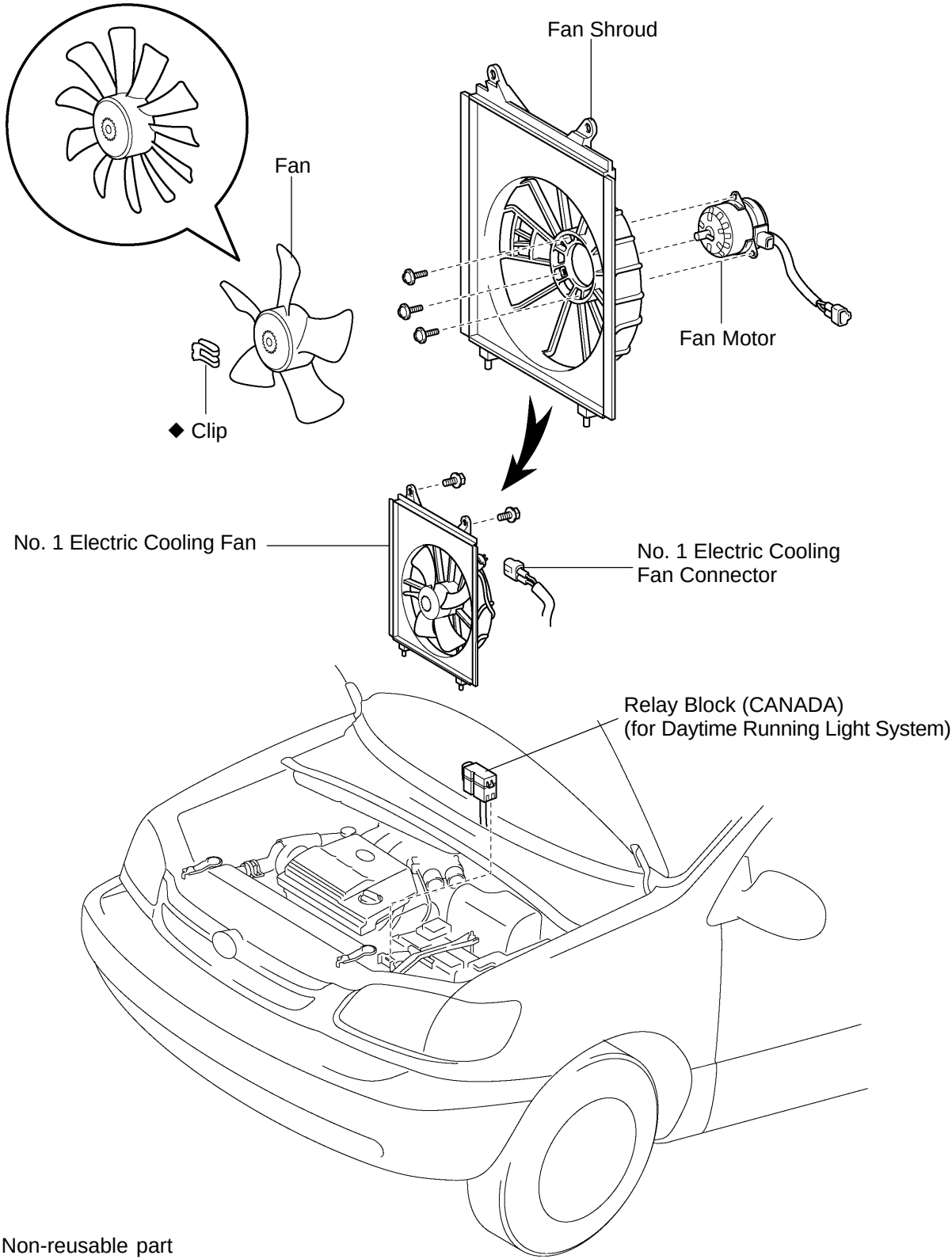


COMPONENTS

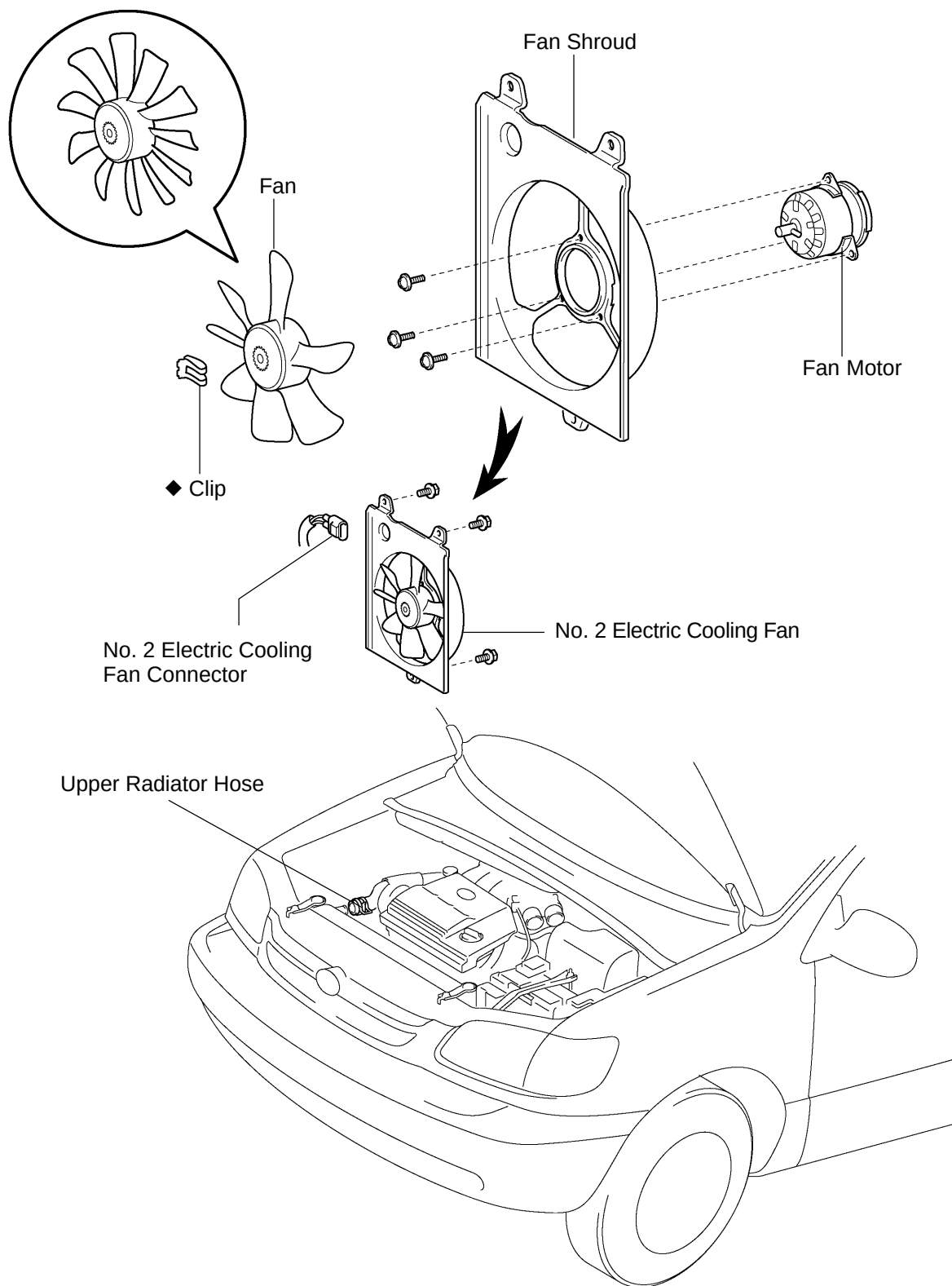
No. 1



◆ Non-reusable part

B13202

No. 2

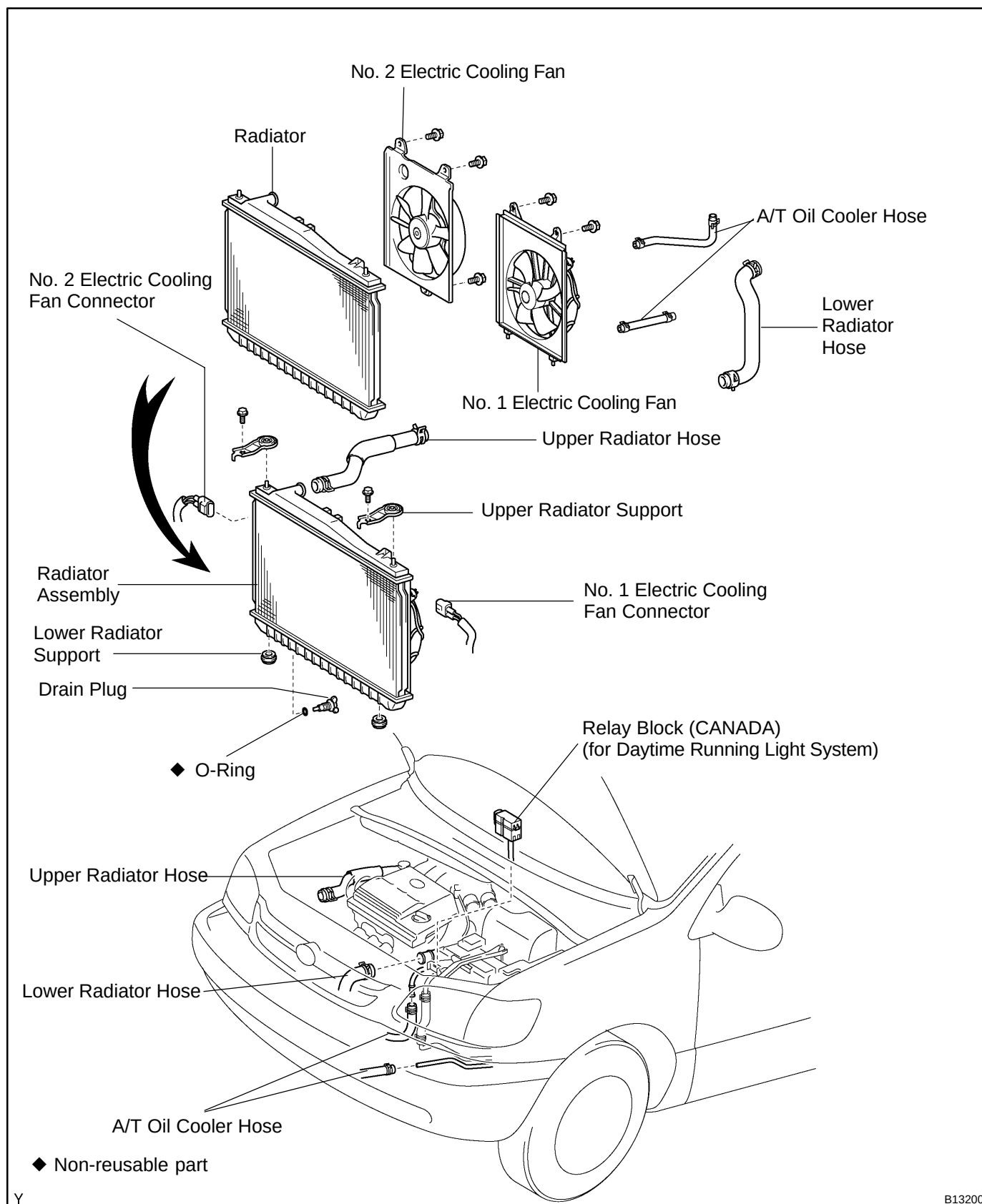


Y

◆ Non-reusable part

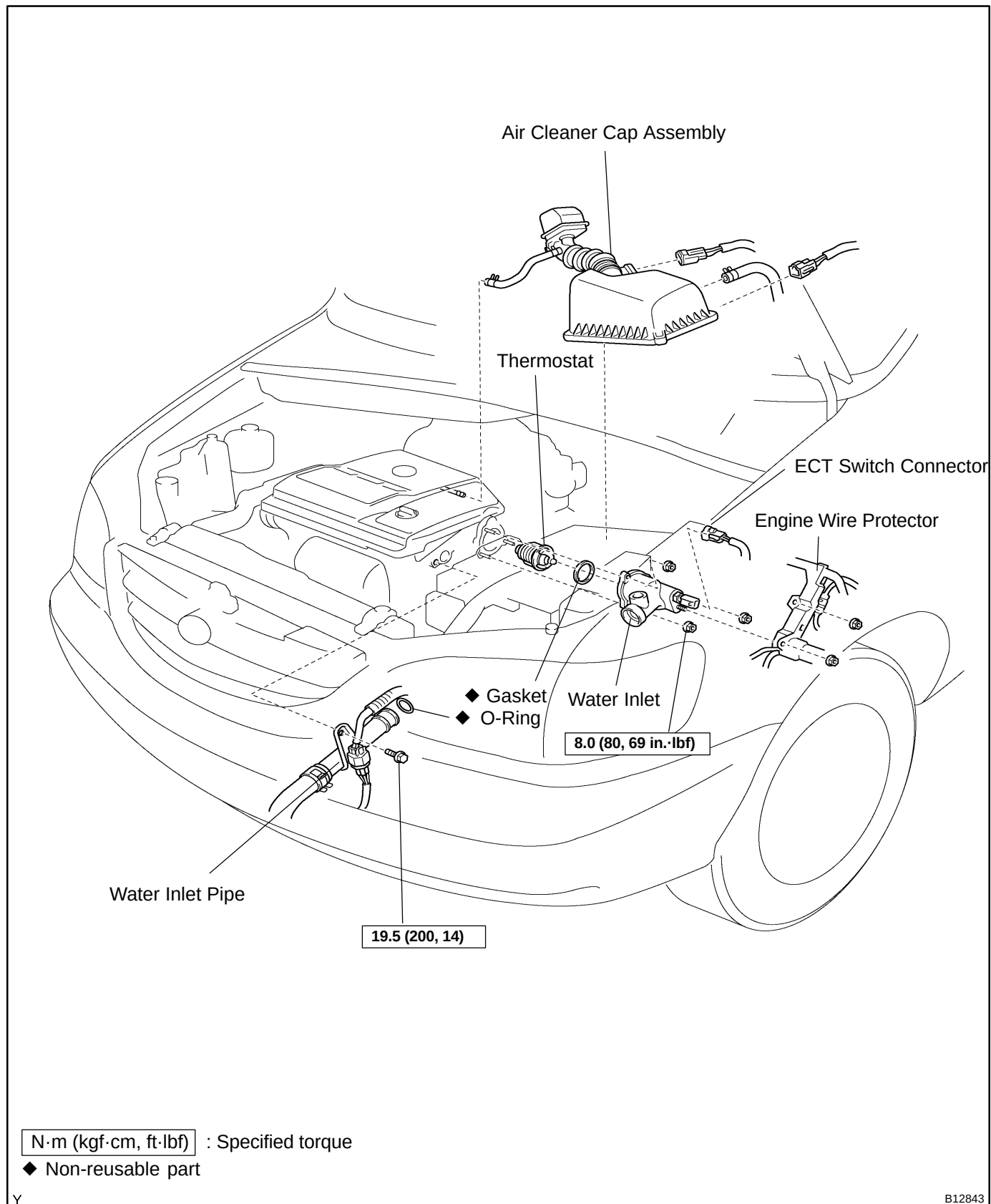
B13203

COMPONENTS



THERMOSTAT COMPONENTS

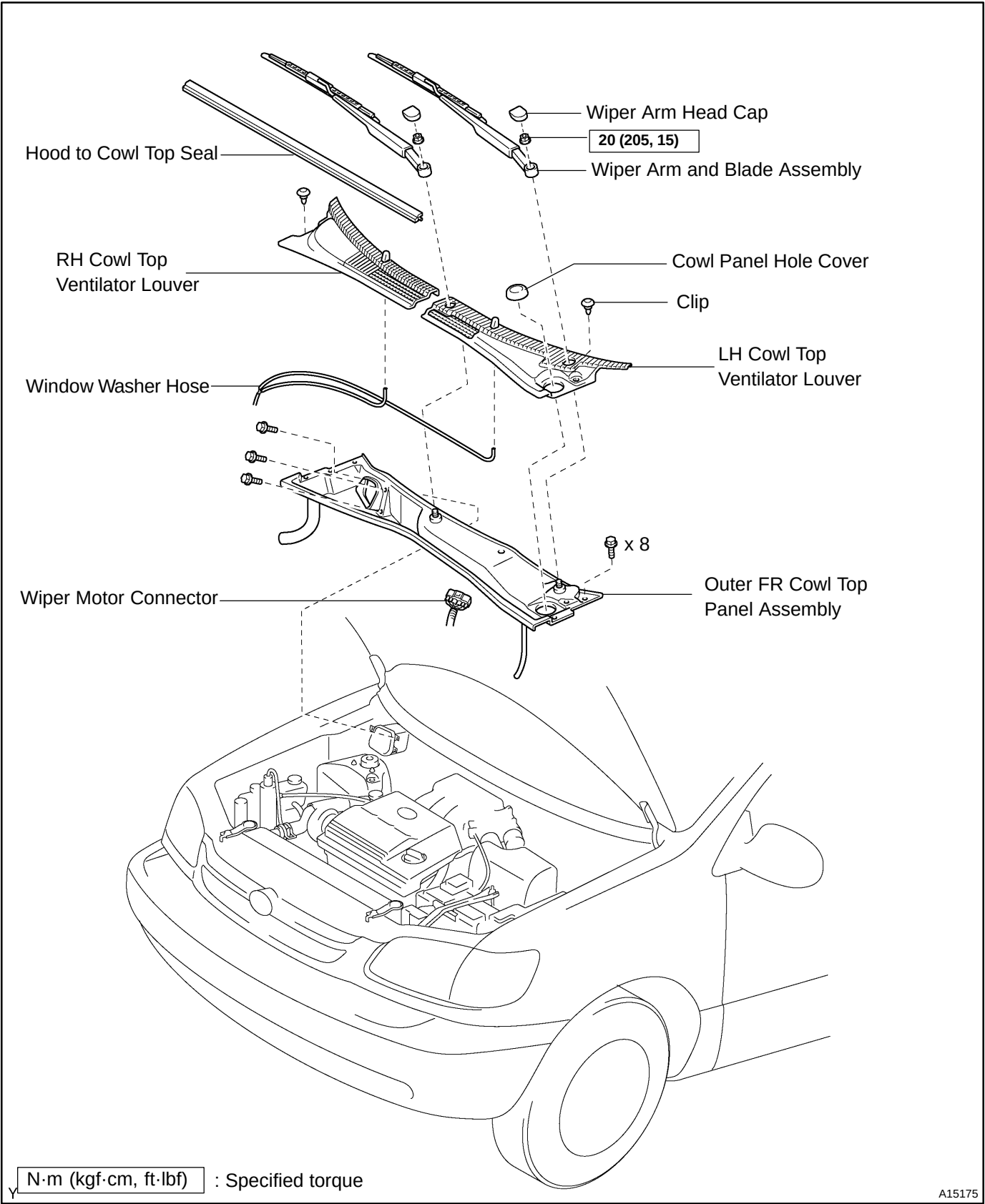
CO080-04

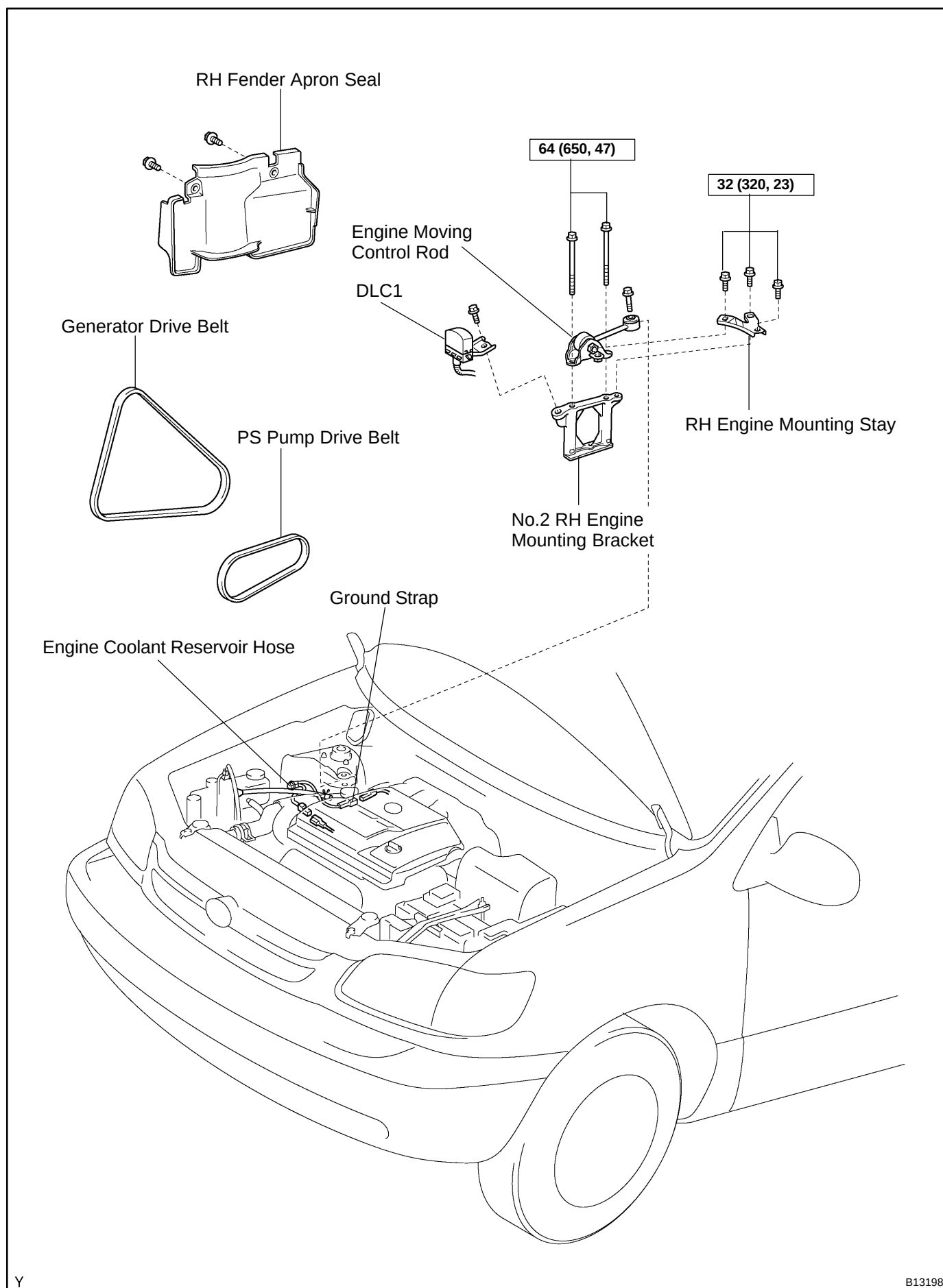


B12843

WATER PUMP COMPONENTS

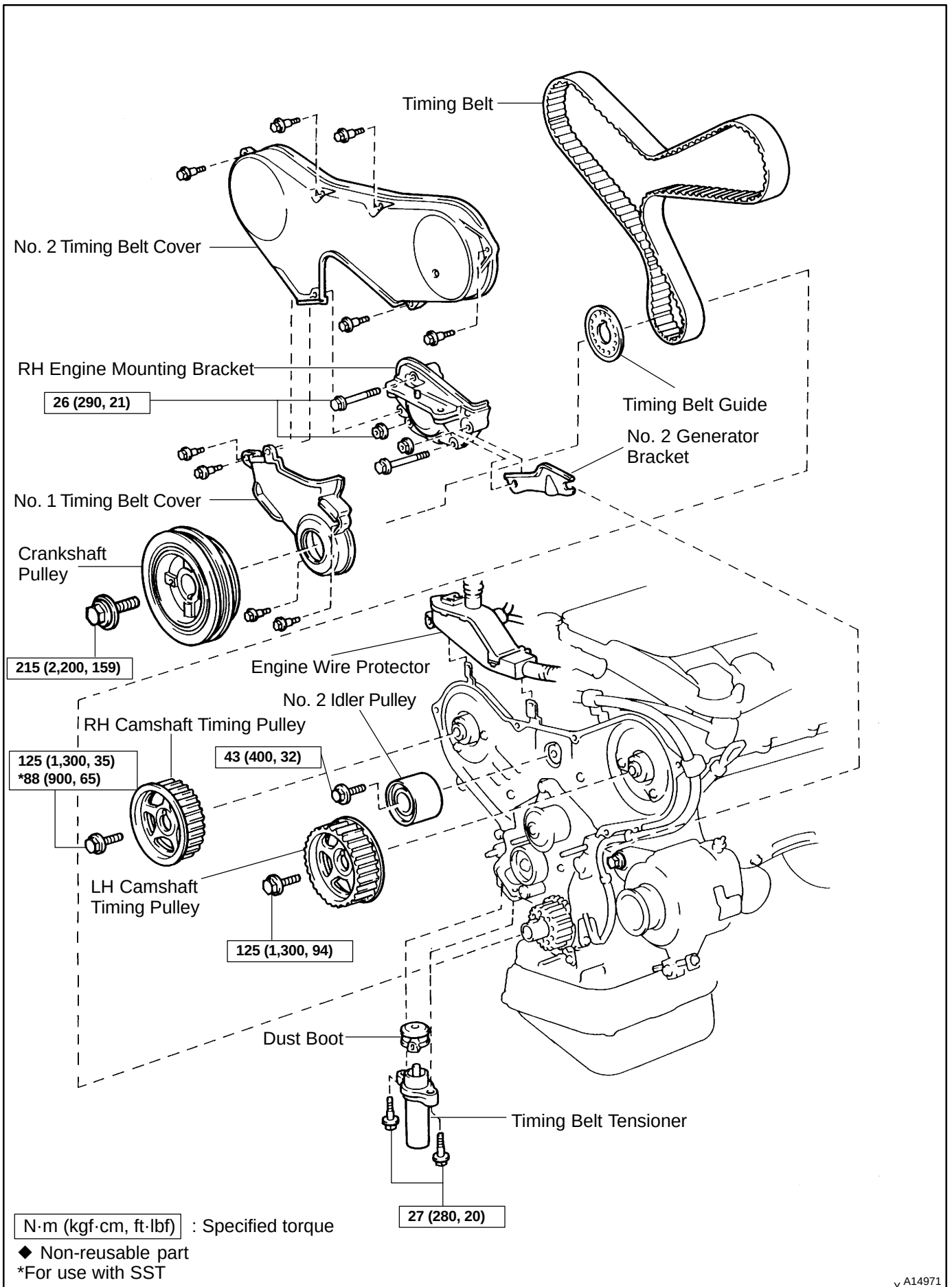
CO07W-05

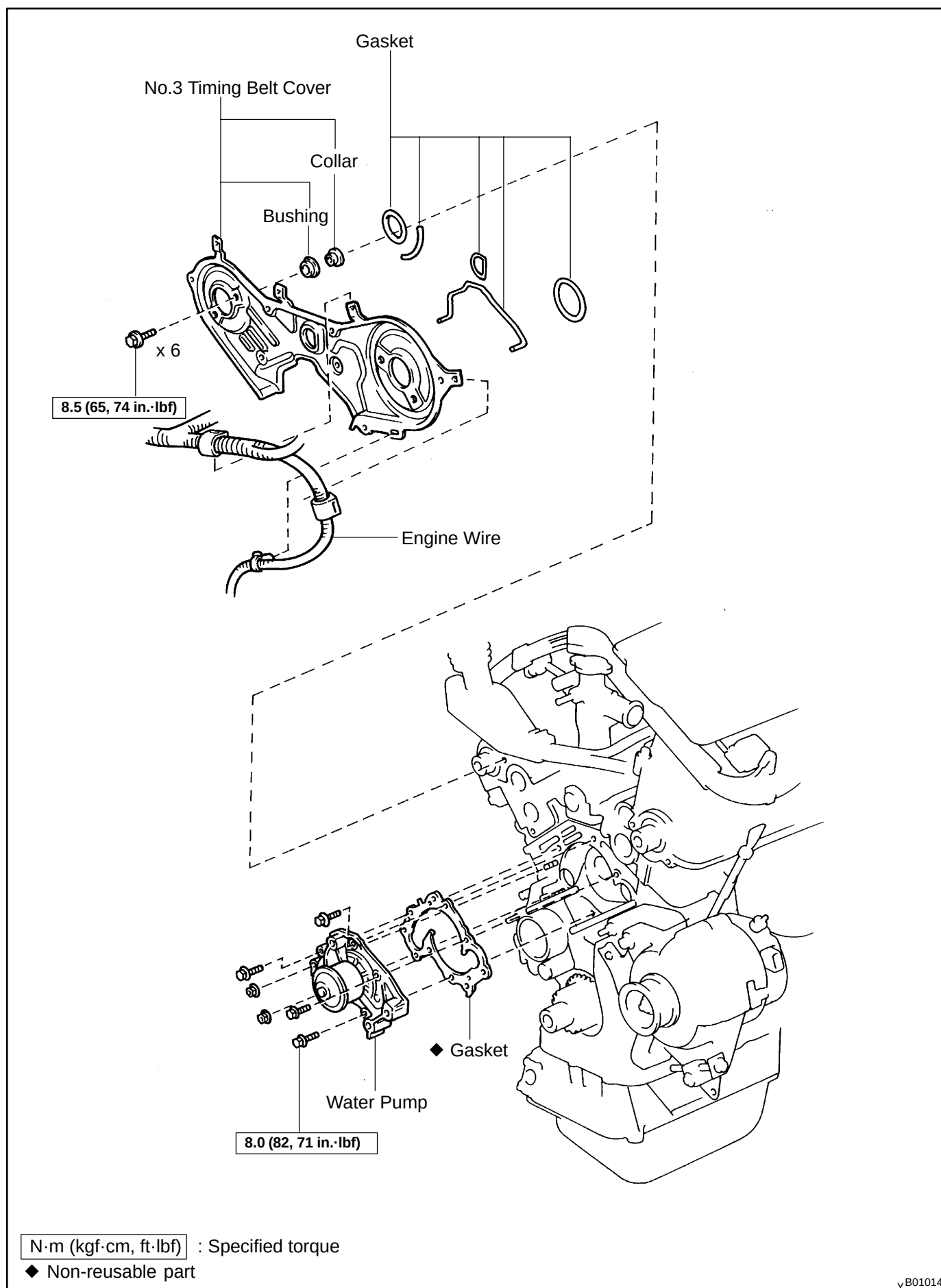


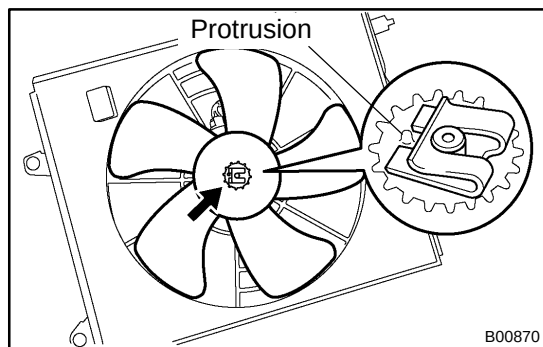


Y

B13198







DISASSEMBLY

1. REMOVE FAN

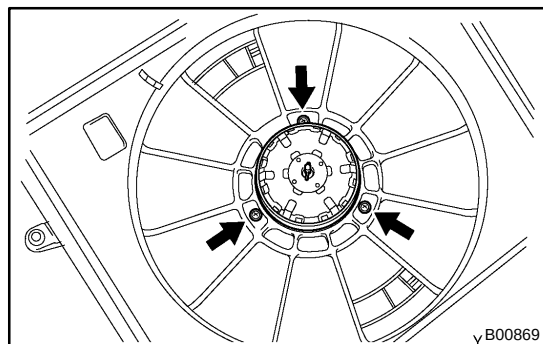
Remove the clip and fan.

NOTICE:

When removing the clip and fan, do not apply too much force to the motor shaft. And do not scratch the motor shaft.

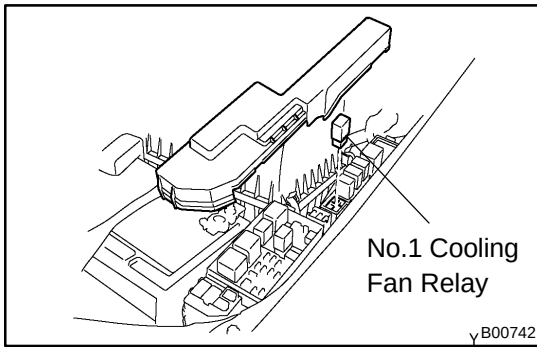
HINT:

At the time assembly, please refer to the following items.
Install a new clip from the side opposite the protrusion on the fan.



2. REMOVE FAN MOTOR

- (a) Disconnect the fan motor connector.
- (b) Remove the 3 screws and fan motor.

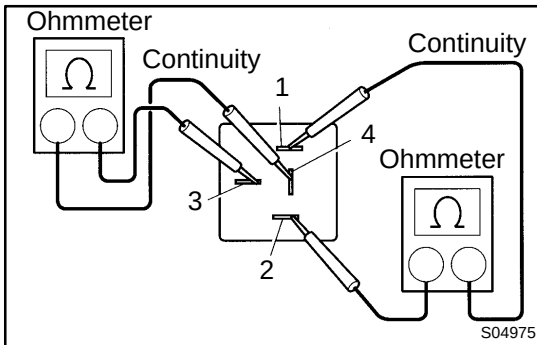


COOLING FAN RELAY INSPECTION

CO08H-01

1. INSPECT NO.1 COOLING FAN RELAY

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



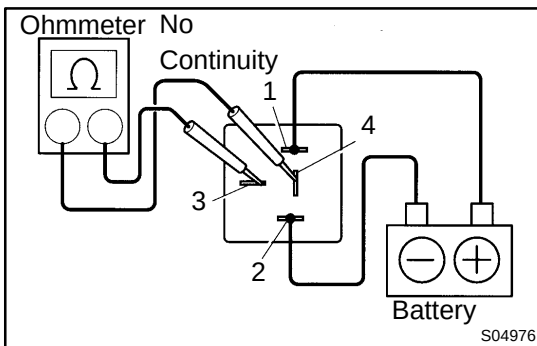
- (b) Inspect the No.1 cooling fan relay continuity.

- (1) Using an ohmmeter, check that there is continuity between terminals 1 and 2.

If there is no continuity, replace the relay.

- (2) Check that there is continuity between terminals 3 and 4.

If there is no continuity, replace the relay.



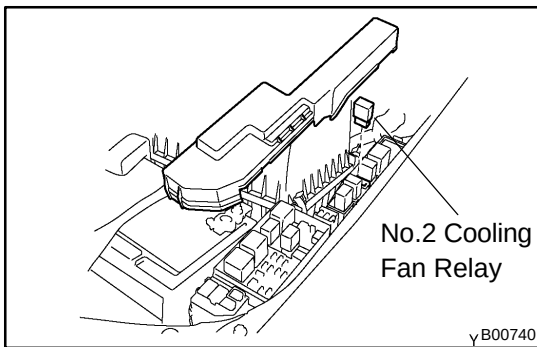
- (c) Inspect the No.1 cooling fan relay operation.

- (1) Apply battery voltage across terminals 1 and 2.

- (2) Using an ohmmeter, check that there is no continuity between terminals 3 and 4.

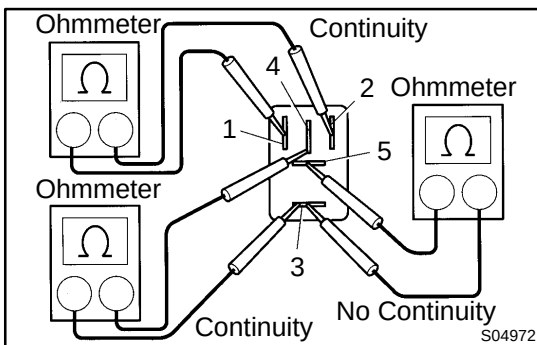
If there is continuity, replace the relay.

- (d) Install the No.1 cooling fan relay.



2. INSPECT NO.2 COOLING FAN RELAY

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



- (b) Inspect the No.2 cooling fan relay continuity.

- (1) Using an ohmmeter, check that there is continuity between terminals 1 and 2.

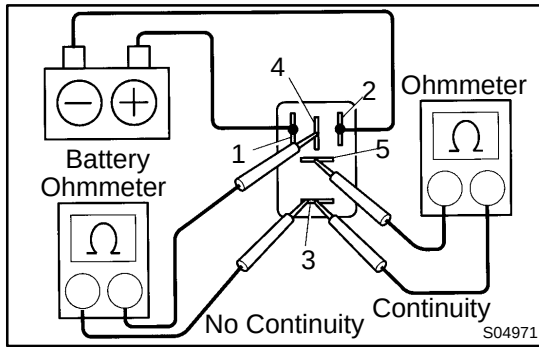
If there is no continuity, replace the relay.

- (2) Check that there is continuity between terminals 3 and 4.

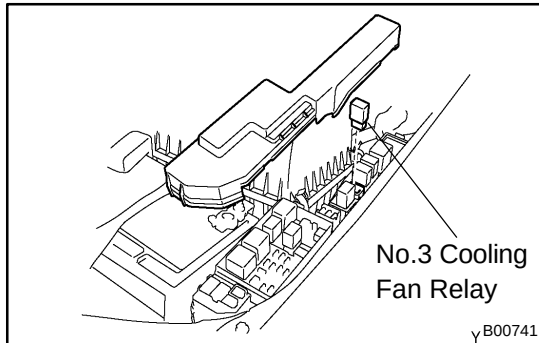
If there is no continuity, replace the relay.

- (3) Check that there is no continuity between terminals 3 and 5.

If there is continuity, replace the relay.

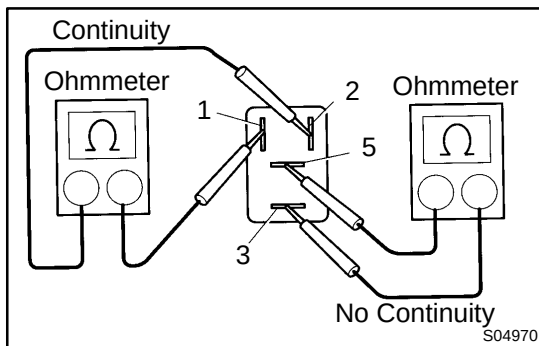


- (c) Inspect the No.2 cooling fan relay operation.
- (1) Apply battery voltage across terminals 1 and 2.
 - (2) Using an ohmmeter, check that there is no continuity between terminals 3 and 4.
- If there is continuity, replace the relay.
- (3) Using an ohmmeter, check that there is continuity between terminals 3 and 5.
- If there is no continuity, replace the relay.
- (d) Install the No.2 cooling fan relay.

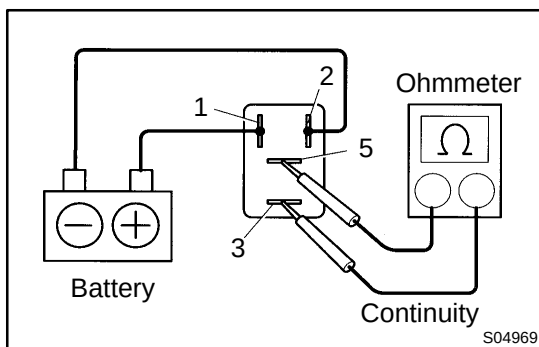


3. INSPECT NO.3 COOLING FAN RELAY

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



- (b) Inspect the No.3 cooling fan relay continuity.
- (1) Using an ohmmeter, check that there is continuity between terminals 1 and 2.
- If there is no continuity, replace the relay.
- (2) Check that there is no continuity between terminals 3 and 5.
- If there is continuity, replace the relay.



- (c) Inspect the No.3 cooling fan relay operation.
- (1) Apply battery voltage across terminals 1 and 2.
 - (2) Using an ohmmeter, check that there is continuity between terminals 3 and 5.
- If there is no continuity, replace the relay.
- (d) Install the No.3 cooling fan relay.

COOLANT INSPECTION

C007U-01

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 engine coolant up to the "FULL" line.

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.

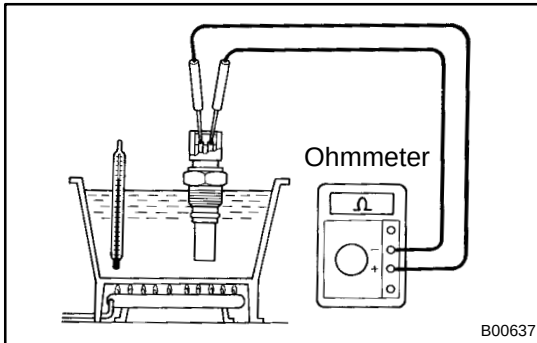
If excessively dirty, clean the coolant passages and replace the coolant.

- (c) Reinstall the radiator cap.

ENGINE COOLANT TEMPERATURE (ECT) SWITCH INSPECTION

CO16N-01

1. DRAIN ENGINE COOLANT
2. REMOVE ECT SWITCHES



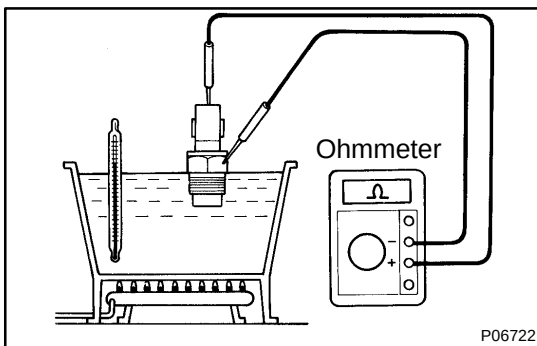
3. INSPECT NO.1 ECT SWITCH

- (a) Using an ohmmeter, check that there is no continuity between the switch terminals when the coolant temperature is above 98°C (208°F).

If there is continuity, replace the switch.

- (b) Using an ohmmeter, check that there is continuity between the switch terminals when the coolant temperature is below 88°C (190°F).

If there is no continuity, replace the switch.



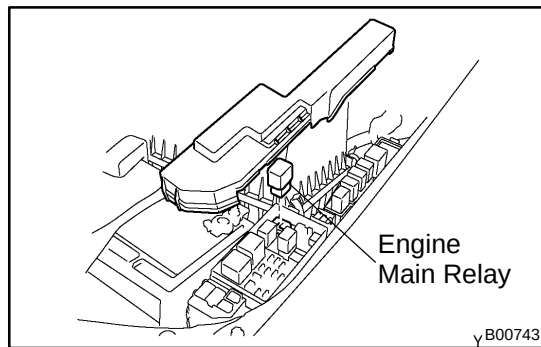
4. INSPECT NO.2 ECT SWITCH

- (a) Using an ohmmeter, check that there is continuity between the switch terminals when the coolant temperature is above 94°C (201°F).

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

If continuity is not as specified, replace the switch.

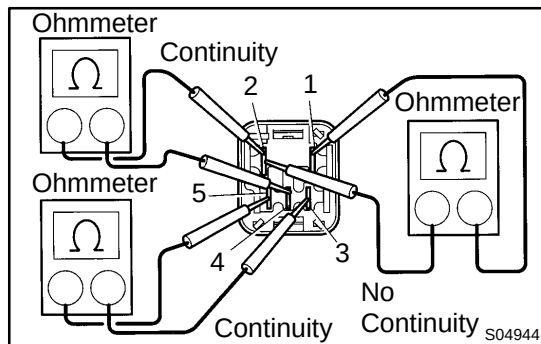
5. REINSTALL ECT SWITCHES
6. REFILL WITH ENGINE COOLANT



ENGINE MAIN RELAY INSPECTION

CO08G-02

1. REMOVE ENGINE MAIN RELAY (Marking: ENGINE MAIN)



2. INSPECT RELAY CONTINUITY

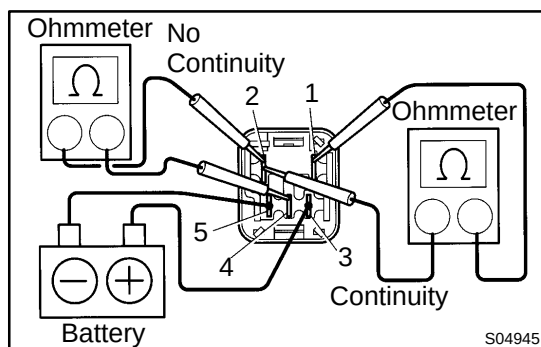
- (a) Using an ohmmeter, check that there is continuity between terminals 3 and 5.

If there is no continuity, replace the relay.

- (b) Check that there is continuity between terminals 2 and 4. If there is no continuity, replace the relay.

- (c) Check that there is no continuity between terminals 1 and 2.

If there is continuity, replace the relay.



3. INSPECT RELAY OPERATION

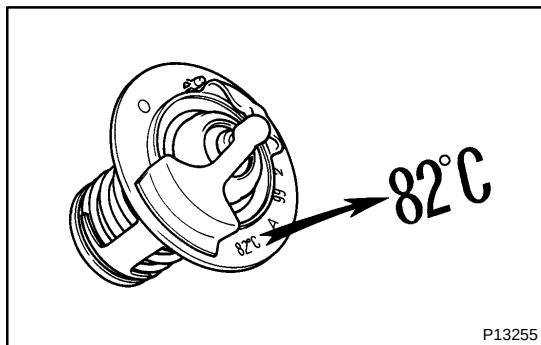
- (a) Apply battery voltage across terminals 3 and 5.

- (b) Using an ohmmeter, check that there is no continuity between terminals 2 and 4.

If there is continuity, replace the relay.

- (c) Check that there is continuity between terminals 1 and 2. If there is no continuity, replace the relay.

4. REINSTALL ENGINE MAIN RELAY

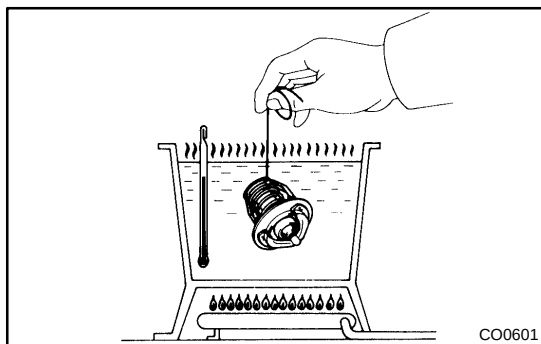


INSPECTION

INSPECT THERMOSTAT

HINT:

The thermostat is numbered with the valve opening temperature.



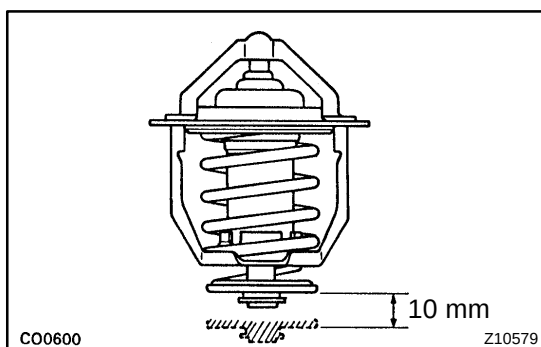
(a) Immerse the thermostat in water and gradually heat the water.

(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.



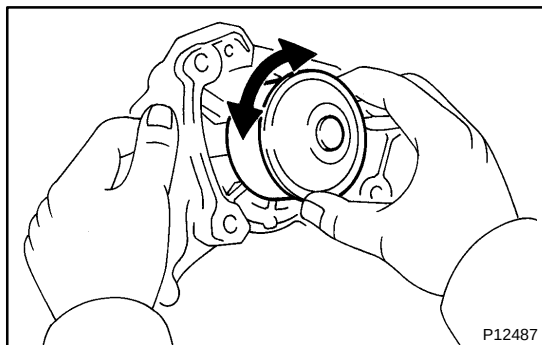
(c) Check the valve lift.

Valve lift: 10.0 mm (0.394 in.) or more at 95°C (203°F)

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

(d) Check that the valve is fully closed when the thermostat is at low temperatures (below 40°C (104°F)).

If not closed, replace the thermostat.



INSPECTION

1. INSPECT WATER PUMP

(a) Visually check the drain hole for coolant leakage.

If leakage is found, replace the water pump.

(b) Turn the pulley, and check that the water pump bearing moves smoothly and quietly.

If necessary, replace the water pump.

2. INSPECT TIMING BELT COMPONENTS

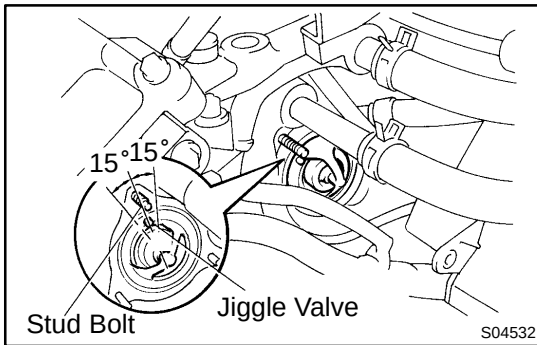
(See page [EM-20](#))

INSTALLATION

Installation is in the reverse order of removal (See page [CO-23](#)).

INSTALLATION

Installation is in the reverse order of removal (See page [CO-17](#)).



INSTALLATION

1. PLACE THERMOSTAT IN WATER PUMP

- (a) Install a new gasket on to the thermostat.
- (b) Align the thermostat jiggle valve with the upper stud bolt, and insert the thermostat in the water inlet housing.

HINT:

The jiggle valve may be set within 15° of either side of the prescribed position.

2. INSTALL WATER INLET

Install the water inlet with the 3 nuts.

Torque: 8.0 N·m (80 kgf·cm, 69 in·lbf)

3. INSTALL WATER INLET PIPE

- (a) Install a new O-ring to the water inlet pipe.
- (b) Apply soapy water to the O-ring.
- (c) Connect the water inlet pipe to the water inlet.
- (d) Install the bolt holding the water inlet pipe to the cylinder head.

Torque: 19.5 N·m (200 kgf·cm, 14 ft·lbf)

4. INSTALL ENGINE WIRE PROTECTOR

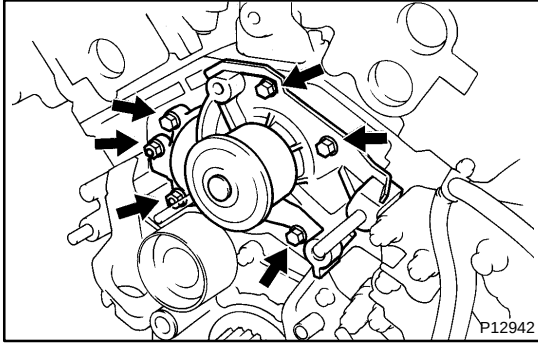
5. CONNECT ECT SWITCH CONNECTORS

6. REINSTALL AIR CLEANER CAP WITH AIR CLEANER HOSE

7. FILL WITH ENGINE COOLANT

8. START ENGINE AND CHECK FOR LEAKS

9. RECHECK ENGINE COOLANT LEVEL



INSTALLATION

1. INSTALL WATER PUMP

Install a new gasket and the water pump with the 4 bolts and 2 nuts.

Torque: 8.0 N·m (82 kgf·cm, 71 in·lbf)

NOTICE:

Do not get oil on the gasket.

2. INSTALL NO.3 TIMING BELT COVER

(See page [EM-60](#))

3. INSTALL NO.2 IDLER PULLEY

(See page [EM-22](#))

4. INSTALL CAMSHAFT TIMING PULLEYS

(See page [EM-22](#))

5. INSTALL TIMING BELT

(See page [EM-22](#))

6. INSTALL OUTER FR COWL TOP PANEL ASSEMBLY

(See page [EM-82](#))

7. FILL WITH ENGINE COOLANT

8. START ENGINE AND CHECK FOR LEAKS

9. RECHECK ENGINE COOLANT LEVEL

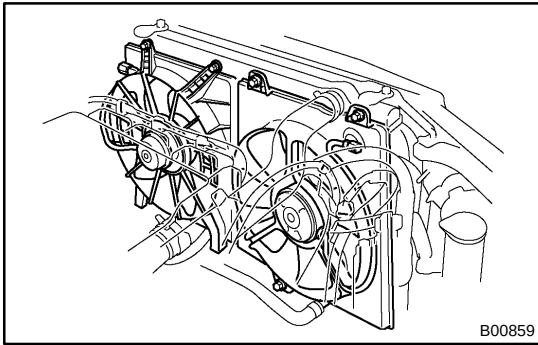
RADIATOR ON-VEHICLE CLEANING

CO084-01

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 radiator core)



ELECTRIC COOLING FAN ON-VEHICLE INSPECTION

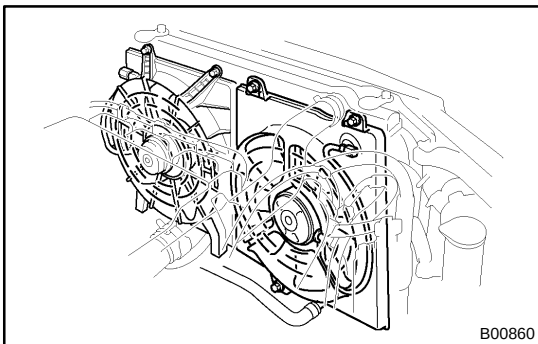
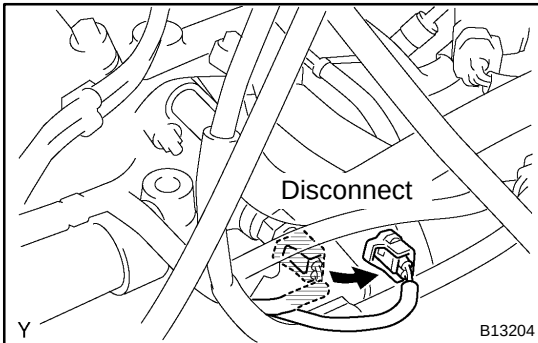
CO089-02

1. CHECK COOLING FAN OPERATION WITH LOW TEMPERATURE (Below 88°C (190°F))

- (a) Turn the ignition switch ON.
- (b) 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.

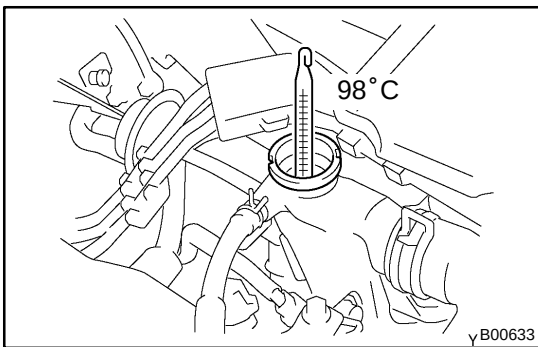
- (c) Disconnect the No.1 ECT switch connector.



- (d) Check that the cooling fan rotates.

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

- (e) Reconnect the No.1 ECT switch connector.

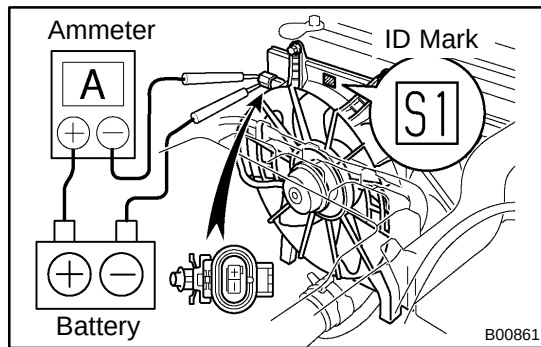


2. CHECK COOLING FAN OPERATION WITH HIGH TEMPERATURE (Above 98°C (208°F))

- (a) Start the engine, and raise coolant temperature to above 98°C (208°F).

- (b) Check that the cooling fan rotates.

If not, replace the No.1 ECT switch.



3. INSPECT NO.1 COOLING FAN

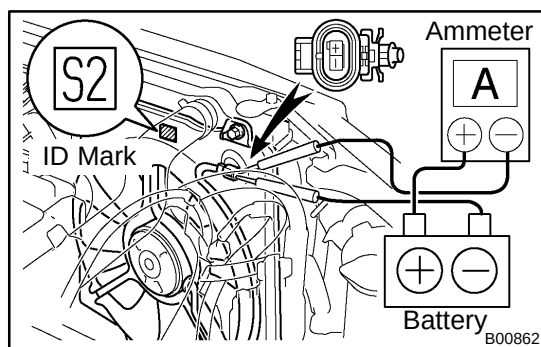
- Start the engine, and raise coolant temperature to above 98°C (208°F).
- Stop the engine.
- Disconnect the cooling fan connector.
- Connect battery and ammeter to the cooling fan connector.
- Check that the cooling fan rotates smoothly, and check the reading on the ammeter.

Standard amperage:

ID mark S1: 8.5 - 11.5 A at 20°C (68°F)

ID mark T1: 14.0 - 20.0 A at 20°C (68°F)

- Reconnect the cooling fan connector.



4. INSPECT NO.2 COOLING FAN

- Start the engine, and raise coolant temperature to above 98°C (208°F).
- Stop the engine.
- 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:

ID mark S2: 8.5 - 11.5 A at 20°C (68°F)

ID mark T2: 14.0 - 20.0 A at 20°C (68°F)

- Reconnect the cooling fan connector.

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 blow 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 pump tester at an angle of over 30° above the horizontal.
- Before using a radiator cap tester, wet the relief valve and pressure valve with engine coolant or water.

- (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:

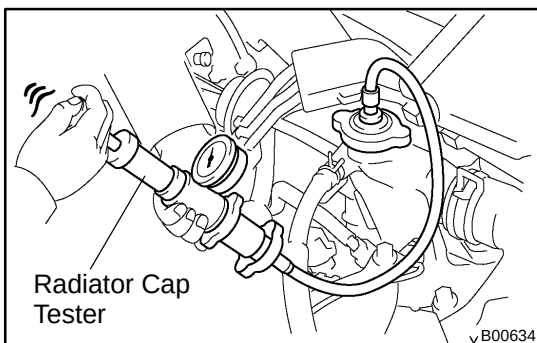
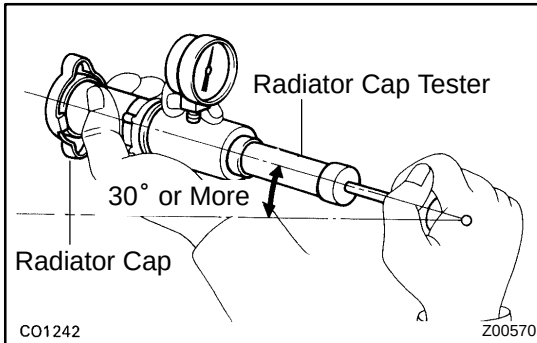
83 - 113 kPa (0.85 - 1.15 kgf/cm², 12.1 - 16.4 psi)

Minimum opening pressure:

69 kPa (0.7 kgf/cm², 10.0 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

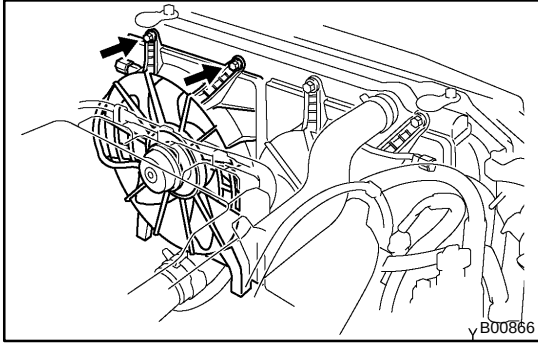
- (a) Fill the radiator with coolant and attach a radiator cap tester.
- (b) Warm up the engine.
- (c) Pump it to 127 kPa (1.3 kgf/cm², 18.5 psi), and check that the pressure does not drop.

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

REASSEMBLY

Reassembly is in the reverse order of disassembly (See page [CO-24](#)).



REMOVAL

1. REMOVE NO.1 COOLING FAN

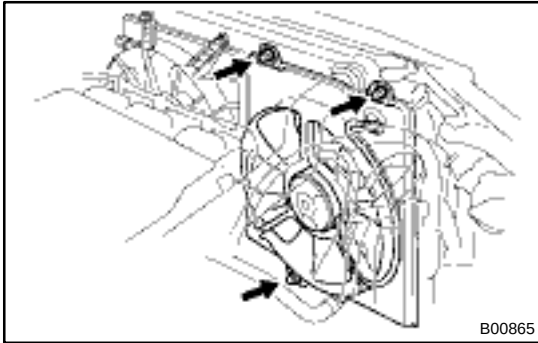
(a) (CANADA)

Disconnect the relay block (for daytime running light system) from the battery hold-down clamp.

(b) Disconnect the cooling fan connector.

(c) Remove the 2 bolts and cooling fan.

Torque: 5.0 N·m (50 kgf·cm, 44 in·lbf)



2. REMOVE NO.2 COOLING FAN

(a) Drain engine coolant.

(b) Disconnect the upper radiator hose from the radiator.

(c) Disconnect the cooling fan connector.

(d) Remove the 3 bolts and cooling fan.

Torque: 5.0 N·m (50 kgf·cm, 44 in·lbf)

REMOVAL

HINT:

- At the time of installation, please refer to the following items.
- Start the engine, and check for coolant and A/T fluid leaks.
- Check the A/T fluid level (See page [DI-157](#)).

1. DRAIN ENGINE COOLANT

2. REMOVE RADIATOR ASSEMBLY

(a) CANADA:

Disconnect the relay block (for daytime running light system) from the battery hold-down clamp.

(b) Disconnect these connectors and hoses:

- No.1 electric cooling fan connector
- No.2 electric cooling fan connector
- Upper radiator hose from radiator
- Lower radiator hose from water inlet pipe
- 2 oil cooler hoses from oil cooler pipes

(c) Remove the 2 bolts and 2 upper radiator supports.

Torque: 13 N·m (130 kgf·cm, 9 ft·lbf)

(d) Lift out the radiator assembly.

(e) Remove the 2 lower radiator supports.

(f) Remove these hoses from the radiator:

- Lower radiator hose
- 2 oil cooler hoses

3. REMOVE NO.1 ELECTRIC COOLING FAN FROM RADIATOR

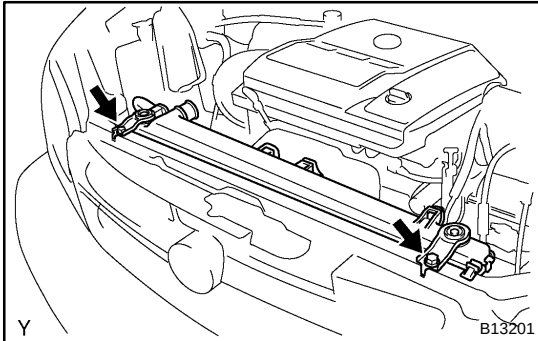
Remove the 2 bolts and cooling fan.

Torque: 5.0 N·m (50 kgf·cm, 44 in·lbf)

4. REMOVE NO.2 ELECTRIC COOLING FAN FROM RADIATOR

Remove the 2 bolts and cooling fan.

Torque: 5.0 N·m (50 kgf·cm, 44 in·lbf)



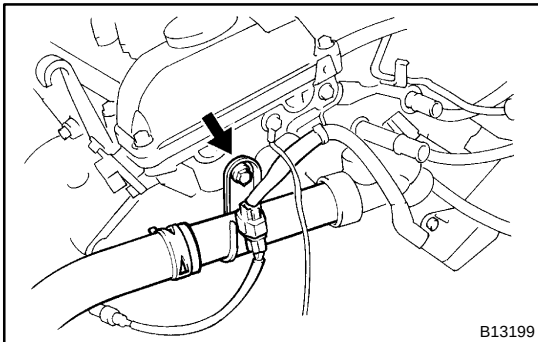
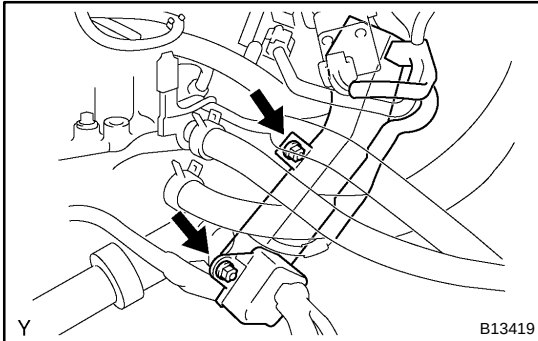
REMOVAL

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.

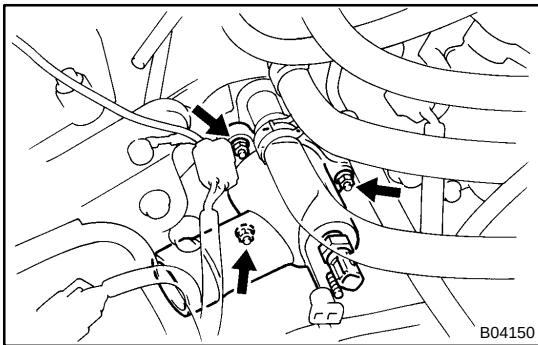
1. **DRAIN ENGINE COOLANT**
2. **REMOVE AIR CLEANER CAP WITH AIR CLEANER HOSE**
3. **DISCONNECT ECT SWITCH CONNECTORS**
4. **DISCONNECT ENGINE WIRE PROTECTOR FROM WATER INLET AND RH CYLINDER HEAD**

Remove the 2 nuts, and disconnect the engine wire protector from the water inlet and cylinder head.



5. **DISCONNECT WATER INLET PIPE FROM WATER INLET AND LH CYLINDER HEAD**

- (a) Remove the bolt, and disconnect the inlet pipe from the water inlet.
- (b) Remove the O-ring from the inlet pipe.



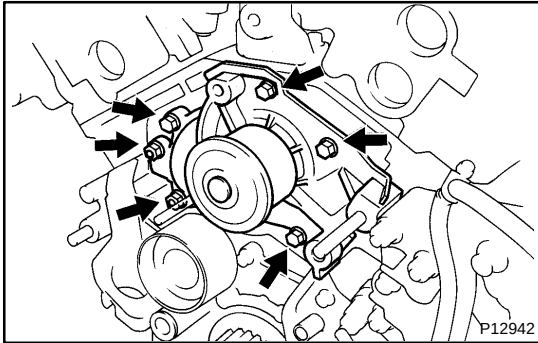
6. **REMOVE WATER INLET AND THERMOSTAT**

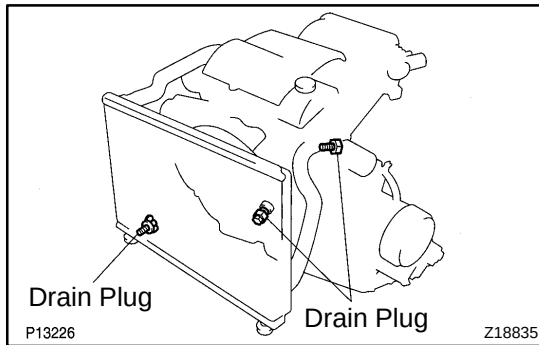
- (a) Remove the 3 nuts, water inlet and thermostat.
- (b) Remove the gasket from the thermostat.

REMOVAL

1. DRAIN ENGINE COOLANT
2. REMOVE OUTER FR COWL TOP PANEL ASSEMBLY
(See page [EM-76](#))
3. REMOVE TIMING BELT
(See page [EM-16](#))
4. REMOVE CAMSHAFT TIMING PULLEYS
(See page [EM-16](#))
5. REMOVE NO.2 IDLER PULLEY
(See page [EM-16](#))
6. REMOVE NO.3 TIMING BELT COVER
(See page [EM-33](#))
7. REMOVE WATER PUMP

Remove the 4 bolts, 2 nuts, water pump and gasket.





REPLACEMENT

1. DRAIN ENGINE COOLANT

- (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) Loosen the radiator drain plug and engine drain plugs, and drain the coolant.
 (c) Close the drain plugs.

Torque:

RH engine drain plug on cylinder block side cover:

7 N·m (70 kgf·cm, 61 in·lbf)

LH engine drain plug on union:

13 N·m (130 kgf·cm, 9 ft·lbf)

2. FILL ENGINE COOLANT

- (a) Slowly fill the system with coolant.
- Use a good brand of ethylene-glycol base engine coolant and mix it according to the manufacturer'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/o Rear Heater: 9.5 liters (10.0 US qts, 8.4 Imp. qts)

w/ Rear Heater: 10.4 liters (11.0 US qts, 9.2 Imp. qts)

- (b) Install the radiator cap.
 (c) Start the engine, and bleed the cooling system.
 (d) If necessary, refill coolant into the reservoir up to the "FULL" line.

3. CHECK ENGINE COOLANT FOR LEAKS