

Last Modified: 3-27-2012	6.4 A	From: 201203
Model Year: 2013	Model: FR-S	Doc ID: RM00000419K00HX
Title: FA20 COOLING: COOLANT: REPLACEMENT (2013 FR-S)		

REPLACEMENT

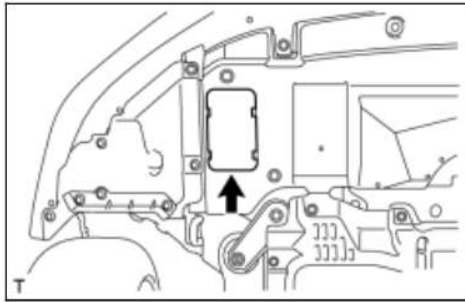
1. DRAIN ENGINE COOLANT

NOTICE:

Do not remove the radiator cap, cylinder block drain cock plugs and 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.

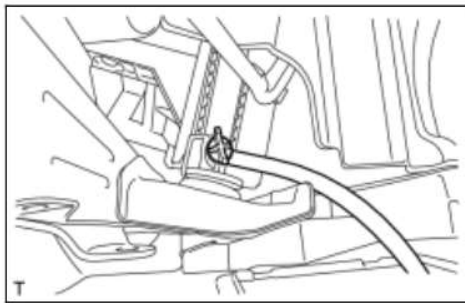
HINT:

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

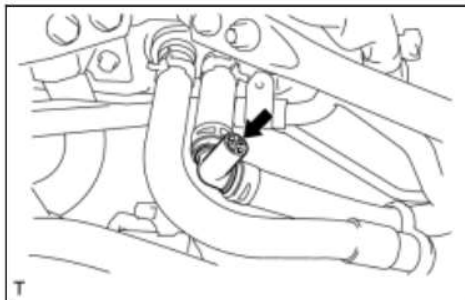


- (a) Remove the service hole cover from the front bumper under cover.

- (b) Connect a hose with an inside diameter of 8 mm (0.315 in.) to the drain plug.



- (c) Loosen the radiator drain cock plug.



- (d) Open the air bleed plug on the heater hose side.

- (e) Remove the radiator cap and drain the coolant.

2. ADD ENGINE COOLANT

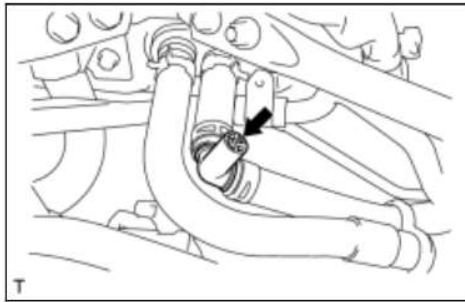
HINT:

Before replenishing the coolant, turn the A/C switch off.

- (a) Tighten the radiator drain cock plug.
 (b) Pour in coolant of the specified density until it reaches the base of the entrance to the water inlet.

HINT:

- The coolant contains anti-freeze and anti-rust agents for use with engines with aluminum cylinder blocks. Using other than the specified coolant may cause rust, so be sure to use Toyota SLLC 50 Blue.
- Crimp the inlet and outlet radiator hoses several times by hand, and add water if the water level in the entrance water inlet drops.
- The coolant quantity includes the quantity in the reserve tank.



- (c) Open the air bleed plug on the heater hose side.

- (d) If the water level in the entrance to the water inlet drops, pour coolant in until it reaches the base of the entrance to the water inlet.
 (e) Close the air bleed plug when the coolant begins to come out of the air bleed valve on the heater hose side.
 (f) Pour in coolant of the specified concentration until it reaches the "FULL" level of the radiator reserve tank.
 (g) Close the radiator cap. [*1]
 (h) Start the engine, race it 5 to 6 times at under 3000 rpm or less, and then stop the engine. [*2]

HINT:

Finish this operation within 40 seconds.

- (i) 1 minute after stopping the engine, remove the radiator cap and pour coolant in if the water level in the entrance to the water inlet has dropped. [*3]
 (j) Repeat operations [*1], [*2], and [*3] until the water level in the entrance to the water inlet does not drop.

HINT:

Perform before the engine warms up, as the air that comes out of the inlet radiator hose will travel to the radiator side when the engine warms up and the thermostat opens.

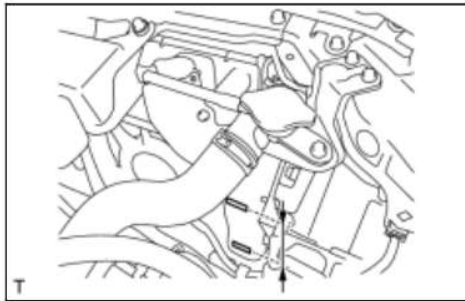
- (k) Close the radiator cap and the radiator reserve tank cap.

- (l) Start the engine, set the heater on full warm, and then run it with the blower speed set to "LO".
- (m) Run the engine at 2000 rpm or less until the radiator fan starts and stops. [*4]

HINT:

To prevent overheating, pay attention to the water temperature.

- (n) Stop the engine and wait until the coolant temperature drops to 30 °C (86 °F) or less. [*5]
- (o) Remove the radiator cap and, if the volume of coolant has dropped, pour coolant in until it reaches the base of the entrance to the water inlet and until it reaches the "FULL" level in the radiator reserve tank. [*6]
- (p) Close the radiator cap. [*7]
- (q) Set the heater to full warm, and, with the blower speed set to "LO", race the engine at 3000 rpm or less. [*8]
- (r) At this point, if the engine coolant can be heard flowing in the heater core, repeat operations [*4], [*5], [*6], [*7], and [*8].



- (s) When the water level no longer drops, adjust the water level so that the water level in the radiator reserve tank reaches the "FULL" line.

3. INSPECT FOR COOLANT LEAK

INFO

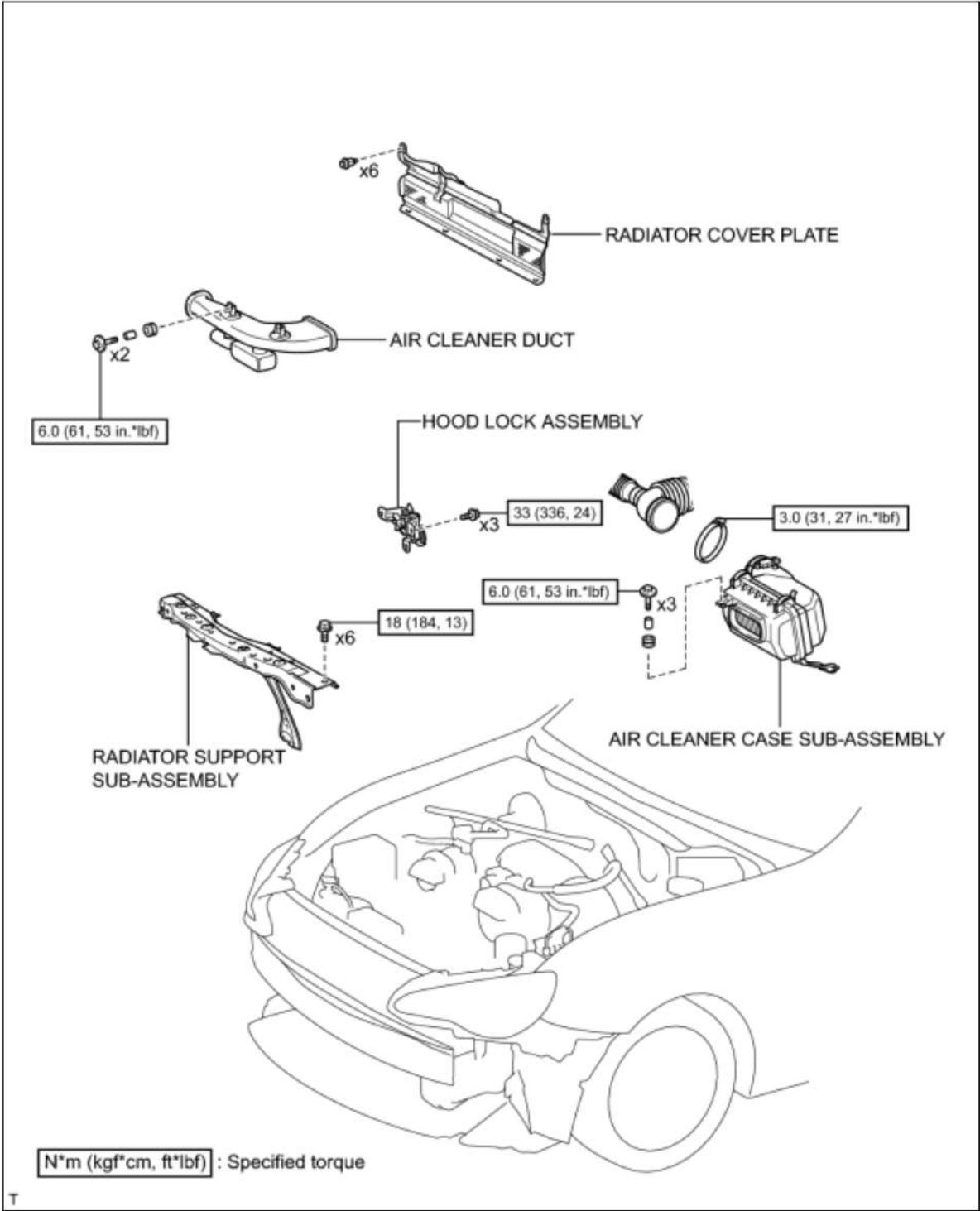


TOYOTA

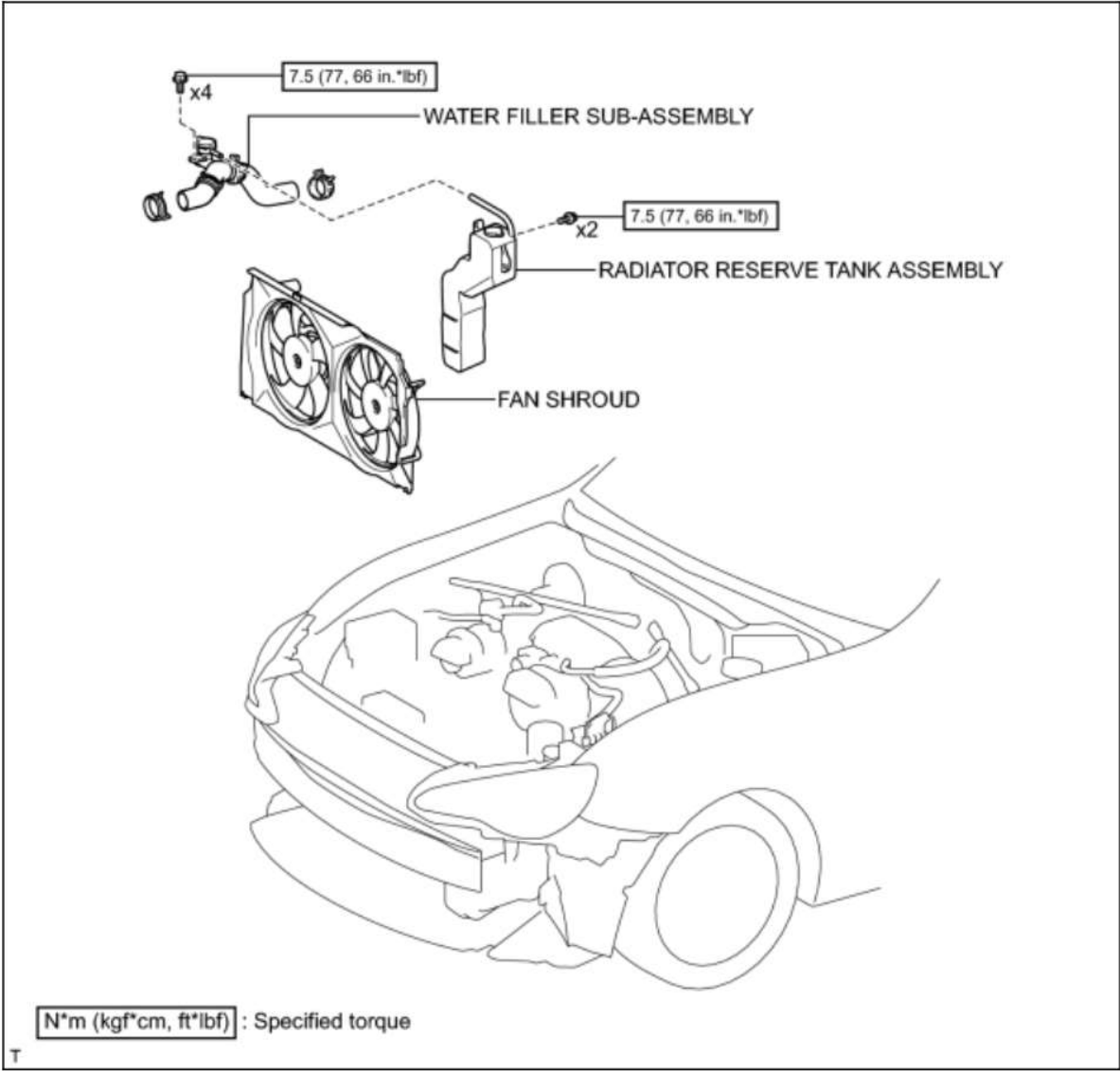
Last Modified: 3-27-2012	6.4 K	From: 201203
Model Year: 2013	Model: FR-S	Doc ID: RM000002BMP01CX
Title: FA20 COOLING: COOLING FAN MOTOR: COMPONENTS (2013 FR-S)		

COMPONENTS

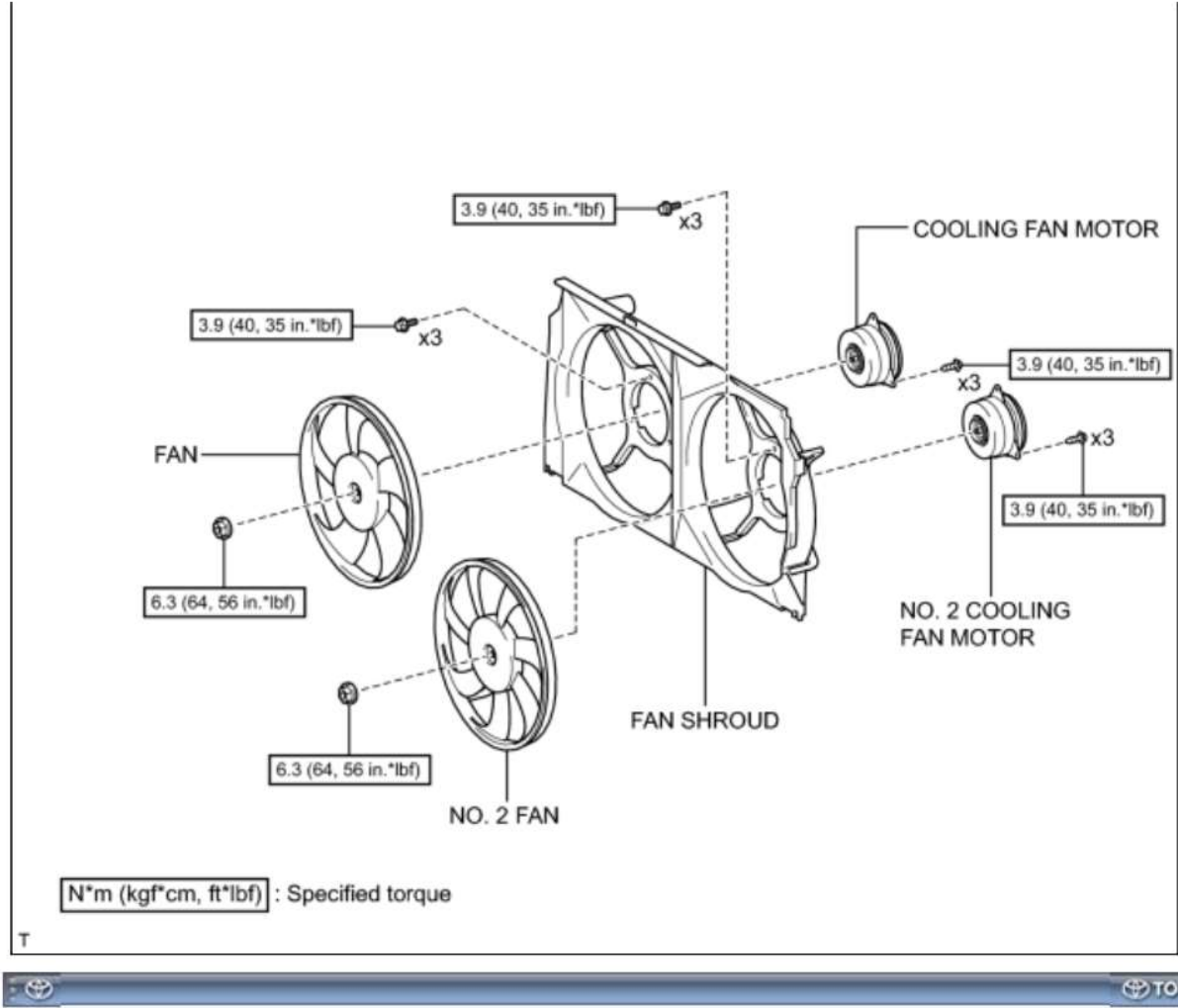
ILLUSTRATION



ILLUSTRATION



ILLUSTRATION



Last Modified: 3-27-2012	6.4 A	From: 201203
Model Year: 2013	Model: FR-S	Doc ID: RM000002BMO01NX
Title: FA20 COOLING: COOLING FAN MOTOR: INSTALLATION (2013 FR-S)		

INSTALLATION

1. 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)

2. 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 wire harness to the 2 cooling fan motors.

3. INSTALL NO. 2 FAN

- (a) Install the No. 2 fan with the nut.

Torque: 6.3 N·m (64 kgf·cm, 56in·lbf)

4. INSTALL FAN

- (a) Install the fan with the nut.

Torque: 6.3 N·m (64 kgf·cm, 56in·lbf)

5. INSTALL FAN SHROUD

HINT:

Insert a cardboard or a blanket between the radiator assembly and the fan shroud to protect the radiator assembly.

- (a) Engage the fitting sections in the bottom of the fan shroud with the fitting sections of the radiator assembly.

NOTICE:

Do not damage the outlet radiator hose, inlet radiator hose, No.1 radiator hose, water filler sub-assembly, or air conditioner tube and accessory assembly.

- (b) Attach the 2 claws and install the fan shroud to the radiator assembly.
(c) Connect the 2 cooling fan motor connectors and 2 clamps to the radiator assembly.

6. INSTALL RADIATOR SUPPORT SUB-ASSEMBLY INFO

7. INSTALL RADIATOR COVER PLATE INFO

8. REMOVE AIR CLEANER DUCT INFO

9. CONNECT HOOD LOCK ASSEMBLY INFO

10. INSTALL WATER FILLER SUB-ASSEMBLY

- (a) Install the water filler sub-assembly with the 4 bolts.

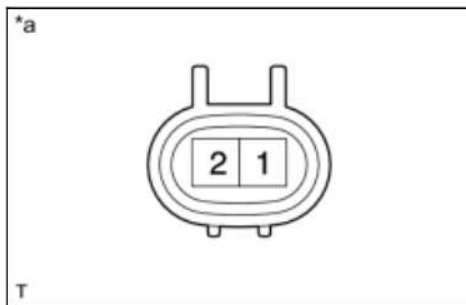
Torque: 7.5 N·m (77 kgf·cm, 66in·lbf)

11. INSTALL RADIATOR RESERVE TANK ASSEMBLY**INFO****12. INSTALL FRONT BUMPER COVER****INFO****13. INSTALL AIR CLEANER CASE SUB-ASSEMBLY****INFO**

Last Modified: 3-27-2012	6.4 G	From: 201203
Model Year: 2013	Model: FR-S	Doc ID: RM00000202U02NX
Title: FA20 COOLING: COOLING FAN MOTOR: ON-VEHICLE INSPECTION (2013 FR-S)		

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.

Text in Illustration

*a	Component without harness connected (Cooling fan motor)
----	--

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

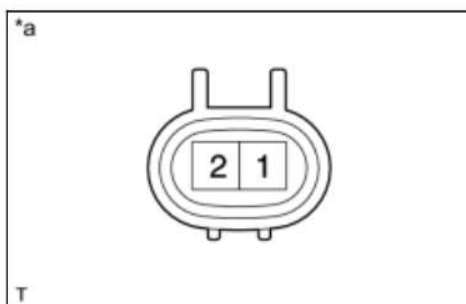
- (b) Measure the current while the motor is operating.

Standard Current:

ITEM	CONDITION	SPECIFIED CONDITION
Cooling fan motor	20°C (68°F)	7.4 to 11.4 A at 12 V

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 No. 2 cooling fan motor connector.

Text in Illustration

*a	Component without harness connected (No. 2 cooling fan motor)
----	--

If the motor does not operate smoothly, replace the No. 2 cooling fan motor.

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

Standard Current:

ITEM	CONDITION	SPECIFIED CONDITION
No. 2 cooling fan motor	20°C (68°F)	7.4 to 11.4 A at 12 V

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



Last Modified: 3-27-2012	6.4 A	From: 201203
Model Year: 2013	Model: FR-S	Doc ID: RM000002BMQ01NX
Title: FA20 COOLING: COOLING FAN MOTOR: REMOVAL (2013 FR-S)		

REMOVAL

1. REMOVE AIR CLEANER CASE SUB-ASSEMBLY

INFO

2. REMOVE FRONT BUMPER COVER

INFO

3. REMOVE AIR CLEANER DUCT

INFO

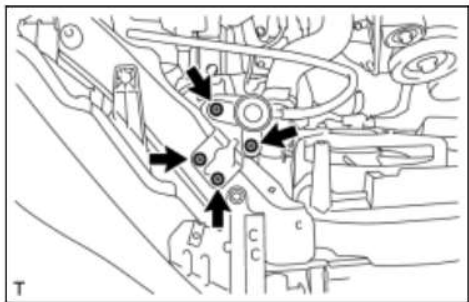
4. REMOVE RADIATOR COVER PLATE

INFO

5. REMOVE RADIATOR RESERVE TANK ASSEMBLY

INFO

6. REMOVE WATER FILLER SUB-ASSEMBLY



(a) Remove the 4 bolts and separate the water filler sub-assembly.

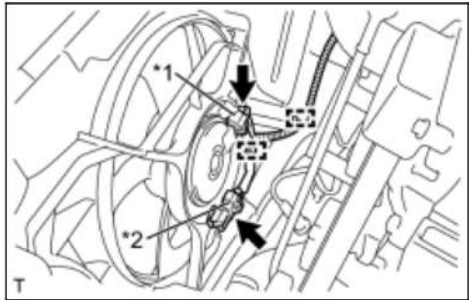
7. DISCONNECT HOOD LOCK ASSEMBLY

INFO

8. REMOVE RADIATOR SUPPORT SUB-ASSEMBLY

INFO

9. REMOVE FAN SHROUD



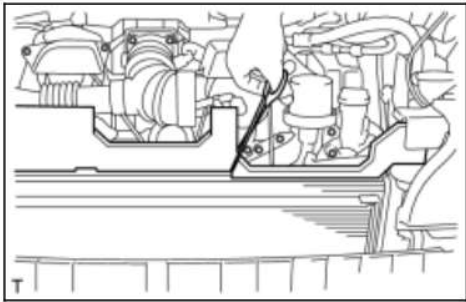
(a) Disconnect the 2 wire harness clamps and the 2 cooling fan motor connectors.

Text in Illustration

*1	Cooling fan motor connector
*2	No. 2 cooling fan motor connector

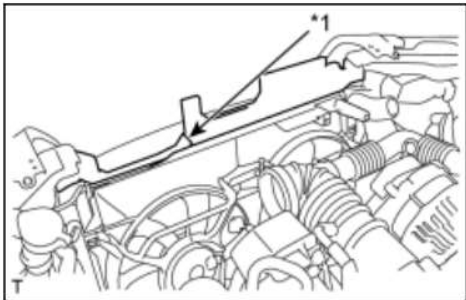
NOTICE:
Be careful not to damage the connectors.

(b) Mark the sponge on the upper surface of the fan shroud, and use scissors, etc. to cut the sponge.



HINT:

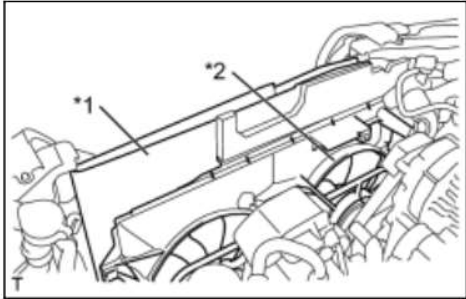
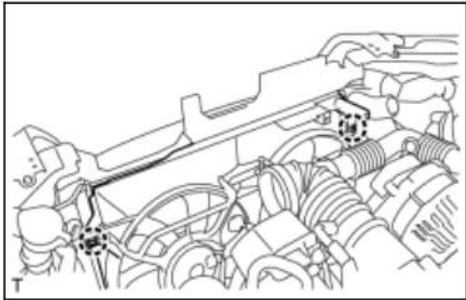
Cut the radiator packing at the position between the corner of the radiator packing and the edge of the fan shroud.



Text in Illustration

*1	Cutting Line
----	--------------

(c) Detach the 2 claws and separate the fan shroud from the radiator assembly.



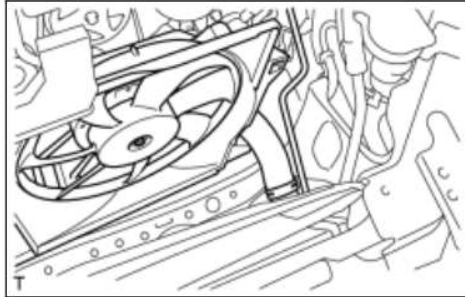
Text in Illustration

*1	Cardboard or Blanket
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*2	Fan shroud
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HINT:

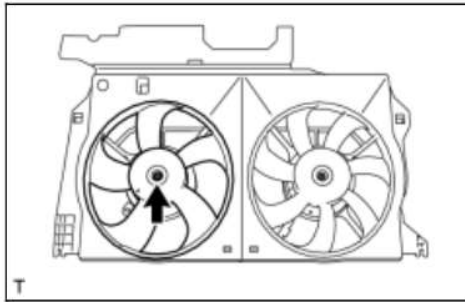
Insert a cardboard or a blanket between the radiator assembly and the fan shroud to protect the radiator assembly.



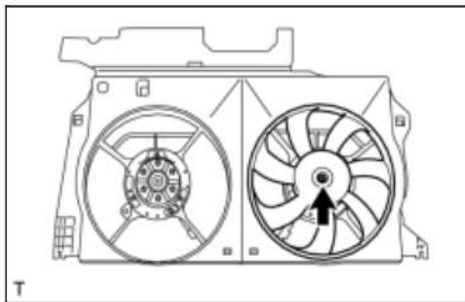
(d) Remove the fan shroud from the radiator assembly.

NOTICE:

Do not apply any excessive force to the outlet radiator hose, inlet radiator hose, No.1 radiator hose, pipe or water filler sub-assembly when removing the fan shroud.

10. REMOVE FAN

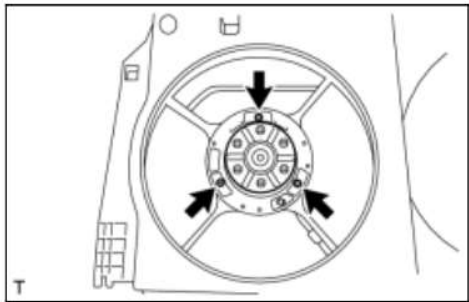
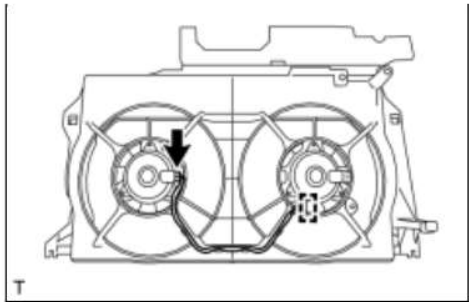
(a) Remove the nut and fan.

11. REMOVE NO. 2 FAN

(a) Remove the nut and No. 2 fan.

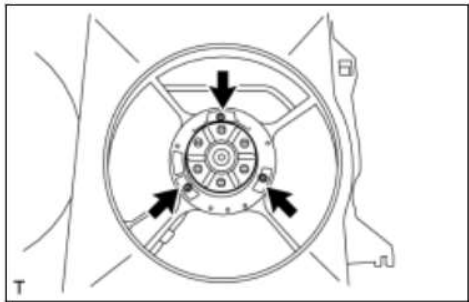
12. REMOVE COOLING FAN MOTOR

(a) Disengage the connector clamp, and disconnect the connector from cooling fan motor.



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

13. REMOVE NO. 2 COOLING FAN MOTOR



(a) Remove the 3 screws and the No. 2 cooling fan motor.



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Model Year: 2013	Model: FR-S	Doc ID: RM000002YZE03HX
Title: FA20 COOLING: COOLING FAN SYSTEM: Cooling Fan Circuit (2013 FR-S)		

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

Refer to System Diagram  .

INSPECTION PROCEDURE

NOTICE:

Inspect the fuses for circuits related to this system before performing the following inspection procedure.

PROCEDURE

1.	PERFORM ACTIVE TEST USING TECHSTREAM (CONTROL THE ELECTRIC COOLING FAN)
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- Connect the Techstream to the DLC3.
- Turn the ignition switch to ON.
- Turn the Techstream on.
- Enter the following menus: Powertrain / Engine / Active Test / Control the Electric Cooling Fan.
- Check the operation of the cooling fans while operating them using the Techstream.

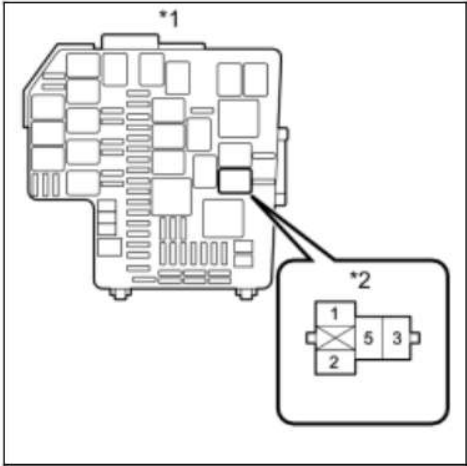
OK:

TESTER OPERATION	SPECIFIED CONDITION
ON	Cooling fans operate
OFF	Cooling fans stop

NG  **PROCEED TO NEXT SUSPECTED AREA SHOWN IN PROBLEM SYMPTOMS TABLE**

OK
▼

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



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

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

TESTER CONNECTION	SWITCH CONDITION	SPECIFIED CONDITION
5 (FAN NO. 1 relay terminal) - Body ground	Always	11 to 14 V

Text in Illustration

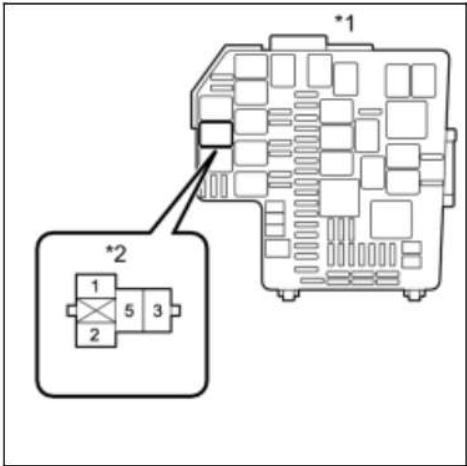
*1	Engine Room Relay Block
*2	FAN No. 1 Relay Terminals

(c) Reinstall the FAN No. 1 relay.

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

OK
▼

3. INSPECT ENGINE ROOM RELAY BLOCK (FAN NO. 3 RELAY VOLTAGE)



(a) Remove the 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	SWITCH CONDITION	SPECIFIED CONDITION
5 (FAN NO. 3 relay terminal) - Body ground	Always	11 to 14 V

Text in Illustration

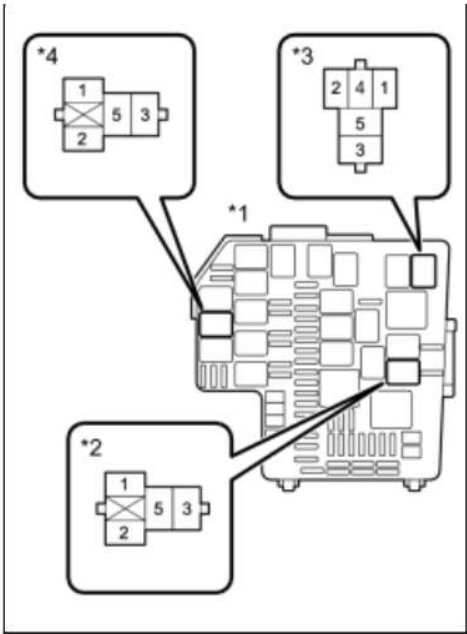
*1	Engine Room Relay Block
*2	FAN No. 3 Relay Terminals

(c) Reinstall the FAN No. 3 relay.

NG ► REPAIR OR REPLACE HARNESS OR CONNECTOR (BATTERY - FAN NO. 3 RELAY)

OK
▼

4.	CHECK HARNESS AND CONNECTOR (FAN NO. 1, NO. 2 OR NO. 3 RELAY)
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(a) Remove the FAN No. 1, FAN No. 2 and FAN No. 3 relays from the engine room relay block.

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

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
2 (FAN NO. 1 relay terminal) - Body ground	Ignition switch ON	11 to 14 V
1 (FAN NO. 2 relay terminal) - Body ground	Ignition switch ON	11 to 14 V
2 (FAN NO. 3 relay terminal) - Body ground	Ignition switch ON	11 to 14 V

Text in Illustration

*1	Engine Room Relay Block
*2	FAN No. 1 Relay Terminals
*3	FAN No. 2 Relay Terminals
*4	FAN No. 3 Relay Terminals

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

NG  **REPAIR OR REPLACE HARNESS OR CONNECTOR (FAN NO. 1, NO. 2 OR NO. 3 RELAY)**

OK


5. INSPECT FAN NO. 1 RELAY

(a) Inspect the FAN No. 1 relay .

NG  **REPLACE FAN NO. 1 RELAY**

OK

**6. INSPECT FAN NO. 2 RELAY**

(a) Inspect the FAN No. 2 relay .

NG  **REPLACE FAN NO. 2 RELAY**

OK

**7. INSPECT FAN NO. 3 RELAY**

(a) Inspect the FAN No. 3 relay .

NG  **REPLACE FAN NO. 3 RELAY**

OK

**8. CHECK HARNESS AND CONNECTOR (FAN NO. 2 RELAY - 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 (Check for Open):

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

(c) Reinstall the FAN No. 2 relay.

NG  **REPAIR OR REPLACE HARNESS OR CONNECTOR (FAN NO. 2 RELAY - BODY GROUND)**

OK


9.

INSPECT COOLING FAN MOTOR

(a) Inspect the cooling fan motor  .

NG  **REPLACE COOLING FAN MOTOR**

OK


10.

CHECK HARNESS AND CONNECTOR (COOLING FAN MOTOR - BODY GROUND)

- (a) Disconnect the A45 cooling fan motor connector.
- (b) Measure the resistance according to the value(s) in the table below.
- Standard Resistance (Check for Open):

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
A45-1 - Body ground	Always	Below 1 Ω

(c) Reconnect the A45 cooling fan motor connector.

NG  **REPAIR OR REPLACE HARNESS OR CONNECTOR (COOLING FAN MOTOR - BODY GROUND)**

OK


CHECK HARNESS AND CONNECTOR (COOLING FAN MOTOR - ENGINE ROOM

11. RELAY BLOCK)

- (a) Disconnect the A45 cooling fan motor connector.
- (b) Remove the FAN No. 1 and FAN No. 2 relays 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
A45-2 - 3 (FAN NO. 1 relay terminal)	Always	Below 1 Ω
A45-2 - 4 (FAN NO. 2 relay terminal)	Always	Below 1 Ω

Standard Resistance (Check for Short):

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
A45-2 or 3 (FAN NO. 1 relay terminal) or 4 (FAN NO. 2 relay terminal) - Body ground	Always	10 k Ω or higher

- (d) Reconnect the A45 cooling fan motor connector.
- (e) Reinstall the FAN No. 1 and FAN No. 2 relays.

NG  **REPAIR OR REPLACE HARNESS OR CONNECTOR (COOLING FAN MOTOR - ENGINE ROOM RELAY BLOCK)**

OK


12. INSPECT NO. 2 COOLING FAN MOTOR

- (a) Inspect the No. 2 cooling fan motor .

NG  **REPLACE NO. 2 COOLING FAN MOTOR**

OK


13. CHECK HARNESS AND CONNECTOR (NO. 2 COOLING FAN MOTOR - ENGINE ROOM RELAY BLOCK)

- (a) Disconnect the A46 No. 2 cooling fan motor connector.
- (b) Remove the FAN No. 2 and FAN No. 3 relays 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
A46-1 - 3 (FAN NO. 2 relay terminal)	Always	Below 1 Ω
A46-2 - 3 (FAN NO. 3 relay terminal)	Always	Below 1 Ω

Standard Resistance (Check for Short):

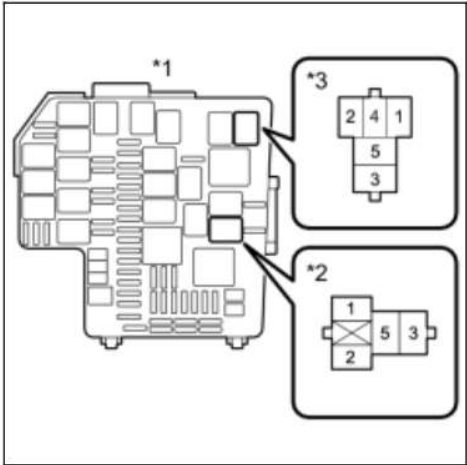
TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
A46-1 or 3 (FAN NO. 2 relay terminal) - Body ground	Always	10 kΩ or higher
A46-2 or 3 (FAN NO. 3 relay terminal) - Body ground	Always	10 kΩ or higher

- (d) Reconnect the A46 No. 2 cooling fan motor connector.
- (e) Reinstall the FAN No. 2 and FAN No. 3 relays.

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

OK


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



- (a) Remove the FAN No. 1 and FAN No. 2 relays 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 terminal) - 2 (FAN NO. 2 relay terminal)	Always	Below 1 Ω

Standard Resistance (Check for Short):

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
1 (FAN NO. 1 relay terminal) or 2 (FAN NO. 2 relay terminal) - Body ground	Always	10 k Ω or higher

Text in Illustration

*1	Engine Room Relay Block
*2	FAN NO. 1 Relay Terminals
*3	FAN NO. 2 Relay Terminals

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

NG  **REPLACE ENGINE ROOM RELAY BLOCK**

OK



15.	CHECK HARNESS AND CONNECTOR (ECM - ENGINE ROOM RELAY BLOCK)
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(a) Disconnect the A35 ECM connector.

(b) Remove the FAN No. 2 and FAN No. 3 relays 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
A35-11 (FAN1) - 1 (FAN NO. 1 relay terminal)	Always	Below 1 Ω
A35-11 (FAN1) - 2 (FAN NO. 2 relay terminal)	Always	Below 1 Ω
A35-12 (FAN2) - 1 (FAN NO. 3 relay terminal)	Always	Below 1 Ω

Standard Resistance (Check for Short):

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TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
A35-11 (FAN1) or 1 (FAN NO. 1 relay terminal) or 2 (FAN NO. 2 relay terminal) - Body ground	Always	10 kΩ or higher
A35-12 (FAN2) or 1 (FAN NO. 3 relay terminal) - Body ground	Always	10 kΩ or higher

(d) Reconnect the A35 ECM connector.

(e) Reinstall the FAN No. 2 and FAN No. 3 relays.

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

OK  **REPLACE ECM**



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Model Year: 2013	Model: FR-S	Doc ID: RM000000XW0075X
Title: FA20 COOLING: COOLING FAN SYSTEM: ON-VEHICLE INSPECTION (2013 FR-S)		

ON-VEHICLE INSPECTION

1. INSPECT COOLING FAN OPERATION AT LOW TEMPERATURES (Below 83 °C (181 °F))

(a) Turn the ignition switch to ON.

(b) Check that the cooling fans stop.

If it does not, check the cooling fan relays and engine coolant temperature sensor, and check whether there is a disconnection or an open circuit between them.

(c) Disconnect the engine coolant temperature sensor connector.

(d) Check that the cooling fans operate.

If it does not, check the fuses, cooling fan relays, ECM and cooling fans, and check for a short circuit between the cooling fan relays and the engine coolant temperature sensor.

(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 raise the engine coolant temperature to above 96 °C (205 °F).

HINT:

The engine coolant temperature is detected by the engine coolant temperature sensor on the water outlet.

(b) Check that the cooling fans operate.

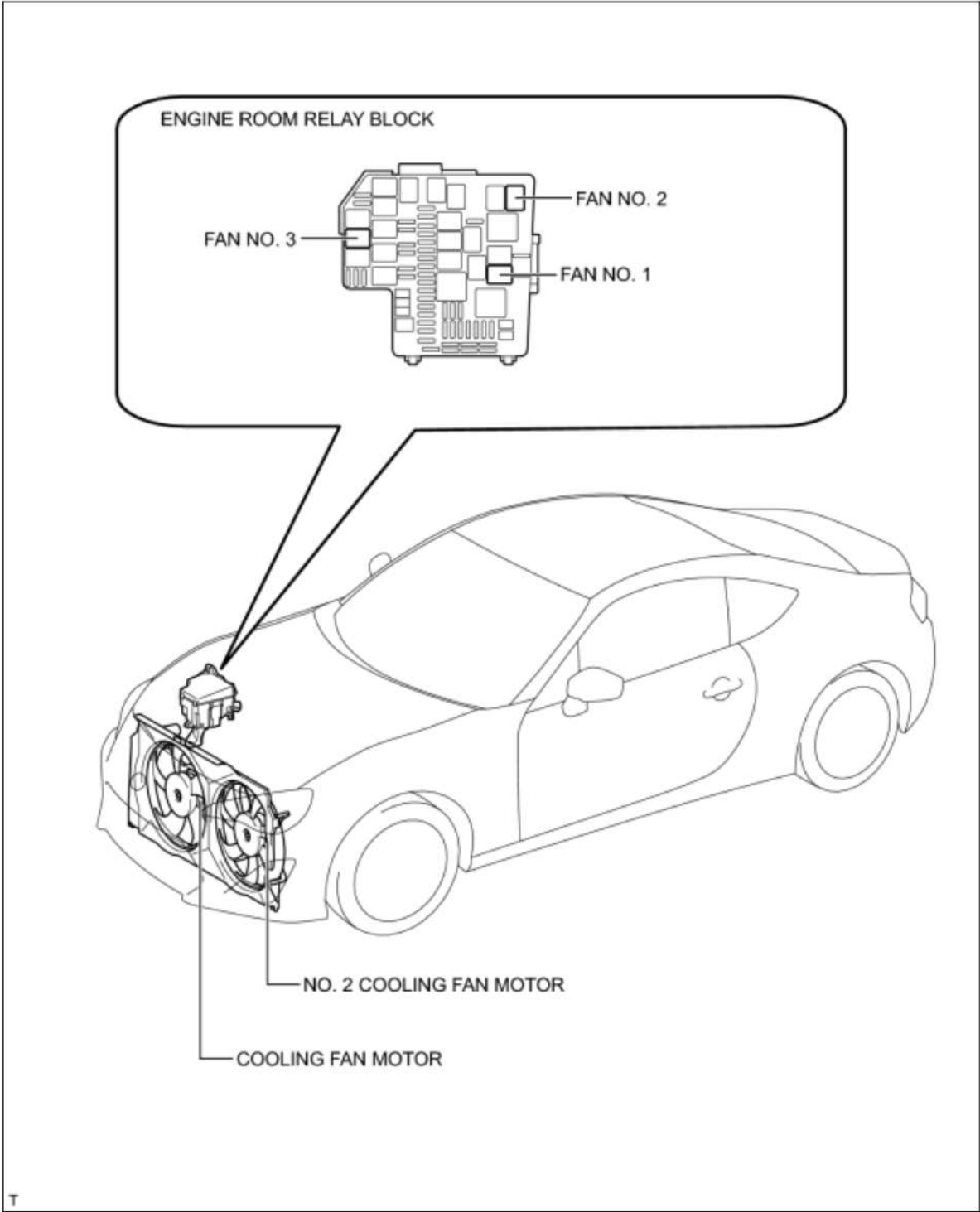
If it does not, replace the engine coolant temperature sensor.



Last Modified: 3-27-2012	6.4 R	From: 201203
Model Year: 2013	Model: FR-S	Doc ID: RM00000419I00DX
Title: FA20 COOLING: COOLING FAN SYSTEM: PARTS LOCATION (2013 FR-S)		

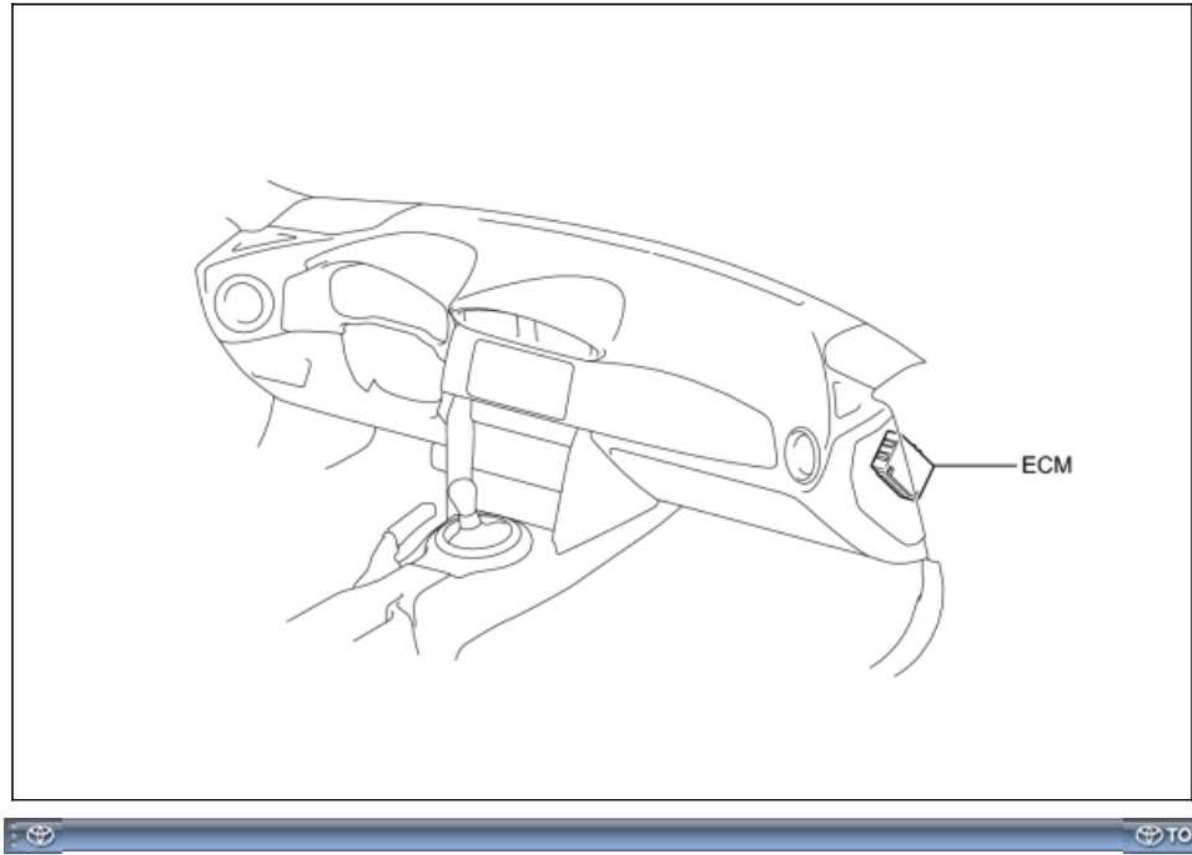
PARTS LOCATION

ILLUSTRATION



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ILLUSTRATION



Last Modified: 3-27-2012	6.4 T	From: 201203
Model Year: 2013	Model: FR-S	Doc ID: RM000003E0003BX
Title: FA20 COOLING: COOLING FAN SYSTEM: PROBLEM SYMPTOMS TABLE (2013 FR-S)		

PROBLEM SYMPTOMS TABLE

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.

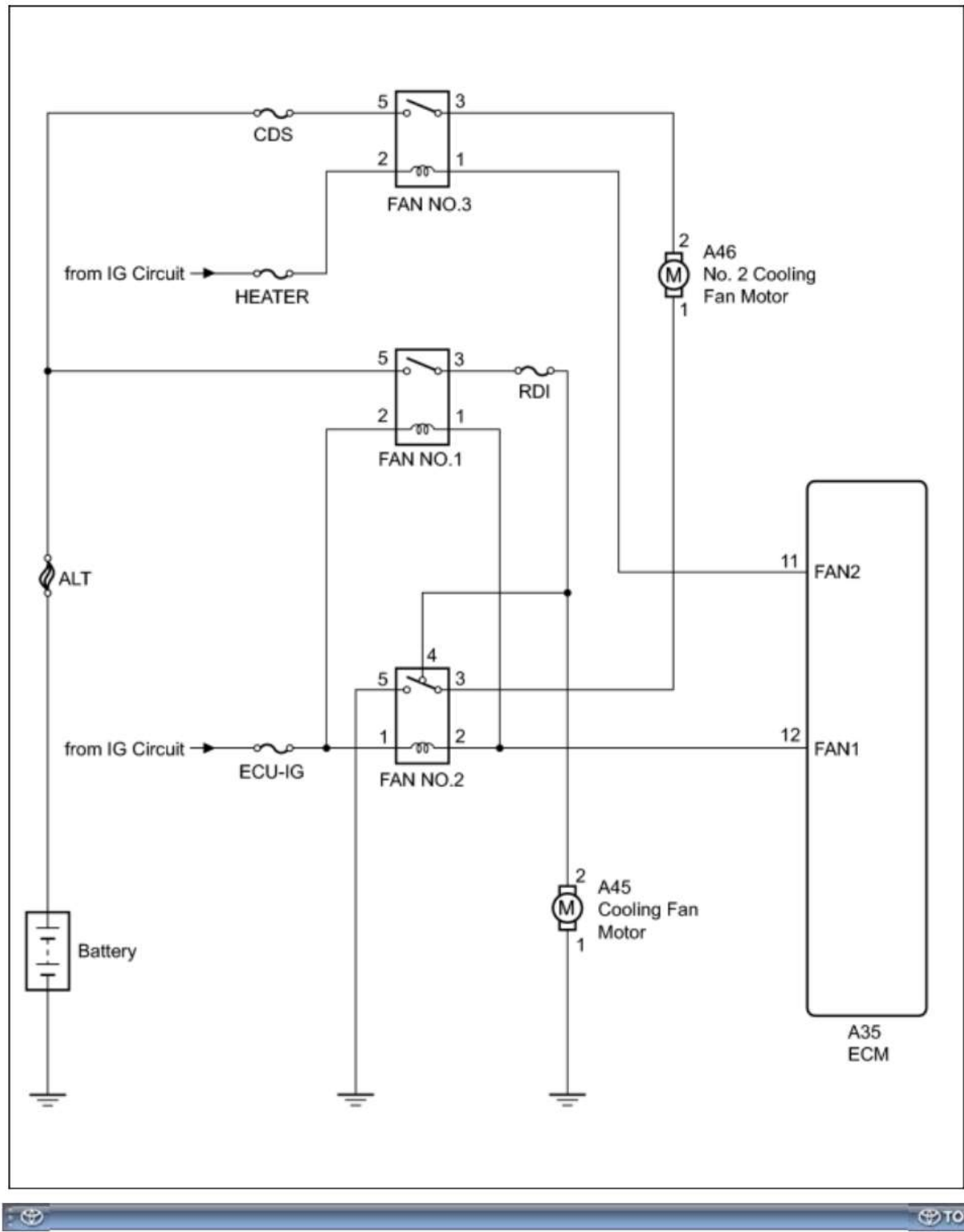
Cooling Fan System

SYMPTOM	SUSPECTED AREA	SEE PAGE
Cooling fan does not operate	Engine coolant temperature sensor	INFO
	Cooling fan motor	INFO
	No. 2 cooling fan motor	INFO
	FAN NO. 1 relay	INFO
	FAN NO. 3 relay	INFO
	Cooling fan circuit	INFO
	ECM	INFO
Cooling fan does not stop	Engine coolant temperature sensor	INFO
	Cooling fan circuit (for short circuit)	INFO
	FAN NO. 1 relay	INFO
	FAN NO. 3 relay	INFO
	ECM	INFO
Cooling fan speed does not change	FAN NO. 2 relay	INFO
	Cooling fan circuit	INFO
	ECM	INFO



Last Modified: 3-27-2012	6.4 U	From: 201203
Model Year: 2013	Model: FR-S	Doc ID: RM000003D8M00UX
Title: FA20 COOLING: COOLING FAN SYSTEM: SYSTEM DIAGRAM (2013 FR-S)		

SYSTEM DIAGRAM



Last Modified: 3-27-2012	6.4 G	From: 201203
Model Year: 2013	Model: FR-S	Doc ID: RM000000V1Q0BLX
Title: FA20 COOLING: COOLING SYSTEM: ON-VEHICLE INSPECTION (2013 FR-S)		

ON-VEHICLE INSPECTION

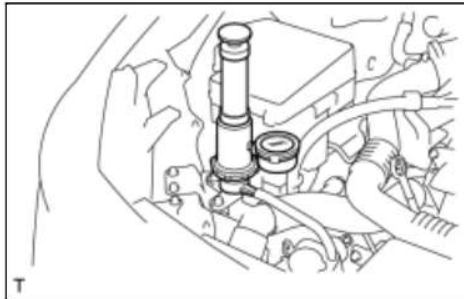
1. INSPECT FOR COOLANT LEAK

CAUTION:

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

NOTICE:

Before performing each inspection, turn the A/C switch off.



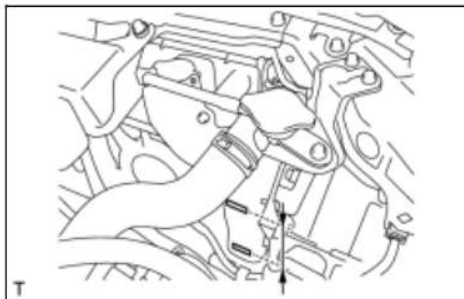
- (a) Fill the radiator with coolant and attach a radiator cap tester.

- (b) Warm up the engine.

- (c) Using a radiator cap tester, increase the pressure inside the radiator to 137 kPa (1.4 kgf/cm², 20 psi), and check that the pressure does not drop.

If the pressure drops, check the hoses, radiator and water pump for leaks. If no external leaks are found, check the heater core, cylinder block and cylinder head.

2. INSPECT ENGINE COOLANT LEVEL



- (a) Check that the engine coolant level is between the low and full lines when the engine is cold.

If the engine coolant level is low, check for leaks and add TOYOTA Genuine 50/50 Pre-mixed Super Long Life Coolant BLUE or similar high quality ethylene glycol based non-silicate, non-amine, non-nitrite and non-borate coolant with long-life hybrid organic acid technology to the full line.

NOTICE:

Do not substitute plain water for engine coolant.

3. INSPECT ENGINE COOLANT QUALITY

- (a) Remove the radiator cap.

CAUTION:

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

- (b) Check if there are any excessive deposits of rust or scales around the radiator cap and radiator filler hole. Also, the coolant should be free of oil.

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

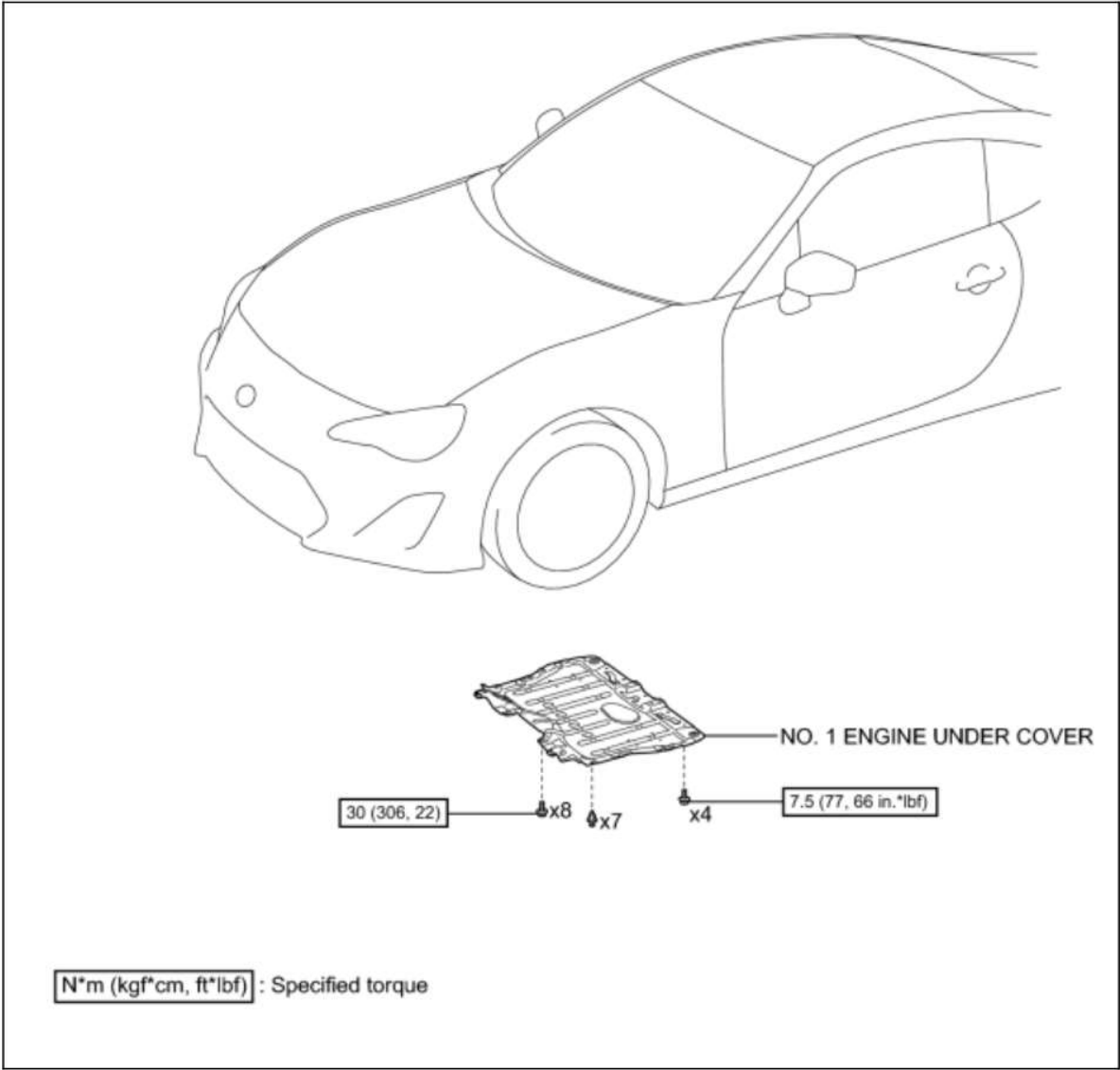
- (c) Install the radiator cap.



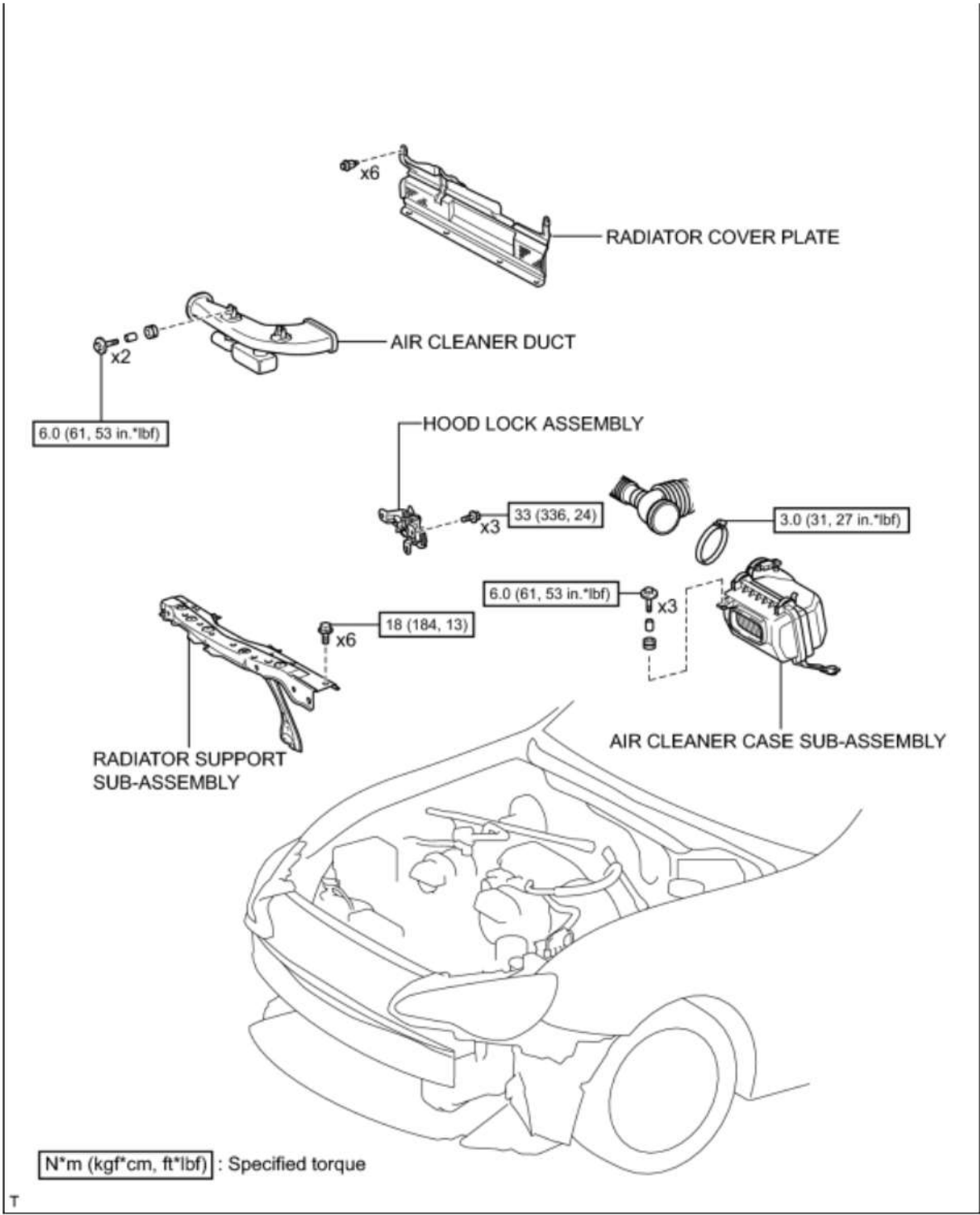
Last Modified: 3-27-2012	6.4 K	From: 201203
Model Year: 2013	Model: FR-S	Doc ID: RM000001BJV01LX
Title: FA20 COOLING: RADIATOR: COMPONENTS (2013 FR-S)		

COMPONENTS

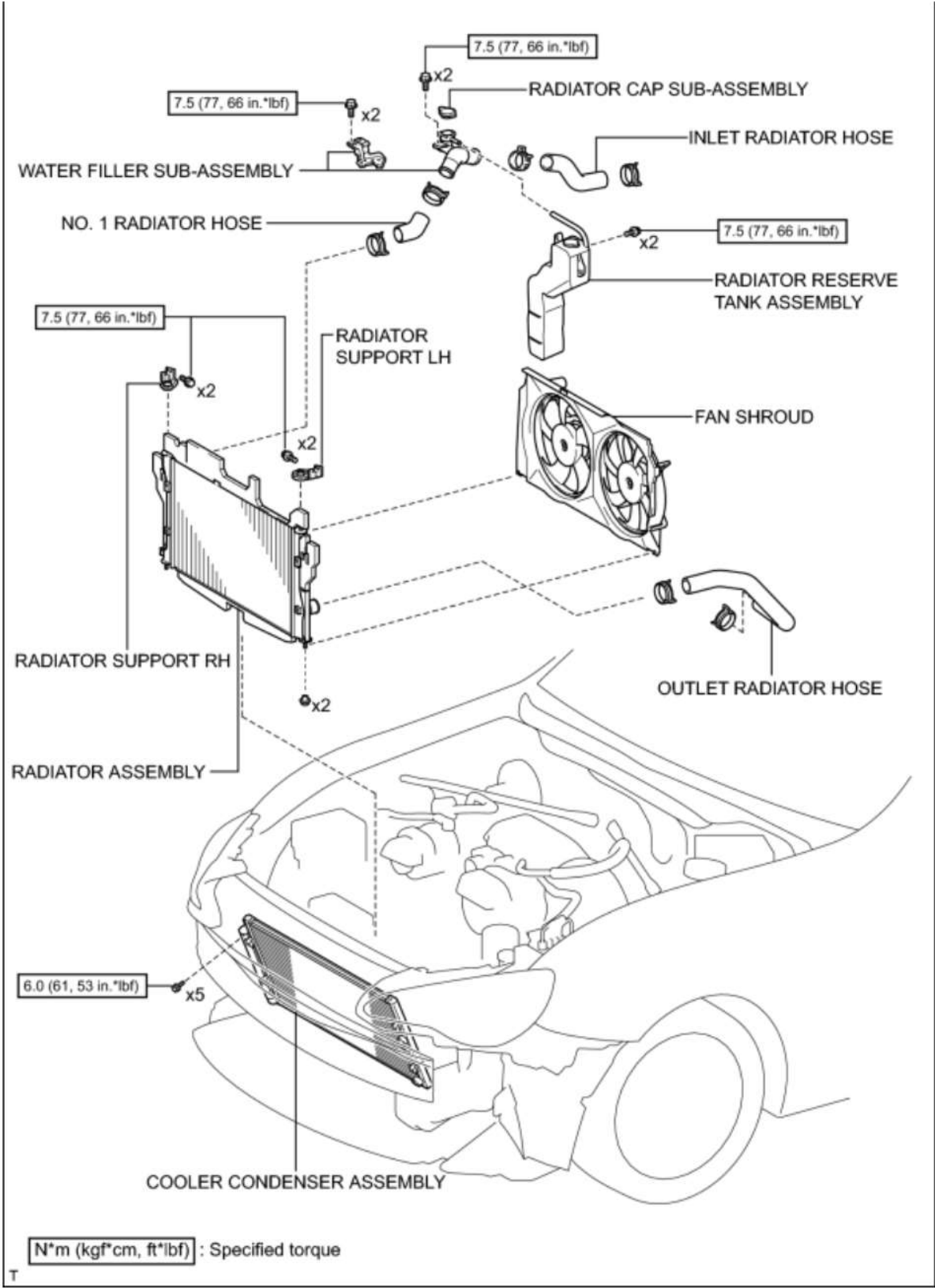
ILLUSTRATION



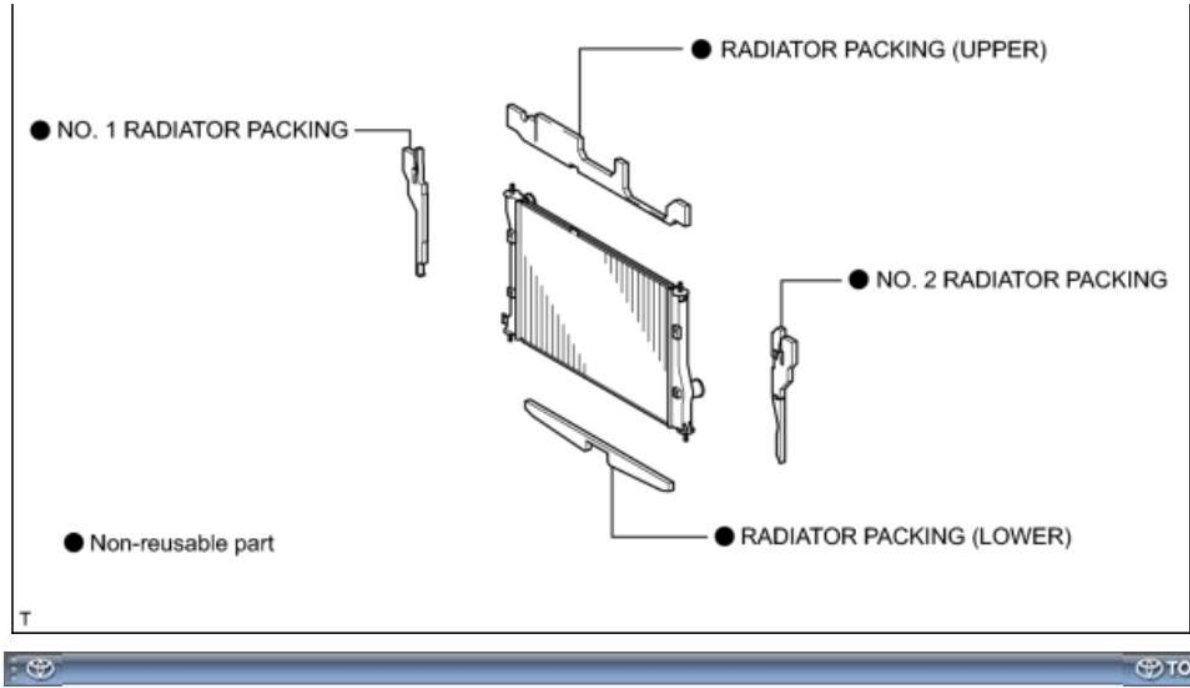
ILLUSTRATION



ILLUSTRATION



ILLUSTRATION



Last Modified: 3-27-2012	6.4 A	From: 201203
Model Year: 2013	Model: FR-S	Doc ID: RM000000MV1038X
Title: FA20 COOLING: RADIATOR: INSTALLATION (2013 FR-S)		

INSTALLATION

1. REMOVE RADIATOR PACKING (LOWER)

- (a) Install the new radiator packing.

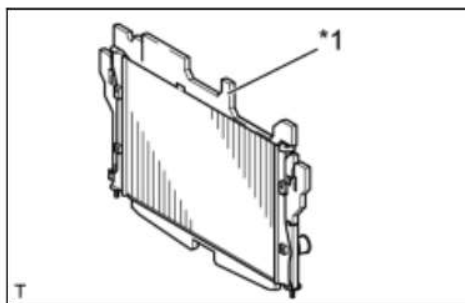
2. REMOVE NO. 2 RADIATOR PACKING

- (a) Install the new No. 2 radiator packing.

3. REMOVE NO. 1 RADIATOR PACKING

- (a) Install the new No. 1 radiator packing.

4. REMOVE RADIATOR PACKING (UPPER)



- (a) Install the new radiator packing.

Text in Illustration

*1	Radiator Packing
----	------------------

HINT:

Cut the radiator packing at the same position in the removal.

5. INSTALL OUTLET RADIATOR HOSE

- (a) Since the radiator hose must be attached in the correct position, apply match marks before removing it.
- (b) Install the outlet radiator hose to the radiator assembly and secure it with the clamp.

6. INSTALL NO. 1 RADIATOR HOSE

- (a) Since the radiator hose must be attached in the correct position, apply match marks before removing it.
- (b) Install the No. 1 radiator hose to the water filler sub-assembly and secure it with the clamp.

7. INSTALL INLET RADIATOR HOSE

- (a) Since the radiator hose must be attached in the correct position, apply match marks before removing it.
- (b) Install the inlet radiator hose to the radiator assembly and secure it with the clamp.

8. INSTALL RADIATOR ASSEMBLY

- (a) Install the 2 radiator support cushions to the radiator assembly.
- (b) While lifting the outlet radiator hose, install the radiator assembly.

NOTICE:

Push a blanket or a cardboard against the cooler condenser assembly to protect it.

- (c) Attach the claw and install the thermistor assembly.
- (d) Install the radiator support RH with the 2 bolts.

Torque: 7.5 N·m (77 kgf·cm, 66in·lbf)

- (e) Install the radiator support LH with the 2 bolts.

Torque: 7.5 N·m (77 kgf·cm, 66in·lbf)

9. REMOVE FAN SHROUD INFO

10. INSTALL COOLER CONDENSER ASSEMBLY

- (a) Install the cooler condenser assembly to the radiator assembly with the 5 bolts.

Torque: 6.0 N·m (61 kgf·cm, 53in·lbf)

11. INSTALL RADIATOR SUPPORT SUB-ASSEMBLY

- (a) Install the 6 bolts and radiator support sub-assembly.

Torque: 18 N·m (184 kgf·cm, 13ft·lbf)

12. INSTALL HOOD LOCK ASSEMBLY INFO

13. INSTALL WATER FILLER SUB-ASSEMBLY

- (a) Install the water filler sub-assembly and water filler bracket with the 4 bolts.

Torque: 7.5 N·m (77 kgf·cm, 66in·lbf)

- (b) Connect the inlet radiator hose and No. 1 radiator hose to the radiator assembly with the 2 clamps.

- (c) Connect the radiator cap hose to the water filler sub-assembly.

14. INSTALL RADIATOR COVER PLATE

- (a) Install the radiator cover plate with the 6 clips.

15. INSTALL AIR CLEANER DUCT

- (a) Install the air cleaner duct with the 2 bolts.

Torque: 6.0 N·m (61 kgf·cm, 53in·lbf)

16. INSTALL RADIATOR RESERVE TANK ASSEMBLY

- (a) Install the radiator reserve tank assembly with the 2 bolts.

Torque: 7.5 N·m (77 kgf·cm, 66in·lbf)

17. CONNECT OUTLET RADIATOR HOSE INFO

18. ADD ENGINE COOLANT INFO

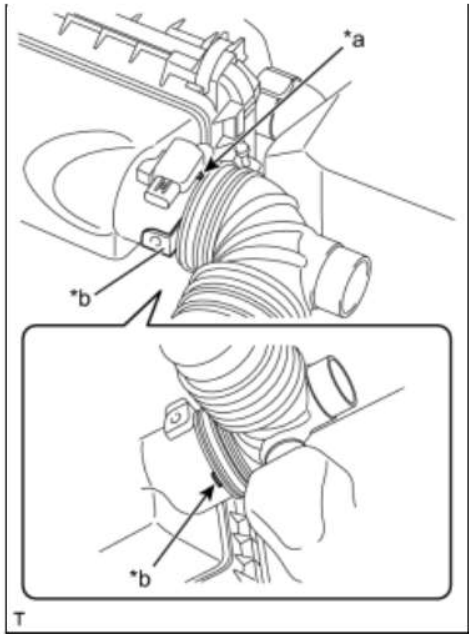
19. INSPECT FOR COOLANT LEAK INFO

20. INSTALL NO. 1 ENGINE UNDER COVER INFO

21. INSTALL FRONT BUMPER COVER

INFO

22. INSTALL AIR CLEANER CASE SUB-ASSEMBLY



(a) Connect the hose.

Torque: 3.0 N·m (31 kgf·cm, 27in·lbf)

HINT:

When connecting the hose, align the protrusion of the air cleaner case sub-assembly with the cutout of the hose, and push in the hose until it contacts the stopper of the air cleaner case sub-assembly.

Text in Illustration

*a	match marks
*b	Stopper

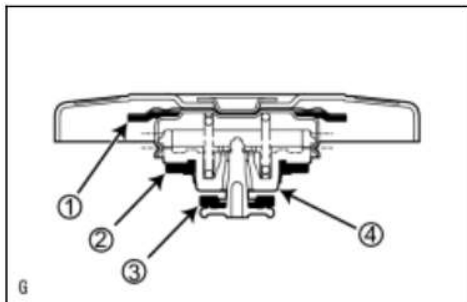


Last Modified: 3-27-2012	6.4 G	From: 201203
Model Year: 2013	Model: FR-S	Doc ID: RM000000XYW08QX
Title: FA20 COOLING: RADIATOR: ON-VEHICLE INSPECTION (2013 FR-S)		

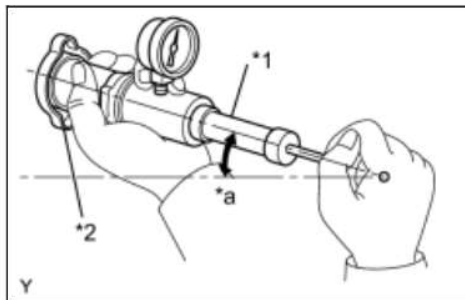
ON-VEHICLE INSPECTION

1. CHECK RADIATOR CAP SUB-ASSEMBLY

(a) Measure the valve opening pressure.



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



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

Text in Illustration

*1	Radiator Cap Tester
*2	Radiator cap sub-assembly
*a	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 a defect.**

Judgment Criterion:

ITEM	SPECIFIED CONDITION
Standard valve (for brand-new cap)	93 to 123 kPa (0.95 to 1.25 kgf/cm ² , 14 to 18 psi)

Minimum standard valve (for used cap)	83 kPa (0.85 kgf/cm ² , 12 psi)
--	--

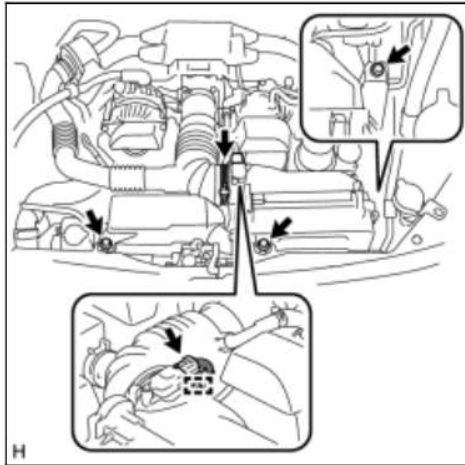
If the maximum pressure is less than the minimum standard valve, replace the radiator cap sub-assembly.



Last Modified: 3-27-2012	6.4 A	From: 201203
Model Year: 2013	Model: FR-S	Doc ID: RM000000MV3036X
Title: FA20 COOLING: RADIATOR: REMOVAL (2013 FR-S)		

REMOVAL

1. REMOVE AIR CLEANER CASE SUB-ASSEMBLY



(a) Disengage the clamp, and disconnect the mass air flow meter connector.

- (b) Remove the 3 bolts.
- (c) Loosen the hose clamp, and disconnect the hose.
- (d) Remove the air cleaner case sub-assembly.

2. REMOVE FRONT BUMPER COVER

INFO

3. REMOVE NO. 1 ENGINE UNDER COVER

INFO

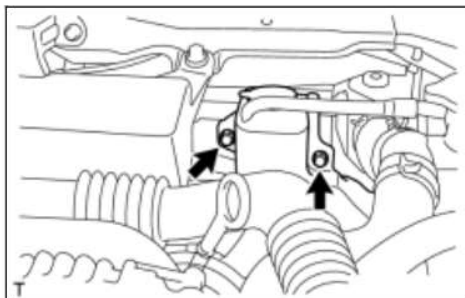
4. DRAIN ENGINE COOLANT

INFO

5. DISCONNECT OUTLET RADIATOR HOSE

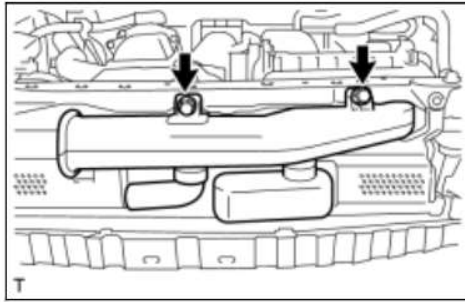
INFO

6. REMOVE RADIATOR RESERVE TANK ASSEMBLY



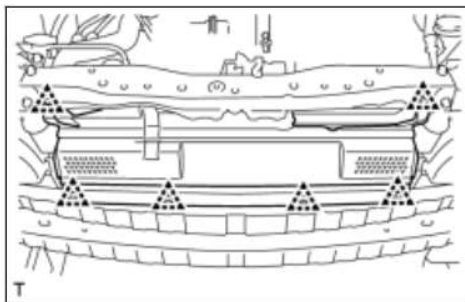
(a) Remove the 2 bolts and radiator reserve tank assembly.

7. REMOVE AIR CLEANER DUCT



(a) Remove the 2 bolts and air cleaner duct.

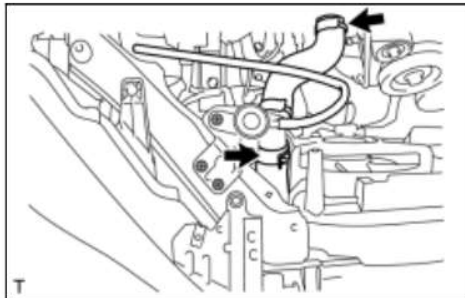
8. REMOVE RADIATOR COVER PLATE



(a) Remove the 6 clips and radiator cover plate.

9. REMOVE WATER FILLER SUB-ASSEMBLY

(a) Disconnect the radiator cap hose.



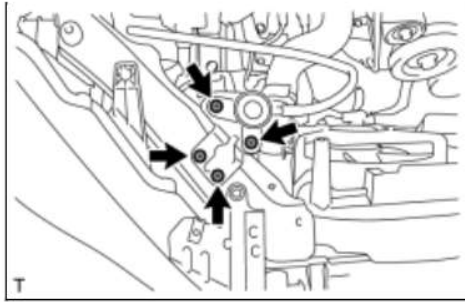
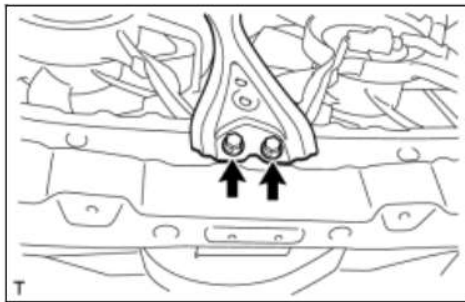
(b) Detach the 2 water hose clamps.

(c) Disconnect the inlet radiator hose and No. 1 radiator hose.

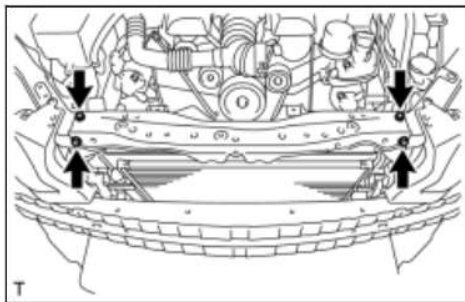
HINT:

Since the radiator hose must be attached in the correct position, apply match marks before removing it.

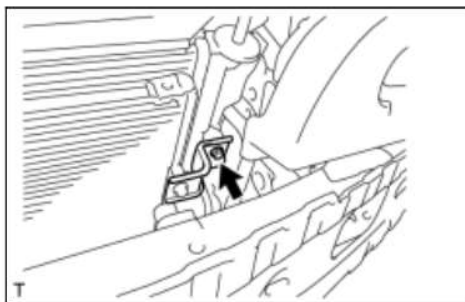
(d) Remove the 4 bolts and the water filler sub-assembly with water filler bracket.

**10. REMOVE HOOD LOCK ASSEMBLY** INFO**11. REMOVE RADIATOR SUPPORT SUB-ASSEMBLY**

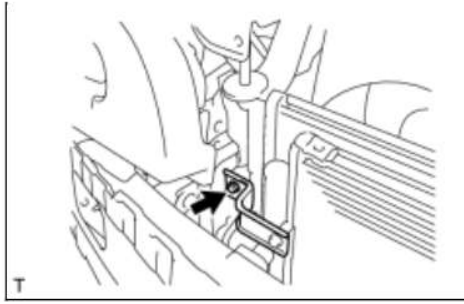
(a) Remove the 2 bolts.



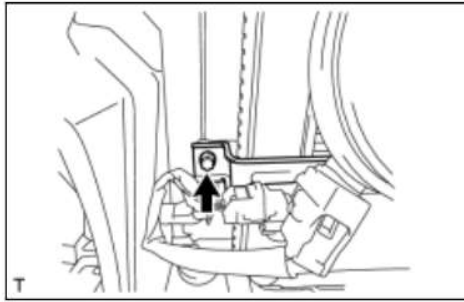
(b) Remove the 4 bolts and radiator support sub-assembly.

12. SEPARATE COOLER CONDENSER ASSEMBLY

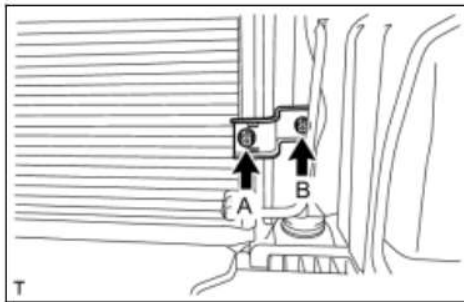
(a) Remove the bolt.



(b) Remove the bolt.



(c) Remove the bolt.

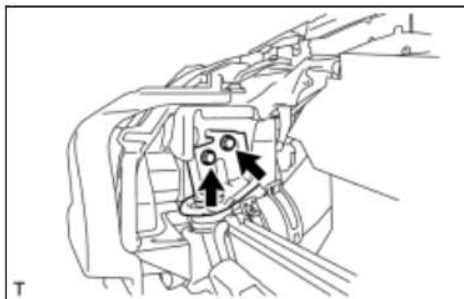


(d) Remove the bolt A.

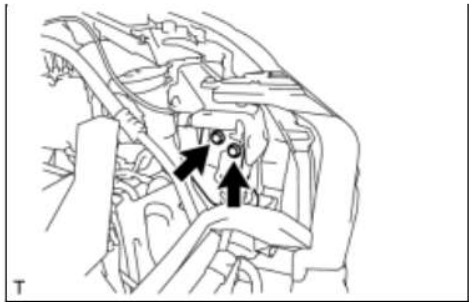
(e) Remove the bolt B and separate the cooler condenser assembly from the radiator assembly.

13. REMOVE FAN SHROUD INFO

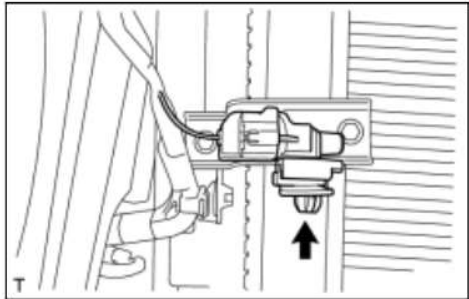
14. REMOVE RADIATOR ASSEMBLY



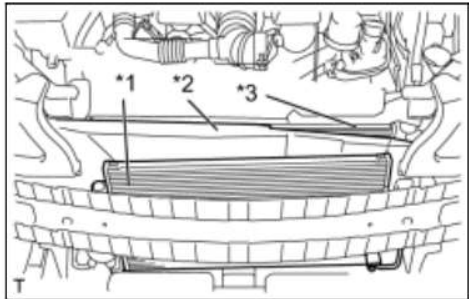
(a) Remove the 2 bolts and radiator support RH.



(b) Remove the 2 bolts and radiator support LH.



(c) Detach the claw and disconnect the thermistor assembly.

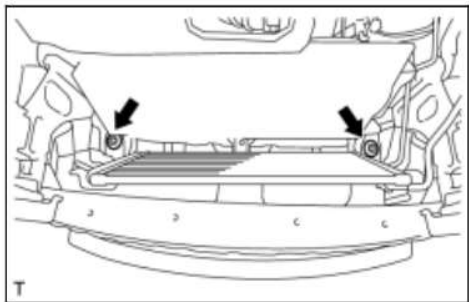


(d) While lifting the outlet radiator hose, remove the radiator assembly.

NOTICE:
Insert cardboard or a blanket between the radiator assembly and the cooler condenser assembly to protect the cooler condenser assembly.

Text in Illustration

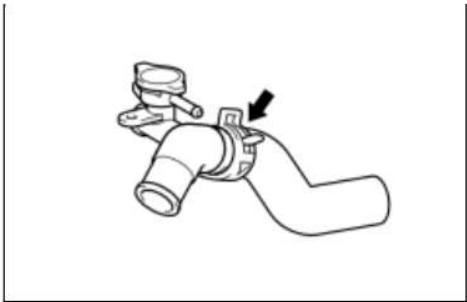
*1	Cooler condenser assembly
*2	Cardboard or Blanket
*3	Radiator assembly



(e) Remove the 2 radiator support cushions.

15. REMOVE INLET RADIATOR HOSE

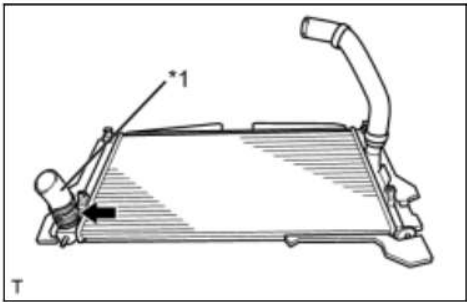
(a) Remove the clamp and the inlet radiator hose from the water filler sub-assembly.



HINT:

Since the radiator hose must be attached in the correct position, apply match marks before removing it.

16. REMOVE NO. 1 RADIATOR HOSE



(a) Remove the clamp and No. 1 radiator hose from the radiator assembly.

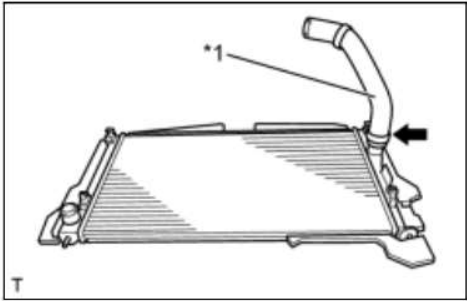
Text in Illustration

*1	No. 1 radiator hose
----	---------------------

HINT:

Since the radiator hose must be attached in the correct position, apply match marks before removing it.

17. REMOVE OUTLET RADIATOR HOSE



(a) Remove the clamp and outlet radiator hose from the radiator assembly.

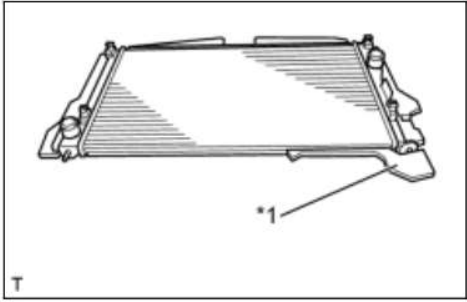
Text in Illustration

*1	Outlet radiator hose
----	----------------------

HINT:

Since the radiator hose must be attached in the correct position, apply match marks before removing it.

18. REMOVE RADIATOR PACKING (UPPER)

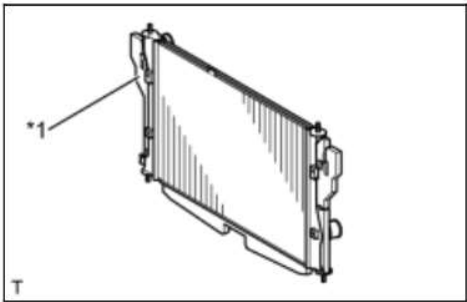


(a) Remove the radiator packing.

Text in Illustration

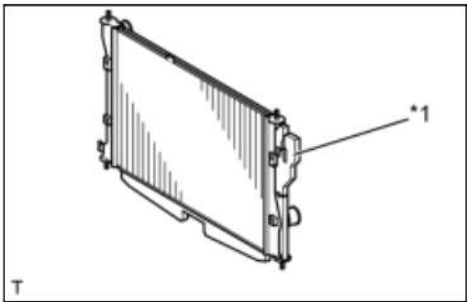
*1	Radiator Packing
----	------------------

19. REMOVE NO. 1 RADIATOR PACKING



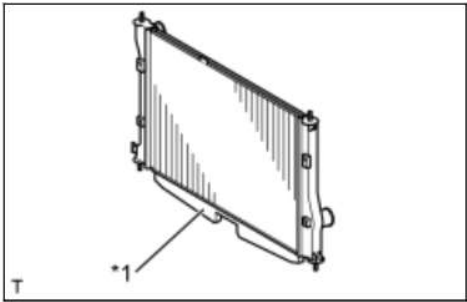
- (a) Remove the No. 1 radiator packing.
- Text in Illustration**
- | | |
|----|------------------------|
| *1 | No. 1 Radiator Packing |
|----|------------------------|

20. REMOVE NO. 2 RADIATOR PACKING



- (a) Remove the No. 2 radiator packing.
- Text in Illustration**
- | | |
|----|------------------------|
| *1 | No. 2 Radiator Packing |
|----|------------------------|

21. REMOVE RADIATOR PACKING (LOWER)



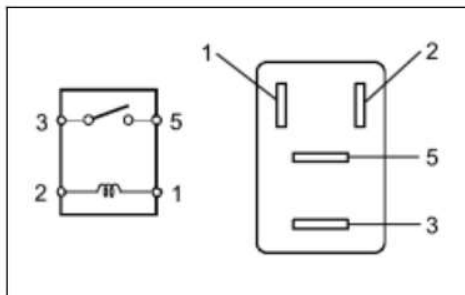
- (a) Remove the radiator packing.
- Text in Illustration**
- | | |
|----|------------------|
| *1 | Radiator Packing |
|----|------------------|



Last Modified: 3-27-2012	6.4 G	From: 201203
Model Year: 2013	Model: FR-S	Doc ID: RM000000XX00ABX
Title: FA20 COOLING: RELAY: ON-VEHICLE INSPECTION (2013 FR-S)		

ON-VEHICLE INSPECTION

1. FAN NO. 1 RELAY



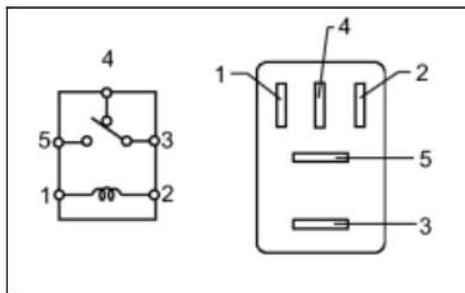
(a) Measure the resistance according to the value(s) in the table below.

Standard Resistance:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
3 - 5	Battery voltage is not applied between terminals 1 and 2	10 k Ω or higher
3 - 5	Battery voltage is applied between terminals 1 and 2	Below 1 Ω

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

2. FAN NO. 2 RELAY



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

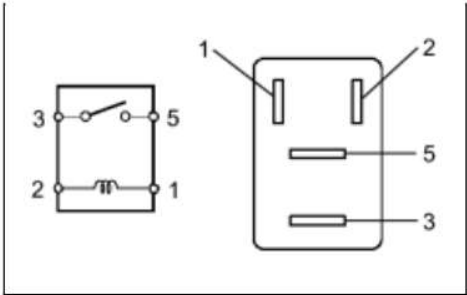
Standard Resistance:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
3 - 4	Battery voltage is not applied between terminals 1 and 2	Below 1 Ω
3 - 5	Battery voltage is not applied between terminals 1 and 2	10 k Ω or higher
3 - 4	Battery voltage is applied between terminals 1 and 2	10 k Ω or higher
3 - 5	Battery voltage is applied between terminals 1 and 2	Below 1 Ω

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

3. FAN NO. 3 RELAY

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



Standard Resistance:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
3 - 5	Battery voltage is not applied between terminals 1 and 2	10 k Ω or higher
3 - 5	Battery voltage is applied between terminals 1 and 2	Below 1 Ω

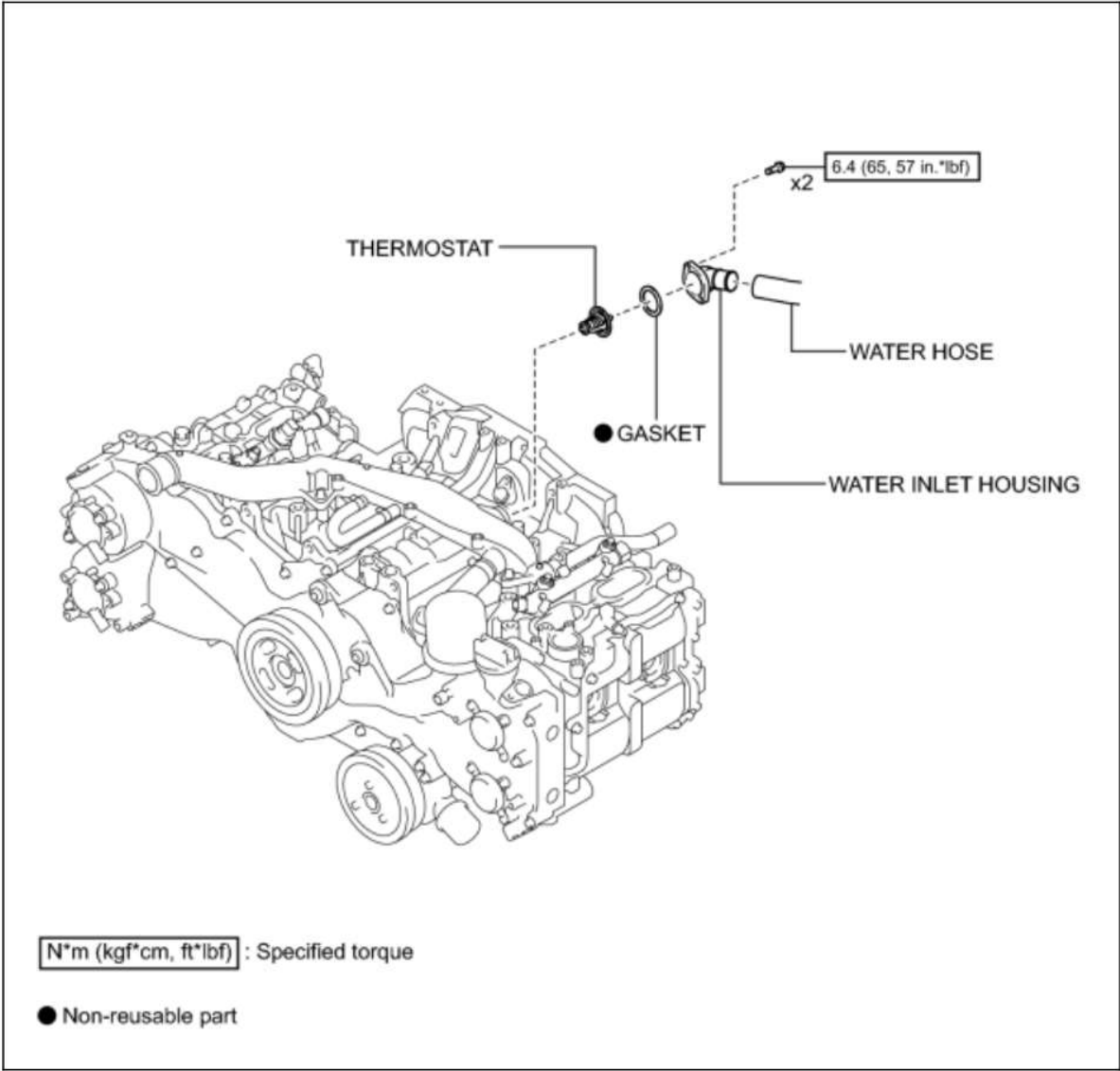
If the result is not as specified, replace the relay.



Last Modified: 3-27-2012	6.4 K	From: 201203
Model Year: 2013	Model: FR-S	Doc ID: RM000000RTE03TX
Title: FA20 COOLING: THERMOSTAT (for Automatic Transmission): COMPONENTS (2013 FR-S)		

COMPONENTS

ILLUSTRATION



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Last Modified: 3-27-2012	6.4 G	From: 201203
Model Year: 2013	Model: FR-S	Doc ID: RM00000335X02CX
Title: FA20 COOLING: THERMOSTAT (for Automatic Transmission): INSPECTION (2013 FR-S)		

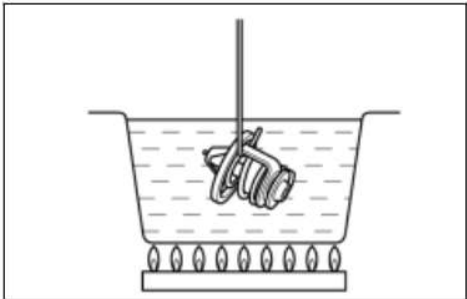
INSPECTION

1. INSPECT THERMOSTAT

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

HINT:

Hold the thermostat with a wire or the like, so that the thermostat does not come into contact with the bottom of the container.



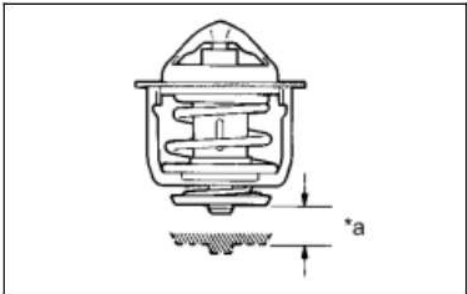
(b) Check the valve opening temperature of the thermostat.
Valve opening temperature:
48 to 52°C (118 to 126°F)

HINT:

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

(c) Check the valve lift.

Text in Illustration



*a	Valve Lift
----	------------

Valve lift:
6.0 mm (0.236 in.) or more at 63°C (145°F)

HINT:

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

(d) Check that the valve is fully closed when the water inlet with thermostat is at low temperatures (below 45°C (113°F)).

HINT:

If it is not fully closed, replace the thermostat.

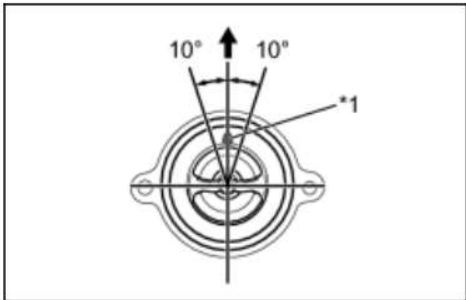


Last Modified: 3-27-2012	6.4 A	From: 201203
Model Year: 2013	Model: FR-S	Doc ID: RM000000RTC04VX
Title: FA20 COOLING: THERMOSTAT (for Automatic Transmission): INSTALLATION (2013 FR-S)		

INSTALLATION

1. INSTALL THERMOSTAT

- (a) Install a new gasket to the thermostat.
- (b) Install the thermostat to the water inlet housing as shown in the illustration.



Text in Illustration

*1	Jiggle Valve
	Upper Side

HINT:

The jiggle valve must be set within 10° on either side of the position shown in the illustration.

2. CONNECT WATER INLET HOUSING

- (a) Install the water inlet housing with the 2 bolts.
- Torque: 6.4 N·m (65 kgf·cm, 57in·lbf)

3. CONNECT WATER HOSE

- (a) Connect the water hose to the water inlet housing with the hose clamp.

4. ADD COOLANT

5. INSPECT FOR COOLANT LEAK

6. INSTALL INTAKE MANIFOLD

Last Modified: 3-27-2012	6.4 A	From: 201203
Model Year: 2013	Model: FR-S	Doc ID: RM000000RTF04VX
Title: FA20 COOLING: THERMOSTAT (for Automatic Transmission): REMOVAL (2013 FR-S)		

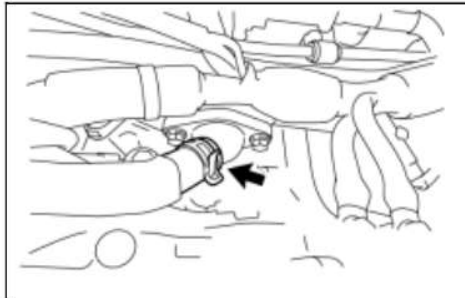
REMOVAL

1. DRAIN COOLANT INFO

2. REMOVE INTAKE MANIFOLD

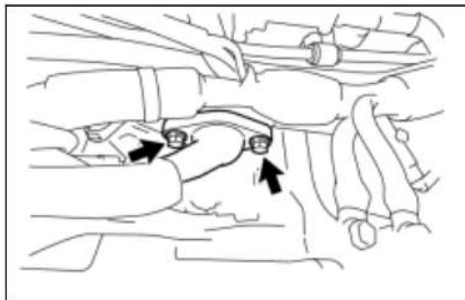
INFO

3. DISCONNECT WATER HOSE



(a) Loosen the hose clamp and disconnect the water hose from the water inlet housing.

4. DISCONNECT WATER INLET HOUSING



(a) Remove the 2 bolts and water inlet housing.

5. REMOVE THERMOSTAT

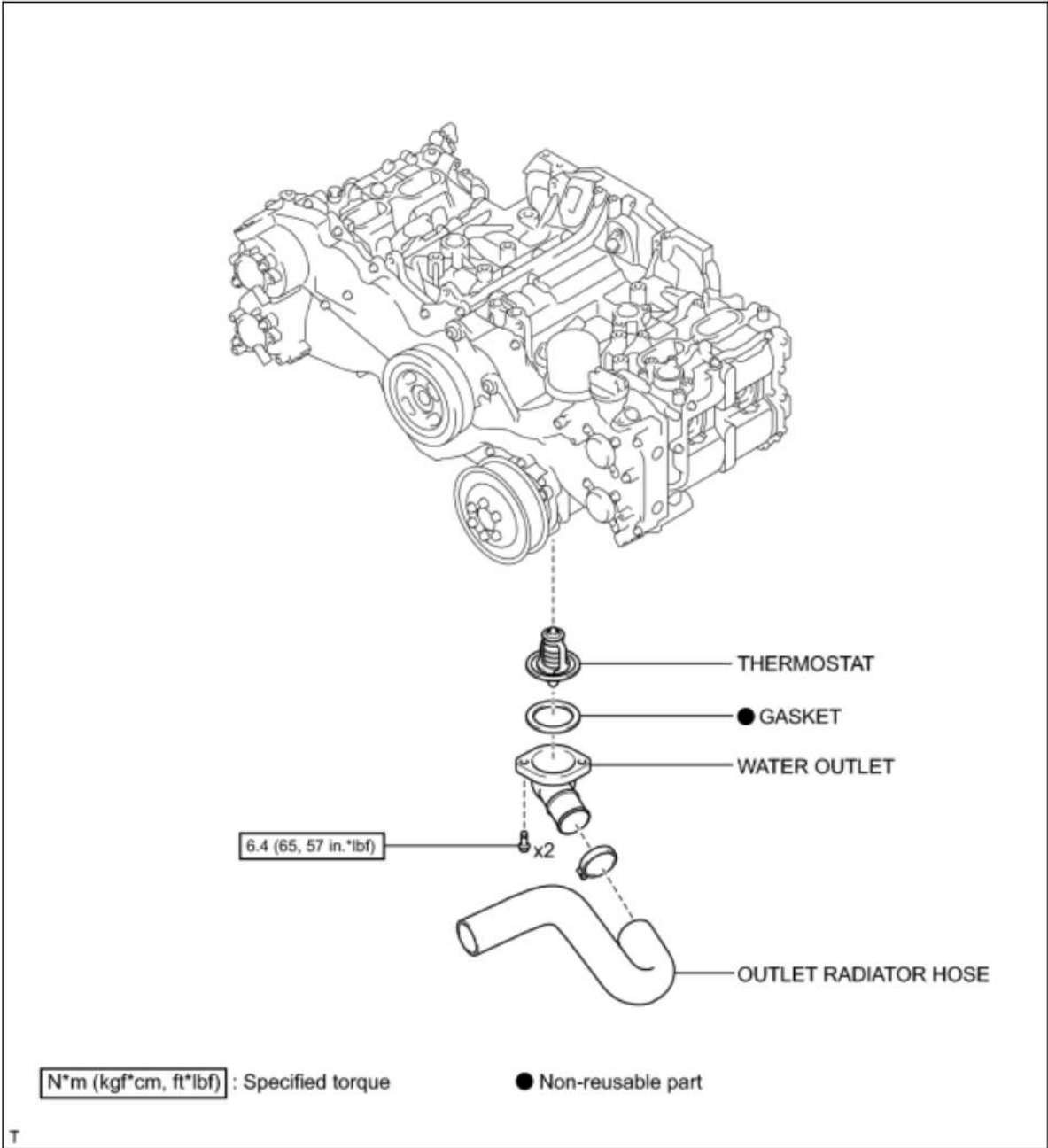
- (a) Remove the thermostat.
- (b) Remove the gasket from the thermostat.



Last Modified: 3-27-2012	6.4 K	From: 201203
Model Year: 2013	Model: FR-S	Doc ID: RM000001BK2017X
Title: FA20 COOLING: THERMOSTAT (for Engine Coolant): COMPONENTS (2013 FR-S)		

COMPONENTS

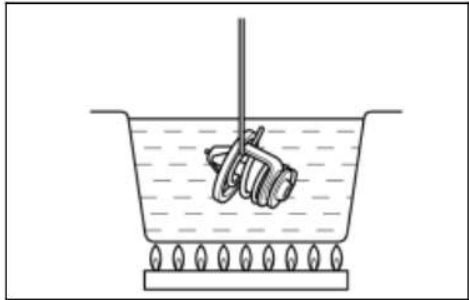
ILLUSTRATION



Last Modified: 3-27-2012	6.4 G	From: 201203
Model Year: 2013	Model: FR-S	Doc ID: RM0000041GQ00BX
Title: FA20 COOLING: THERMOSTAT (for Engine Coolant): INSPECTION (2013 FR-S)		

INSPECTION

1. INSPECT THERMOSTAT



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

HINT:
Hold the thermostat with a wire or the like, so that the thermostat does not come into contact with the bottom of the container.

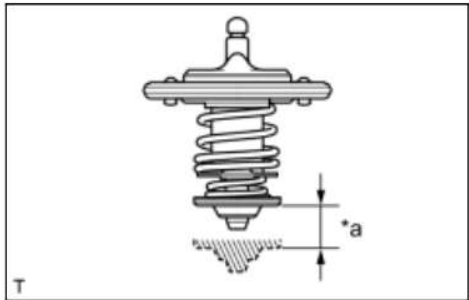
(b) Check the valve opening temperature of the thermostat.
Standard valve opening temperature:
86 to 90 °C (187 to 194 °F)

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

(c) Check the valve opening temperature.

(d) Check the valve lift.

Text in Illustration



*a	Valve lift
----	------------

Valve lift:
8.0 mm (0.315 in.) or more at 95 °C (203 °F)

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

(e) When the temperature of the thermostat drops below 83 °C (181 °F), check that the valve is fully closed.

HINT:
If the valve is not fully closed, replace the thermostat.

Last Modified: 3-27-2012	6.4 A	From: 201203
Model Year: 2013	Model: FR-S	Doc ID: RM000000MWC028X
Title: FA20 COOLING: THERMOSTAT (for Engine Coolant): INSTALLATION (2013 FR-S)		

INSTALLATION

1. INSTALL THERMOSTAT

- (a) Install a new thermostat gasket to the thermostat.
- (b) Install the thermostat to the water outlet.

2. INSTALL WATER OUTLET

- (a) Install the water outlet with the 2 bolts.
Torque: 6.4 N·m (65 kgf·cm, 57in·lbf)

3. CONNECT OUTLET RADIATOR HOSE

- (a) Since the radiator hose must be attached in the correct position, apply match marks before removing it.
- (b) Connect the outlet radiator hose to the water outlet with the hose clamp.

4. ADD ENGINE COOLANT

INFO

5. INSPECT FOR COOLANT LEAK

INFO

6. INSTALL EXHAUST MANIFOLD

INFO



Last Modified: 3-27-2012	6.4 A	From: 201203
Model Year: 2013	Model: FR-S	Doc ID: RM000000MWE028X
Title: FA20 COOLING: THERMOSTAT (for Engine Coolant): REMOVAL (2013 FR-S)		

REMOVAL

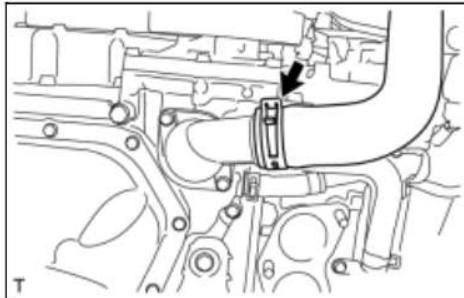
1. REMOVE EXHAUST MANIFOLD

INFO

2. DRAIN ENGINE COOLANT

INFO

3. SEPARATE OUTLET RADIATOR HOSE

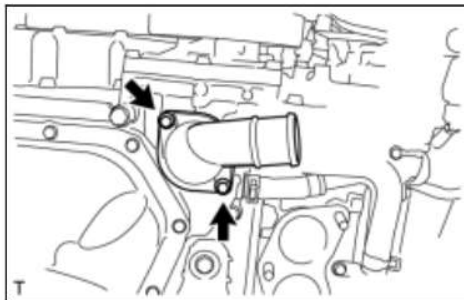


- (a) Loosen the hose clamp and disconnect the outlet radiator hose from the water outlet.

HINT:

Since the radiator hose must be attached in the correct position, apply match marks before removing it.

4. REMOVE WATER OUTLET



- (a) Remove the 2 bolts and water outlet.

5. REMOVE THERMOSTAT

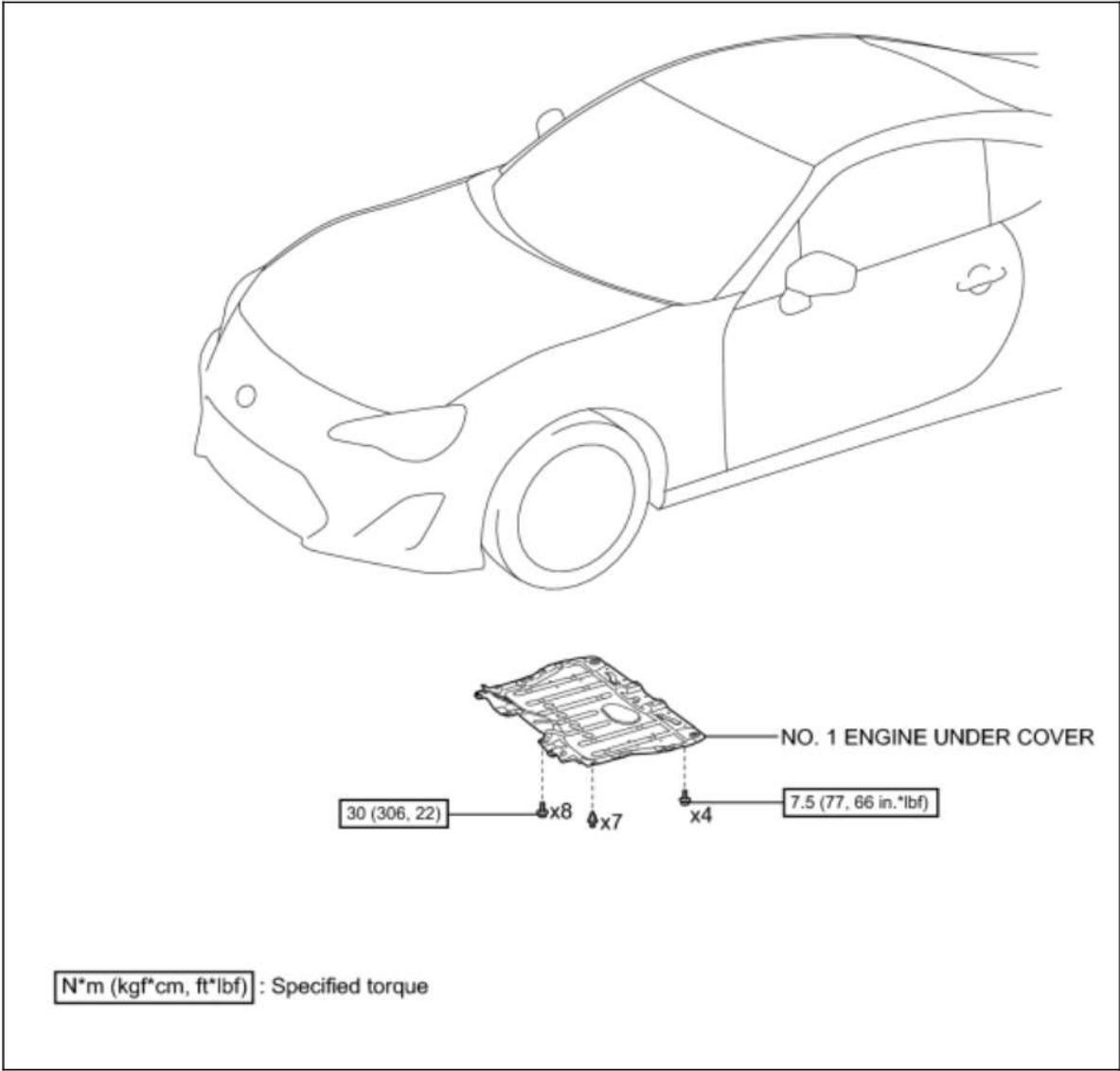
- (a) Remove the thermostat.
(b) Remove the thermostat gasket from the thermostat.



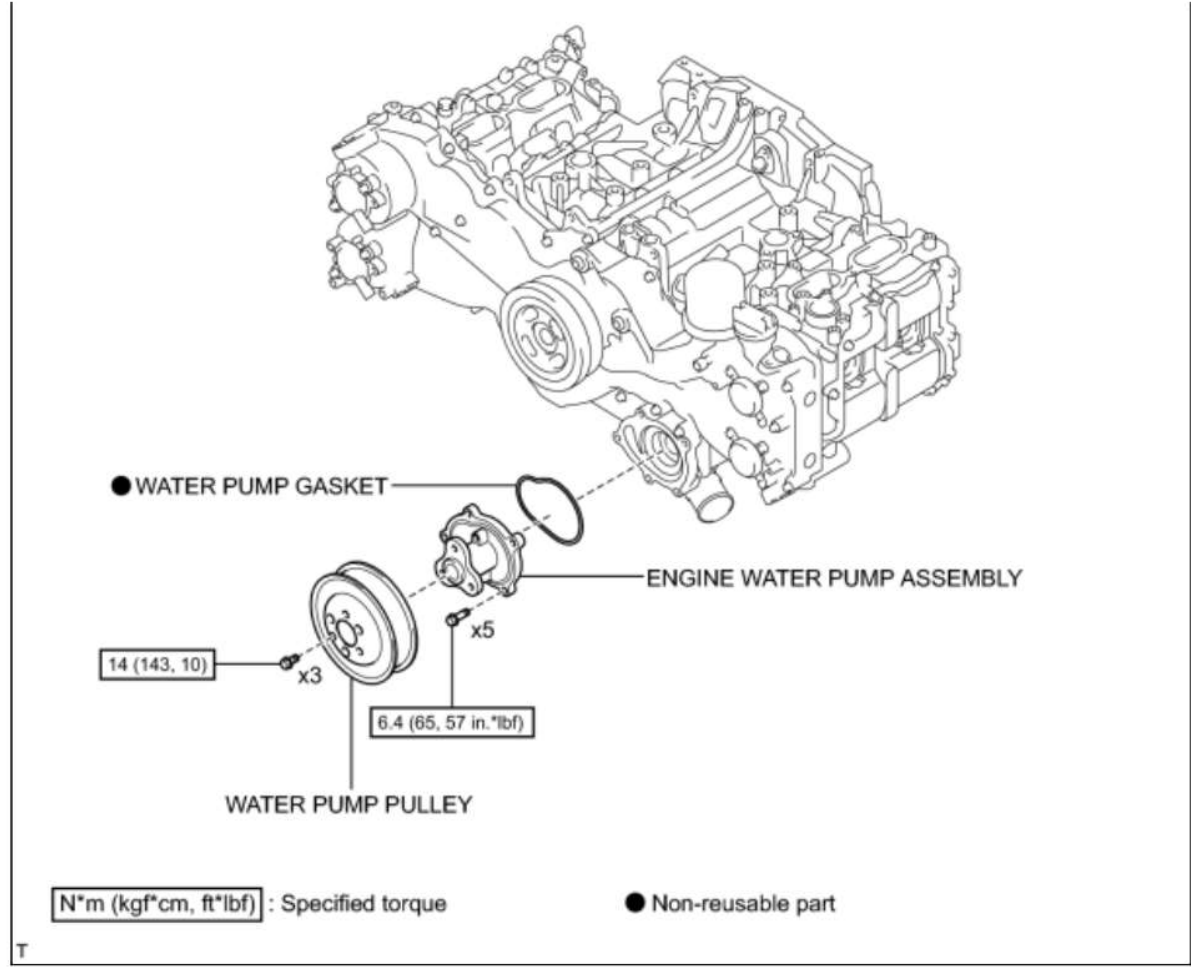
Last Modified: 3-27-2012	6.4 K	From: 201203
Model Year: 2013	Model: FR-S	Doc ID: RM000001BJY017X
Title: FA20 COOLING: WATER PUMP: COMPONENTS (2013 FR-S)		

COMPONENTS

ILLUSTRATION



ILLUSTRATION



Last Modified: 3-27-2012	6.4 A	From: 201203
Model Year: 2013	Model: FR-S	Doc ID: RM000000MW802FX
Title: FA20 COOLING: WATER PUMP: INSTALLATION (2013 FR-S)		

INSTALLATION

1. INSTALL ENGINE WATER PUMP ASSEMBLY

- (a) Install a new water pump gasket and the engine water pump assembly with the 5 bolts.

Torque: 6.4 N·m (65 kgf·cm, 57in·lbf)

2. INSTALL WATER PUMP PULLEY

- (a) Temporarily install the water pump pulley with the 3 bolts.
 (b) Using SST, hold the water pump pulley and tighten the 3 bolts.

SST: 09960-10010

09962-01000

09963-00700

Torque: 14 N·m (143 kgf·cm, 10ft·lbf)

3. REMOVE EXHAUST MANIFOLD

INFO

4. INSTALL FAN AND GENERATOR V BELT

INFO

5. ADD ENGINE COOLANT

INFO

6. INSPECT FOR COOLANT LEAK

INFO

7. INSTALL NO. 1 ENGINE UNDER COVER



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Last Modified: 3-27-2012	6.4 G	From: 201203
Model Year: 2013	Model: FR-S	Doc ID: RM0000041DB00HX
Title: FA20 COOLING: WATER PUMP: ON-VEHICLE INSPECTION (2013 FR-S)		

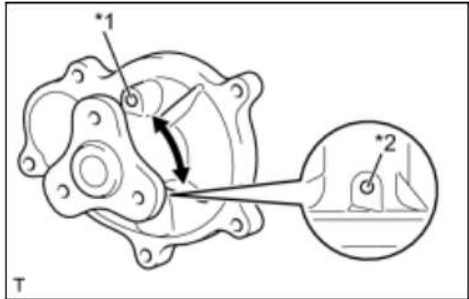
ON-VEHICLE INSPECTION

1. REMOVE WATER PUMP PULLEY

INFO

2. INSPECT ENGINE WATER PUMP ASSEMBLY

- (a) Turn the pulley and check that the water pump bearing moves smoothly and quietly. If necessary, replace the engine water pump assembly.
- If necessary, replace the engine water pump assembly.



- (b) Visually check the air hole and water hole for coolant leaks.

Text in Illustration

*1	Air Hole
*2	Water Hole

If necessary, replace the engine water pump assembly.

3. INSTALL WATER PUMP PULLEY

INFO



Last Modified: 3-27-2012	6.4 A	From: 201203
Model Year: 2013	Model: FR-S	Doc ID: RM000000MWA02CX
Title: FA20 COOLING: WATER PUMP: REMOVAL (2013 FR-S)		

REMOVAL

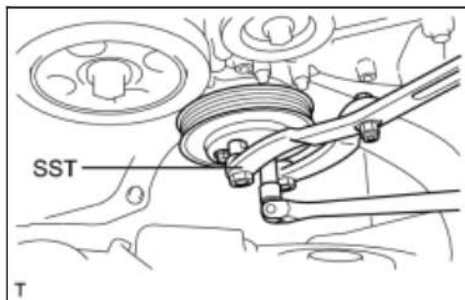
1. REMOVE NO. 1 ENGINE UNDER COVER INFO

2. DRAIN ENGINE COOLANT INFO

3. REMOVE FAN AND GENERATOR V BELT INFO

4. REMOVE EXHAUST MANIFOLD INFO

5. REMOVE WATER PUMP PULLEY

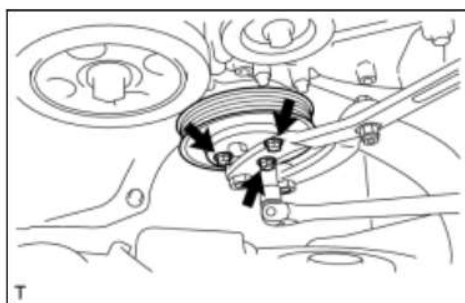


(a) Using SST, hold the water pump pulley.

SST: 09960-10010

09962-01000

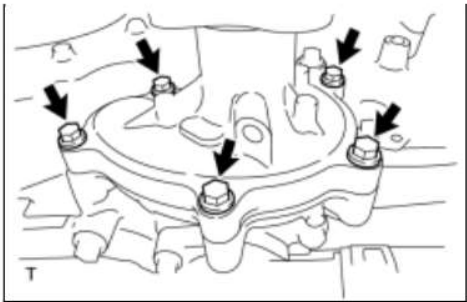
09963-00700



(b) Remove the 3 bolts and water pump pulley.

6. REMOVE ENGINE WATER PUMP ASSEMBLY

(a) Remove the 5 bolts, engine water pump assembly and water pump gasket.



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