

Last Modified: 3-10-2010	6.4 A	From: 200901
Model Year: 2010	Model: Corolla	Doc ID: RM000002KK801PX
Title: 2AZ-FE COOLING: COOLANT: REPLACEMENT (2010 Corolla)		

REPLACEMENT

1. DRAIN ENGINE COOLANT

- (a) Loosen the lower radiator drain cock plug.

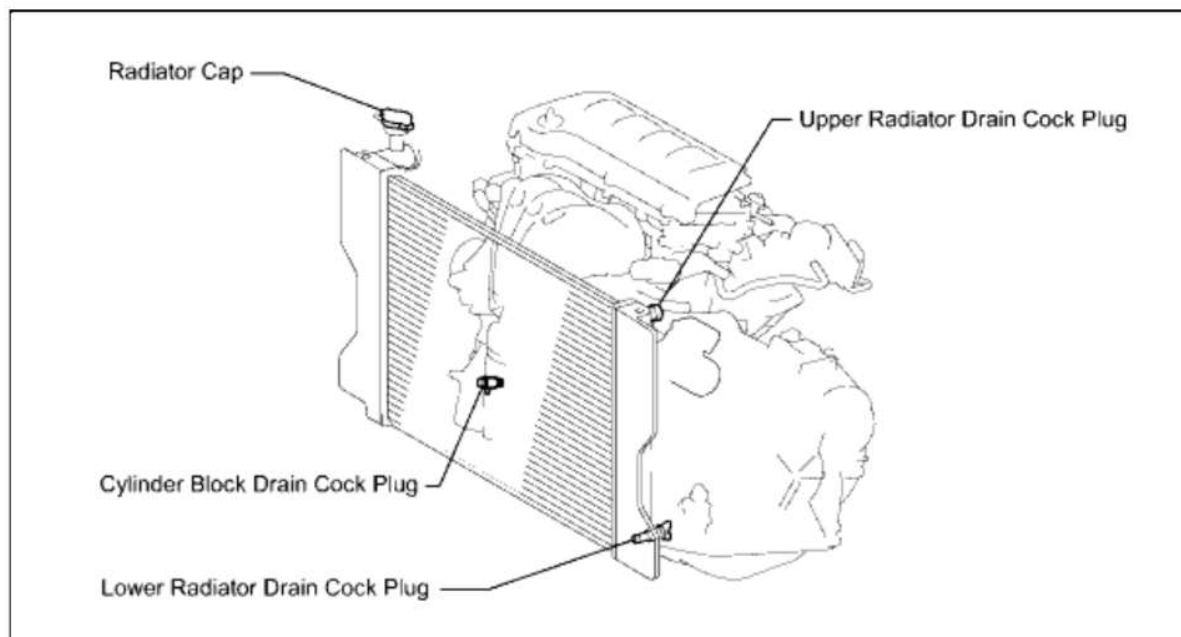
CAUTION:

Do not loosen the lower radiator drain cock plug while the engine and radiator are still hot. Pressurized, hot engine coolant and steam may be released and cause serious burns.

HINT:

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

- (b) Remove the radiator cap.
(c) Loosen the cylinder block drain cock plug.



2. ADD ENGINE COOLANT

- (a) Tighten the lower radiator drain cock plug.
(b) Tighten the cylinder block drain cock plug.
(c) Loosen the upper radiator drain cock plug.
(d) Slowly fill the radiator with TOYOTA Super Long Life Coolant (SLLC).

Standard Capacity:

ITEM	CAPACITY
Engine coolant	5.7 liters (6.0 US qts, 5.0 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).
- Contact your TOYOTA dealer for further details.

NOTICE:

Never use water as a substitute for engine coolant.

- (e) Squeeze the inlet and outlet radiator hoses several times by hand, and then check the level of the coolant.

If the coolant level is low, add coolant.

- (f) Tighten the upper radiator drain cock plug.
- (g) Slowly pour coolant into the radiator reservoir tank until it reaches the FULL line.
- (h) Install the radiator cap sub-assembly and reservoir tank cap.
- (i) Start the engine and warm it up.
- (j) Bleed air from the cooling system.

NOTICE:

- Before starting the engine, turn the A/C switch off.
- Adjust the air conditioning temperature setting to MAX (HOT).
- Adjust the air conditioning blower setting to LO.

- (1) Warm up the engine until the thermostat opens. While the thermostat is open, allow the coolant to circulate for several minutes.

HINT:

Thermostat opening timing can be determined by squeezing the inlet radiator hose, and sensing vibrations when the engine coolant starts to flow inside the hose.

CAUTION:

When squeezing the radiator hoses:

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

- (k) Stop the engine, and wait until the engine coolant cools down.
- (l) Add engine coolant to the FULL line on the radiator reservoir.

3. INSPECT FOR COOLANT LEAK

INFO



TOYOTA

Last Modified: 3-10-2010	6.4 A	From: 200901
Model Year: 2010	Model: Corolla	Doc ID: RM000002KK8010X
Title: 2ZR-FE COOLING: COOLANT: REPLACEMENT (2010 Corolla)		

REPLACEMENT

1. DRAIN ENGINE COOLANT

- (a) Loosen the lower radiator drain cock plug.

CAUTION:

Do not loosen the lower radiator drain cock plug while the engine and radiator are still hot. Pressurized, hot engine coolant and steam may be released and cause serious burns.

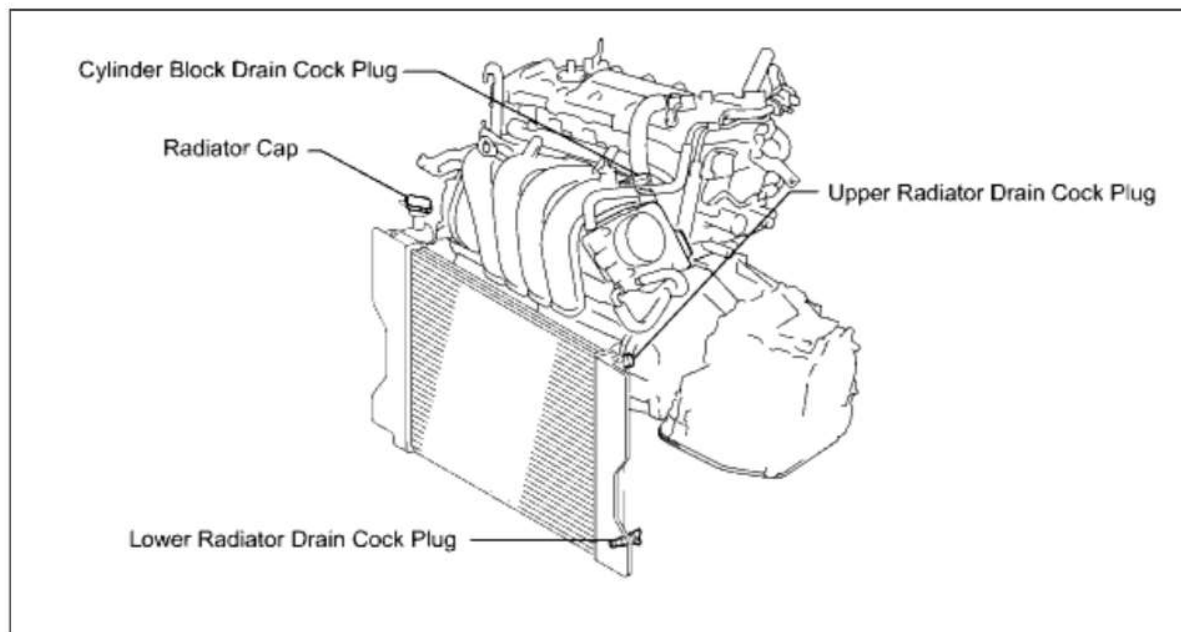
HINT:

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

- (b) Remove the radiator cap.
(c) Loosen the cylinder block drain cock plug.

HINT:

The plug is on the backside of the generator on the exhaust manifold side.



2. ADD ENGINE COOLANT

- (a) Tighten the lower radiator drain cock plug.
(b) Tighten the cylinder block drain cock plug.
Torque: 13 N·m (130 kgf·cm, 9ft·lbf)
(c) Loosen the upper radiator drain cock plug.
(d) Slowly fill the radiator with TOYOTA Super Long Life Coolant (SLLC).

Standard Capacity:

ITEM	CAPACITY
Engine coolant	5.5 liters (5.8 US qts, 4.8 Imp. qts)

HINT:

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

NOTICE:

Never use water as a substitute for engine coolant.

- (e) Squeeze the inlet and outlet radiator hoses several times by hand, and then check the level of the coolant.

If the coolant level is low, add coolant.

- (f) Tighten the upper radiator drain cock plug.
- (g) Slowly pour coolant into the radiator reservoir tank until it reaches the FULL line.
- (h) Install the radiator cap sub-assembly and reservoir tank cap.
- (i) Start the engine and warm it up.
- (j) Bleed air from the cooling system.

NOTICE:

- Before starting the engine, turn the A/C switch off.
- Adjust the air conditioning temperature setting to MAX (HOT).
- Adjust the air conditioning blower setting to LO.

- (1) Warm up the engine until the thermostat opens. While the thermostat is open, allow the coolant to circulate for several minutes.

HINT:

Thermostat opening timing can be determined by squeezing the inlet radiator hose, and sensing vibrations when the engine coolant starts to flow inside the hose.

When squeezing the radiator hoses:

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

- (k) Stop the engine, and wait until the engine coolant cools down.
- (l) Add engine coolant to the FULL line on the radiator reservoir.

3. INSPECT FOR COOLANT LEAK

INFO



TOYOTA

Last Modified: 3-10-2010	6.4 G	From: 200901
Model Year: 2010	Model: Corolla	Doc ID: RM000002YRG00WX
Title: 2ZR-FE COOLING: COOLING FAN ECU: ON-VEHICLE INSPECTION (2010 Corolla)		

ON-VEHICLE INSPECTION

1. CHECK COOLING FAN SYSTEM

(a) Put the vehicle in the following conditions:

- (1) The ignition switch is off.
- (2) The coolant temperature is less than 95°C (203°F).
- (3) The battery voltage is between 11 and 14 V.
- (4) The A/C switch is off.

(b) Connect the pickup of a clamp-on ammeter over one of the two wires for the cooling fan motor.

(c) Turn the ignition switch to ON and wait for approximately 10 seconds. Check that the fan stops.

(d) Start the engine. Check that the fan stops with the engine idling.

HINT:

- Make sure that the coolant temperature is less than 95°C (203°F).
- Turn the A/C switch off.

(e) Check that the fan operates when the A/C switch is turned on (MAX COOL and the magnetic clutch is operating).

(f) Measure the current while the motor is operating.

Standard Current:

CONNECTION	CONDITION	SPECIFIED CONDITION
Fan wire	20°C (68°F)	2 to 15.2 A

HINT:

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

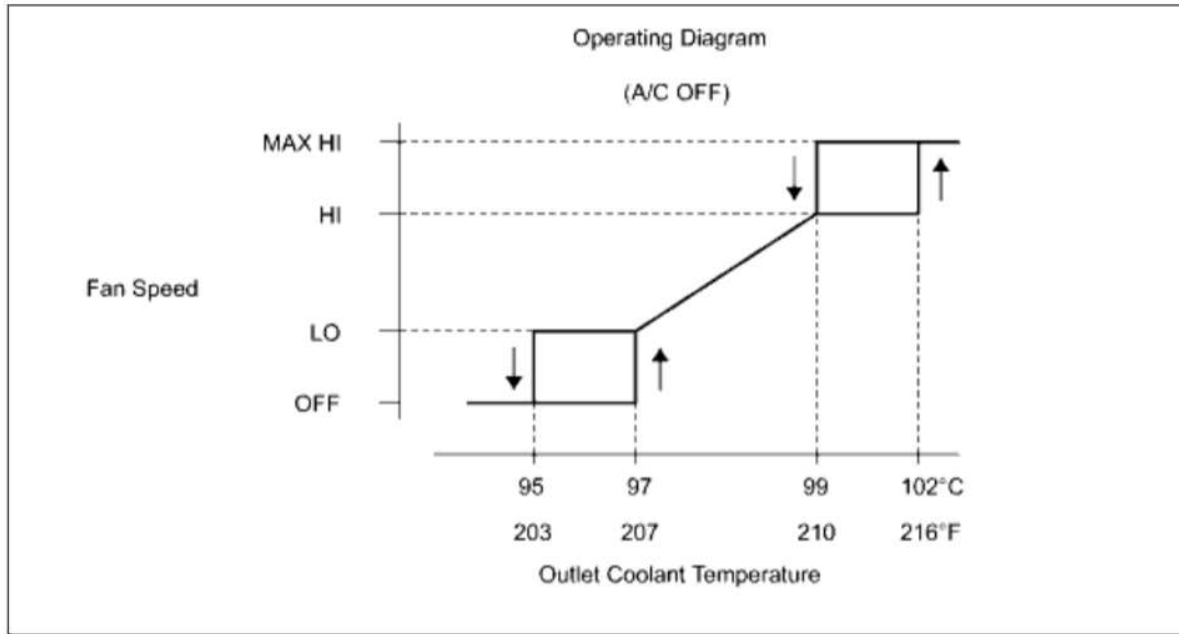
(g) Check that the fan operates when the water temperature sensor connector is disconnected.

(h) Measure the current while the motor is operating.

Standard Current:

CONNECTION	CONDITION	SPECIFIED CONDITION
Fan wire	20°C (68°F)	2 to 15.2 A

(i) After the engine is warmed up, check that the fan operates as shown in the illustration below.

**HINT:**

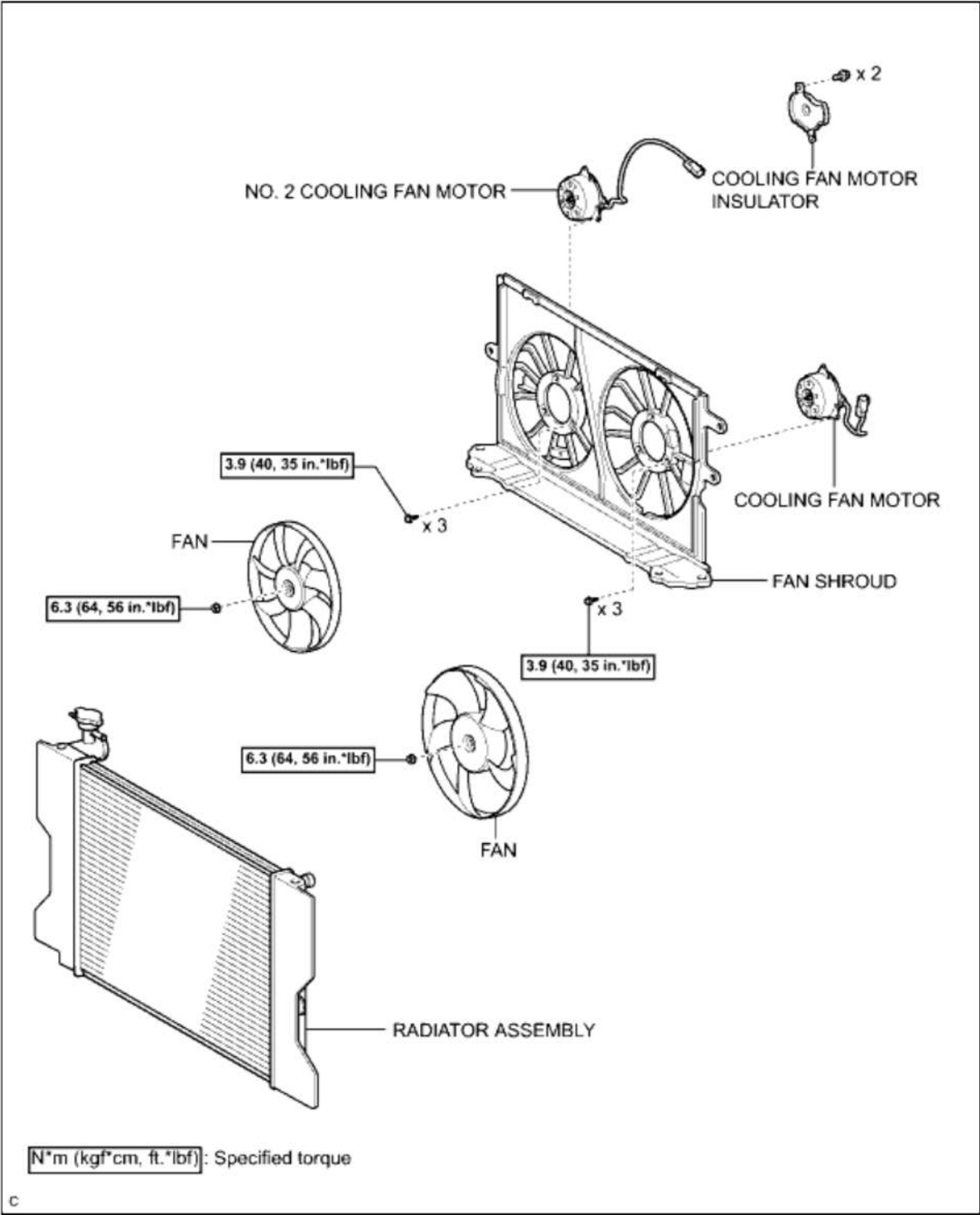
- The coolant temperature at which the fan starts operating is approximately 97°C (207°F).
- This system can also be checked using the Techstream.
- Enter the following menus: Powertrain / Engine and ECT / Data List / Coolant Temp.



Last Modified: 3-10-2010	6.4 K	From: 200901
Model Year: 2010	Model: Corolla	Doc ID: RM000002GF700DX
Title: 2AZ-FE COOLING: COOLING FAN MOTOR: COMPONENTS (2010 Corolla)		

COMPONENTS

ILLUSTRATION



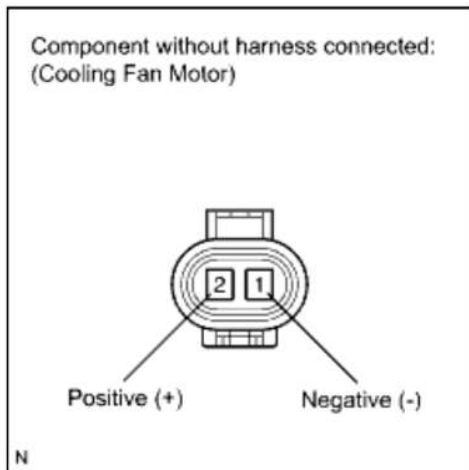


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Last Modified: 3-10-2010	6.4 G	From: 200901
Model Year: 2010	Model: Corolla	Doc ID: RM000000YFJ04XX
Title: 2AZ-FE COOLING: COOLING FAN MOTOR: ON-VEHICLE INSPECTION (2010 Corolla)		

ON-VEHICLE INSPECTION

1. INSPECT COOLING FAN MOTOR



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

If the motor does not operate smoothly, replace the cooling fan motor.

- (b) Connect the pickup of a clamp-on ammeter over one of the two wires for the cooling fan motor.

- (c) Measure the current while the motor is operating.

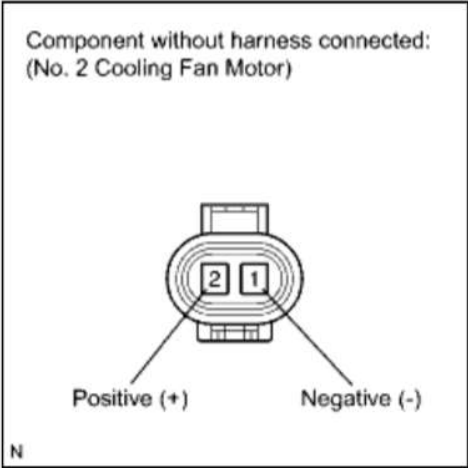
Standard Current:

CONNECTION	CONDITION	SPECIFIED CONDITION
Fan wire	20°C (68°F)	7.4 to 11.4 A

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

2. INSPECT NO. 2 COOLING FAN MOTOR

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



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

Standard Current:

CONNECTION	CONDITION	SPECIFIED CONDITION
Fan wire	20°C (68°F)	4.7 to 8.7 A

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



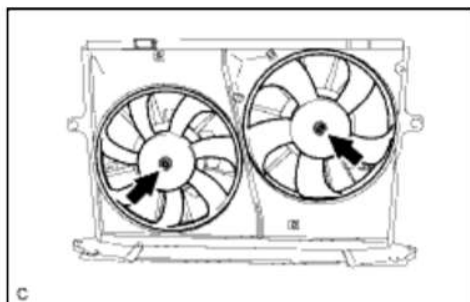
Last Modified: 3-10-2010	6.4 A	From: 200901
Model Year: 2010	Model: Corolla	Doc ID: RM000002GF800EX
Title: 2AZ-FE COOLING: COOLING FAN MOTOR: REMOVAL (2010 Corolla)		

REMOVAL

1. REMOVE RADIATOR ASSEMBLY

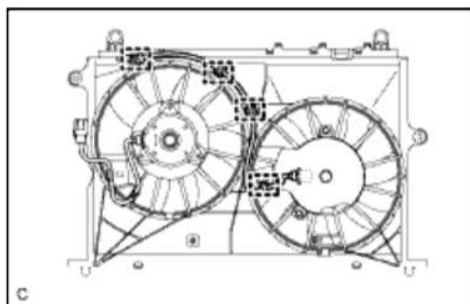
HINT:  .

2. REMOVE FAN

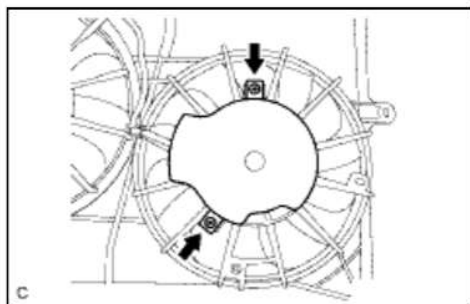


(a) Remove the 2 nuts and 2 fans.

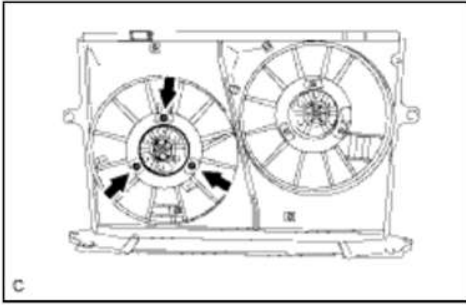
3. REMOVE NO. 2 COOLING FAN MOTOR



(a) Detach the 4 harness clamps from the fan shroud.

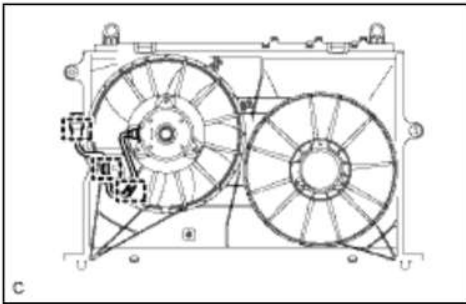


(b) Remove the 2 screws and cooling fan motor insulator.

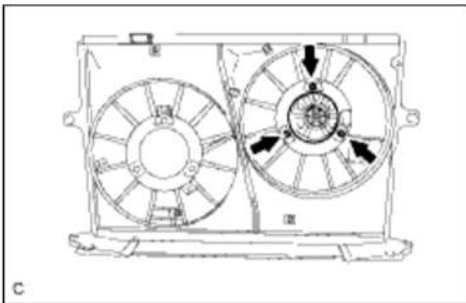


(c) Remove the 3 screws, and then remove the No. 2 cooling fan motor.

4. REMOVE COOLING FAN MOTOR



(a) Detach the 3 harness clamps from the fan shroud.

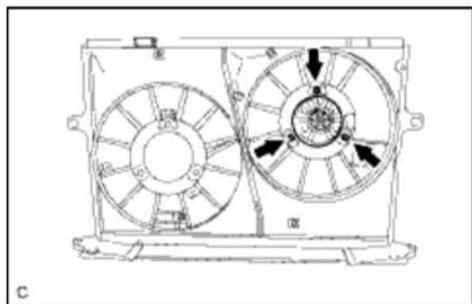


(b) Remove the 3 screws, and then remove the cooling fan motor.

Last Modified: 3-10-2010	6.4 A	From: 200901
Model Year: 2010	Model: Corolla	Doc ID: RM000002GF600EX
Title: 2AZ-FE COOLING: COOLING FAN MOTOR: INSTALLATION (2010 Corolla)		

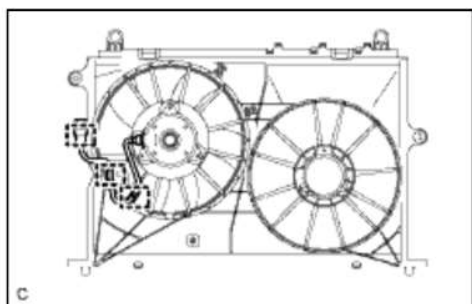
INSTALLATION

1. INSTALL COOLING FAN MOTOR



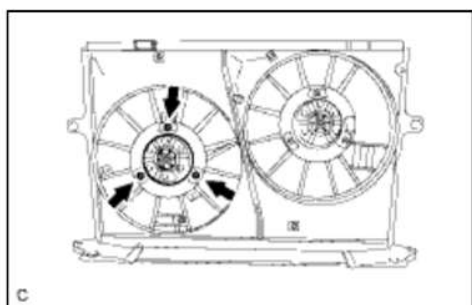
(a) Install the cooling fan motor with the 3 screws.

Torque: 3.9 N·m (40 kgf·cm, 35in·lbf)



(b) Attach the 3 harness clamps to the fan shroud.

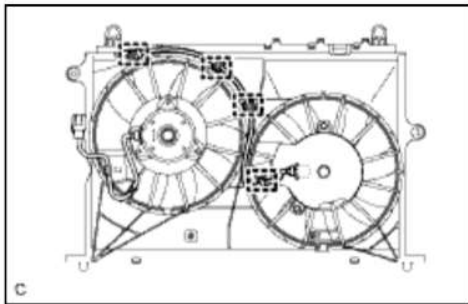
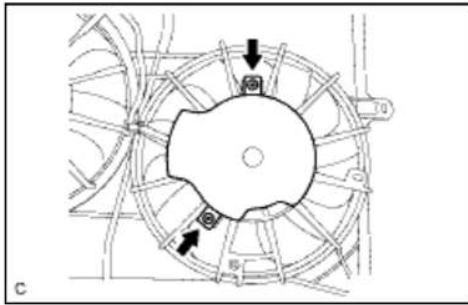
2. INSTALL NO. 2 COOLING FAN MOTOR



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

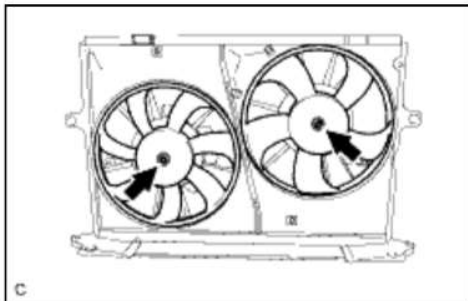
Torque: 3.9 N·m (40 kgf·cm, 35in·lbf)

(b) Install the cooling fan motor insulator with the 2 screws.



(c) Attach the 4 harness clamps to the fan shroud.

3. INSTALL FAN



(a) Install the 2 fans with the 2 nuts.

Torque: 6.3 N·m (64 kgf·cm, 56in·lbf)

4. INSTALL RADIATOR ASSEMBLY

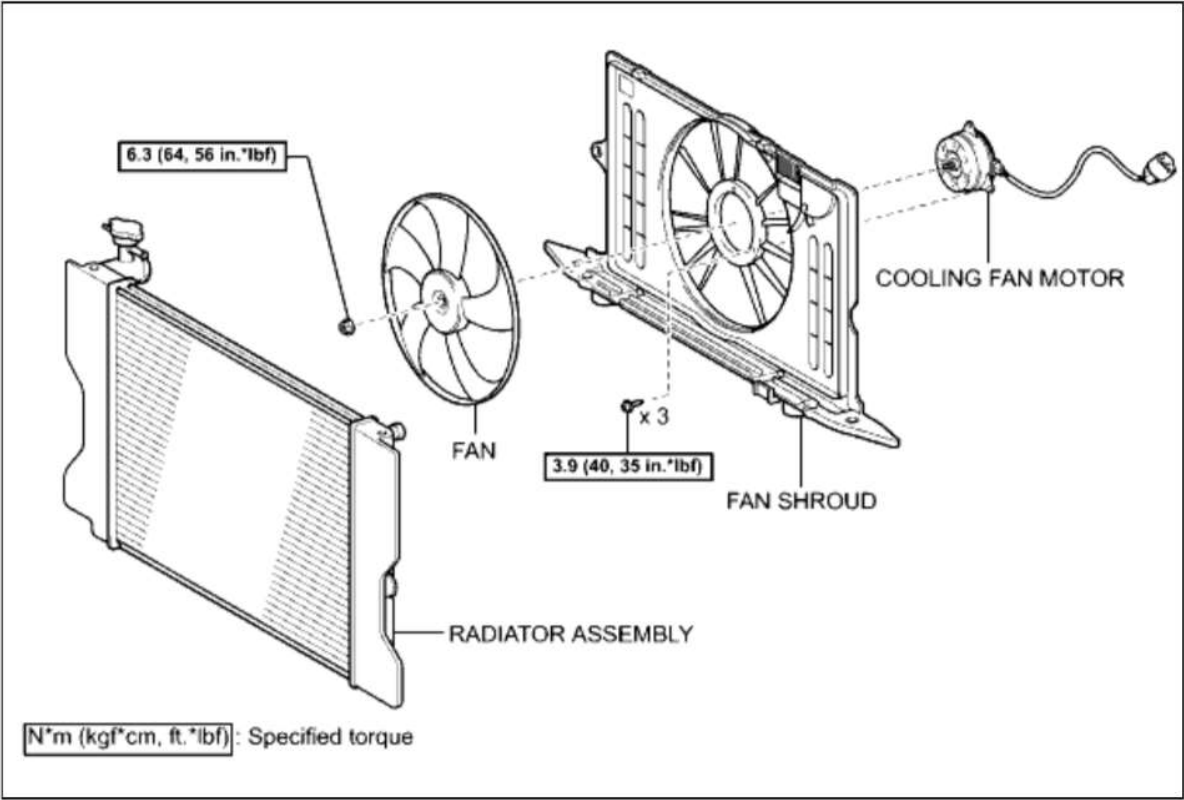
HINT:  .



Last Modified: 3-10-2010	6.4 K	From: 200901
Model Year: 2010	Model: Corolla	Doc ID: RM000002X0R01QX
Title: 2ZR-FE COOLING: COOLING FAN MOTOR: COMPONENTS (2010 Corolla)		

COMPONENTS

ILLUSTRATION



Last Modified: 3-10-2010	6.4 J	From: 200901
Model Year: 2010	Model: Corolla	Doc ID: RM000002YZE015X
Title: 2AZ-FE COOLING: COOLING FAN SYSTEM: Cooling Fan Circuit (2010 Corolla)		

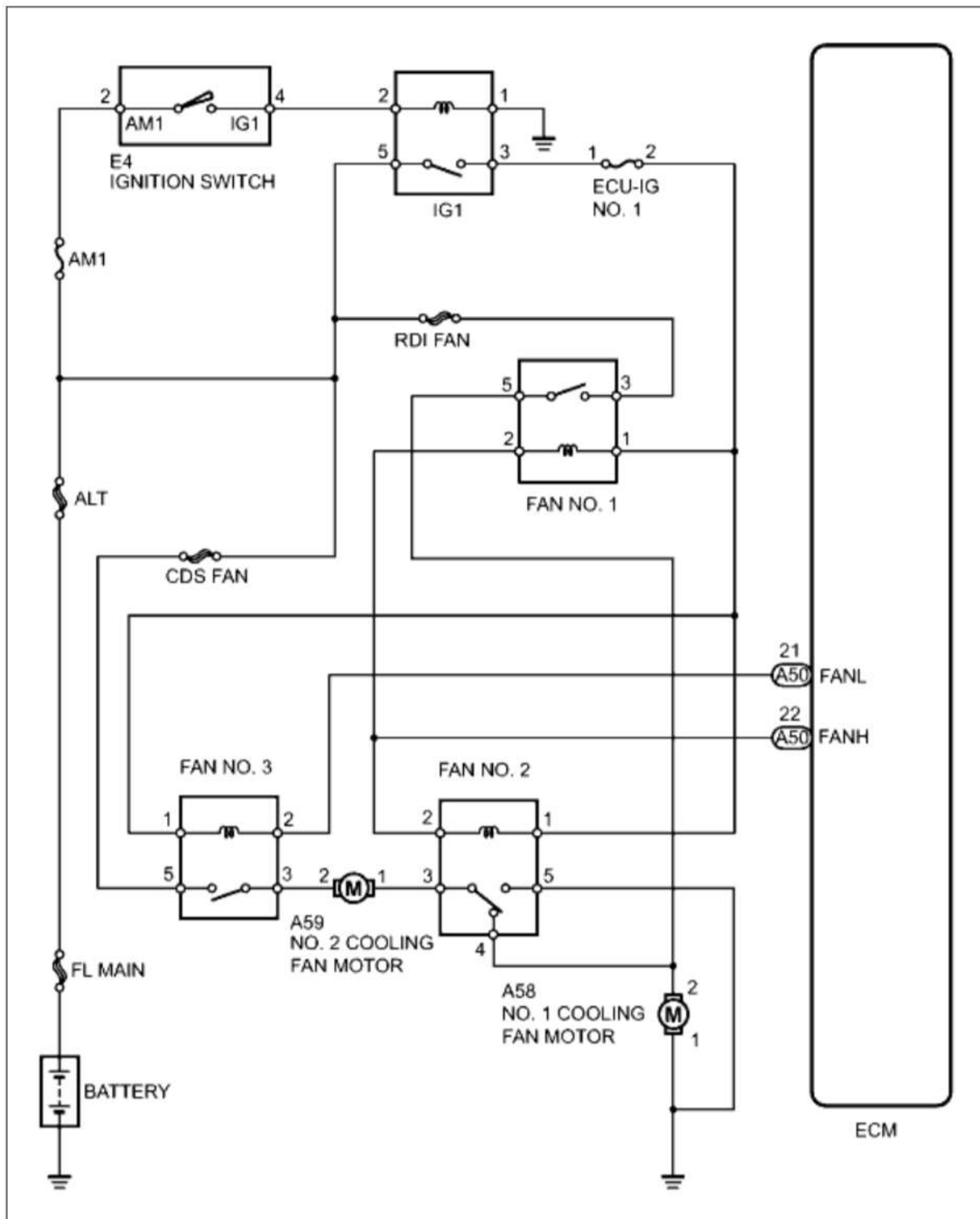
Cooling Fan Circuit

DESCRIPTION

The ECM turns on or off the fan relays using signals calculated from the engine coolant temperature, air conditioning (ON/OFF), air conditioner refrigerant pressure, engine speed, and vehicle speed signals.

The ECM switches the circuit of the cooling fan motors between series and parallel by turning on or off the fan relays in order to control the speed of the cooling fan motors in two steps.

WIRING DIAGRAM



INSPECTION PROCEDURE

NOTICE:

After replacing the ECM, the new ECM needs registration



PROCEDURE

1. PERFORM ACTIVE TEST USING TECHSTREAM (OPERATE ELECTRIC COOLING FAN)

- (a) Connect the Techstream to the DLC3.
- (b) Turn the ignition switch to ON.
- (c) Turn the Techstream on.
- (d) Enter the following menus: Powertrain / Engine and ECT / Active Test / Control the Electric Cooling Fan.

OK:

TESTER OPERATION	SPECIFIED CONDITION
ON	Fans operate
OFF	Fans do not operate

Result:

RESULT	PROCEED TO
OK	A
NG (Cooling fans do not operate)	B
NG (Cooling fans do not stop)	C

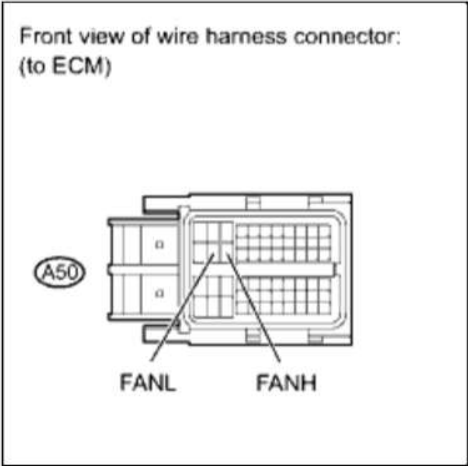
C ► INSPECT FAN NO. 1 RELAY

B ► INSPECT ECM (FANL AND FANH VOLTAGE)

A ► PROCEED TO NEXT INSPECTION PROCEDURE SHOWN IN PROBLEM SYMPTOMS TABLE

2. INSPECT ECM (FANL AND FANH VOLTAGE)

- (a) Disconnect the ECM connector.



- (b) Turn the ignition switch to ON.
- (c) Measure the voltage according to the value(s) in the table below.
- Standard V oltage:

TESTER CONNECTION	SWITCH CONDITION	SPECIFIED CONDITION
A 50-21 (FANL) - Body ground	Ignition switch ON	11 to 14 V
A 50-22 (FANH) - Body ground	Ignition switch ON	11 to 14 V

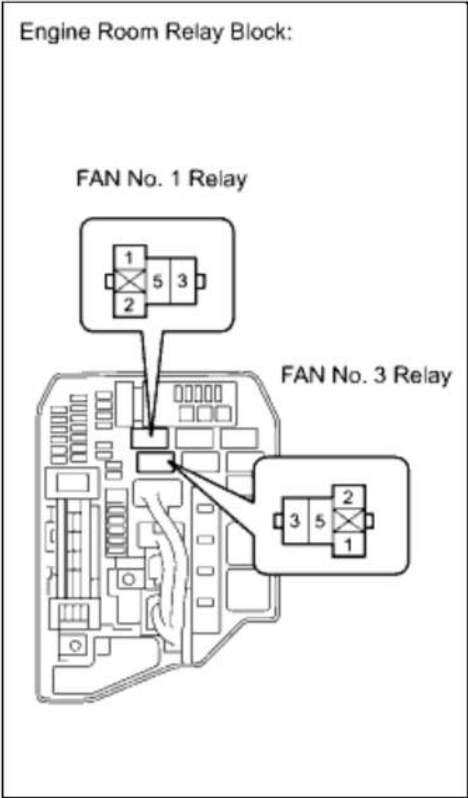
- (d) Reconnect the ECM connector.

NG ► **CHECK FUSE (ECU-IG NO. 1 FUSE)**

OK
▼

3.	INSPECT ENGINE ROOM RELAY BLOCK (FAN NO. 1 RELAY AND FAN NO. 3 RELAY VOLTAGE)
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- (a) Remove the FAN No. 1 relay and FAN No. 3 relay from the engine room relay block.



(b) Measure the voltage according to the value(s) in the table below.

Standard Voltage:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
3 (FAN No. 1 relay) - Body ground	Always	11 to 14 V
5 (FAN No. 3 relay) - Body ground	Always	11 to 14 V

(c) Reinstall the FAN No. 1 relay and FAN No. 3 relay.

NG ► **REPAIR OR REPLACE HARNESS OR CONNECTOR (BATTERY - ENGINE ROOM RELAY BLOCK)**

OK
▼

4.

INSPECT FAN NO. 1 RELAY

(a) Inspect the FAN No. 1 relay INFO.

NG ► **REPLACE FAN NO. 1 RELAY**

OK
▼

5. INSPECT FAN NO. 2 RELAY

(a) Inspect the FAN No. 2 relay .

NG ► **REPLACE FAN NO. 2 RELAY**

OK
▼

6. INSPECT FAN NO. 3 RELAY

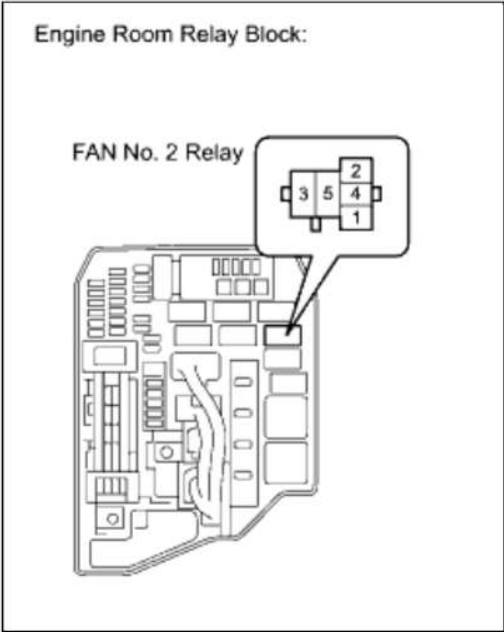
(a) Inspect the FAN No. 3 relay .

NG ► **REPLACE FAN NO. 3 RELAY**

OK
▼

7. CHECK HARNESS AND CONNECTOR (ENGINE ROOM RELAY BLOCK - BODY GROUND)

(a) Remove the FAN No. 2 relay from the engine room relay block.



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

Standard Resistance:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
5 (FAN No. 2 relay) - Body ground	Always	Below 1 Ω

(c) Reinstall the FAN No. 2 relay.

NG ► **REPAIR OR REPLACE HARNESS OR CONNECTOR (ENGINE ROOM RELAY BLOCK - BODY GROUND)**

OK
▼

8.

INSPECT NO. 1 COOLING FAN MOTOR (RADIATOR FAN MOTOR)

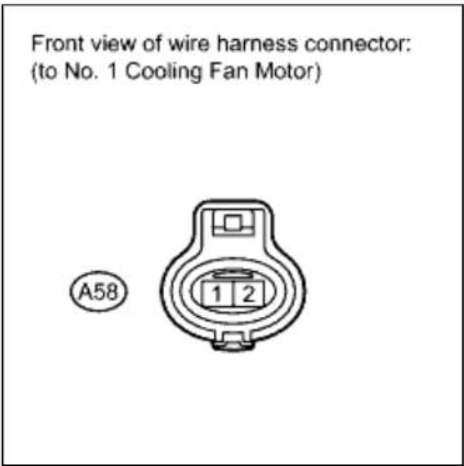
(a) Inspect the No. 1 cooling fan motor .

NG ► **REPLACE NO. 1 COOLING FAN MOTOR (RADIATOR FAN MOTOR)**

OK



9. CHECK HARNESS AND CONNECTOR (NO. 1 COOLING FAN MOTOR - BODY GROUND)



(a) Disconnect the No. 1 cooling fan motor (radiator fan motor) connector.

(b) Measure the resistance according to the value(s) in the table below.
Standard Resistance:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
A58-1 - Body ground	Always	Below 1 Ω

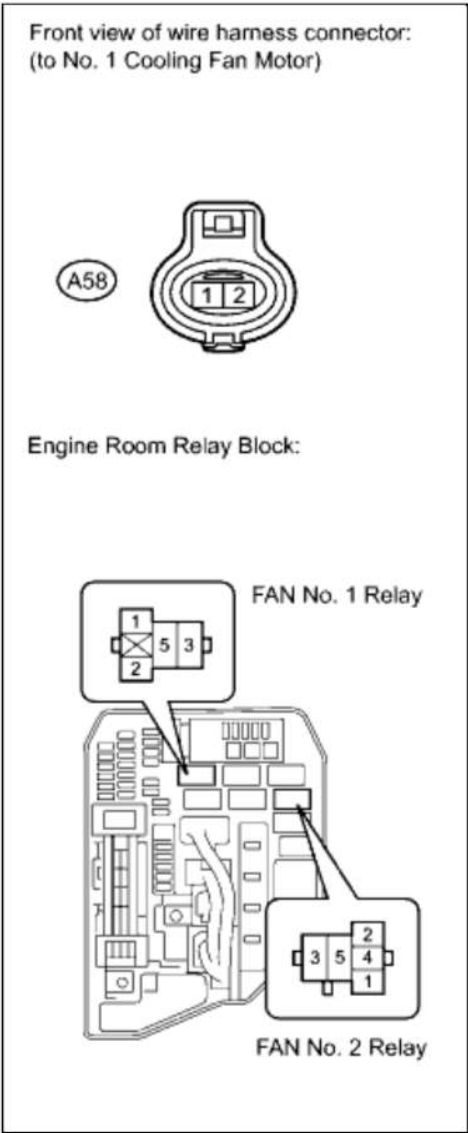
(c) Reconnect the No. 1 cooling fan motor connector.

NG ► REPAIR OR REPLACE HARNESS OR CONNECTOR
(NO. 1 COOLING FAN MOTOR - BODY GROUND)

OK
▼

10. CHECK HARNESS AND CONNECTOR (NO. 1 COOLING FAN MOTOR - ENGINE ROOM RELAY BLOCK)

(a) Disconnect the No. 1 cooling fan motor (radiator fan motor) connector.



(b) Remove the FAN No. 1 relay and FAN No. 2 relay from the engine room relay block.

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

Standard Resistance (Check for Open):

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
A58-2 - 5 (FAN No. 1 relay)	Always	Below 1 Ω
A58-2 - 4 (FAN No. 2 relay)	Always	Below 1 Ω

Standard Resistance (Check for Short):

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
A58-2 or 5 (FAN No. 1 relay) - Body ground	Always	10 kΩ or higher
A58-2 or 4 (FAN No. 2 relay) - Body ground	Always	10 kΩ or higher

- (d) Reconnect the radiator fan motor connector.
- (e) Reinstall the FAN No. 1 relay and FAN No. 2 relay.

NG ► **REPAIR OR REPLACE HARNESS OR CONNECTOR
(NO. 1 COOLING FAN MOTOR - ENGINE ROOM
RELAY BLOCK)**

OK



11.	INSPECT NO. 2 COOLING FAN MOTOR (AIR CONDITIONER CONDENSER FAN MOTOR)
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- (a) Inspect the No. 2 cooling fan motor .

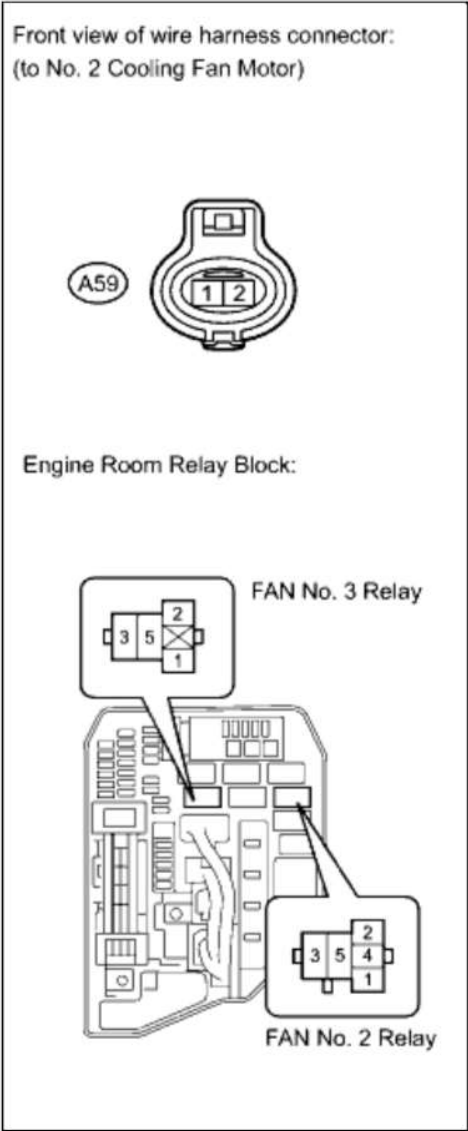
NG ► **REPLACE NO. 2 COOLING FAN MOTOR (AIR
CONDITIONER CONDENSER FAN MOTOR)**

OK



12.	CHECK HARNESS AND CONNECTOR (NO. 2 COOLING FAN MOTOR - ENGINE ROOM RELAY BLOCK)
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- (a) Disconnect the No. 2 cooling fan motor (air conditioner condenser fan motor) connector.



- (b) Remove the FAN No. 2 relay and FAN No. 3 relay from the engine room relay block.
- (c) Measure the resistance according to the value(s) in the table below.

Standard Resistance (Check for Open):

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
A59-1 - 3 (FAN No. 2 relay)	Always	Below 1 Ω
A59-2 - 3 (FAN No. 3 relay)	Always	Below 1 Ω

Standard Resistance (Check for Short):

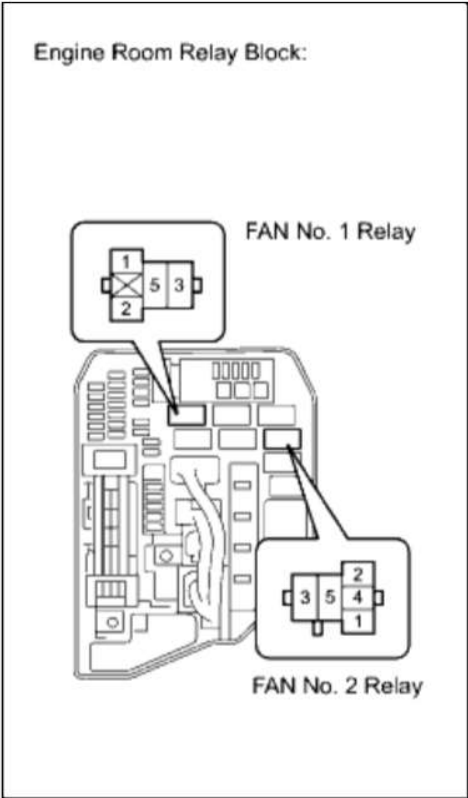
TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
A59-1 or 3 (FAN No. 2 relay) - Body ground	Always	10 kΩ or higher
A59-2 or 3 (FAN No. 3 relay) - Body ground	Always	10 kΩ or higher

- (d) Reconnect the No. 2 cooling fan motor connector.
- (e) Reinstall the FAN No. 2 relay and FAN No. 3 relay.

NG ► **REPAIR OR REPLACE HARNESS OR CONNECTOR (NO. 2 COOLING FAN MOTOR - ENGINE ROOM RELAY BLOCK)**

OK
▼

13. INSPECT ENGINE ROOM RELAY BLOCK (FAN NO. 1 RELAY - FAN NO. 2 RELAY)



- (a) Remove the FAN No. 1 relay and FAN No. 2 relay from the engine room relay block.

- (b) Measure the resistance according to the value(s) in the table below.
- Standard Resistance (Check for Open):

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
1 (FAN No. 1 relay) - 1 (FAN No. 2 relay)	Always	Below 1 Ω
2 (FAN No. 1 relay) - 2 (FAN No. 2 relay)	Always	Below 1 Ω

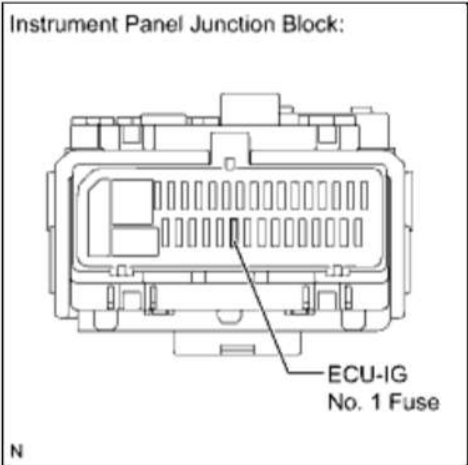
Standard Resistance (Check for Short):

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
1 (FAN No. 1 relay) or 1 (FAN No. 2 relay) - Body ground	Always	10 kΩ or higher
2 (FAN No. 1 relay) or 2 (FAN No. 2 relay) - Body ground	Always	10 kΩ or higher

(c) Reinstall the FAN No. 1 relay and FAN No. 2 relay.

- NG▶ REPLACE ENGINE ROOM RELAY BLOCK
- OK▶ REPLACE ECM

14. CHECK FUSE (ECU-IG NO. 1 FUSE)



(a) Remove the ECU-IG No. 1 fuse from the instrument panel junction block.

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

Standard Resistance:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
ECU-IG No. 1 fuse	Always	Below 1 Ω

(c) Reinstall the ECU-IG No. 1 fuse.

- NG▶ REPLACE FUSE (ECU-IG NO. 1 FUSE)

OK

▼

15. INSPECT FAN NO. 1 RELAY

(a) Inspect the FAN No. 1 relay .

NG ► **REPLACE FAN NO. 1 RELAY**

OK

16. INSPECT FAN NO. 2 RELAY

(a) Inspect the FAN No. 2 relay .

NG ► **REPLACE FAN NO. 2 RELAY**

OK

17. INSPECT FAN NO. 3 RELAY

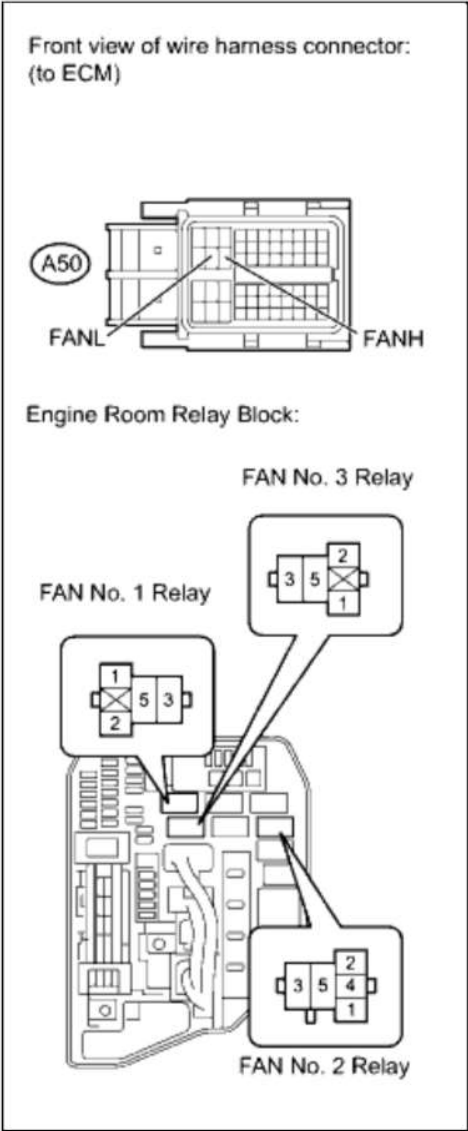
(a) Inspect the FAN No. 3 relay .

NG ► **REPLACE FAN NO. 3 RELAY**

OK

18. CHECK HARNESS AND CONNECTOR (ENGINE ROOM RELAY BLOCK - ECM)

(a) Remove the FAN No. 1 relay, FAN No. 2 relay and FAN No. 3 relay from the engine room relay block.

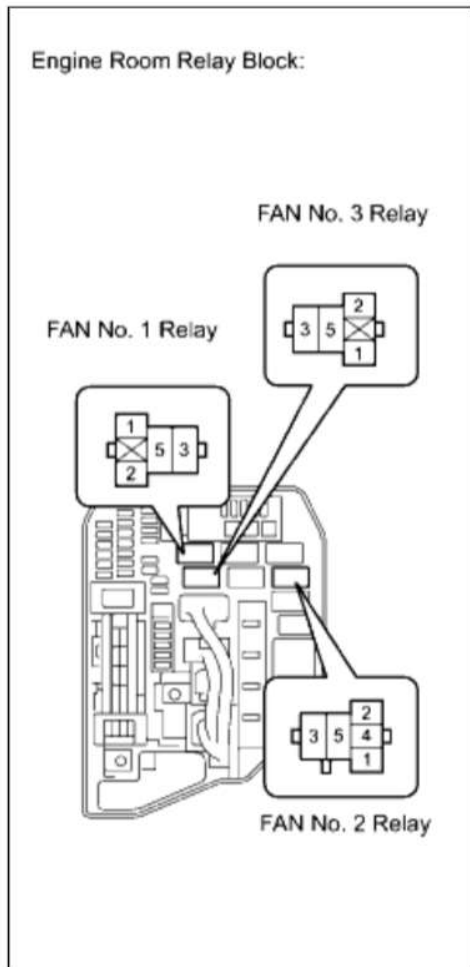


- (b) Disconnect the ECM connector.
- (c) Measure the resistance according to the value(s) in the table below.
- Standard Resistance (Check for Open):

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
2 (FAN No. 1 relay) - A50-22 (FANH)	Always	Below 1 Ω
2 (FAN No. 2 relay) - A50-22 (FANH)	Always	Below 1 Ω
2 (FAN No. 3 relay) - A50-21 (FANL)	Always	Below 1 Ω

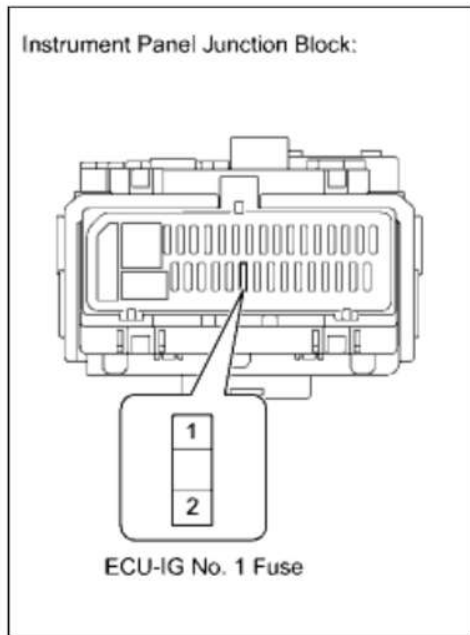
- (d) Reinstall the FAN No. 1 relay, FAN No. 2 relay and FAN No. 3 relay.
- (e) Reconnect the ECM connector.

NG ► **REPAIR OR REPLACE HARNESS OR CONNECTOR
(ENGINE ROOM RELAY BLOCK - ECM)**

OK
▼**19.****CHECK HARNESS AND CONNECTOR (ECU-IG NO. 1 FUSE - ENGINE ROOM RELAY BLOCK)**

(a) Remove the FAN No. 1 relay, FAN No. 2 relay and FAN No. 3 relay from the engine room relay block.

(b) Remove the ECU-IG No. 1 fuse from the instrument panel junction block.



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

Standard Resistance (Check for Open):

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
1 (FAN No. 1 relay) - 2 (ECU-IG No. 1 fuse)	Always	Below 1 Ω
1 (FAN No. 2 relay) - 2 (ECU-IG No. 1 fuse)	Always	Below 1 Ω
1 (FAN No. 3 relay) - 2 (ECU-IG No. 1 fuse)	Always	Below 1 Ω

Standard Resistance (Check for Short):

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
1 (FAN No. 1 relay) or 2 (ECU-IG No. 1 fuse) - Body ground	Always	10 k Ω or higher
1 (FAN No. 2 relay) or 2 (ECU-IG No. 1 fuse) - Body ground	Always	10 k Ω or higher
1 (FAN No. 3 relay) or 2 (ECU-IG No. 1 fuse) - Body ground	Always	10 k Ω or higher

(d) Reinstall the FAN No. 1 relay, FAN No. 2 relay and FAN No. 3 relay.

(e) Reinstall the ECU-IG No. 1 fuse.

NG ► **REPAIR OR REPLACE HARNESS OR CONNECTOR (ECU-IG NO. 1 FUSE - ENGINE ROOM RELAY BLOCK)**

OK ► **CHECK FOR INTERMITTENT PROBLEMS**

20. INSPECT FAN NO. 1 RELAY

(a) Inspect the FAN No. 1 relay .

NG ► **REPLACE FAN NO. 1 RELAY**

OK

21. INSPECT FAN NO. 3 RELAY

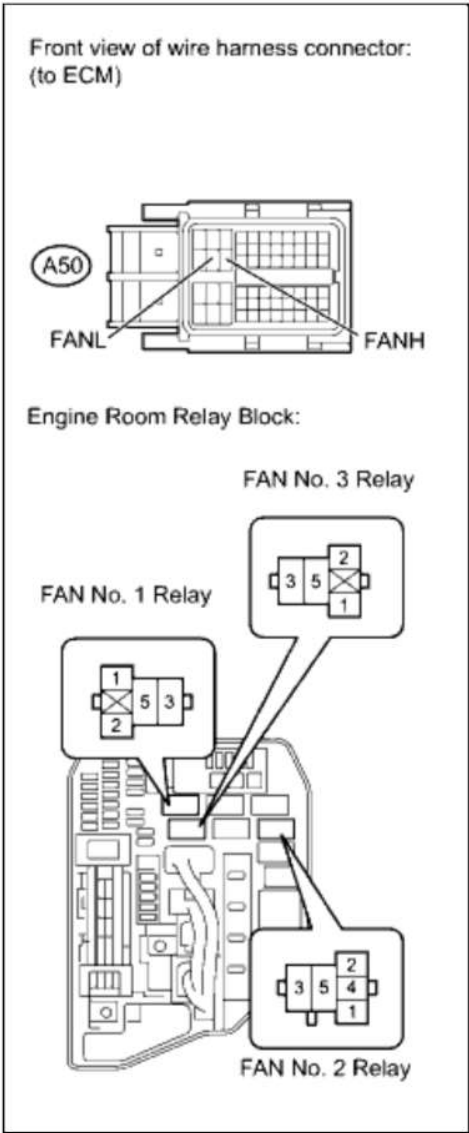
(a) Inspect the FAN No. 3 relay .

NG ► **REPLACE FAN NO. 3 RELAY**

OK

22. CHECK HARNESS AND CONNECTOR

(a) Remove the FAN No. 1 relay, FAN No. 2 relay and FAN No. 3 relay from the engine room relay block.



- (b) Disconnect the ECM connector.
- (c) Measure the resistance according to the value(s) in the table below.
- Standard Resistance (Check for Short):

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
2 (FAN No. 1 relay) or A50-22 (FANH) - Body ground	Always	10 kΩ or higher
2 (FAN No. 2 relay) or A50-22 (FANH) - Body ground	Always	10 kΩ or higher
2 (FAN No. 3 relay) or A50-21 (FANL) - Body ground	Always	10 kΩ or higher

- (d) Reinstall the FAN No. 1 relay, FAN No. 2 relay and FAN No. 3 relay.
- (e) Reconnect the ECM connector.

NG ► **REPAIR OR REPLACE HARNESS OR CONNECTOR
(ECU-IG NO. 1 FUSE - ENGINE ROOM RELAY**

BLOCK)

OK ► **REPLACE ECM**

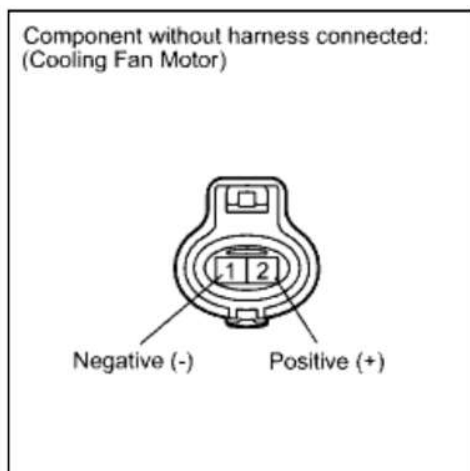


TOYOTA

Last Modified: 3-10-2010	6.4 G	From: 200901
Model Year: 2010	Model: Corolla	Doc ID: RM000000YFJ04WX
Title: 2ZR-FE COOLING: COOLING FAN MOTOR: ON-VEHICLE INSPECTION (2010 Corolla)		

ON-VEHICLE INSPECTION

1. INSPECT COOLING FAN MOTOR



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

If the motor does not operate smoothly, replace the cooling fan motor.

- (b) Connect the pickup of a clamp-on ammeter over one of the two wires for the cooling fan motor.

- (c) Measure the current while the motor is operating.

Standard Current:

CONNECTION	CONDITION	SPECIFIED CONDITION
Fan wire	20°C (68°F)	7.4 to 10.9 A

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



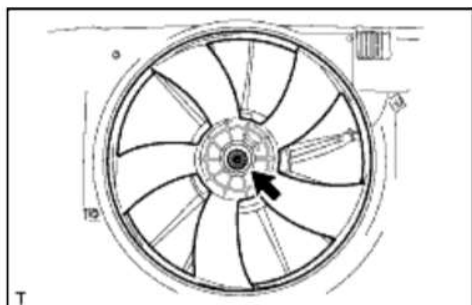
Last Modified: 3-10-2010	6.4 A	From: 200901
Model Year: 2010	Model: Corolla	Doc ID: RM000002X0S01QX
Title: 2ZR-FE COOLING: COOLING FAN MOTOR: REMOVAL (2010 Corolla)		

REMOVAL

1. REMOVE RADIATOR ASSEMBLY

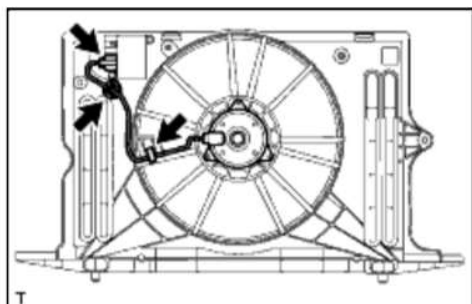
HINT: 

2. REMOVE FAN

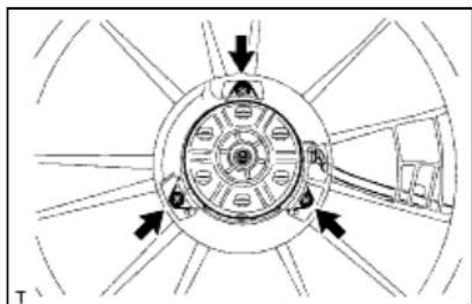


(a) Remove the nut, then remove the fan.

3. REMOVE COOLING FAN MOTOR



(a) Disconnect the connector and 2 clamps from the fan shroud.

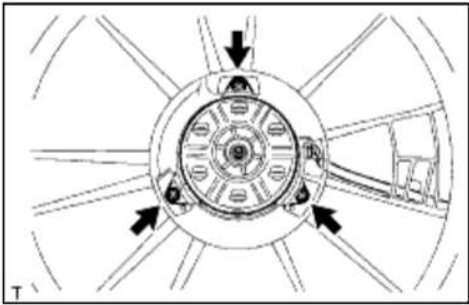


(b) Remove the 3 screws, then remove the cooling fan motor.

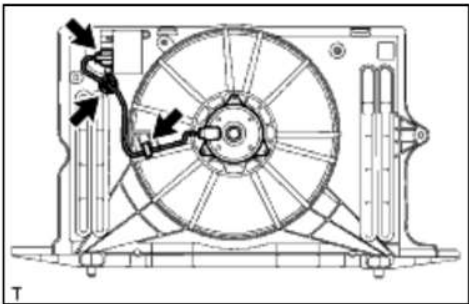
Last Modified: 3-10-2010	6.4 A	From: 200901
Model Year: 2010	Model: Corolla	Doc ID: RM000002X0Q01QX
Title: 2ZR-FE COOLING: COOLING FAN MOTOR: INSTALLATION (2010 Corolla)		

INSTALLATION

1. INSTALL COOLING FAN MOTOR

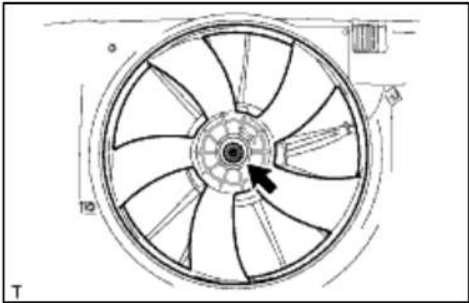


- (a) Install the cooling fan motor with the 3 screws.
Torque: 3.9 N·m (40 kgf·cm, 35in·lbf)



- (b) Connect the connector and 2 clamps.
NOTICE:
Be careful not to damage the connector.

2. INSTALL FAN



- (a) Install the fan with the nut.
Torque: 6.3 N·m (64 kgf·cm, 56in·lbf)

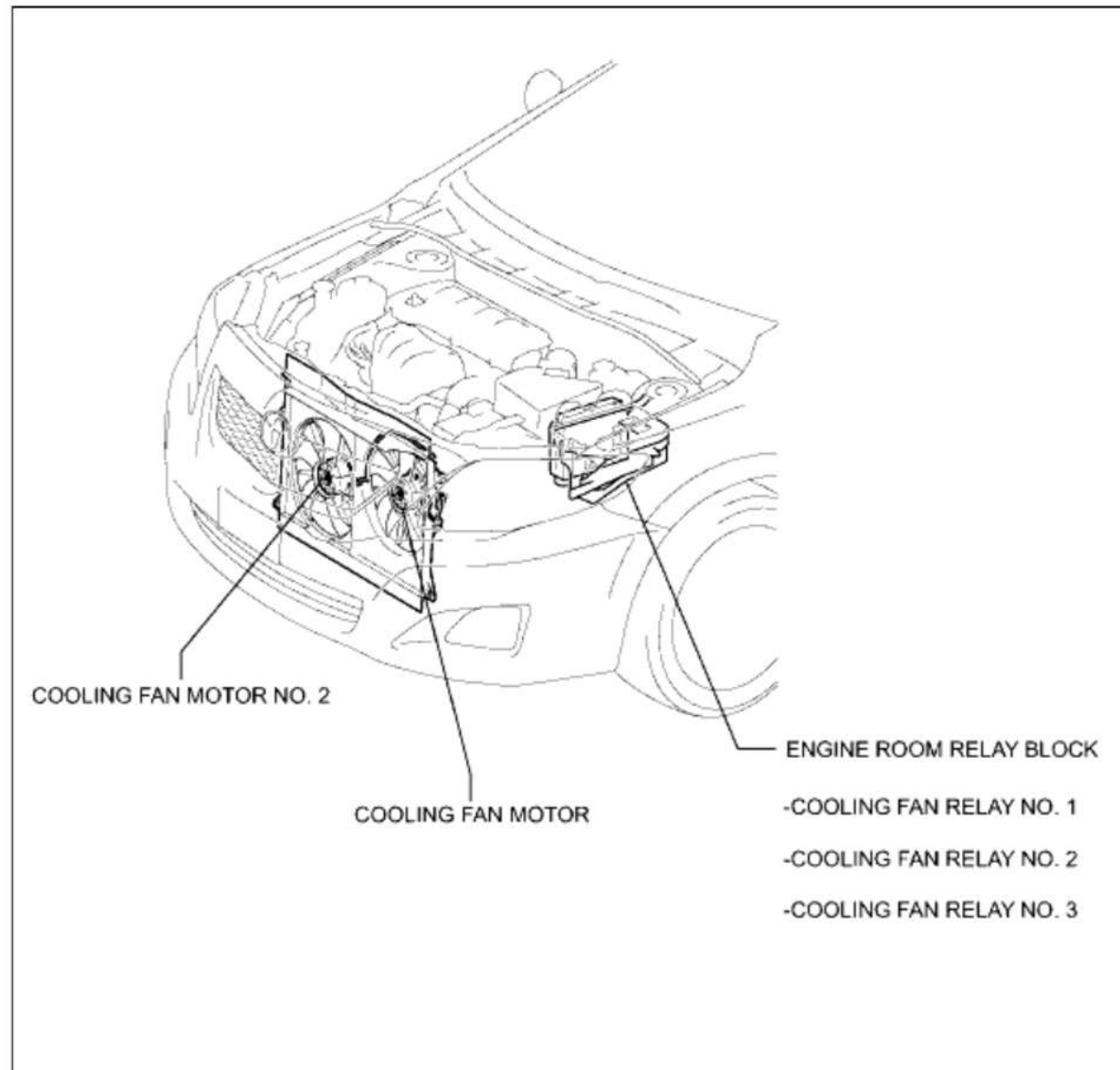
3. INSTALL RADIATOR ASSEMBLY

HINT: 

Last Modified: 3-10-2010	6.4 R	From: 200901
Model Year: 2010	Model: Corolla	Doc ID: RM000000XVY036X
Title: 2AZ-FE COOLING: COOLING FAN SYSTEM: PARTS LOCATION (2010 Corolla)		

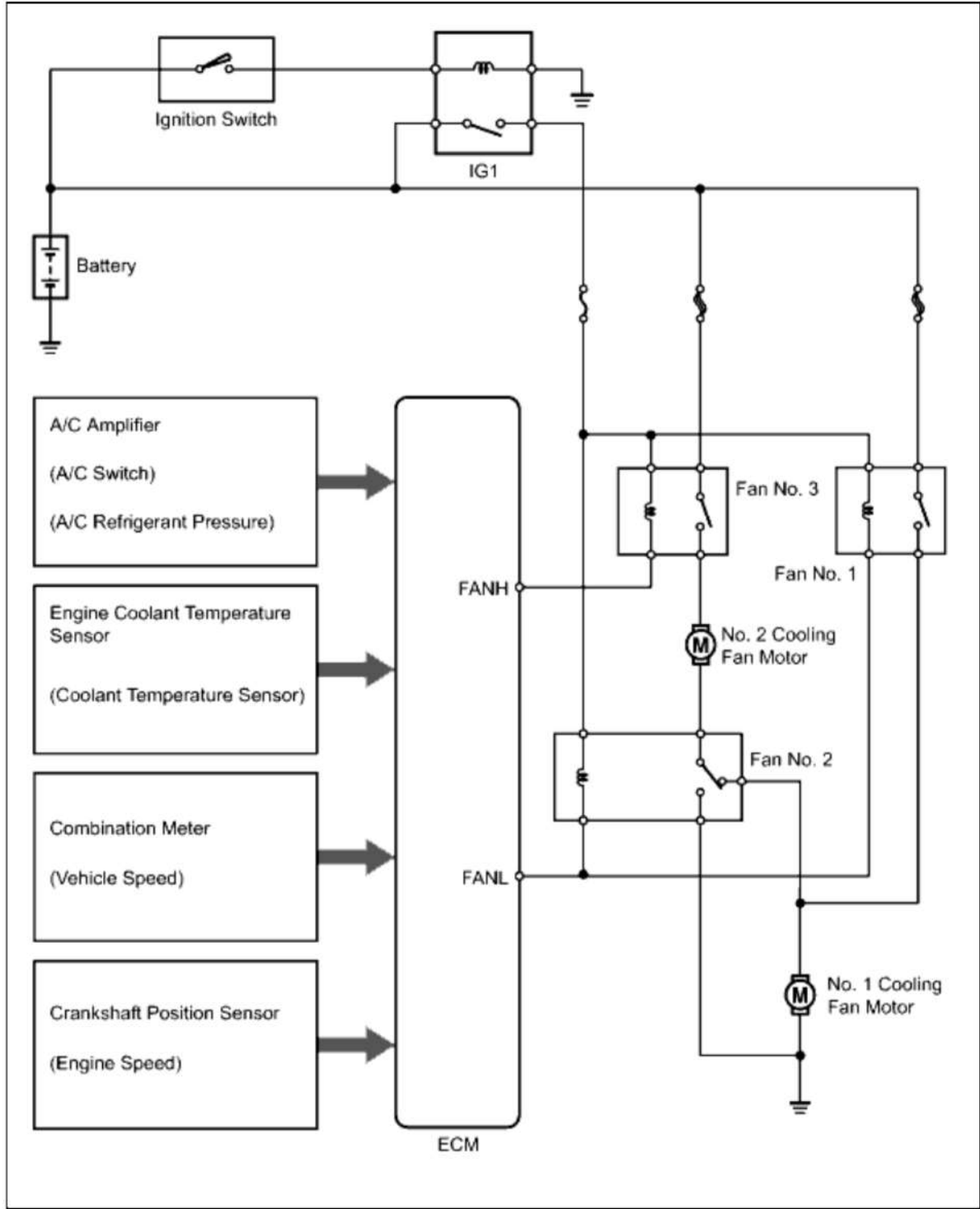
PARTS LOCATION

ILLUSTRATION



Last Modified: 3-10-2010	6.4 U	From: 200901
Model Year: 2010	Model: Corolla	Doc ID: RM000003D8M004X
Title: 2AZ-FE COOLING: COOLING FAN SYSTEM: SYSTEM DIAGRAM (2010 Corolla)		

SYSTEM DIAGRAM



Last Modified: 3-10-2010	6.4 T	From: 200901
Model Year: 2010	Model: Corolla	Doc ID: RM000003E0000FX
Title: 2AZ-FE COOLING: COOLING FAN SYSTEM: PROBLEM SYMPTOMS TABLE (2010 Corolla)		

PROBLEM SYMPTOMS TABLE

Use the table below to help determine the cause of the problem symptoms. If multiple suspected areas are listed, the potential causes of the symptoms are listed in order of probability in the "Suspected area" column of the table. Check each symptom by checking the suspected areas in the order they are listed. Replace parts as necessary.

COOLING FAN SYSTEM

SYMPTOM	SUSPECTED AREA	SEE PAGE
Cooling fan does not operate	No. 1 cooling fan motor	INFO
	No. 2 cooling fan motor	INFO
	Fan No. 1 relay	INFO
	Fan No. 2 relay	INFO
	Fan No. 3 relay	INFO
	CAN communication system	INFO
	Cooling fan circuit	INFO
	ECM	-
Cooling fan does not stop	Fan No. 1 relay	INFO
	Fan No. 3 relay	INFO
	CAN communication system	INFO
	Cooling fan circuit	INFO
	ECM	-
Cooling fan speed does not change	Fan No. 2 relay	INFO
	CAN communication system	INFO
	Cooling fan circuit	INFO
	ECM	-

Last Modified: 3-10-2010	6.4 G	From: 200901
Model Year: 2010	Model: Corolla	Doc ID: RM000000XW0038X
Title: 2AZ-FE COOLING: COOLING FAN SYSTEM: ON-VEHICLE INSPECTION (2010 Corolla)		

ON-VEHICLE INSPECTION

HINT:

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

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

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

(b) Check that the cooling fans stop.

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

(c) Disconnect the engine coolant temperature sensor connector.

(d) Check that the cooling fans operate.

If either does not, check the fuses, cooling fan relays, ECM and cooling fan, and then check for an open circuit in the cooling fan relay.

(e) Reconnect the engine coolant temperature sensor connector.

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

(a) Start the engine, and then raise the coolant temperature 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 fans operate.

If either does not, check the fuses, engine coolant temperature sensor, cooling fan, harness or connector.



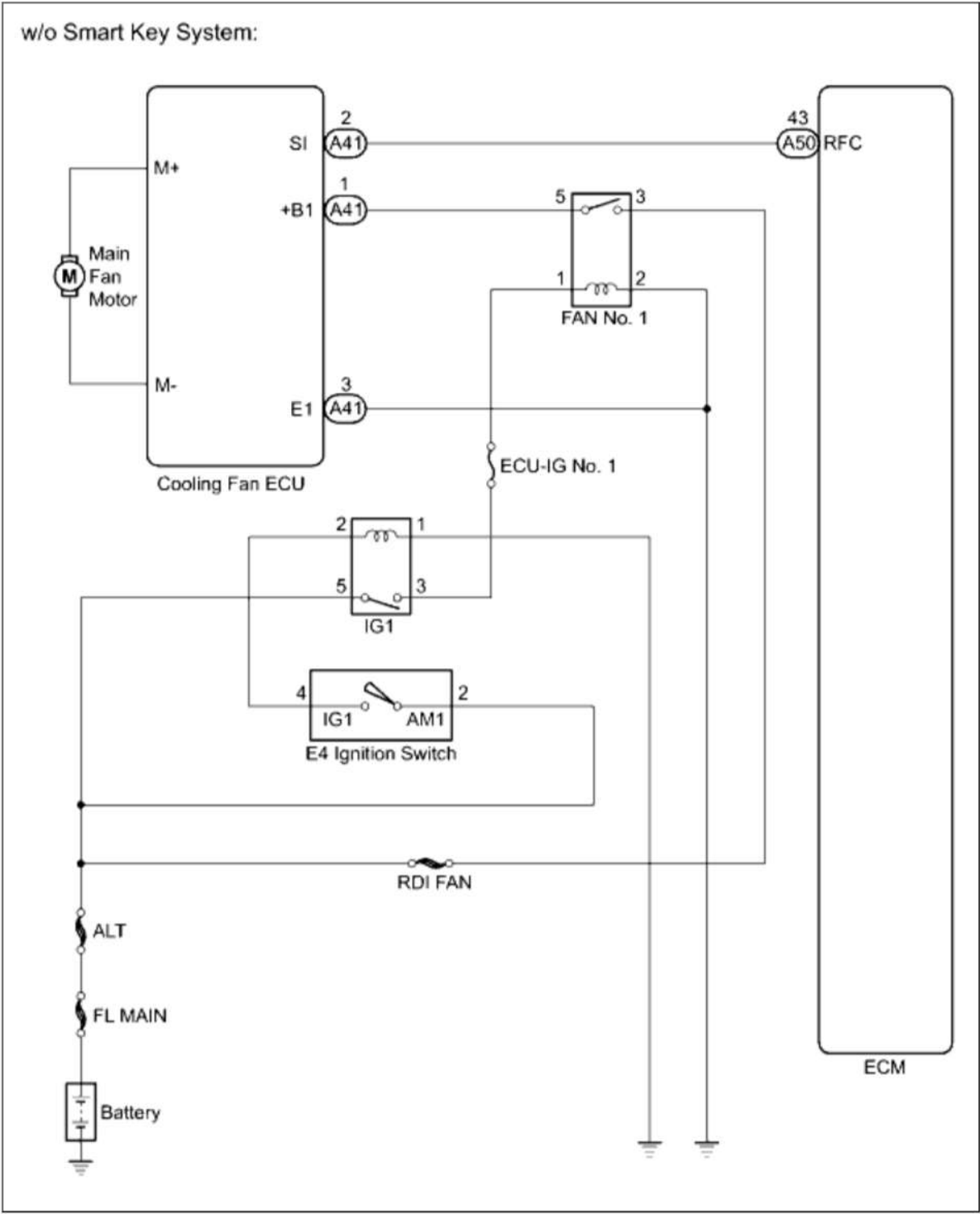
Last Modified: 3-10-2010	6.4 J	From: 200901
Model Year: 2010	Model: Corolla	Doc ID: RM000002WE901XX
Title: 2ZR-FE COOLING: COOLING FAN SYSTEM: Cooling Fan Circuit (2010 Corolla)		

Cooling Fan Circuit

DESCRIPTION

The ECM calculates an appropriate cooling fan speed based on the engine coolant temperature, air conditioning switch condition, refrigerant pressure, engine speed, and vehicle speed and sends the signals to the cooling fan ECU to regulate the cooling fan. The cooling fan ECU controls the cooling fan speed based on the duty ratio signal sent from the ECM. By basing its control on the operating conditions, the ECM can control the fan speed optimally using the cooling fan ECU, achieving both high cooling performance and quietness. The cooling fan speed is determined based on the engine coolant temperature, air conditioner operating conditions, engine speed, and vehicle speed.

WIRING DIAGRAM



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- (a) Connect the Techstream to the DLC3.
- (b) Turn the ignition switch to ON.
- (c) Enter the following menus: Powertrain / Engine and ECT / Active Test / Control the Electric Cooling Fan.
- (d) Check the operation of the cooling fan using the Techstream.
- OK:

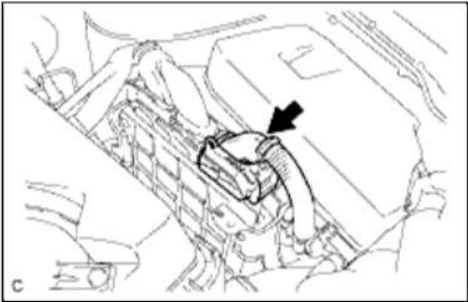
TESTER OPERATION	FAN OPERATION
ON	Cooling fan operates
OFF	Cooling fan stopped

Result:

RESULT	PROCEED TO
OK	A
NG (Cooling fan does not operate)	B
NG (Cooling fan does not stop)	C

- C ► CHECK HARNESS AND CONNECTOR (ECM - COOLING FAN ECU)
- B ► INSPECT COOLING FAN ECU
- A ► PROCEED TO NEXT INSPECTION PROCEDURE SHOWN IN PROBLEM SYMPTOMS TABLE

2. INSPECT COOLING FAN ECU



- (a) Disconnect the ECM connector.

- (b) Turn the ignition switch to ON.
- (c) Check the operation of the cooling fan.

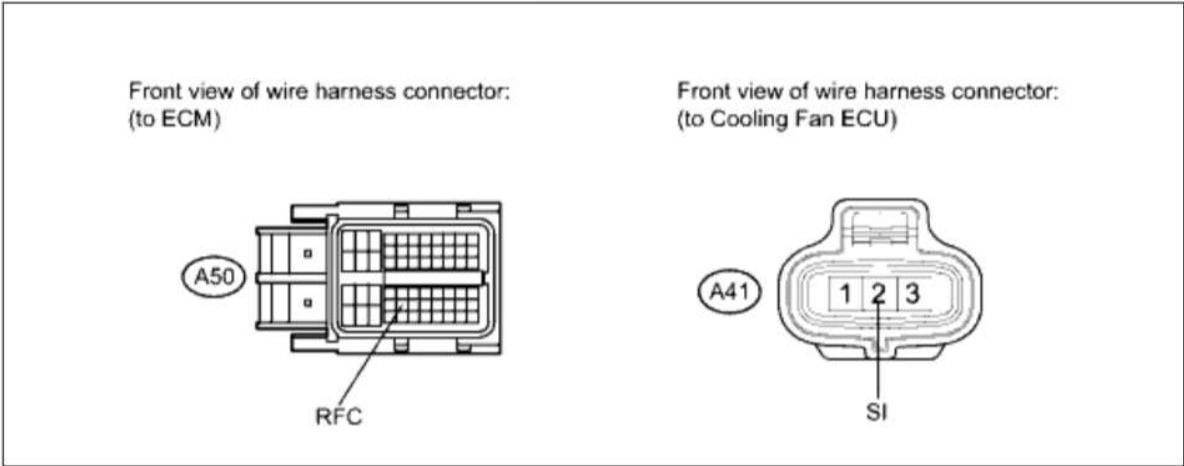
OK:
The cooling fan operates.

(d) Reconnect the ECM connector.

- NG▶CHECK HARNESS AND CONNECTOR (ECM - COOLING FAN ECU)
- OK▶REPLACE ECM

3. CHECK HARNESS AND CONNECTOR (ECM - COOLING FAN ECU)

(a) Disconnect the cooling fan ECU connector.



- (b) Disconnect the ECM connector.
- (c) Measure the resistance according to the value(s) in the table below.
- Standard Resistance (Check for Open):

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
A 50-43 (RFC) - A 41-2 (SI)	Always	Below 1 Ω

Standard Resistance (Check for Short):

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
A 50-43 (RFC) or A 41-2 (SI) - Body ground	Always	10 kΩ or higher

- (d) Reconnect the ECM connector.
- (e) Reconnect the cooling fan ECU connector.

**NG ► REPAIR OR REPLACE HARNESS OR CONNECTOR
(ECM - COOLING FAN ECU)**

OK



4. INSPECT COOLING FAN MOTOR

Component without harness connected:
(Cooling Fan Motor)



(a) Disconnect the cooling fan ECU connector.

(b) Connect a battery positive (+) lead to terminal 2 of the cooling fan motor connector, and connect a battery negative (-) lead to terminal 1 of the cooling fan motor connector.

(c) Check the cooling fan motor.

OK:

The cooling fan operates.

(d) Reconnect the cooling fan ECU connector.

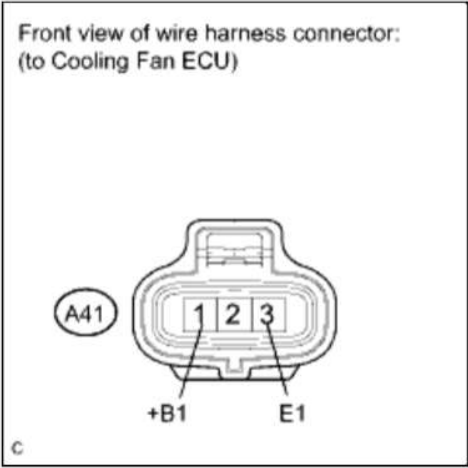
NG ► REPLACE COOLING FAN MOTOR

OK



5. CHECK COOLING FAN ECU (POWER SOURCE)

(a) Disconnect the cooling fan ECU connector.



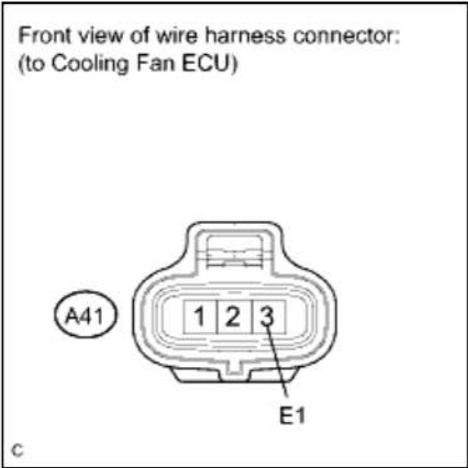
- (b) Turn the ignition switch to ON.
- (c) Measure the voltage according to the value(s) in the table below.
- Standard V voltage:

TESTER CONNECTION	SWITCH CONDITION	SPECIFIED CONDITION
A41-1 (+B1) - A41-3 (E1)	Ignition switch ON	11 to 14 V

- (d) Reconnect the cooling fan ECU connector.

- NG** ► **CHECK HARNESS AND CONNECTOR (COOLING FAN ECU - BODY GROUND)**
- OK** ► **REPLACE COOLING FAN ECU**

6. CHECK HARNESS AND CONNECTOR (COOLING FAN ECU - BODY GROUND)



- (a) Disconnect the cooling fan ECU connector.

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

Standard Resistance:

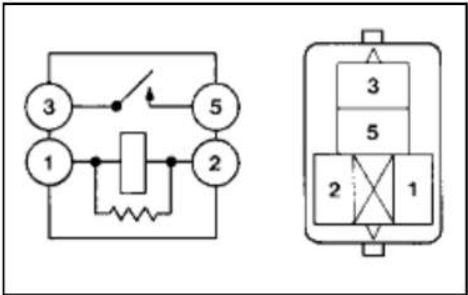
TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
A 41 -3 (E1) - Body ground	Always	Below 1 Ω

(c) Reconnect the cooling fan ECU connector.

NG ► REPAIR OR REPLACE HARNESS OR CONNECTOR (COOLING FAN ECU - BODY GROUND)

OK ▼

7. INSPECT FAN NO. 1 RELAY



(a) Remove the FAN No. 1 relay from the engine room relay block.

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

Standard Resistance:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
3 - 5	Normal	10 kΩ or higher
3 - 5	Apply battery voltage between terminals 1 and 2	Below 1 Ω

(c) Reinstall the FAN No. 1 relay.

NG ► REPLACE FAN NO. 1 RELAY

OK
▼

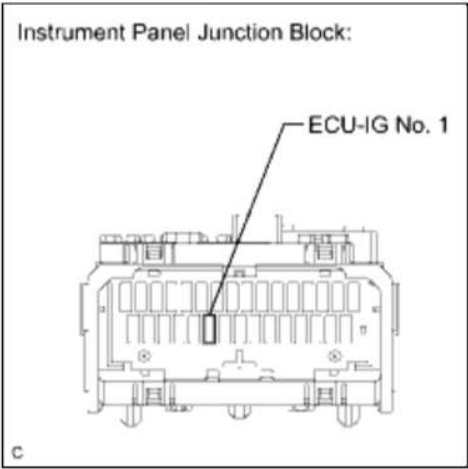
8. INSPECT FUSIBLE LINK BLOCK (RDI FAN FUSE)

(a) Check the RDI FAN fuse.

NG ► REPLACE FUSIBLE LINK BLOCK

OK
▼

9. INSPECT FUSE (ECU-IG NO. 1)



(a) Remove the ECU-IG No. 1 fuse from the instrument panel junction block.

(b) Measure the resistance according to the value(s) in the table below.
Standard Resistance:

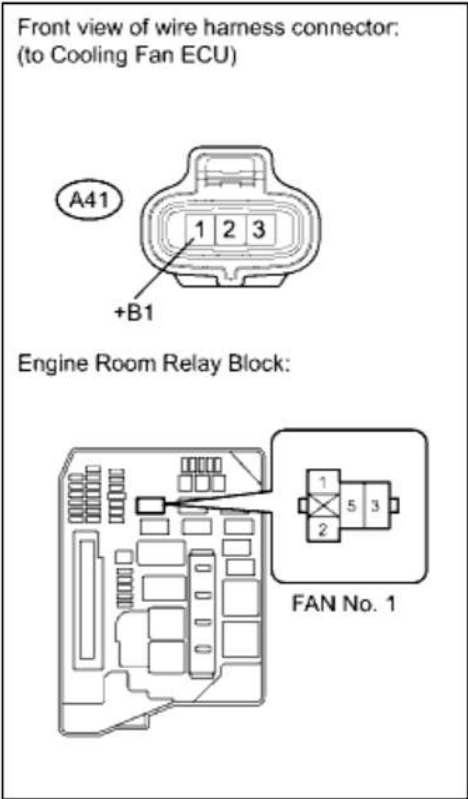
TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
ECU-IG No. 1 fuse	Always	Below 1 Ω

(c) Reinstall the ECU-IG No. 1 fuse.

NG ► REPLACE FUSE (ECU-IG NO. 1 FUSE)

OK

10. CHECK HARNESS AND CONNECTOR (COOLING FAN ECU - FAN NO. 1 RELAY)



(a) Disconnect the cooling fan ECU connector.

- (b) Remove the FAN No. 1 relay from the engine room relay block.
- (c) Measure the resistance according to the value(s) in the table below.

Standard Resistance (Check for Open):

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
A 41-1 (+B1) - 5 (FAN No.1 relay)	Always	Below 1 Ω

Standard Resistance (Check for Short):

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
A 41-1 (+B1) or 5 (FAN No.1 relay) - Body ground	Always	10 k Ω or higher

- (d) Reconnect the cooling fan ECU connector.

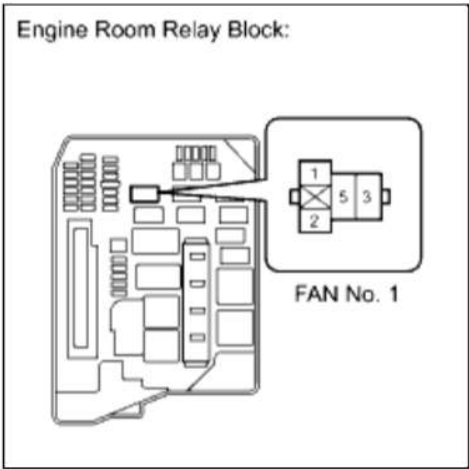
NG

▶ REPAIR OR REPLACE HARNESS OR CONNECTOR
(COOLING FAN ECU - FAN NO. 1 RELAY)

OK

▼

11. CHECK HARNESS AND CONNECTOR (FAN NO. 1 RELAY - BODY GROUND)



(a) Remove the FAN No. 1 relay from the engine room relay block.

(b) Measure the resistance according to the value(s) in the table below.
Standard Resistance:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
2 (FAN No.1 relay) - Body ground	Always	Below 1 Ω

(c) Reinstall the FAN No. 1 relay.

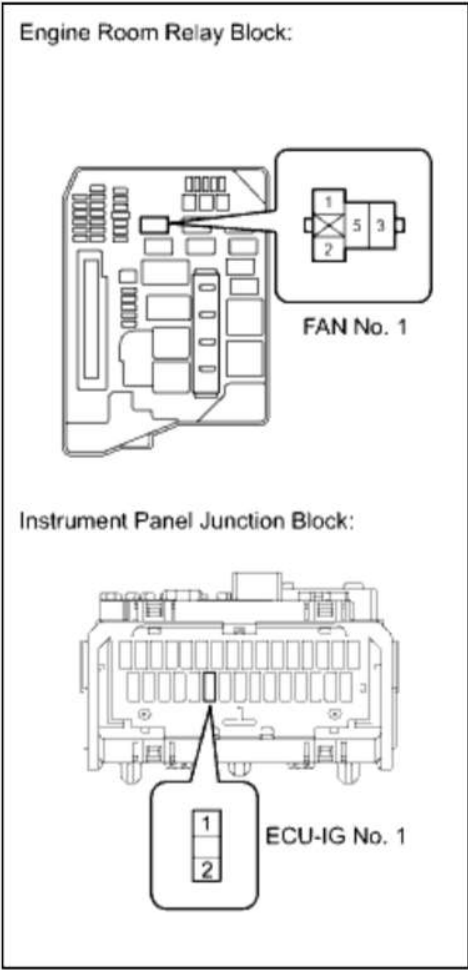
NG

▶ REPAIR OR REPLACE HARNESS OR CONNECTOR
(FAN NO. 1 RELAY - BODY GROUND)

OK

▼

12. CHECK HARNESS AND CONNECTOR (FAN NO. 1 RELAY - ECU-IG NO. 1 FUSE)



(a) Remove the ECU-IG No. 1 fuse from the instrument panel junction block.

- (b) Remove the FAN No. 1 relay from the engine room relay block.
- (c) Measure the resistance according to the value(s) in the table below.

Standard Resistance (Check for Open):

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
2 (ECU-IG No. 1 fuse) - 1 (FAN No.1 relay)	Always	Below 1 Ω

Standard Resistance (Check for Short):

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
2 (ECU-IG No. 1 fuse) or 1 (FAN No.1 relay) - Body ground	Always	10 kΩ or higher

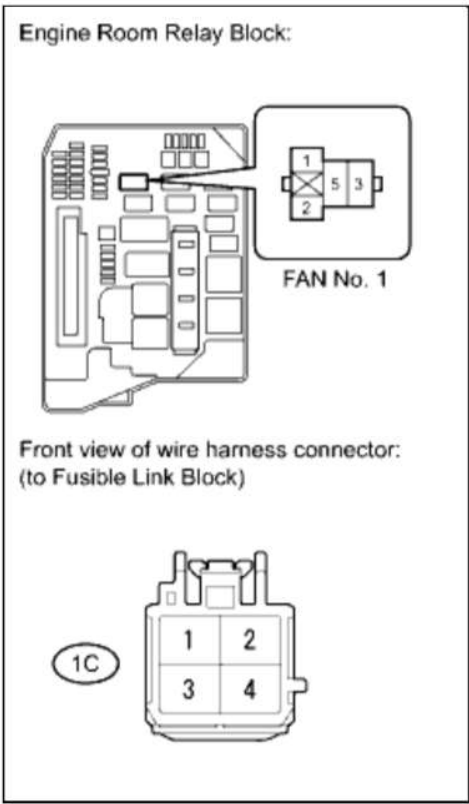
- (d) Reinstall the ECU-IG No. 1 fuse.
- (e) Reinstall the FAN No. 1 relay.

NG ► **REPAIR OR REPLACE HARNESS OR CONNECTOR**
(FAN NO. 1 RELAY - ECU-IG NO. 1 FUSE)

OK
▼

13. CHECK HARNESS AND CONNECTOR (FAN NO. 1 RELAY - RDI FAN FUSE)

- (a) Remove the fusible link block assembly from the engine room relay block.
- (b) Disconnect the fusible link block connector.



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

Standard Resistance (Check for Open):

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
3 (FAN No. 1 relay) - 1C-2 (Fusible link block)	Always	Below 1 Ω

Standard Resistance (Check for Short):

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
3 (FAN No. 1 relay) or 1C-2 (Fusible link block) - Body ground	Always	10 kΩ or higher

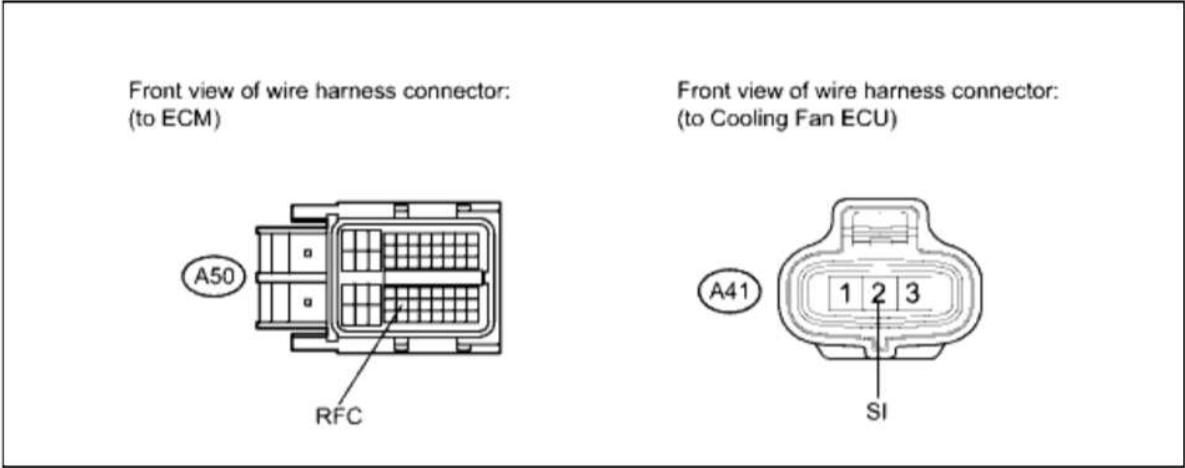
- (d) Reconnect the fusible link block connector.
- (e) Reinstall the fusible link block assembly.

NG ► REPAIR OR REPLACE HARNESS OR CONNECTOR (FAN NO. 1 RELAY - RDI FAN FUSE)

OK ► REPAIR OR REPLACE HARNESS OR CONNECTOR (BATTERY - RDI FAN FUSE)

14. CHECK HARNESS AND CONNECTOR (ECM - COOLING FAN ECU)

- (a) Disconnect the cooling fan ECU connector.



- (b) Disconnect the ECM connector.
- (c) Measure the resistance according to the value(s) in the table below.
- Standard Resistance:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
A 50-43 (RFC) - A 41-2 (SI)	Always	Below 1 Ω

- (d) Reconnect the ECM connector.
- (e) Reconnect the cooling fan ECU connector.

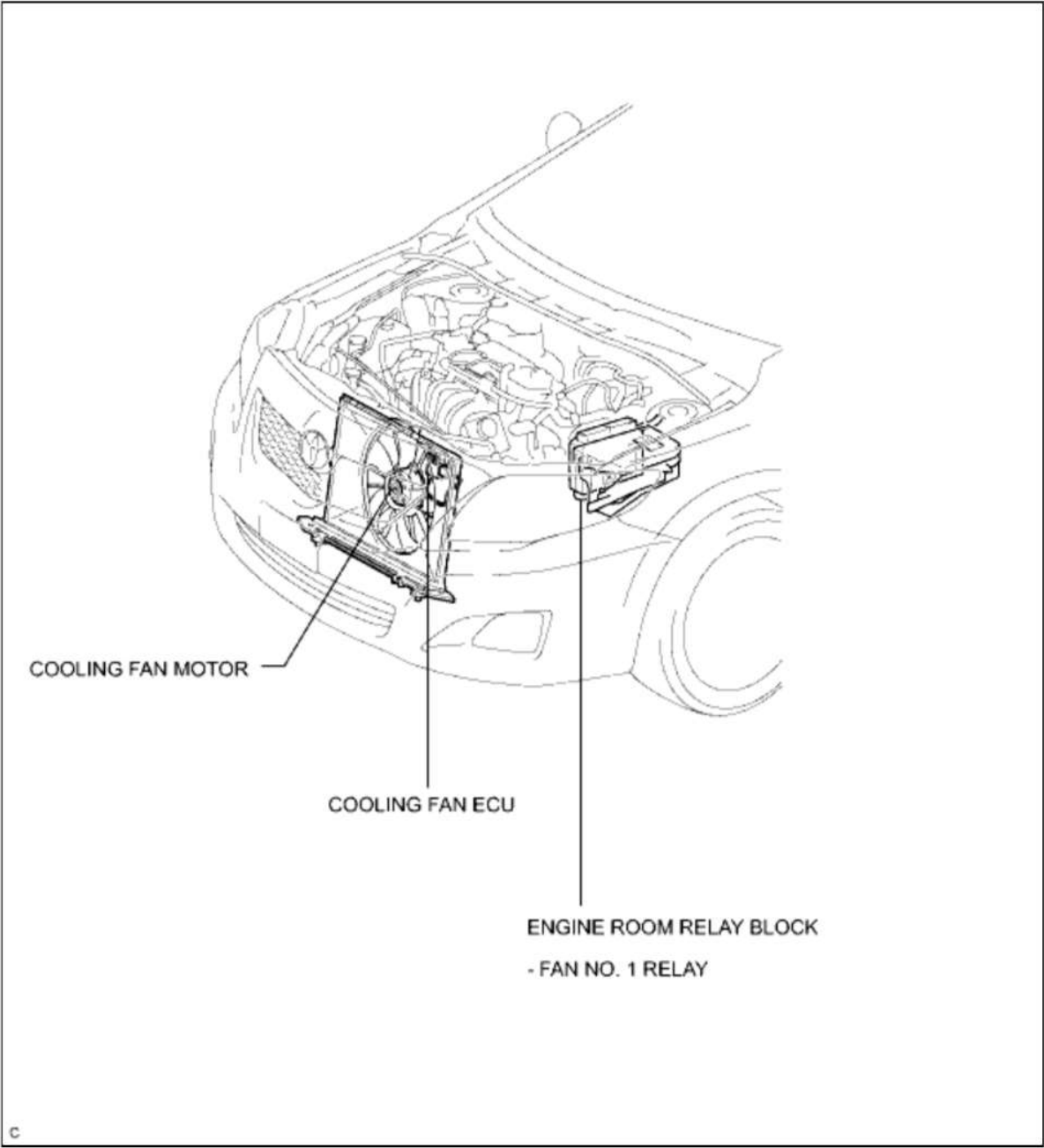
NG ► **REPAIR OR REPLACE HARNESS OR CONNECTOR (ECM - COOLING FAN ECU)**

OK ► **REPLACE COOLING FAN ECU**

Last Modified: 3-10-2010	6.4 R	From: 200901
Model Year: 2010	Model: Corolla	Doc ID: RM0000020WP01IX
Title: 2ZR-FE COOLING: COOLING FAN SYSTEM: PARTS LOCATION (2010 Corolla)		

PARTS LOCATION

ILLUSTRATION



Last Modified: 3-10-2010	6.4 U	From: 200901
Model Year: 2010	Model: Corolla	Doc ID: RM000002ZNS00LX
Title: 2ZR-FE COOLING: COOLING FAN SYSTEM: SYSTEM DIAGRAM (2010 Corolla)		

SYSTEM DIAGRAM

Refer to Cooling Fan Circuit  .



Last Modified: 3-10-2010	6.4 T	From: 200901
Model Year: 2010	Model: Corolla	Doc ID: RM000003E0000EX
Title: 2ZR-FE COOLING: COOLING FAN SYSTEM: PROBLEM SYMPTOMS TABLE (2010 Corolla)		

PROBLEM SYMPTOMS TABLE

HINT:

- Use the table below to help determine the cause of problem symptoms. If multiple suspected areas are listed, the potential causes of the symptoms are listed in order of probability in the "Suspected Area" column of the table. Check each symptom by checking the suspected areas in the order they are listed. Replace parts as necessary.
- Inspect the fuses and relays related to this system before inspecting the suspected areas below.

Cooling Fan System

SYMPTOM	SUSPECTED AREA	SEE PAGE
Cooling fan does not operate	Engine coolant temperature sensor	INFO
	Cooling fan motor	INFO
	FAN No. 1 relay	INFO
	Cooling fan circuit	INFO
	Cooling fan ECU	INFO
	ECM	INFO
Cooling fan does not stop	Cooling fan circuit	INFO
	CAN communication system	INFO
	Cooling fan ECU	INFO
	ECM	INFO
Cooling fan speed does not change	Cooling fan circuit	INFO
	CAN communication system	INFO
	Cooling fan ECU	INFO
	ECM	INFO



Last Modified: 3-10-2010	6.4 G	From: 200901
Model Year: 2010	Model: Corolla	Doc ID: RM000001E6G010X
Title: 2ZR-FE COOLING: COOLING FAN SYSTEM: ON-VEHICLE INSPECTION (2010 Corolla)		

ON-VEHICLE INSPECTION

1. INSPECT COOLING FAN MOTOR

- (a) Connect the Techstream to the DLC3.
- (b) Turn the ignition switch to ON.
- (c) Enter the following menus: Powertrain / Engine / Active Test / Control the Cooling Fan.
- (d) Check the operation of the cooling fan while operating it using the Techstream.

If the cooling fan motor does not operate, check the cooling fan circuit. 



Last Modified: 3-10-2010	6.4 G	From: 200901
Model Year: 2010	Model: Corolla	Doc ID: RM000000V1Q05PX
Title: 2AZ-FE COOLING: COOLING SYSTEM: ON-VEHICLE INSPECTION (2010 Corolla)		

ON-VEHICLE INSPECTION

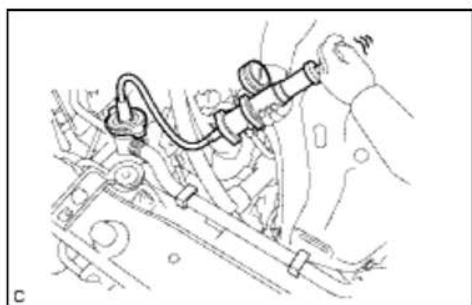
CAUTION:

Be sure that the ignition switch is off when working near the electric cooling fans or radiator grille. With the ignition switch ON, the electric cooling fans may automatically start to run if the engine coolant temperature becomes high and/or the air conditioning is turned on.

1. INSPECT FOR COOLANT LEAK

CAUTION:

To avoid the danger of being burned, do not remove the radiator cap sub-assembly while the engine and radiator assembly are still hot. Thermal expansion will cause hot engine coolant and steam to blow out from the radiator assembly.



- Fill the radiator assembly with engine coolant, then attach a radiator cap tester.
- Pump the tester to 118 kPa (1.2 kgf/cm², 17.1 psi), then check that the pressure does not drop.

If the pressure drops, check the hoses, radiator assembly and water pump assembly for leakage. If there are no signs or traces of external engine coolant leakage, check the heater core, cylinder block and head.

2. INSPECT RESERVE TANK ENGINE COOLANT LEVEL

- The engine coolant should be between the LOW and FULL lines when the engine is cold.

HINT:

If it 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. INSPECT ENGINE COOLANT QUALITY

- Remove the radiator cap sub-assembly.

CAUTION:

To avoid the danger of being burned, do not remove the radiator cap sub-assembly while the engine and radiator assembly are still hot. Thermal expansion will cause hot engine coolant and steam to blow out from the radiator assembly.

- Check for excessive deposits of rust or scale around the radiator cap sub-assembly and radiator filler hole. The engine coolant should be free of oil. If excessively dirty, replace the engine coolant.

If excessively dirty, replace the engine coolant.

- Reinstall the radiator cap sub-assembly.



Last Modified: 3-10-2010	6.4 G	From: 200901
Model Year: 2010	Model: Corolla	Doc ID: RM000001E6D01KX
Title: 2ZR-FE COOLING: COOLING SYSTEM: ON-VEHICLE INSPECTION (2010 Corolla)		

ON-VEHICLE INSPECTION

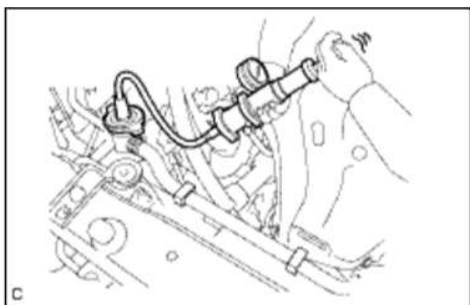
CAUTION:

Be sure that the ignition switch is off when working near the electric cooling fan or radiator grille. With the ignition switch ON, the electric cooling fan may automatically start to run if the engine coolant temperature becomes high and/or the air conditioning is turned on.

1. INSPECT FOR COOLANT LEAK

CAUTION:

To avoid the danger of being burned, do not remove the radiator cap sub-assembly while the engine and radiator assembly are still hot. Thermal expansion will cause hot engine coolant and steam to blow out from the radiator assembly.



- (a) Fill the radiator assembly with engine coolant, then attach a radiator cap tester.

- (b) Pump it to 118 kPa (1.2 kgf/cm², 17.0 psi), then check that the pressure does not drop.

If the pressure drops, check the hoses, radiator assembly and water pump assembly for leakage. If there are no signs or traces of external engine coolant leakage, check the heater core, cylinder block and head.

2. INSPECT RESERVOIR TANK ENGINE COOLANT LEVEL

- (a) The engine coolant should be between the LOW and FULL lines when the engine is cold.

HINT:

If it 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. INSPECT ENGINE COOLANT QUALITY

- (a) Remove the radiator cap sub-assembly.

CAUTION:

To avoid the danger of being burned, do not remove the radiator cap sub-assembly while the engine and radiator assembly are still hot.

Thermal expansion will cause hot engine coolant and steam to blow out from the radiator assembly.

- (b) Check for excessive deposits of rust or scale around the radiator cap sub-assembly and radiator filler hole. The engine coolant should be free of oil.

If excessively dirty, replace the engine coolant.

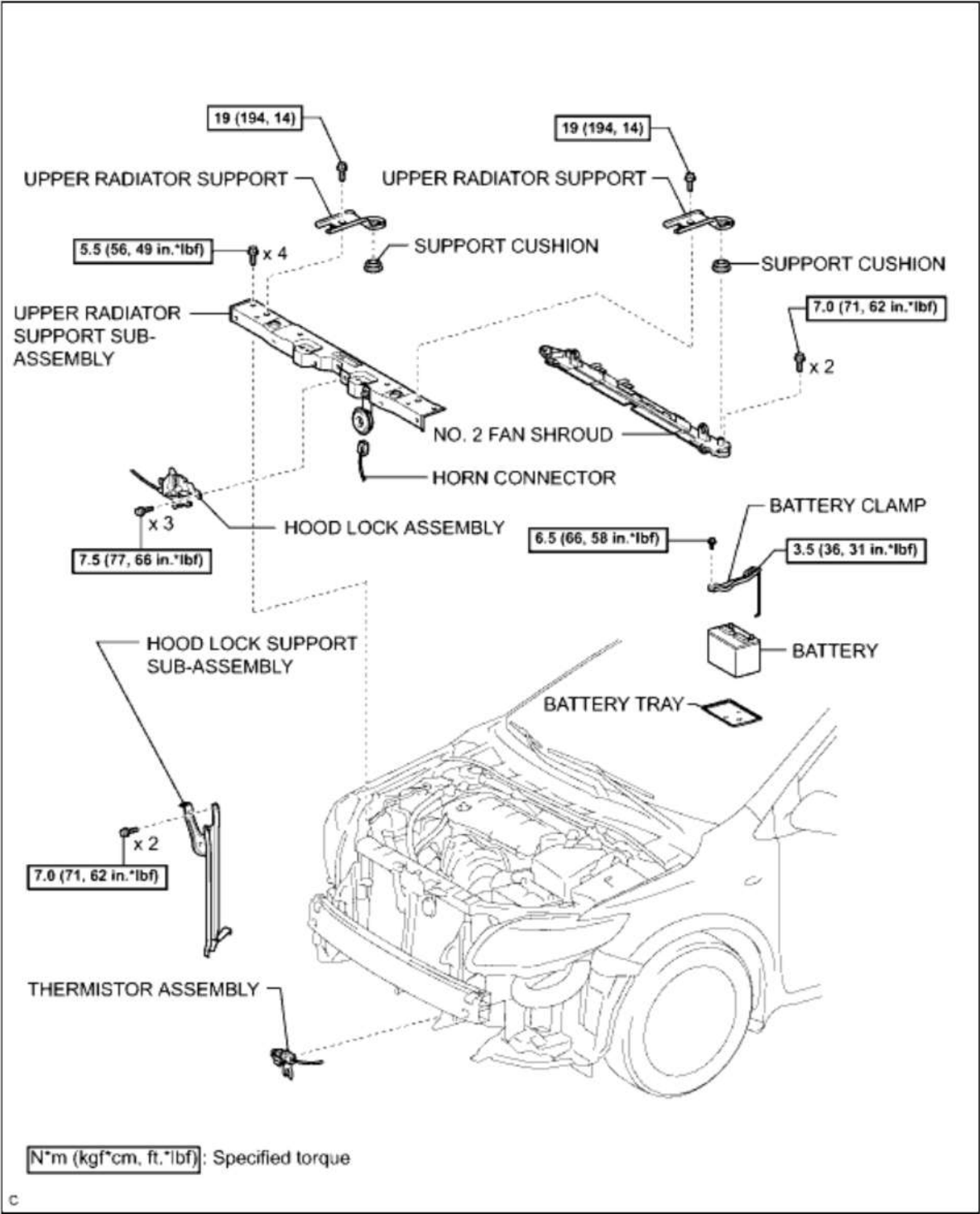
(c) Reinstall the radiator cap sub-assembly.



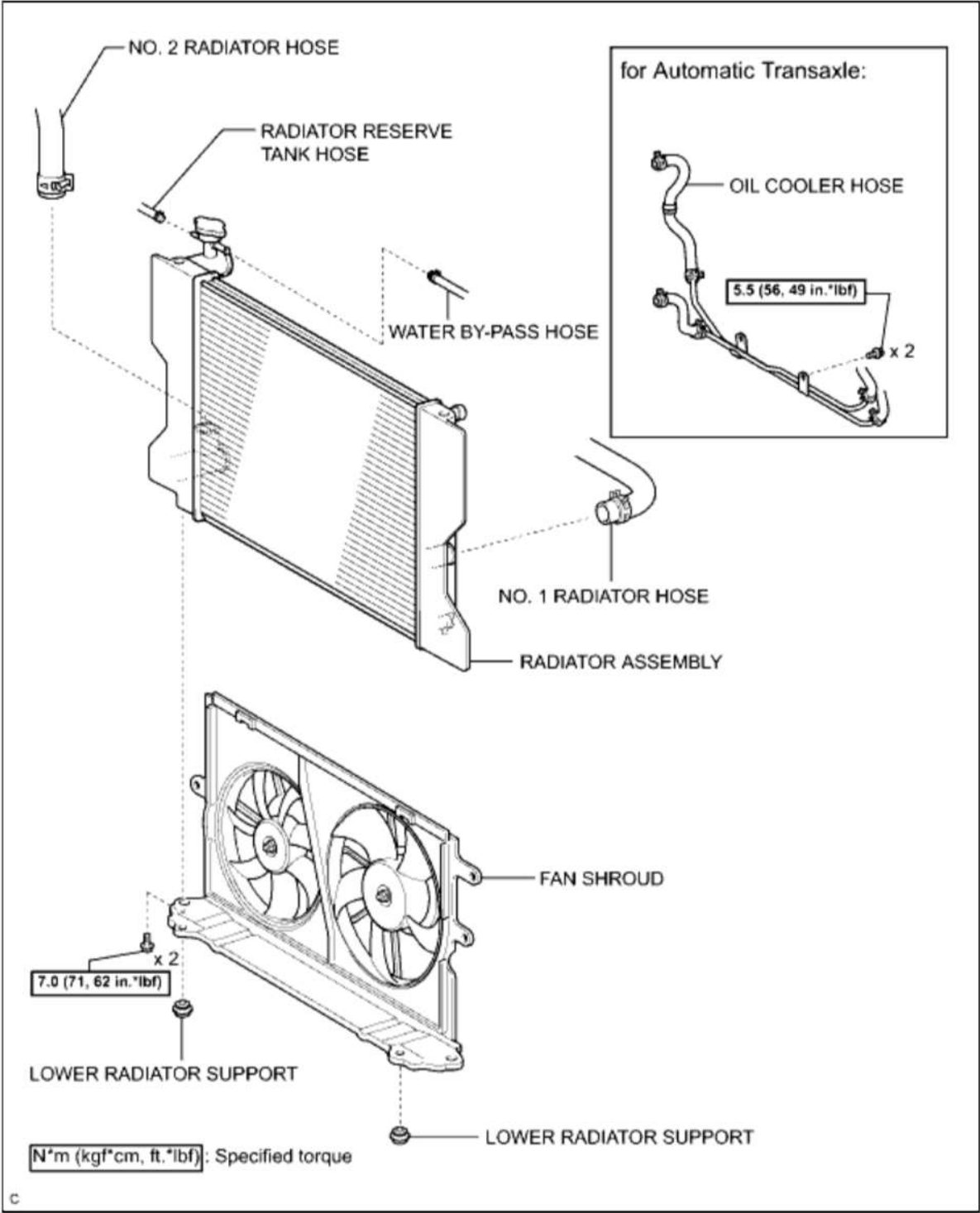
Last Modified: 3-10-2010	6.4 K	From: 200901
Model Year: 2010	Model: Corolla	Doc ID: RM000001IQB01BX
Title: 2AZ-FE COOLING: RADIATOR: COMPONENTS (2010 Corolla)		

COMPONENTS

ILLUSTRATION



ILLUSTRATION



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Last Modified: 3-10-2010	6.4 A	From: 200901
Model Year: 2010	Model: Corolla	Doc ID: RM000001IQD01TX
Title: 2AZ-FE COOLING: RADIATOR: REMOVAL (2010 Corolla)		

REMOVAL

1. DISCONNECT CABLE FROM NEGATIVE BATTERY TERMINAL

2. REMOVE ENGINE UNDER COVER LH

3. REMOVE ENGINE UNDER COVER RH

4. DRAIN ENGINE COOLANT 

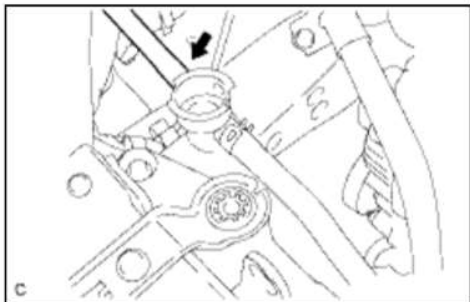
5. REMOVE BATTERY 

6. REMOVE FRONT BUMPER COVER

HINT:  .

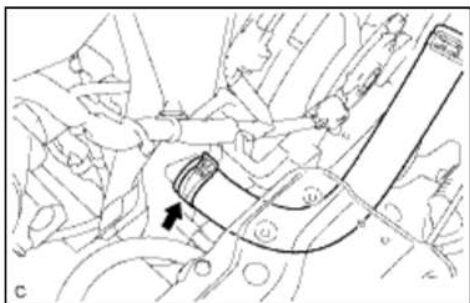
7. REMOVE THERMISTOR ASSEMBLY

8. DISCONNECT RADIATOR RESERVE TANK HOSE



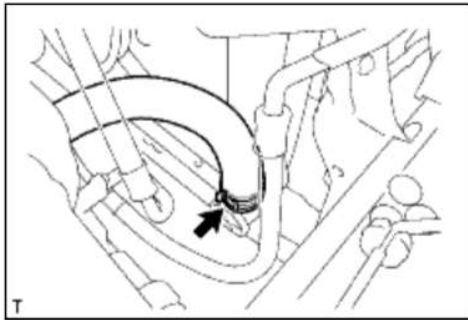
(a) Disconnect the radiator reserve tank hose from the radiator assembly.

9. DISCONNECT NO. 1 RADIATOR HOSE



(a) Disconnect the No. 1 radiator hose from the radiator assembly.

10. DISCONNECT NO. 2 RADIATOR HOSE

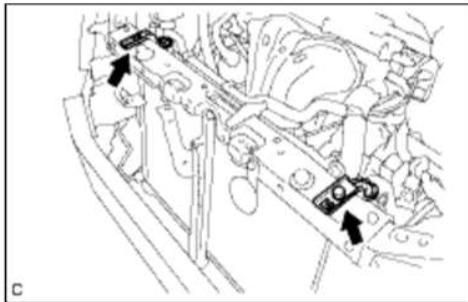


(a) Disconnect the No. 2 radiator hose from the radiator assembly.

11. DISCONNECT OIL COOLER HOSE (for Automatic Transaxle)

INFO

12. REMOVE UPPER RADIATOR SUPPORT



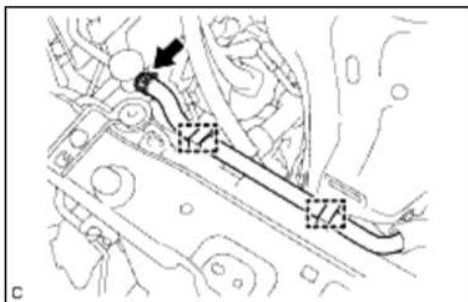
(a) Remove the 2 bolts and 2 upper radiator supports.

(b) Remove the 2 support cushions from the 2 upper radiator supports.

13. REMOVE HOOD LOCK ASSEMBLY

INFO

14. SEPARATE WATER BY-PASS HOSE

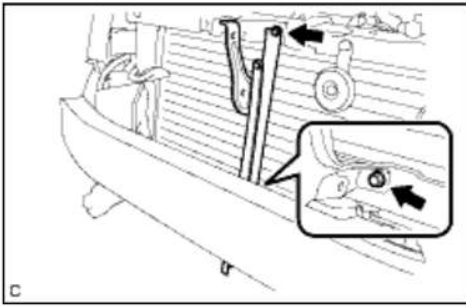


(a) Separate the water by-pass hose from the 2 clamps.

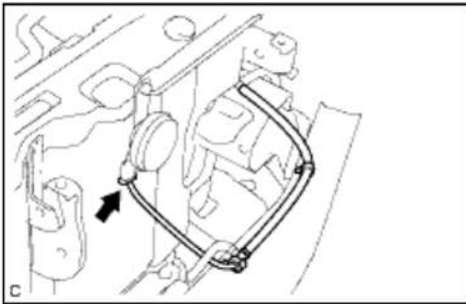
(b) Disconnect the water by-pass hose from the radiator assembly.

15. REMOVE HOOD LOCK SUPPORT SUB-ASSEMBLY

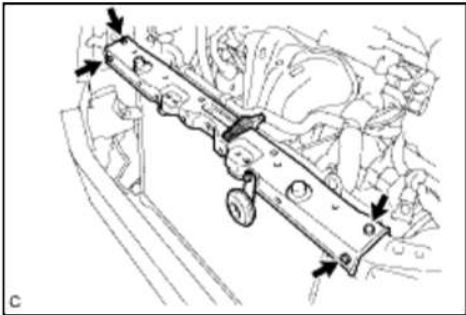
(a) Remove the 2 bolts and hood lock support sub-assembly.



16. REMOVE UPPER RADIATOR SUPPORT SUB-ASSEMBLY

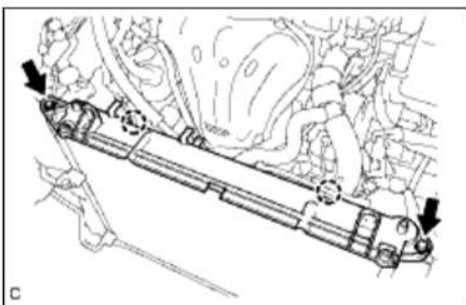


(a) Disconnect the horn connector.



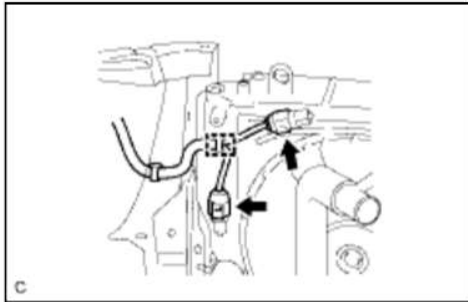
(b) Remove the 4 bolts and upper radiator support sub-assembly.

17. REMOVE NO. 2 FAN SHROUD



(a) Remove the 2 bolts, disengage the 2 claws, and remove the No. 2 fan shroud from the radiator assembly.

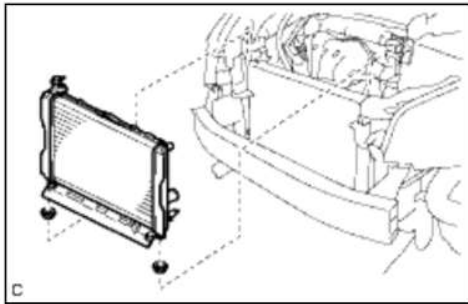
18. REMOVE RADIATOR ASSEMBLY



- (a) Disconnect the 2 cooling fan motor connectors and wire harness clamp.

NOTICE:

Be careful not to damage the connector.



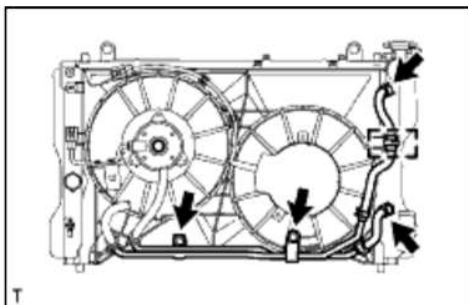
- (b) Remove the radiator assembly with the fan shroud.

NOTICE:

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

- (c) Remove the 2 lower radiator supports.

19. REMOVE OIL COOLER HOSE (for Automatic Transaxle)



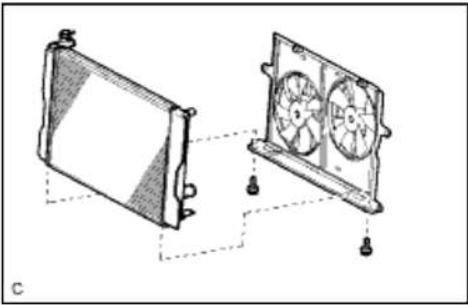
- (a) Disconnect the 2 oil cooler hoses from the radiator.

- (b) Disconnect the clamp from the fan shroud.

- (c) Remove the 2 bolts and oil cooler hose.

20. REMOVE FAN SHROUD

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

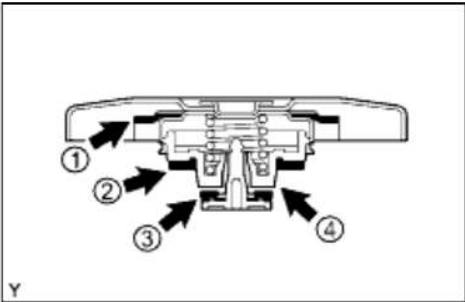


Last Modified: 3-10-2010	6.4 G	From: 200901
Model Year: 2010	Model: Corolla	Doc ID: RM000001HC801GX
Title: 2AZ-FE COOLING: RADIATOR: ON-VEHICLE INSPECTION (2010 Corolla)		

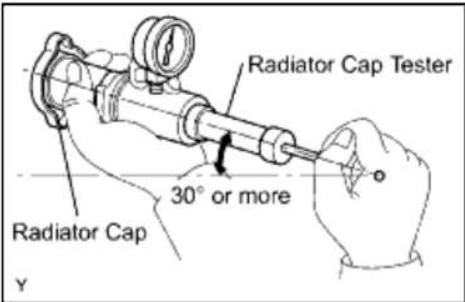
ON-VEHICLE INSPECTION

1. CHECK RADIATOR CAP SUB-ASSEMBLY

(a) Measure the valve opening pressure.



- (1) If there are water stains or foreign matter on rubber seal 1, 2 or 3, clean the part(s) with water and finger scouring.
- (2) Check that rubber seals 1, 2 and 3 are not deformed, cracked or swollen.
- (3) Check that rubber seals 3 and 4 are not stuck together.
- (4) Apply engine coolant to rubber seals 2 and 3 before using a radiator cap tester.



(5) When using the cap tester, tilt it upwards 30° or more.

(6) Pump the cap tester several times, and check the maximum pressure*1.

Pumping speed:
1 pump per second

HINT:

*1: Even if the cap cannot maintain the maximum pressure, it is not defective.

Judgment Criteria:

ITEM	SPECIFIED CONDITION
Standard value	74 to 103 kPa (0.75 to 1.05 kgf/cm ² , 10.7 to 15 psi)

ITEM	SPECIFIED CONDITION
(for brand-new cap)	
Minimum standard value (for used cap)	59 kPa (0.60 kgf/cm ² , 8.6 psi)

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

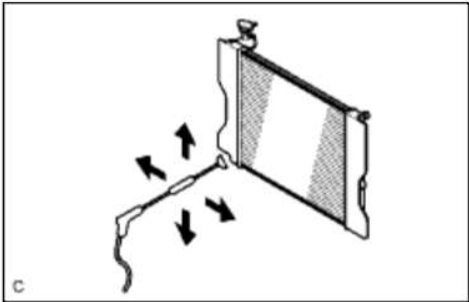
2. INSPECT FINS FOR BLOCKAGE

(a) If the fins are clogged, wash them with water or a steam cleaner and dry them with compressed air.

NOTICE:

- To avoid damaging the fins, the injection direction should be at right angles to the radiator core surface (Please use it for core perpendicularly).
- If the steam cleaner is too close to the radiator core, there is a possibility of damaging the fins, so keep the following injection distances.

Standard Injection Distance:



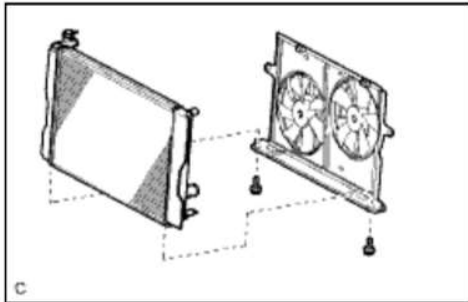
INJECTION PRESSURE	SPECIFIED CONDITION
2942 to 4903 kPa (30 to 50 kgf/cm ² , 427 to 711 psi)	300 mm (11.811 in.)
4903 to 7845 kPa (50 to 80 kgf/cm ² , 711 to 1138 psi)	500 mm (19.685 in.)

- If the fins are bent, straighten them with a screwdriver or pliers.
- Do not expose electronic components to water.

Last Modified: 3-10-2010	6.4 A	From: 200901
Model Year: 2010	Model: Corolla	Doc ID: RM000001IQ901TX
Title: 2AZ-FE COOLING: RADIATOR: INSTALLATION (2010 Corolla)		

INSTALLATION

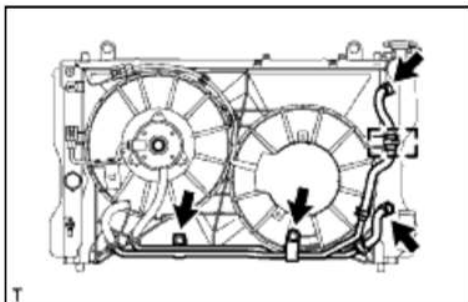
1. INSTALL FAN SHROUD



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

Torque: 7.0 N·m (71 kgf·cm, 62in·lbf)

2. INSTALL OIL COOLER HOSE (for Automatic Transaxle)



- (a) Install the oil cooler hose with the 2 bolts.

Torque: 5.5 N·m (56 kgf·cm, 49in·lbf)

- (b) Connect the clamp to the fan shroud.

- (c) Connect the 2 oil cooler hoses to the radiator.

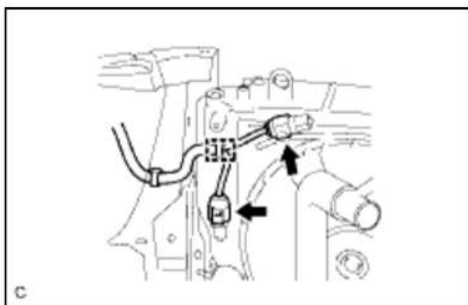
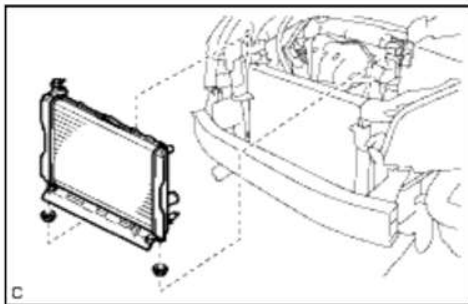
3. INSTALL RADIATOR ASSEMBLY

- (a) Install the 2 lower radiator supports.

- (b) Install the radiator assembly with the fan shroud.

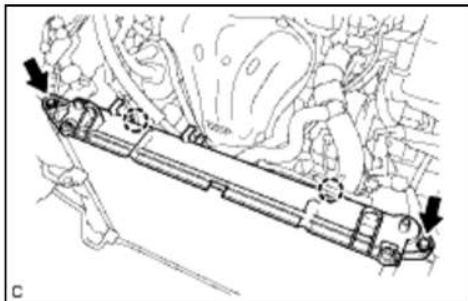
NOTICE:

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



(c) Connect the 2 cooling fan motor connectors and wire harness clamp.

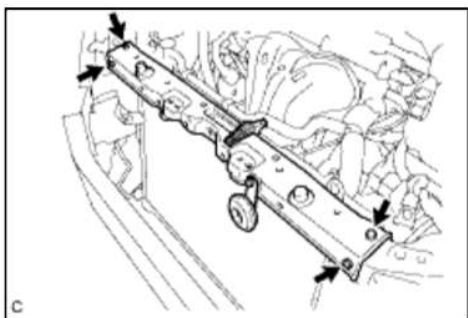
4. INSTALL NO. 2 FAN SHROUD



(a) Engage the 2 claws and install the No. 2 fan shroud to the radiator assembly with the 2 bolts.

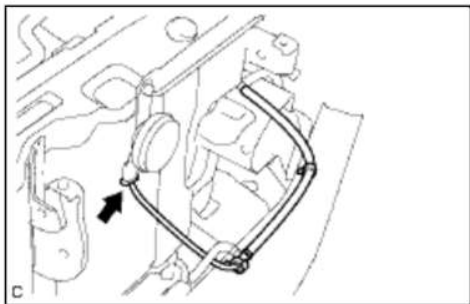
Torque: 7.0 N·m (71 kgf·cm, 62in·lbf)

5. INSTALL UPPER RADIATOR SUPPORT SUB-ASSEMBLY



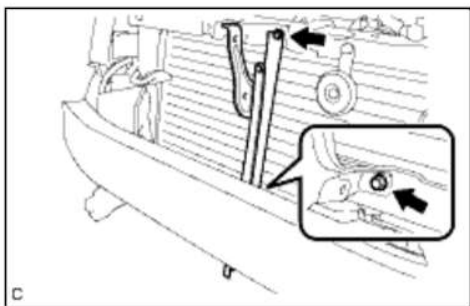
(a) Install the upper radiator support sub-assembly with the 4 bolts.

Torque: 5.5 N·m (56 kgf·cm, 49in·lbf)



(b) Connect the horn connector.

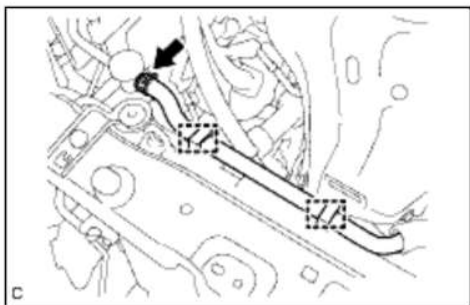
6. INSTALL HOOD LOCK SUPPORT SUB-ASSEMBLY



(a) Install the hood lock support sub-assembly with the 2 bolts.

Torque: 7.0 N·m (71 kgf·cm, 62in·lbf)

7. INSTALL WATER BY-PASS HOSE



(a) Install the water by-pass hose with the 2 clamps.

(b) Connect the water by-pass hose to the radiator assembly with the clamp.

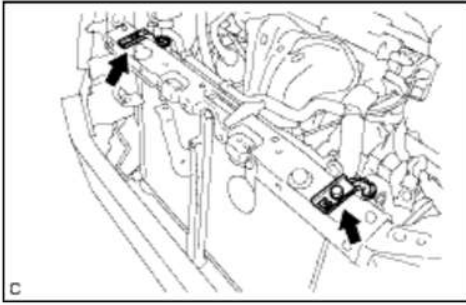
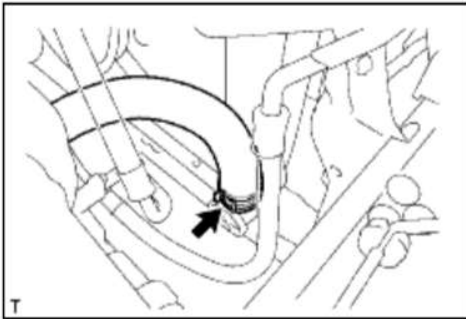
8. INSTALL HOOD LOCK ASSEMBLY INFO

9. INSTALL UPPER RADIATOR SUPPORT

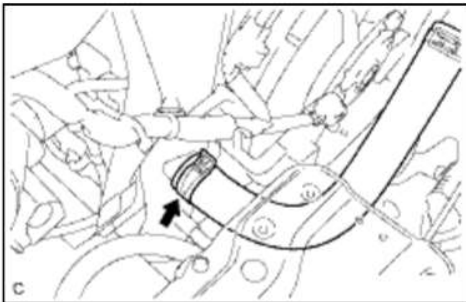
(a) Install the 2 radiator support cushions to the 2 upper radiator supports.

(b) Install the 2 upper radiator supports with the 2 bolts.

Torque: 19 N·m (194 kgf·cm, 14ft·lbf)

**10. CONNECT OIL COOLER HOSE (for Automatic Transaxle)****11. CONNECT NO. 2 RADIATOR HOSE**

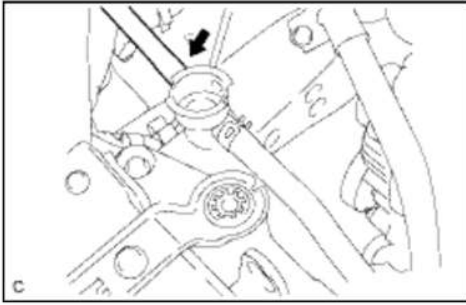
(a) Connect the No. 2 radiator hose to the radiator assembly with the clamp.

12. CONNECT NO. 1 RADIATOR HOSE

(a) Connect the No. 1 radiator hose to the radiator assembly with the clamp.

13. CONNECT RADIATOR RESERVE TANK HOSE

(a) Connect the radiator reserve tank hose to the radiator assembly with the clamp.

**14. INSTALL THERMISTOR ASSEMBLY****15. INSTALL BATTERY** INFO**16. CONNECT CABLE TO NEGATIVE BATTERY TERMINAL**

Torque: 5.4 N·m (55 kgf·cm, 48in·lbf)

17. ADD ENGINE COOLANT INFO**18. INSPECT FOR COOLANT LEAK** INFO**19. INSPECT RESERVOIR TANK ENGINE COOLANT LEVEL** INFO**20. INSTALL FRONT BUMPER COVER**

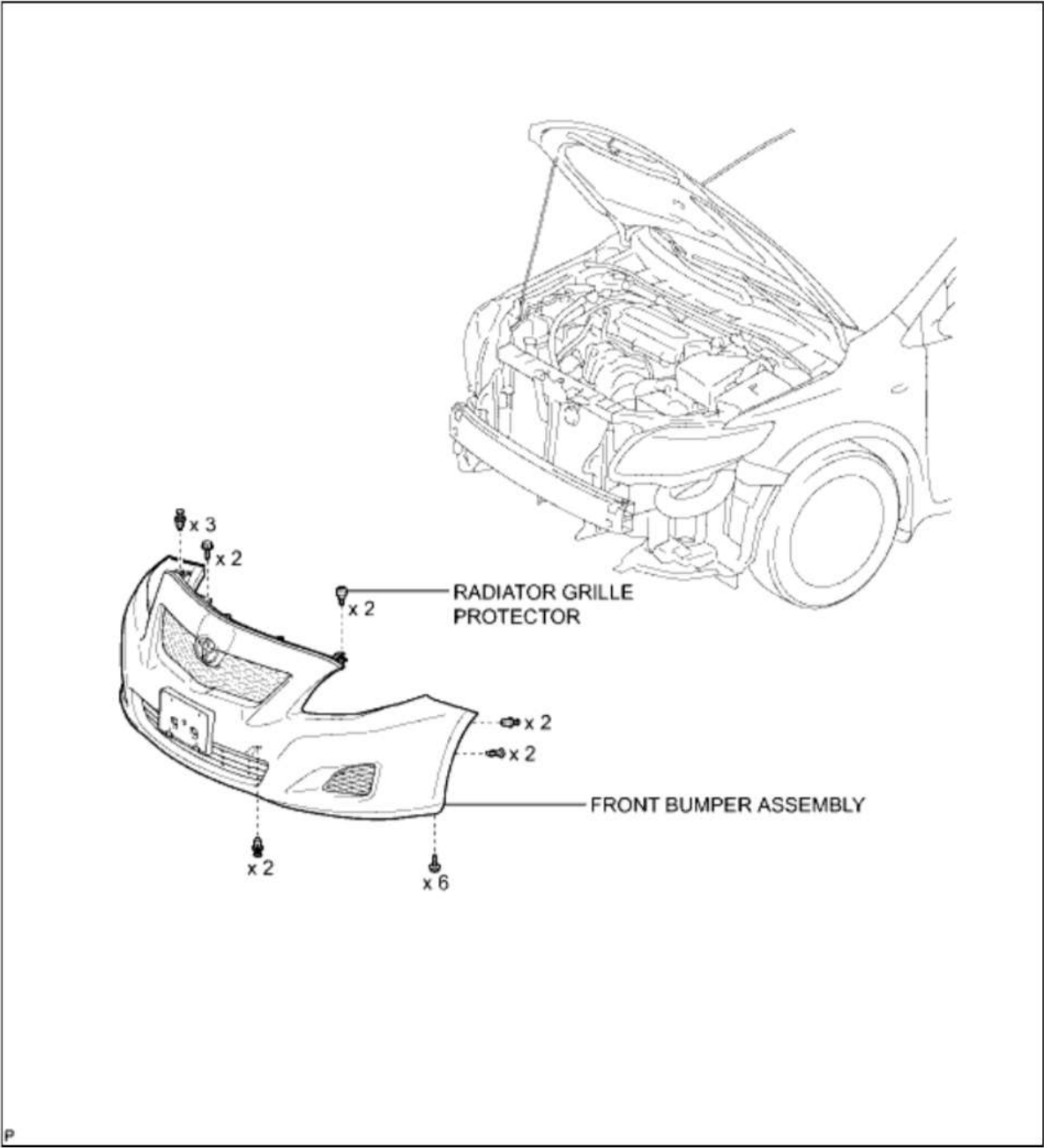
HINT: INFO .



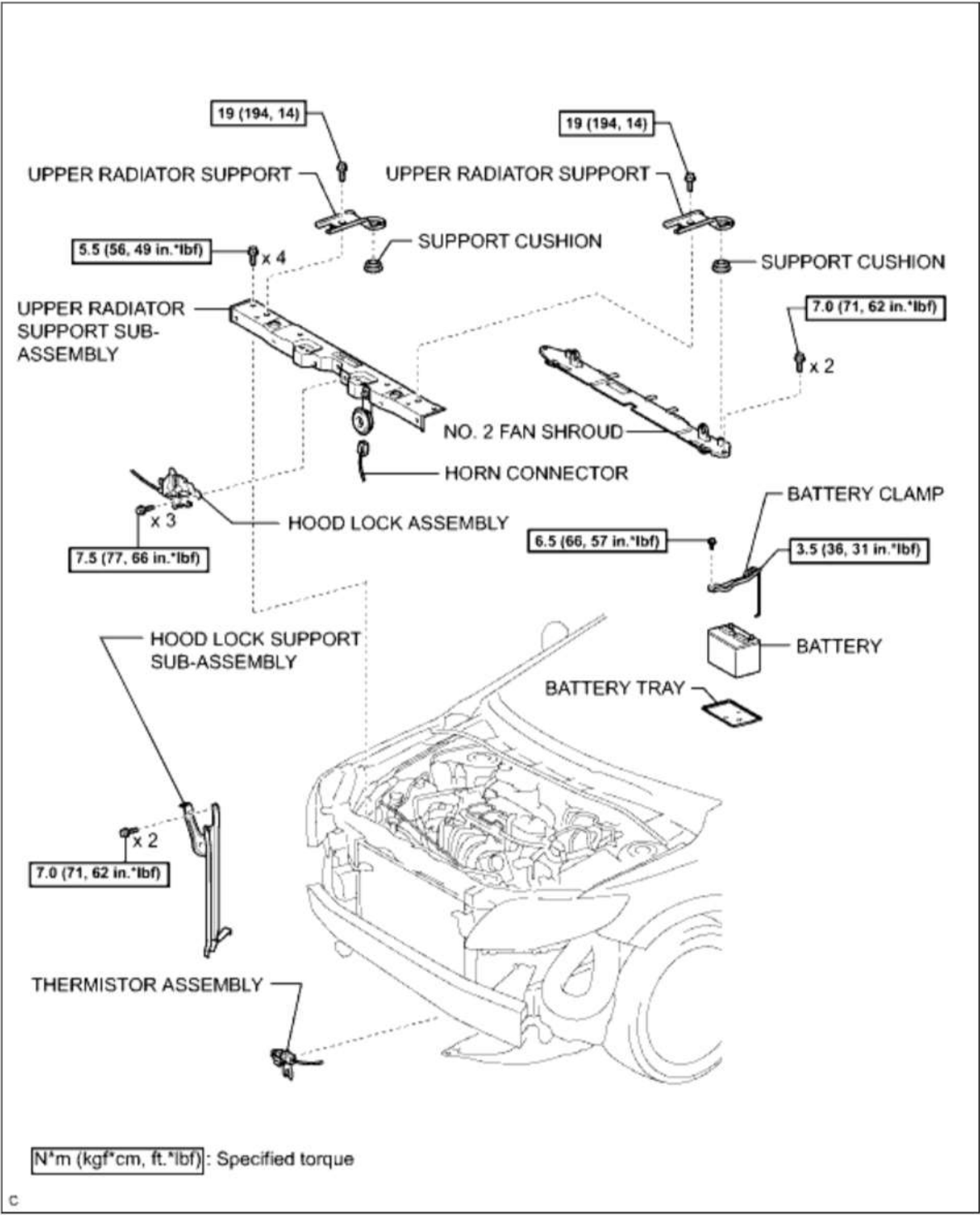
Last Modified: 3-10-2010	6.4 K	From: 200901
Model Year: 2010	Model: Corolla	Doc ID: RM000000AS401TX
Title: 2ZR-FE COOLING: RADIATOR: COMPONENTS (2010 Corolla)		

COMPONENTS

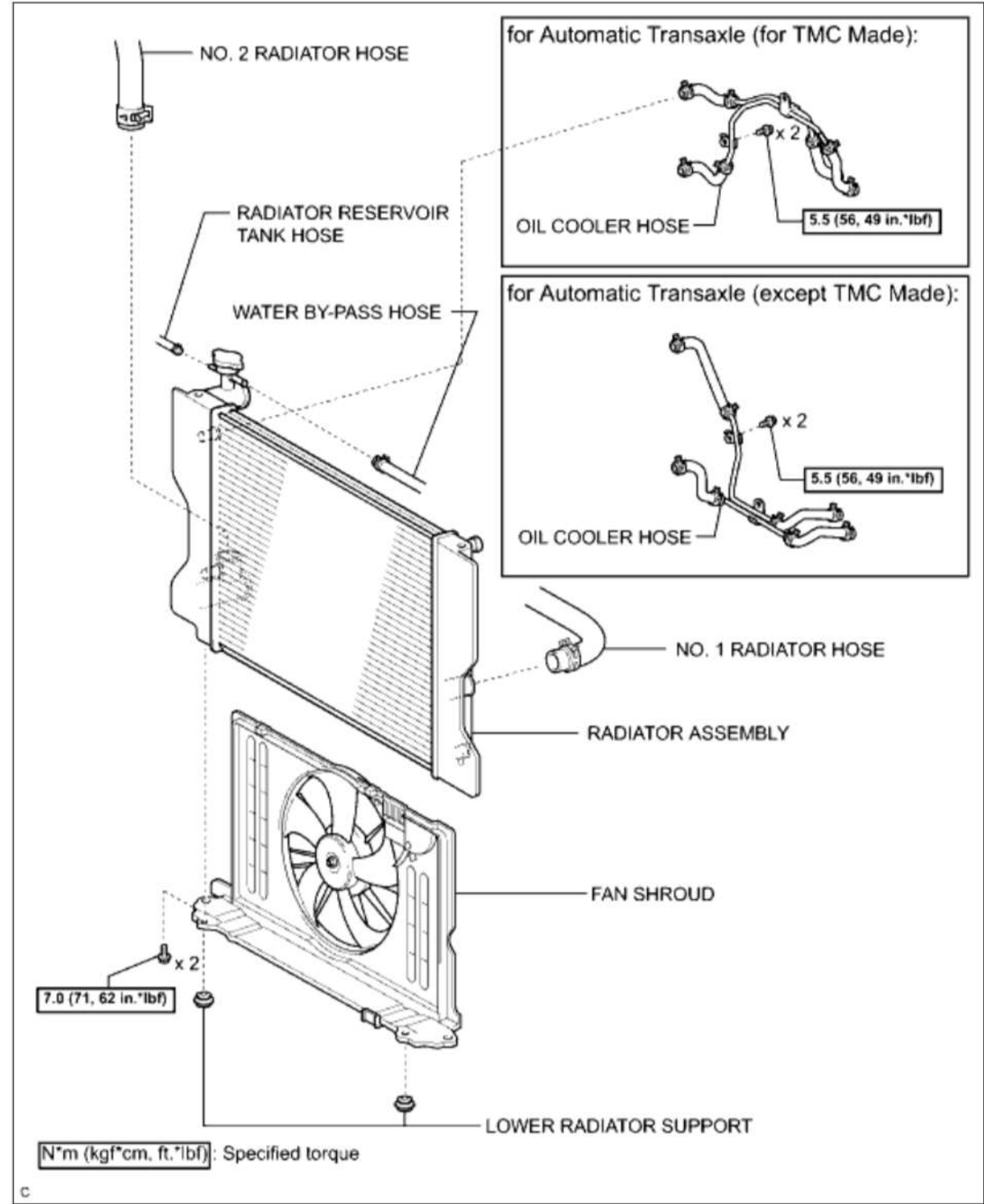
ILLUSTRATION



ILLUSTRATION



ILLUSTRATION



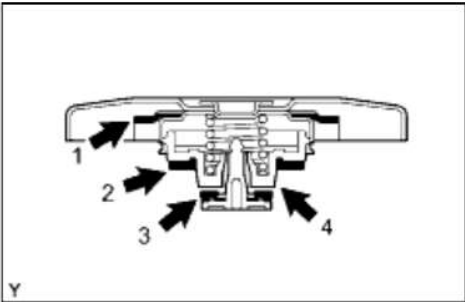
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Last Modified: 3-10-2010	6.4 G	From: 200901
Model Year: 2010	Model: Corolla	Doc ID: RM000001H5B01NX
Title: 2ZR-FE COOLING: RADIATOR: ON-VEHICLE INSPECTION (2010 Corolla)		

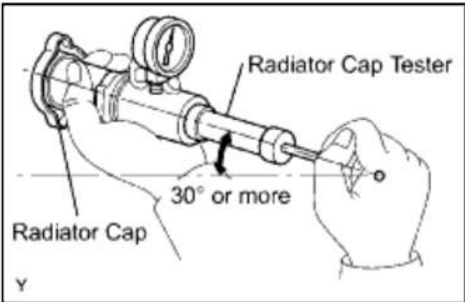
ON-VEHICLE INSPECTION

1. CHECK RESERVE TANK CAP

(a) Measure the valve opening pressure.



- (1) If there are water stains or foreign matter on rubber seal 1, 2 or 3, clean the part(s) with water and finger scouring.
- (2) Check that rubber seals 1, 2 and 3 are not deformed, cracked or swollen.
- (3) Check that rubber seals 3 and 4 are not stuck together.
- (4) Apply engine coolant to rubber seals 2 and 3 before using a radiator cap tester.



(5) When using the cap tester, tilt it upwards 30° or more.

(6) Pump the cap tester several times, and check the maximum pressure*1.

Pumping speed:
1 pump per second

HINT:

*1: Even if the cap cannot maintain the maximum pressure, it is not defective.

Judgment Criteria:

ITEM	SPECIFIED CONDITION
Standard value	74 to 103 kPa (0.8 to 1.1 kgf/cm ² , 10.7 to 15 psi)

ITEM	SPECIFIED CONDITION
(for brand-new cap)	
Minimum standard value (for used cap)	59 kPa (0.6 kgf/cm ² , 8.6 psi)

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

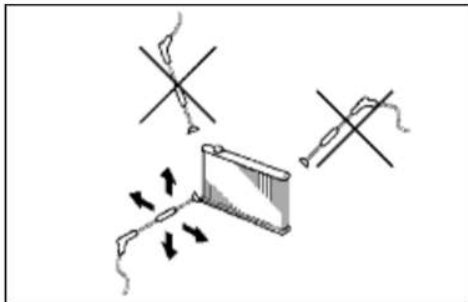
2. INSPECT FINS FOR BLOCKAGE

- (a) If the fins are clogged, wash them with water or a steam cleaner and dry them with compressed air.

NOTICE:

- To avoid damaging the fins, the injection direction should be at right angles to the radiator core surface.
- Use it foe core perpendicularly.
- If the steam cleaner is too close to the radiator core, there is a possibility of damaging the fins, so keep the following injection distances.

Standard Injection Distance:



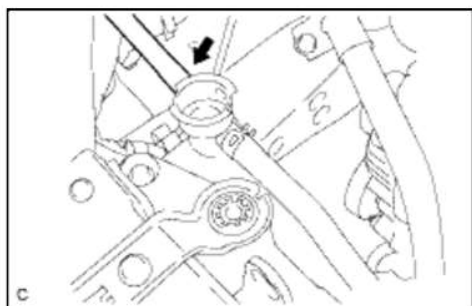
INJECTION PRESSURE	SPECIFIED CONDITION
2942 to 4903 kPa (30 to 50 kgf/cm ² , 427 to 711 psi)	300 mm (11.81 in.)
4903 to 7845 kPa (50 to 80 kgf/cm ² , 711 to 1138 psi)	500 mm (19.69 in.)

- If the fins are bent, straighten them with a screwdriver or pliers.
- Do not expose electronic components to water.

Last Modified: 3-10-2010	6.4 A	From: 200901
Model Year: 2010	Model: Corolla	Doc ID: RM000000AS502CX
Title: 2ZR-FE COOLING: RADIATOR: REMOVAL (2010 Corolla)		

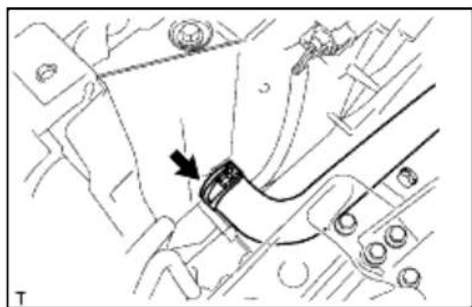
REMOVAL

1. REMOVE BATTERY INFO
2. REMOVE RADIATOR GRILLE PROTECTOR INFO
3. REMOVE FRONT BUMPER ASSEMBLY INFO
4. DRAIN ENGINE COOLANT INFO
5. REMOVE THERMISTOR ASSEMBLY
6. DISCONNECT RADIATOR RESERVOIR TANK HOSE



(a) Disconnect the radiator reservoir tank hose from the radiator assembly.

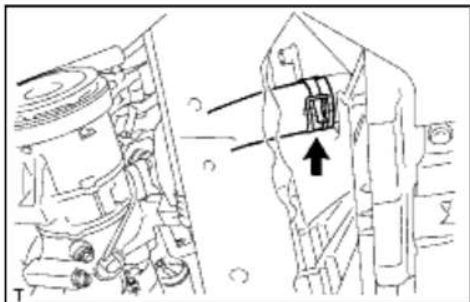
7. DISCONNECT NO. 1 RADIATOR HOSE



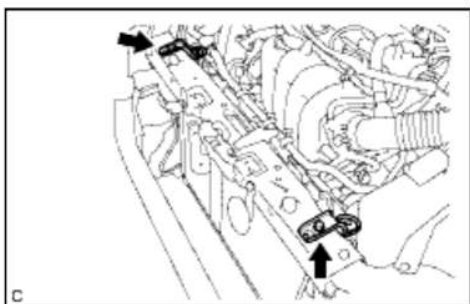
(a) Disconnect the No. 1 radiator hose from the radiator assembly.

8. DISCONNECT NO. 2 RADIATOR HOSE

(a) Disconnect the No. 2 radiator hose from the radiator assembly.



9. REMOVE UPPER RADIATOR SUPPORT



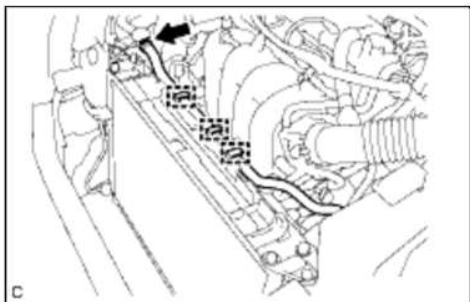
(a) Remove the 2 bolts and 2 upper radiator supports.

(b) Remove the 2 support cushions from the 2 upper radiator supports.

10. DISCONNECT HOOD LOCK ASSEMBLY

INFO

11. SEPARATE WATER BY-PASS HOSE

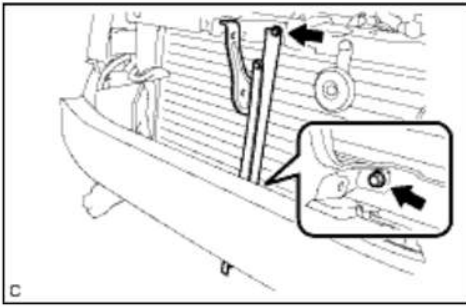


(a) Separate the water by-pass hose from the 3 clamps.

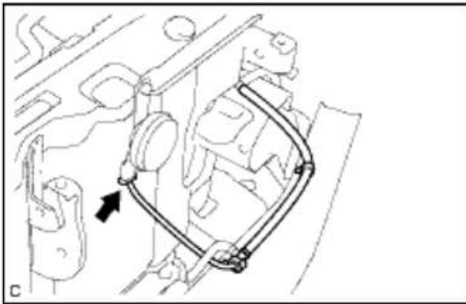
(b) Disconnect the water by-pass hose from the radiator assembly.

12. REMOVE HOOD LOCK SUPPORT SUB-ASSEMBLY

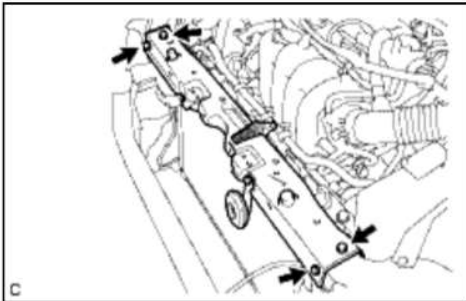
(a) Remove the 2 bolts and hood lock support sub-assembly.



13. REMOVE UPPER RADIATOR SUPPORT SUB-ASSEMBLY

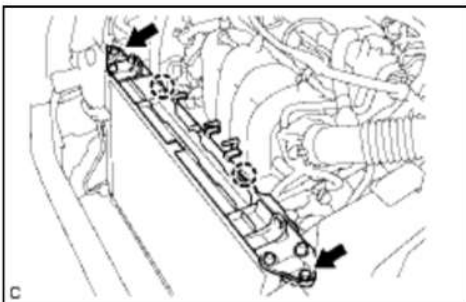


(a) Disconnect the horn connector.



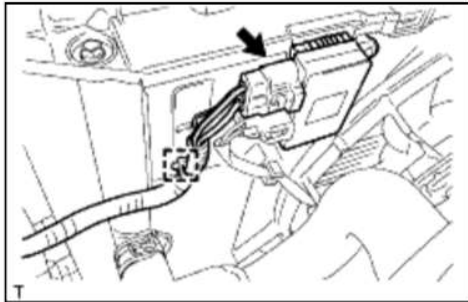
(b) Remove the 4 bolts and upper radiator support sub-assembly.

14. REMOVE NO. 2 FAN SHROUD



(a) Remove the 2 bolts, disengage the 2 claws, and remove the No. 2 fan shroud from the radiator assembly.

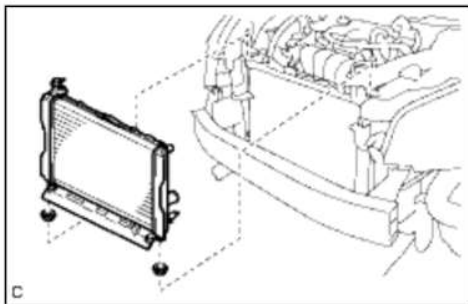
15. REMOVE RADIATOR ASSEMBLY



- (a) Disconnect the cooling fan ECU connector and wire harness clamp.

NOTICE:

Be careful not to damage the connector.



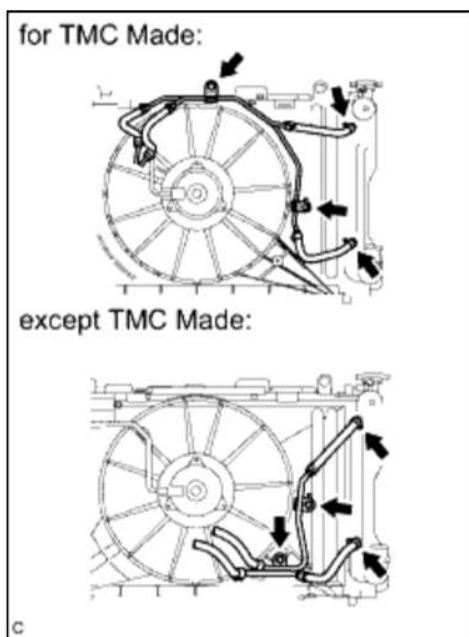
- (b) Remove the radiator assembly with the fan shroud.

NOTICE:

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

- (c) Remove the 2 lower radiator supports.

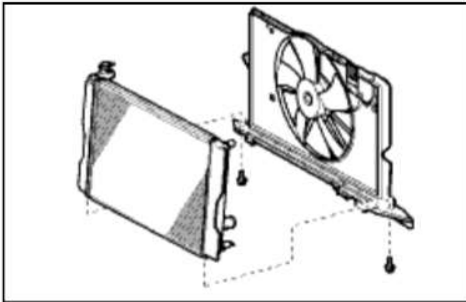
16. REMOVE OIL COOLER HOSE (for Automatic Transaxle)



- (a) Disconnect the 2 oil cooler hoses from the radiator.

- (b) Remove the 2 bolts and oil cooler hose.

17. REMOVE FAN SHROUD



(a) Remove the 2 bolts and fan shroud from the radiator assembly.

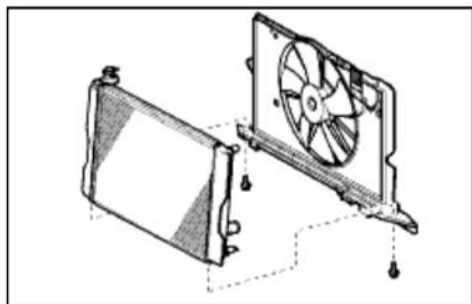


TOYOTA

Last Modified: 3-10-2010	6.4 A	From: 200901
Model Year: 2010	Model: Corolla	Doc ID: RM000000AS302DX
Title: 2ZR-FE COOLING: RADIATOR: INSTALLATION (2010 Corolla)		

INSTALLATION

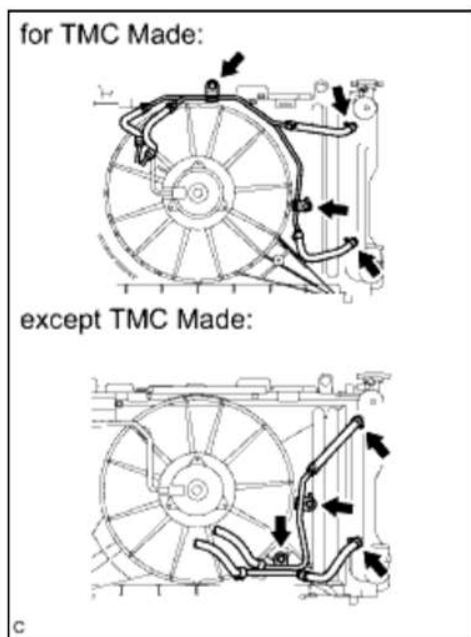
1. INSTALL FAN SHROUD



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

Torque: 7.0 N·m (71 kgf·cm, 62in·lbf)

2. INSTALL OIL COOLER HOSE (for Automatic Transaxle)



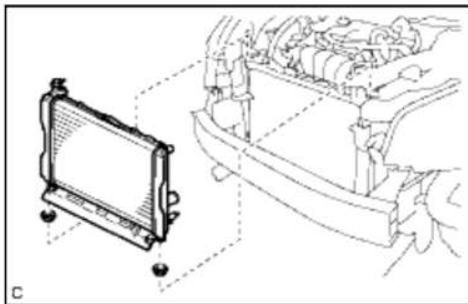
(a) Install the oil cooler hose with the 2 bolts.

Torque: 5.5 N·m (56 kgf·cm, 49in·lbf)

(b) Connect the 2 oil cooler hoses to the radiator.

3. INSTALL RADIATOR ASSEMBLY

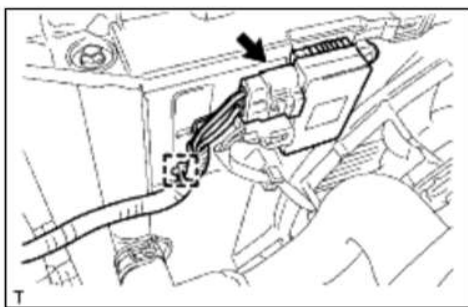
(a) Install the 2 lower radiator supports.



(b) Install the radiator assembly with the fan shroud.

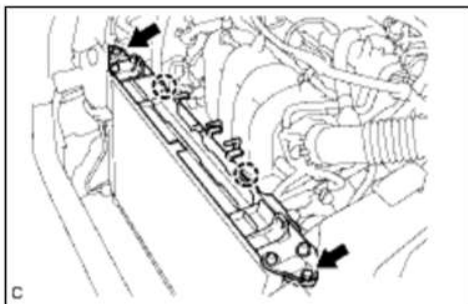
NOTICE:

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



(c) Connect the cooling fan ECU connector and wire harness clamp.

4. INSTALL NO. 2 FAN SHROUD



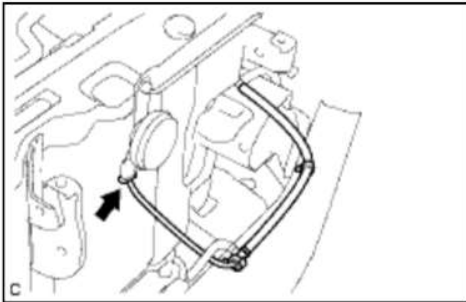
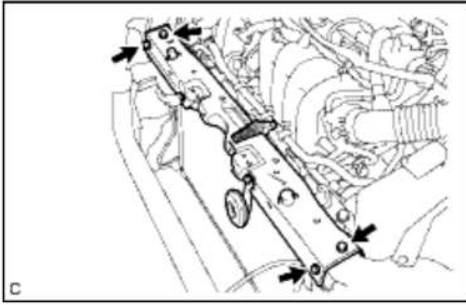
(a) Engage the 2 claws and install the No. 2 fan shroud to the radiator assembly with the 2 bolts.

Torque: 7.0 N·m (71 kgf·cm, 62in·lbf)

5. INSTALL UPPER RADIATOR SUPPORT SUB-ASSEMBLY

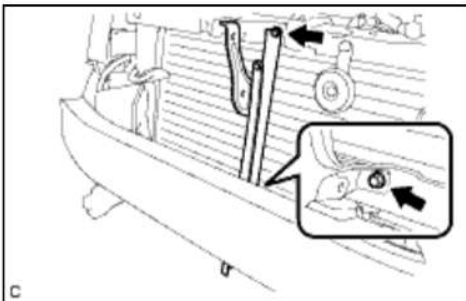
(a) Install the upper radiator support sub-assembly with the 4 bolts.

Torque: 5.5 N·m (56 kgf·cm, 49in·lbf)



(b) Connect the horn connector.

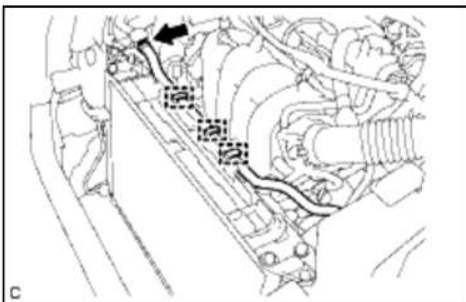
6. INSTALL HOOD LOCK SUPPORT SUB-ASSEMBLY



(a) Install the hood lock support sub-assembly with the 2 bolts.

Torque: 7.0 N·m (71 kgf·cm, 62in·lbf)

7. INSTALL WATER BY-PASS HOSE

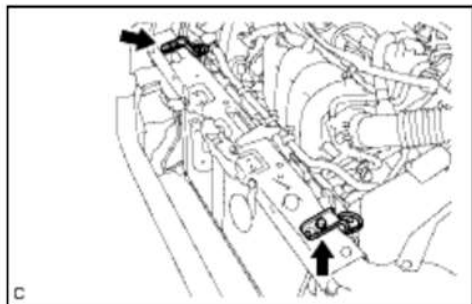


(a) Install the water by-pass hose with the 3 clamps.

(b) Connect the water by-pass hose to the radiator assembly with the clamp.

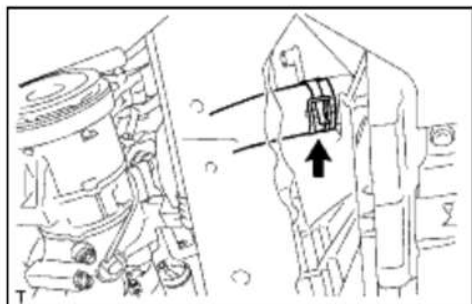
8. INSTALL HOOD LOCK ASSEMBLY**9. INSTALL UPPER RADIATOR SUPPORT**

(a) Install the 2 radiator support cushions to the 2 upper radiator supports.

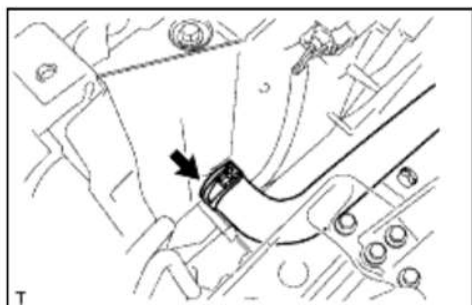


(b) Install the 2 upper radiator supports with the 2 bolts.

Torque: 19 N·m (194 kgf·cm, 14ft·lbf)

10. CONNECT NO. 2 RADIATOR HOSE

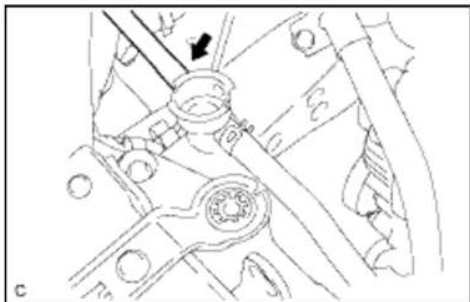
(a) Connect the No. 2 radiator hose to the radiator assembly with the clamp.

11. CONNECT NO. 1 RADIATOR HOSE

(a) Connect the No. 1 radiator hose to the radiator assembly with the clamp.

12. CONNECT RADIATOR RESERVOIR TANK HOSE

(a) Connect the radiator reservoir tank hose to the radiator assembly with the clamp.



13. INSTALL THERMISTOR ASSEMBLY

14. INSTALL FRONT BUMPER ASSEMBLY [INFO](#)

15. INSTALL RADIATOR GRILLE PROTECTOR [INFO](#)

16. INSTALL BATTERY [INFO](#)

17. ADD ENGINE COOLANT [INFO](#)

18. INSPECT INSPECT FOR COOLANT LEAK [INFO](#)

19. VEHICLE PREPARATION FOR FOG LIGHT AIMING ADJUSTMENT [INFO](#)

20. PREPARATION FOR FOG LIGHT AIMING [INFO](#)

21. FOG LIGHT AIMING INSPECTION [INFO](#)

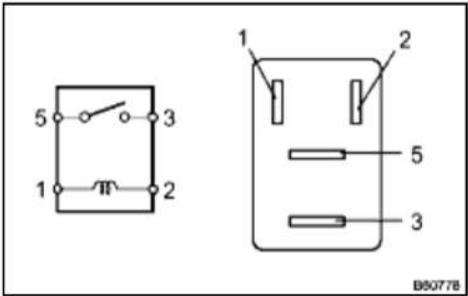
22. FOG LIGHT AIMING ADJUSTMENT [INFO](#)



Last Modified: 3-10-2010	6.4 G	From: 200901
Model Year: 2010	Model: Corolla	Doc ID: RM000000XX004UX
Title: 2AZ-FE COOLING: RELAY: ON-VEHICLE INSPECTION (2010 Corolla)		

ON-VEHICLE INSPECTION

1. INSPECT COOLING FAN RELAY NO. 1



(a) Remove the relay from the engine room relay block.

(b) Measure the resistance of the relay.

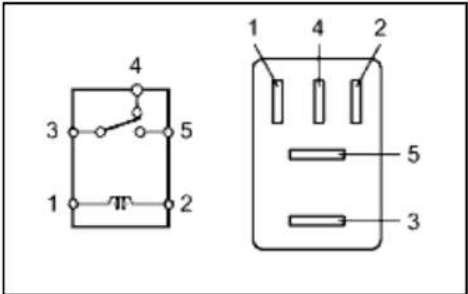
Standard Resistance:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
3 - 5	-	10 kΩ or higher
3 - 5	When battery voltage is applied to terminals 1 and 2	Below 1 Ω

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

(c) Install the relay.

2. INSPECT COOLING FAN RELAY NO. 2



(a) Remove the relay from the engine room relay block.

(b) Measure the resistance of the relay.

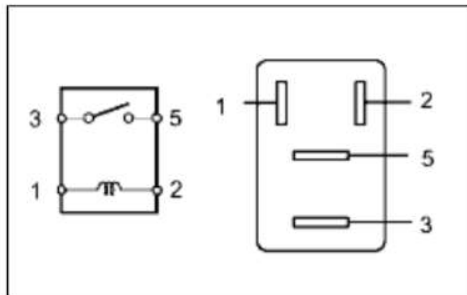
Standard Resistance:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
3 - 4	-	Below 1 Ω
3 - 4	When battery voltage is applied to terminals 1 and 2	10 k Ω or higher
3 - 5	-	10 k Ω or higher
3 - 5	When battery voltage is applied to terminals 1 and 2	Below 1 Ω

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

(c) Install the relay.

3. INSPECT COOLING FAN RELAY NO. 3



(a) Remove the relay from the engine room relay block.

(b) Measure the resistance of the relay.

Standard Resistance:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
3 - 5	-	10 k Ω or higher
3 - 5	When battery voltage is applied to terminals 1 and 2	Below 1 Ω

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

(c) Install the relay.



Last Modified: 3-10-2010	6.4 G	From: 200901
Model Year: 2010	Model: Corolla	Doc ID: RM000000XX004TX
Title: 2ZR-FE COOLING: RELAY: ON-VEHICLE INSPECTION (2010 Corolla)		

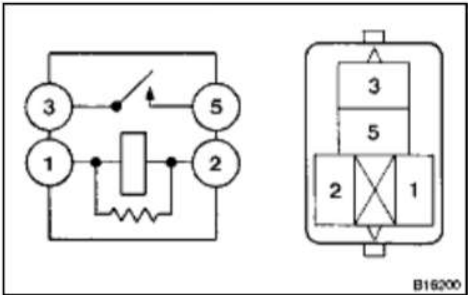
ON-VEHICLE INSPECTION

1. INSPECT FAN NO. 1 RELAY

(a) Remove the relay from the engine room relay block.

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

Standard Resistance:



TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
3 - 5	-	10 MΩ or higher
3 - 5	When battery voltage is applied to terminals 1 and 2	Below 1 Ω

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

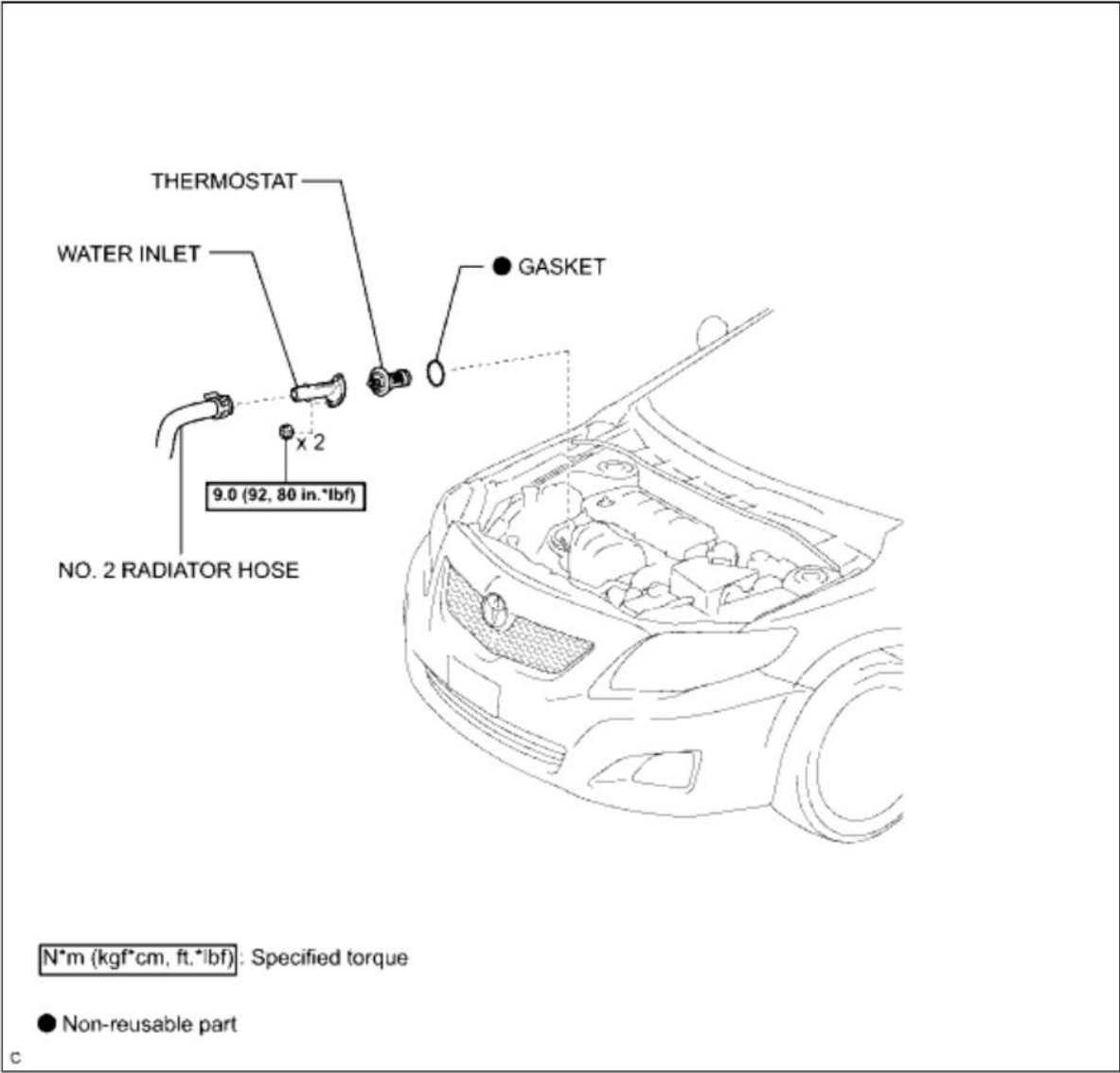
(c) Install the relay to the engine room relay block.



Last Modified: 3-10-2010	6.4 K	From: 200901
Model Year: 2010	Model: Corolla	Doc ID: RM000001X97011X
Title: 2AZ-FE COOLING: THERMOSTAT: COMPONENTS (2010 Corolla)		

COMPONENTS

ILLUSTRATION



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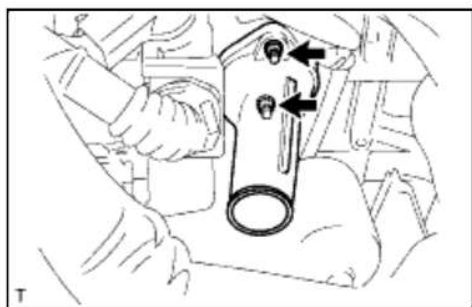
Last Modified: 3-10-2010	6.4 A	From: 200901
Model Year: 2010	Model: Corolla	Doc ID: RM0000017WE01JX
Title: 2AZ-FE COOLING: THERMOSTAT: REMOVAL (2010 Corolla)		

REMOVAL

1. DRAIN ENGINE COOLANT

[INFO](#)

2. DISCONNECT NO. 2 RADIATOR HOSE

[INFO](#)

3. REMOVE WATER INLET

- (a) Remove the 2 nuts and disconnect the water inlet from the cylinder block.

4. REMOVE THERMOSTAT

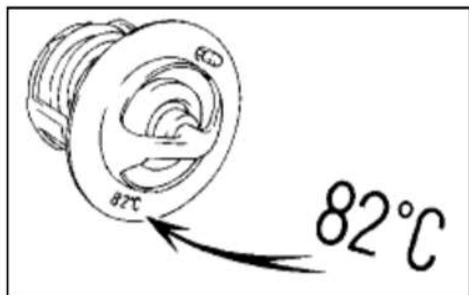
- (a) Remove the thermostat and gasket.



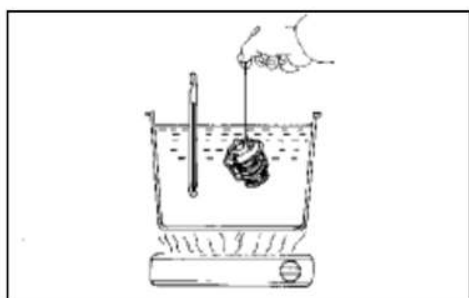
Last Modified: 3-10-2010	6.4 G	From: 200901
Model Year: 2010	Model: Corolla	Doc ID: RM0000017WC01GX
Title: 2AZ-FE COOLING: THERMOSTAT: INSPECTION (2010 Corolla)		

INSPECTION

1. INSPECT THERMOSTAT



(a) The valve opening temperature is inscribed on the thermostat.



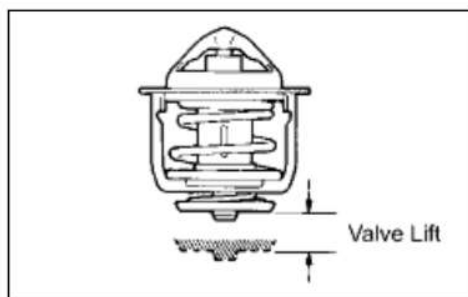
(b) Immerse the thermostat in water, and then gradually heat the water.

(c) 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.



(d) 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.

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

If it is not fully closed, replace the thermostat.

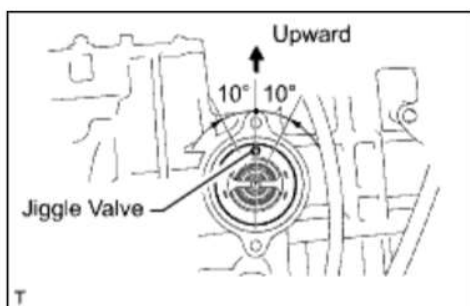


Last Modified: 3-10-2010	6.4 A	From: 200901
Model Year: 2010	Model: Corolla	Doc ID: RM0000017WB01JX
Title: 2AZ-FE COOLING: THERMOSTAT: INSTALLATION (2010 Corolla)		

INSTALLATION

1. INSTALL THERMOSTAT

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

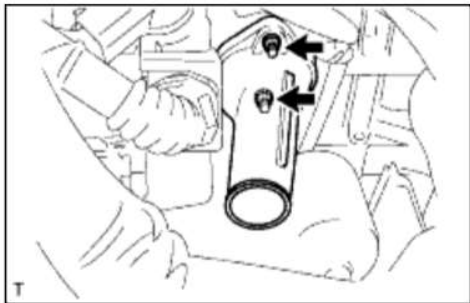


- (b) Install the thermostat with the jiggle valve upward.

HINT:

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

2. INSTALL WATER INLET



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

Torque: 9.0 N·m (92 kgf·cm, 80in·lbf)

3. CONNECT NO. 2 RADIATOR HOSE INFO

4. ADD ENGINE COOLANT INFO

5. INSPECT FOR COOLANT LEAK INFO

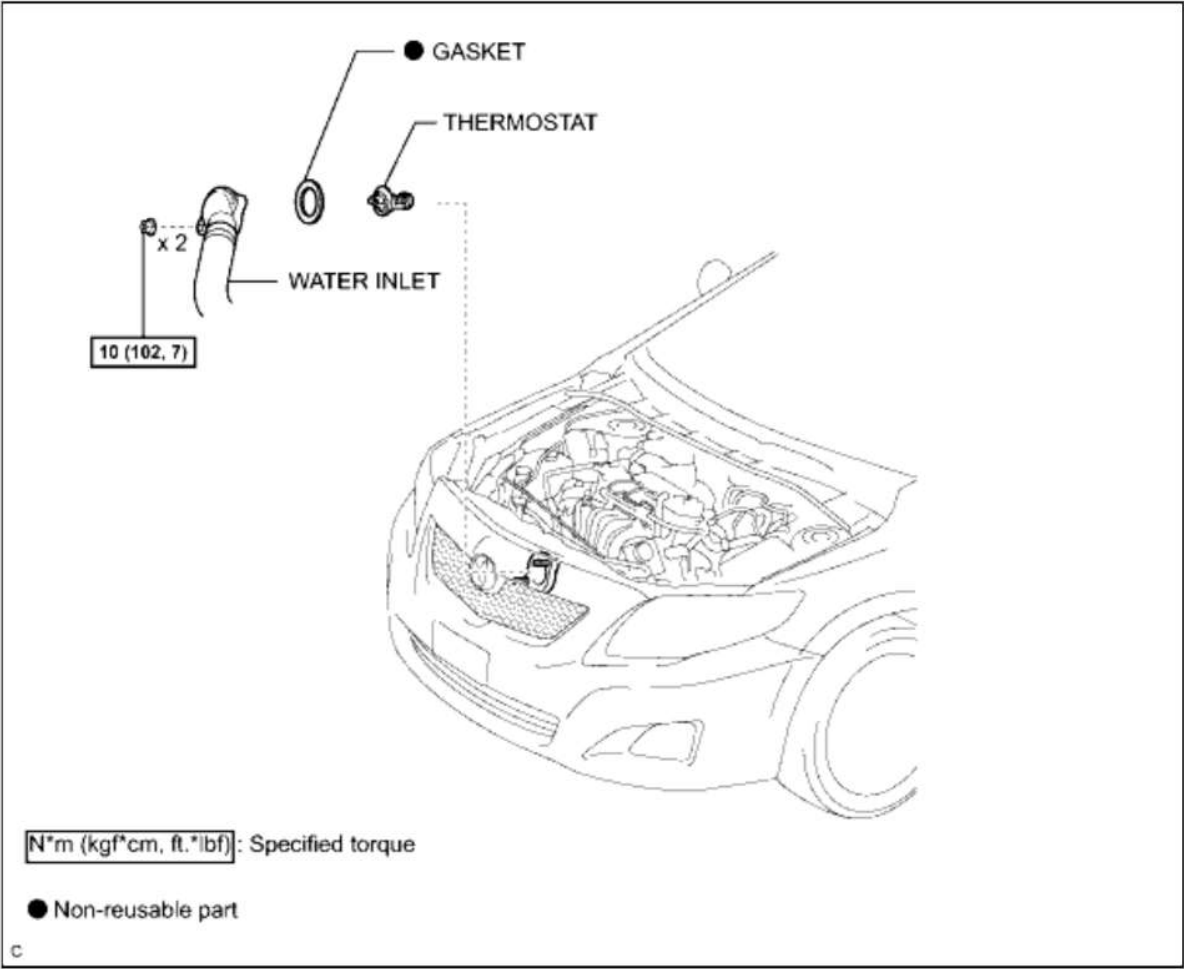
6. INSPECT RESERVOIR TANK ENGINE COOLANT LEVEL INFO



Last Modified: 3-10-2010	6.4 K	From: 200901
Model Year: 2010	Model: Corolla	Doc ID: RM000000RTE00ZX
Title: 2ZR-FE COOLING: THERMOSTAT: COMPONENTS (2010 Corolla)		

COMPONENTS

ILLUSTRATION



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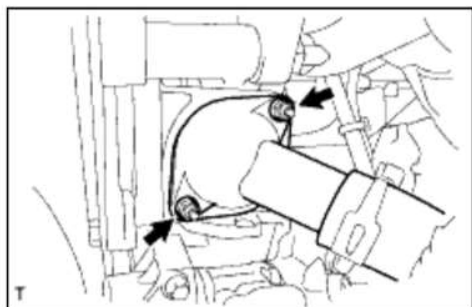
Last Modified: 3-10-2010	6.4 A	From: 200901
Model Year: 2010	Model: Corolla	Doc ID: RM000000RTF00ZX
Title: 2ZR-FE COOLING: THERMOSTAT: REMOVAL (2010 Corolla)		

REMOVAL

1. DRAIN ENGINE COOLANT

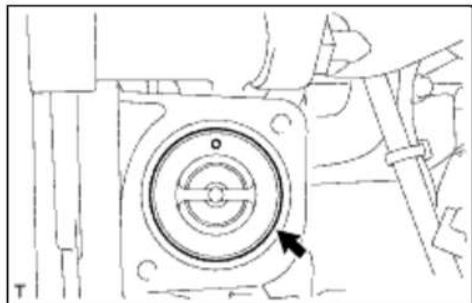
[INFO](#)

2. REMOVE WATER INLET



(a) Remove the 2 nuts and water inlet.

3. REMOVE THERMOSTAT



(a) Remove the thermostat.

(b) Remove the gasket from the thermostat.



TOYOTA

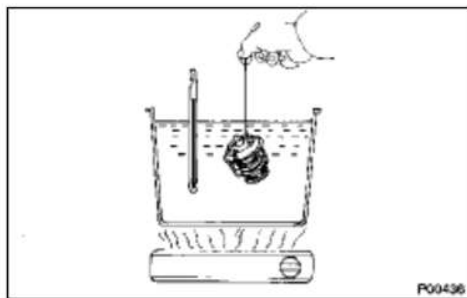
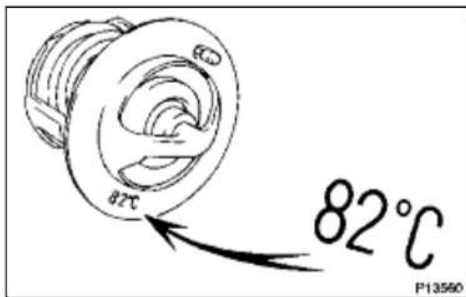
Last Modified: 3-10-2010	6.4 G	From: 200901
Model Year: 2010	Model: Corolla	Doc ID: RM00000335X00JX
Title: 2ZR-FE COOLING: THERMOSTAT: INSPECTION (2010 Corolla)		

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)

HINT:

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

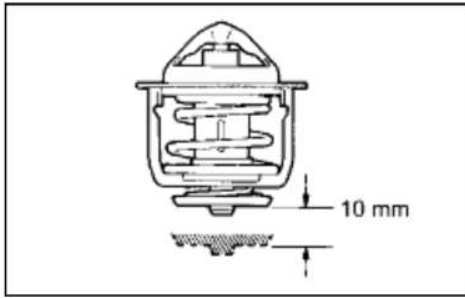
(c) Check the valve lift.

Standard valve lift:

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

HINT:

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)).

HINT:

If it is not fully closed, replace the thermostat.



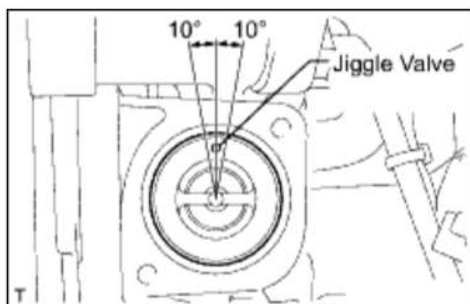
TOYOTA

Last Modified: 3-10-2010	6.4 A	From: 200901
Model Year: 2010	Model: Corolla	Doc ID: RM000000RTC00ZX
Title: 2ZR-FE COOLING: THERMOSTAT: INSTALLATION (2010 Corolla)		

INSTALLATION

1. INSTALL THERMOSTAT

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

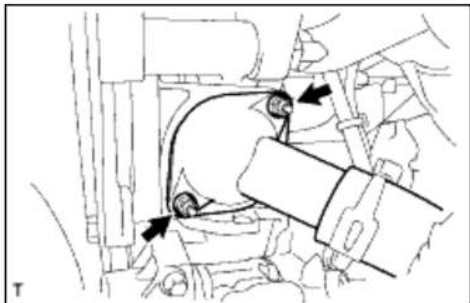


- (b) Install the thermostat to the water inlet with the jiggle valve upward.

HINT:

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

2. INSTALL WATER INLET



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

Torque: 10 N·m (102 kgf·cm, 7ft·lbf)

3. ADD ENGINE COOLANT

INFO

4. INSPECT FOR COOLANT LEAK

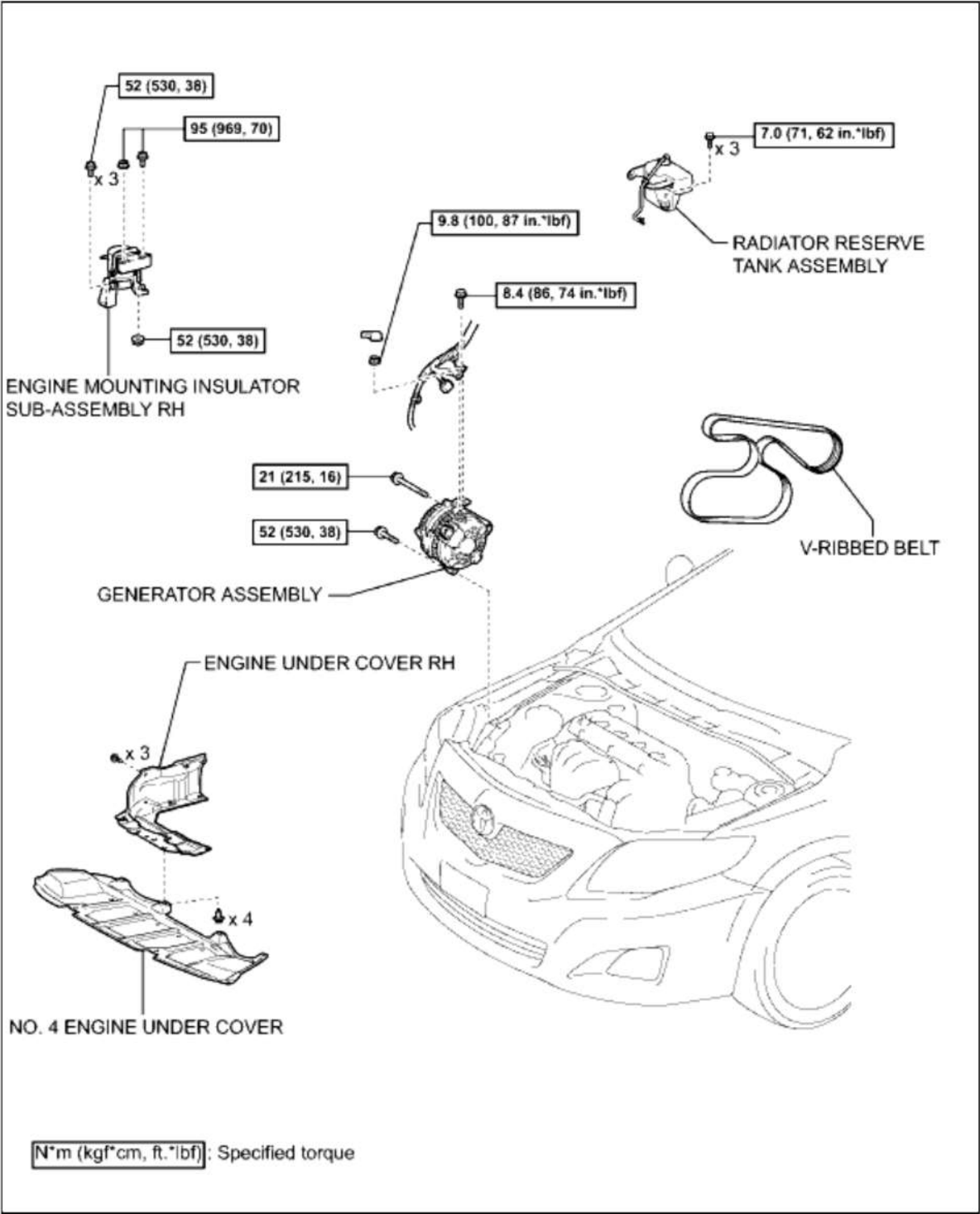
INFO



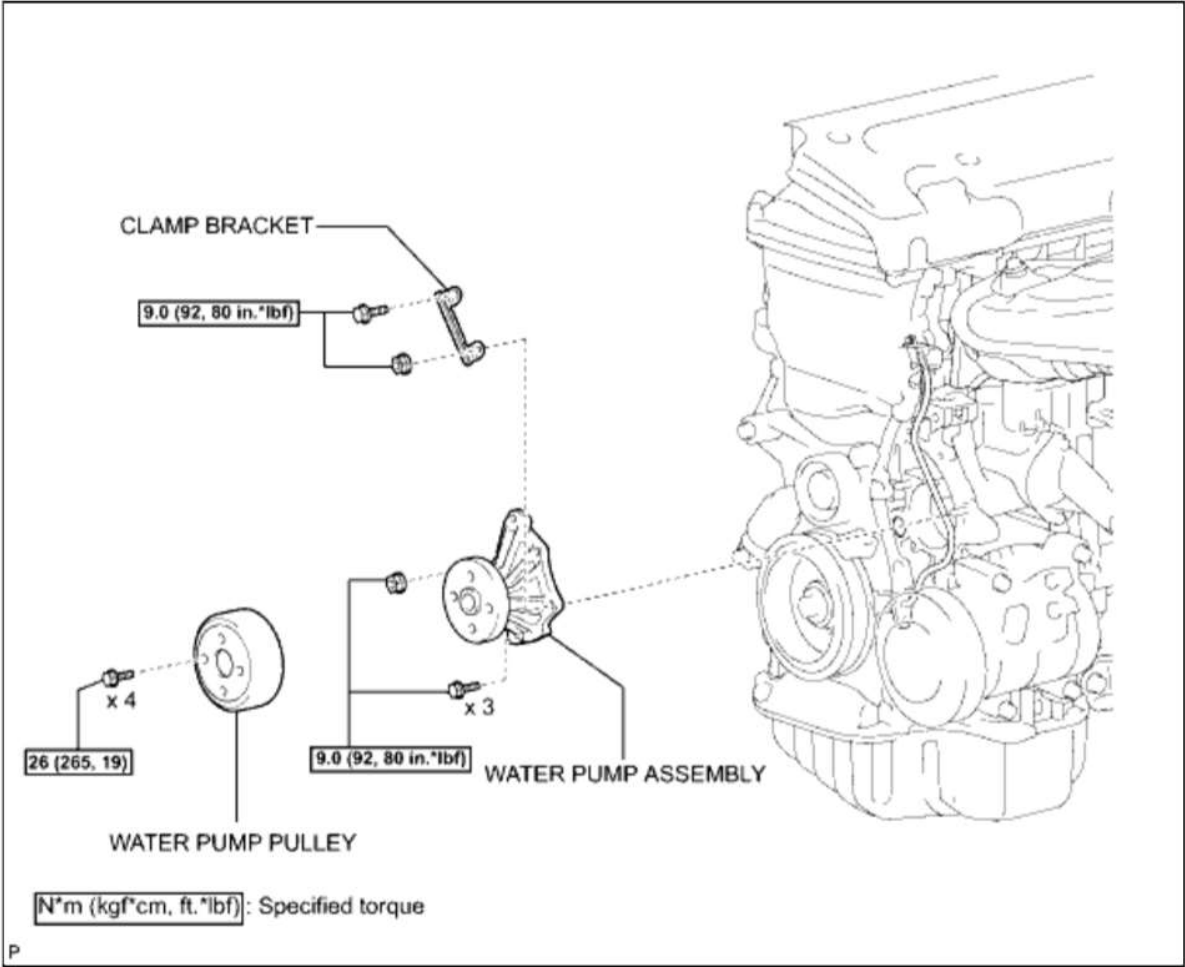
Last Modified: 3-10-2010	6.4 K	From: 200901
Model Year: 2010	Model: Corolla	Doc ID: RM000001X96011X
Title: 2AZ-FE COOLING: WATER PUMP: COMPONENTS (2010 Corolla)		

COMPONENTS

ILLUSTRATION



ILLUSTRATION



Last Modified: 3-10-2010	6.4 G	From: 200901
Model Year: 2010	Model: Corolla	Doc ID: RM0000017W8019X
Title: 2AZ-FE COOLING: WATER PUMP: ON-VEHICLE INSPECTION (2010 Corolla)		

ON-VEHICLE INSPECTION

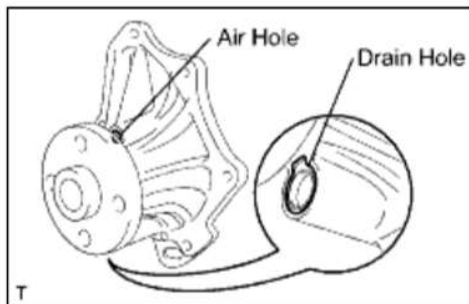
1. REMOVE GENERATOR ASSEMBLY

HINT:  .

2. REMOVE ENGINE MOUNTING INSULATOR SUB-ASSEMBLY RH

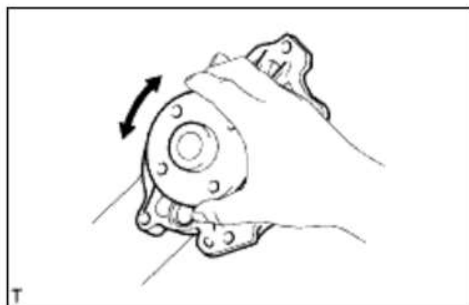
3. REMOVE WATER PUMP PULLEY

4. INSPECT WATER PUMP ASSEMBLY



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

If leakage is found, replace the water pump assembly.



(b) Turn the pulley, then check that the water pump bearing moves smoothly without making a "click" sound.

If it does not move smoothly, replace the water pump assembly.

5. INSTALL WATER PUMP PULLEY

6. INSTALL ENGINE MOUNTING INSULATOR SUB-ASSEMBLY RH

7. INSTALL GENERATOR ASSEMBLY

HINT:  .

Last Modified: 3-10-2010	6.4 A	From: 200901
Model Year: 2010	Model: Corolla	Doc ID: RM0000017WA01KX
Title: 2AZ-FE COOLING: WATER PUMP: REMOVAL (2010 Corolla)		

REMOVAL

1. DISCONNECT CABLE FROM NEGATIVE BATTERY TERMINAL

2. REMOVE ENGINE UNDER COVER LH

3. REMOVE ENGINE UNDER COVER RH

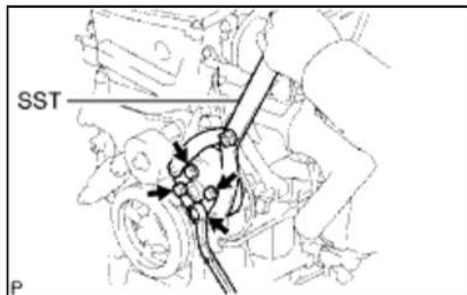
4. DRAIN ENGINE COOLANT 

5. REMOVE V-RIBBED BELT 

6. REMOVE GENERATOR ASSEMBLY 

7. REMOVE ENGINE MOUNTING INSULATOR SUB-ASSEMBLY RH 

8. REMOVE WATER PUMP PULLEY



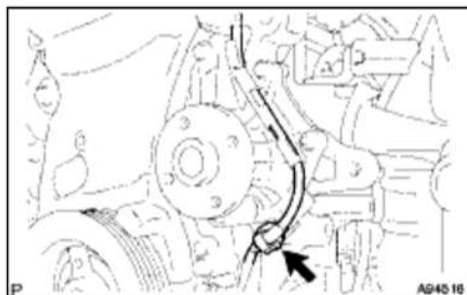
(a) Using SST, remove the 4 bolts and water pump pulley.

SST: 09960-10010

09962-01000

09963-00700

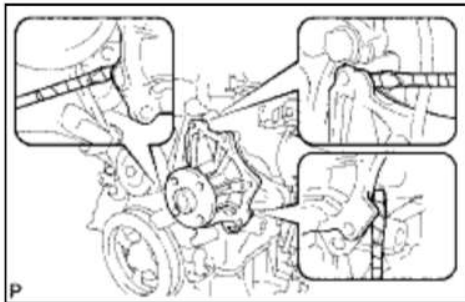
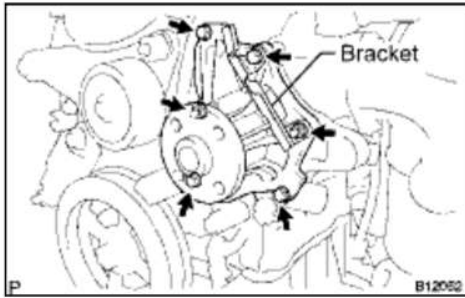
9. REMOVE WATER PUMP ASSEMBLY



(a) Remove the clamp of the crankshaft position sensor from the water pump.

(b) Disconnect the wire of the crankshaft position sensor from the clamp bracket.

(c) Remove the 4 bolts, 2 nuts and clamp bracket.



(d) Using a screwdriver, pry between the water pump and cylinder block, and then remove the water pump.

HINT:

Tape the screwdriver tip before use.

NOTICE:

Be careful not to damage the contact surfaces of the water pump and cylinder block.

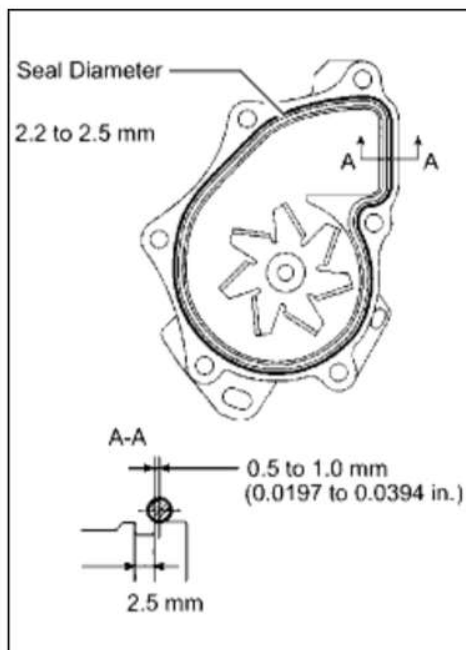


Last Modified: 3-10-2010	6.4 A	From: 200901
Model Year: 2010	Model: Corolla	Doc ID: RM0000017W701MX
Title: 2AZ-FE COOLING: WATER PUMP: INSTALLATION (2010 Corolla)		

INSTALLATION

1. INSTALL WATER PUMP ASSEMBLY

- (a) Remove any old seal packing material from the contact surface.



- (b) Apply a continuous line of seal packing as shown in the illustration.

Seal packing:

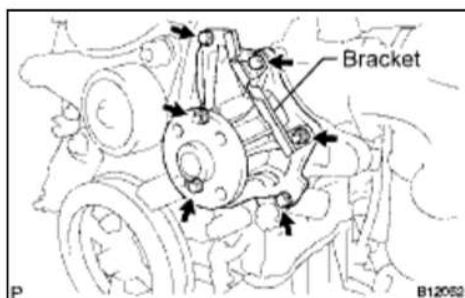
Toyota Genuine Seal Packing Black, Three Bond 1207B or equivalent

Standard seal diameter:

2.2 to 2.5 mm (0.0866 to 0.0984 in.)

NOTICE:

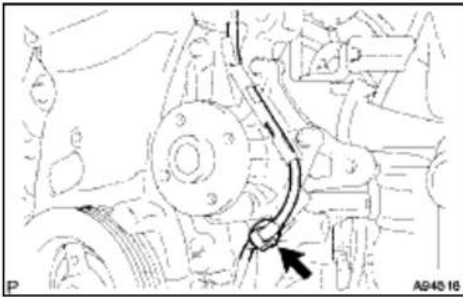
- Remove any oil from the contact surface.
- The parts must be set within 3 minutes after applying seal packing. Otherwise, the material must be removed and reapplied.



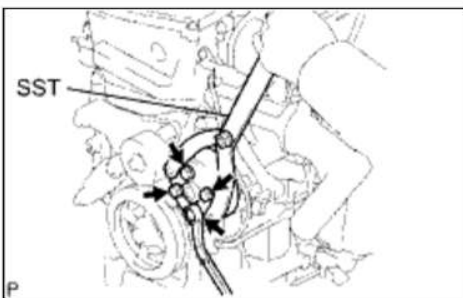
- (c) Install the water pump and clamp bracket with the 4 bolts and 2 nuts.

Torque: 9.0 N·m (92 kgf·cm, 80in·lbf)

- (d) Confirm that the wire harness of the crankshaft position sensor is secured to the wire harness clamp bracket through the back of the rib of the timing chain cover.



(e) Install the wire harness clamp.



2. INSTALL WATER PUMP PULLEY

(a) Using SST, install the water pump pulley with the 4 bolts.

SST: 09960-10010

09962-01000

09963-00700

Torque: 26 N·m (265 kgf·cm, 19ft·lbf)

3. INSTALL ENGINE MOUNTING INSULATOR SUB-ASSEMBLY RH

[INFO](#)

4. INSTALL GENERATOR ASSEMBLY

[INFO](#)

5. INSTALL V-RIBBED BELT

[INFO](#)

6. CONNECT CABLE TO NEGATIVE BATTERY TERMINAL

Torque: 5.4 N·m (55 kgf·cm, 48in·lbf)

7. ADD ENGINE COOLANT

[INFO](#)

8. INSPECT FOR COOLANT LEAK

[INFO](#)

9. INSPECT RESERVOIR TANK ENGINE COOLANT LEVEL

[INFO](#)

10. INSTALL ENGINE UNDER COVER LH

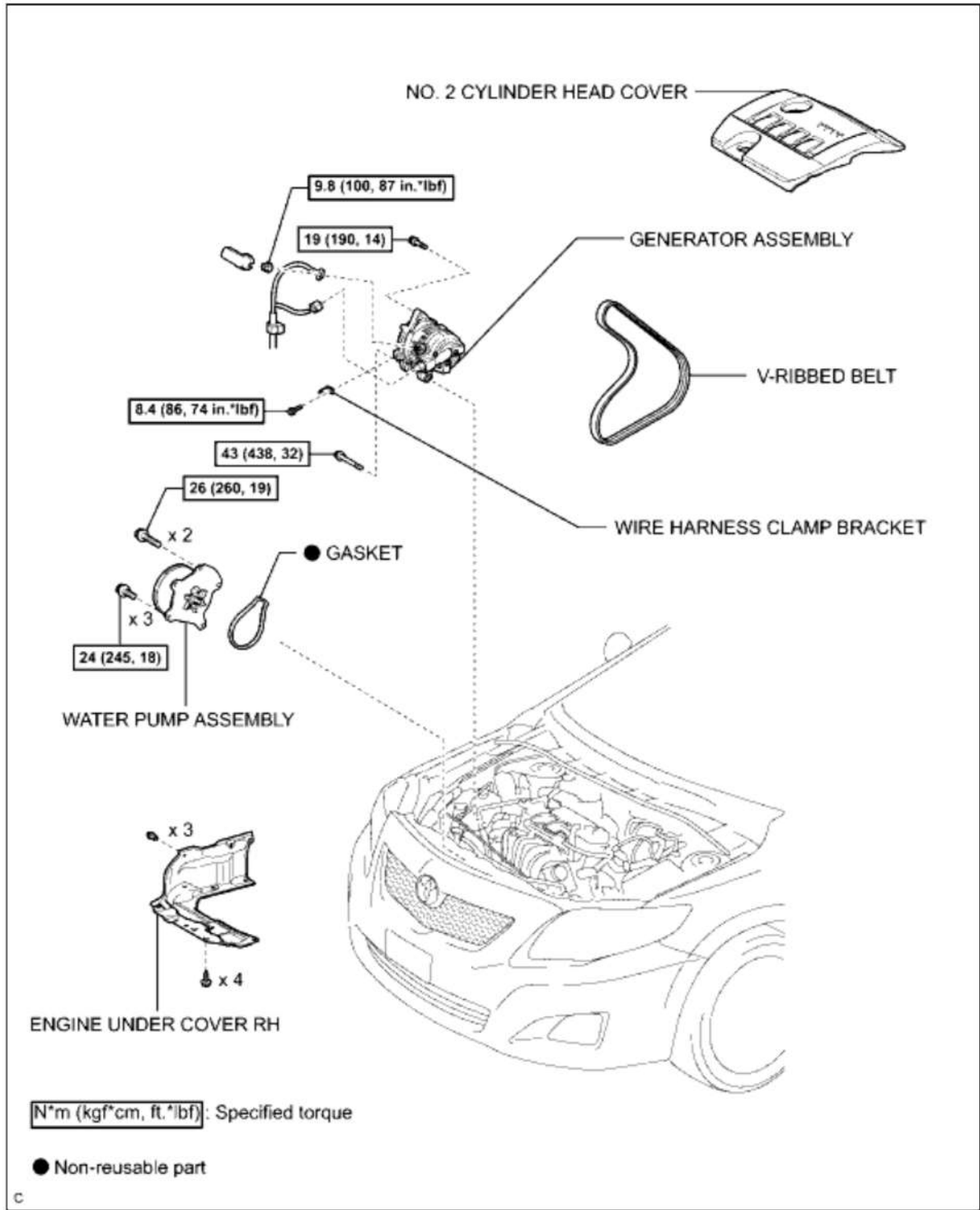
11. INSTALL ENGINE UNDER COVER RH



Last Modified: 3-10-2010	6.4 K	From: 200901
Model Year: 2010	Model: Corolla	Doc ID: RM000000RT900ZX
Title: 2ZR-FE COOLING: WATER PUMP: COMPONENTS (2010 Corolla)		

COMPONENTS

ILLUSTRATION





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Last Modified: 3-10-2010	6.4 G	From: 200901
Model Year: 2010	Model: Corolla	Doc ID: RM00000253V01TX
Title: 2ZR-FE COOLING: WATER PUMP: ON-VEHICLE INSPECTION (2010 Corolla)		

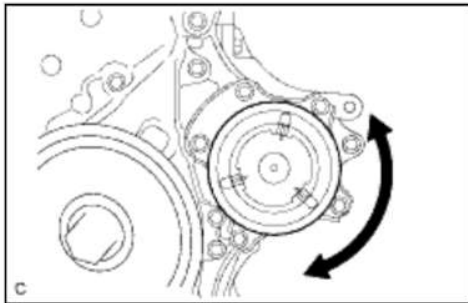
ON-VEHICLE INSPECTION

1. REMOVE NO. 2 CYLINDER HEAD COVER

2. REMOVE ENGINE UNDER COVER RH

3. REMOVE V-RIBBED BELT

4. INSPECT WATER PUMP ASSEMBLY



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

If necessary, replace the water pump assembly.

(b) Make sure that there are no drops of coolant on the water pump housing.

If necessary, replace the water pump assembly.

5. INSTALL V-RIBBED BELT

6. ADJUST V-RIBBED BELT

7. INSPECT V-RIBBED BELT

8. INSTALL ENGINE UNDER COVER RH

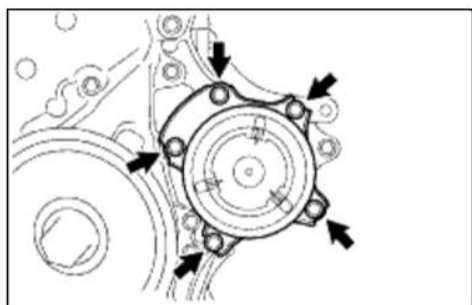
9. INSTALL NO. 2 CYLINDER HEAD COVER



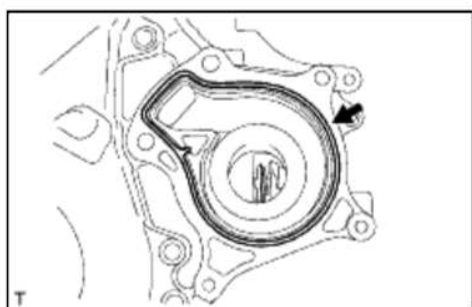
Last Modified: 3-10-2010	6.4 A	From: 200901
Model Year: 2010	Model: Corolla	Doc ID: RM000000RTA010X
Title: 2ZR-FE COOLING: WATER PUMP: REMOVAL (2010 Corolla)		

REMOVAL

1. REMOVE NO. 2 CYLINDER HEAD COVER [INFO](#)
2. REMOVE ENGINE UNDER COVER RH
3. DRAIN ENGINE COOLANT [INFO](#)
4. DISCONNECT CABLE FROM NEGATIVE BATTERY TERMINAL
5. REMOVE V-RIBBED BELT [INFO](#)
6. REMOVE GENERATOR ASSEMBLY [INFO](#)
7. REMOVE WATER PUMP ASSEMBLY



(a) Remove the 5 bolts and water pump assembly from the timing chain cover.

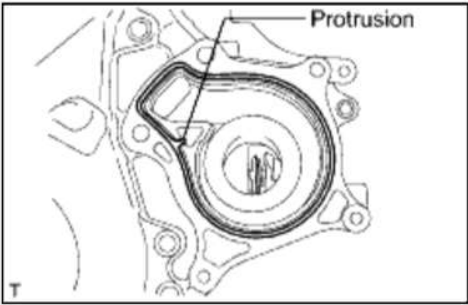


(b) Remove the water pump gasket from the timing chain cover.

Last Modified: 3-10-2010	6.4 A	From: 200901
Model Year: 2010	Model: Corolla	Doc ID: RM000000RT8010X
Title: 2ZR-FE COOLING: WATER PUMP: INSTALLATION (2010 Corolla)		

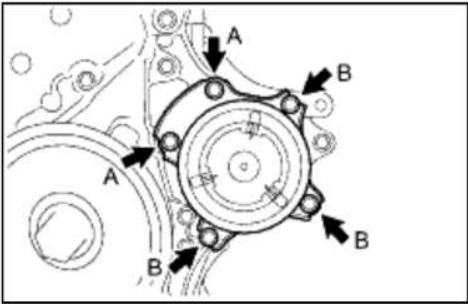
INSTALLATION

1. INSTALL WATER PUMP ASSEMBLY



- (a) Align the protrusion of a new water pump gasket with the cutout in the timing chain cover and install the gasket to the groove of the timing chain cover.

HINT:
Be sure to clean the contact surfaces.



- (b) Install the water pump assembly to the timing chain cover with the 5 bolts.

Bolt A - Torque: 26 N·m (260 kgf·cm, 19ft·lbf)
Bolt B - Torque: 24 N·m (245 kgf·cm, 18ft·lbf)
Bolt Length:

ITEM	LENGTH
Bolt A	35 mm (1.38 in.)
Bolt B	18 mm (0.709 in.)

2. INSTALL GENERATOR ASSEMBLY
3. INSTALL V-RIBBED BELT
4. ADJUST V-RIBBED BELT
5. INSPECT V-RIBBED BELT
6. CONNECT CABLE TO NEGATIVE BATTERY TERMINAL
7. ADD ENGINE COOLANT
8. INSPECT INSPECT FOR COOLANT LEAK
9. INSTALL ENGINE UNDER COVER RH
10. INSTALL NO. 2 CYLINDER HEAD COVER

