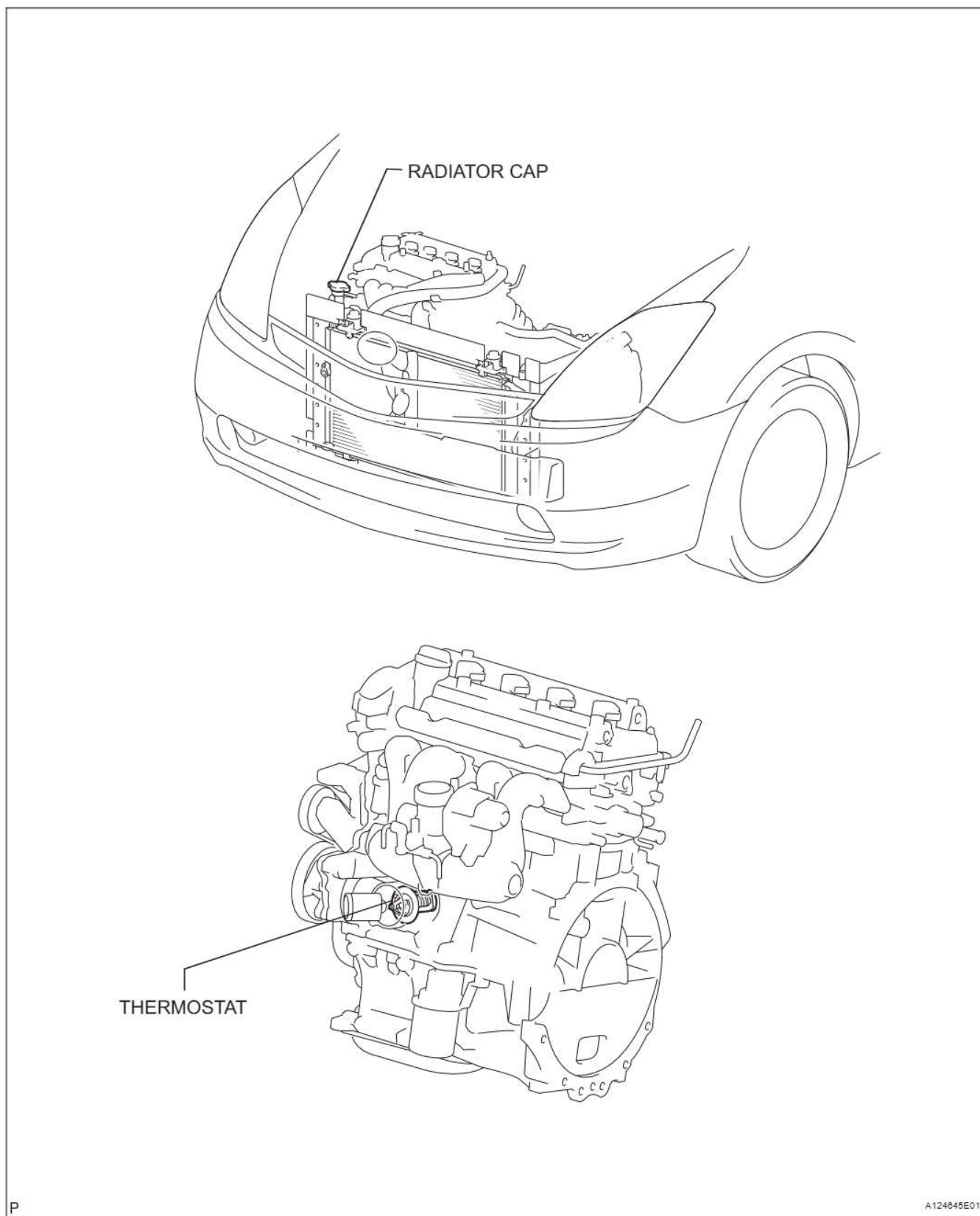


COOLING SYSTEM

PARTS LOCATION



CO

CO-2

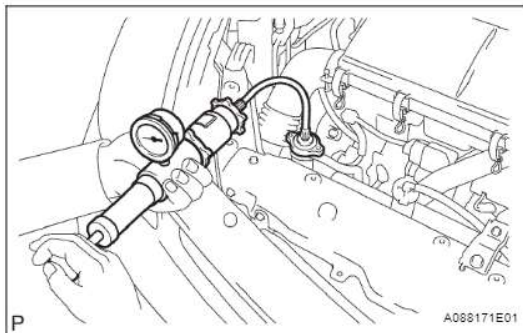
1NZ-FXE COOLING – COOLING SYSTEM

ON-VEHICLE INSPECTION

1. CHECK COOLING SYSTEM FOR LEAKS

CAUTION:

Do not remove the radiator cap while the engine and radiator are still hot. Pressurized, hot engine coolant and steam may be released and cause serious burns.



- (a) Fill the radiator with coolant and attach a radiator cap tester.
- (b) Warm up the engine.
- (c) Using the radiator cap tester, increase the pressure inside the radiator to 177 kPa (1.8 kgf/cm², 25.6 psi), and check that the pressure does not drop. If the pressure drops, check the hoses, radiator and water pump for leaks. If no external leaks are found, check the cylinder block and head.

2. CHECK ENGINE COOLANT LEVEL IN RESERVOIR

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

NOTICE:

Never use water as a substitute for engine coolant.

3. CHECK ENGINE COOLANT QUALITY

- (a) Remove the radiator cap.
CAUTION:
Do not remove the radiator cap while the engine and radiator are still hot. Pressurized, hot engine coolant and steam may be released and cause serious burns.
- (b) Check if there are excessive deposits of rust or scale around the radiator cap and radiator filler hole. Also, the coolant should be free of oil. If excessively dirty, replace the coolant.
- (c) Install the radiator cap.

CO

COOLING FAN SYSTEM

PARTS LOCATION

ENGINE COOLANT TEMPERATURE SENSOR

COOLING FAN MOTOR

ENGINE ROOM RELAY BLOCK, JUNCTION BLOCK

- RDI H-FUSE
- NO. 2 FAN RELAY (Marking: FAN NO. 2)
- CDS FAN FUSE
- NO. 3 FAN RELAY (Marking: FAN NO. 3)
- INTEGRATION RELAY (UNIT C: NO. 1 (FAN NO. 1) RELAY)

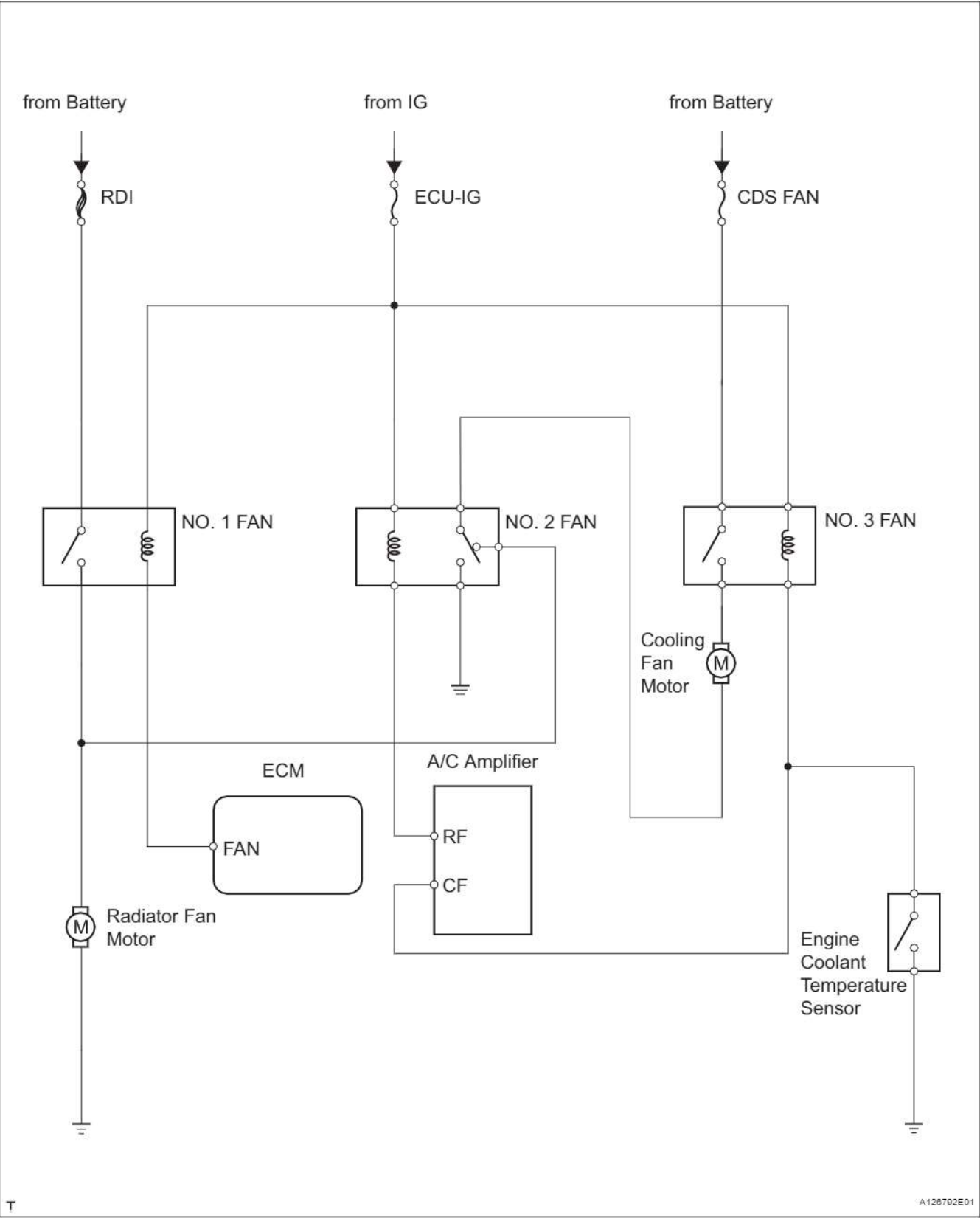
ECM

A/C AMPLIFIER

CO-4

1NZ-FXE COOLING – COOLING FAN SYSTEM

SYSTEM DIAGRAM



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 TEMPERATURE (Below 83°C (181°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 relay and engine coolant temperature sensor, and check if there is a disconnection or circuit open between them.
- (c) Disconnect the engine coolant temperature sensor connector.
- (d) Check that the cooling fan rotates.
If it does not, check the fuses, cooling fan relay, ECM and cooling fan, and check for a short in the 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 TEMPERATURE (Above 93°C (199°F))

- (a) Start the engine, and raise the coolant temperature to above 93°C (199°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 fuses, cooling fan relay, ECM, cooling fan and engine coolant temperature sensor.

3. CHECK COOLING FAN

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

Standard amperage:

9.2 to 11.0 A

- (d) Reconnect the cooling fan connector.

CO

CO-6

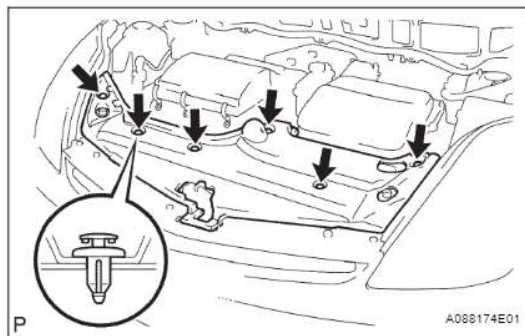
1NZ-FXE COOLING – COOLANT

COOLANT

ON-VEHICLE INSPECTION

CAUTION:

Do not remove the radiator cap while the engine and radiator are still hot. Pressurized, hot engine coolant and steam may be released and cause serious burns.



1. REMOVE RADIATOR SUPPORT OPENING COVER

- (a) Remove the 6 clips and radiator support opening cover.

2. REMOVE ENGINE UNDER COVER LH

3. REMOVE FRONT FENDER LINER LH

- (a) Remove the front part of the front fender liner LH.

4. DRAIN ENGINE COOLANT

- (a) Disconnect the coolant heat storage water pump connector.
- (b) Connect a vinyl hose to the drain cock of the radiator.
- (c) Connect a vinyl hose to the drain cock of the engine.
- (d) Connect a vinyl hose to the drain cock of the coolant heat storage tank.

CAUTION:

If the tank has any malfunctions, the tank surface becomes hot. To prevent injuries from burns, do not touch the tank.

- (e) Loosen the drain cock plugs of the radiator, engine and coolant heat storage tank, then drain the coolant.

CAUTION:

Even if the engine is cold, the coolant in the coolant heat storage tank is still hot. Be careful of the hot coolant when draining it.

HINT:

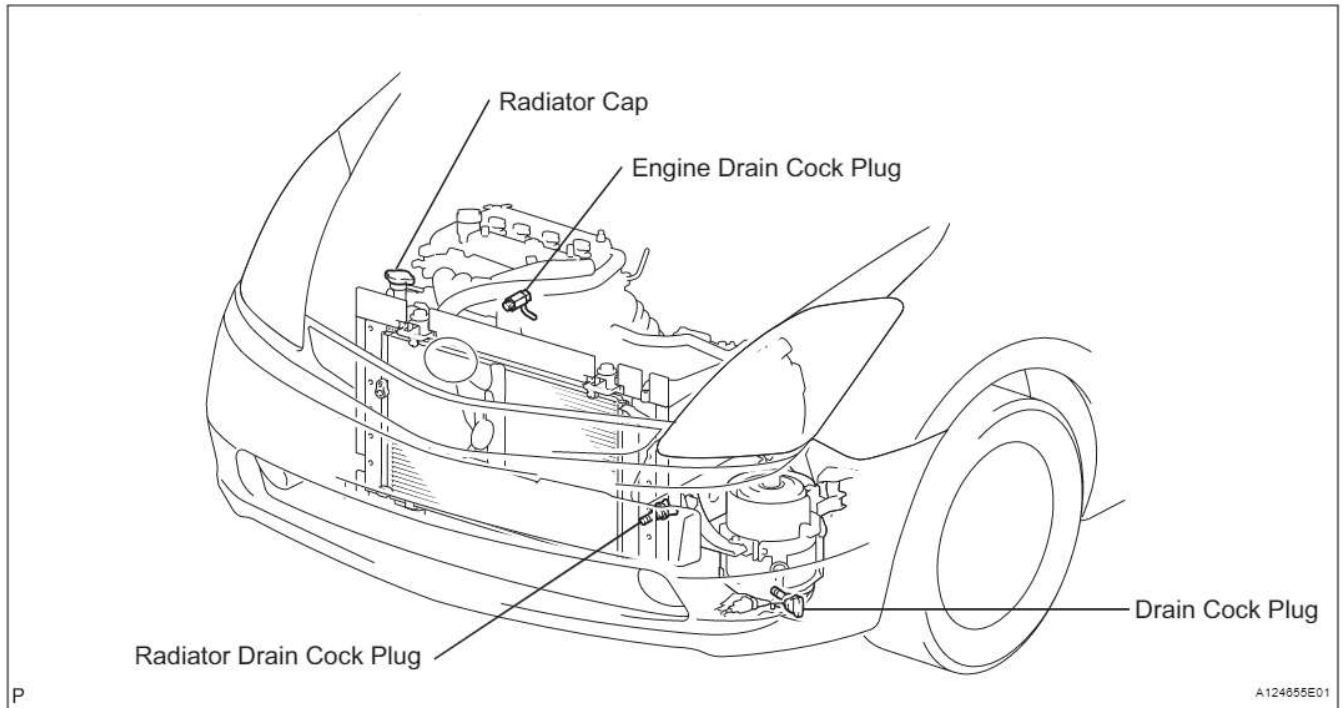
Record the amount of the drained coolant. It will be referred to when refilling the tank with coolant.

CO

1NZ-FXE COOLING – COOLANT

CO-7

- (f) Remove the radiator cap.



- (g) Drain the coolant in the radiator reservoir.

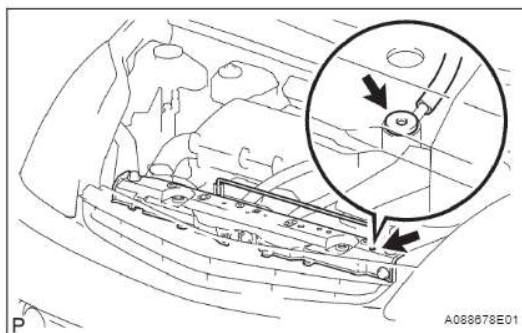
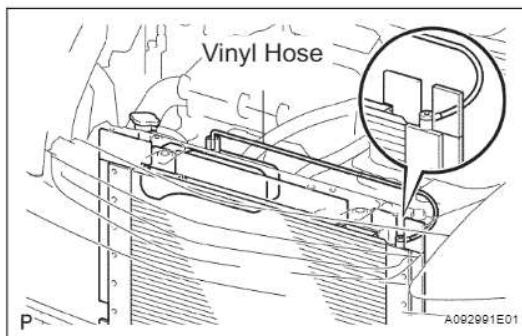
5. ADD ENGINE COOLANT

- (a) Tighten the drain cock plug of the coolant heat storage tank, then disconnect the vinyl hose.
 (b) Tighten the drain cock plug of the engine, then disconnect the vinyl hose.
Torque: 13 N*m (133 kgf*cm, 9.6 ft.*lbf)
 (c) Tighten the drain cock plug of the radiator, then disconnect the vinyl hose.

- (d) Connect a vinyl hose to the bleeder plug of the radiator assembly and the radiator reservoir.

HINT:

Insert the vinyl hose inside the radiator reservoir tank.



- (e) Using a 6 mm socket hexagon wrench, loosen the radiator bleeder plug from the radiator support service hole.
 (f) Fill the radiator with coolant up to the fill port.

Standard capacity:

8.6 liters (9.1 US qts, 7.6 Imp. qts)

HINT:

- When filling coolant, press the radiator hose a few times. If the coolant level goes down, add more coolant.

CO-8

1NZ-FXE COOLING – COOLANT

- Amount of coolant to fill: Approximately 2.4 liters (2.5 US qts, 2.1 Imp. qts)
- Use of improper coolants may damage the engine cooling system.
- Only use "Toyota Super Long Life Coolant", or similar high quality ethylene glycol based non-silicate, non-amine, non-nitrite, and non-borate coolant with long-life hybrid organic acid technology.
- New Toyota vehicles are filled with Toyota Super Long Life Coolant (color is pink, premixed ethylene-glycol concentration is approximately 50% and freezing temperature is -35°C (-31°F)). When replacing the coolant, Toyota Super Long Life Coolant is recommended.
- Observe the coolant level inside the radiator by pressing the inlet and outlet radiator hoses several times by hand. If the coolant level goes down, add more coolant.

NOTICE:

Never use water as a substitute for engine coolant.

- (g) Using a 6 mm socket hexagon wrench, tighten the radiator bleeder plug.
- Torque: 1.5 N*m (15 kgf*cm, 13 in.*lbf)**
- (h) Install the radiator cap.
- (i) Fill the radiator reservoir tank with coolant to the full level.
- (j) Connect the coolant heat storage water pump connector.
- (k) Connect the intelligent tester to the DLC3.
- (l) Turn the power switch ON (IG).
- (m) Select the item:
DIAGNOSIS / ENHANCED OBD II / ACTIVE TEST / WATER PUMP

NOTICE:

- **The water pump motor operates for 30 seconds after WATER PUMP is ON in the ACTIVE TEST mode, then it automatically stops operating.**
- **Do not actuate the water pump motor without coolant filled.**

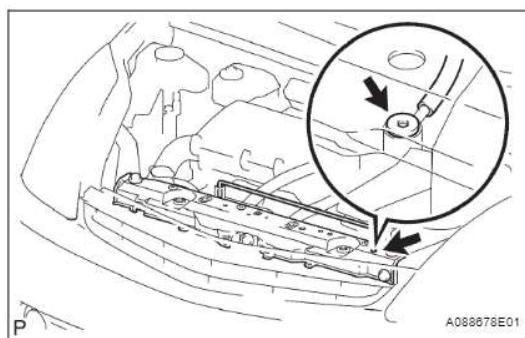
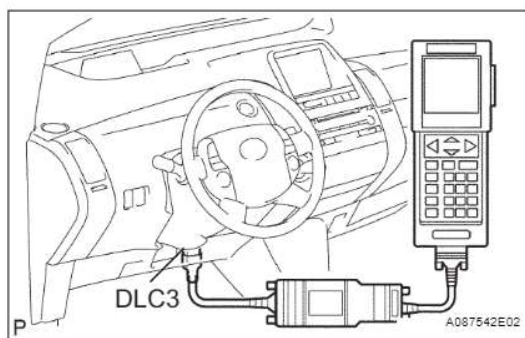
- (n) Using a 6 mm socket hexagon wrench, loosen the radiator bleeder plug from the radiator support service hole.
- (o) Remove the radiator cap, then fill the radiator with coolant up to the fill port.

HINT:

When filling coolant, press the radiator hose a few times. If the coolant level goes down, add more coolant.

- (p) Using a 6 mm socket hexagon wrench, tighten the radiator bleeder plug.

Torque: 1.5 N*m (15 kgf*cm, 13 in.*lbf)



1NZ-FXE COOLING – COOLANT

CO-9

- (q) Install the radiator cap.
- (r) Slowly pour coolant into the radiator reservoir until it reaches the full line.
- (s) Disconnect the vinyl hose between the bleeder plug of the radiator assembly and the radiator reservoir tank.
- (t) Set the vehicle to inspection mode (see page IN-5).
- (u) Warm up the engine until the thermostat is open.
- (v) Stop the engine, then wait until the coolant becomes cold. Remove the radiator cap and check the coolant level.

CAUTION:

If the engine or radiator is hot, do not remove the radiator cap.

If the coolant level is lower, add coolant again. Warm up the engine, then check the coolant level.

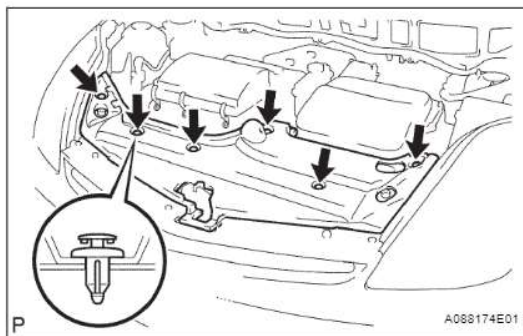
- (w) When the coolant level stops going down, add coolant to the radiator reservoir tank up to the full level.

6. CHECK FOR ENGINE COOLANT LEAKS

- (a) Fill the radiator with engine coolant and attach a radiator cap tester.
- (b) Pump the tester to 137 kPa (1.4 kgf/cm², 19.9 psi) and check for leakage.

7. INSTALL FRONT FENDER LINER LH**8. INSTALL ENGINE UNDER COVER LH****9. INSTALL RADIATOR SUPPORT OPENING COVER**

- (a) Install the opening cover with the 6 clips.



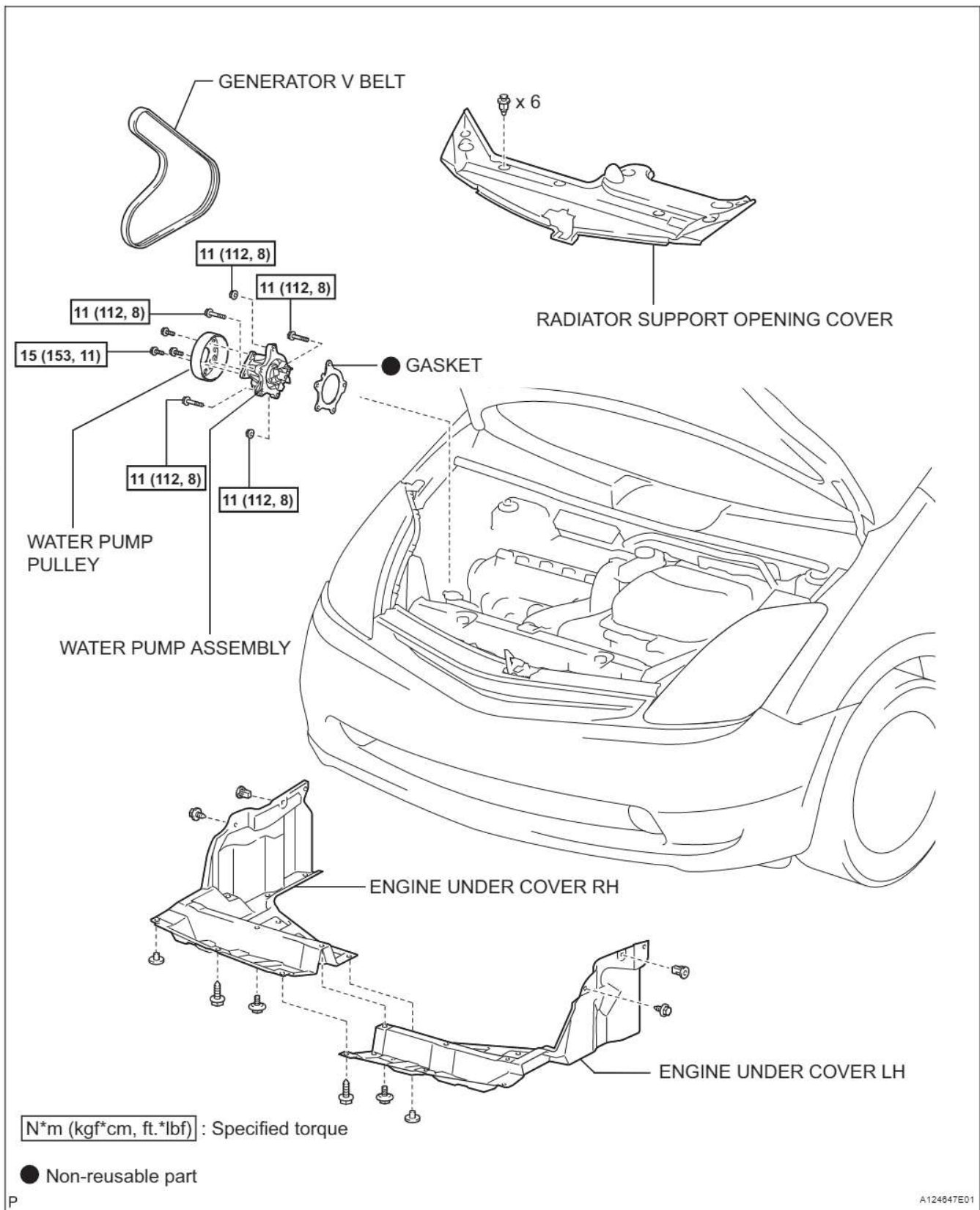
CO

CO-10

1NZ-FXE COOLING – WATER PUMP

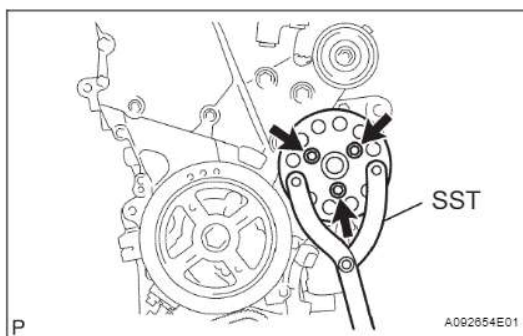
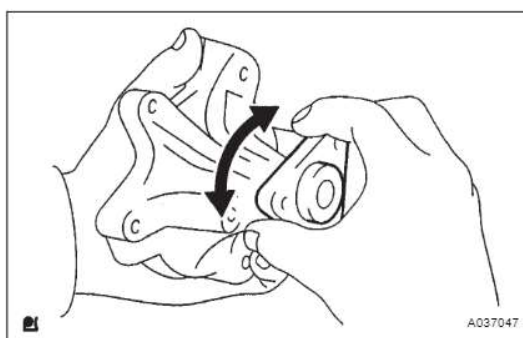
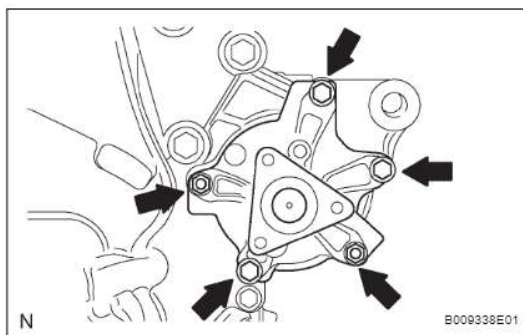
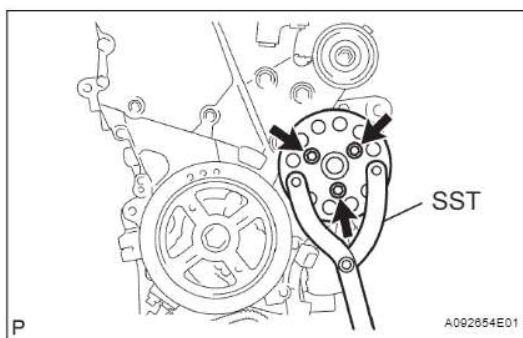
WATER PUMP

COMPONENTS



REMOVAL

1. REMOVE RADIATOR SUPPORT OPENING COVER (See page [CO-6](#))
2. REMOVE ENGINE UNDER COVER LH
3. REMOVE ENGINE UNDER COVER RH
4. DRAIN ENGINE COOLANT (See page [CO-6](#))
5. REMOVE GENERATOR V BELT (See page [EM-6](#))
6. REMOVE ENGINE MOUNTING INSULATOR SUB-ASSEMBLY RH (See page [EM-32](#))
7. REMOVE WATER PUMP PULLEY
 - (a) Using SST, hold the pump pulley.
SST 09960-10010 (09962-01000, 09963-00600)
 - (b) Remove the 3 bolts and pump pulley.



8. REMOVE WATER PUMP ASSEMBLY
 - (a) Remove the 3 bolts and 2 nuts.
 - (b) Remove the water pump and gasket.

INSPECTION

1. INSPECT WATER PUMP ASSEMBLY
 - (a) Visually check the water hole and air hole for coolant leakage.
If leakage is found, replace the water pump assembly.
 - (b) Turn the pulley, and check that the pump bearing moves smoothly and quietly.
If it moves roughly or noisily, replace the water pump assembly.

INSTALLATION

1. INSTALL WATER PUMP ASSEMBLY
 - (a) Install a new gasket and the water pump with the 3 bolts and 2 nuts.
Torque: 11 N*m (112 kgf*cm, 8 ft.*lbf)
2. INSTALL WATER PUMP PULLEY
 - (a) Using SST, install the pump pulley with the 3 bolts.
SST 09960-10010 (09962-01000, 09963-00600)
Torque: 15 N*m (153 kgf*cm, 11 ft.*lbf)

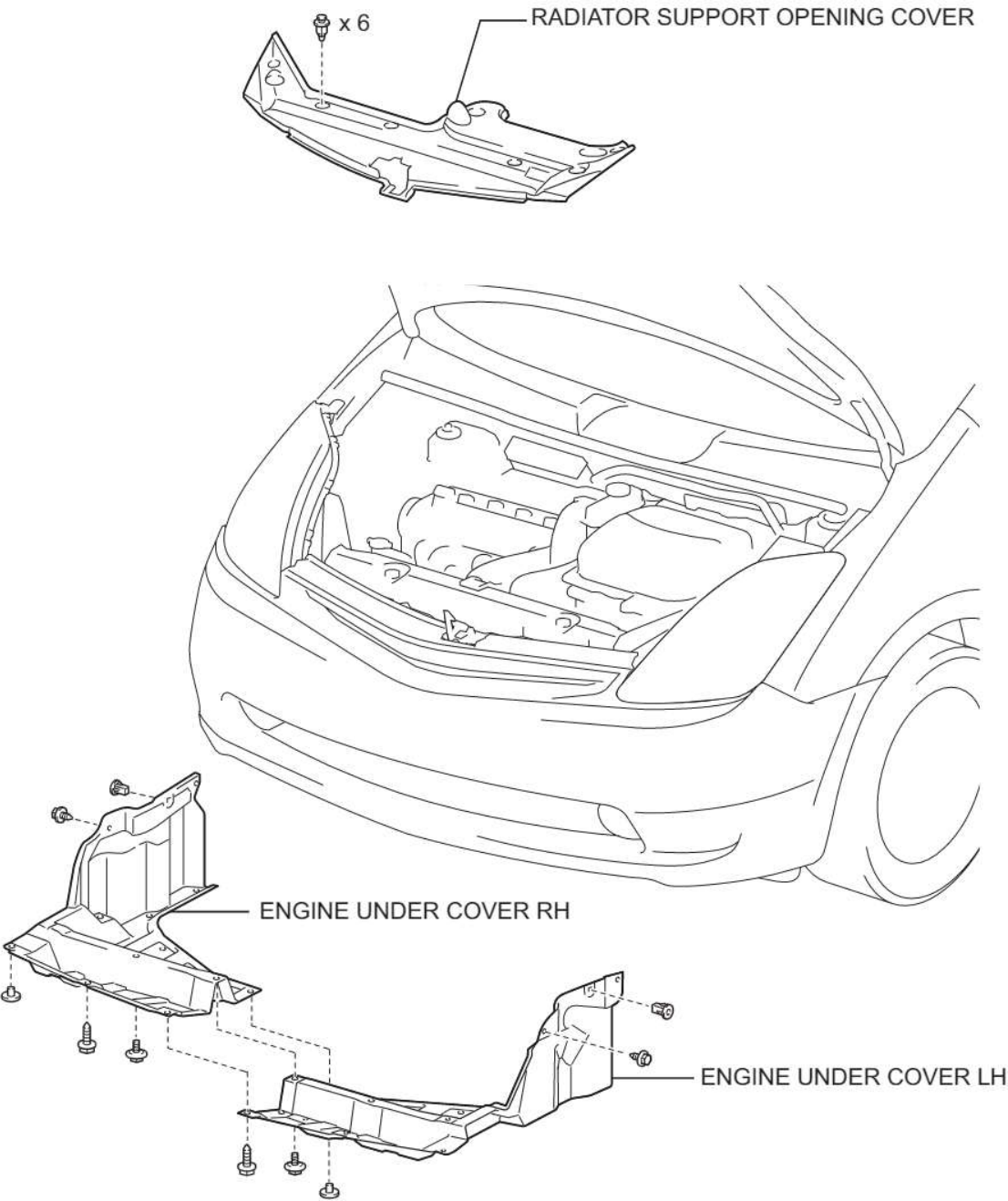
CO-12**1NZ-FXE COOLING – WATER PUMP**

3. **INSTALL ENGINE MOUNTING INSULATOR SUB-ASSEMBLY RH** (See page [EM-38](#))
4. **INSTALL GENERATOR V BELT** (See page [EM-6](#))
5. **ADJUST GENERATOR V BELT** (See page [EM-6](#))
6. **ADD ENGINE COOLANT** (See page [CO-7](#))
7. **CHECK FOR ENGINE COOLANT LEAKS** (See page [CO-9](#))
8. **INSTALL ENGINE UNDER COVER RH**
9. **INSTALL ENGINE UNDER COVER LH**
10. **INSTALL RADIATOR SUPPORT OPENING COVER** (See page [CO-9](#))

CO

THERMOSTAT
COMPONENTS

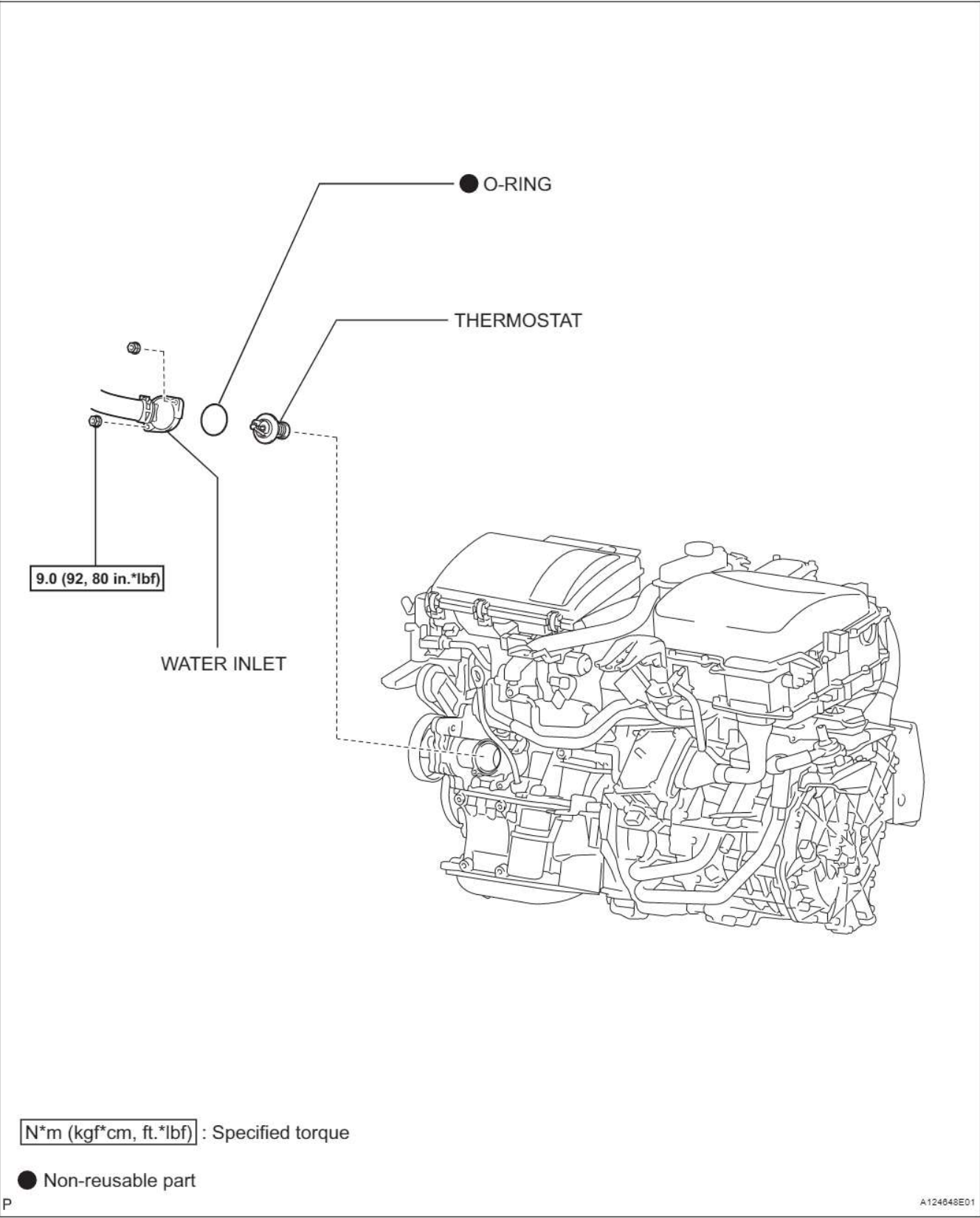
CO



CO-14

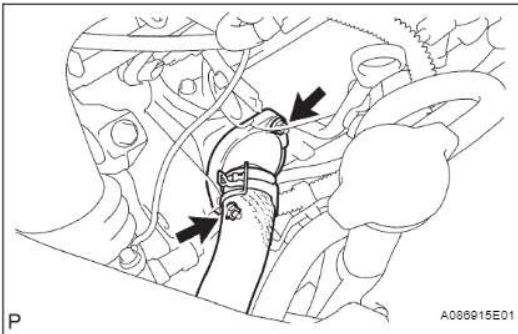
1NZ-FXE COOLING – THERMOSTAT

CO

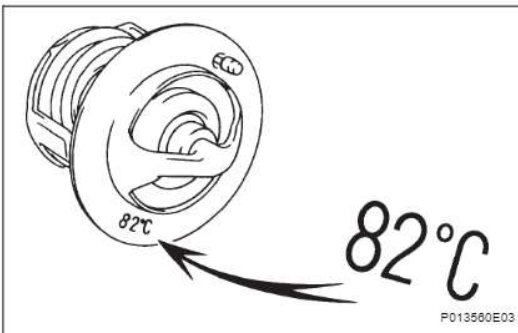
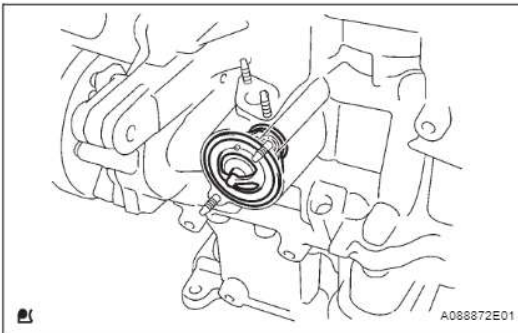


REMOVAL

1. REMOVE RADIATOR SUPPORT OPENING COVER
(See page [CO-6](#))
2. REMOVE ENGINE UNDER COVER LH
3. REMOVE ENGINE UNDER COVER RH
4. DRAIN ENGINE COOLANT (See page [CO-6](#))
5. REMOVE WATER INLET
 - (a) Remove the 2 nuts and disconnect the water inlet from the cylinder block.



6. REMOVE THERMOSTAT
 - (a) Remove the thermostat.
 - (b) Remove the gasket from the thermostat.



INSPECTION

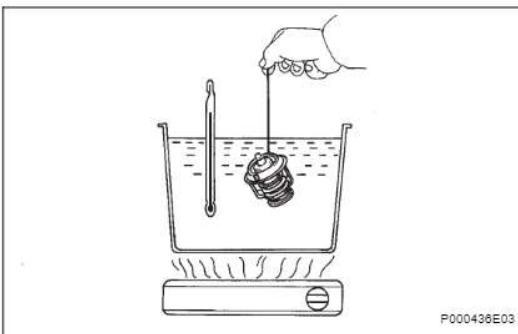
1. INSPECT THERMOSTAT
HINT:
The valve opening temperature is inscribed on the thermostat.

- (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:

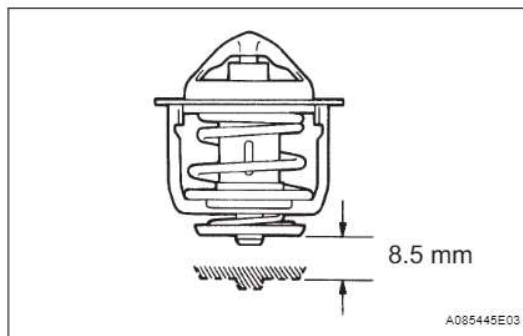
80 to 84°C (176 to 183°F)

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



CO-16

1NZ-FXE COOLING – THERMOSTAT



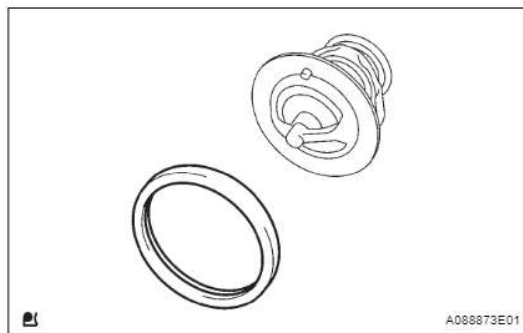
- (c) Check the valve lift.

Standard valve lift:

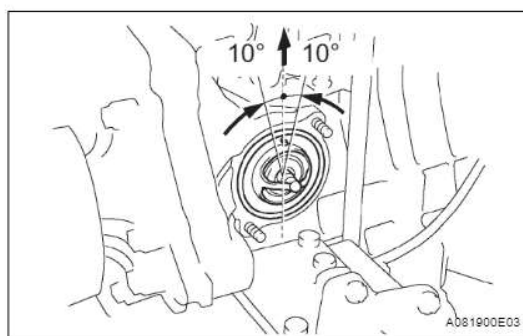
8.5 mm (0.338 in.) or more at 95°C (203°F)

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

- (d) Check that the valve is fully closed when the thermostat temperature is below 77°C (171°F).
If not fully closed, replace the thermostat.

**INSTALLATION****1. INSTALL THERMOSTAT**

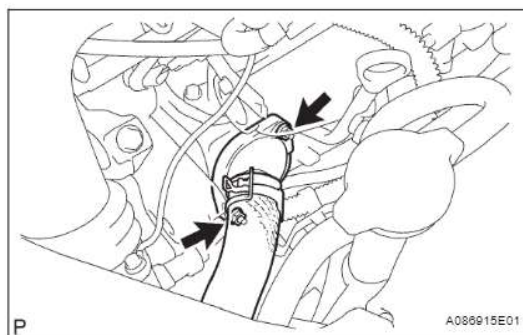
- (a) Install a new gasket to the thermostat.



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

HINT:

The jiggle valve may be set within 10° of either side as shown in the illustration.

**2. INSTALL WATER INLET**

- (a) Install the water inlet to the cylinder block with the 2 nuts.

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

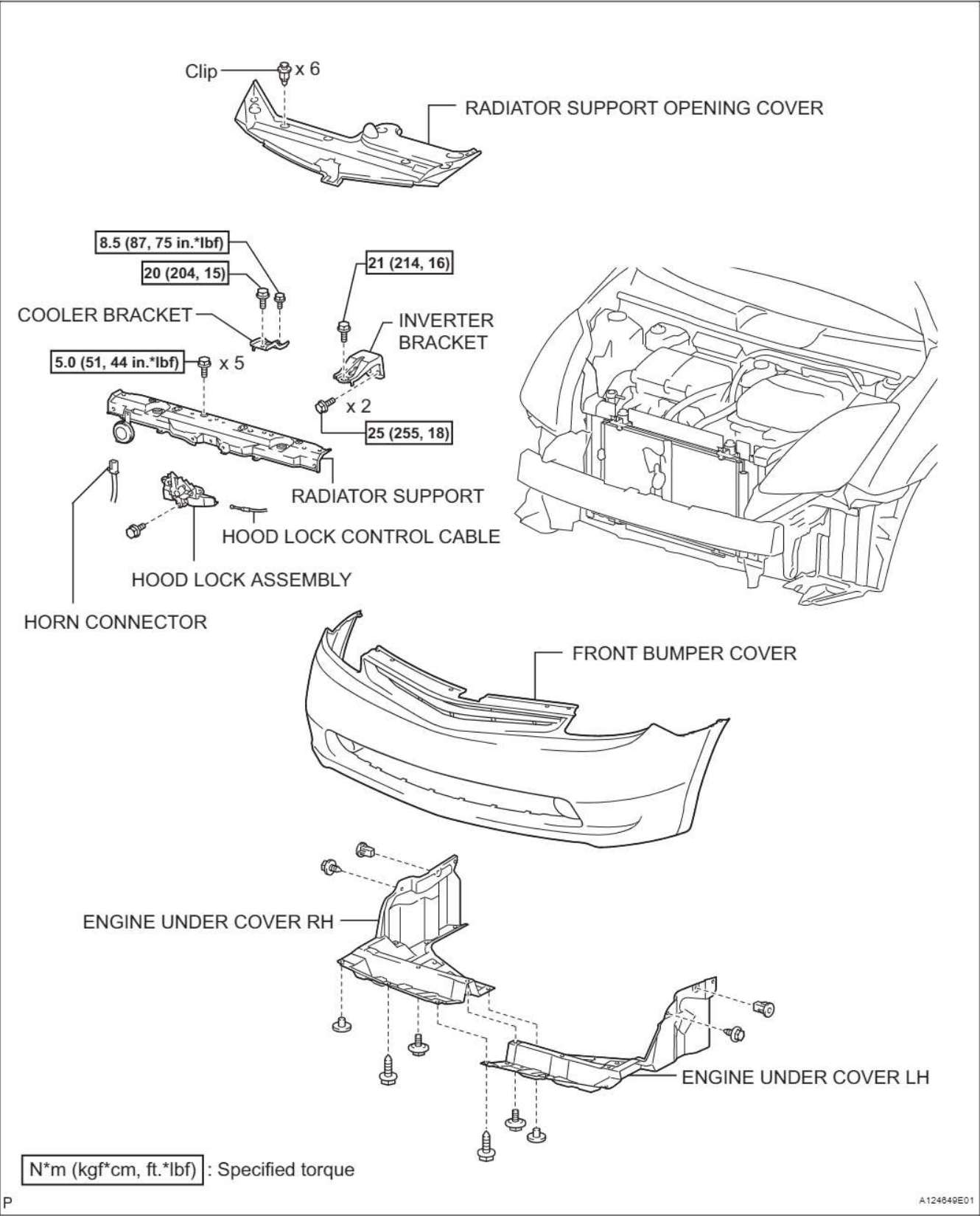
NOTICE:

Ensure that the gasket is not stuck between the water inlet and cylinder block.

3. ADD ENGINE COOLANT (See page CO-7)**4. CHECK FOR ENGINE COOLANT LEAKS (See page CO-9)****5. INSTALL ENGINE UNDER COVER RH****6. INSTALL ENGINE UNDER COVER LH****7. INSTALL RADIATOR SUPPORT OPENING COVER (See page CO-9)**

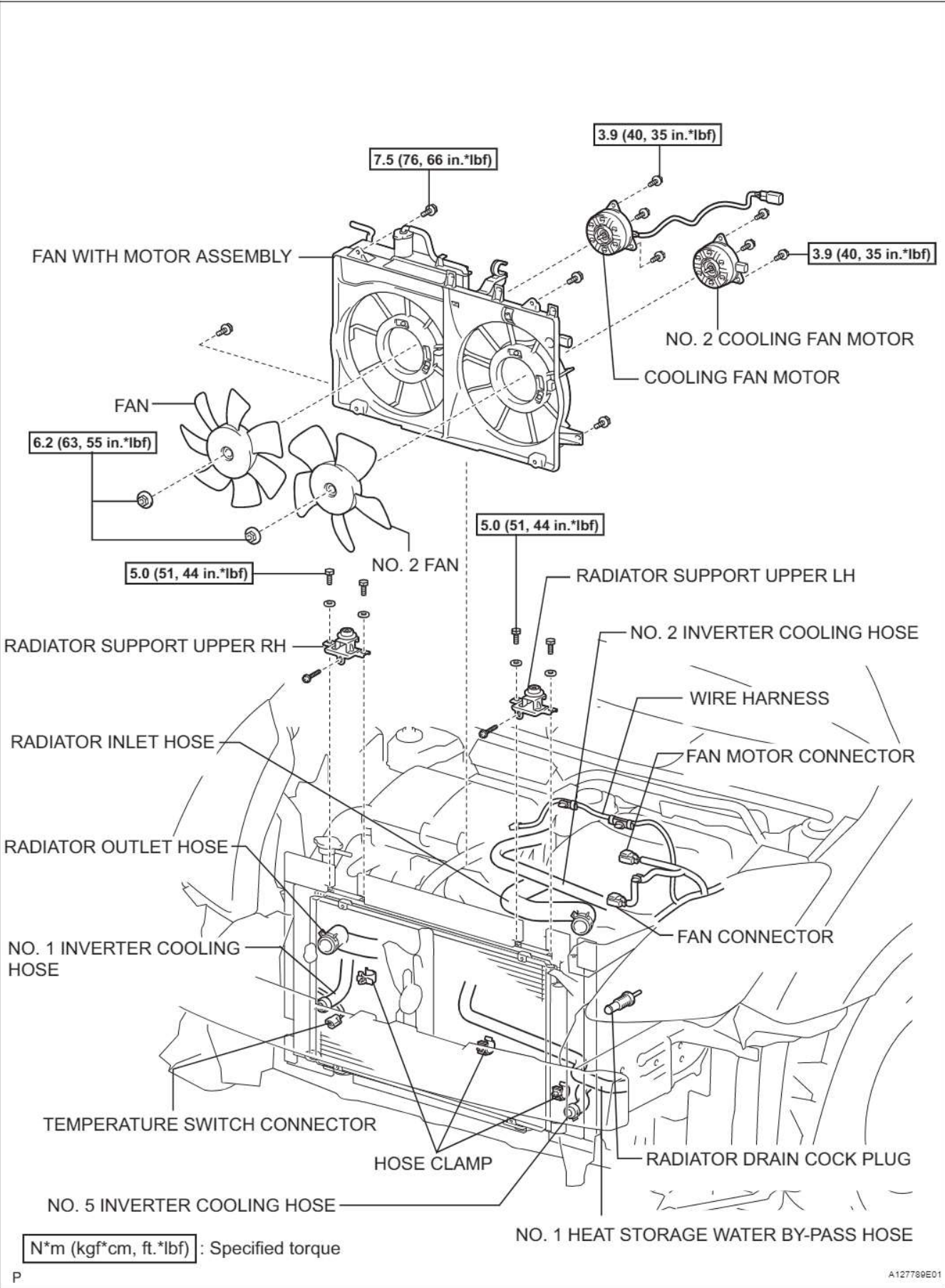
FAN

COMPONENTS



CO-18

1NZ-FXE COOLING – FAN



REMOVAL

1. REMOVE REAR NO. 2 FLOOR BOARD (See page [CH-4](#))
2. REMOVE REAR DECK FLOOR BOX (See page [CH-4](#))
3. REMOVE REAR NO. 3 FLOOR BOARD (See page [CH-4](#))

4. DISCONNECT CABLE FROM BATTERY NEGATIVE TERMINAL

CAUTION:

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

5. REMOVE RADIATOR SUPPORT OPENING COVER (See page [CO-6](#))

6. REMOVE ENGINE UNDER COVER LH

7. REMOVE ENGINE UNDER COVER RH

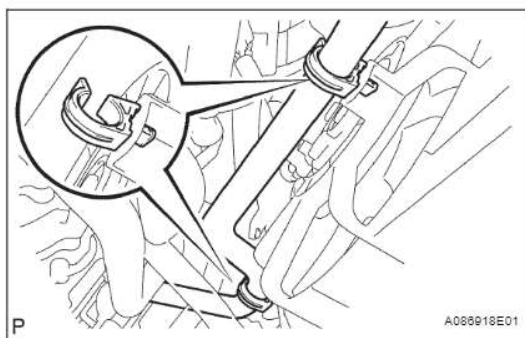
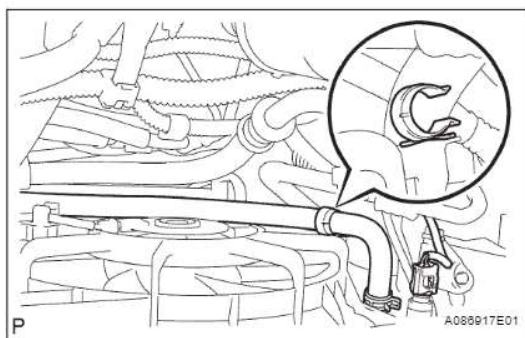
8. DRAIN ENGINE COOLANT

- (a) Drain the coolant in the radiator on the engine side (see page [CO-6](#)).
- (b) After draining the coolant in the radiator on the engine side, remove the radiator drain cock plug.
- (c) Drain the coolant in the radiator on the hybrid side (see page [HX-58](#)).

9. REMOVE FRONT BUMPER COVER (See page [ET-4](#))

10. REMOVE FAN WITH MOTOR ASSEMBLY

- (a) Disconnect the connector and hose shown in the illustration.
- (b) After disconnecting the hose, remove the hose clamp.

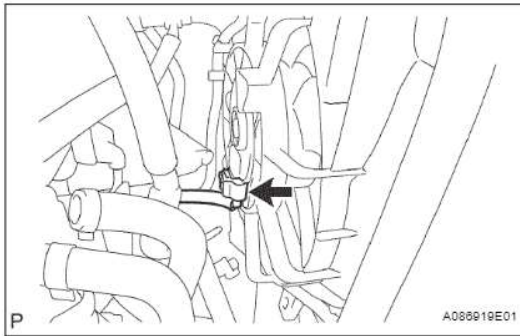


- (c) Disconnect the hose shown in the illustration.
- (d) After disconnecting the hose, remove the 2 hose clamps.

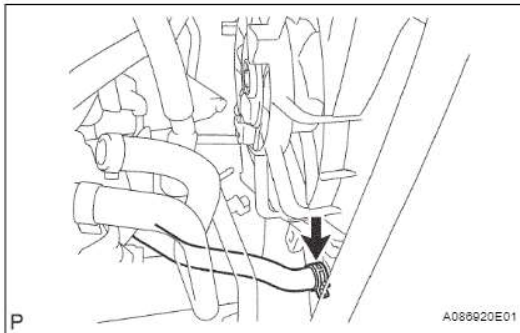
CO

CO-20

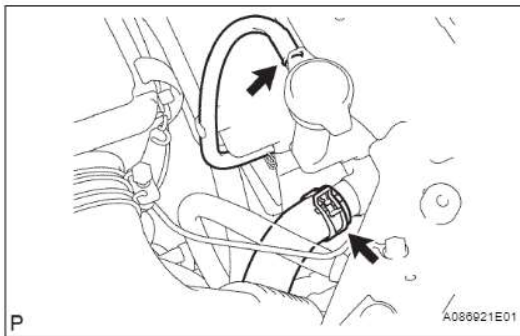
1NZ-FXE COOLING – FAN



(e) Disconnect the connector shown in the illustration.

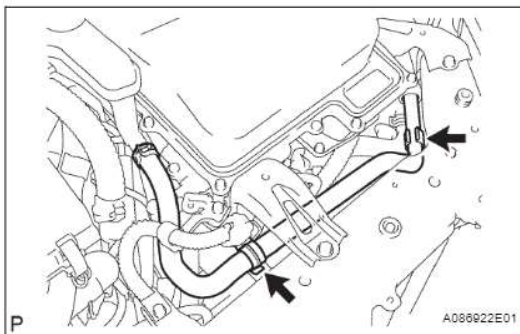


(f) Disconnect the hose shown in the illustration.

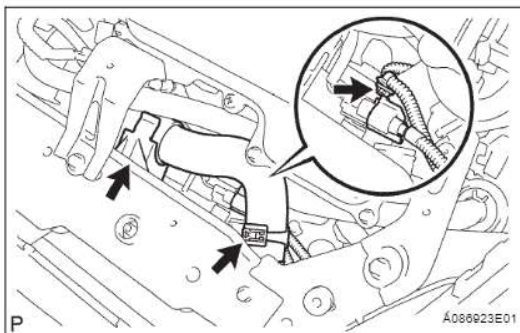


(g) Disconnect the radiator outlet hose.

(h) Disconnect the radiator reservoir hose.



(i) Disconnect the inverter reservoir hose from the clamps.

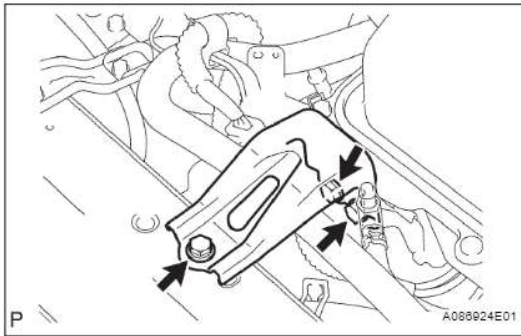


(j) Disconnect the radiator inlet hose.

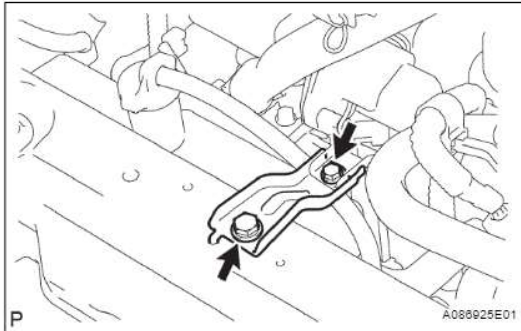
(k) Disconnect the connector and remove the clamp shown in the illustration.

1NZ-FXE COOLING – FAN

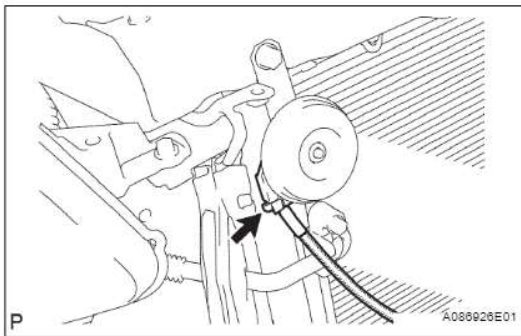
CO-21



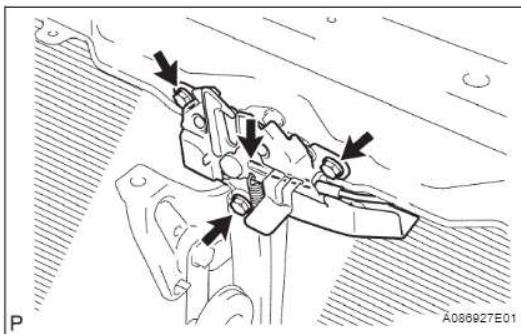
(l) Remove the 3 bolts and inverter bracket.



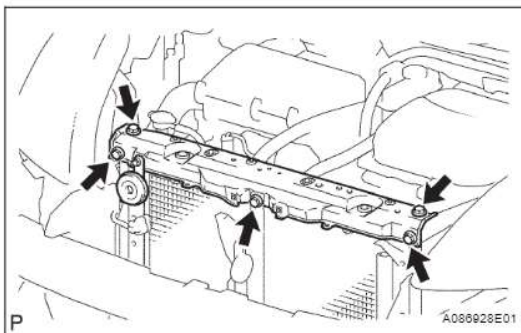
(m) Remove the 2 bolts and cooler bracket.



(n) Disconnect the horn connector shown in the illustration.



(o) Remove the 3 bolts, disconnect the hood lock control cable, and then remove the hood lock.



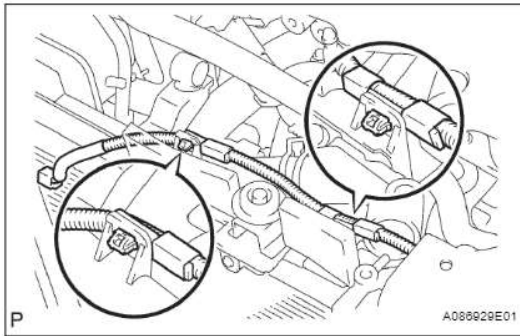
(p) Remove the 5 bolts and radiator support.

(q) Remove the hood lock control cable from the radiator support.

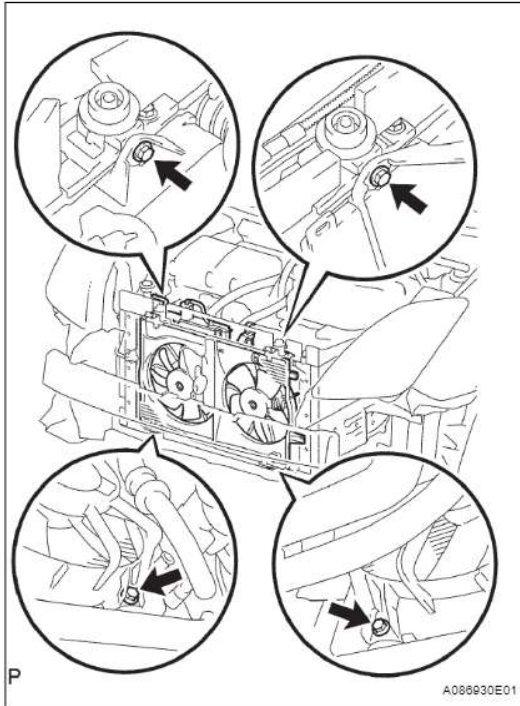
CO

CO-22

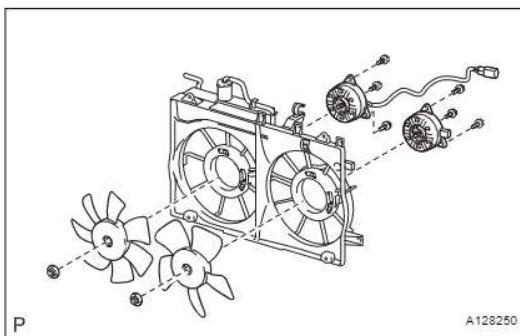
1NZ-FXE COOLING – FAN



- (r) Disconnect the wire harness clamps shown in the illustration.



- (s) Remove the 4 bolts, then remove the fan with motor from the vehicle.

**11. REMOVE FAN**

- (a) Remove the nut and fan.

12. REMOVE NO. 2 FAN

- (a) Remove the nut and fan.

13. REMOVE COOLING FAN MOTOR

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

14. REMOVE NO. 2 COOLING FAN MOTOR

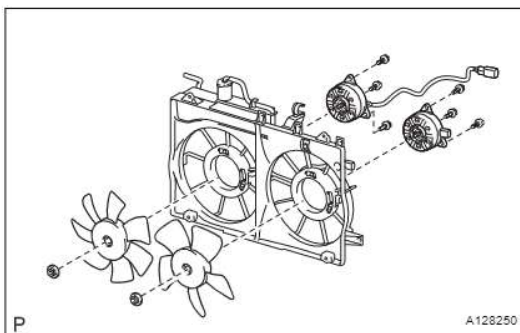
- (a) Remove the 3 bolts and fan motor.

INSTALLATION**1. INSTALL COOLING FAN MOTOR**

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

2. INSTALL NO. 2 COOLING FAN MOTOR

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



1NZ-FXE COOLING – FAN

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3. INSTALL FAN

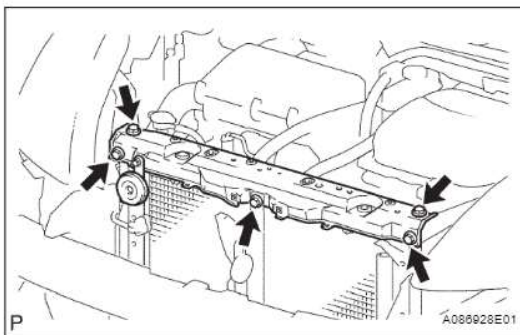
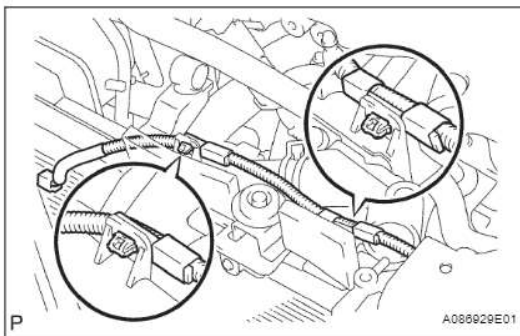
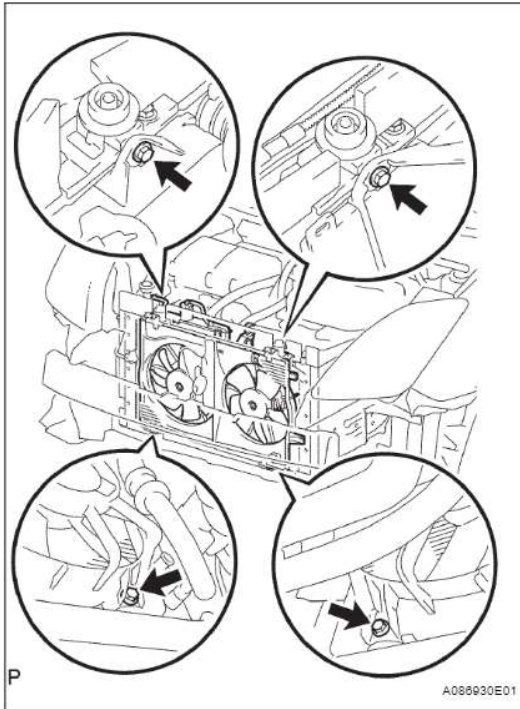
- (a) Install the fan with the nut.

Torque: 6.2 N*m (63 kgf*cm, 55 in.*lbf)**4. INSTALL NO. 2 FAN**

- (a) Install the fan with the nut.

Torque: 6.2 N*m (63 kgf*cm, 55 in.*lbf)**5. INSTALL FAN WITH MOTOR ASSEMBLY**

- (a) Set the fan with motor to the vehicle, then install it with the 4 bolts.

Torque: 7.5 N*m (76 kgf*cm, 66 in.*lbf)

- (b) Connect the 2 wire harness clamps shown in the illustration.

- (c) Install the hood lock control cable to the radiator support.

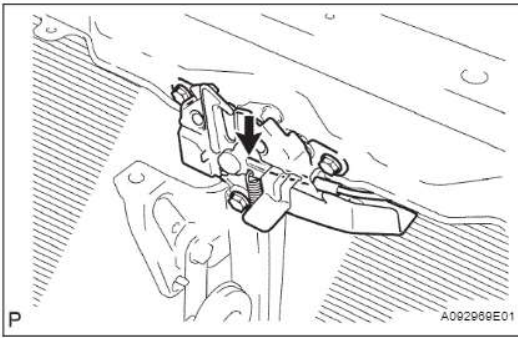
- (d) Install the radiator support with the 5 bolts.

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

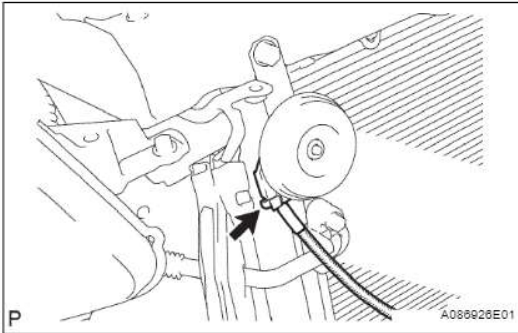
CO

CO-24

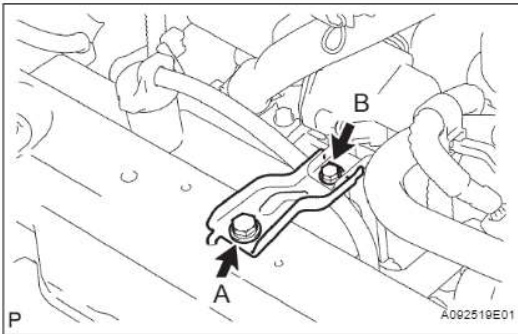
1NZ-FXE COOLING – FAN



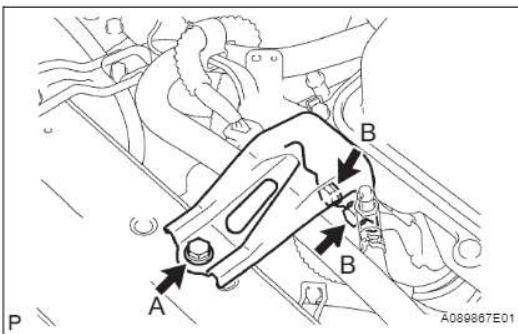
- (e) Connect the hood lock control cable to the hood lock.
- (f) Install the hood lock with the 3 bolts (see page [ED-5](#)).



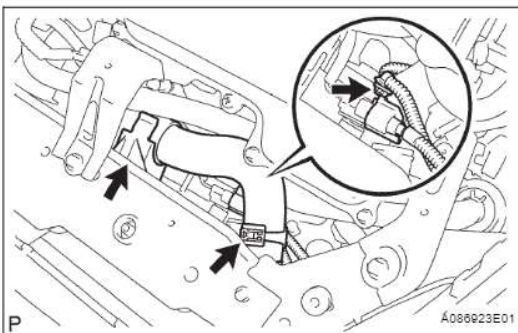
- (g) Connect the horn connector shown in the illustration.



- (h) Install the cooler bracket with the 2 bolts.
Torque: 20 N*m (204 kgf*cm, 15 ft.*lbf) for bolt A
Torque: 8.5 N*m (87 kgf*cm, 75 in.*lbf) for bolt B



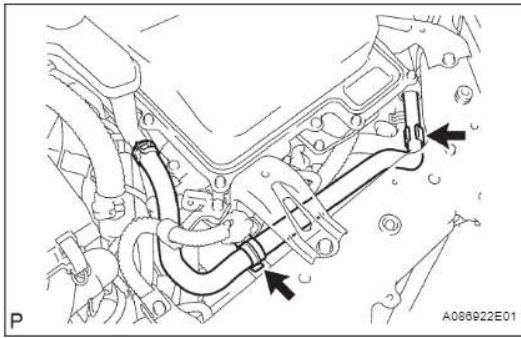
- (i) Install the inverter bracket with the 3 bolts.
Torque: 21 N*m (214 kgf*cm, 16 ft.*lbf) for bolt A
Torque: 25 N*m (255 kgf*cm, 18 ft.*lbf) for bolt B



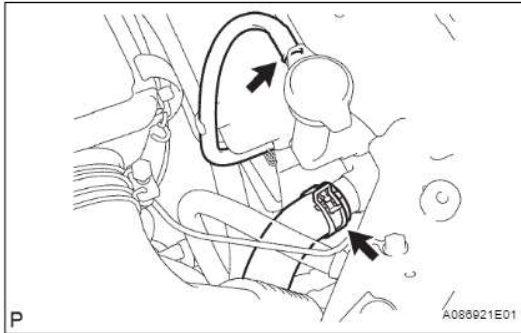
- (j) Connect the connector and install the clamp.
- (k) Connect the radiator inlet hose.

1NZ-FXE COOLING – FAN

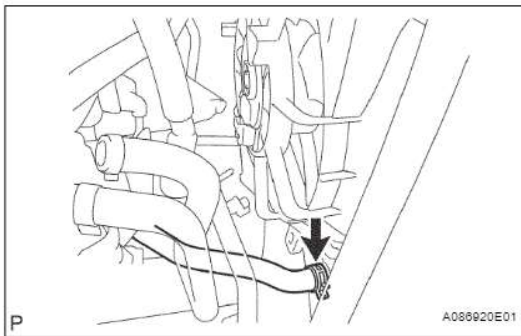
CO-25



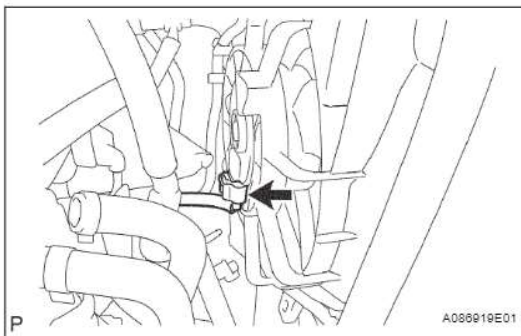
(l) Connect the inverter reservoir hose to each clamp.



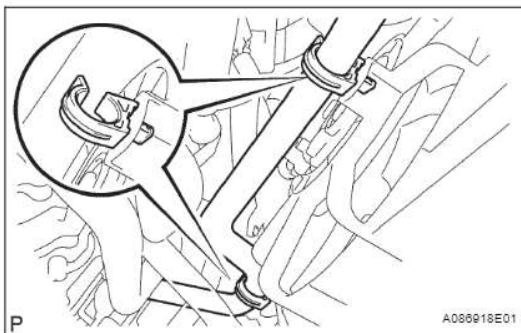
(m) Connect the radiator reservoir hose.
(n) Connect the radiator outlet hose.



(o) Connect the hose shown in the illustration.



(p) Connect the connector shown in the illustration.

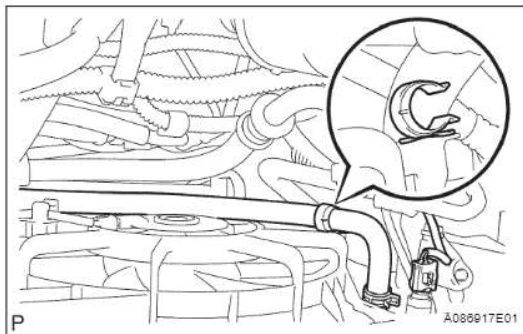


(q) Install the 2 hose clamps to the fan shroud.
(r) Connect the hose shown in the illustration.

CO

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1NZ-FXE COOLING – FAN



- (s) Install the hose clamp to the fan shroud.
- (t) Connect the hose and connector shown in the illustration.

6. **INSTALL FRONT BUMPER COVER** (See page [ET-6](#))
7. **CONNECT CABLE TO BATTERY NEGATIVE TERMINAL**
8. **INSTALL REAR NO. 3 FLOOR BOARD** (See page [CH-8](#))
9. **INSTALL REAR DECK FLOOR BOX** (See page [CH-8](#))
10. **INSTALL REAR NO. 2 FLOOR BOARD** (See page [CH-8](#))
11. **ADD ENGINE COOLANT**
 - (a) Fill the radiator on the hybrid side with coolant (see page [HX-58](#)).
 - (b) Fill the radiator on the engine side with coolant (see page [CO-7](#)).
12. **CHECK FOR ENGINE COOLANT LEAKS**
 - (a) Check the cooling system on the hybrid side for coolant leaks.
 - (b) Check the cooling system on the engine side for coolant leaks (see page [CO-9](#)).
13. **INSTALL ENGINE UNDER COVER RH**
14. **INSTALL ENGINE UNDER COVER LH**
15. **INSTALL RADIATOR SUPPORT OPENING COVER** (See page [CO-9](#))
16. **PERFORM INITIALIZATION**
 - (a) Perform initialization (see page [IN-32](#)).

NOTICE:
 Certain systems need to be initialized after disconnecting the cable from the negative (-) battery terminal.

CO

COOLING FAN RELAY

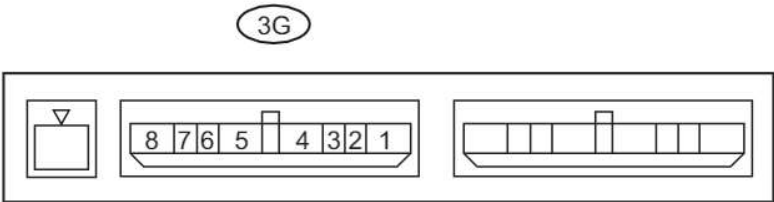
ON-VEHICLE INSPECTION

1. INSPECT INTEGRATION RELAY (UNIT C: NO. 1 FAN (FAN NO. 1) RELAY)
- (a) Inspect the resistance of the fan relay.

(1) Measure the resistance between the terminals.

Standard resistance

Tester Connection	Specified Condition
3G-1- 3G-4	10 kΩ or higher
3G-1- 3G-4	Below 1 Ω (apply battery voltage to terminals 3G-2 and 3G-3)



If the resistance is not as specified, replace the integration relay.

2. INSPECT NO. 2 FAN RELAY (Marking: FAN NO. 2)
- (a) Remove the relay from the engine room relay block.

(b) Measure the resistance of the relay.

Standard resistance

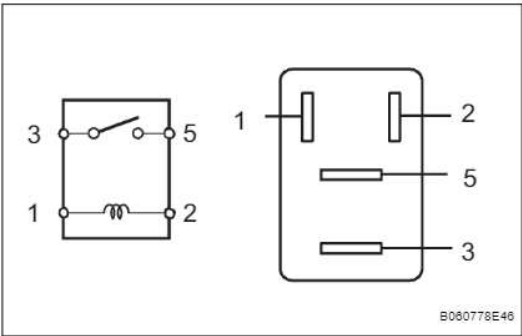
Tester Connection	Specified Condition
3 - 4	Below 1 Ω
3 - 5	10 kΩ or higher
3 - 4	10 kΩ or higher (when battery voltage is applied to terminals 1 and 2)
3 - 5	Below 1 Ω (when battery voltage is applied to terminals 1 and 2)

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

- (c) Install the relay.

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1NZ-FXE COOLING – COOLING FAN RELAY



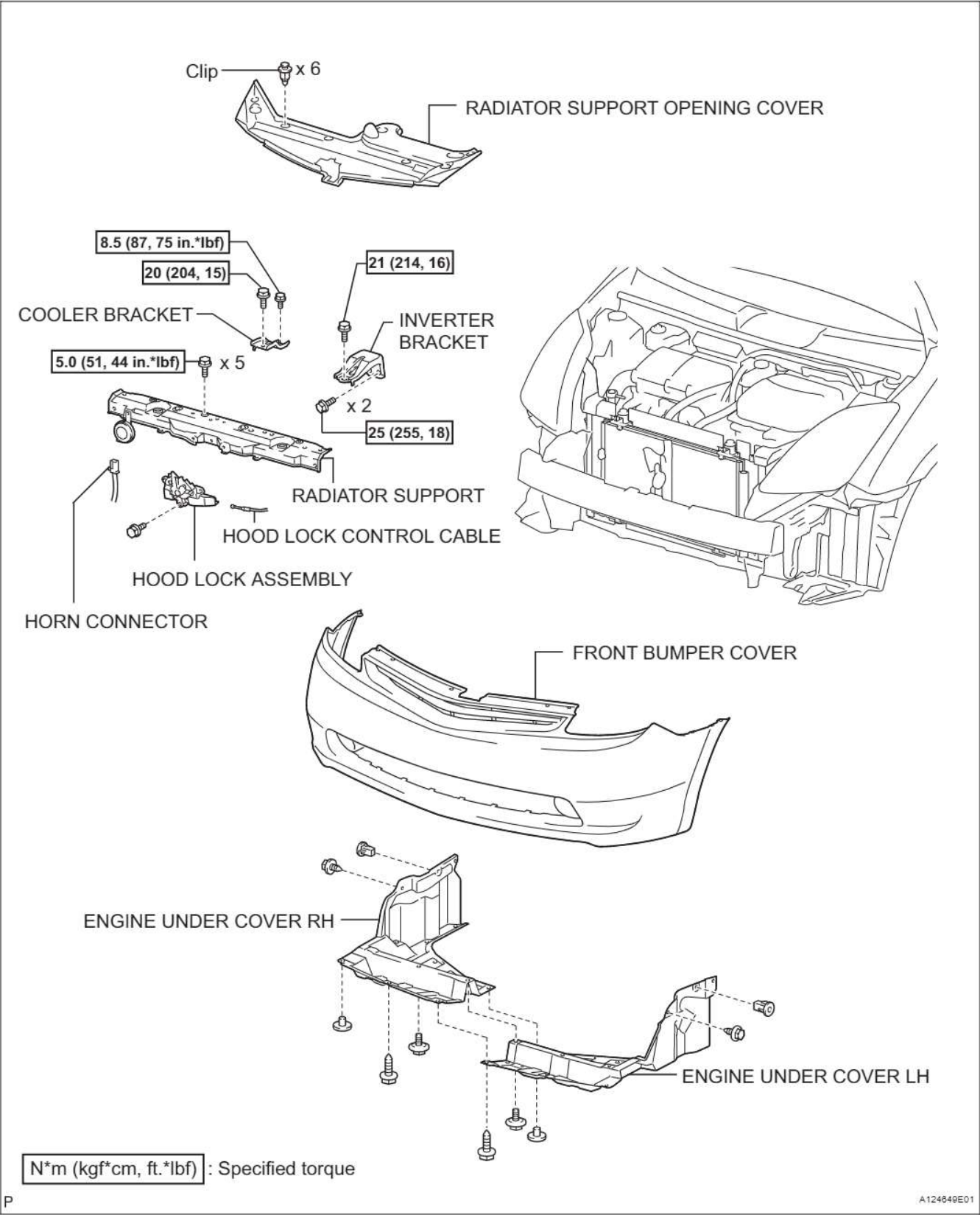
3. INSPECT NO. 3 FAN RELAY (Marking: FAN NO. 3)
- (a) Remove the relay from the engine room relay block.
 - (b) Measure the resistance of the relay.

Standard resistance

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

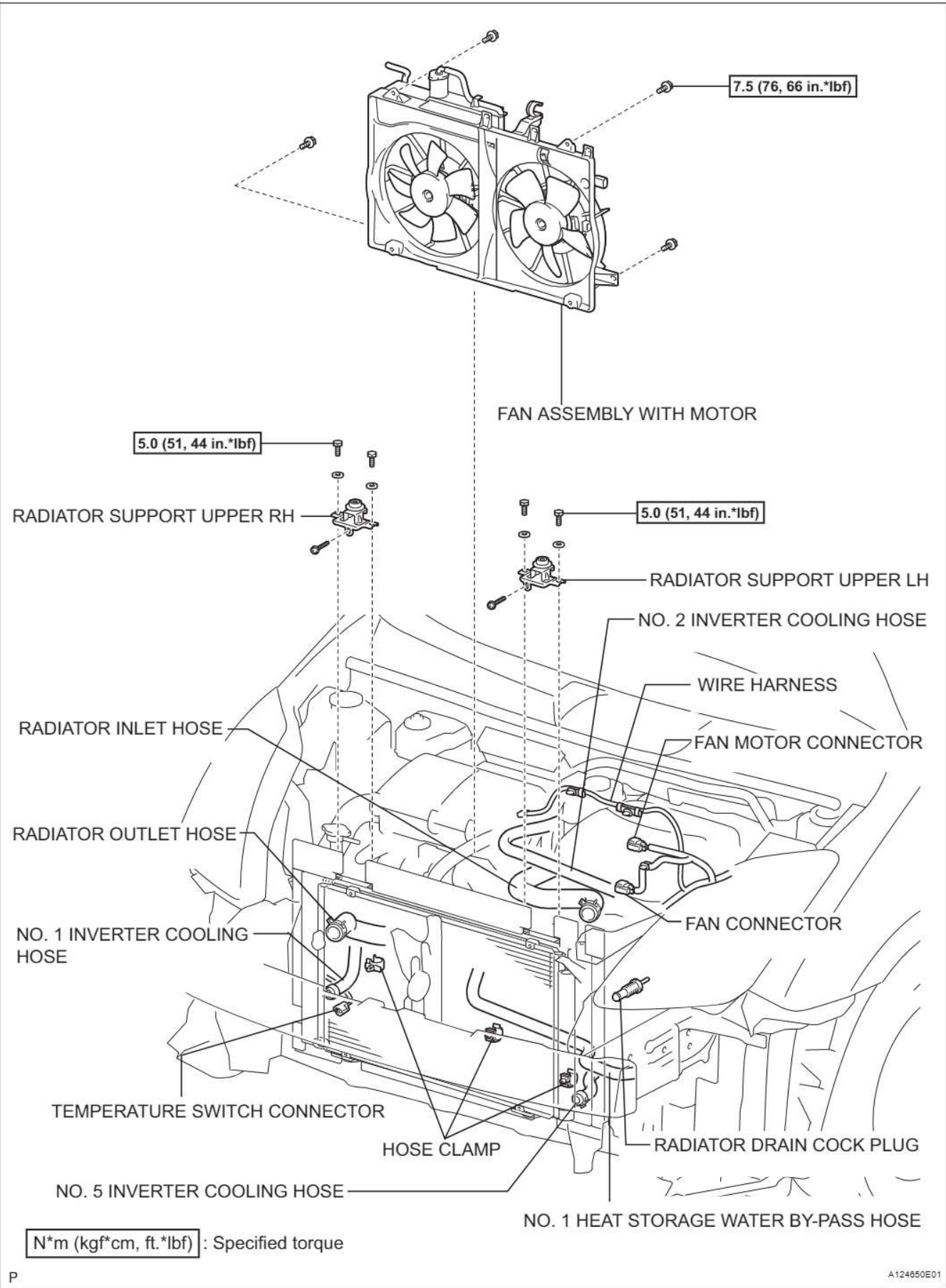
- If the result is not as specified, replace the relay.
- (c) Install the relay.

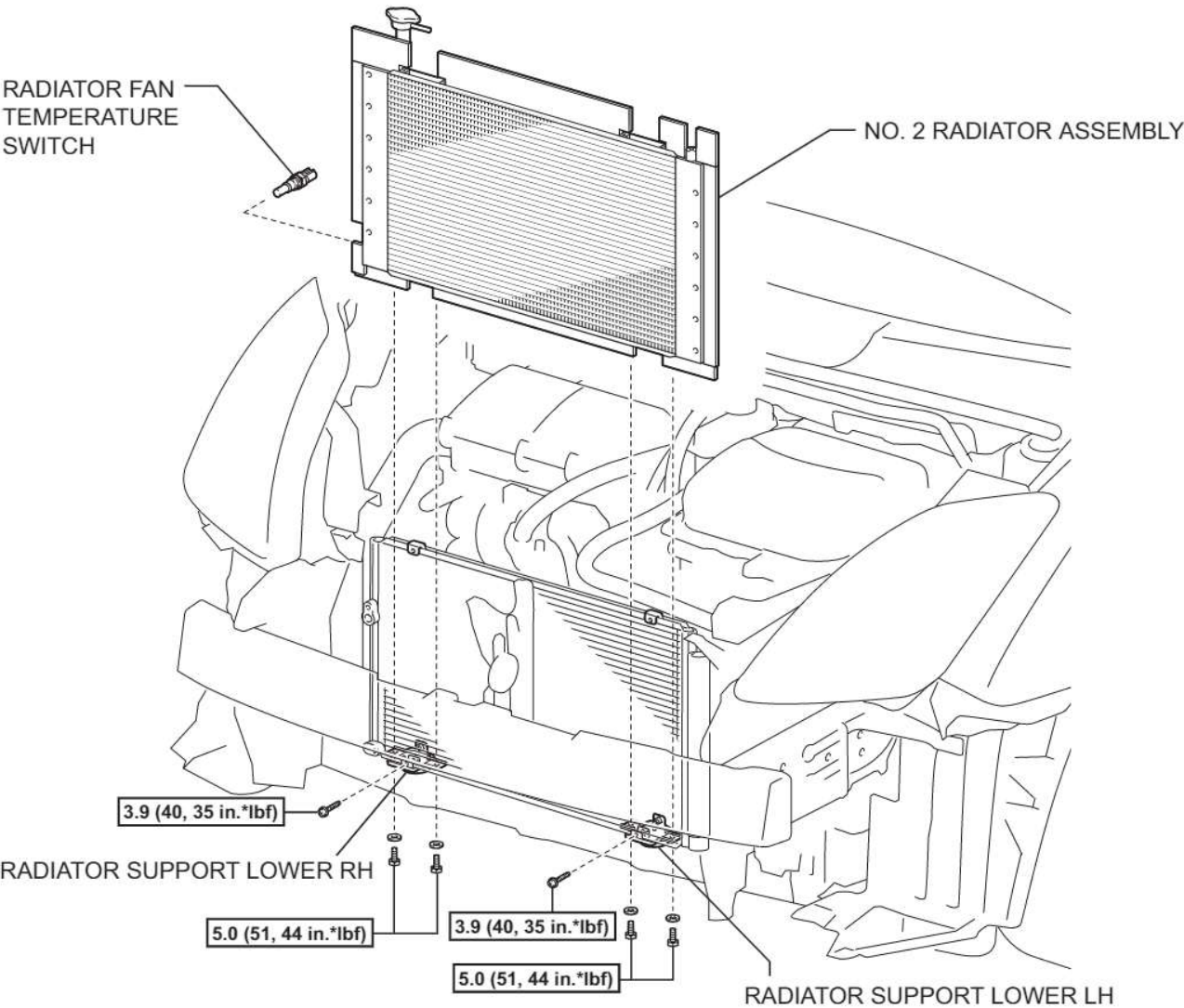
RADIATOR
COMPONENTS



CO-30

1NZ-FXE COOLING – RADIATOR

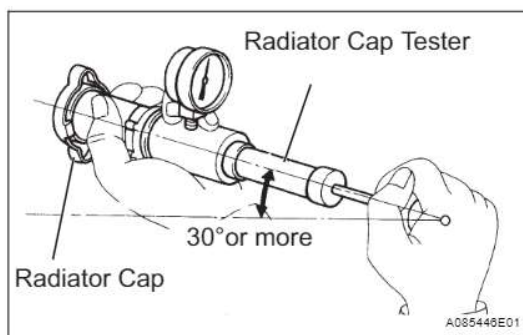
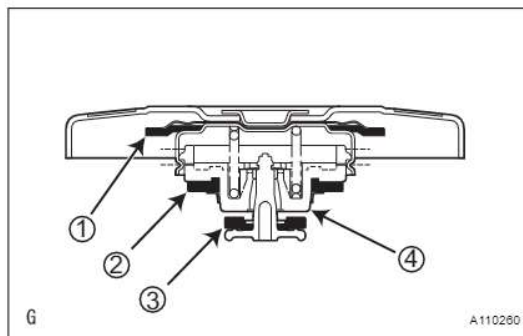




N*m (kgf*cm, ft.*lbf) : Specified torque

CO-32

1NZ-FXE COOLING – RADIATOR



ON-VEHICLE INSPECTION

1. CHECK RADIATOR CAP SUB-ASSEMBLY

- (a) Measure the valve opening pressure.
 - (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 1, 2 or 3 is not deformed, cracked or swollen.
 - (3) Check that 3 and 4 are not stuck together.
 - (4) Apply engine coolant to 2 and 3 before using the radiator cap tester.
 - (5) Pump the cap tester several times, and check the maximum pressure*.

NOTICE:

When using the cap tester, keep the tester at an angle of 30° or more above horizontal.

Pumping 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 cap sub-assembly.

ON-VEHICLE CLEANING

1. CHECK FINS FOR BLOCKAGE

- (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:

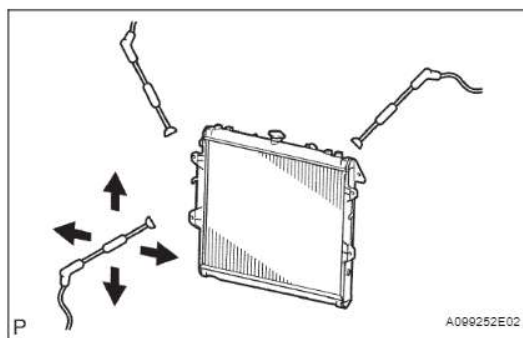
- If the distance between the steam cleaner and core is too close, the fins may be damaged.
- Keep the following injection distance.

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.



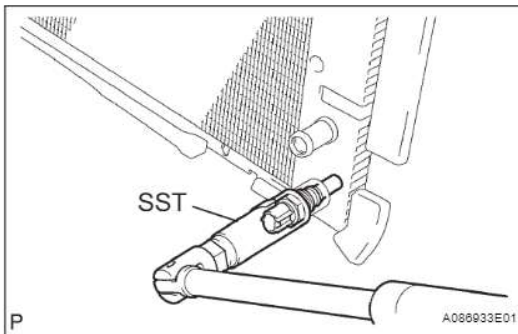
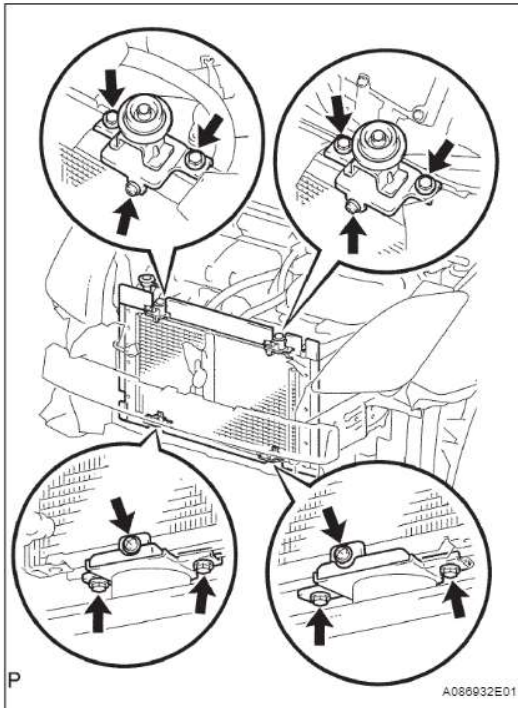
REMOVAL

1. REMOVE FAN ASSEMBLY WITH MOTOR

- (a) Remove the fan with motor (see page CO-19).

2. REMOVE NO. 2 RADIATOR ASSEMBLY

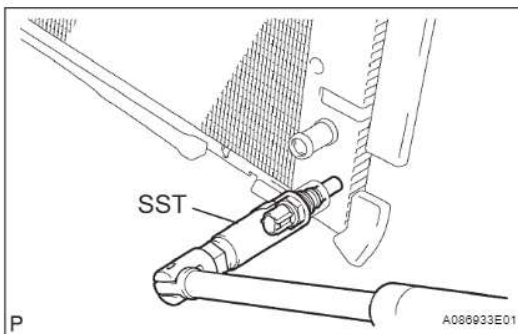
- (a) Remove the 3 bolts and radiator support upper RH.
 (b) Remove the 3 bolts and radiator support upper LH.
 (c) Remove the 3 bolts and radiator support lower RH.
 (d) Remove the 3 bolts and radiator support lower LH.
 (e) Remove the No. 2 radiator from the vehicle.



3. REMOVE RADIATOR FAN TEMPERATURE SWITCH

- (a) Using SST, remove the radiator fan temperature switch.

SST 09817-33190



INSTALLATION

1. INSTALL RADIATOR FAN TEMPERATURE SWITCH

- (a) Using SST, install the radiator fan temperature switch.

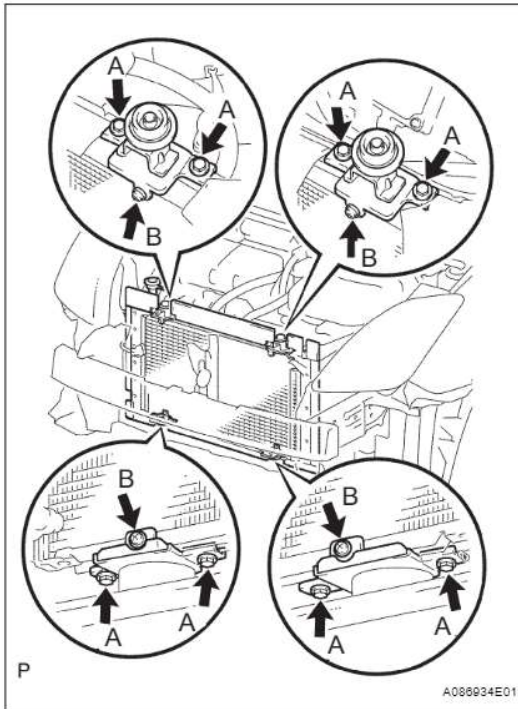
SST 09817-33190

Torque: 7.0 N*m (71 kgf*cm, 62 in.*lbf)

CO

CO-34

1NZ-FXE COOLING – RADIATOR

**2. INSTALL NO. 2 RADIATOR ASSEMBLY**

- (a) Install the No. 2 radiator to the vehicle.
- (b) Install the radiator support lower LH with the 3 bolts.
Torque: 5.0 N*m (51 kgf*cm, 44 in.*lbf) for bolt A
3.9 N*m (40 kgf*cm, 35 in.*lbf) for bolt B
- (c) Install the radiator support lower RH with the 3 bolts.
Torque: 5.0 N*m (51 kgf*cm, 44 in.*lbf) for bolt A
3.9 N*m (40 kgf*cm, 35 in.*lbf) for bolt B
- (d) Install the radiator support upper LH with the 3 bolts.
Torque: 5.0 N*m (51 kgf*cm, 44 in.*lbf) for bolt A
3.9 N*m (40 kgf*cm, 35 in.*lbf) for bolt B
- (e) Install the radiator support upper RH with the 3 bolts.
Torque: 5.0 N*m (51 kgf*cm, 44 in.*lbf) for bolt A
3.9 N*m (40 kgf*cm, 35 in.*lbf) for bolt B

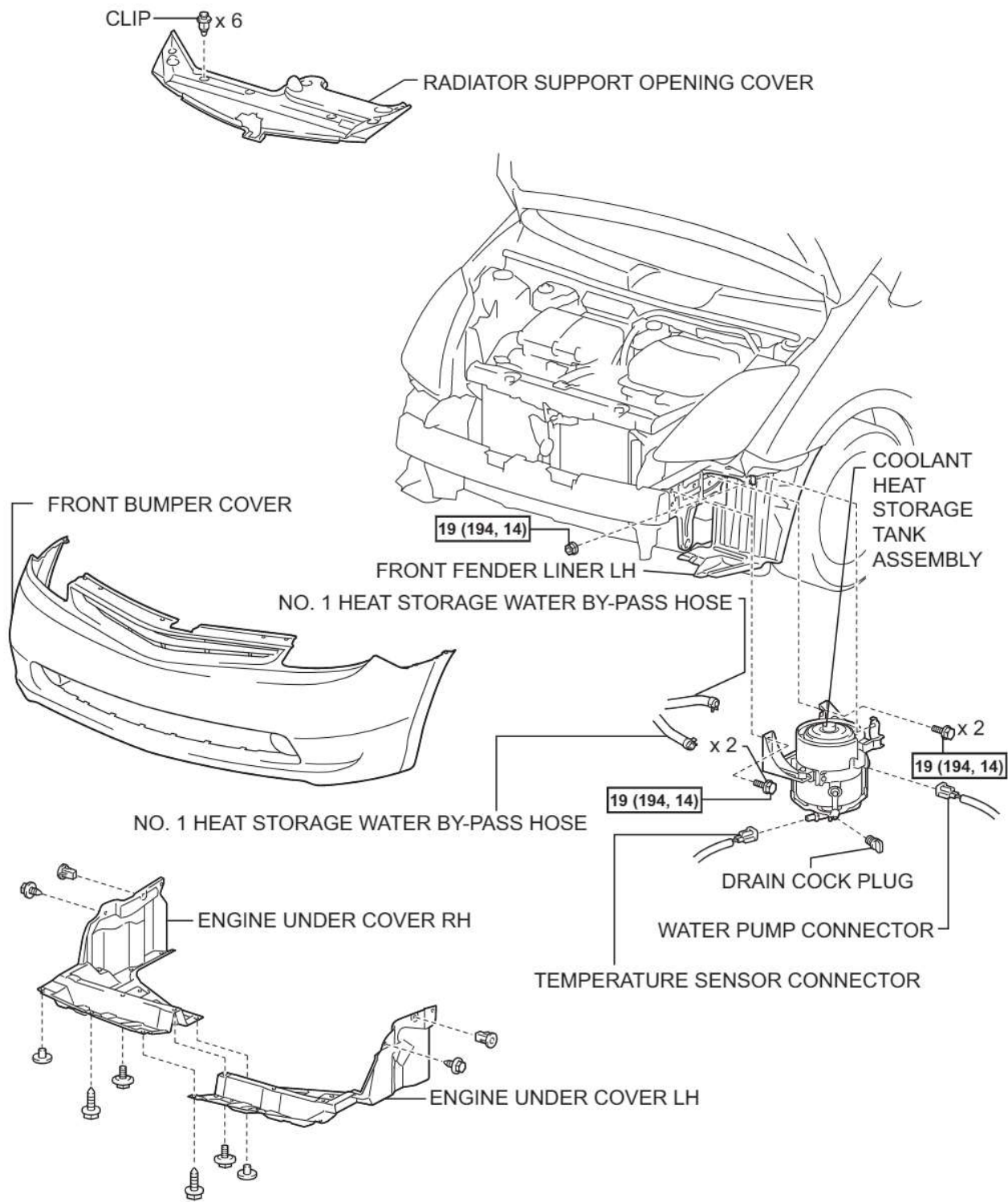
3. INSTALL FAN ASSEMBLY WITH MOTOR

- (a) Install the fan with motor (see page [CO-22](#)).

COOLANT HEAT STORAGE TANK

COMPONENTS

CO



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

P

A124053E01

REMOVAL

CAUTION:

- Before and after the procedure, be sure to check DTCs and confirm that no DTCs are output.
- If the tank has any malfunctions, the tank surface becomes hot. To prevent injuries from burns, do not touch the tank.
- The coolant heat storage tank assembly is prohibited from being disassembled and can be disassembled only as instructed.

1. REMOVE REAR NO. 2 FLOOR BOARD (See page [CH-4](#))
2. REMOVE REAR DECK FLOOR BOX (See page [CH-4](#))
3. REMOVE REAR NO. 3 FLOOR BOARD (See page [CH-4](#))
4. DISCONNECT CABLE FROM BATTERY NEGATIVE TERMINAL

CAUTION:

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

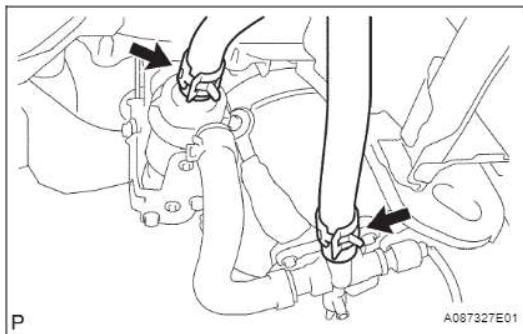
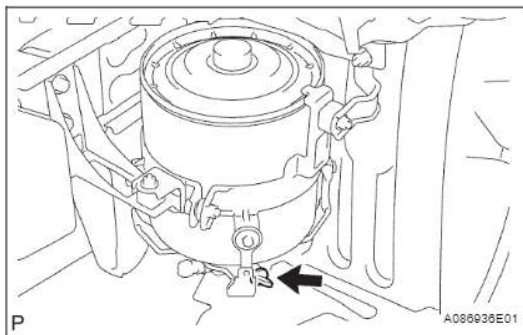
5. REMOVE RADIATOR SUPPORT OPENING COVER (See page [CO-6](#))
6. REMOVE ENGINE UNDER COVER LH
7. REMOVE ENGINE UNDER COVER RH
8. REMOVE FRONT BUMPER COVER (See page [ET-4](#))
9. REMOVE FRONT FENDER LINER LH
(a) Partially remove the front fender liner LH.

10. DRAIN ENGINE COOLANT

- (a) Loosen the drain cock plug, then drain the coolant.

CAUTION:

Even if the engine is cold, the coolant in the coolant heat storage tank is still hot. Be careful of the hot coolant when draining it.

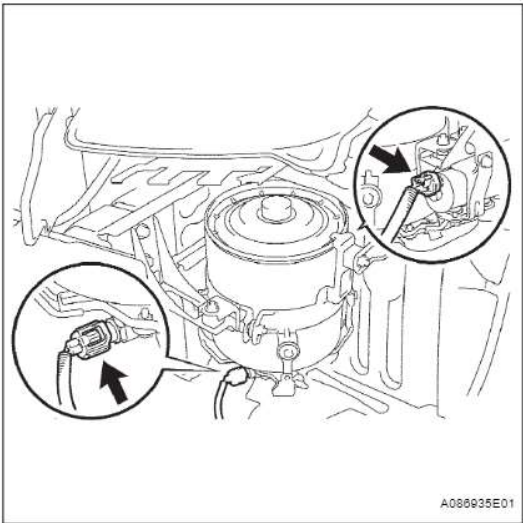


11. REMOVE COOLANT HEAT STORAGE TANK ASSEMBLY

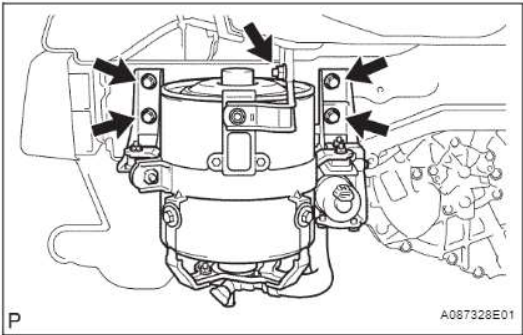
- (a) Disconnect the 2 hoses.

1NZ-FXE COOLING – COOLANT HEAT STORAGE TANK

CO-37

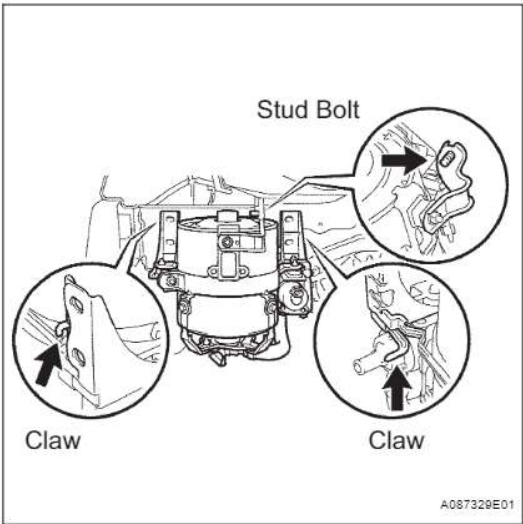


- (b) Disconnect the water pump motor and temperature sensor connectors.



- (c) Remove the nut and 4 bolts.
NOTICE:
The coolant heat storage tank bracket can be easily bent. Hold the coolant heat storage tank tightly when removing the nut and bolts.

CO



- (d) Separate the stud bolt and 2 claws shown in the illustration, then remove the coolant heat storage tank.

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1NZ-FXE COOLING – COOLANT HEAT STORAGE TANK

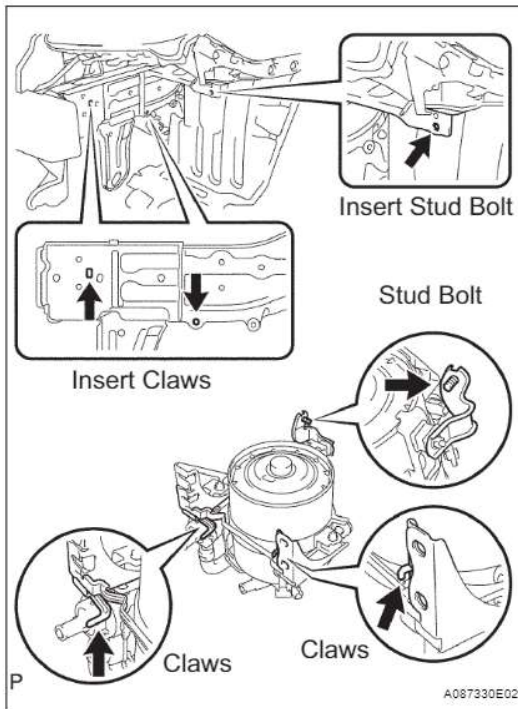
INSTALLATION

1. INSTALL COOLANT HEAT STORAGE TANK ASSEMBLY

- (a) Insert the 2 claws shown in the illustration to the vehicle side, then insert the stud bolt to the vehicle side.

NOTICE:

The coolant storage tank bracket can be easily bent. Hold the coolant storage tank tightly when inserting the claws and stud bolt.

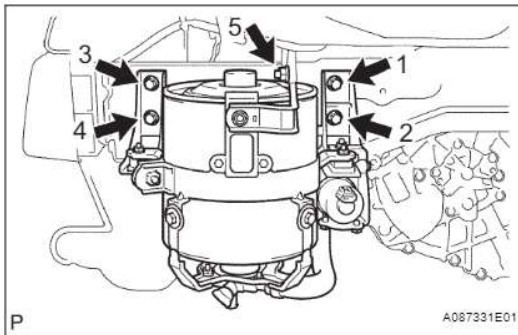


- (b) Install the 4 bolts and nut.

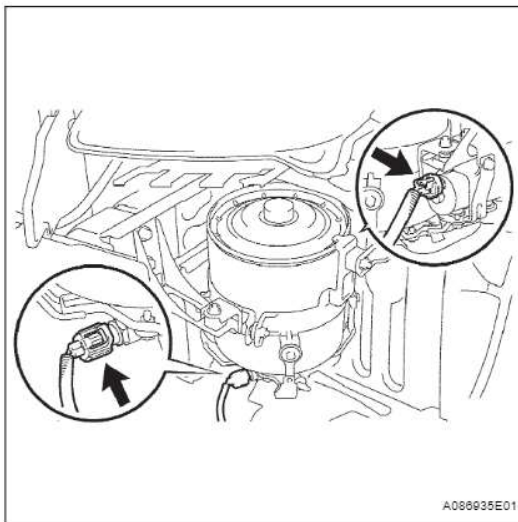
Torque: 19 N*m (194 kgf*cm, 14 ft.*lbf)

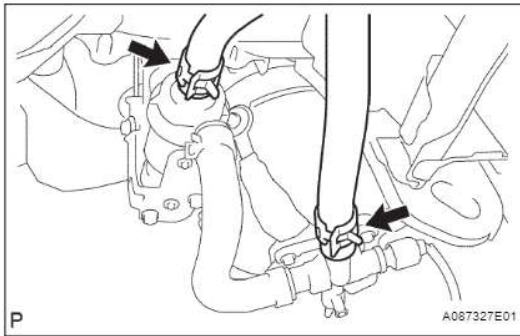
NOTICE:

- When tightening bolt 1 and 2, push the coolant heat storage tank bracket to the vehicle front.
- The coolant heat storage tank bracket can be easily bent. Hold the coolant heat storage tank tightly when installing the bolts and nut.



- (c) Connect the water pump motor and temperature sensor connectors.



1NZ-FXE COOLING – COOLANT HEAT STORAGE TANK**CO-39**

(d) Connect the 2 hoses shown in the illustration.

2. **CONNECT CABLE TO BATTERY NEGATIVE TERMINAL**
3. **INSTALL REAR NO. 3 FLOOR BOARD** (See page [CH-8](#))
4. **INSTALL REAR DECK FLOOR BOX** (See page [CH-8](#))
5. **INSTALL REAR NO. 2 FLOOR BOARD** (See page [CH-8](#))
6. **ADD ENGINE COOLANT** (See page [HX-58](#))
7. **CHECK FOR ENGINE COOLANT LEAKS**
8. **INSTALL FRONT FENDER LINER LH**
9. **INSTALL FRONT BUMPER COVER** (See page [ET-6](#))
10. **INSTALL ENGINE UNDER COVER RH**
11. **INSTALL ENGINE UNDER COVER LH**
12. **INSTALL RADIATOR SUPPORT OPENING COVER** (See page [CO-9](#))
13. **PERFORM INITIALIZATION**
 - (a) Perform initialization (see page [IN-32](#)).

NOTICE:

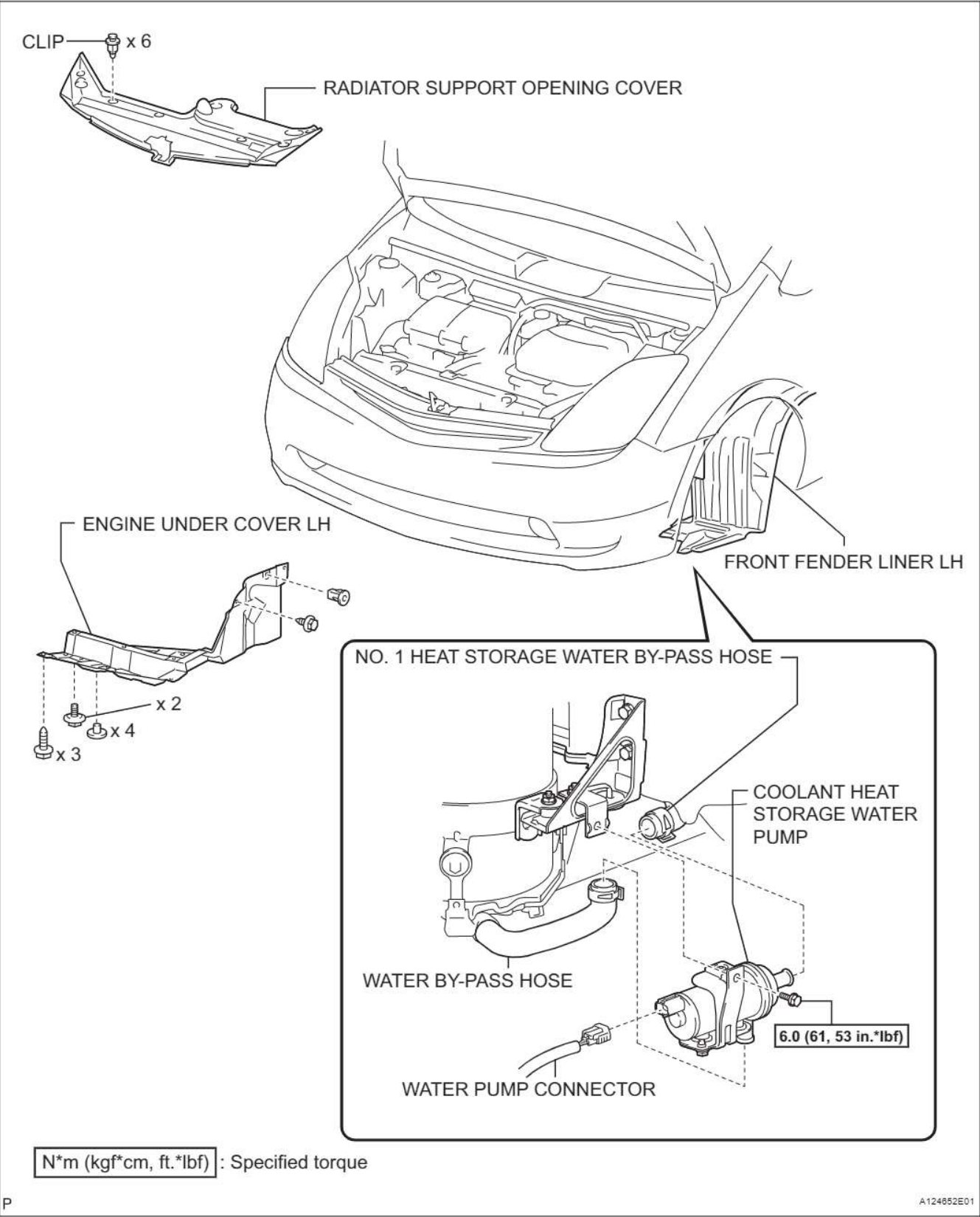
Certain systems need to be initialized after disconnecting the cable from the negative (-) battery terminal.

CO

CO-40

1NZ-FXE COOLING – COOLANT HEAT STORAGE WATER PUMP

COOLANT HEAT STORAGE WATER PUMP COMPONENTS



REMOVAL

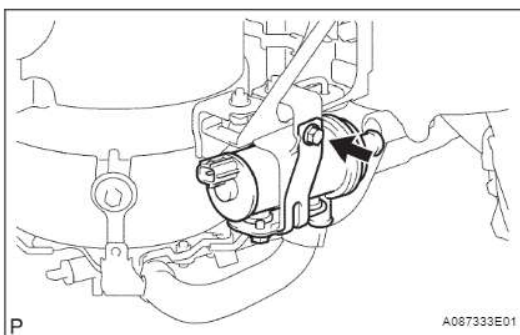
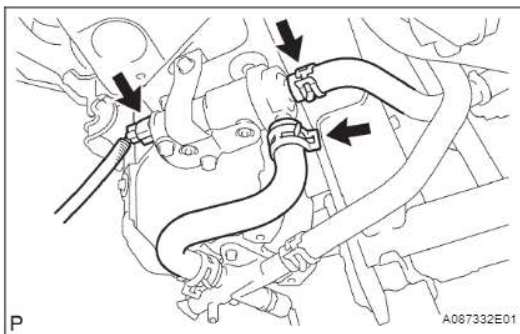
1. REMOVE REAR FLOOR NO. 2 BOARD (See page [CH-4](#))
2. REMOVE REAR DECK FLOOR BOX (See page [CH-4](#))
3. REMOVE REAR FLOOR NO. 3 BOARD (See page [CH-4](#))
4. DISCONNECT CABLE FROM BATTERY NEGATIVE TERMINAL

CAUTION:

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

5. REMOVE RADIATOR SUPPORT OPENING COVER (See page [CO-6](#))
6. REMOVE FRONT WHEEL LH
7. REMOVE ENGINE UNDER COVER LH
8. REMOVE FRONT FENDER LINER LH
 - (a) Partially remove the front fender liner LH.
9. DRAIN ENGINE COOLANT (See page [HX-58](#))
10. REMOVE COOLANT HEAT STORAGE WATER PUMP
 - (a) Disconnect the coolant heat storage water pump connector.
 - (b) Disconnect the 2 hoses.

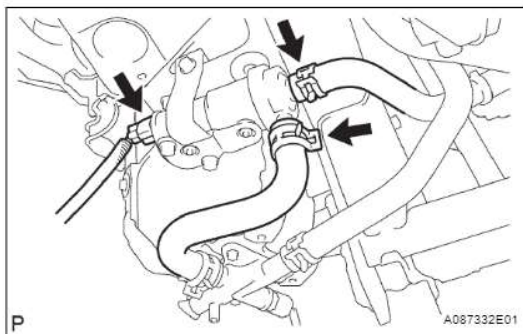
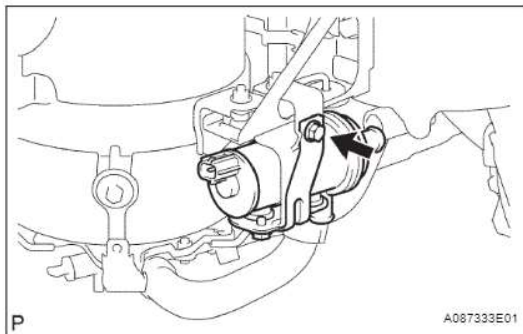
CO



- (c) Remove the bolt and coolant heat storage water pump.

CO-42

1NZ-FXE COOLING – COOLANT HEAT STORAGE WATER PUMP



INSTALLATION

1. INSTALL COOLANT HEAT STORAGE WATER PUMP

- (a) Install the coolant heat storage pump water pump with the bolt.

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

- (b) Connect the 2 hoses.

- (c) Connect the connector to the coolant heat storage pump.

2. CONNECT CABLE TO BATTERY NEGATIVE TERMINAL

3. INSTALL REAR FLOOR NO. 3 BOARD (See page [CH-8](#))4. INSTALL REAR DECK FLOOR BOX (See page [CH-8](#))5. INSTALL REAR FLOOR NO. 2 BOARD (See page [CH-8](#))6. ADD ENGINE COOLANT (See page [HX-58](#))

7. CHECK FOR ENGINE COOLANT LEAKS

8. INSTALL FRONT FENDER LINER LH

9. INSTALL ENGINE UNDER COVER LH

10. INSTALL FRONT WHEEL LH

Torque: 103 N*m (1050 kgf*cm, 76 ft.*lbf)

11. INSTALL RADIATOR SUPPORT OPENING COVER (See page [CO-9](#))

12. PERFORM INITIALIZATION

- (a) Perform initialization (see page [IN-32](#)).

NOTICE:

Certain systems need to be initialized after disconnecting and reconnecting the cable from the negative (-) battery terminal.