

# COOLANT

## INSPECTION

CO0BD-01

### 1. CHECK ENGINE COOLANT LEVEL AT RADIATOR RESERVOIR

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

If low, check for leaks and add engine coolant up to the "FULL" line.

### 2. CHECK ENGINE COOLANT QUALITY

- (a) Remove the radiator cap.

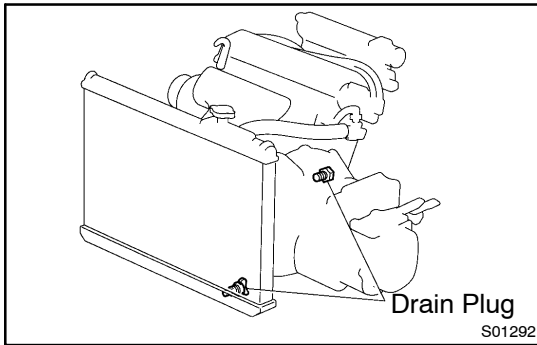
#### **CAUTION:**

**To avoid the danger of being burned, do not remove the radiator cap while the engine and radiator are still hot, 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 radiator filler hole, and the coolant should be free from oil.

If excessively dirty, replace the coolant.

- (c) Reinstall the radiator cap.



## REPLACEMENT

### 1. DRAIN ENGINE COOLANT

- (a) 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, as fluid and steam can be blown out under pressure.**

- (b) Loosen the radiator drain plug (on the left side of the radiator lower tank) and engine drain plug (on the left rear of the cylinder block), and drain the coolant.
- (c) Close the drain plugs.

#### Torque: Engine drain plug

**25 N·m (250 kgf·cm, 18 ft·lbf)**

### 2. FILL ENGINE COOLANT

- (a) Slowly fill the system with coolant.
- Use a good brand of ethylene-glycol base coolant and mix it according to the manufacture's directions.
  - Using coolant which includes more than 50 % ethylene-glycol (but not more than 70 %) is recommended.

#### NOTICE:

- **Do not use an alcohol type coolant.**
- **The coolant should be mixed with demineralized water or distilled water.**

#### Capacity (w/ Heater):

**M/T: 8.0 liters (8.5 US qts, 7.0 Imp. qts)**

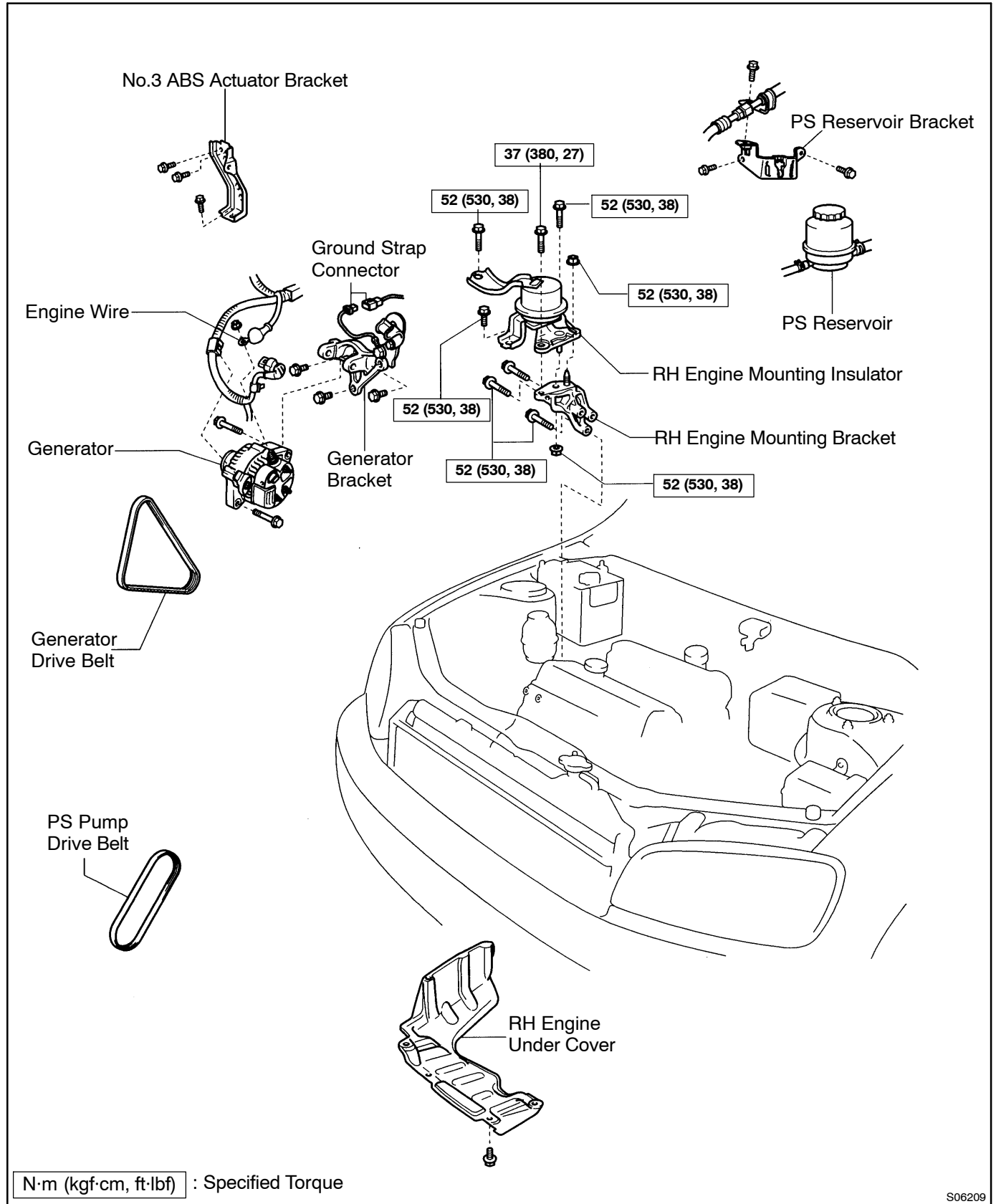
**A/T: 7.7 liters (8.1 US qts, 6.8 Imp. qts)**

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

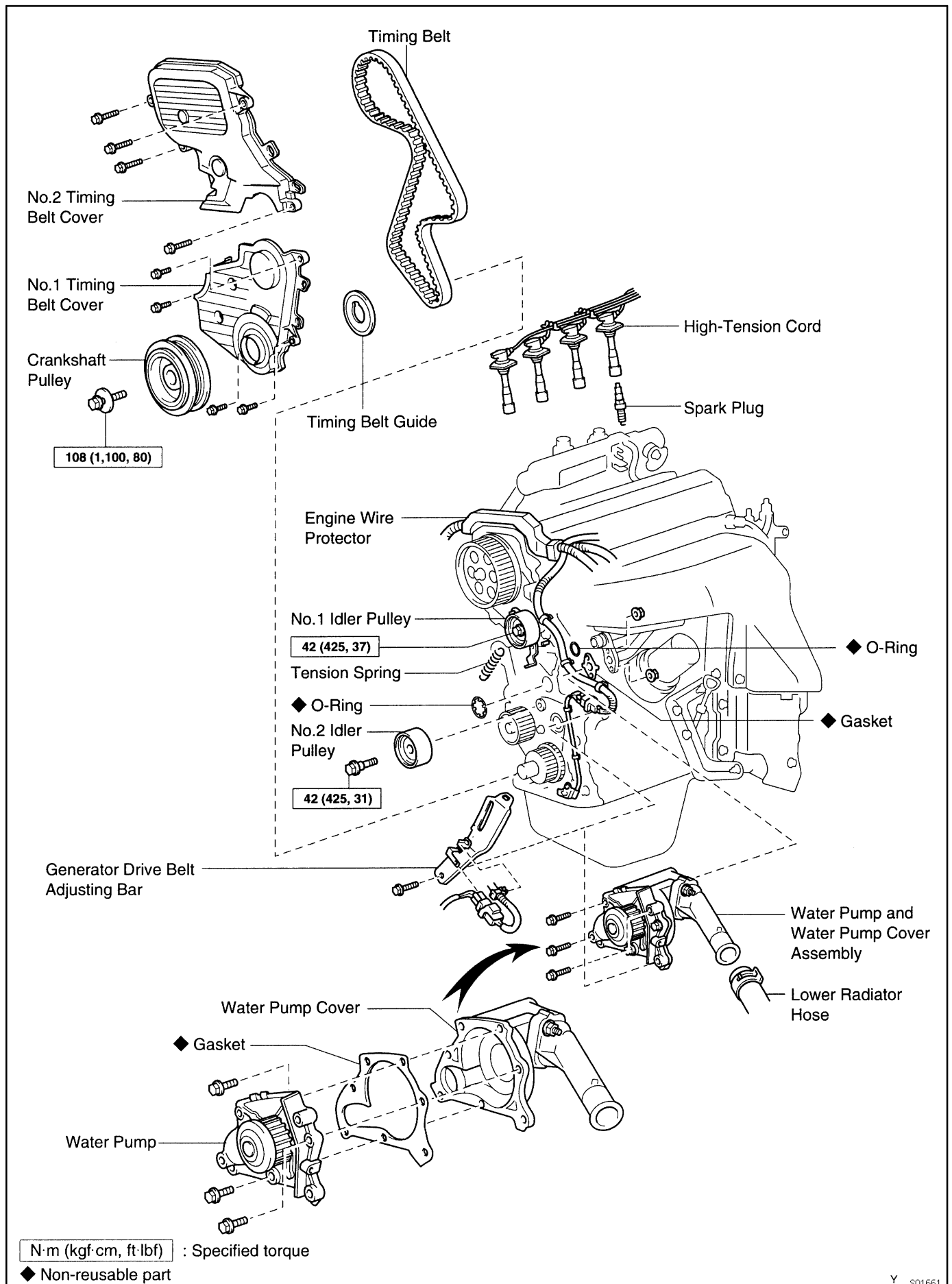
### 3. CHECK ENGINE COOLANT FOR LEAKS

# WATER PUMP COMPONENTS

C00BF-03

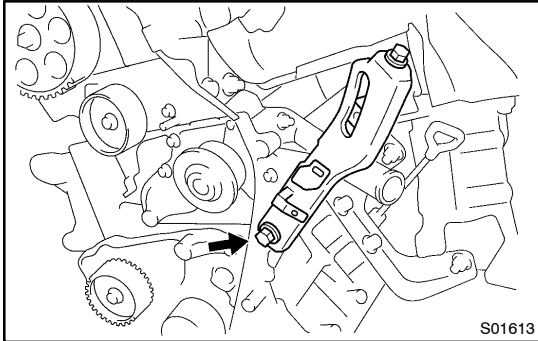


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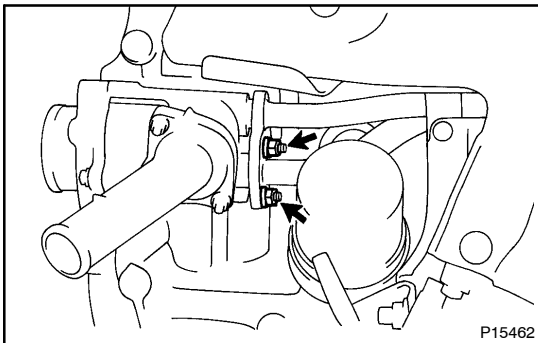


## REMOVAL

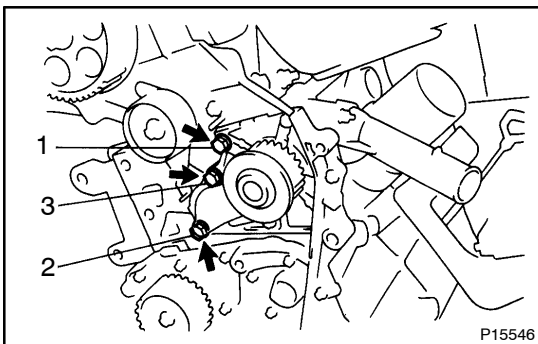
1. REMOVE RH ENGINE UNDER COVER
2. DRAIN ENGINE COOLANT
3. REMOVE TIMING BELT (See page [EM-15](#))
4. DISCONNECT LOWER RADIATOR HOSE FROM WATER INLET
5. REMOVE TIMING BELT TENSION SPRING AND NO.2 IDLER PULLEY



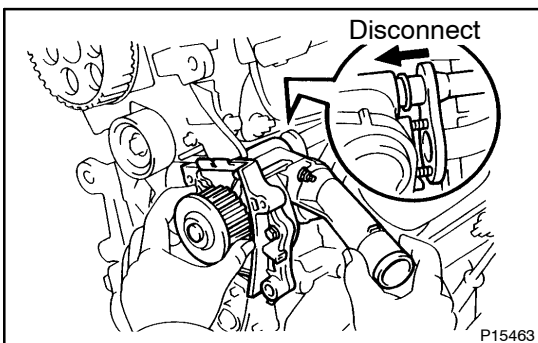
6. REMOVE GENERATOR DRIVE BELT ADJUSTING BAR
  - (a) Disconnect the crankshaft position sensor connector clamp.
  - (b) Remove the bolt and adjusting bar.



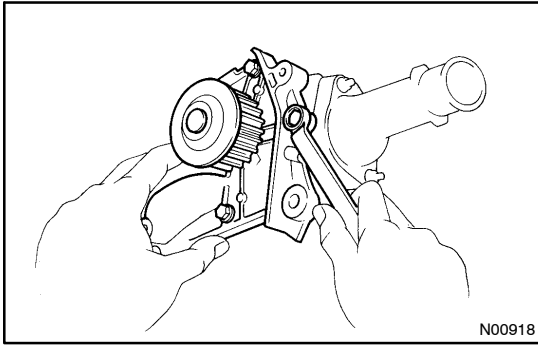
7. REMOVE WATER PUMP AND WATER PUMP COVER ASSEMBLY
  - (a) Remove the 2 nuts holding the water pump to the water bypass pipe.



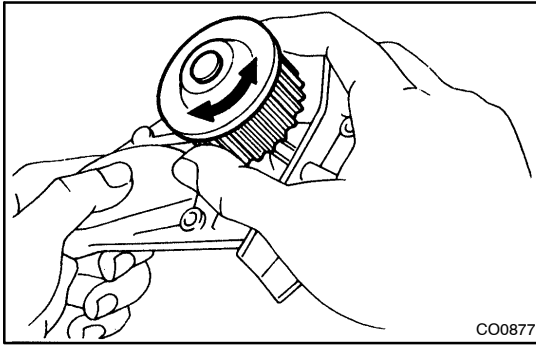
- (b) Remove the 3 bolts in the sequence shown.



- (c) Disconnect the water pump cover from the water bypass pipe, and remove the water pump and water pump cover assembly.
- (d) Remove the gasket and 2 O-ring from the water pump and water bypass pipe.

**8. REMOVE WATER PUMP FROM WATER PUMP COVER**

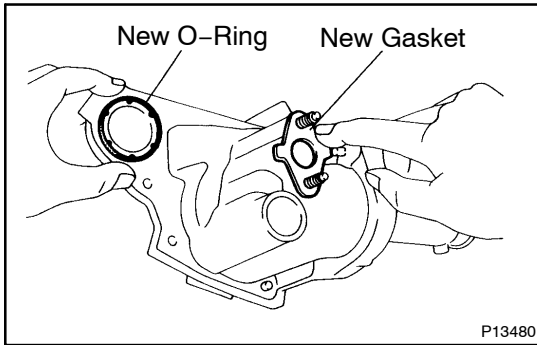
Remove the 3 bolts, water pump and gasket.



## INSPECTION

### INSPECT WATER PUMP

- (a) Visually check the drain hole for coolant leakage. If leakage is found, replace the water pump. If engine coolant has leaked onto the timing belt, replace the timing belt.
- (b) Turn the pulley, and check that the water pump bearing moves smoothly and quietly. If necessary, replace the water pump.



## INSTALLATION

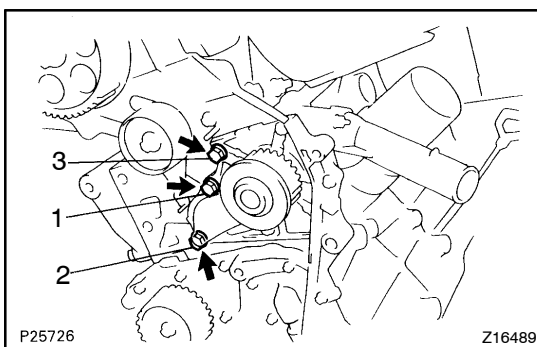
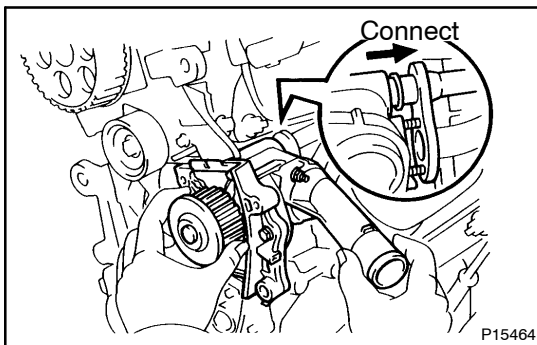
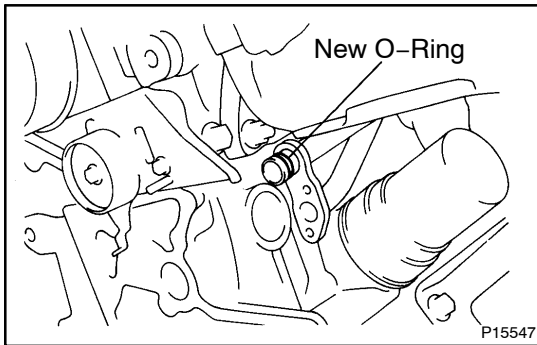
### 1. INSTALL WATER PUMP TO WATER PUMP COVER

Install a new gasket and the water pump with the 3 bolts.

**Torque: 8.8 N·m (90 kgf·cm, 78 in·lbf)**

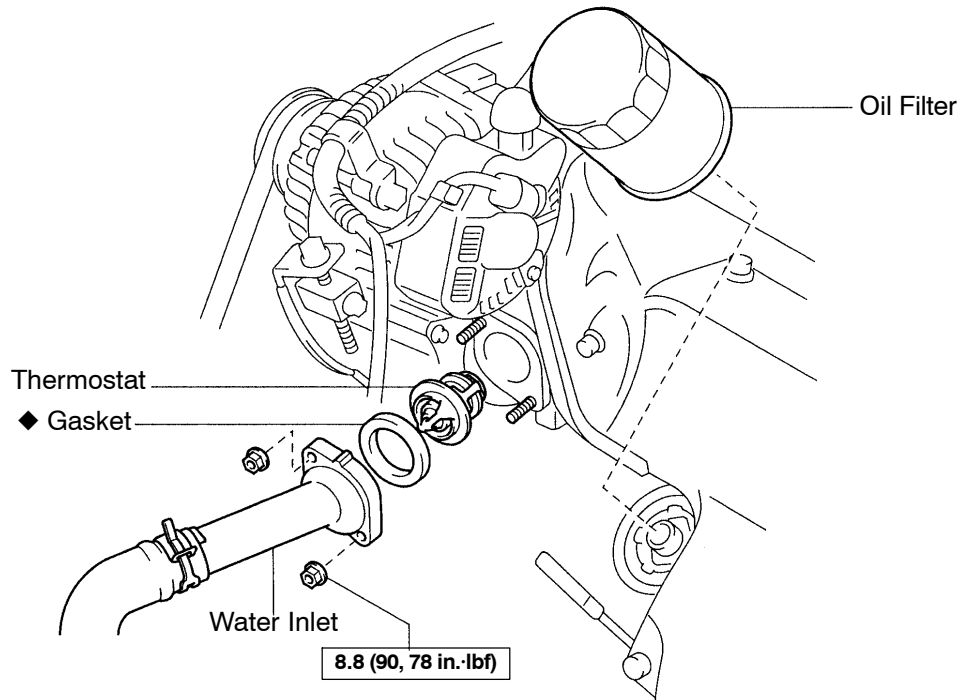
### 2. INSTALL WATER PUMP AND WATER PUMP COVER ASSEMBLY

- (a) Install new O-ring and gasket to water pump cover.
  - (b) Install a new O-ring to the water bypass pipe.
  - (c) Apply soapy water to the O-ring on the water bypass pipe.
  - (d) Connect the water pump cover to the water bypass pipe. Do not install the nuts yet.
  - (e) Install the water pump with the 3 bolts. Tighten the bolts in the sequence shown.  
**Torque: 8.8 N·m (90 kgf·cm, 78 in·lbf)**
  - (f) Install the 2 nuts holding the water pump cover to the water bypass pipe.  
**Torque: 9.3 N·m (95 kgf·cm, 82 in·lbf)**
- ### 3. INSTALL GENERATOR DRIVE BELT ADJUSTING BAR
- (a) Install the adjusting bar with the bolt.  
**Torque: 27 N·m (275 kgf·cm, 20 ft·lbf)**
  - (b) Connect the crankshaft position sensor connector clamp.
- ### 4. INSTALL NO.2 IDLER PULLEY AND TIMING BELT TENSION SPRING
- ### 5. CONNECT LOWER RADIATOR HOSE
- ### 6. INSTALL TIMING BELT (See page [EM-20](#))
- ### 7. FILL WITH ENGINE COOLANT
- ### 8. START ENGINE AND CHECK FOR COOLANT LEAKS
- ### 9. INSTALL RH ENGINE UNDER COVER



# THERMOSTAT COMPONENTS

C00BJ-01



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

◆ Non-reusable part

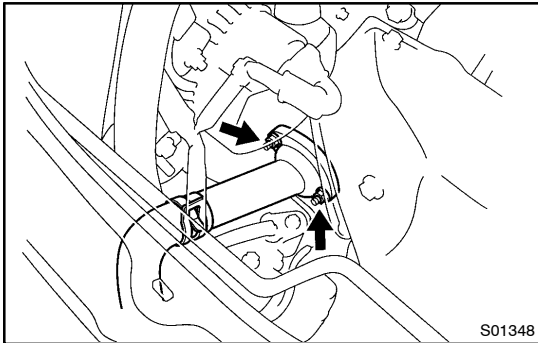
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## REMOVAL

### HINT:

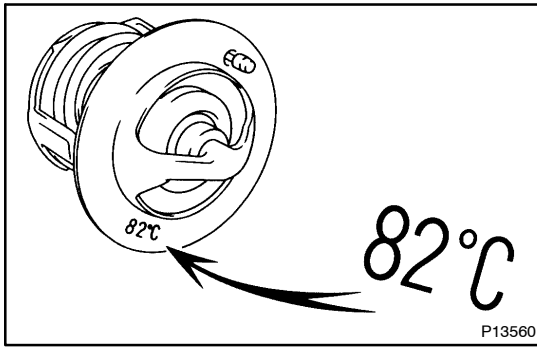
Removal of the thermostat would have an adverse effect, causing a lowering of cooling efficiency. Do not remove the thermostat, even if the engine tends to overheat.

1. **DRAIN ENGINE COOLANT**
2. **REMOVE OIL FILTER (See page [LU-2](#))**



3. **REMOVE WATER INLET AND THERMOSTAT**

- (a) Remove the 2 nuts, and disconnect the water inlet from the water pump cover.
- (b) Remove the thermostat.
- (c) Remove the gasket from the thermostat.

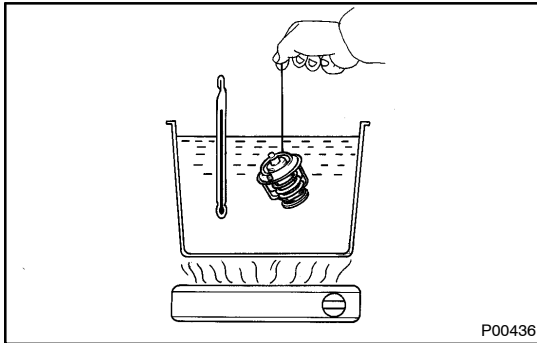


## INSPECTION

### INSPECT THERMOSTAT

#### HINT:

The thermostat is numbered with the valve operating temperature.



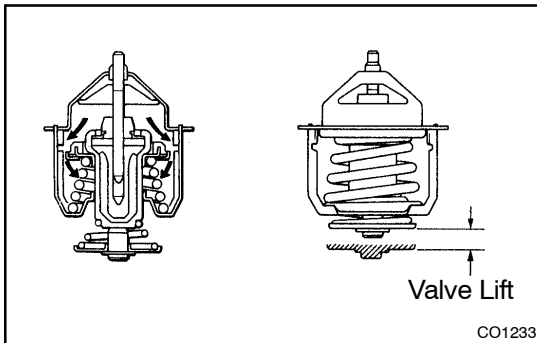
(a) Immerse the thermostat in water and gradually heat the water.

(b) Check the valve opening temperature.

#### Valve opening temperature:

**80 – 84°C (176 – 183°F)**

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



(c) Check the valve lift.

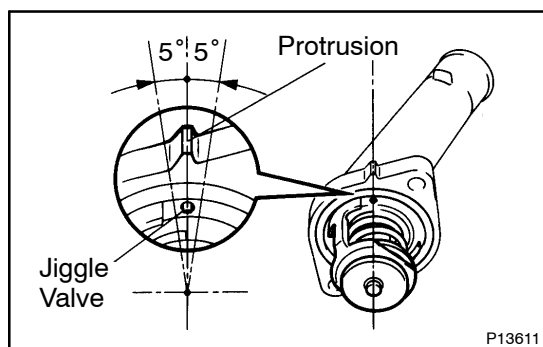
#### Valve lift:

**At 95°C (203°F): 8 mm (0.31 in.) or more**

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 40°C (104°F)).

If not closed, replace the thermostat.



## INSTALLATION

### 1. PLACE THERMOSTAT IN WATER PUMP

- Install a new gasket to the thermostat.
- Align the jiggle valve of the thermostat with the protrusion of the water inlet, and insert the thermostat in the water inlet.

#### HINT:

The jiggle valve may be set within 5° of either side of the prescribed position.

### 2. INSTALL WATER INLET AND THERMOSTAT

Install the water inlet and thermostat with the 2 nuts.

**Torque: 8.8 N·m (90 kgf·cm, 78 in.·lbf)**

### 3. INSTALL OIL FILTER (See page [LU-2](#))

### 4. FILL WITH ENGINE COOLANT

### 5. START ENGINE AND CHECK FOR LEAKS

### 6. CHECK ENGINE OIL LEVEL

# RADIATOR

## ON-VEHICLE CLEANING

CO0BN-01

Using water or a steam cleaner, remove any mud or dirt from the radiator core.

**NOTICE:**

**If using a high pressure type cleaner, be careful not to deform the fins of the radiator core. (i.e. Maintain a distance between the cleaner nozzle and radiator core.)**

## 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

#### NOTICE:

- If the radiator cap has contaminations, always rinse it with 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)

#### 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 and measure the relief valve opening pressure.

#### Pump speed:

1 push within 1 second

#### NOTICE:

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:

74 – 103 kPa (0.75 – 1.05 kgf/cm<sup>2</sup>, 10.7 – 14.9 psi)

#### Minimum opening pressure:

59 kPa (0.6 kgf/cm<sup>2</sup>, 8.5 psi)

#### HINT:

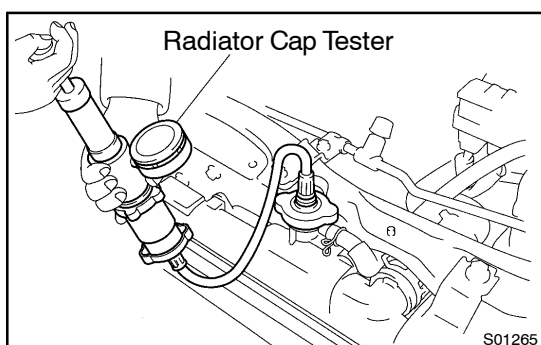
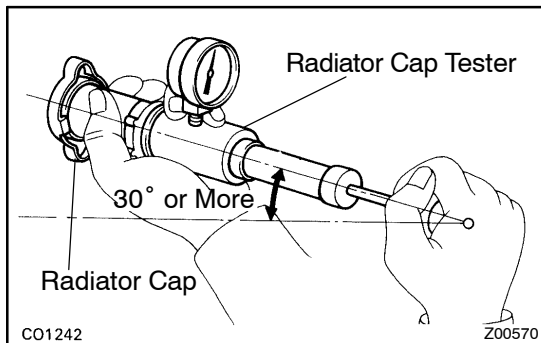
Use the tester's maximum reading as the opening pressure. If the opening pressure is less than minimum, replace the radiator cap.

### 3. INSPECT COOLING SYSTEM FOR LEAKS

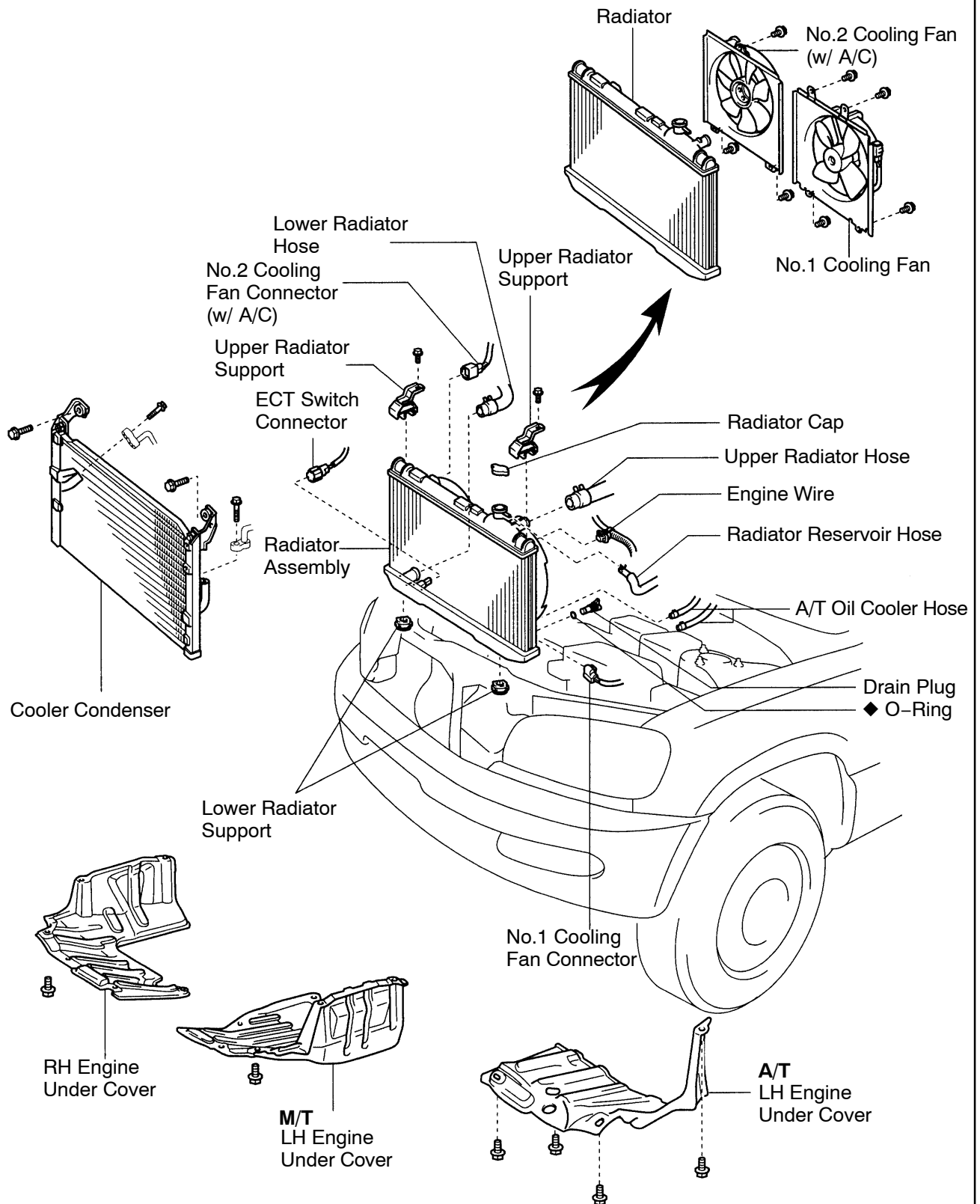
- (a) Fill the radiator with coolant and attach a radiator cap tester.
- (b) Warm up the engine.
- (c) Pump it to 118kPa (1.2 kgf/cm<sup>2</sup>, 17.1 psi), and check that the pressure does not drop.

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 cylinder head.

### 4. REINSTALL RADIATOR CAP



## COMPONENTS

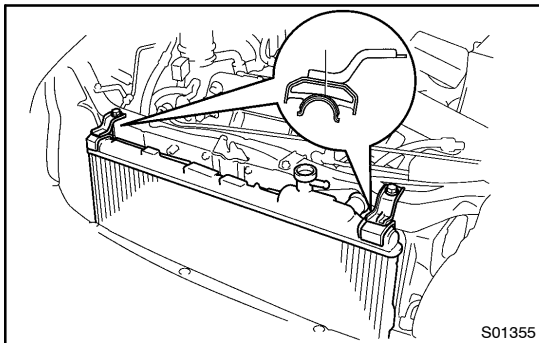


◆ Non-reusable part

S01819

## REMOVAL

1. **REMOVE ENGINE UNDER COVERS**
2. **DRAIN ENGINE COOLANT**
3. **w/ A/C:**  
**REMOVE COOLER CONDENSER** (See page [AC-47](#))
4. **REMOVE RADIATOR ASSEMBLY**
  - (a) Disconnect the No.1 cooling fan connector.
  - (b) **w/ A/C:**  
Disconnect the No.2 cooling fan connector.
  - (c) Disconnect the ECT switch connector for electric cooling fan.
  - (d) Disconnect the engine wire clamp from No.1 cooling fan shroud.
  - (e) Disconnect the upper radiator hose from radiator.
  - (f) Disconnect the lower radiator hose from radiator.
  - (g) Disconnect the radiator reservoir hose from radiator.
  - (h) Disconnect the 2 A/T oil cooler hoses from oil cooler pipes.



- (i) Remove the 2 bolts and 2 upper radiator supports.

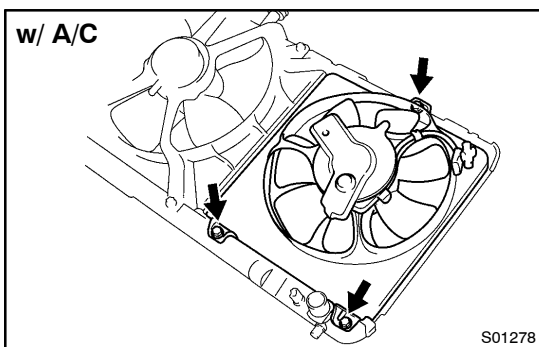
**Torque: 13 N·m (130 kgf·cm, 9 ft·lbf)**

- (j) Remove the radiator assembly.

### HINT:

At the time of installation, please refer to the following items. After installation, check that the rubber cushion (A) of the support is not depressed.

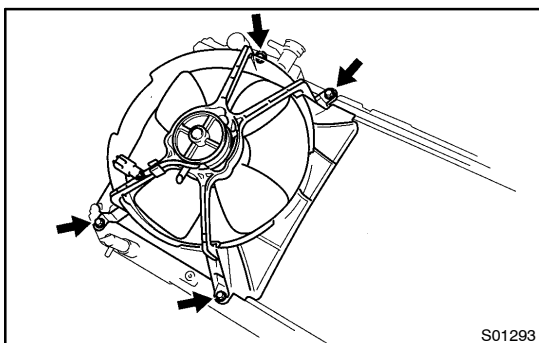
- (k) Remove the 2 lower radiator supports.



5. **w/ A/C:**  
**REMOVE NO.2 COOLING FAN FROM RADIATOR**

Remove the 3 bolts and cooling fan.

**Torque: 5.0 N·m (50 kgf·cm, 43 in·lbf)**



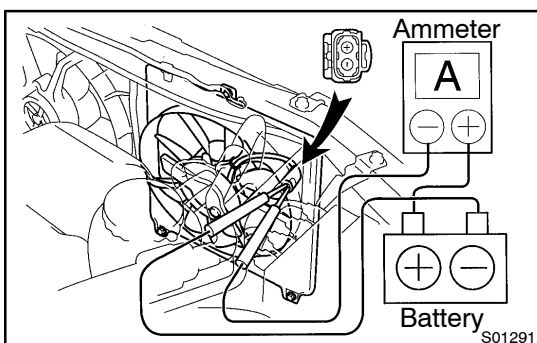
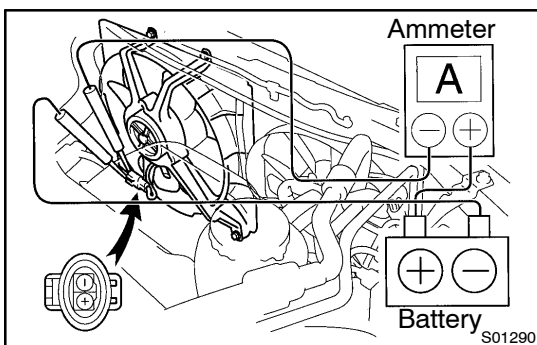
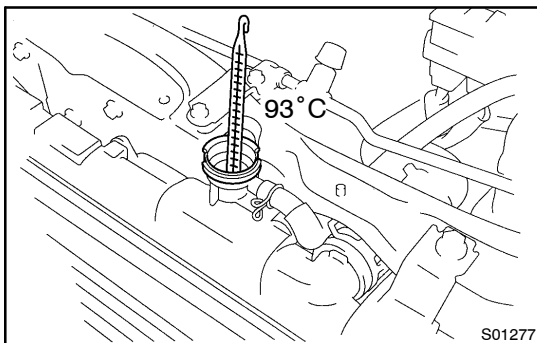
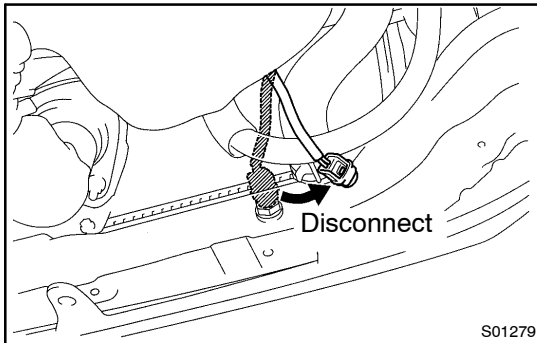
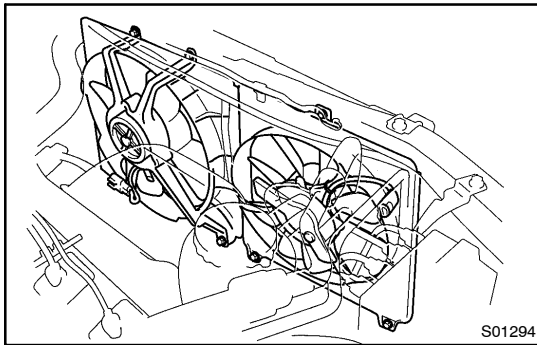
6. **REMOVE NO.1 COOLING FAN FROM RADIATOR**

Remove the 4 bolts and cooling fan.

**Torque: 5.0 N·m (50 kgf·cm, 43 in·lbf)**

## INSTALLATION

Installation is in the reverse order of removal (See page [CO-16](#)).



## ELECTRIC COOLING FAN ON-VEHICLE INSPECTION

CO0BS-03

### 1. CHECK COOLING FAN OPERATION WITH LOW TEMPERATURE (Below 83°C (181°F))

- Turn the ignition switch ON.
- Check that the cooling fan stops.

If not, check the cooling fan relay and ECT switch, and check for a separated connector or severed wire between the cooling fan relay and ECT switch.

- Disconnect the ECT switch connector.
- Check that the cooling fan rotates.

If not, check the fan main relay, cooling fan relay, cooling fan, fuses, and check for short circuit between the cooling fan relay and ECT switch.

- Reconnect the ECT switch connector.

### 2. CHECK COOLING FAN OPERATION WITH HIGH TEMPERATURE (Above 93°C (199°F))

- Start the engine, and raise coolant temperature to above 93°C (199°F).
  - Check that the cooling fan rotates.
- If not, replace the ECT switch.

### 3. INSPECT NO.1 COOLING FAN

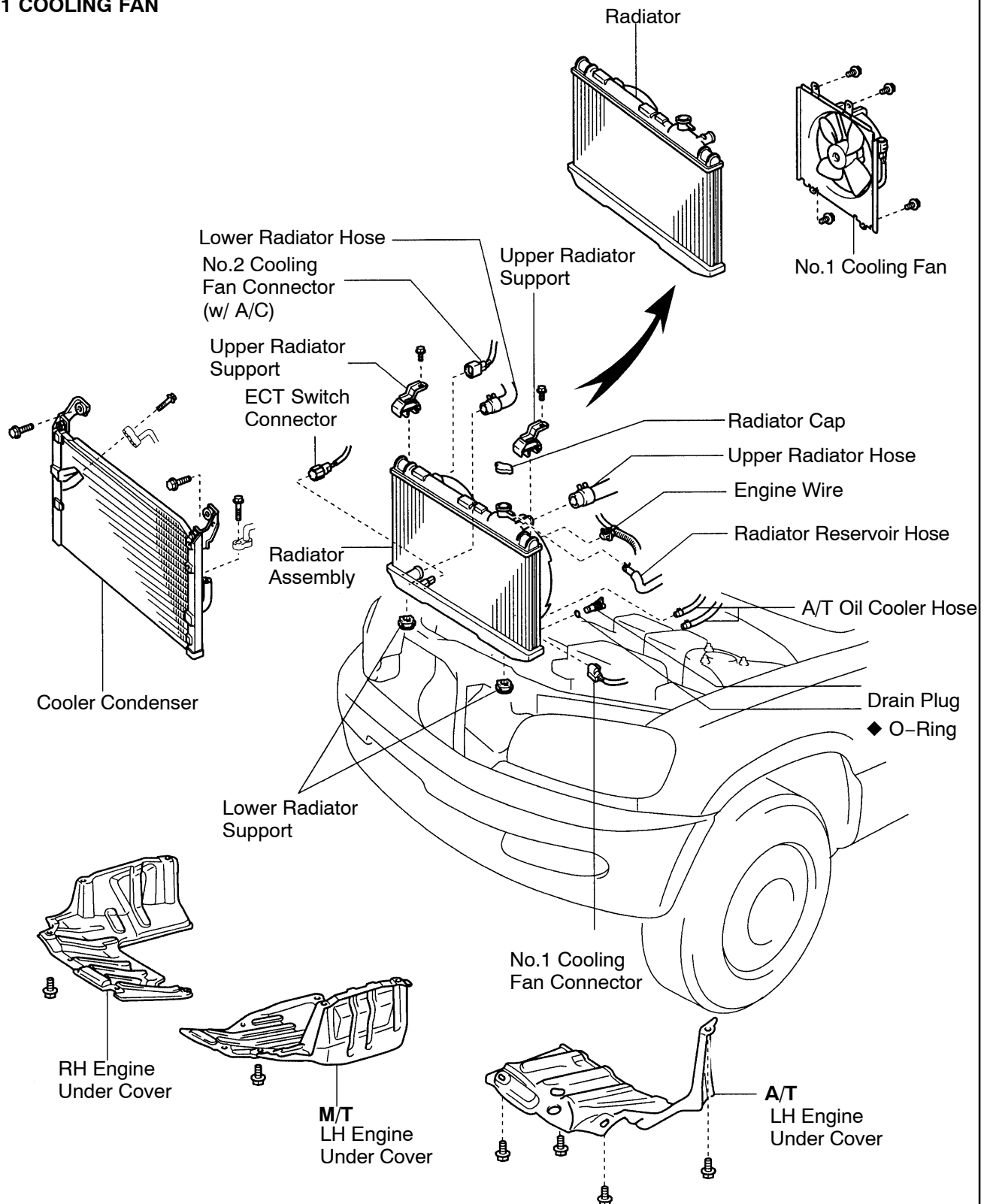
- Disconnect the cooling fan connector.
  - Connect battery and ammeter to the cooling fan connector.
  - Check that the cooling fan rotates smoothly, and check the reading on the ammeter.
- Standard amperage: 10.9 – 13.9 A**
- Reconnect the cooling fan connector.

### 4. INSPECT NO.2 COOLING FAN

- Disconnect the cooling fan connector.
  - Connect battery and ammeter to the cooling fan connector.
  - Check that the cooling fan rotates smoothly, and check the reading on the ammeter.
- Standard amperage: 9.1 – 11.1 A**
- Reconnect the cooling fan connector.

# COMPONENTS

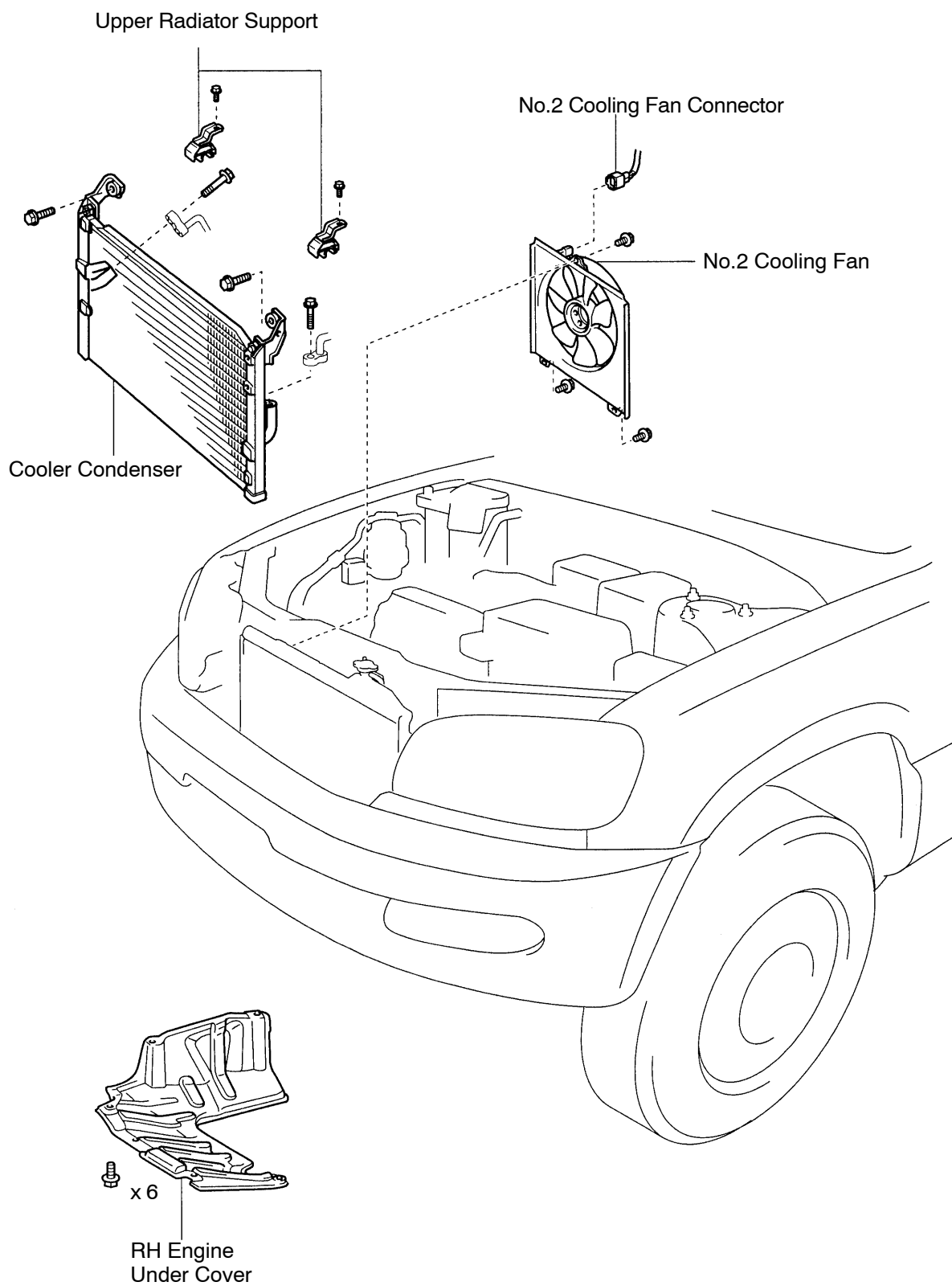
## NO.1 COOLING FAN



◆ Non-reusable Part

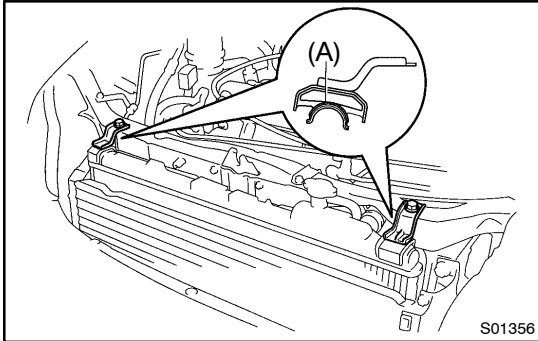
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## NO.2 COOLING FAN



## REMOVAL

### 1. REMOVE NO.1 COOLING FAN (See page [CO-16](#))



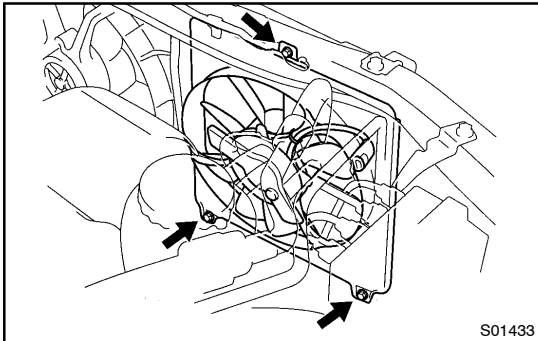
### 2. REMOVE NO.2 COOLING FAN

- (a) Remove the RH engine under cover.
- (b) w/ A/C:  
Remove the cooler condenser (See page [AC-47](#)).
- (c) Remove the upper radiator supports.

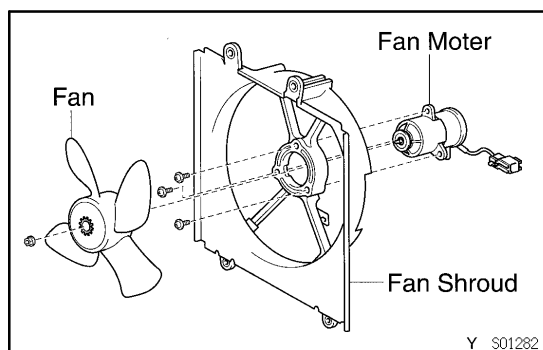
**Torque: 13 N·m (130kgf·cm, 9 ft·lbf)**

#### HINT:

At the time of installation, please refer to the following items. After installation, check that the rubber cushion (A) of the support is not depressed.



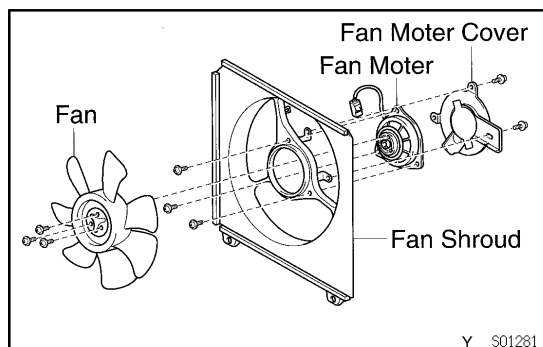
- (d) Remove the No.2 cooling fan.
  - (1) Disconnect the cooling fan connector.
  - (2) Push the radiator toward the front bumper.
  - (3) Remove the 3 bolts.
  - (4) Push the No.2 cooling fan toward radiator and pull it upward.



## DISASSEMBLY

### 1. DISASSEMBLE NO.1 COOLING FAN

- Remove the nut and fan.
- Disconnect the wire and connector from the fan shroud.
- Remove the 3 screws and fan motor.



### 2. DISASSEMBLE NO.2 COOLING FAN

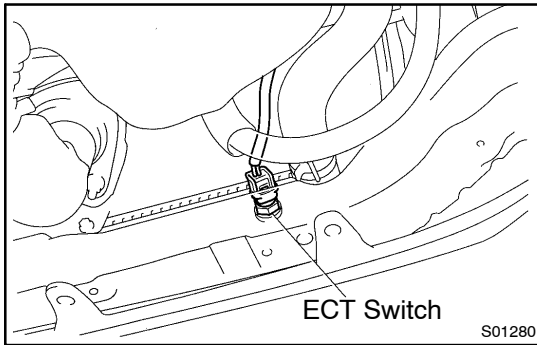
- Remove the 3 screws and fan.
- Remove the 2 screws and motor cover.
- Disconnect the wire and connector from the fan shroud.
- Remove the 3 screws and fan motor.

## REASSEMBLY

- **No. 1 Cooling Fan:**  
Reassembly is in the reverse order of disassembly (See page [CO-22](#)).
- **No. 2 Cooling Fan:**  
Reassembly is in the reverse order of disassembly (See page [CO-22](#)).

## INSTALLATION

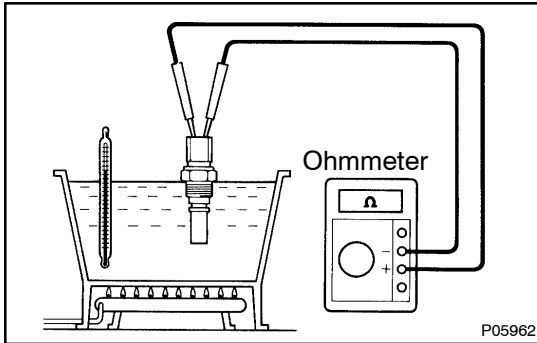
- **No. 1 Cooling Fan:**  
Installation is in the reverse order of removal (See page [CO-21](#)).
- **No. 2 Cooling Fan:**  
Installation is in the reverse order of removal (See page [CO-21](#)).



## ENGINE COOLANT TEMPERATURE (ECT) SWITCH INSPECTION

CO0BY-01

1. DRAIN ENGINE COOLANT
2. REMOVE ECT SWITCH



### 3. INSPECT ECT SWITCH

- (a) Using an ohmmeter, check that there is no continuity between the terminals when the coolant temperature is above 93°C (199°F).
- (b) Using an ohmmeter, check that there is continuity between the terminals when the coolant temperature is below 83°C (181°F).

If continuity is not as specified, replace the switch.

4. REINSTALL ECT SWITCH
5. REFILL WITH ENGINE COOLANT
6. START ENGINE AND CHECK FOR COOLANT LEAKS