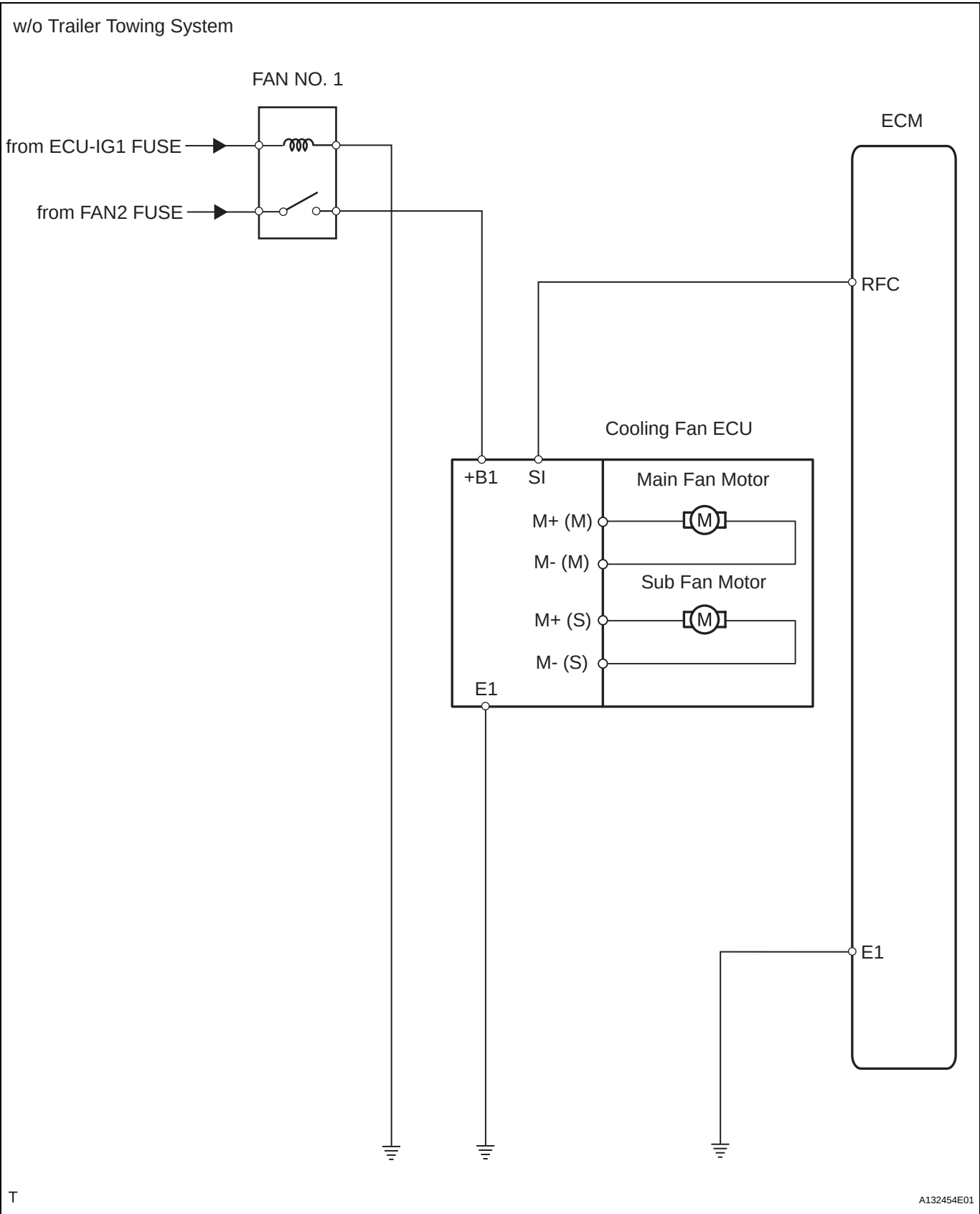
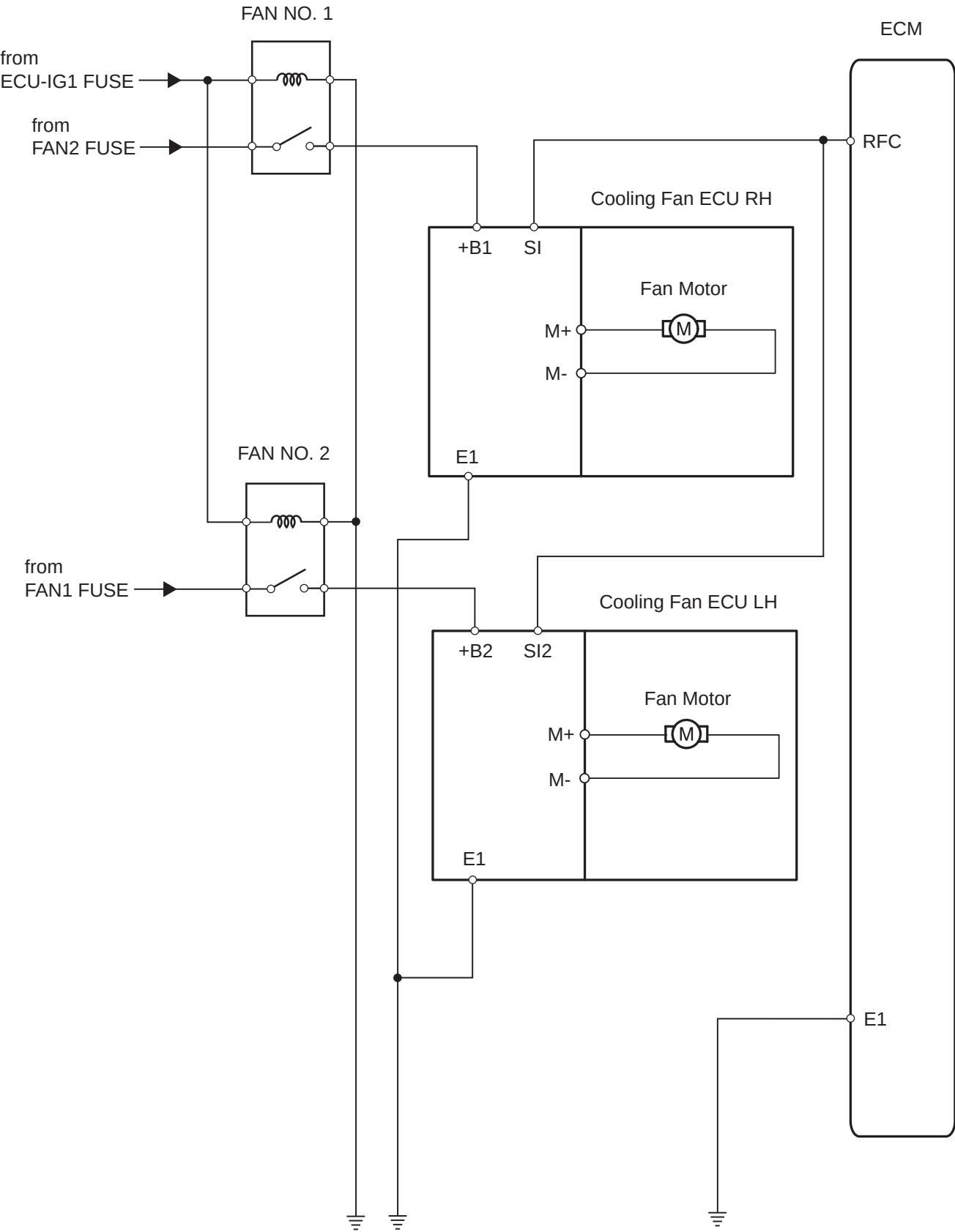


SYSTEM DIAGRAM



w/ Trailer Towing System



CO

ON-VEHICLE INSPECTION

HINT:

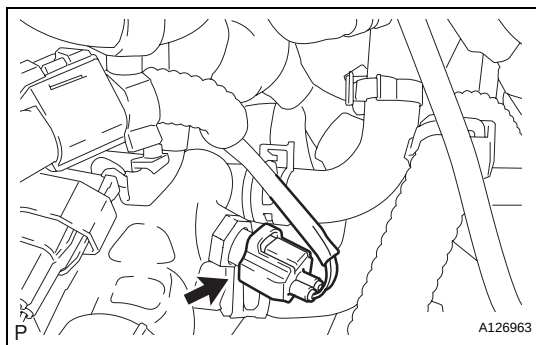
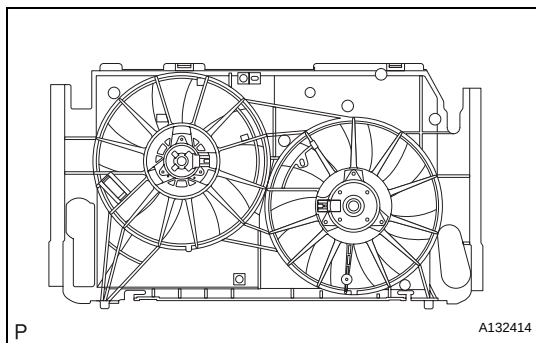
It is normal for the cooling fan to sometimes rotate when the ignition switch is turned from ACC to ON.

1. CHECK COOLING FAN OPERATION AT LOW TEMPERATURES (Below 94°C (201°F))

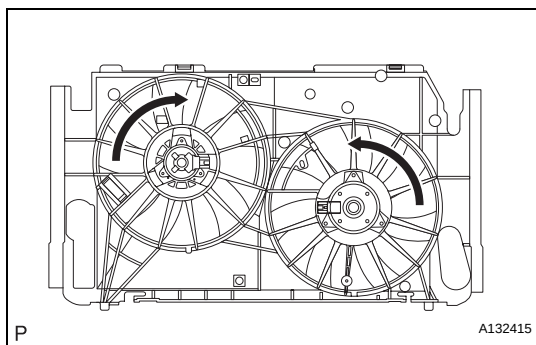
(a) Turn the ignition switch ON with the A/C switch OFF.

(b) Check that the cooling fan stops.

If it does not, check the cooling fan relays and engine coolant temperature sensor, and then check for disconnection of the connector or wire breaks between the cooling fan relay and engine coolant temperature sensor.



(c) Disconnect the engine coolant temperature sensor connector.



(d) Check that the cooling fan rotates.

If it does not, check the fuses, cooling fan relays, ECM and cooling fan, and then check for an open circuit between the cooling fan relay and engine coolant temperature sensor.

(e) Reconnect the engine coolant temperature sensor connector.

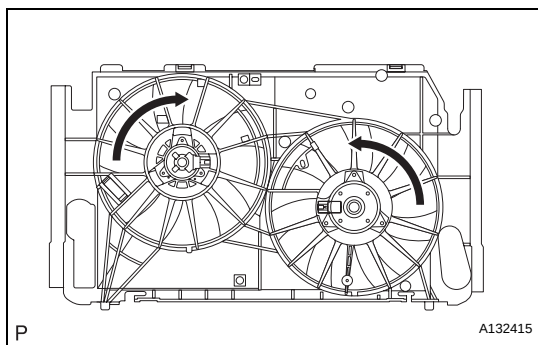
2. CHECK COOLING FAN OPERATION AT HIGH TEMPERATURES (Above 96°C (205°F))

(a) Start the engine, and then raise the coolant temperature to above 96°C (205°F).

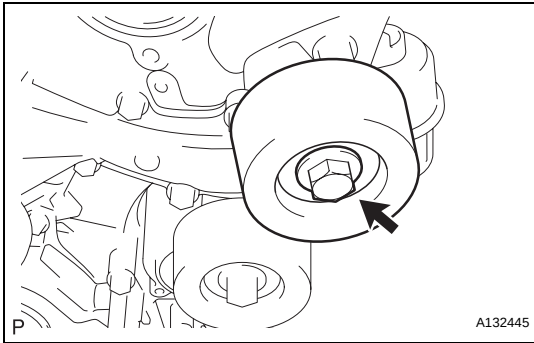
HINT:

Coolant temperature is the value detected by the engine coolant temperature sensor on the cylinder head.

(b) Check that the A/C switch is OFF.

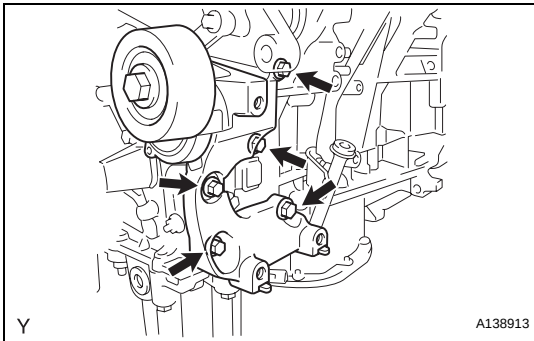


- (c) Check that the cooling fan rotates.
If it does not, check the engine coolant temperature sensor, cooling fan, harness or connector.



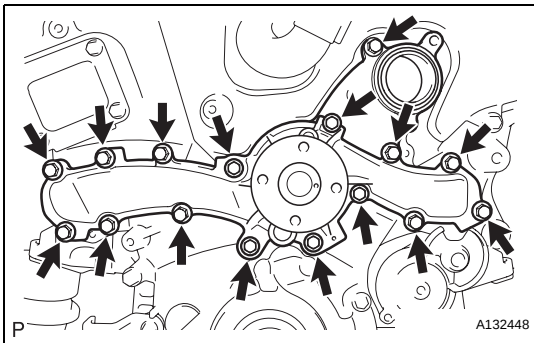
6. REMOVE NO. 2 IDLER PULLEY SUB-ASSEMBLY

- Remove the bolt, No. 2 idler pulley cover plate and No. 2 idler pulley.



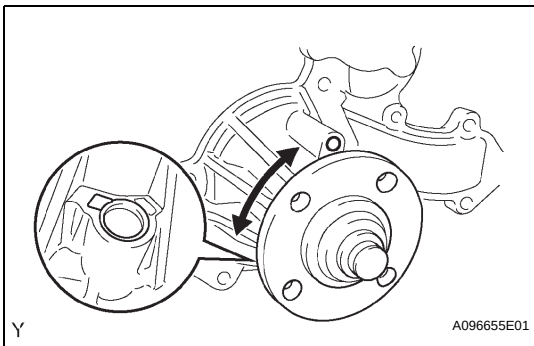
7. REMOVE V-RIBBED BELT TENSIONER ASSEMBLY

- Remove the 5 bolts and V-ribbed belt tensioner assembly.



8. REMOVE WATER PUMP ASSEMBLY

- Remove the 16 bolts, water pump and water pump gasket.



INSPECTION

1. INSPECT WATER PUMP ASSEMBLY

- Visually check the drain hole for coolant leakage. If leakage is found, replace the water pump assembly.
- Turn the pulley, and then check that the water pump bearing moves smoothly without making a clicking noise. If it does not move smoothly, replace the water pump assembly.

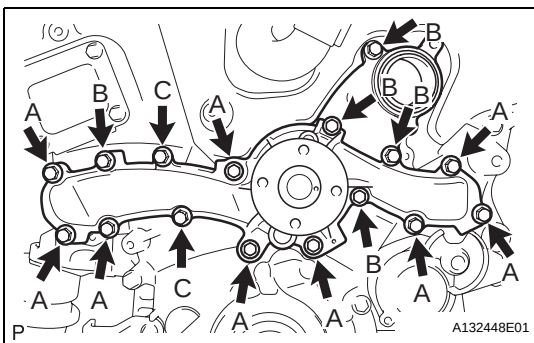
CO

INSTALLATION

1. INSTALL WATER PUMP ASSEMBLY

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

Torque: 21 N*m (214 kgf*cm, 15 ft.*lbf) for bolt A
 9.1 N*m (93 kgf*cm, 81 in.*lbf) for bolt B and C



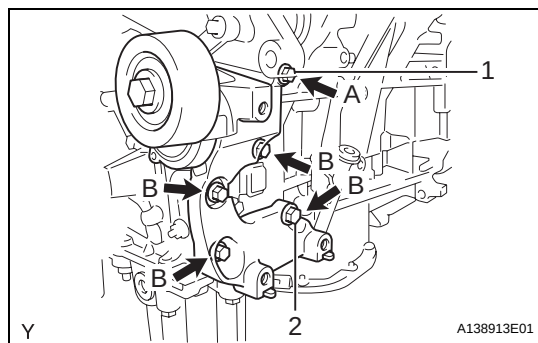
NOTICE:

- Be sure to replace the 2 C bolts with new ones or reuse them after applying adhesive.

Adhesive:

Toyota Genuine Adhesive 1344, Three Bond 1344 or Equivalent

- Make sure that there is no oil on the threads of the A bolts.

**2. INSTALL V-RIBBED BELT TENSIONER ASSEMBLY**

- (a) Temporarily install the V-ribbed belt tensioner with the 5 bolts.

HINT:

Each bolt length is as follows:

A: 70 mm (2.76 in.)

B: 30 mm (1.30 in.)

- (b) Install the V-ribbed belt tensioner by tightening the bolt 1 and bolt 2 in the order shown in the illustration.

Torque: 43 N*m (438 kgf*cm, 32 ft.*lbf)

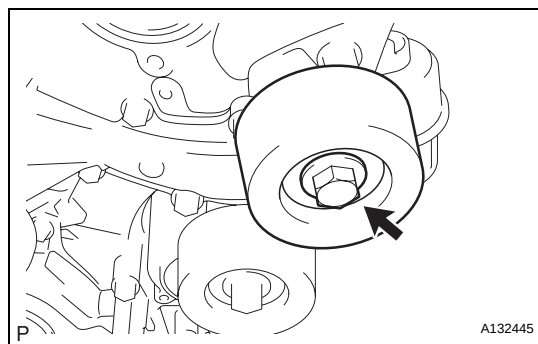
- (c) Tighten the other bolts.

Torque: 43 N*m (438 kgf*cm, 32 ft.*lbf)

3. INSTALL NO. 2 IDLER PULLEY SUB-ASSEMBLY

- (a) Install the No. 2 idler pulley cover plate and No. 2 idler pulley with the bolt.

Torque: 43 N*m (438 kgf*cm, 32 ft.*lbf)

**4. INSTALL WATER PUMP PULLEY**

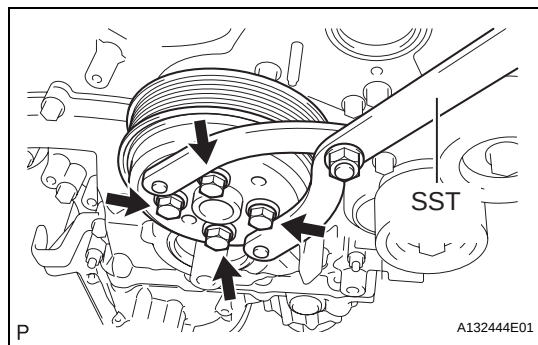
- (a) Temporarily install the water pump pulley with the 4 bolts.

- (b) Using SST, hold the water pump pulley.

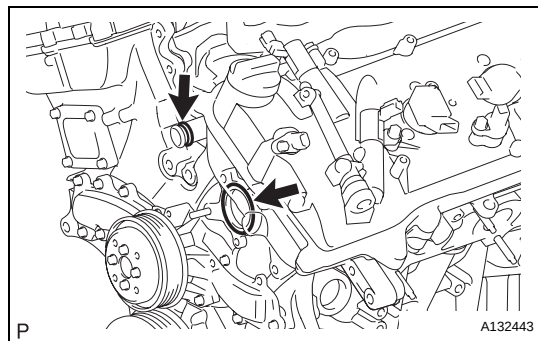
SST 09960-10010 (09962-01000, 09963-00700)

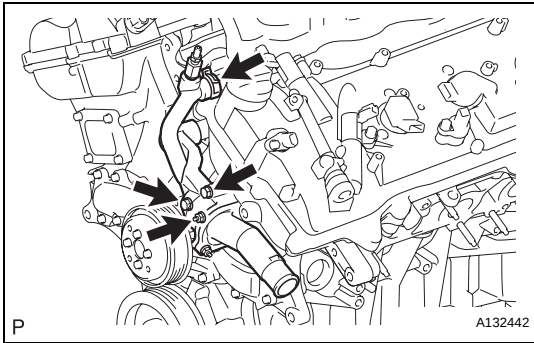
- (c) Tighten the 4 bolts.

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

5. INSTALL CRANKSHAFT PULLEY (See page [EM-126](#))**6. INSTALL WATER INLET HOUSING**

- (a) Install a new water inlet housing No. 1 gasket and water outlet pipe O-ring.





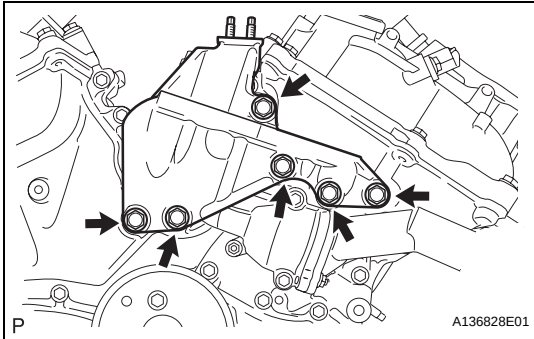
- (b) Install the water inlet with the 2 bolts and nut.

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

NOTICE:

Be careful not to allow the O-ring to get caught between the parts.

- (c) Connect the water hose.



7. INSTALL FRONT NO. 1 ENGINE MOUNTING BRACKET LH

- (a) Install the front No. 1 engine mounting bracket LH with the 6 bolts.

Torque: 54 N*m (551 kgf*cm, 40 ft.*lbf)

NOTICE:

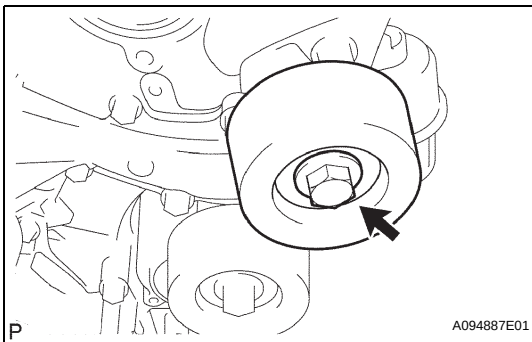
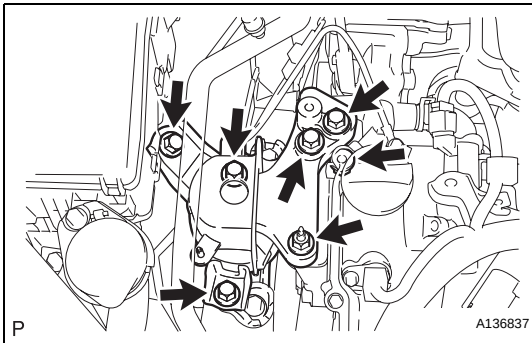
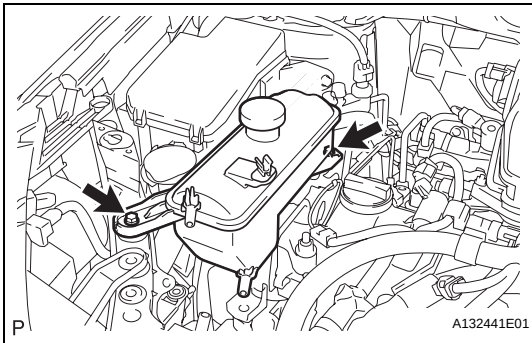
- Install the water inlet and mounting bracket within 15 minutes after installing the chain cover.
- Do not start the engine for at least 2 hours after installation.

8. INSTALL ENGINE ASSEMBLY

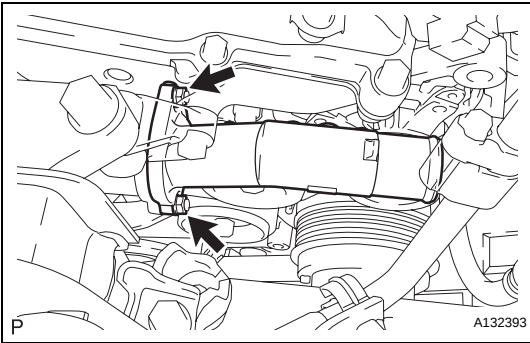
- (a) Install the engine (see page [EM-31](#)).

REMOVAL

1. REMOVE FRONT WHEEL RH
2. REMOVE NO. 1 ENGINE UNDER COVER (See page [EM-21](#))
3. REMOVE ENGINE UNDER COVER REAR RH (See page [EM-21](#))
4. REMOVE FRONT SUSPENSION MEMBER REINFORCEMENT RH (See page [EM-7](#))
5. DRAIN ENGINE COOLANT (See page [CO-8](#))
6. REMOVE V-BANK COVER SUB-ASSEMBLY (See page [EM-21](#))
7. REMOVE RADIATOR SUPPORT OPENING COVER (See page [EM-22](#))
8. REMOVE RADIATOR RESERVOIR TANK
 - (a) Remove the 2 bolts and radiator reservoir.
9. REMOVE FAN AND GENERATOR V BELT (See page [EM-8](#))



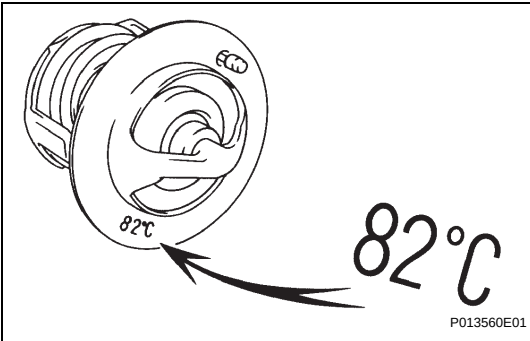
10. REMOVE ENGINE MOUNTING INSULATOR RH
 - (a) Remove the 5 bolts, 2 nuts and engine mounting insulator RH.
11. REMOVE FRONT NO. 1 ENGINE MOUNTING BRACKET LH (See page [CO-12](#))
12. REMOVE NO. 2 IDLER PULLEY SUB-ASSEMBLY
 - (a) Remove the bolt, No. 2 idler pulley cover plate and No. 2 idler pulley.
13. DISCONNECT NO. 2 RADIATOR HOSE



14. REMOVE WATER INLET

- (a) Remove the 2 nuts and remove the water inlet from the water inlet housing.

15. REMOVE THERMOSTAT

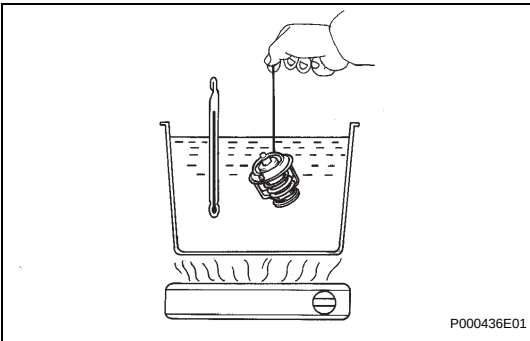


INSPECTION

1. INSPECT THERMOSTAT

HINT:

The valve opening temperature is inscribed on the thermostat.



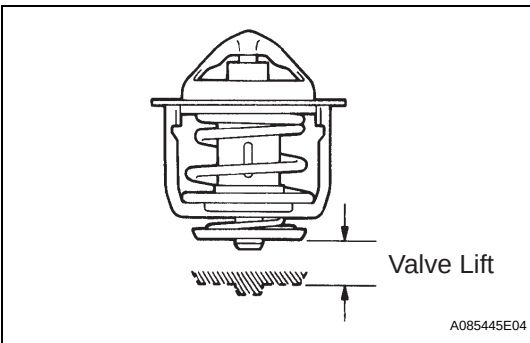
- (a) Immerse the thermostat in water, and then gradually heat the water.

- (b) Check the valve opening temperature of the thermostat.

Standard valve opening temperature:

80 to 84°C (176 to 183°F)

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



- (c) Check the valve lift.

Standard valve lift:

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

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

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

If not fully closed, replace the thermostat.

INSTALLATION

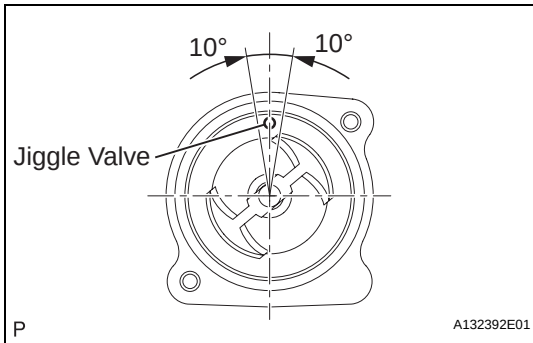
1. INSTALL THERMOSTAT

(a) Install a new gasket to the thermostat.

(b) Install the thermostat with the jiggle valve facing upward.

HINT:

The jiggle valve can be set to within 10° of either side of the upward position.

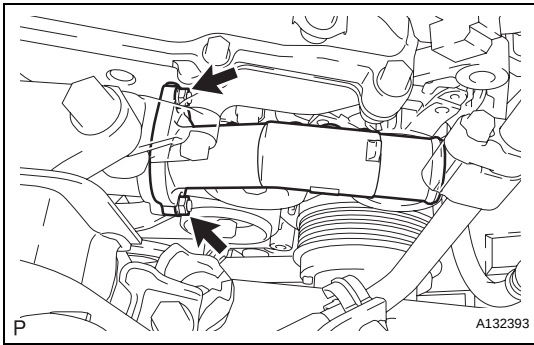


2. INSTALL WATER INLET

(a) Install the water inlet with the 2 nuts.

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

3. CONNECT NO. 2 RADIATOR HOSE

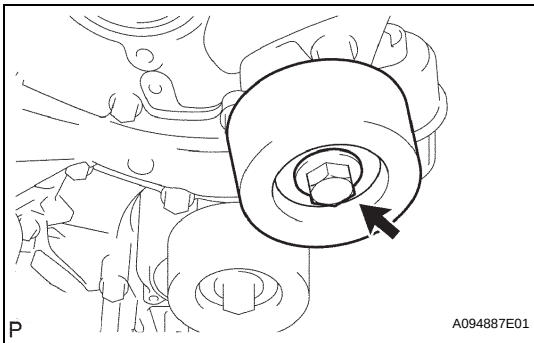


4. INSTALL NO. 2 IDLER PULLEY SUB-ASSEMBLY

(a) Install the No. 2 idler pulley cover plate and No. 2 idler pulley with the bolt.

Torque: 43 N*m (438 kgf*cm, 32 ft.*lbf)

5. INSTALL FRONT NO. 1 ENGINE MOUNTING BRACKET LH (See page [CO-15](#))

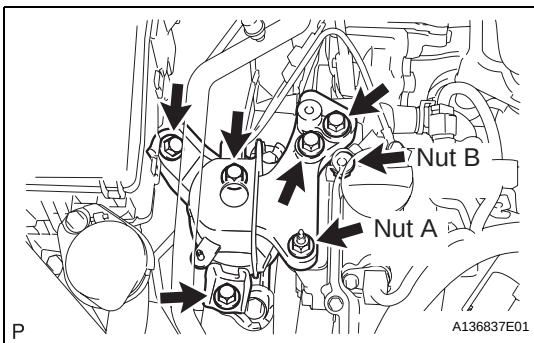


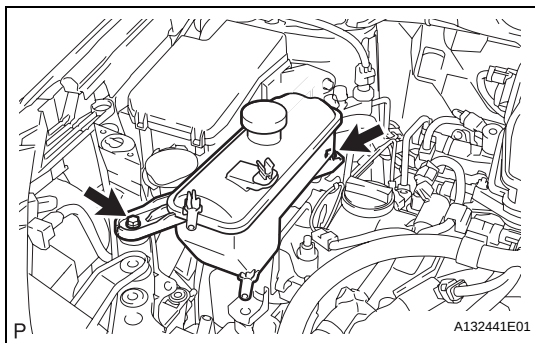
6. INSTALL ENGINE MOUNTING INSULATOR RH

(a) Install the engine mounting insulator RH with the 2 nuts and 5 bolts.

Torque: 95 N*m (969 kgf*cm, 70 ft.*lbf) for bolt
95 N*m (969 kgf*cm, 70 ft.*lbf) for nut A
52 N*m (530 kgf*cm, 38 ft.*lbf) for nut B

7. INSTALL FAN AND GENERATOR V BELT (See page [EM-8](#))





8. **INSTALL RADIATOR RESERVOIR TANK**
(a) Install the radiator reservoir with the 2 bolts.
Torque: 5.0 N*m (51 kgf*cm, 44 in.*lbf)
9. **INSTALL RADIATOR SUPPORT OPENING COVER**
(See page [EM-42](#))
10. **INSTALL V-BANK COVER SUB-ASSEMBLY** (See page [EM-42](#))
11. **ADD ENGINE COOLANT** (See page [CO-8](#))
12. **CHECK FOR ENGINE COOLANT LEAKAGE** (See page [CO-1](#))
13. **INSTALL FRONT SUSPENSION MEMBER REINFORCEMENT RH** (See page [EM-9](#))
14. **INSTALL ENGINE UNDER COVER REAR RH** (See page [EM-41](#))
15. **INSTALL NO. 1 ENGINE UNDER COVER** (See page [EM-41](#))
16. **INSTALL FRONT WHEEL RH**

REMOVAL

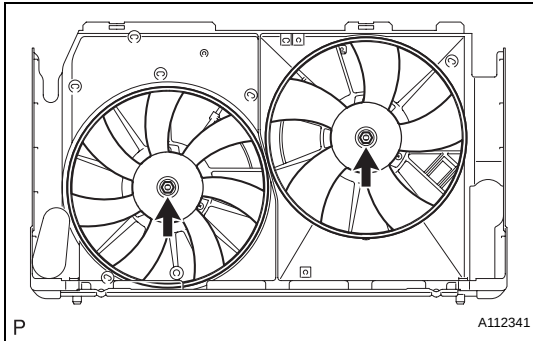
1. REMOVE RADIATOR ASSEMBLY

- (a) Remove the radiator (see page [CO-36](#)).

DISASSEMBLY

1. REMOVE FAN

- (a) Remove the 2 nuts and 2 fans.

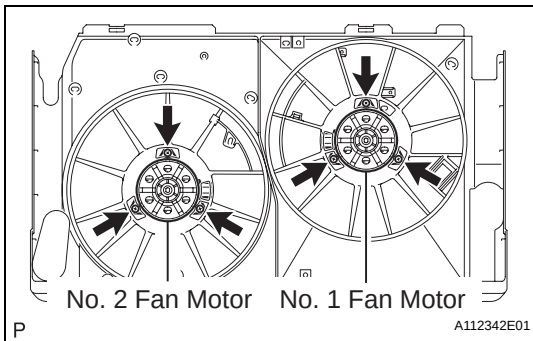


2. REMOVE NO. 1 COOLING FAN MOTOR

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

3. REMOVE NO. 2 COOLING FAN MOTOR

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



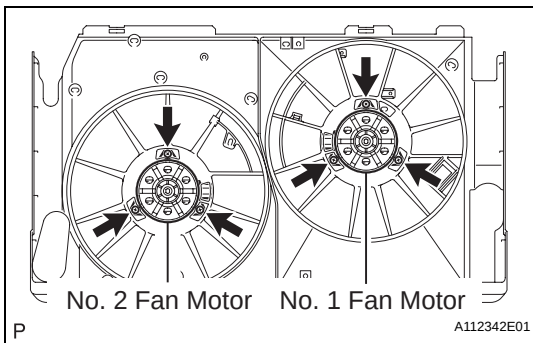
REASSEMBLY

1. INSTALL NO. 2 COOLING FAN MOTOR

- (a) Install the fan motor with the 3 screws.
Torque: 3.9 N*m (40 kgf*cm, 35 in.*lbf)

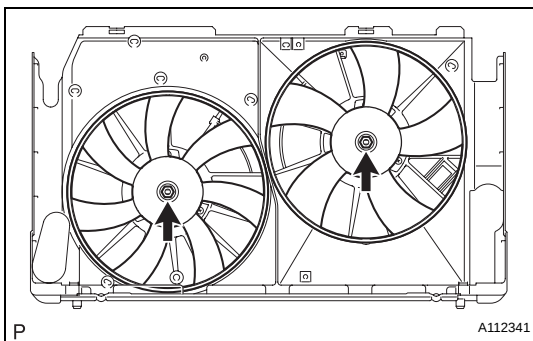
2. INSTALL NO. 1 COOLING FAN MOTOR

- (a) Install the fan motor with the 3 screws.
Torque: 3.9 N*m (40 kgf*cm, 35 in.*lbf)



3. INSTALL FAN

- (a) Install the 2 fans with the 2 nuts.
Torque: 6.3 N*m (64 kgf*cm, 55 in.*lbf)
(b) Check the fan motor operation.



INSTALLATION

1. INSTALL RADIATOR ASSEMBLY

- (a) Install the radiator (see page [CO-40](#)).

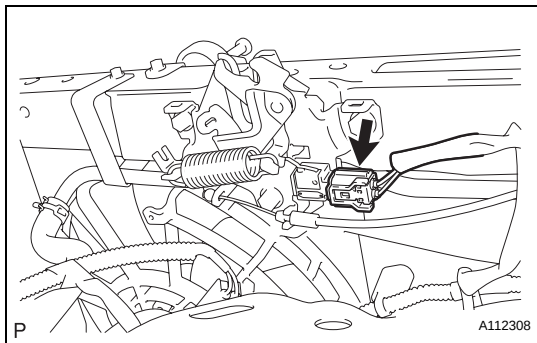
REMOVAL

1. DISCONNECT CABLE FROM NEGATIVE BATTERY TERMINAL

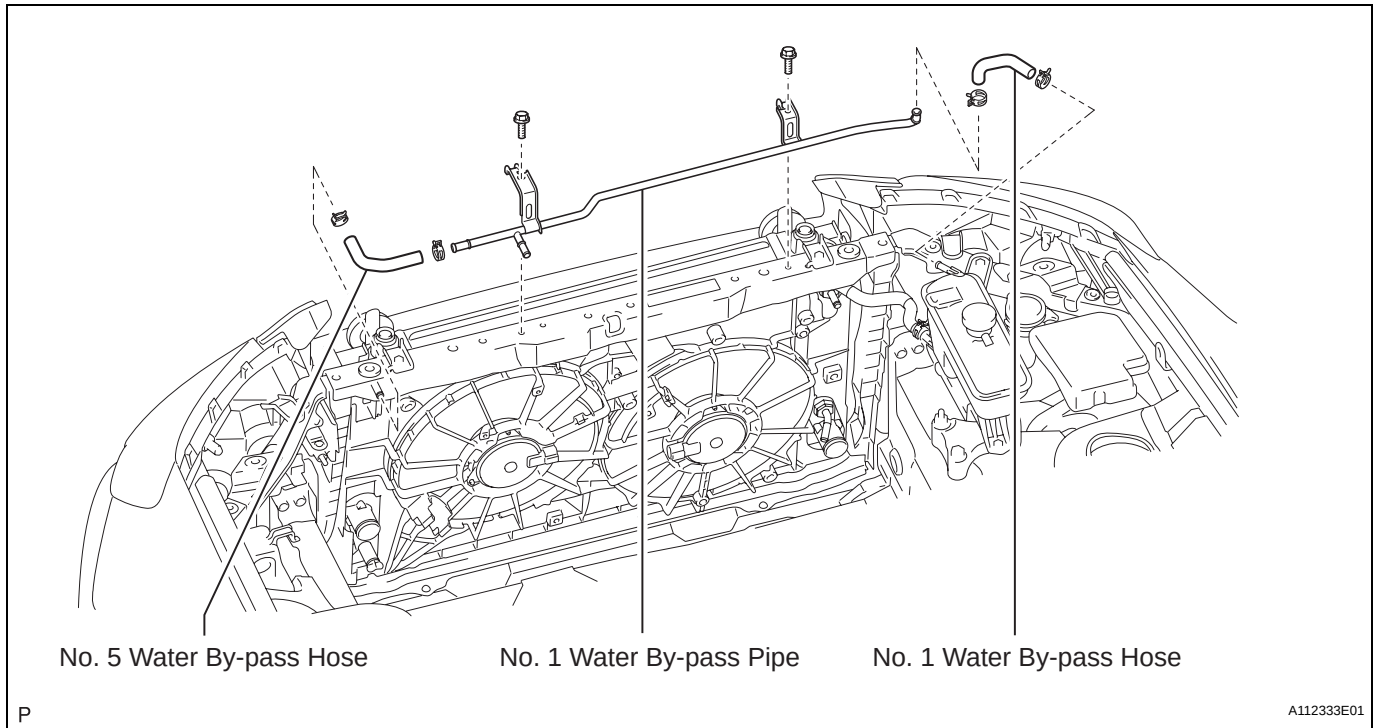
CAUTION:

Wait at least 90 seconds after disconnecting the cable from the negative (-) battery terminal to prevent airbag activation.

2. REMOVE BATTERY CLAMP SUB-ASSEMBLY (See page [ST-6](#))
3. REMOVE BATTERY INSULATOR
4. REMOVE BATTERY
5. REMOVE NO. 1 ENGINE UNDER COVER (See page [EM-21](#))
6. DRAIN ENGINE COOLANT (See page [CO-8](#))
7. REMOVE V-BANK COVER SUB-ASSEMBLY (See page [EM-21](#))
8. REMOVE RADIATOR SUPPORT OPENING COVER (See page [EM-22](#))
9. REMOVE RADIATOR GRILLE SUB-ASSEMBLY (See page [ET-6](#))
10. DISCONNECT HOOD LOCK SWITCH CONNECTOR
11. DISCONNECT NO. 1 WATER BY-PASS HOSE
 - (a) Disconnect the hose from the radiator reservoir.
12. DISCONNECT NO. 5 WATER BY-PASS HOSE
 - (a) Disconnect the hose from the radiator.
13. REMOVE NO. 1 WATER BY-PASS PIPE
 - (a) Disconnect the pipe from the No. 1 radiator hose.

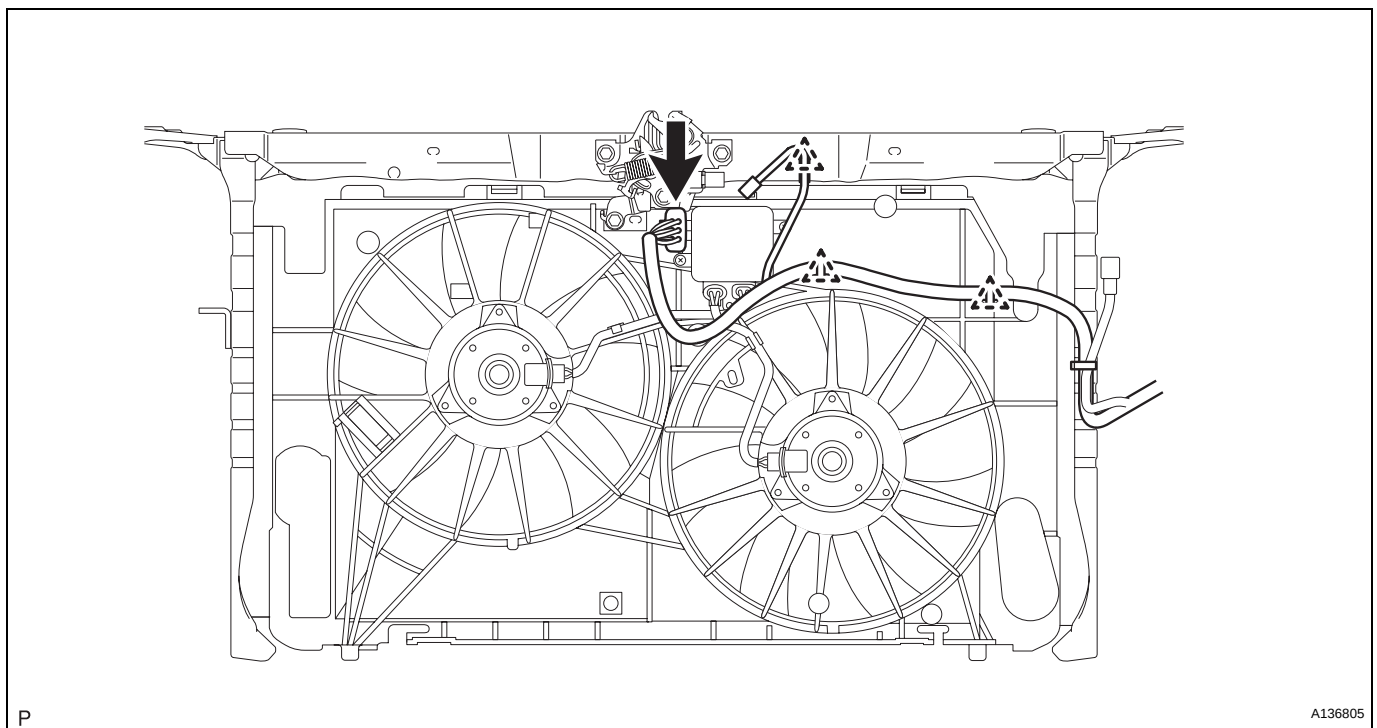


(b) Remove the 2 bolts and pipe.



14. DISCONNECT COOLING FAN ECU HARNESS (w/o Trailer Towing System)

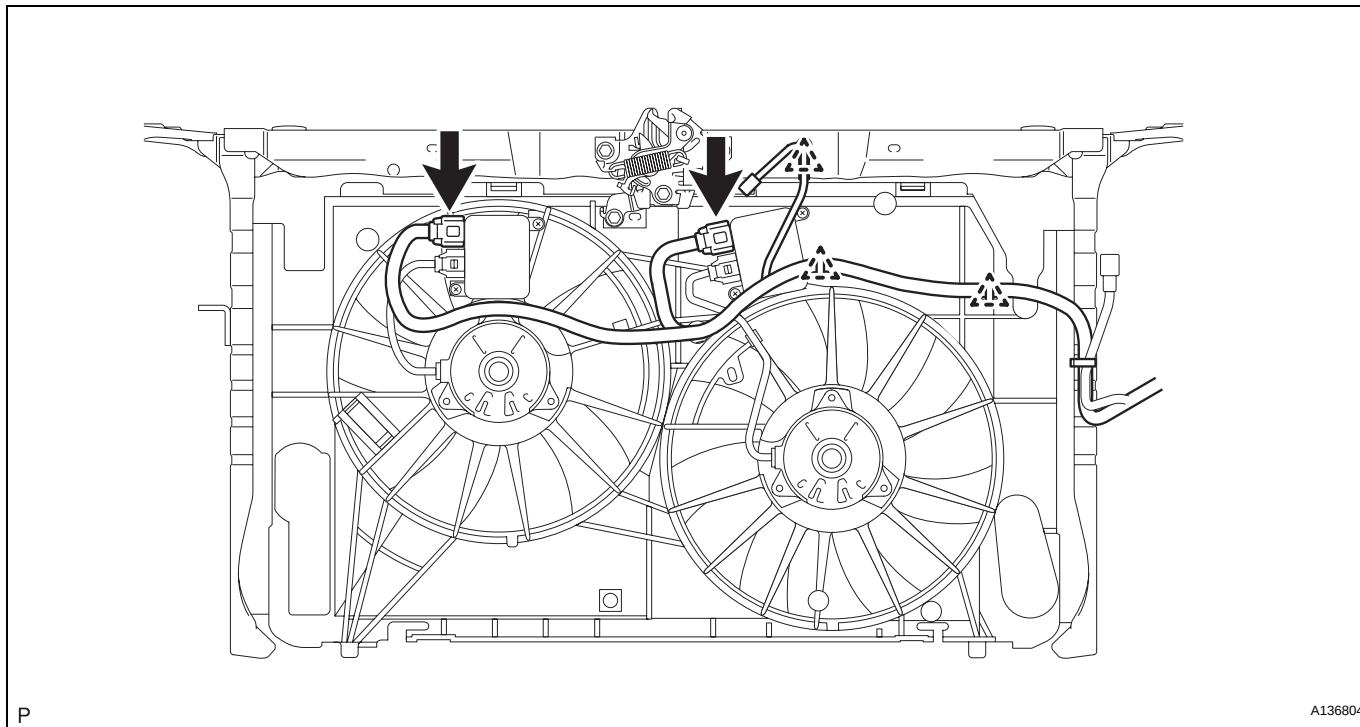
- Disconnect the fan ECU connector.
- Detach the 3 harness clamps from the fan shroud and upper radiator support.



15. DISCONNECT COOLING FAN ECU HARNESS (w/ Trailer Towing System)

- Disconnect the 2 fan ECU connectors.

- (b) Detach the 3 harness clamps from the fan shroud and upper radiator support.

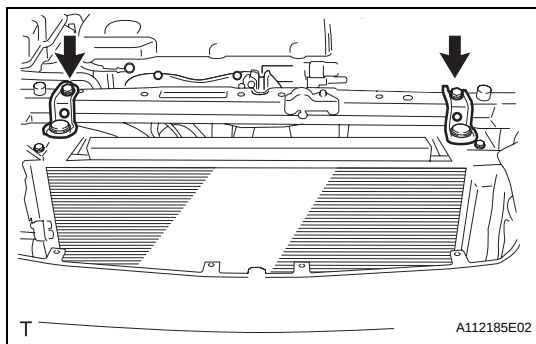


16. DISCONNECT HORN CONNECTOR

- (a) Disconnect the 2 horn connectors.

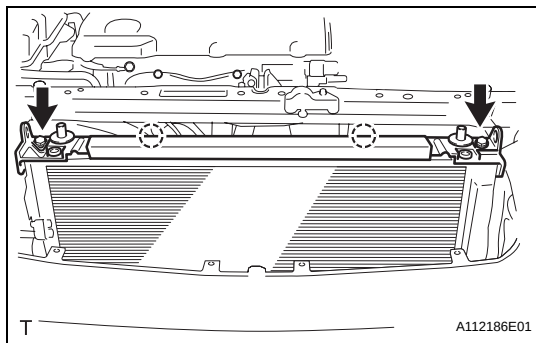
17. REMOVE UPPER RADIATOR SUPPORT BRACKET

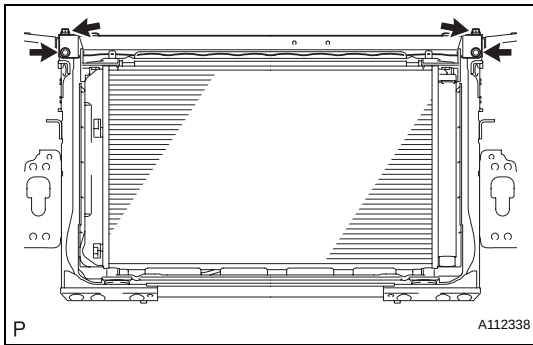
- (a) Remove the 2 bolts and 2 upper radiator support brackets.



18. REMOVE NO. 2 FAN SHROUD

- (a) Remove the 2 bolts.
(b) Detach the 2 claws and No. 2 shroud.





19. REMOVE UPPER RADIATOR SUPPORT SUB-ASSEMBLY

- (a) Remove the 4 bolts and upper radiator support with hood lock.

20. DISCONNECT OIL COOLER INLET HOSE

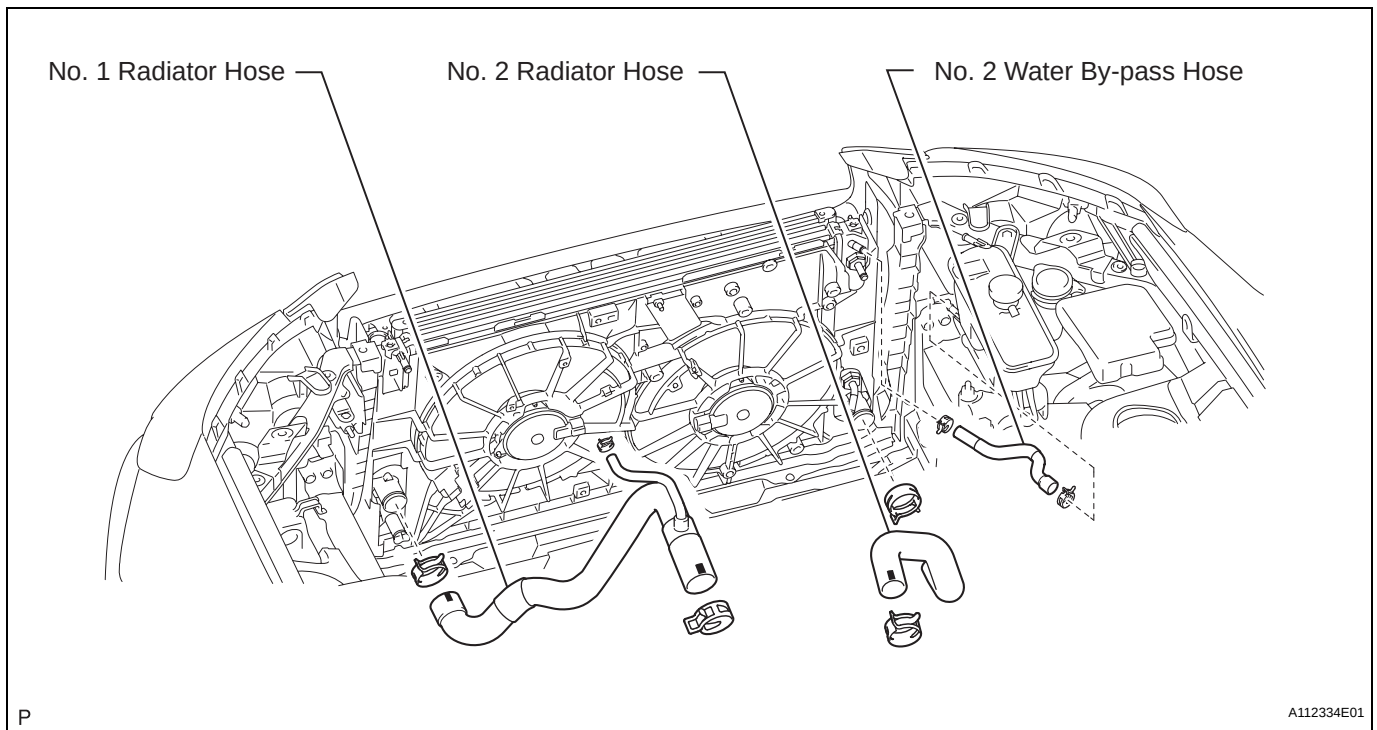
21. DISCONNECT OIL COOLER OUTLET HOSE

22. DISCONNECT NO. 1 RADIATOR HOSE

23. DISCONNECT NO. 2 RADIATOR HOSE

24. DISCONNECT NO. 2 WATER BY-PASS HOSE

- (a) Disconnect the by-pass hose from the radiator reservoir and radiator.



25. REMOVE RADIATOR ASSEMBLY

- (a) Detach the cooler condenser from the radiator.

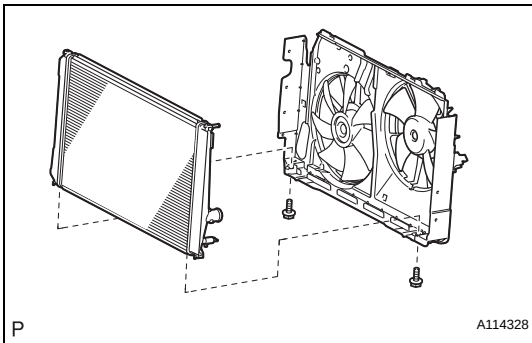
HINT:

After detaching the condenser, make sure that all 4 fan shroud cushions are present.

- (b) Remove the radiator with the 2 radiator support lower cushions.

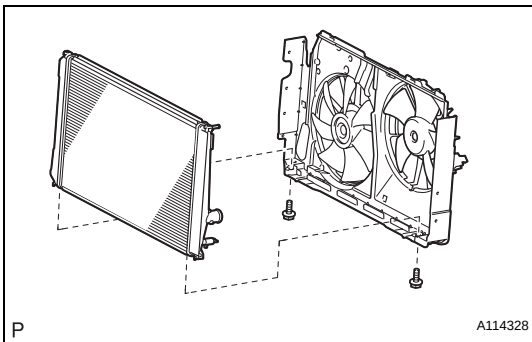
HINT:

After detaching the radiator, make sure that all 2 radiator support lowers are present.



26. REMOVE FAN SHROUD WITH COOLING FAN

- (a) Remove the 2 bolts and fan shroud with cooling fan from the radiator.



INSTALLATION

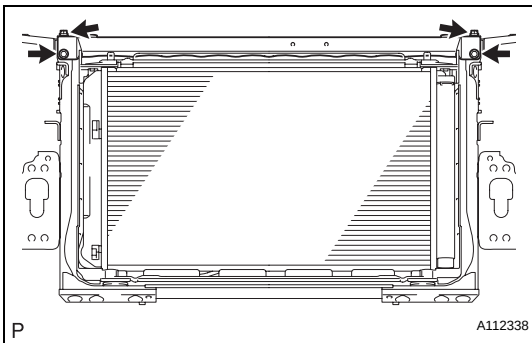
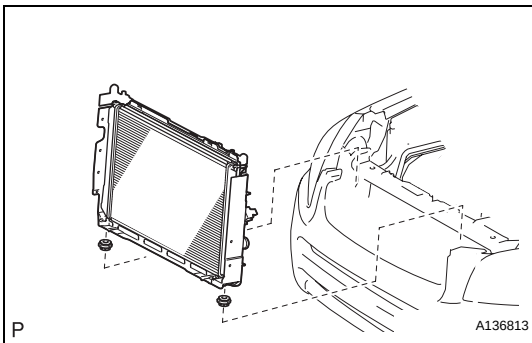
1. INSTALL FAN SHROUD WITH COOLING FAN

- (a) Install the fan shroud with cooling fan to the radiator with the 2 bolts.

Torque: 10.5 N*m (107 kgf*cm, 8 ft.*lbf)

2. INSTALL RADIATOR ASSEMBLY

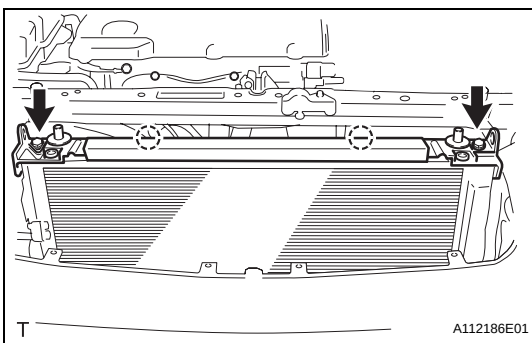
- (a) Install the 4 fan shroud cushions to the cooler condenser.
- (b) Set the cooler condenser into the fan shroud.
- (c) Install the 2 radiator support lower cushions to the fan shroud.
- (d) Install the radiator with cooler condenser and fan shroud to the radiator support lowers.



3. INSTALL UPPER RADIATOR SUPPORT SUB-ASSEMBLY

- (a) Install the upper radiator support with the 4 bolts.

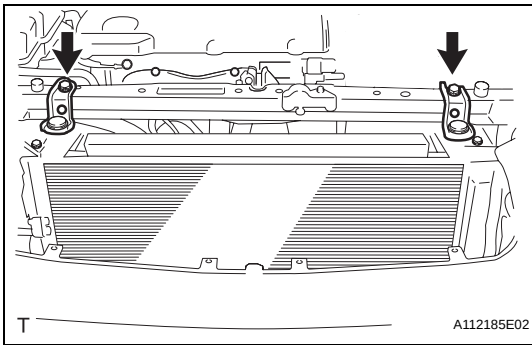
Torque: 29 N*m (296 kgf*cm, 21 ft.*lbf)



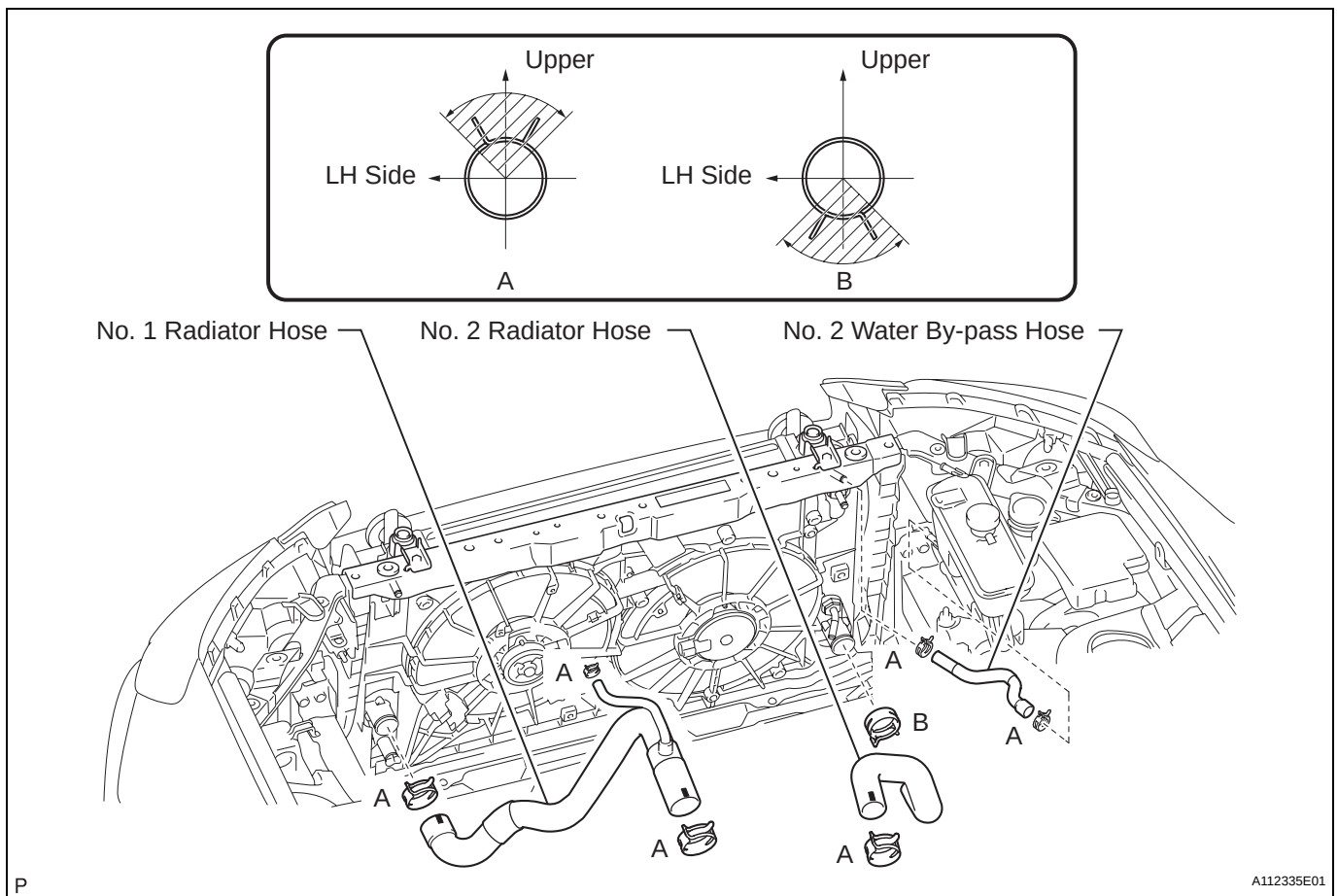
4. INSTALL NO. 2 FAN SHROUD

- (a) Attach the 2 claws to install the No. 2 fan shroud, and install the 2 bolts.

Torque: 10.5 N*m (107 kgf*cm, 8 ft.*lbf)

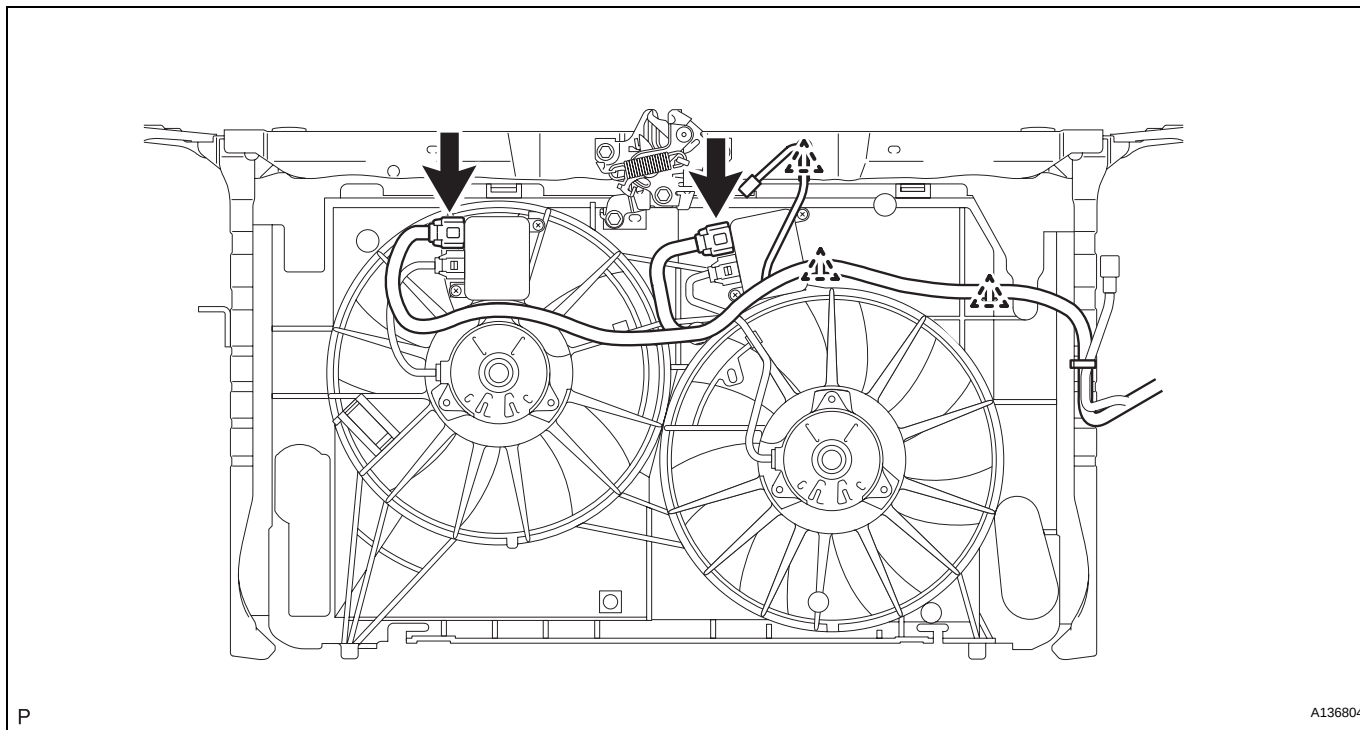


5. **INSTALL UPPER RADIATOR SUPPORT BRACKET**
 - (a) Install the brackets with the 2 bolts.
Torque: 19 N*m (194 kgf*cm, 14 ft.*lbf)
6. **CONNECT HORN CONNECTOR**
 - (a) Connect the 2 horn connectors.
7. **CONNECT NO. 2 WATER BY-PASS HOSE**
 - (a) Connect the by-pass hose to the radiator and radiator reservoir.
HINT:
The direction of the hose clamp is indicated in the illustration.
8. **CONNECT NO. 2 RADIATOR HOSE**
 - HINT:
The direction of the hose clamp is indicated in the illustration.
9. **CONNECT NO. 1 RADIATOR HOSE**
 - HINT:
The direction of the hose clamp is indicated in the illustration.



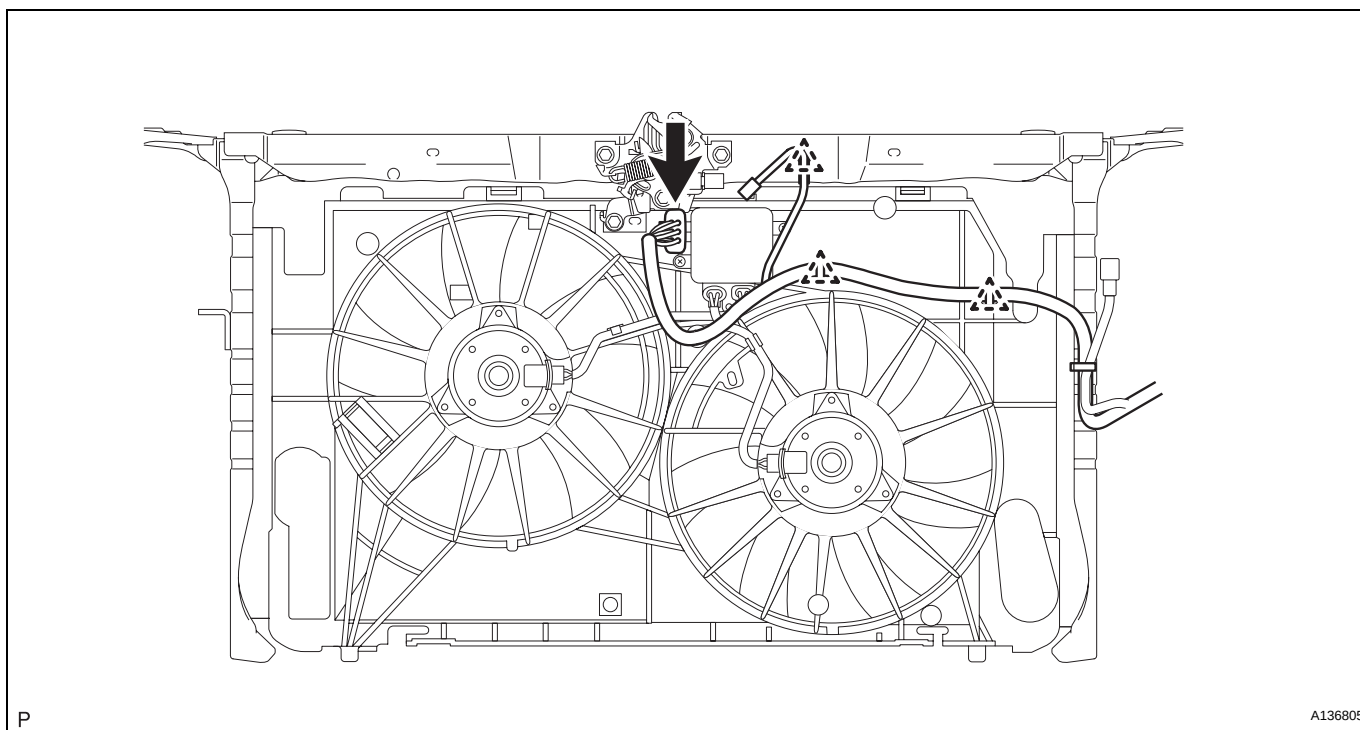
10. **CONNECT OIL COOLER OUTLET HOSE**
11. **CONNECT OIL COOLER INLET HOSE**
12. **CONNECT COOLING FAN ECU HARNESS (w/ Trailer Towing System)**
 - (a) Attach the harness with the 3 clamps.

(b) Connect the 2 fan ECU connectors.



13. CONNECT COOLING FAN ECU HARNESS (w/o Trailer Towing System)

- (a) Attach the harness with the 3 clamps.
- (b) Connect the fan ECU connector.



14. INSTALL NO. 1 WATER BY-PASS PIPE

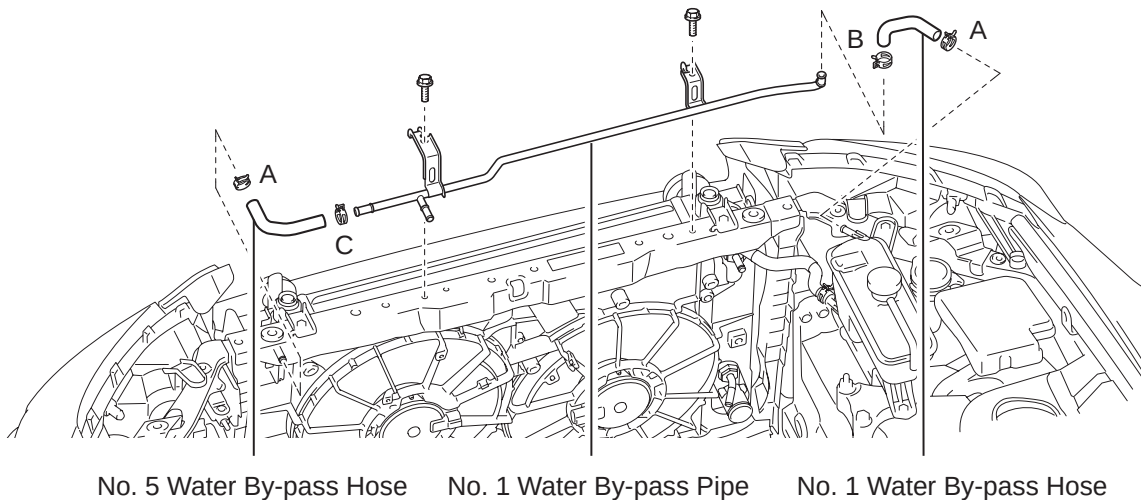
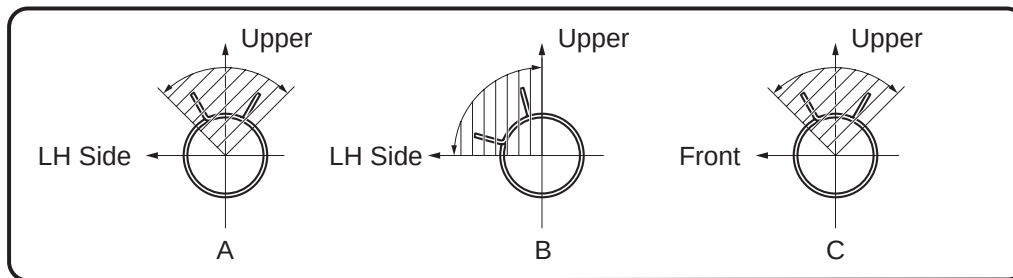
- (a) Install the by-pass pipe with the 2 bolts to the upper radiator support.
Torque: 5.0 N*m (51 kgf*cm, 44 in.*lbf)
- (b) Connect the No. 1 radiator hose to the pipe.

15. CONNECT NO. 5 WATER BY-PASS HOSE

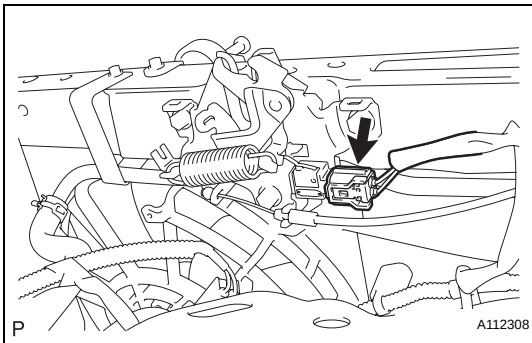
(a) Connect the by-pass hose to the radiator.

16. CONNECT NO. 1 WATER BY-PASS HOSE

(a) Connect the by-pass hose to the radiator reservoir.



A114357E03

**17. CONNECT HOOD LOCK SWITCH CONNECTOR****18. INSTALL RADIATOR GRILLE SUB-ASSEMBLY** (See page [ET-10](#))**19. INSTALL BATTERY****20. INSTALL BATTERY INSULATOR****21. INSTALL BATTERY CLAMP SUB-ASSEMBLY** (See page [ST-15](#))**22. CONNECT CABLE TO NEGATIVE BATTERY TERMINAL****23. INSTALL RADIATOR SUPPORT OPENING COVER** (See page [EM-42](#))**24. INSTALL V-BANK COVER SUB-ASSEMBLY** (See page [EM-42](#))**25. ADD ENGINE COOLANT** (See page [CO-8](#))**26. CHECK FOR ENGINE COOLANT LEAKS** (See page [CO-1](#))

27. INSTALL NO. 1 ENGINE UNDER COVER (See page [EM-41](#))

COOLING SYSTEM

ON-VEHICLE INSPECTION

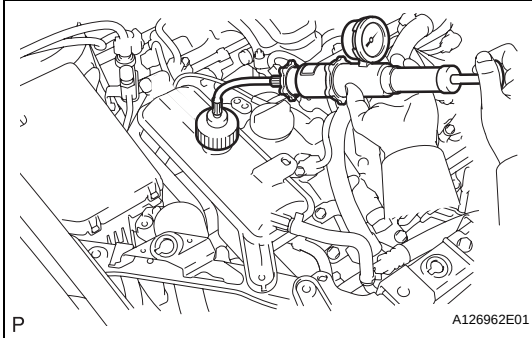
1. CHECK COOLING SYSTEM FOR LEAKS

- (a) Remove the radiator reservoir cap.

CAUTION:

Do not remove the radiator reservoir cap while the engine and radiator are still hot.

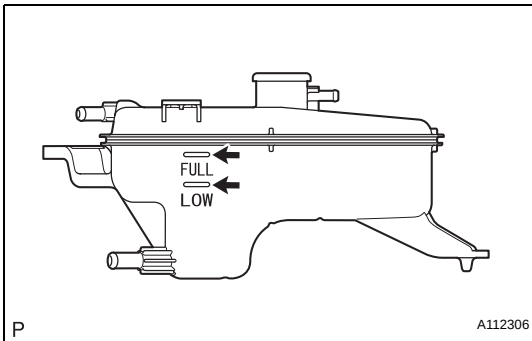
Pressurized, hot engine coolant and steam may be released and cause serious burns.



- (b) Fill the radiator with coolant, and then attach a radiator cap tester.
- (c) Warm up the engine.
- (d) Pump the radiator cap tester to 118 kPa (1.2 kgf/cm², 17.1 psi), and then check that the pressure does not drop.
If the pressure drops, check the hoses, radiator and water pump for leakage.
If there are no signs of external coolant leaks, check the heater core, cylinder block and head.
- (e) Reinstall the radiator cap.

2. CHECK ENGINE COOLANT LEVEL OF RESERVOIR

- (a) The engine coolant should be between the LOW and FULL lines when the engine is cold.
If the coolant level is below the LOW line, check for leakage and add TOYOTA Super Long Life Coolant (SLLC) or similar high quality ethylene glycol based non-silicate, non-amine, non-nitrite, and non-borate coolant with long-life hybrid organic acid technology up to the FULL line.



3. CHECK ENGINE COOLANT QUALITY

- (a) Remove the radiator reservoir cap.

CAUTION:

Do not remove the radiator reservoir cap while the engine and radiator are still hot.

Pressurized, hot engine coolant and steam may be released and cause serious burns.

- (b) Check for any excessive deposits of rust or scale around the radiator reservoir cap and radiator filler hole. The coolant should be free of oil.
If excessively dirty, replace the coolant.
- (c) Install the radiator reservoir cap.

COOLING FAN SYSTEM

PARTS LOCATION

w/o Trailer Towing System

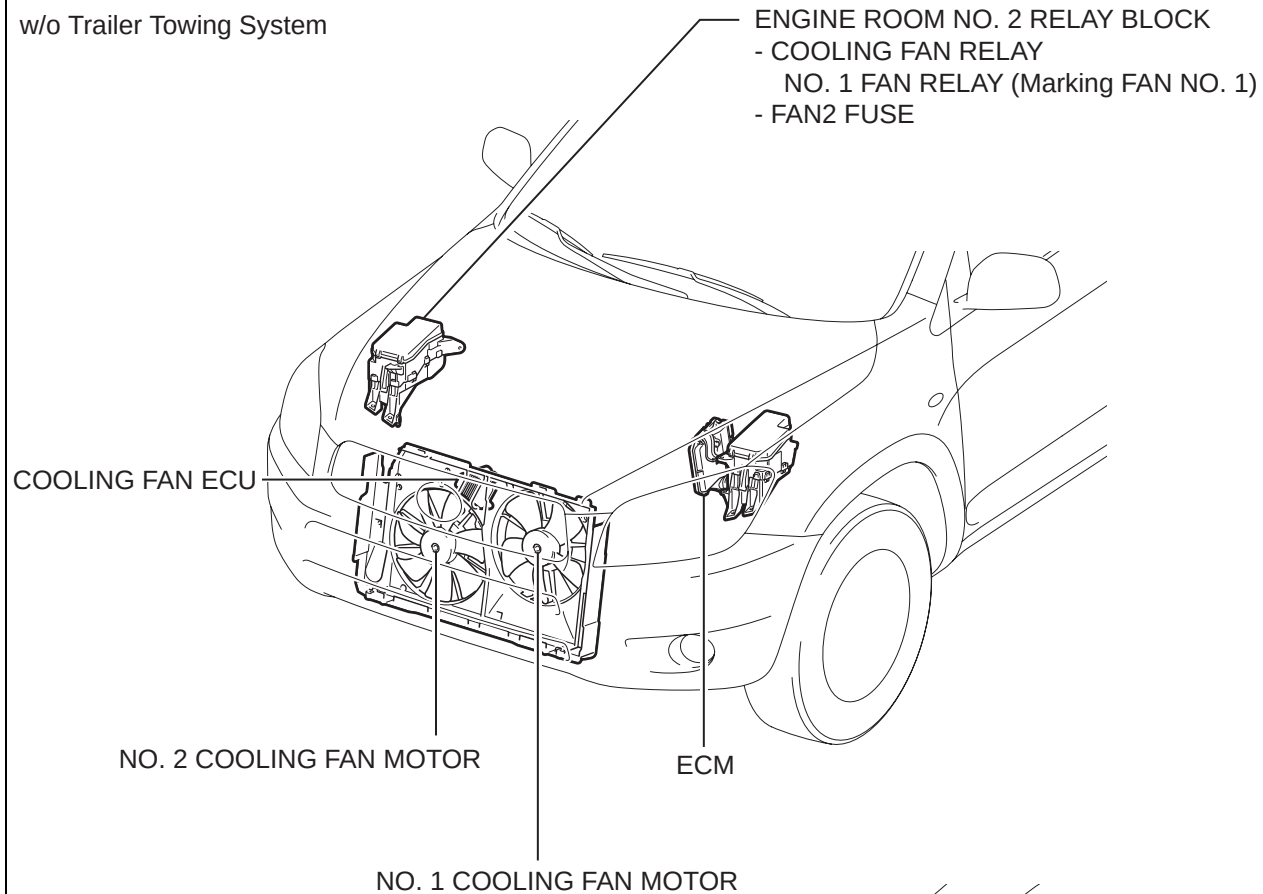
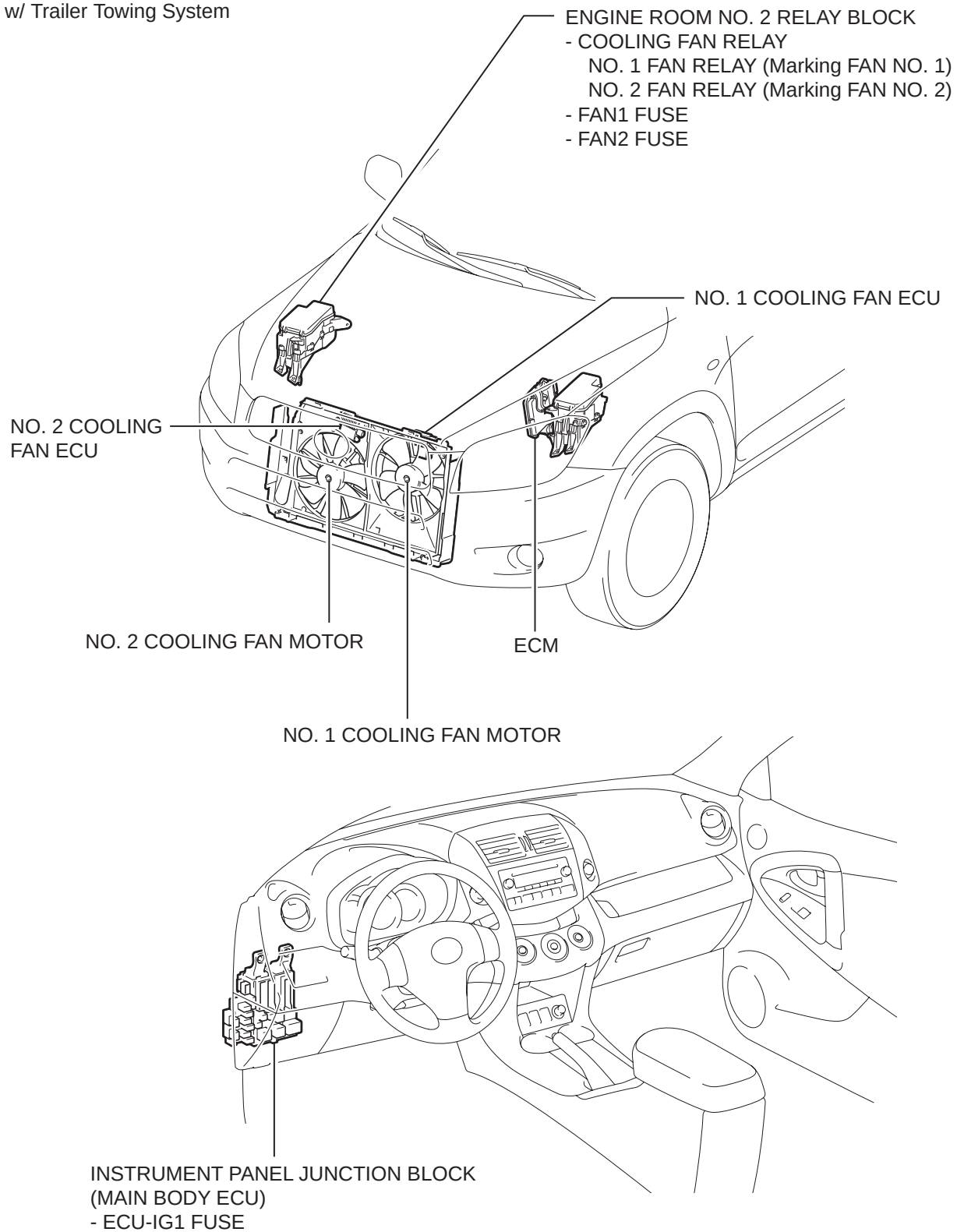


Diagram illustrating the parts location for the instrument panel junction block (MAIN BODY ECU). The components shown are:

- INSTRUMENT PANEL JUNCTION BLOCK (MAIN BODY ECU)
 - ECU-IG1 FUSE

w/ Trailer Towing System



CO

COOLANT

REPLACEMENT

1. REMOVE NO. 1 ENGINE UNDER COVER (See page [EM-21](#))

2. DRAIN ENGINE COOLANT

- (a) Loosen the radiator drain cock plug.

HINT:

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

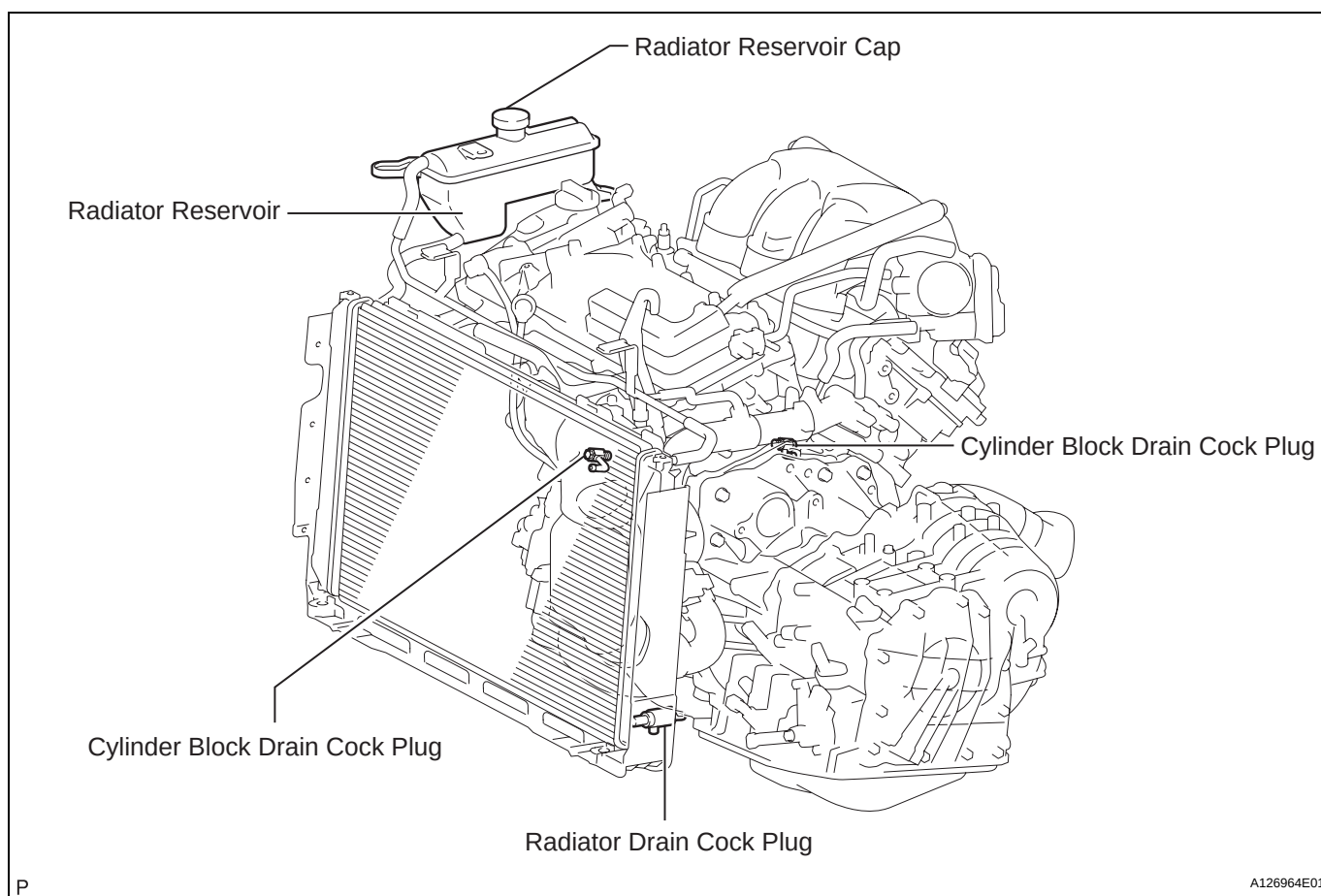
- (b) Remove the radiator reservoir cap.

CAUTION:

Do not remove the radiator reservoir cap while the engine and radiator are still hot.

Pressurized, hot engine coolant and steam may be released and cause serious burns.

- (c) Loosen the 2 cylinder block drain cock plugs.

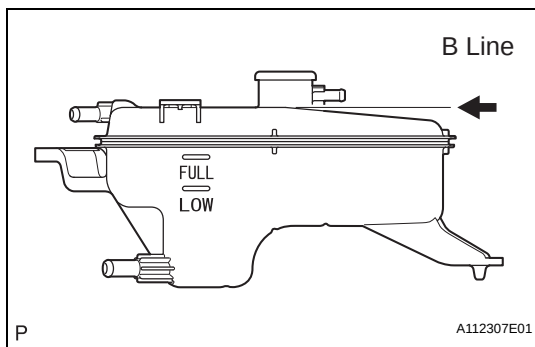


3. ADD ENGINE COOLANT

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

Torque: 12.7 N*m (130 kgf*cm, 10 ft.*lbf)

- (c) Add TOYOTA Super Long Life Coolant (SLLC) to the radiator reservoir filler opening.



- (d) Continue adding TOYOTA SLLC until it is filled to the B line at the base of the reservoir's filler neck.

Standard capacity

Item	Specified Condition
STD (A/T)	8.9 liters (9.4 US qts, 7.8 Imp. qts)
TWG (A/T)	9.3 liters (9.8 US qts, 8.2 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 consists of a combination of low phosphates and organic acids).

NOTICE:

Never use water as a substitute for engine coolant.

- (e) Press the No. 1 and No. 2 radiator hoses several times by hand, and then check the level of the coolant. If the coolant level drops below the B line, add TOYOTA SLLC to the B line.
- (f) Install the radiator reservoir cap.
- (g) Start the engine and warm it up until the cooling fan operates. While the cooling fan operates, circulate the coolant for several minutes.
- (1) Set the air conditioning as follows while warming up the engine.

Item	Specified Condition
Manual Air Conditioning System	Fan speed: Any setting except OFF
	Temperature: Toward WARM Air conditioning switch: OFF
Automatic Air Conditioning System	Temperature: Toward MAX Air conditioning switch: OFF

- (2) Maintain the engine speed at 2,000 to 2,500 rpm and warm up the engine until the cooling fan operates.

NOTICE:

- Make sure that the radiator reservoir still has some coolant in it.
- Pay attention to the needle of the water temperature meter. Make sure that the needle does not show an abnormally high temperature.
- If there is not enough coolant, the engine may burn out or overheat.
- Immediately after starting the engine, if the radiator reservoir does not have any coolant, perform the following: 1) stop the engine, 2) wait until the coolant has cooled down, and 3) add coolant until the coolant is filled to the B line.

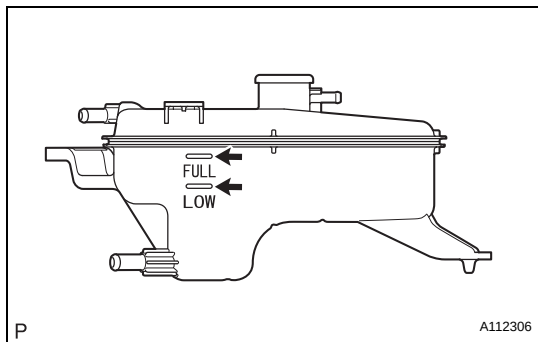
- **Run the engine at 2,000 rpm until the coolant level has stabilized.**

- (h) Press the No. 1 and No. 2 radiator hoses several times by hand to bleed air.

CAUTION:

When pressing the radiator hoses:

- **Wear protective gloves.**
 - **Be careful as the radiator hoses are hot.**
 - **Keep your hands away from the radiator fan.**
- (i) Stop the engine and wait until the coolant cools down to ambient temperature.
- (j) Check that the coolant level is between the FULL and LOW line.
- If the coolant level is below the LOW line, repeat all of the procedures above.
- If the coolant level is above the FULL line, drain coolant so that the coolant level is between the FULL and LOW line.

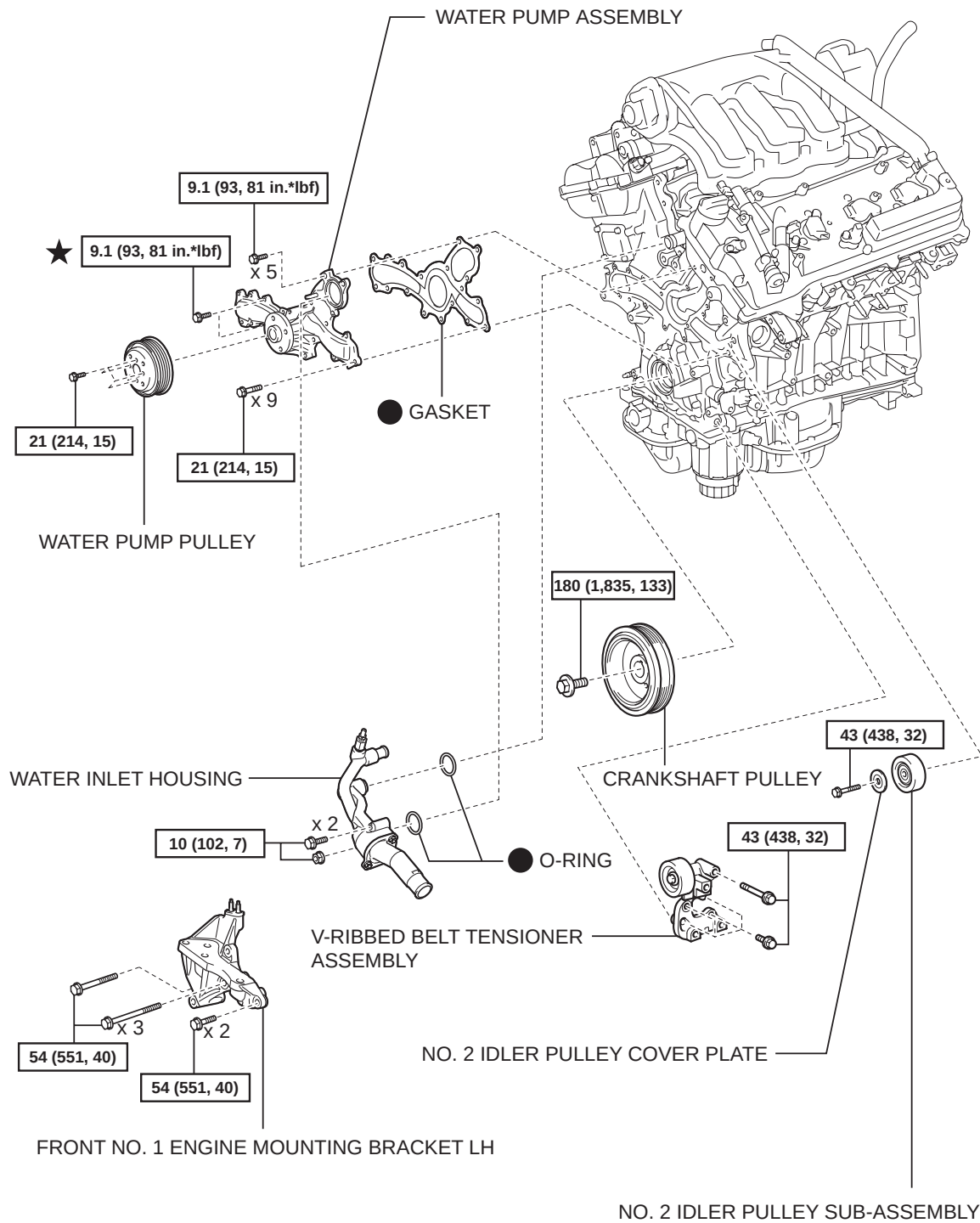


4. **CHECK FOR ENGINE COOLANT LEAKAGE** (See page [CO-1](#))

5. **INSTALL NO. 1 ENGINE UNDER COVER** (See page [EM-41](#))

WATER PUMP

COMPONENTS



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

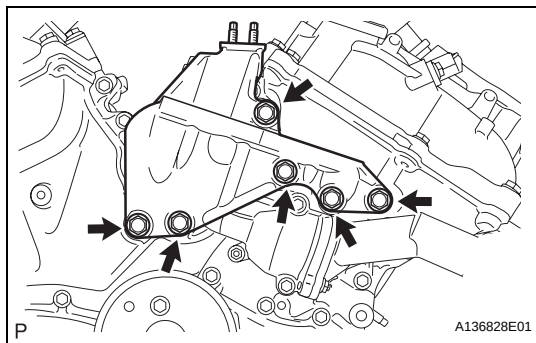
● Non-reusable part

★ Precoated part

REMOVAL

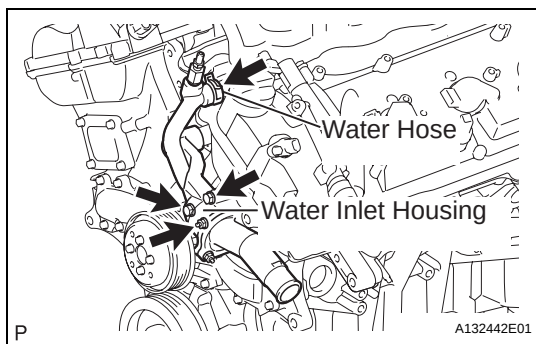
1. REMOVE ENGINE ASSEMBLY

- (a) Remove the engine (see page [EM-21](#)).



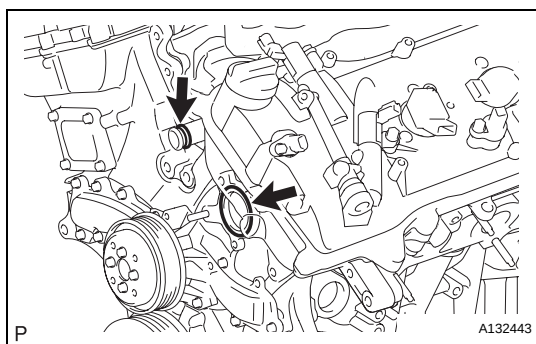
2. REMOVE FRONT NO. 1 ENGINE MOUNTING BRACKET LH

- (a) Remove the 6 bolts and mounting bracket.



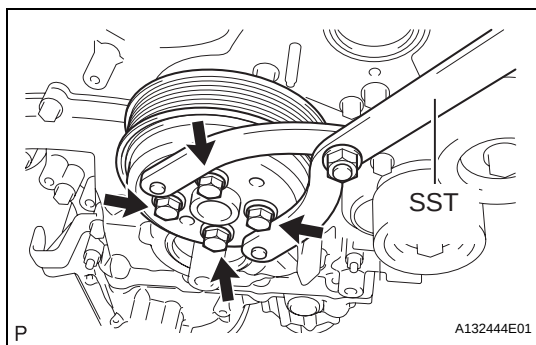
3. REMOVE WATER INLET HOUSING

- (a) Disconnect the water hose.
(b) Remove the 2 bolts, nut and water inlet housing.



- (c) Remove the water inlet housing No. 1 gasket and water outlet pipe O-ring.

4. REMOVE CRANKSHAFT PULLEY (See page [EM-54](#))

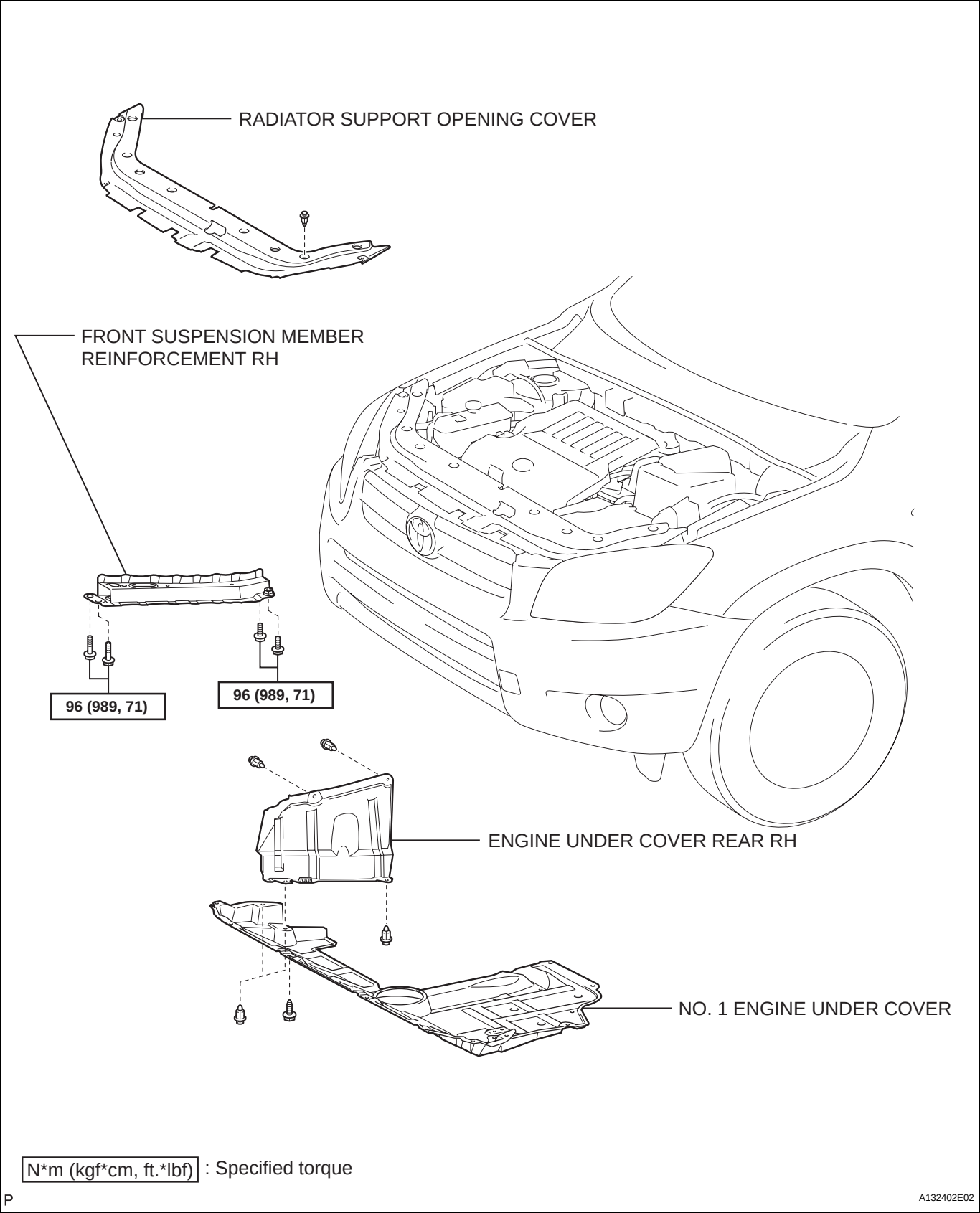


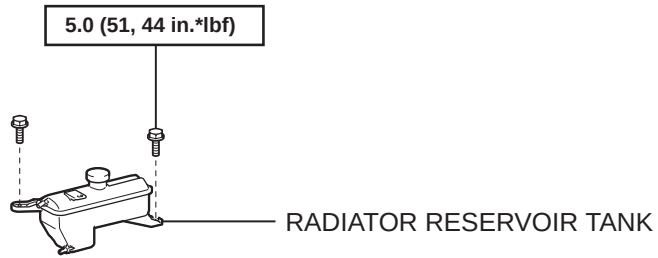
5. REMOVE WATER PUMP PULLEY

- (a) Using SST, hold the water pump pulley.
SST 09960-10010 (09962-01000, 09963-00700)
(b) Remove the 4 bolts and water pump pulley.

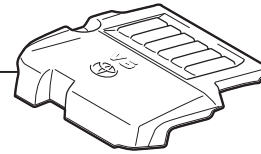
THERMOSTAT

COMPONENTS

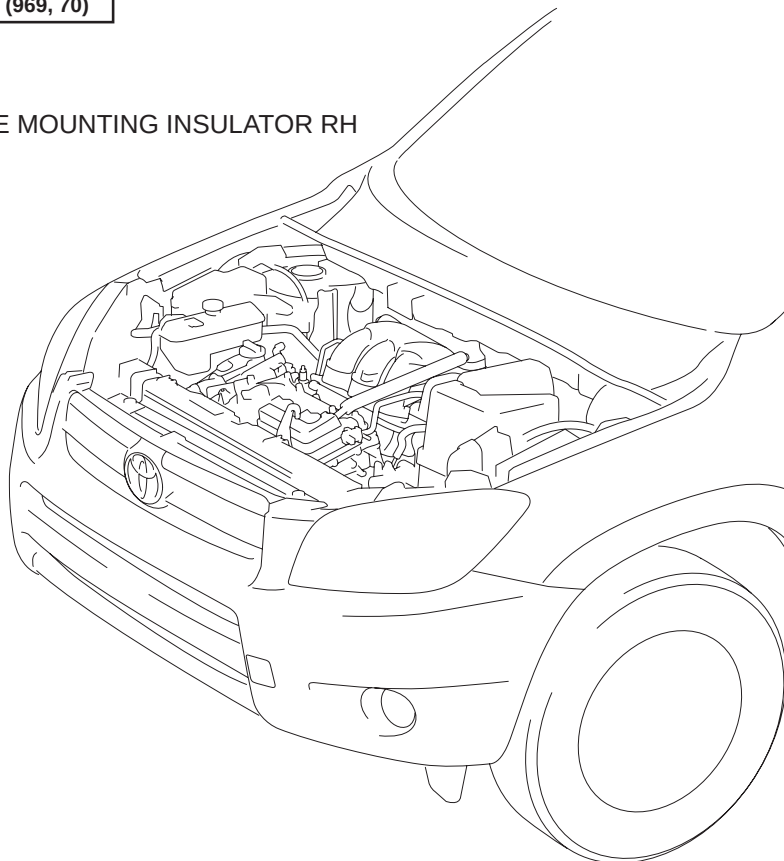
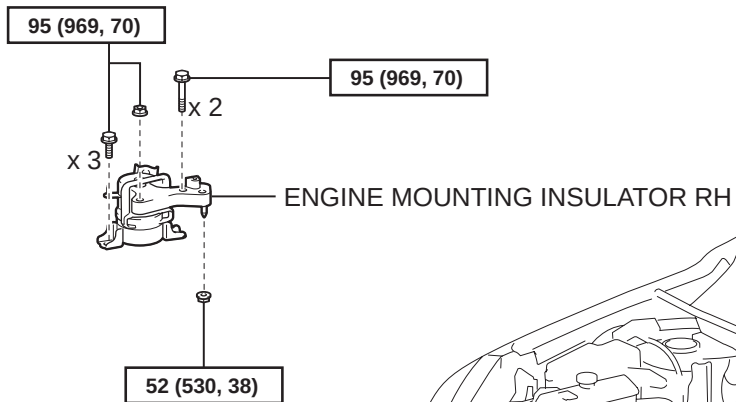




V-BANK COVER SUB-ASSEMBLY

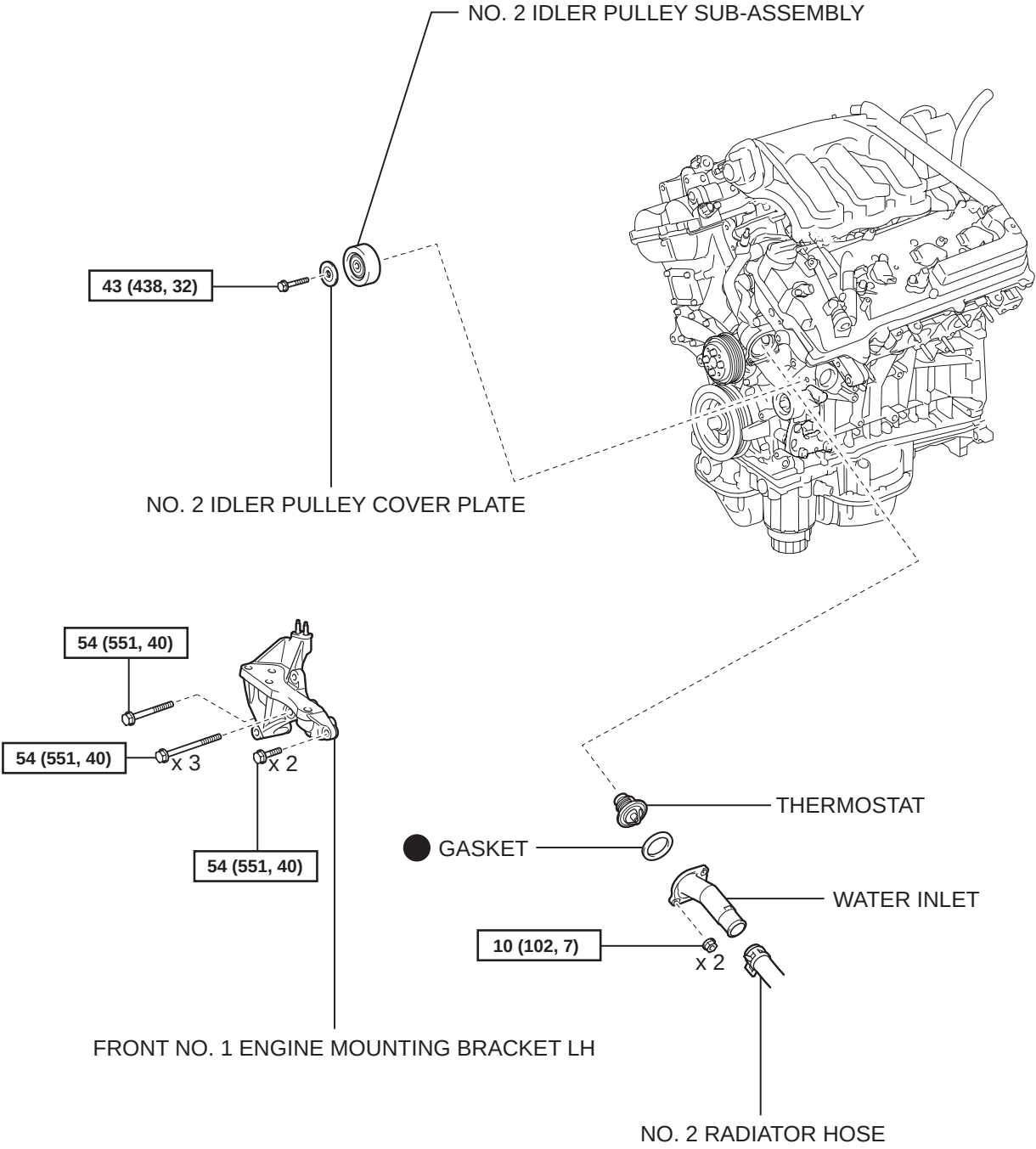


FAN AND GENERATOR V BELT



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

CO

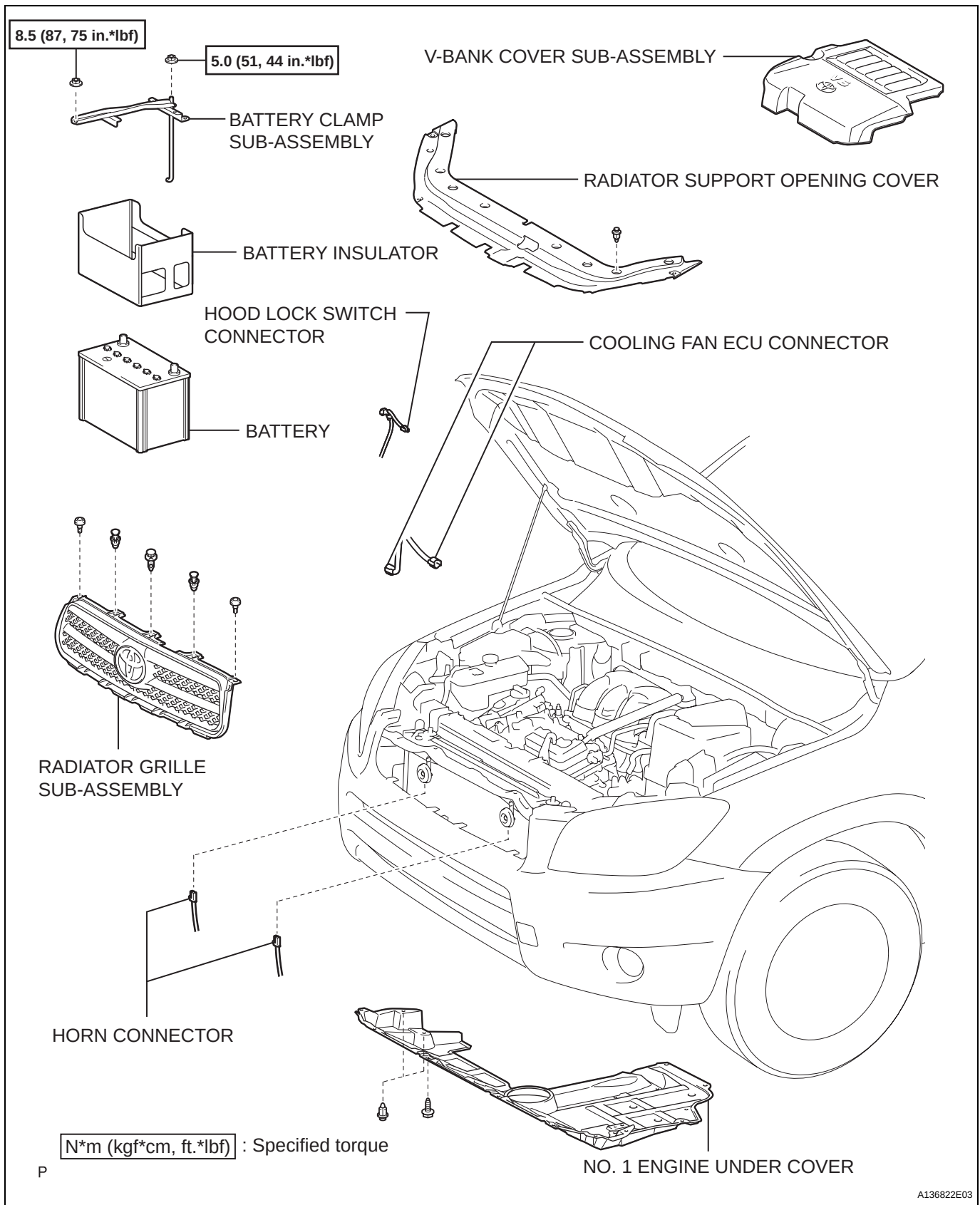


N*m (kgf*cm, ft.*lbf) : Specified torque

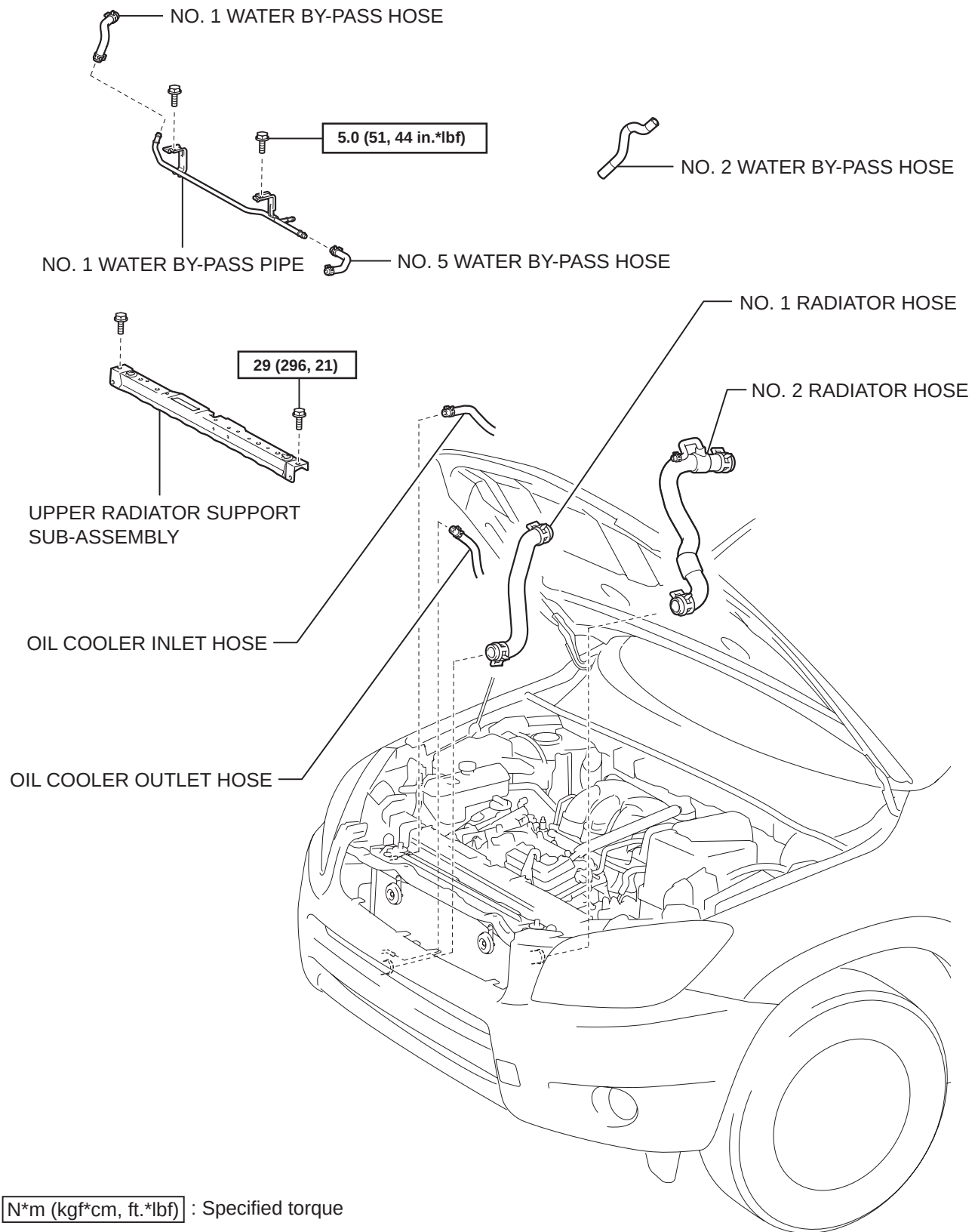
● Non-reusable part

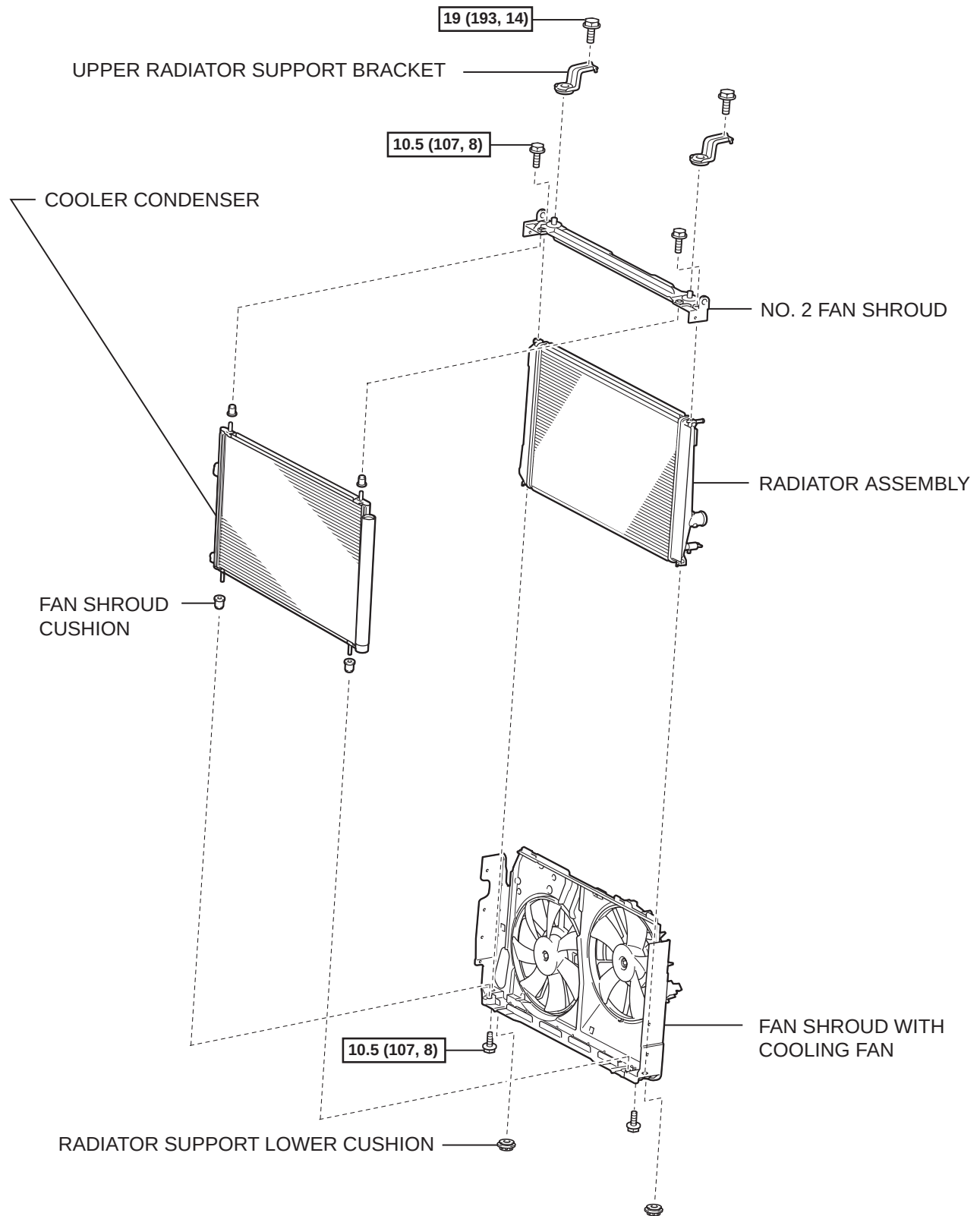
COOLING FAN MOTOR

COMPONENTS



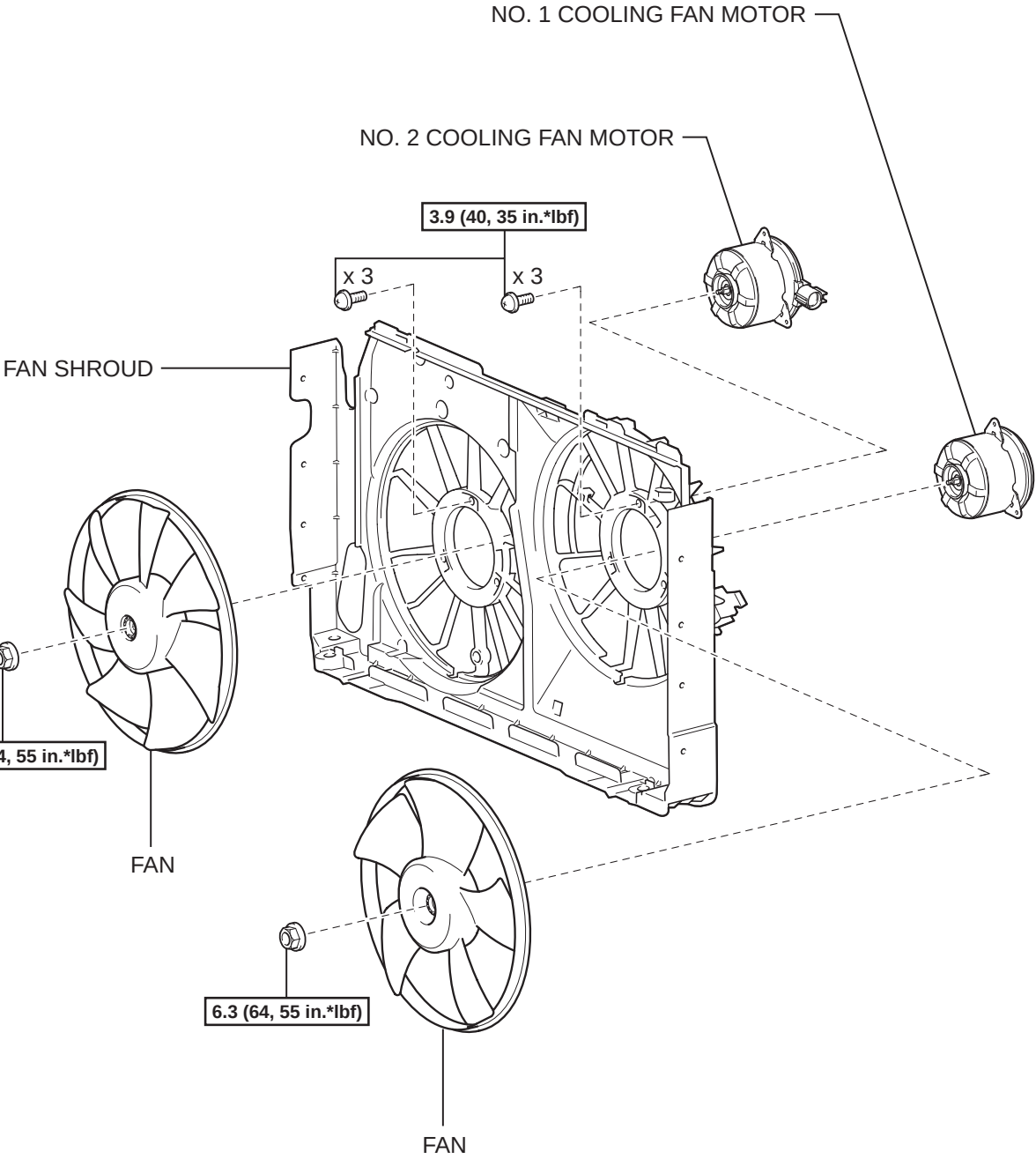
CO



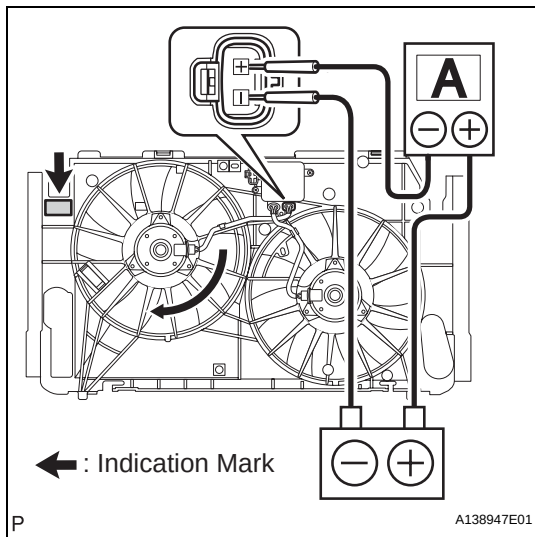


N*m (kgf*cm, ft.*lbf) : Specified torque

CO



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



ON-VEHICLE INSPECTION

1. INSPECT NO. 1 COOLING FAN MOTOR (w/o Trailer Towing System)

- Disconnect the No. 1 fan connector.
- Connect the battery and an ammeter to the No. 1 fan motor connector.
- Check that the No. 1 fan rotates smoothly, and then check the reading on the ammeter.

Standard amperage

Indication Mark	Motor Type	Condition	Specified Condition
E	160 W	at 20°C (68°F)	11.8 to 14.8 A

HINT:

Refer to the illustration for the indication mark location.

If the result is not as specified, replace the No. 1 cooling fan motor.

- Reconnect the No. 1 fan motor connector.

2. INSPECT NO. 1 COOLING FAN MOTOR (w/ Trailer Towing System)

- Disconnect the No. 1 fan connector.
- Connect the battery and an ammeter to the No. 1 fan motor connector.
- Check that the No. 1 fan rotates smoothly, and then check the reading on the ammeter.

Standard amperage

Indication Mark	Motor Type	Condition	Specified Condition
H	240 W	at 20°C (68°F)	18.0 to 22.0 A

HINT:

Refer to the illustration for the indication mark location.

If the result is not as specified, replace the No. 1 cooling fan motor.

- Reconnect the No. 1 fan motor connector.

3. INSPECT NO. 2 COOLING FAN MOTOR (w/o Trailer Towing System)

- Disconnect the No. 2 fan connector.
- Connect the battery and an ammeter to the No. 2 fan motor connector.
- Check that the No. 2 fan rotates smoothly, and then check the reading on the ammeter.

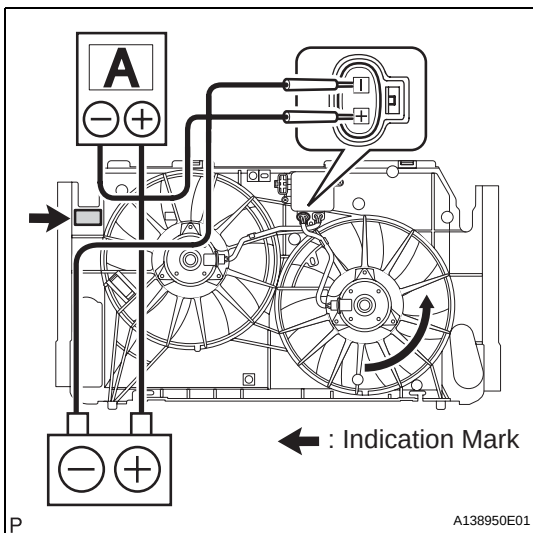
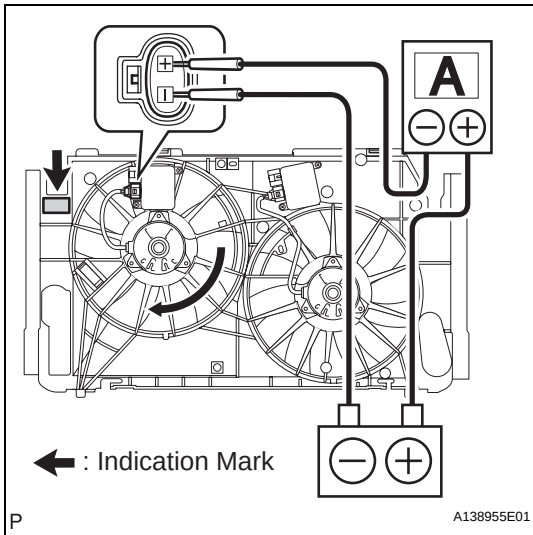
Standard amperage

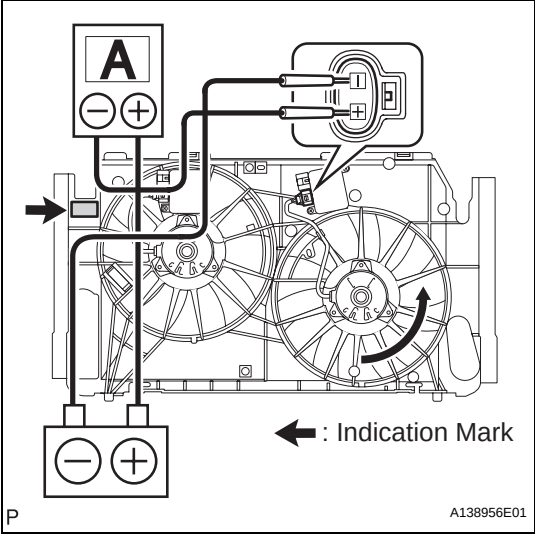
Indication Mark	Motor Type	Condition	Specified Condition
E	160 W	at 20°C (68°F)	11.8 to 14.8 A

HINT:

Refer to the illustration for the indication mark location.

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





(d) Reconnect the No. 2 fan motor connector.

4. **INSPECT NO. 2 COOLING FAN MOTOR (w/ Trailer Towing System)**

- (a) Disconnect the No. 2 fan connector.
- (b) Connect the battery and an ammeter to the No. 2 fan motor connector.
- (c) Check that the No. 2 fan rotates smoothly, and then check the reading on the ammeter.

Standard amperage

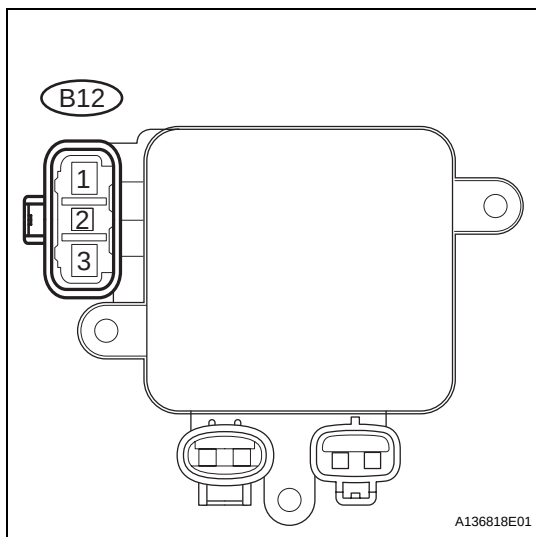
Indication Mark	Motor Type	Condition	Specified Condition
H	240 W	at 20°C (68°F)	18.0 to 22.0 A

HINT:

Refer to the illustration for the indication mark location.

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

- (d) Reconnect the No. 2 fan motor connector.



COOLING FAN ECU

ON-VEHICLE INSPECTION

1. CHECK COOLING FAN ECU (w/o Trailer Towing System)

- Disconnect the B12 ECU connector.
- Measure the voltage and resistance of the wire harness side connector.

Standard voltage

Tester Connection	Condition	Specified Condition
B12-3 (+B) - Body ground	Ignition switch ON	9 to 14 V

Standard resistance

Tester Connection	Condition	Specified Condition
B12-1 (E1) - Body ground	Always	Below 1 Ω

If the result is not as specified, inspect the power source system (fusible link, fuse, wire harness and relay).

- Connect the B12 ECU connector.

2. CHECK COOLING FAN ECU (w/ Trailer Towing System)

- Disconnect the B10 and B11 ECU connector.
- Measure the voltage and resistance of the wire harness side connector.

Standard voltage

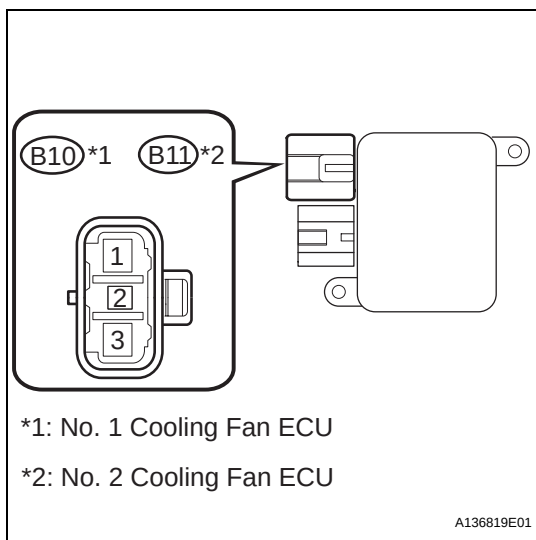
Tester Connection	Condition	Specified Condition
B10-1 (+B1) - Body ground	Ignition switch ON	9 to 14 V
B11-1 (+B2) - Body ground	Ignition switch ON	9 to 14 V

Standard resistance

Tester Connection	Condition	Specified Condition
B10-3 (E1) - Body ground	Always	Below 1 Ω
B11-3 (E2) - Body ground	Always	Below 1 Ω

If the result is not as specified, inspect the power source system (fusible link, fuse, wire harness and relay).

- Connect the B10 and B11 ECU connector.



*1: No. 1 Cooling Fan ECU

*2: No. 2 Cooling Fan ECU

COOLING FAN RELAY

ON-VEHICLE INSPECTION

1. DISCONNECT CABLE FROM NEGATIVE BATTERY TERMINAL

CAUTION:

Wait at least 90 seconds after disconnecting the cable from the negative (-) battery terminal to prevent airbag and seat belt pretensioner activation.

2. REMOVE ENGINE ROOM NO. 2 RELAY BLOCK COVER

3. INSPECT NO. 1 FAN RELAY (Marking: FAN NO. 1)

- (a) Remove the relay from the engine room No. 2 relay block.
(b) Measure the resistance of the relay.

Standard resistance

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

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

- (c) Install the relay.

4. INSPECT NO. 2 FAN RELAY (Marking: FAN NO. 2)

- (a) Remove the relay from the engine room No. 2 relay block.
(b) Measure the resistance of the relay.

Standard resistance

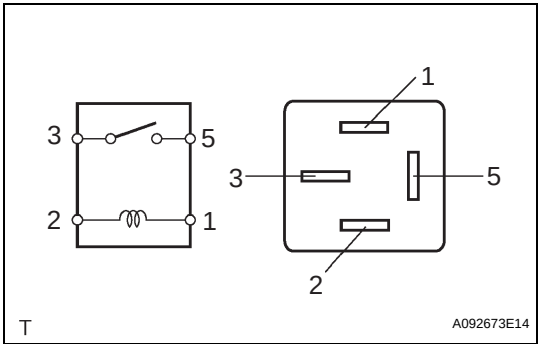
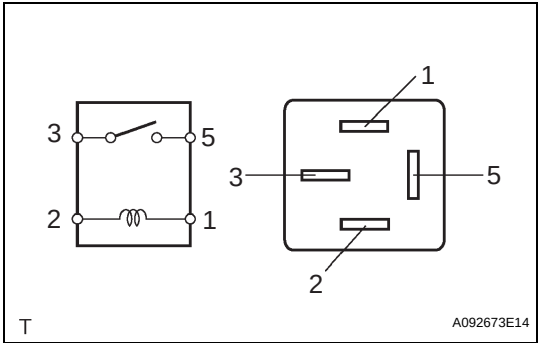
Tester Connection	Specified Condition
3 - 5	10 Ω or higher
3 - 5	Below 1 Ω (when battery voltage is applied to terminals 1 and 2)

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

- (c) Install the relay.

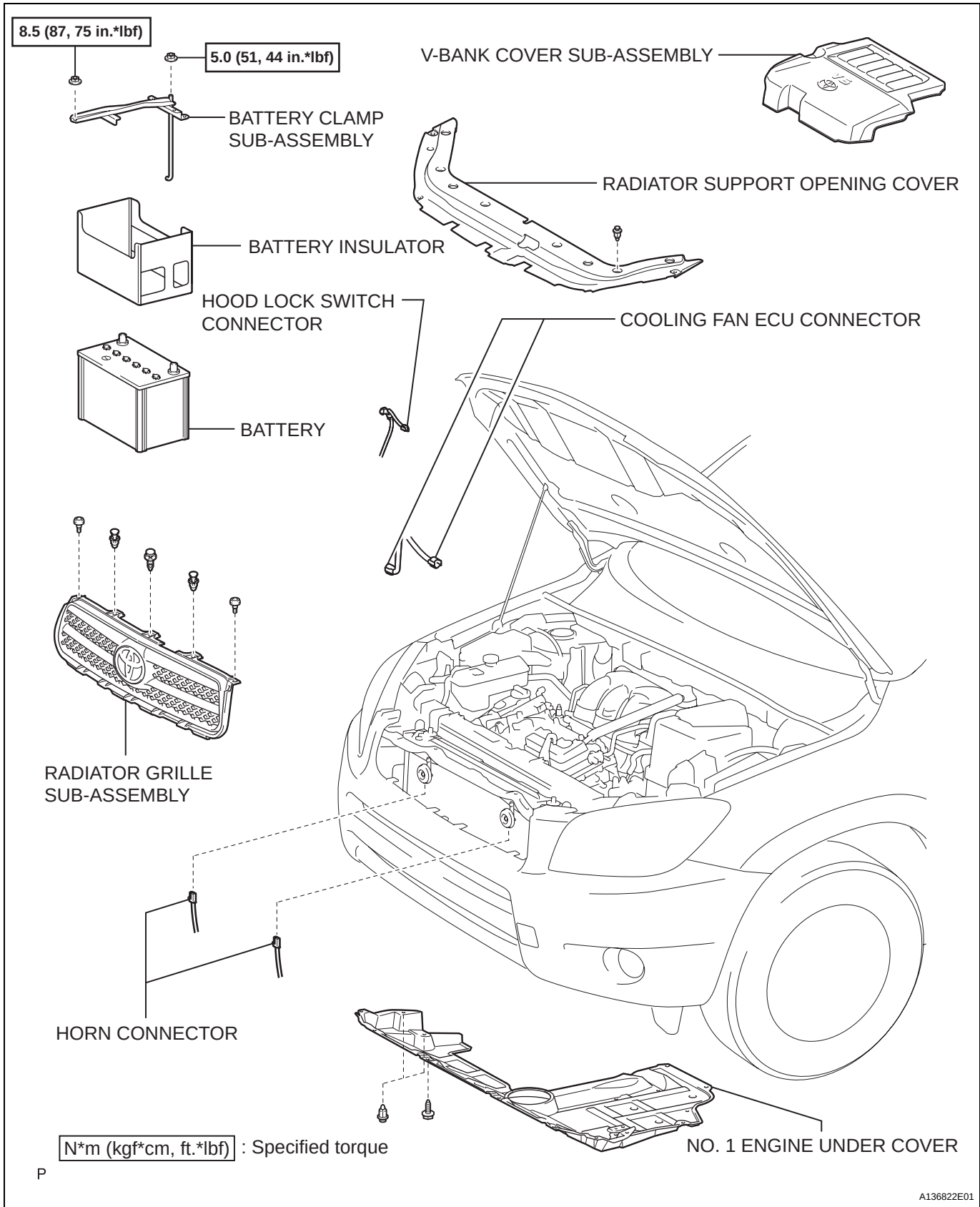
5. INSTALL ENGINE ROOM NO. 2 RELAY BLOCK COVER

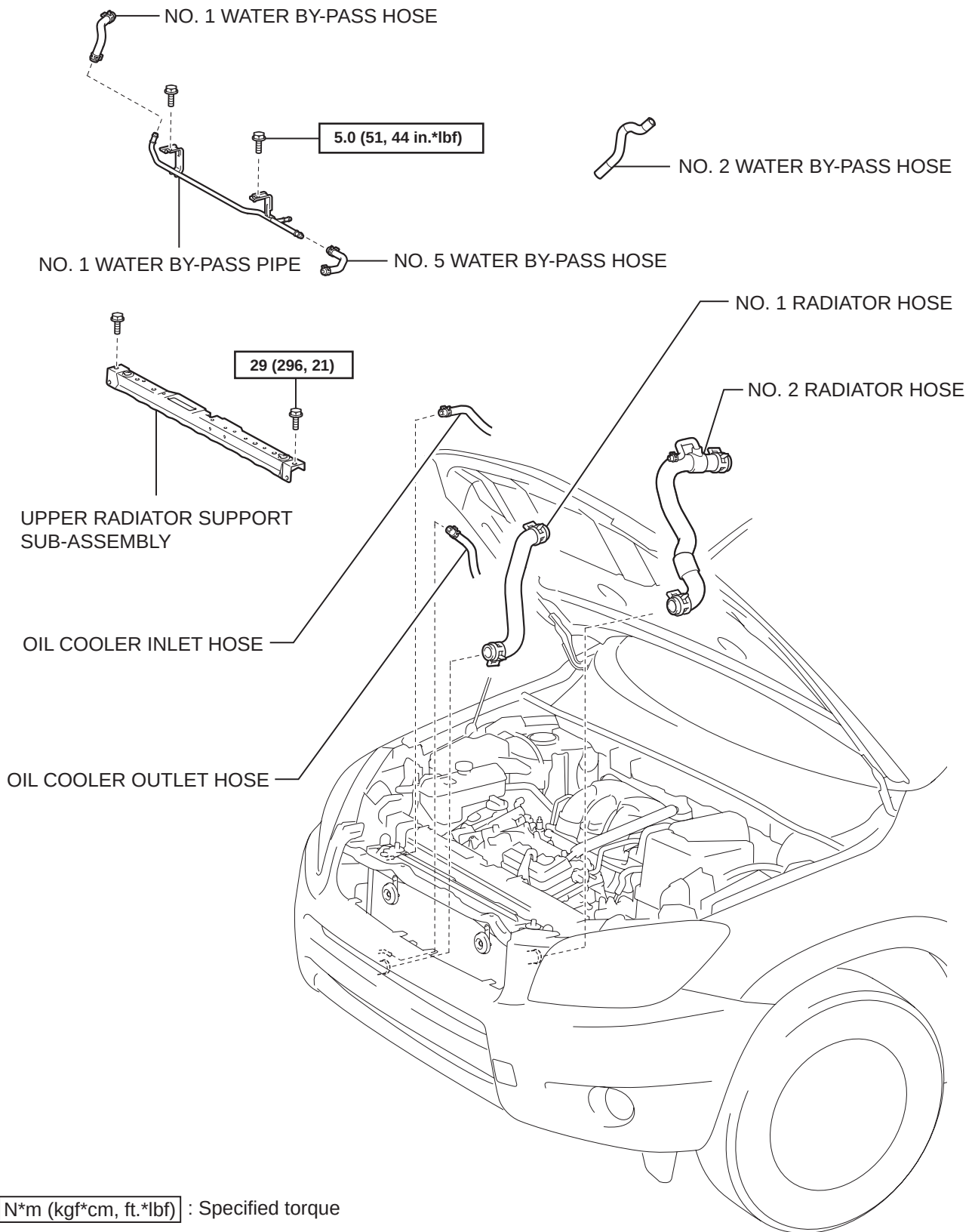
6. CONNECT CABLE TO NEGATIVE BATTERY TERMINAL



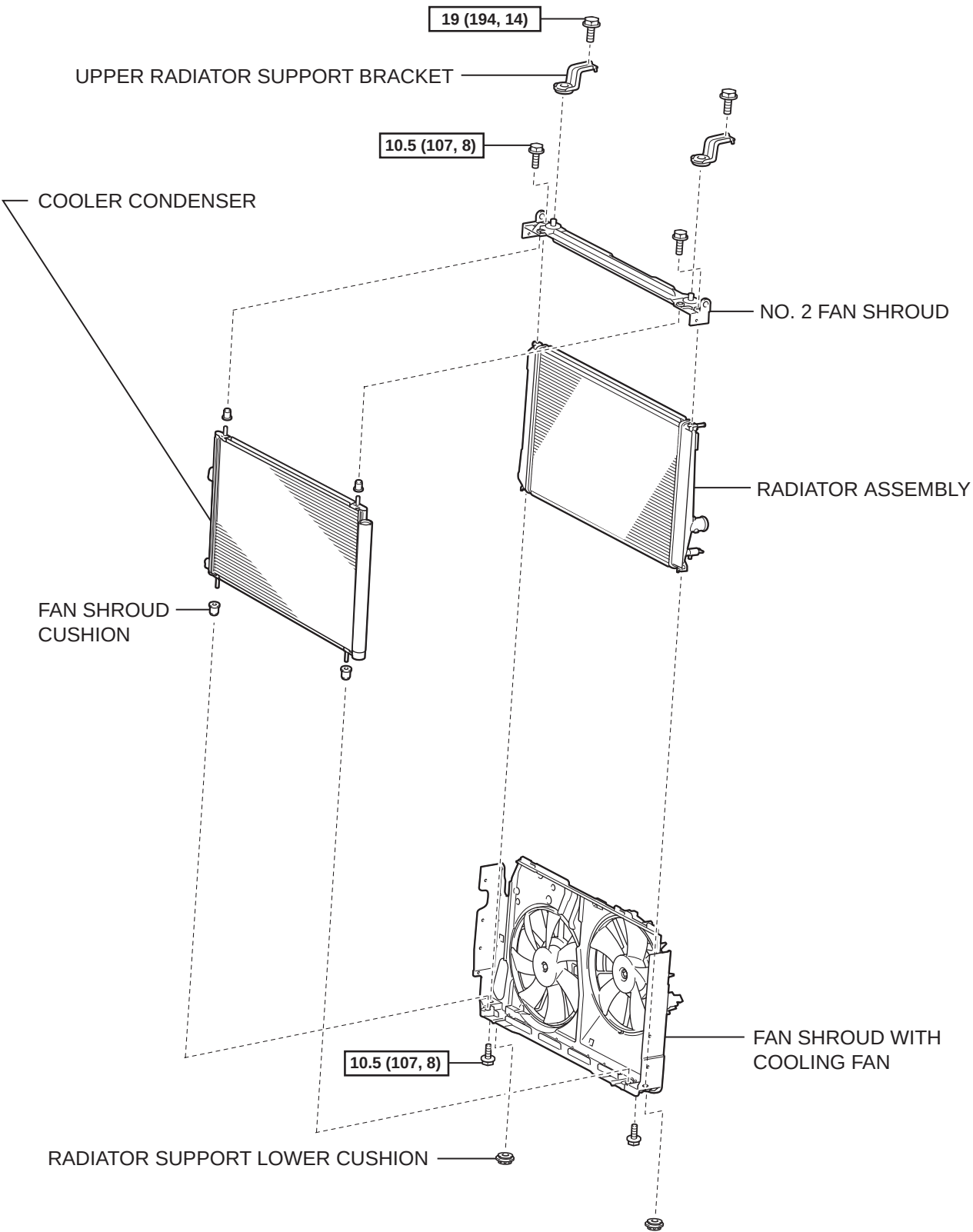
RADIATOR

COMPONENTS

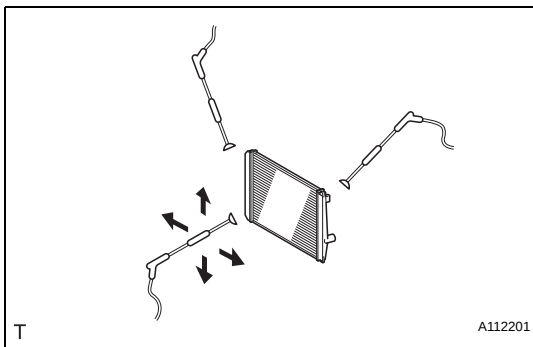
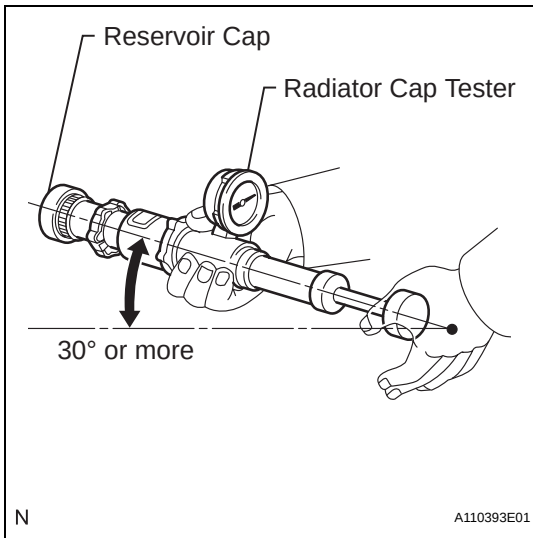
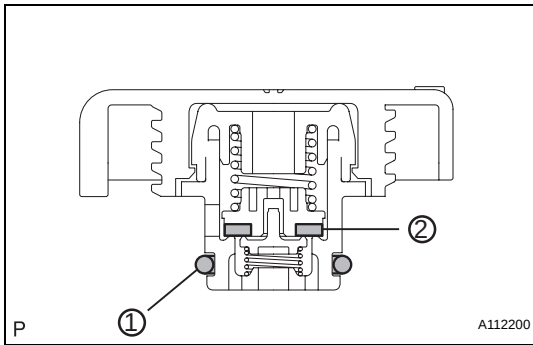




CO



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



ON-VEHICLE INSPECTION

1. CHECK RADIATOR RESERVOIR CAP SUB-ASSEMBLY

- (a) Measure the valve opening pressure.
 - (1) If there are water stains or foreign matter on O-ring 1, clean it with water and finger scouring.
 - (2) Check that O-ring 1 is not deformed, cracked or swollen.
 - (3) Apply engine coolant to O-ring 1 and rubber packing 2 before using a radiator cap tester.
 - (4) When using the cap tester, tilt it more than 30°.
 - (5) 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 (for brand-new cap)	93.3 to 122.7 kPa (0.95 to 1.25 kgf/cm ² , 13.5 to 17.8 psi)
Minimum standard value (after using cap)	78.5 kPa (0.8 kgf/cm ² , 11.4 psi)

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

ON-VEHICLE CLEANING

1. INSPECT RADIATOR ASSEMBLY

- (a) Check that the radiator and condenser are not blocked with leaves, dirt, or insects. Clean the hose connections.

If the fins are blocked, wash them with water or a steam cleaner.

NOTICE:

- If the distance between the steam cleaner and core is too close, the fins may be damaged.
- Keep the following injection distance.

Standard injection distance

Injection Pressure	Specified Condition
2,942 to 4,903 kPa (30 to 50 kgf/cm ² , 427 to 711 psi)	300 mm (11.81 in.)
4,903 to 7,845 kPa (50 to 80 kgf/cm ² , 711 to 1,138 psi)	500 mm (19.69 in.)

- If the fins are bent, straighten them with a screwdriver or pliers.
 - Never apply water directly onto the electronic components.
- (b) Dry the fins with compressed air.