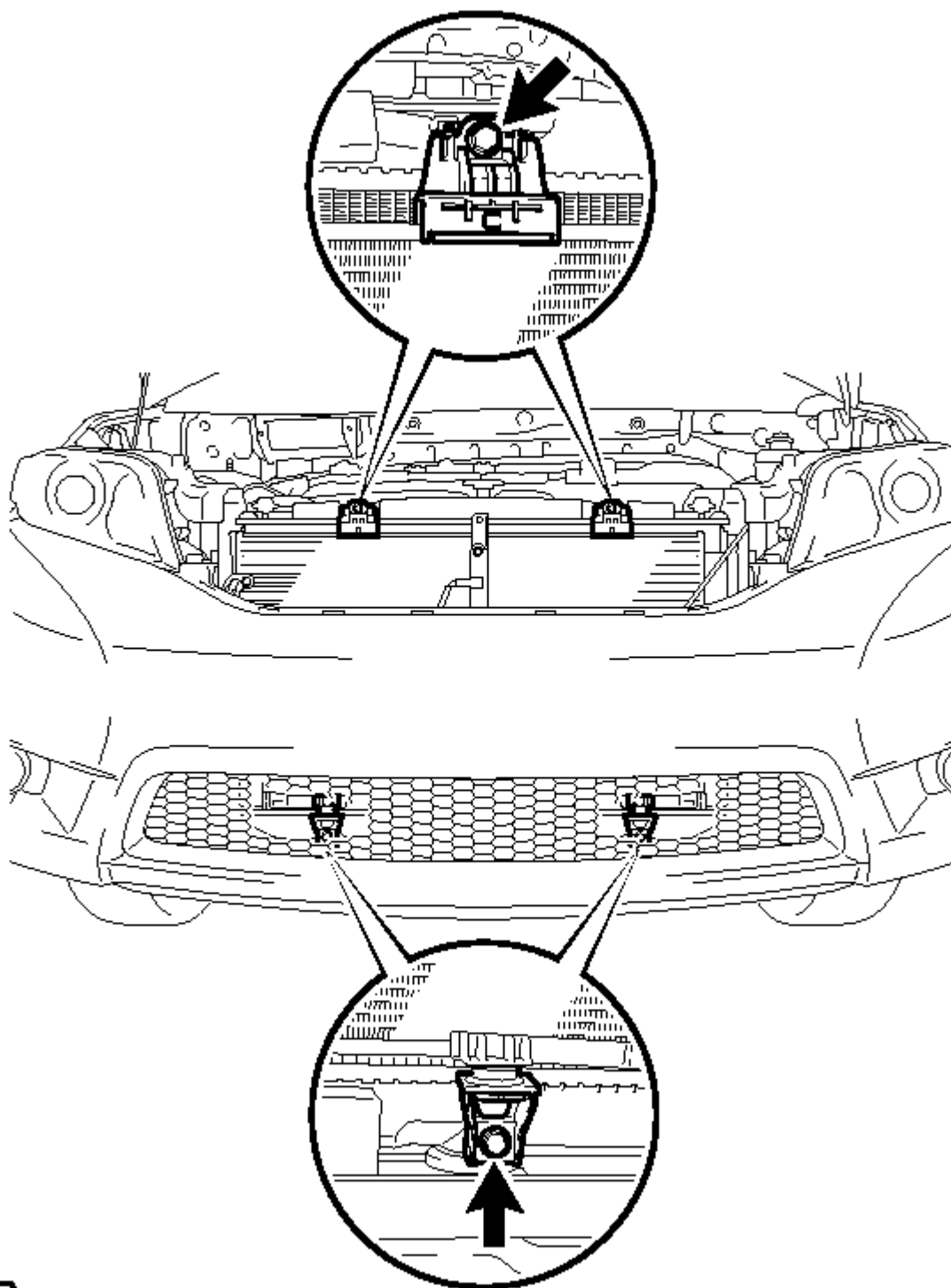


Fig. 35: Identifying Upper Radiator Support Sub-Assembly Horn Connector & Bolts
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- b. Disconnect the 2 horn connectors.
 - c. Remove the 5 bolts and upper radiator support.
13. **REMOVE NO. 2 RADIATOR ASSEMBLY**
 - a. Remove the 4 bolts and the 4 cooler brackets.



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Fig. 36: Identifying No. 2 Radiator Assembly Brackets & Bolts
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- b. Disconnect the 3 wire harness clamps and connector.

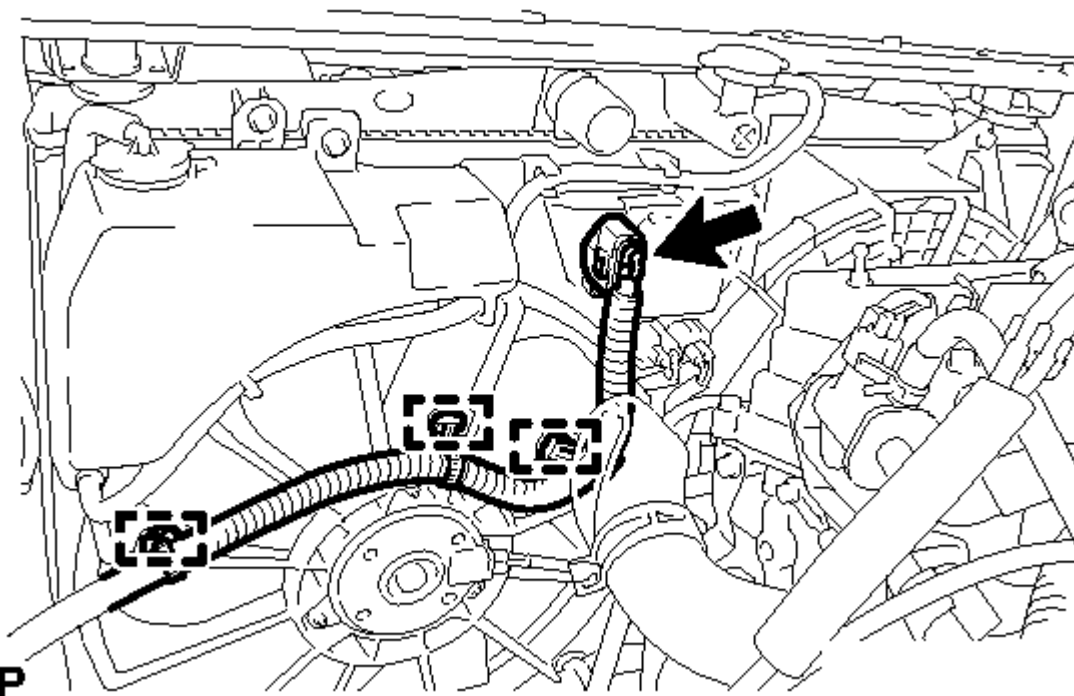


Fig. 37: Identifying No. 2 Radiator Assembly Harness Clamps & Connector
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- c. Remove the radiator assembly and fan assembly with motor from the vehicle.

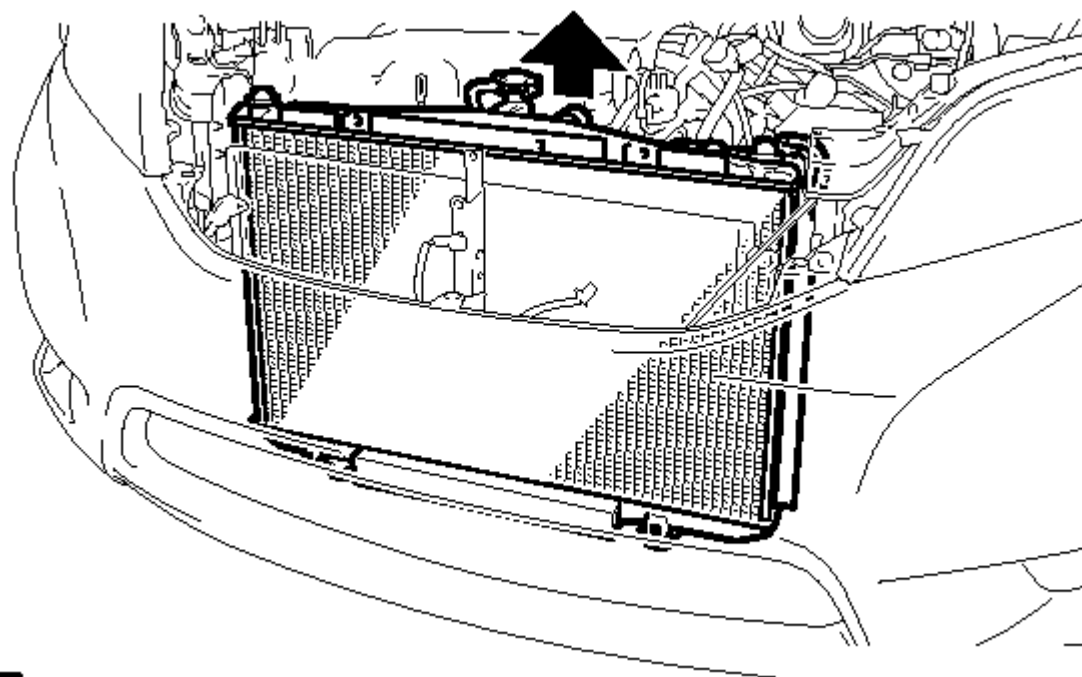
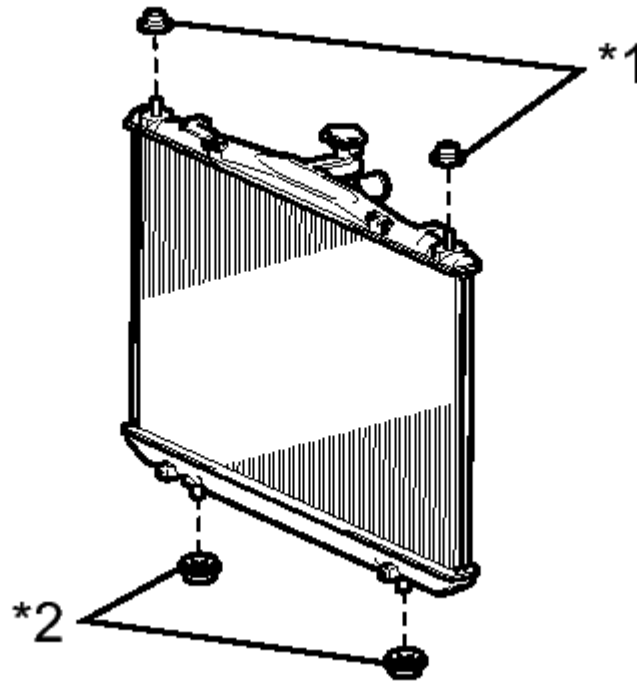


Fig. 38: Removing Radiator & Fan Motor Assembly
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

NOTE: Do not apply any excessive force to the cooler condenser assembly or pipe when removing the radiator assembly.

- d. Remove the 2 radiator support cushions and the 2 lower radiator supports from the radiator.



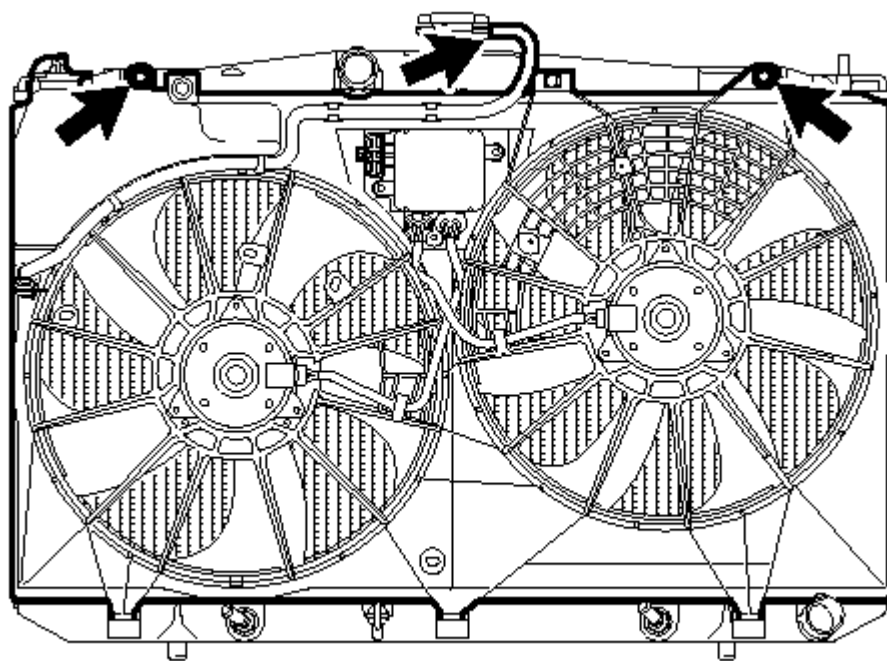
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Fig. 39: Identifying Radiator Support Cushions & Lower Supports
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

TEXT IN ILLUSTRATION

*1	Radiator Support Cushion
*2	Lower Radiator Support

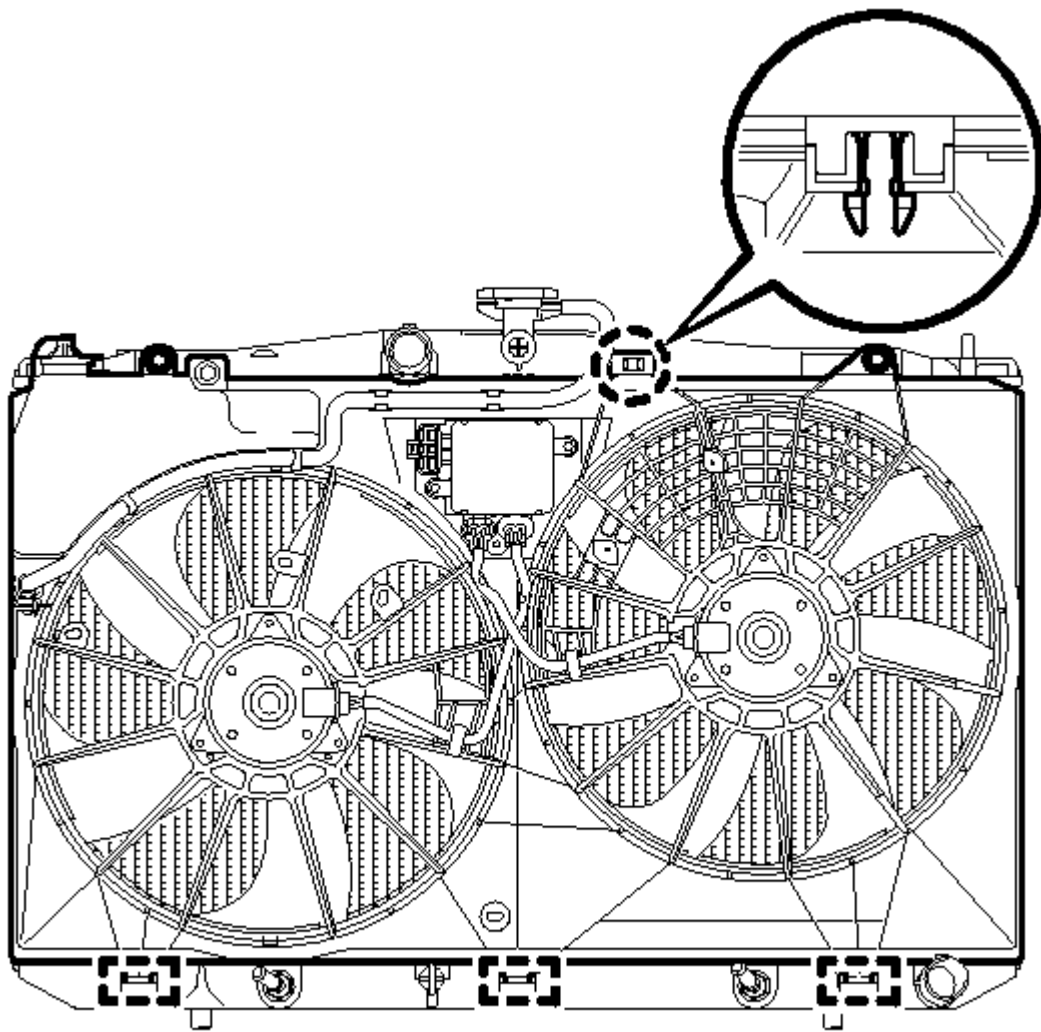
- e. Disconnect the radiator reservoir tank hose.



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Fig. 40: Identifying Radiator Reservoir Tank Hose & Bolts
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- f. Remove the 2 bolts.
- g. Disengage the claw and pull up the fan assembly with motor from the radiator assembly to remove the fan assembly with motor.



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Fig. 41: Identifying Radiator Fan Assembly Claws
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- h. Remove the radiator drain cock plug from the radiator.

INSTALLATION

INSTALLATION

1. INSTALL NO. 2 RADIATOR ASSEMBLY

- a. Install the radiator drain cock plug to the radiator assembly.

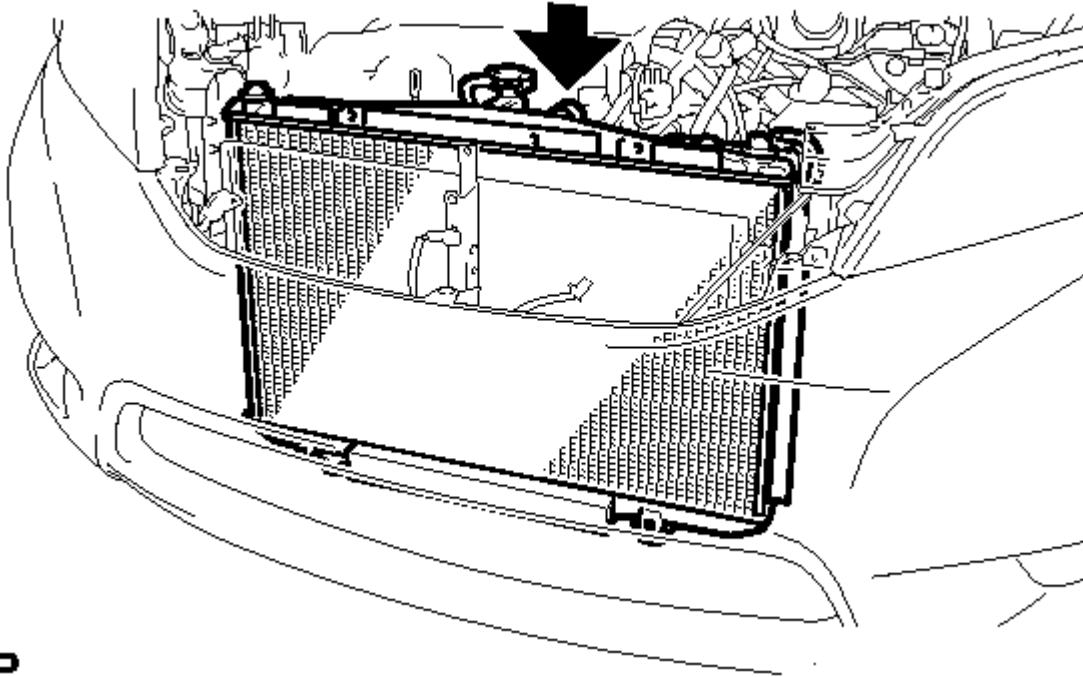
NOTE: Replace the O-ring if it is damaged.

- b. Install the fan assembly with motor to the radiator with the 3 guides at the bottom and engage the claw.

- c. Install the 2 bolts.

Torque: 7.1 N*m (72 kgf*cm, 63 in.*lbf)

- d. Connect the radiator reservoir tank hose.
- e. Install the 2 radiator support cushions and the 2 lower radiator supports to the radiator.
- f. Install the radiator assembly and fan assembly with motor onto the vehicle.



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Fig. 42: Installing Radiator & Fan Motor Assembly
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

NOTE: **Do not apply any excessive force to the cooler condenser assembly or pipe when installing the radiator assembly.**

- g. Connect the 3 wire harness clamps and connector.
- h. Install the radiator assembly with the 4 bolts and 4 cooler brackets.

Torque: 6.0 N*m (61 kgf*cm, 53 in.*lbf)

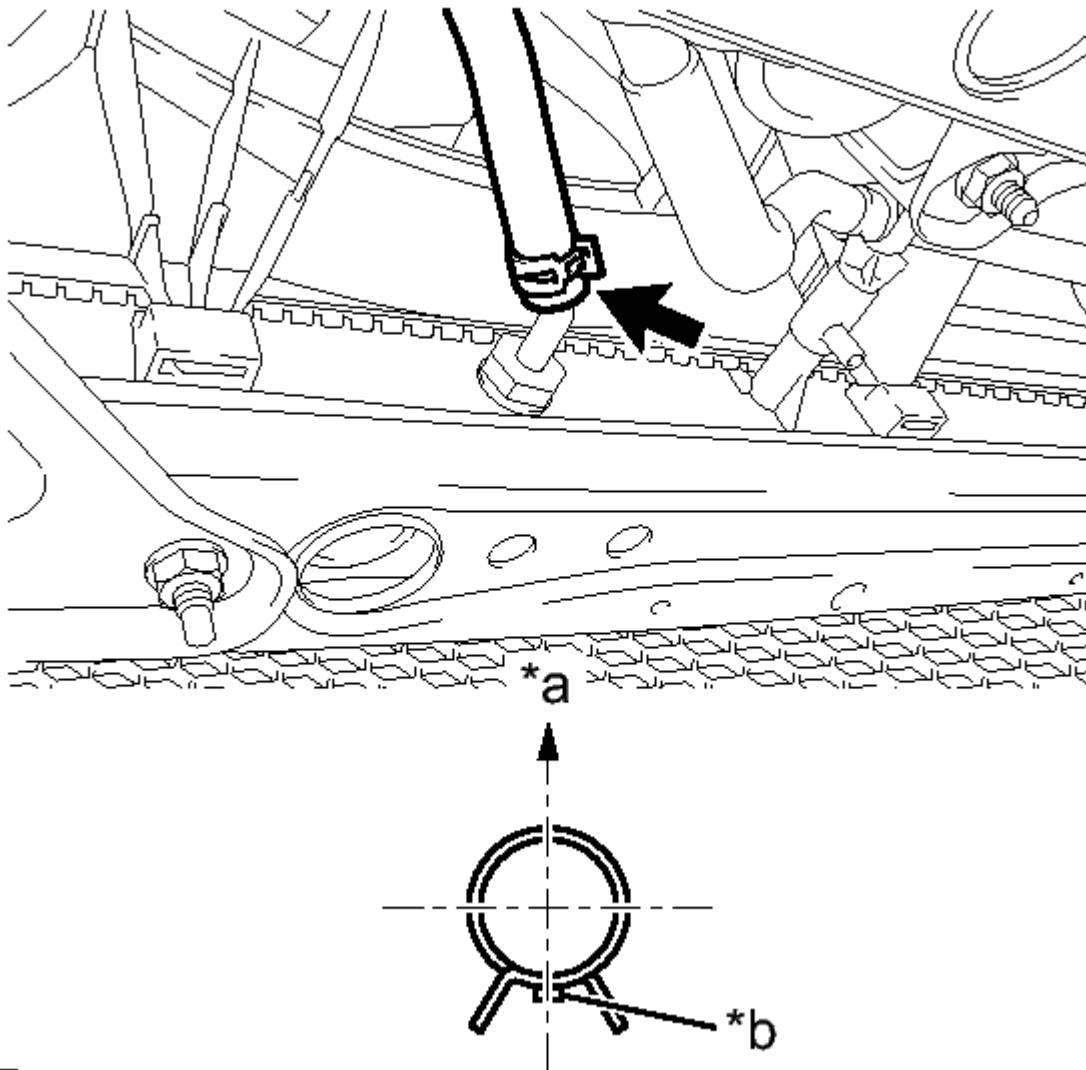
2. INSTALL UPPER RADIATOR SUPPORT SUB-ASSEMBLY

- a. Install the upper radiator support with the 5 bolts.

Torque: 6.0 N*m (61 kgf*cm, 53 in.*lbf)

- b. Connect the 2 horn connectors.

- c. Connect the clamp of the hood lock control cable.
3. **INSTALL HOOD LOCK ASSEMBLY** . Refer to INSTALLATION - Step 6
 4. **INSPECT HOOD LOCK ASSEMBLY** . Refer to ON-VEHICLE INSPECTION - Step 1
 5. **ADJUST HOOD LOCK ASSEMBLY** . Refer to ADJUSTMENT - Step 5
 6. **INSTALL HOOD LOCK NUT CAP** . Refer to INSTALLATION - Step 9
 7. **INSTALL MILLIMETER WAVE RADAR SENSOR (w/ Dynamic Radar Cruise Control System)** . Refer to INSTALLATION - Step 1
 8. **ADJUST MILLIMETER WAVE RADAR SENSOR (w/ Dynamic Radar Cruise Control System)** . Refer to ADJUSTMENT - Step 1
 9. **CONNECT OUTLET OIL COOLER HOSE**
 - a. Connect the outlet oil cooler hose to the radiator with the hose clamp.



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Fig. 43: Identifying Outlet Oil Cooler Hose Clamp Position
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

TEXT IN ILLUSTRATION

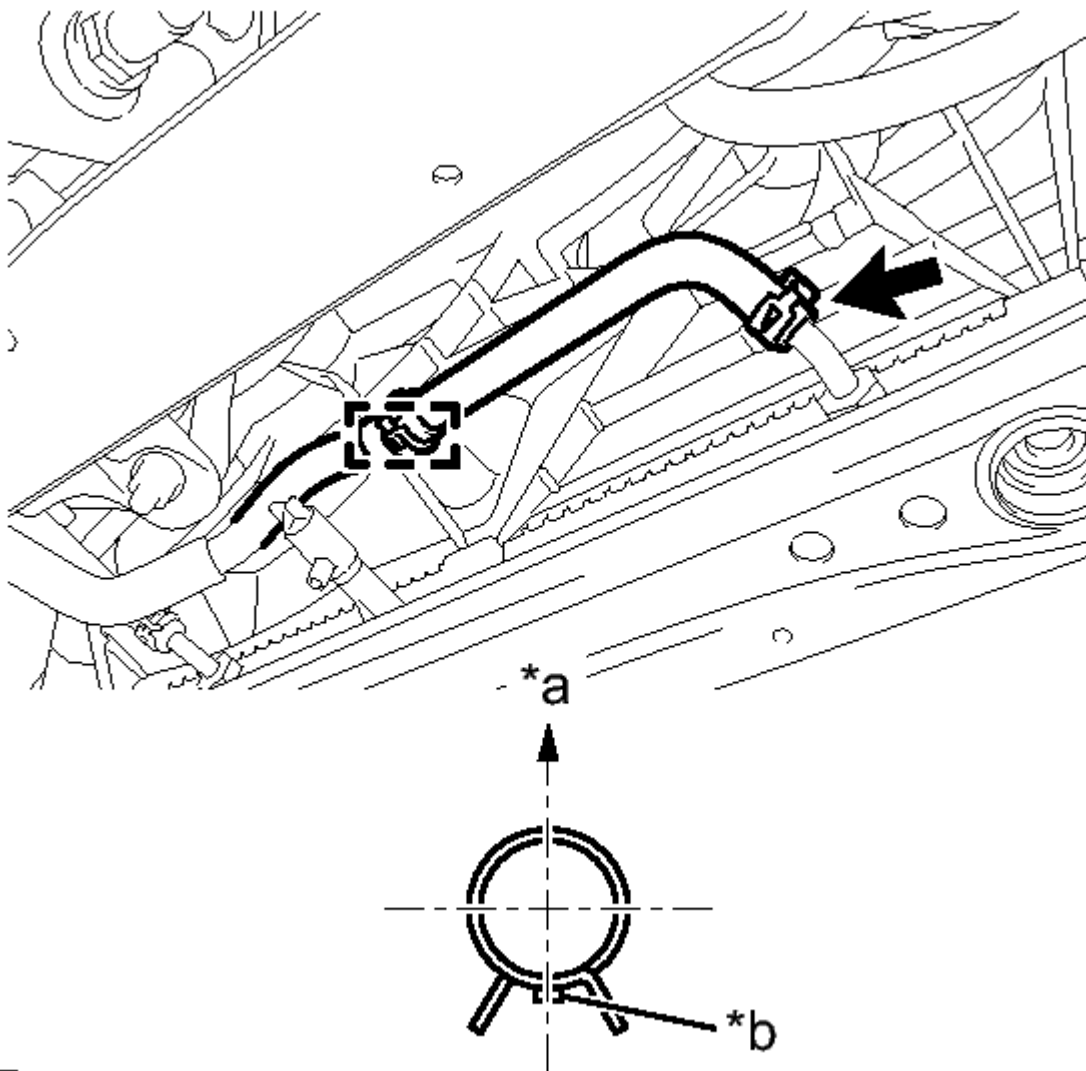
*a	Upper Side
*b	White Paint Mark

HINT:

Perform the installation with the hose clamp and mark at the correct angle.

10. CONNECT INLET OIL COOLER HOSE

- Connect the clamp and inlet oil cooler hose to the radiator with the hose clamp.



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Fig. 44: Identifying Inlet Oil Cooler Hose Clamp Position
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

TEXT IN ILLUSTRATION

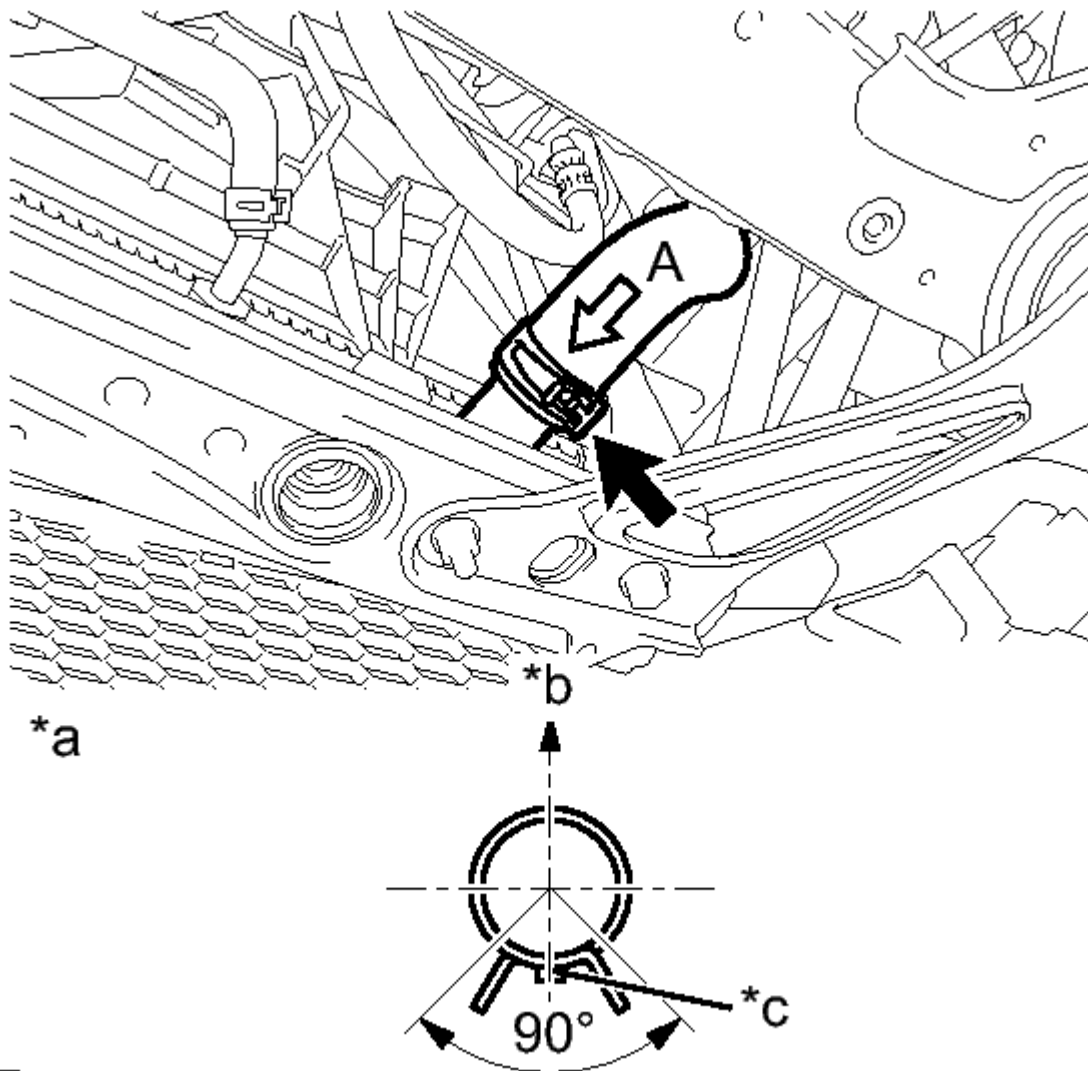
*a	Upper Side
*b	White Paint Mark

HINT:

Perform the installation with the hose clamp and mark at the correct angle.

11. CONNECT NO. 2 RADIATOR HOSE

- Connect the No. 2 radiator hose to the radiator with the hose clamp.



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Fig. 45: Identifying No. 2 Radiator Hose Clamp Position
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

TEXT IN ILLUSTRATION

*a	View A
*b	Upper Side
*c	White Paint Mark

HINT:

Perform the installation with the hose clamp and mark at the correct angle.

12. CONNECT NO. 1 RADIATOR HOSE

- Connect the No. 1 radiator hose to the radiator with the hose clamp.

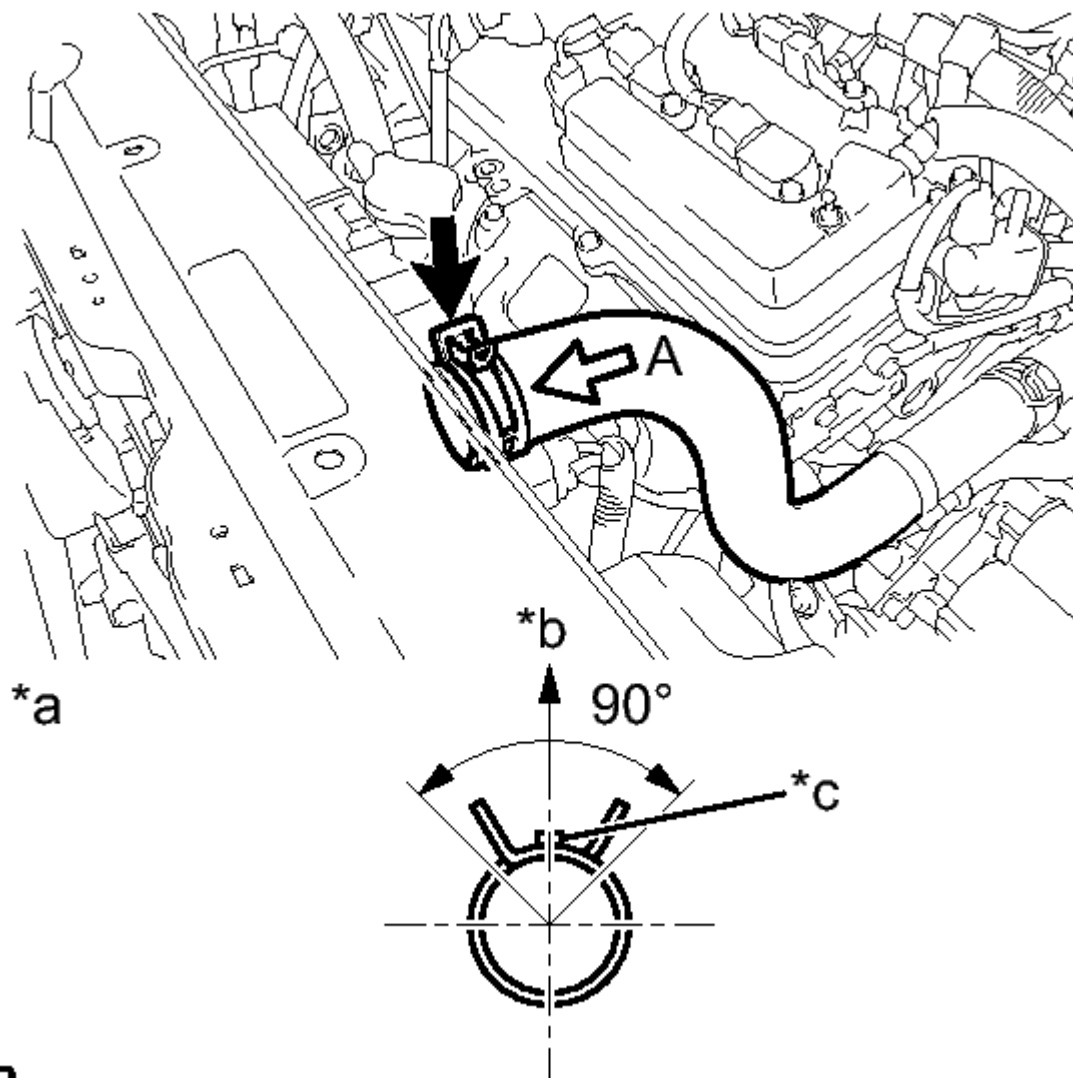


Fig. 46: Identifying No. 1 Radiator Hose Clamp Position
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

TEXT IN ILLUSTRATION

*a	View A
*b	Upper Side
*c	White Paint Mark

HINT:

Perform the installation with the hose clamp and mark at the correct angle.

13. **INSTALL RADIATOR GRILLE SUB-ASSEMBLY** . Refer to **INSTALLATION - Step 2**
14. **INSTALL AIR CLEANER INLET COVER ASSEMBLY SEAL** . Refer to **INSTALLATION - Step 5**
15. **ADD ENGINE COOLANT** See step 4
16. **INSPECT FOR COOLANT LEAK** . Refer to **ON-VEHICLE INSPECTION - Step 1**
17. **ADD AUTOMATIC TRANSAXLE FLUID (for 2WD)** . Refer to **INSTALLATION - Step 78**
18. **ADD AUTOMATIC TRANSAXLE FLUID (for AWD)** . Refer to **INSTALLATION - Step 79**
19. **INSPECT FOR OIL LEAK**
20. **INSTALL NO. 1 ENGINE UNDER COVER** . Refer to **INSTALLATION - Step 16**
21. **WARM UP ENGINE**

RELAY

ON-VEHICLE INSPECTION

ON-VEHICLE INSPECTION

1. INSPECT COOLING FAN RELAY

- a. Measure the resistance according to the value(s) in the table below.

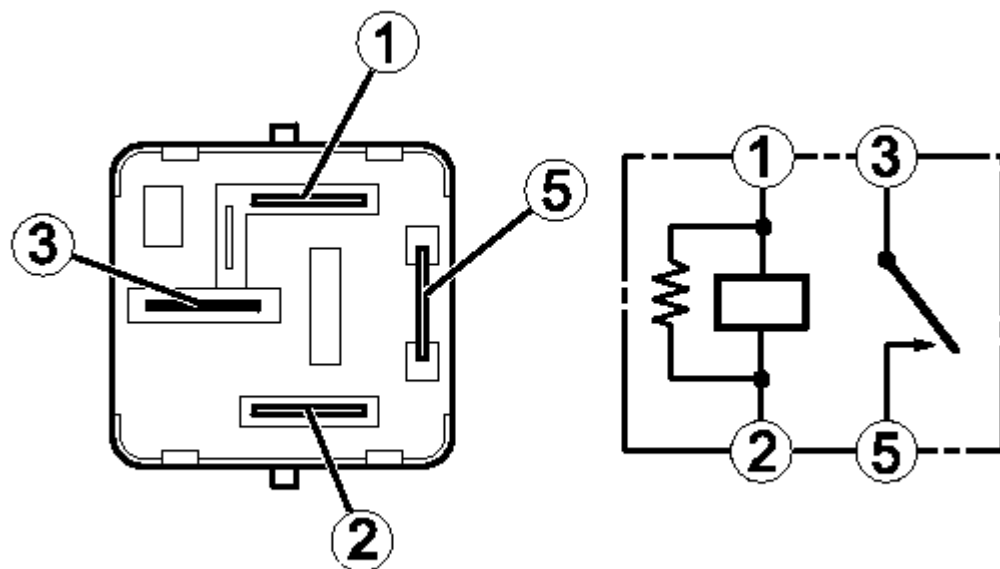


Fig. 47: Inspecting Fan No. 1 Relay
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

Standard Resistance

Tester Connection	Condition	Specified Condition
3 - 5	Battery voltage not applied	10 kohms or higher
3 - 5	Battery voltage applied to terminals 1 and 2	Below 1 ohms

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