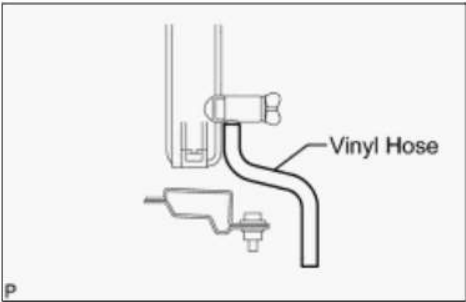


Last Modified: 9-7-2011	6.4 A	From: 201008
Model Year: 2011	Model: RAV4	Doc ID: RM000001YMM01VX
Title: 2AR-FE COOLING: COOLANT: REPLACEMENT (2011 RAV4)		

REPLACEMENT

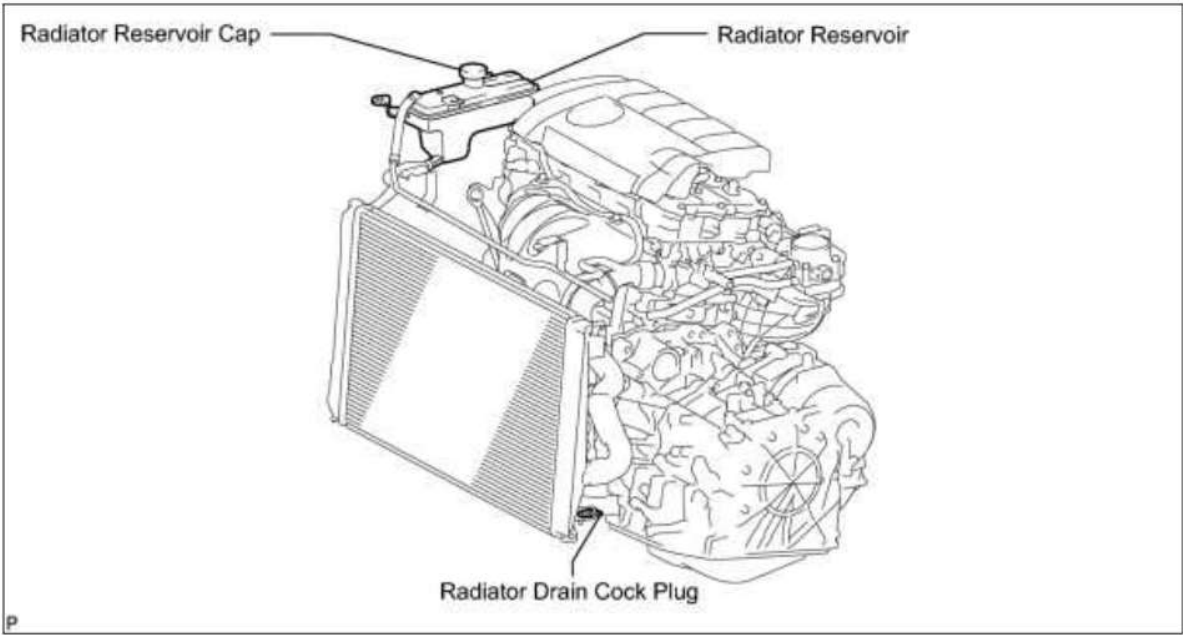
1. REMOVE NO. 1 ENGINE UNDER COVER INFO

2. DRAIN COOLANT



(a) Install a vinyl hose to the drain cock plug on the radiator side.

(b) Loosen the radiator drain cock plug.



HINT:

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

(c) Remove the radiator reservoir cap.

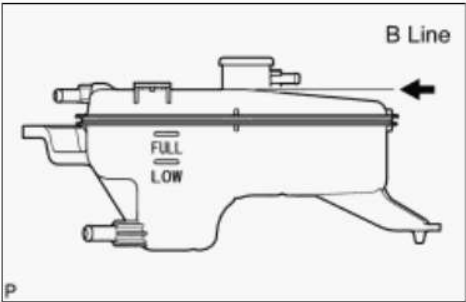
CAUTION:

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

3. ADD ENGINE COOLANT

- (a) Tighten the radiator drain cock plug by hand.
- (b) Add TOYOTA Super Long Life Coolant (SLLC) to the radiator reservoir filler opening until it is filled to the B line at the base of the reservoir filler neck.

HINT:
The B line is the lower edge of the inner wall of the filler neck.



Standard capacity:
6.8 liters (7.2 US qts, 6.0 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).

NOTICE:
Never use water as a substitute for engine coolant.

- (c) Press the No. 1 and No. 2 radiator hoses several times by hand, and then check the level of the coolant. If the coolant level drops below the B line, add TOYOTA SLLC to the B line.
- (d) Install the radiator reservoir cap.
- (e) Start the engine and warm it up until the cooling fan operates.

(1) Set the air conditioning as follows while warming up the engine.

Specified condition

ITEM	SPECIFIED CONDITION
Manual Air Conditioning System	Fan speed: Any setting except off Temperature: Toward WARM Air conditioning switch: Off
Automatic Air Conditioning System	Temperature: Toward MAX Air conditioning switch: Off

- (2) Maintain the engine speed at 2000 to 2500 rpm and warm up the engine until the cooling fan operates.

NOTICE:

- Make sure that the radiator reservoir still has some coolant in it.
- Pay attention to the needle of the coolant temperature meter. Make sure that the needle does not show an abnormally high temperature.
- If there is not enough coolant, the engine may burn out or overheat.
- After starting the engine, if the radiator reservoir does not have any coolant, perform the following: 1) stop

the engine, 2) wait until the coolant has cooled down, and 3) add coolant until the coolant is filled to the B line.

- Run the engine at 2000 rpm until the coolant level has stabilized.

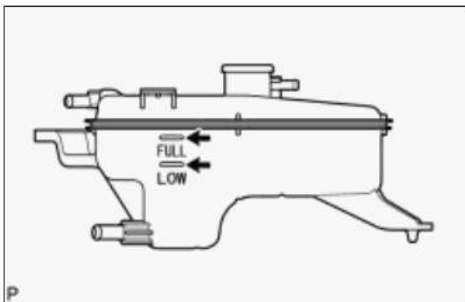
(f) Press the No. 1 and No. 2 radiator hoses several times by hand to bleed air.

CAUTION:

When pressing the radiator hoses:

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

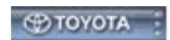
(g) Stop the engine and wait until the coolant cools down to ambient temperature.



(h) Check that the coolant level is between the FULL and LOW line.

If the coolant level is below the LOW line, repeat all of the procedures above.

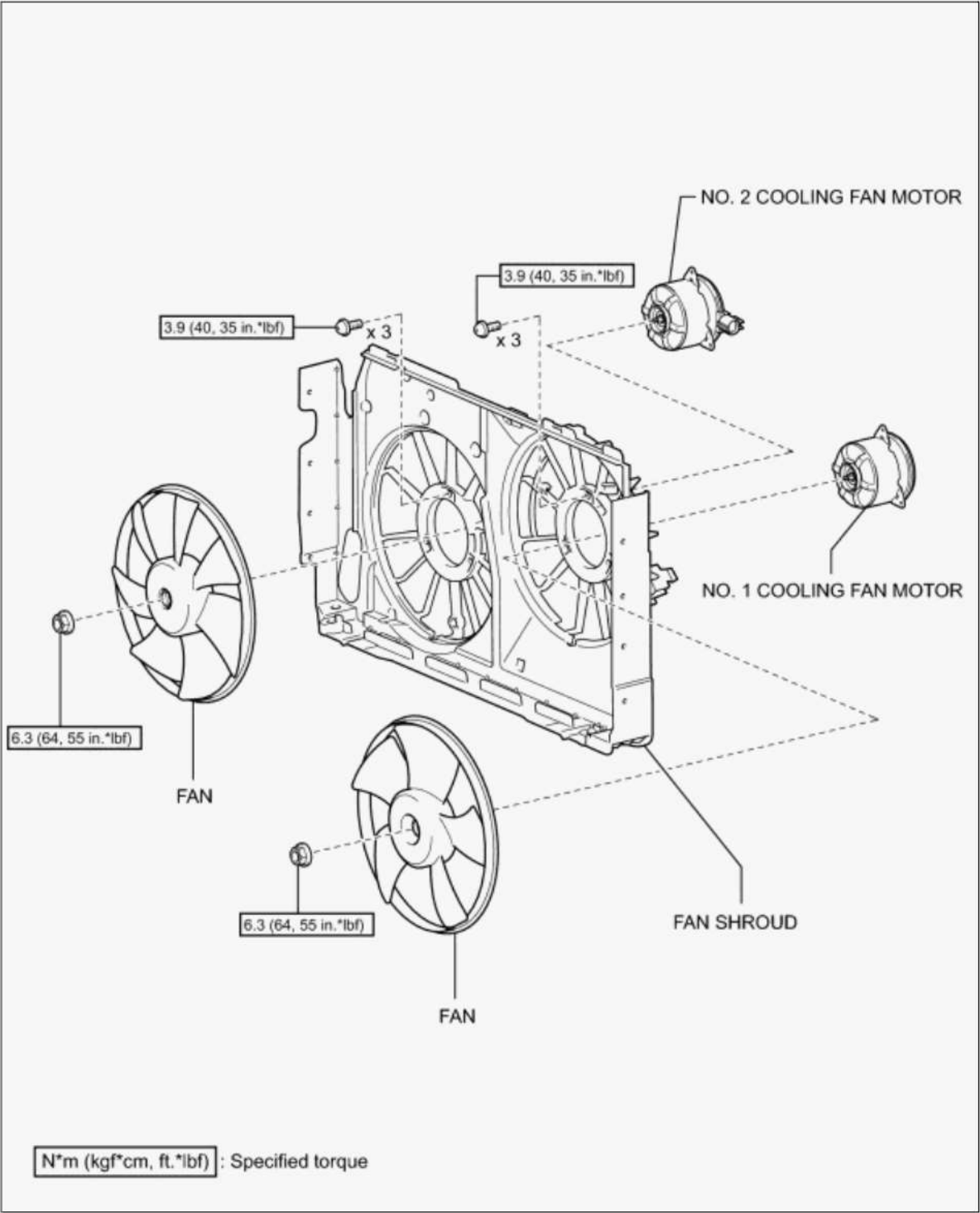
If the coolant level is above the FULL line, drain coolant so that the coolant level is between the FULL and LOW line.

4. INSPECT FOR COOLANT LEAK[INFO](#)**5. INSTALL NO. 1 ENGINE UNDER COVER**[INFO](#)

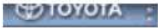
Last Modified: 9-7-2011	6.4 K	From: 201008
Model Year: 2011	Model: RAV4	Doc ID: RM000001X9A016X
Title: 2AR-FE COOLING: COOLING FAN MOTOR: COMPONENTS (2011 RAV4)		

COMPONENTS

ILLUSTRATION



2AR-FE COOLING: COOLING FAN MOTOR: COMPONENTS (201... <https://techinfo.toyota.com/t3Portal/document/rm/RM16B0U/xhtml/RM...>

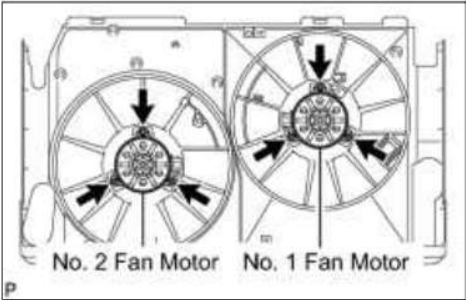


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Last Modified: 9-7-2011	6.4 A	From: 201008
Model Year: 2011	Model: RAV4	Doc ID: RM000001X9D00PX
Title: 2AR-FE COOLING: COOLING FAN MOTOR: INSTALLATION (2011 RAV4)		

INSTALLATION

1. INSTALL NO. 2 COOLING FAN MOTOR

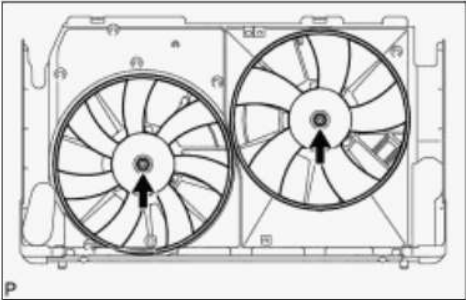


- (a) Install the fan motor with the 3 screws.
Torque: 3.9 N·m (40 kgf·cm, 35in·lbf)

2. INSTALL NO. 1 COOLING FAN MOTOR

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

3. INSTALL FAN

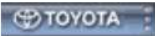


- (a) Install the 2 fans with the 2 nuts.
Torque: 6.3 N·m (64 kgf·cm, 55in·lbf)

- (b) Check the fan motor operation.

4. INSTALL FAN SHROUD WITH COOLING FAN

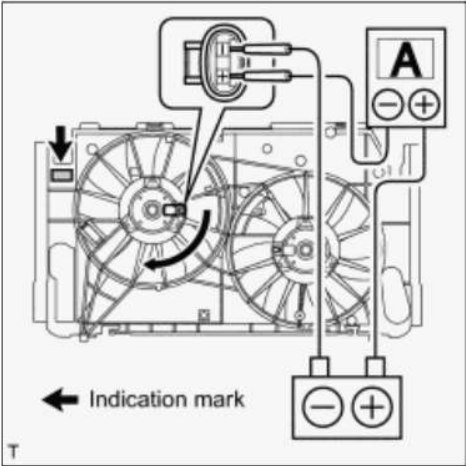
- (a) Install the fan shroud with cooling fan [INFO](#) .



Last Modified: 9-7-2011	6.4 G	From: 201008
Model Year: 2011	Model: RAV4	Doc ID: RM00000202U01AX
Title: 2AR-FE COOLING: COOLING FAN MOTOR: ON-VEHICLE INSPECTION (2011 RAV4)		

ON-VEHICLE INSPECTION

1. INSPECT NO. 1 COOLING FAN MOTOR



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

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

Standard Current:

INDICATION MARK	CONDITION	SPECIFIED CONDITION
C, Q	20°C (68°F)	11.7 to 14.7 A

HINT:

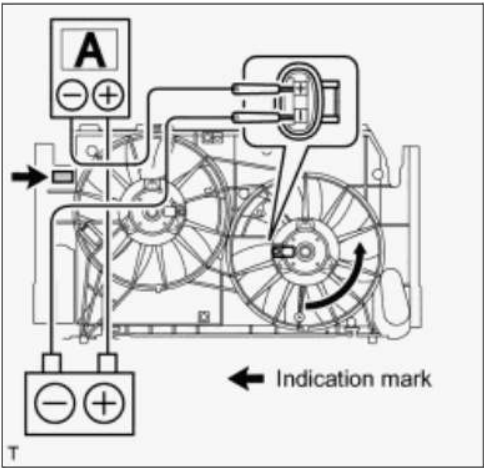
Refer to the illustration for the indication mark location.

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

- (d) Reconnect the No. 1 fan motor connector.

2. INSPECT NO. 2 COOLING FAN MOTOR

(a) Disconnect the No. 2 fan motor connector.



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

INDICATION MARK	CONDITION	SPECIFIED CONDITION
C, Q	20°C (68°F)	11.7 to 14.7 A

HINT:

Refer to the illustration for the indication mark location.

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

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



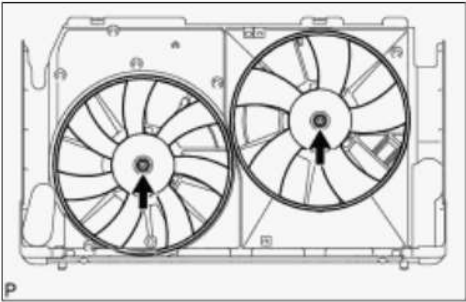
Last Modified: 9-7-2011	6.4 A	From: 201008
Model Year: 2011	Model: RAV4	Doc ID: RM000001X9C00PX
Title: 2AR-FE COOLING: COOLING FAN MOTOR: REMOVAL (2011 RAV4)		

REMOVAL

1. REMOVE FAN SHROUD WITH COOLING FAN

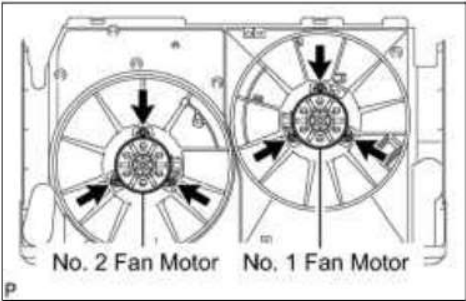
(a) Remove the fan shroud with cooling fan  .

2. REMOVE FAN



(a) Remove the 2 nuts and 2 fans.

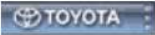
3. REMOVE NO. 1 COOLING FAN MOTOR



(a) Remove the 3 screws and fan motor.

4. REMOVE NO. 2 COOLING FAN MOTOR

(a) Remove the 3 screws and fan motor.



Last Modified: 9-7-2011	6.4 G	From: 201008
Model Year: 2011	Model: RAV4	Doc ID: RM0000017WF01RX
Title: 2AR-FE COOLING: COOLING FAN RELAY: ON-VEHICLE INSPECTION (2011 RAV4)		

ON-VEHICLE INSPECTION

1. DISCONNECT CABLE FROM NEGATIVE BATTERY TERMINAL

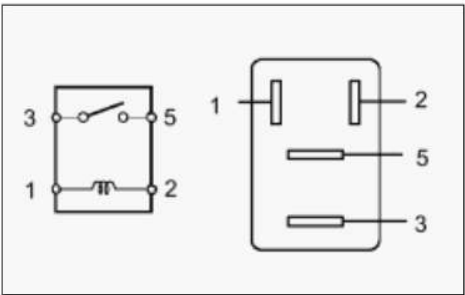
CAUTION:
Wait at least 90 seconds after disconnecting the cable from the negative (-) battery terminal to disable the SRS system.

2. REMOVE ENGINE ROOM NO. 2 RELAY BLOCK COVER

3. INSPECT NO. 1 COOLING FAN RELAY (FAN NO. 1)

- (a) Remove the relay from the engine room No. 2 relay block.
- (b) 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 to terminals 1 and 2	10 kΩ or higher
3 - 5	Battery voltage is applied to terminals 1 and 2	Below 1 Ω

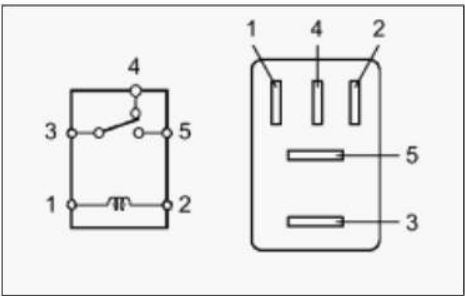
If the result is not as specified, replace the No. 1 cooling fan relay.

- (c) Install the relay.

4. INSPECT NO. 2 COOLING FAN RELAY (FAN NO. 2)

- (a) Remove the relay from the engine room No. 2 relay block.
- (b) 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 to terminals 1 and 2	Below 1 Ω

3 - 5	Battery voltage is not applied to terminals 1 and 2	10 kΩ or higher
3 - 4	Battery voltage is applied to terminals 1 and 2	10 kΩ or higher
3 - 5	Battery voltage is applied to terminals 1 and 2	Below 1 Ω

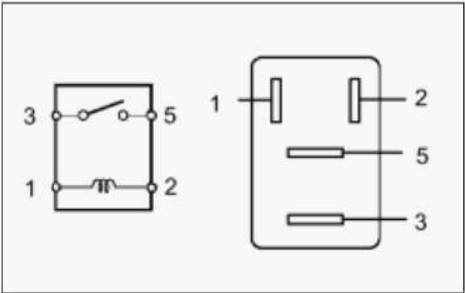
If the result is not as specified, replace the No. 2 cooling fan relay.

(c) Install the relay.

5. INSPECT NO. 3 COOLING FAN RELAY (FAN NO. 3)

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

Standard Resistance:



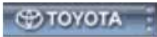
TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
3 - 5	Battery voltage is not applied to terminals 1 and 2	10 kΩ or higher
3 - 5	Battery voltage is applied to terminals 1 and 2	Below 1 Ω

If the result is not as specified, replace the No. 3 cooling fan relay.

(c) Install the relay.

6. INSTALL ENGINE ROOM NO. 2 RELAY BLOCK COVER

7. CONNECT CABLE TO NEGATIVE BATTERY TERMINAL



Last Modified: 9-7-2011	6.4 G	From: 201008
Model Year: 2011	Model: RAV4	Doc ID: RM0000017W5014X
Title: 2AR-FE COOLING: COOLING FAN SYSTEM: ON-VEHICLE INSPECTION (2011 RAV4)		

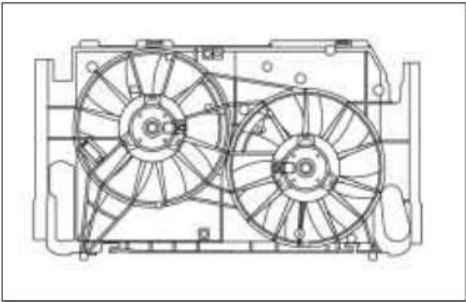
ON-VEHICLE INSPECTION

HINT:

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

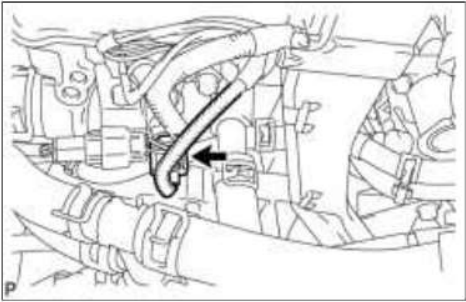
1. CHECK COOLING FAN OPERATION AT LOW TEMPERATURES (Below 94°C (201°F))

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

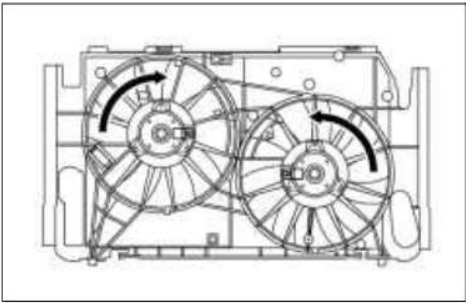


(b) Check that the cooling fan stops.

If the fan does not stop, 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 fan rotates.

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

(e) Reconnect the engine coolant temperature sensor connector.

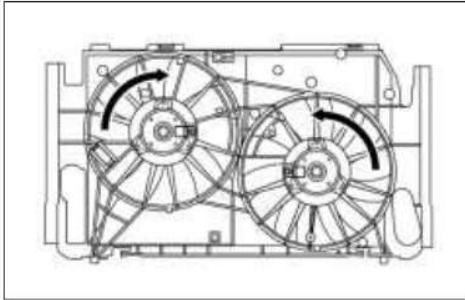
2. CHECK COOLING FAN OPERATION AT HIGH TEMPERATURES (Higher than 96°C (205°F))

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

HINT:

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

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



- (c) Check that the cooling fan rotates.

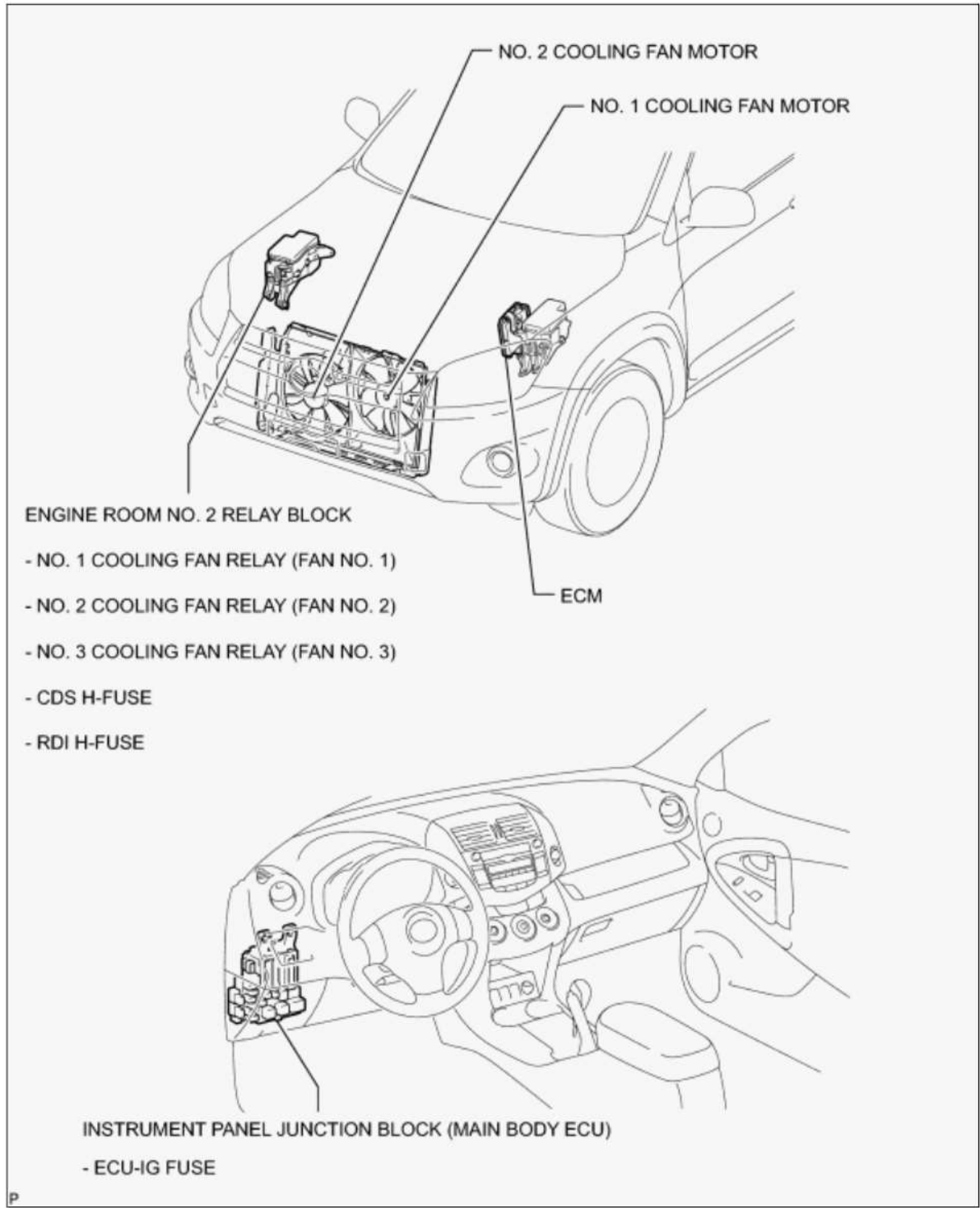
If the fan does not rotate, check the engine coolant temperature sensor, cooling fan, harness and connector.



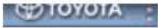
Last Modified: 9-7-2011	6.4 R	From: 201008
Model Year: 2011	Model: RAV4	Doc ID: RM00000201300HX
Title: 2AR-FE COOLING: COOLING FAN SYSTEM: PARTS LOCATION (2011 RAV4)		

PARTS LOCATION

ILLUSTRATION



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Last Modified: 9-7-2011	6.4 L	From: 201008
Model Year: 2011	Model: RAV4	Doc ID: RM000003QMM005X
Title: 2AR-FE COOLING: COOLING FAN SYSTEM: PRECAUTION (2011 RAV4)		

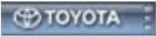
PRECAUTION

1. IGNITION SWITCH EXPRESSION

HINT:

The type of ignition switch used on this model differs according to the specifications of the vehicle. The expressions listed in the table below are used in this section.

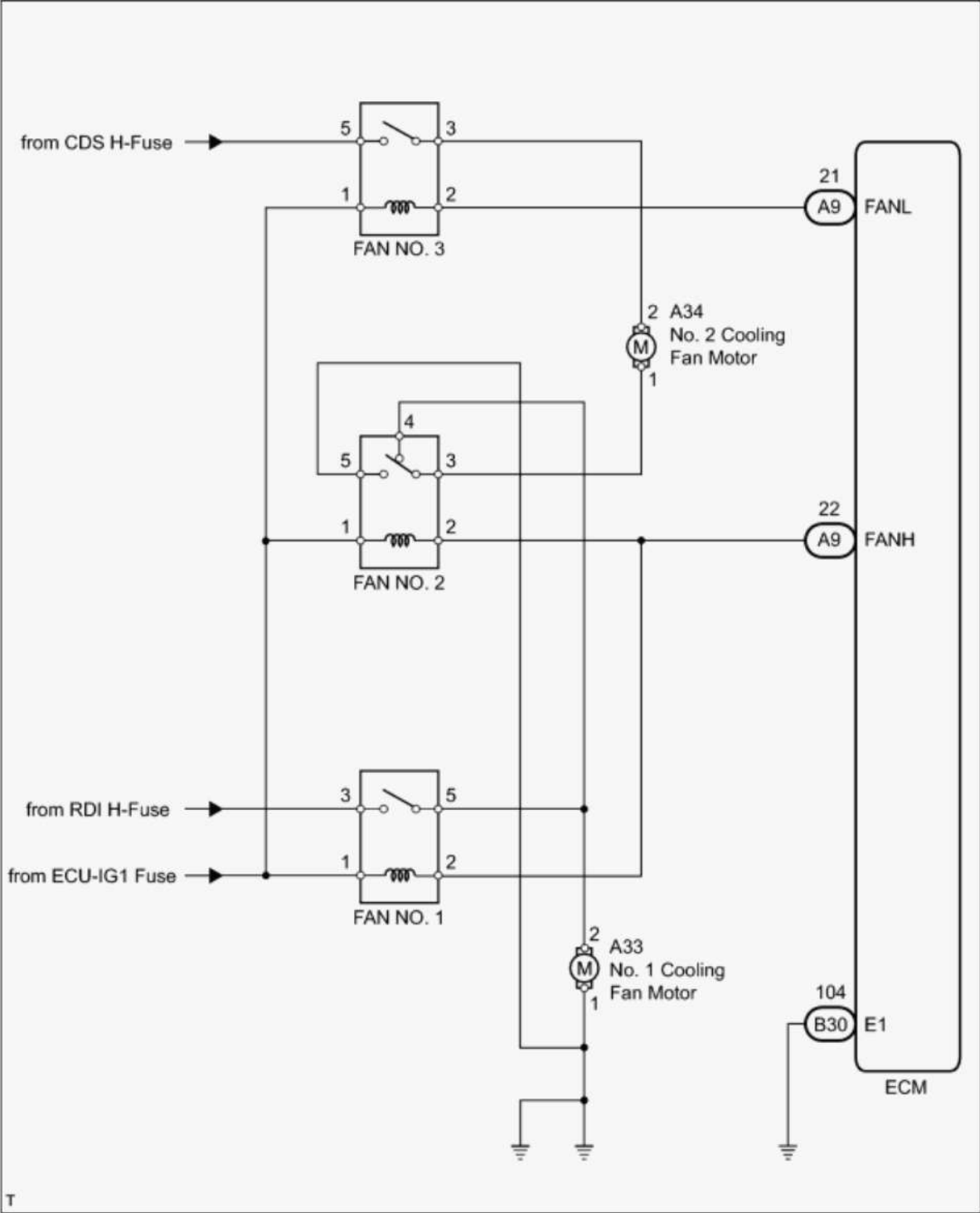
EXPRESSION	IGNITION SWITCH (POSITION)	ENGINE SWITCH (CONDITION)
Ignition Switch off	Off	Off
Ignition Switch ON	ON	On (IG)
Ignition Switch ACC	ACC	On (ACC)
Engine Start	START	Start



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Last Modified: 9-7-2011	6.4 U	From: 201008
Model Year: 2011	Model: RAV4	Doc ID: RM000001YA700VX
Title: 2AR-FE COOLING: COOLING FAN SYSTEM: SYSTEM DIAGRAM (2011 RAV4)		

SYSTEM DIAGRAM



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Last Modified: 9-7-2011	6.4 G	From: 201008
Model Year: 2011	Model: RAV4	Doc ID: RM0000017W2015X
Title: 2AR-FE COOLING: COOLING SYSTEM: ON-VEHICLE INSPECTION (2011 RAV4)		

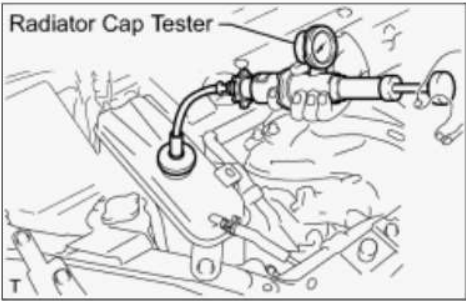
ON-VEHICLE INSPECTION

1. INSPECT FOR COOLANT LEAK

- (a) Remove the radiator reservoir cap.

CAUTION:

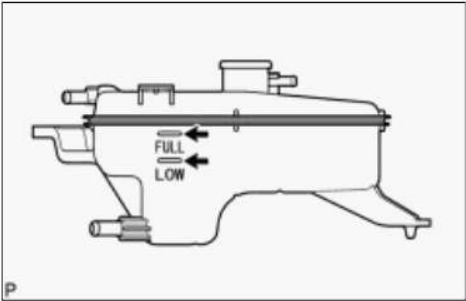
To avoid the danger of being burned, do not remove the radiator reservoir cap while the engine and radiator are still hot. Thermal expansion will cause hot engine coolant and steam to blow out from the radiator reservoir.



- (b) Fill the radiator and reservoir with coolant, and then attach a radiator cap tester.

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

2. CHECK ENGINE COOLANT LEVEL IN RESERVOIR



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

3. CHECK ENGINE COOLANT QUALITY

- (a) Remove the radiator reservoir cap.

CAUTION:

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

- (b) Check for any excessive deposits of rust or scale around the radiator reservoir cap and radiator filler hole; and check that the coolant is free of oil.

If the coolant is excessively dirty, replace the coolant.

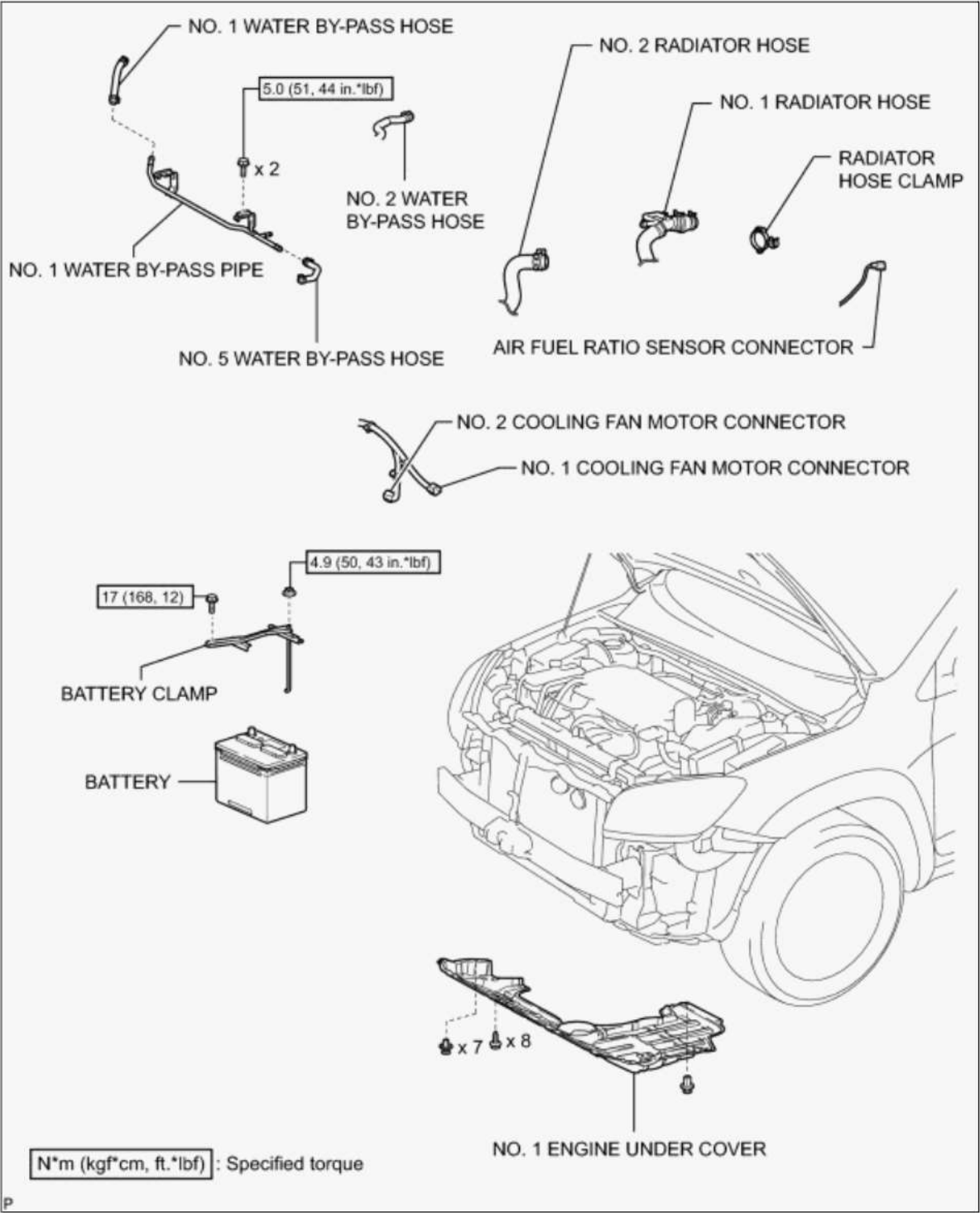
- (c) Install the radiator reservoir cap.



Last Modified: 9-7-2011	6.4 K	From: 201008
Model Year: 2011	Model: RAV4	Doc ID: RM000001X9F01CX
Title: 2AR-FE COOLING: RADIATOR: COMPONENTS (2011 RAV4)		

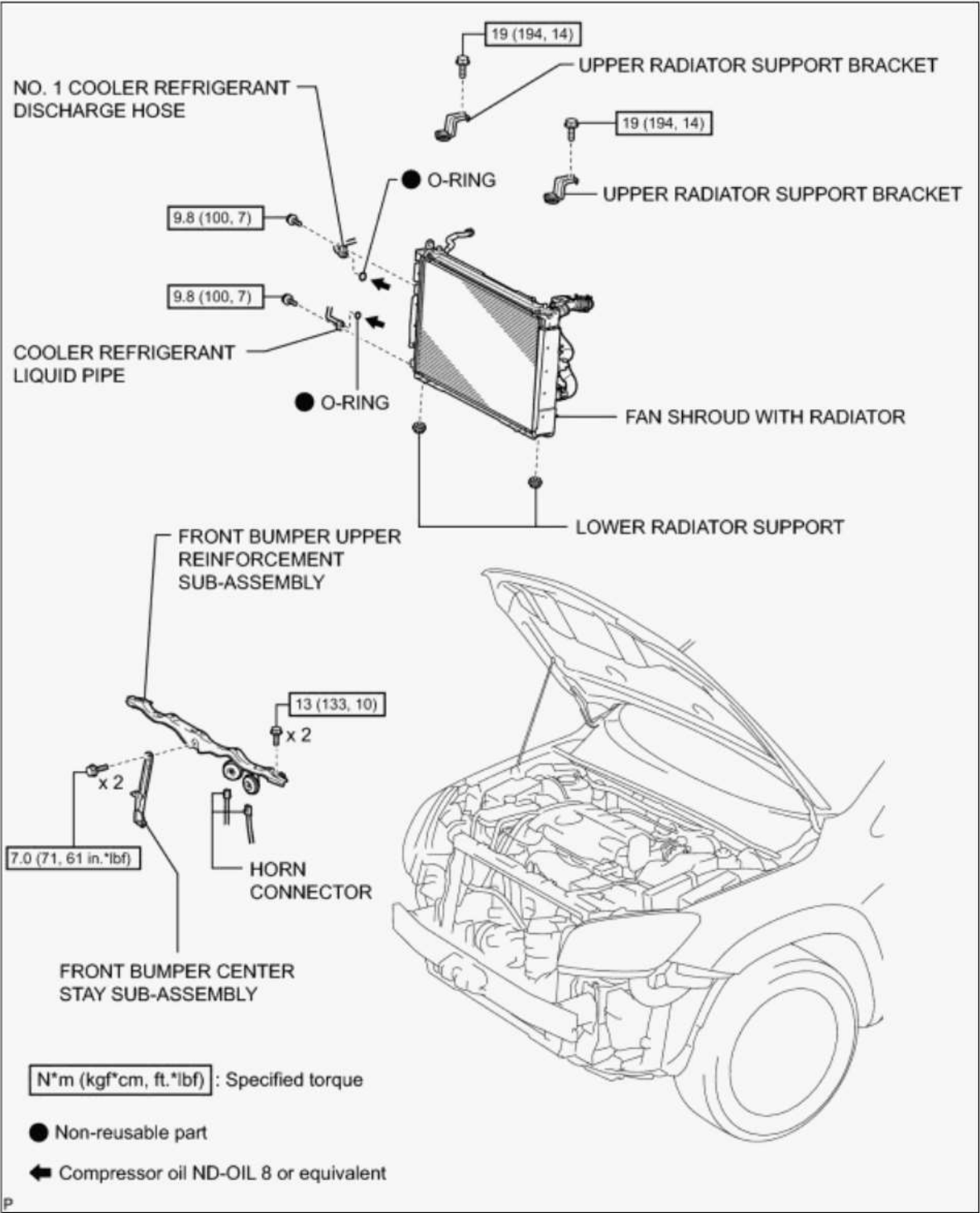
COMPONENTS

ILLUSTRATION

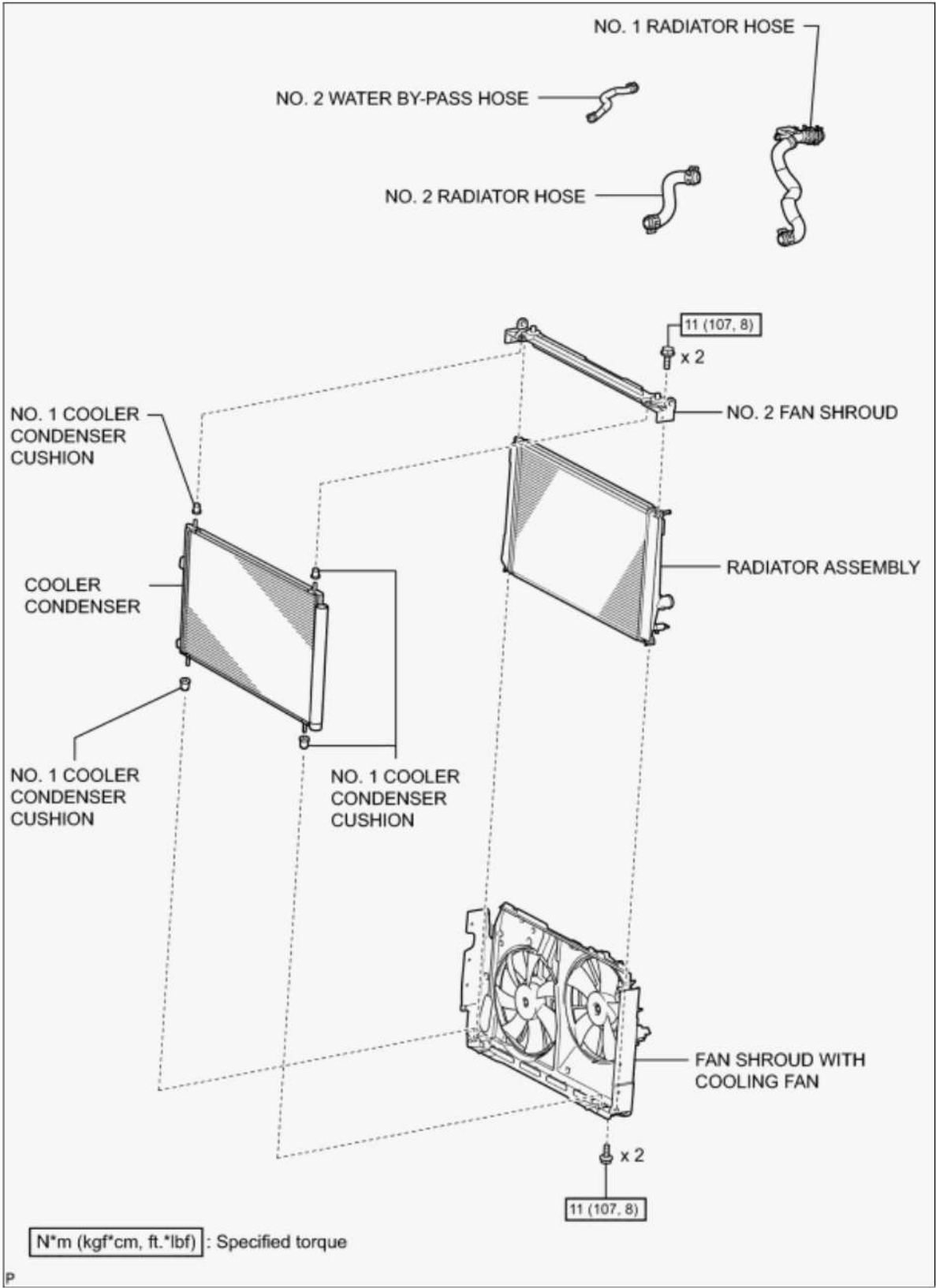


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ILLUSTRATION



ILLUSTRATION

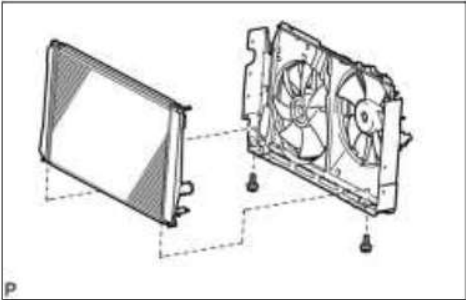


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Last Modified: 9-7-2011	6.4 A	From: 201008
Model Year: 2011	Model: RAV4	Doc ID: RM000001X9E00ZX
Title: 2AR-FE COOLING: RADIATOR: INSTALLATION (2011 RAV4)		

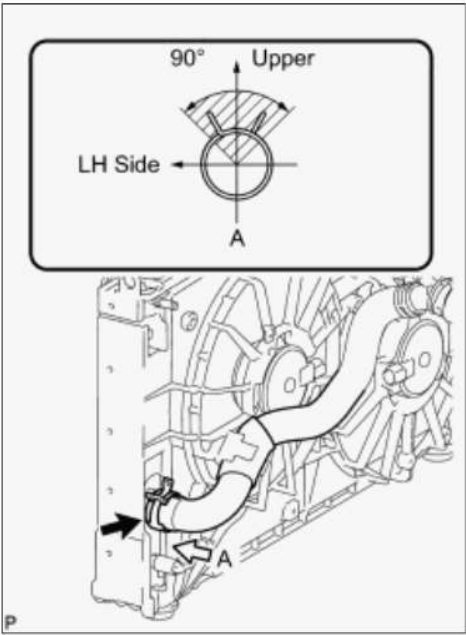
INSTALLATION

1. INSTALL RADIATOR ASSEMBLY



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

Torque: 11 N·m (107 kgf·cm, 8ft·lbf)

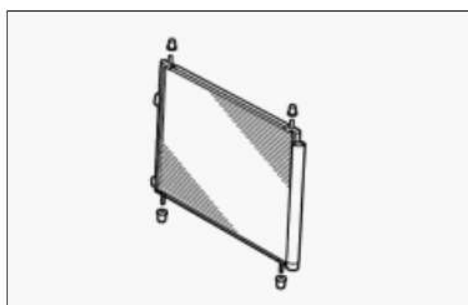
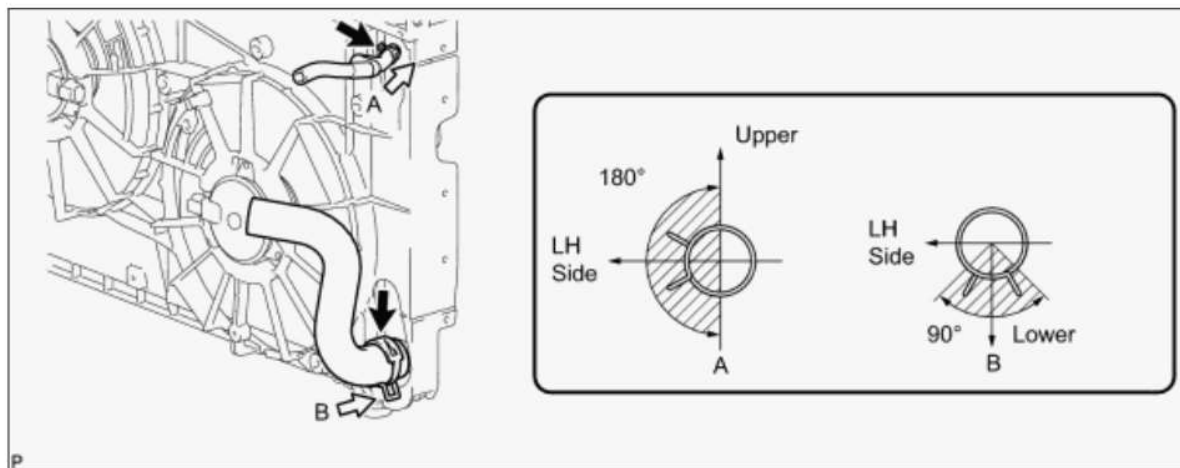


(b) Install the No. 1 radiator hose to the radiator.

HINT:
The direction of the hose clamp is indicated in the illustration.

(c) Install the No. 2 water by-pass hose and No. 2 radiator hose to the radiator.

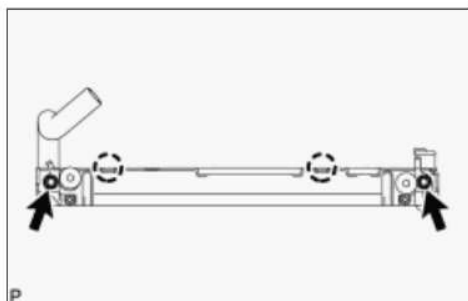
HINT:
The direction of the hose clamp is indicated in the illustration.



(d) Install the cooler condenser to the fan shroud with cooling fan.

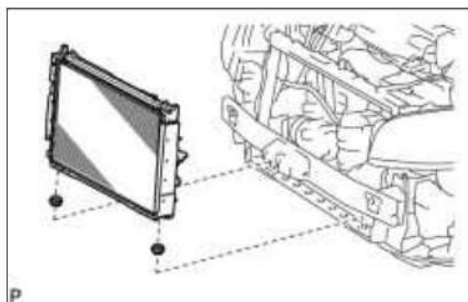
HINT:

Before installing the condenser, make sure that all 4 cooler condenser cushions are attached to the condenser.



(e) Attach the 2 claws to install the No. 2 fan shroud, and then install the 2 bolts.

Torque: 11 N·m (107 kgf·cm, 8ft·lbf)

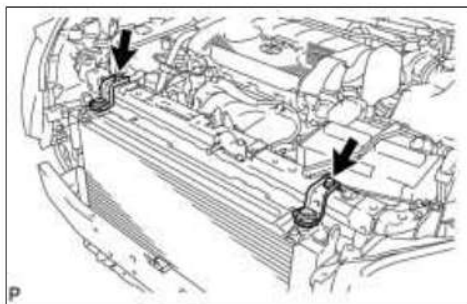


(f) Install the radiator together with the 2 lower radiator supports.

HINT:

Before installing the radiator, make sure that both lower radiator support are attached to the fan shroud.

2. INSTALL UPPER RADIATOR SUPPORT BRACKET



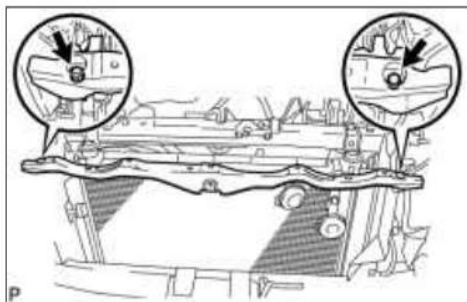
(a) Install the 2 upper radiator support brackets with the 2 bolts.

Torque: 19 N·m (194 kgf·cm, 14ft·lbf)

3. CONNECT COOLER REFRIGERANT LIQUID PIPE INFO

4. CONNECT NO. 1 COOLER REFRIGERANT DISCHARGE HOSE INFO

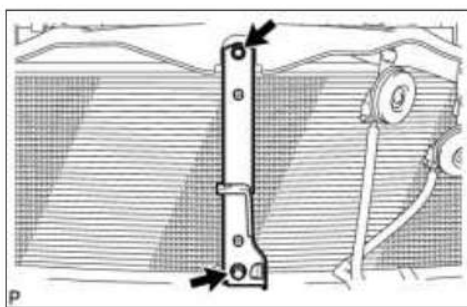
5. INSTALL FRONT BUMPER UPPER REINFORCEMENT SUB-ASSEMBLY



(a) Install the reinforcement with the 2 bolts.

Torque: 13 N·m (133 kgf·cm, 10ft·lbf)

6. INSTALL FRONT BUMPER CENTER STAY SUB-ASSEMBLY

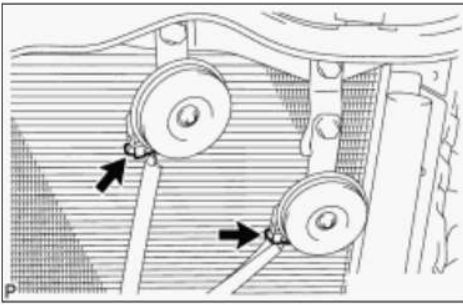


(a) Install the stay with the 2 bolts.

Torque: 7.0 N·m (71 kgf·cm, 61in·lbf)

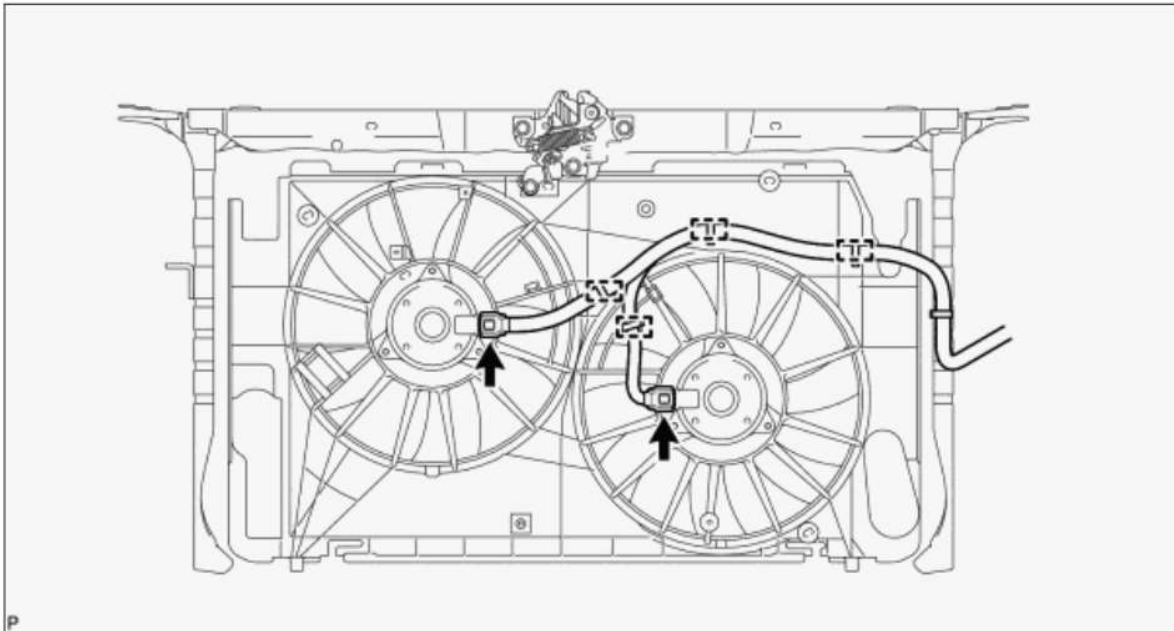
7. CONNECT HORN CONNECTOR

(a) Connect the 2 horn connectors.



8. CONNECT WIRE HARNESS

- (a) Attach the wire harness with the 4 clamps.
- (b) Connect the 2 fan motor connectors.

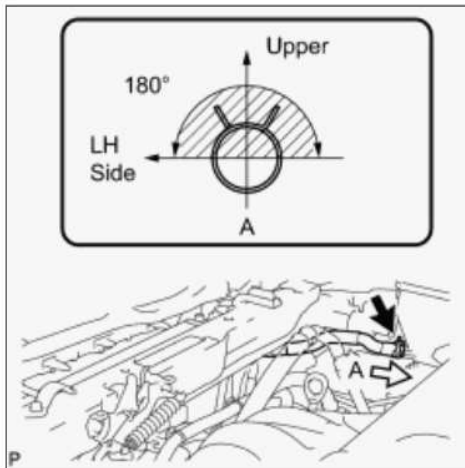


9. CONNECT NO. 2 WATER BY-PASS HOSE

- (a) Connect the No. 2 water by-pass hose to the radiator reservoir.

HINT:

The direction of the hose clamp is indicated in the illustration.



10. INSTALL NO. 1 WATER BY-PASS PIPE

- (a) Install the No. 1 water by-pass pipe to the upper radiator support with the 2 bolts.

Torque: 5.0 N·m (51 kgf·cm, 44in·lbf)

11. INSTALL NO. 5 WATER BY-PASS HOSE

- (a) Install the by-pass hose to the radiator and No. 1 water by-pass pipe.

HINT:

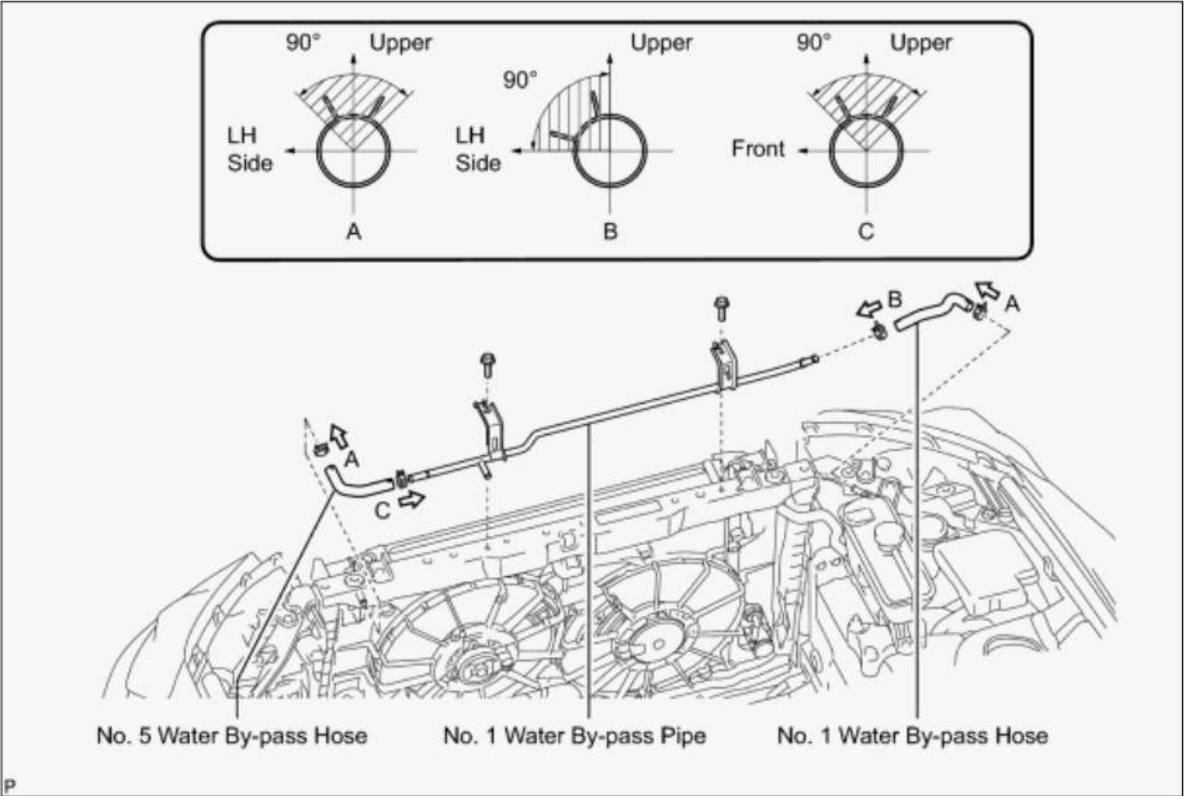
The direction of the hose clamp is indicated in the illustration.

12. INSTALL NO. 1 WATER BY-PASS HOSE

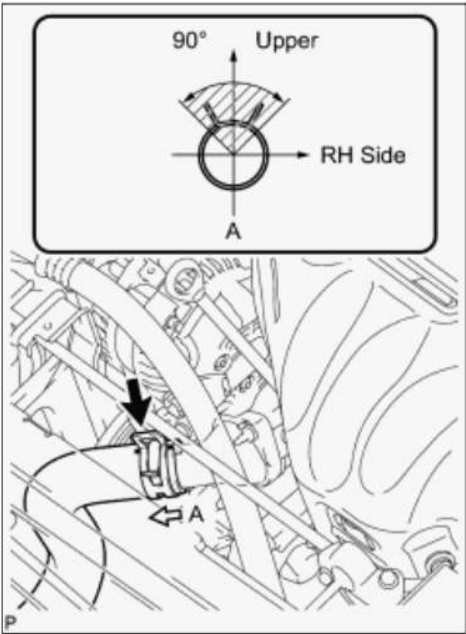
- (a) Install the by-pass hose to the radiator reservoir and No. 1 water by-pass pipe.

HINT:

The direction of the hose clamp is indicated in the illustration.



13. CONNECT NO. 2 RADIATOR HOSE



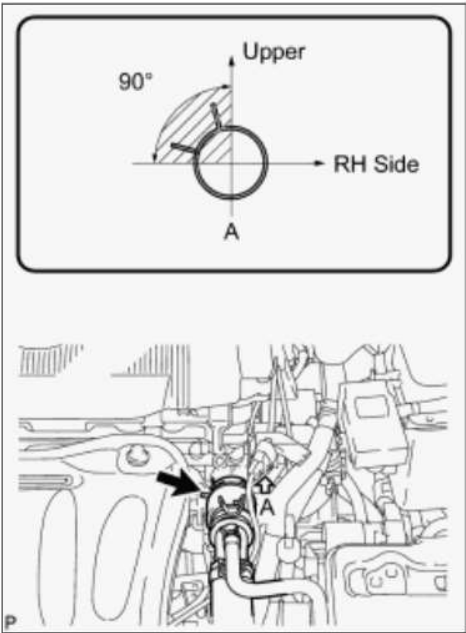
(a) Connect the No. 2 radiator hose to the water inlet housing.

HINT:

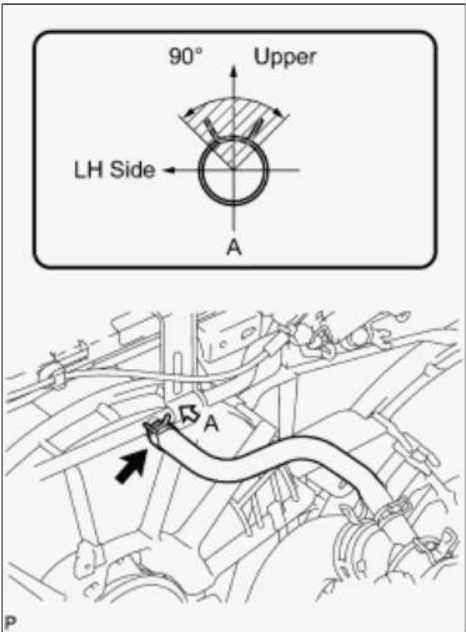
The direction of the hose clamp is indicated in the illustration.

14. CONNECT NO. 1 RADIATOR HOSE

(a) Connect the No. 1 radiator hose to the cylinder head.



HINT:
The direction of the hose clamp is indicated in the illustration.



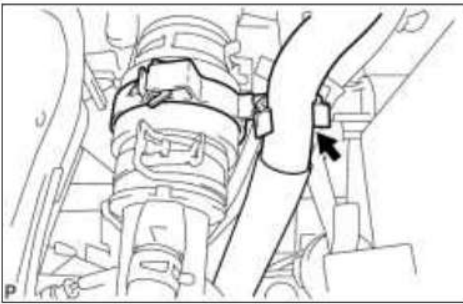
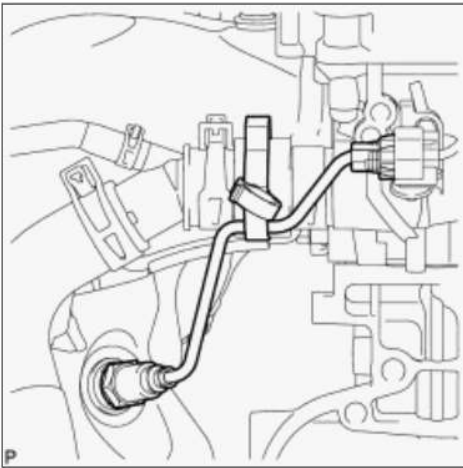
(b) Connect the No. 1 radiator hose to the No. 1 water by-pass pipe.

HINT:
The direction of the hose clamp is indicated in the illustration.

15. INSTALL RADIATOR HOSE CLAMP

(a) Install the radiator hose clamp as shown in the illustration.

NOTICE:
When installing the clamp, make sure that the air fuel ratio sensor wire harness is not pinched excessively.



(b) Connect the No. 4 water by-pass hose to the radiator hose clamp.

16. INSTALL BATTERY

17. INSTALL BATTERY CLAMP INFO

18. INSTALL GENERATOR ASSEMBLY

(a) Install the generator assembly INFO .

19. INSTALL FRONT BUMPER COVER

(a) w/ Under Guard:

Install the front bumper cover INFO .

(b) w/o Under Guard:

Install the front bumper cover INFO .

20. CONNECT CABLE TO NEGATIVE BATTERY TERMINAL

21. ADD ENGINE COOLANT INFO

22. CHARGE REFRIGERANT INFO

23. WARM UP ENGINE INFO

24. INSPECT FOR REFRIGERANT LEAK INFO

25. INSPECT FOR COOLANT LEAK INFO

26. INSTALL NO. 1 ENGINE UNDER COVER

INFO



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Last Modified: 9-7-2011	6.4 N	From: 201008
Model Year: 2011	Model: RAV4	Doc ID: RM00000144F022X
Title: 2AR-FE COOLING: RADIATOR: ON-VEHICLE CLEANING (2011 RAV4)		

ON-VEHICLE CLEANING

1. INSPECT RADIATOR ASSEMBLY

- (a) Check that the radiator and condenser are not blocked with leaves, dirt, or insects. Clean the hose connections.
- If the fins are blocked, wash them with water or a steam cleaner.

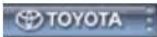
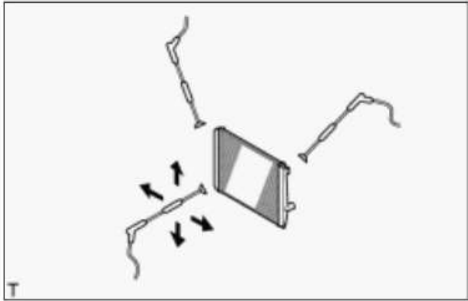
NOTICE:

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

INJECTION PRESSURE	SPECIFIED CONDITION
2,942 to 4,903 kPa (30 to 50 kgf/cm ² , 427 to 711 psi)	300 mm (11.81 in.)
4,903 to 7,845 kPa (50 to 80 kgf/cm ² , 711 to 1,138 psi)	500 mm (19.69 in.)

- If the fins are bent, straighten them with a screwdriver or pliers.
- Never apply water directly onto the electronic components.

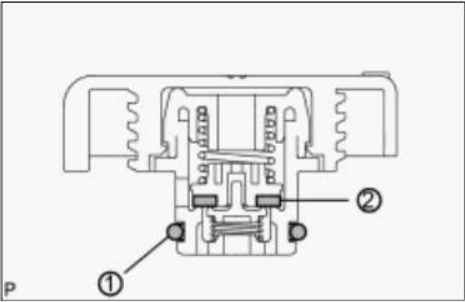
(b) Dry the fins with compressed air.



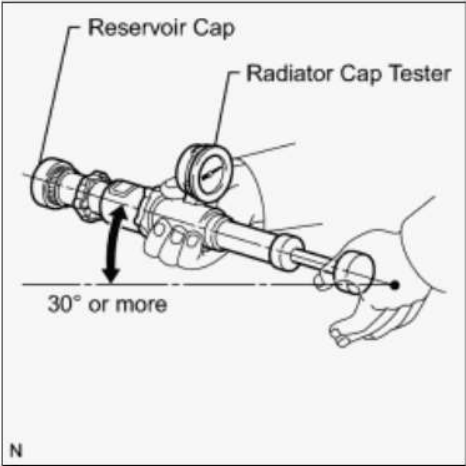
Last Modified: 9-7-2011	6.4 G	From: 201008
Model Year: 2011	Model: RAV4	Doc ID: RM0000016PC02RX
Title: 2AR-FE COOLING: RADIATOR: ON-VEHICLE INSPECTION (2011 RAV4)		

ON-VEHICLE INSPECTION

1. CHECK RADIATOR RESERVOIR CAP SUB-ASSEMBLY



- (a) Measure the valve opening pressure.
- (1) If there are water stains or foreign matter on O-ring 1, clean it with water and finger scouring.
 - (2) Check that O-ring 1 is not deformed, cracked or swollen.
 - (3) Apply engine coolant to O-ring 1 and rubber packing 2, and then install the radiator cap to a radiator cap tester.



- (4) When using the cap tester, tilt it more than 30 degrees.

- (5) Pump the cap tester several times, and check the maximum pressure*.

Pump speed:

1 pump per second

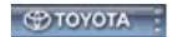
*: Even if the cap cannot maintain the maximum pressure, it is not a defect.

Standard Judgment Criterion:

ITEM	SPECIFIED CONDITION
------	---------------------

ITEM	SPECIFIED CONDITION
Standard value (for brand-new cap)	93 to 123 kPa (1.0 to 1.3 kgf/cm ² , 13.5 to 18 psi)
Minimum standard value (after using cap)	79 kPa (0.8 kgf/cm ² , 11.4 psi)

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



Last Modified: 9-7-2011	6.4 A	From: 201008
Model Year: 2011	Model: RAV4	Doc ID: RM000001X9G00YX
Title: 2AR-FE COOLING: RADIATOR: REMOVAL (2011 RAV4)		

REMOVAL

1. DISCHARGE REFRIGERANT FROM REFRIGERATION SYSTEM INFO

2. DISCONNECT CABLE FROM NEGATIVE BATTERY TERMINAL

3. REMOVE NO. 1 ENGINE UNDER COVER INFO

4. DRAIN ENGINE COOLANT INFO

5. REMOVE FRONT BUMPER COVER

(a) w/ Under Guard:

Remove the front bumper cover INFO.

(b) w/o Under Guard:

Remove the front bumper cover INFO.

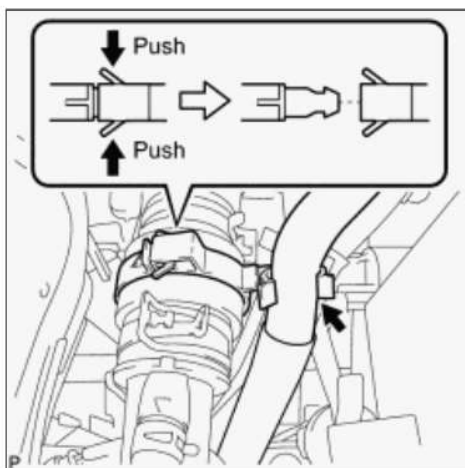
6. REMOVE GENERATOR ASSEMBLY

(a) Remove the generator assembly INFO.

7. REMOVE BATTERY CLAMP INFO

8. REMOVE BATTERY

9. REMOVE RADIATOR HOSE CLAMP

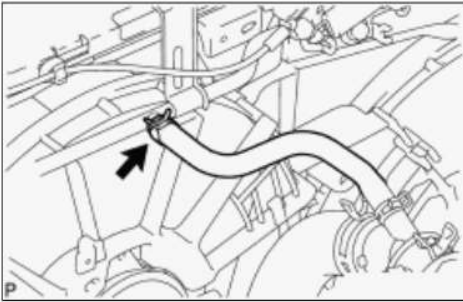
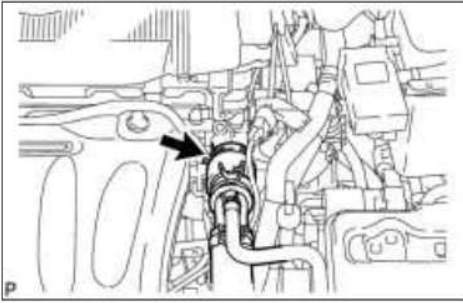


(a) Disconnect the No. 4 water by-pass hose from the radiator hose clamp.

(b) Remove the radiator hose clamp.

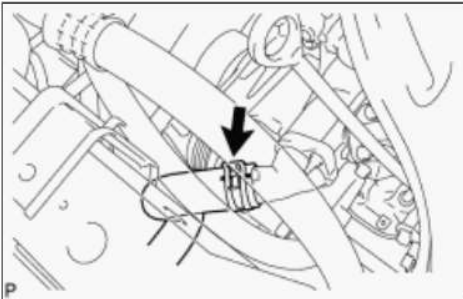
10. DISCONNECT NO. 1 RADIATOR HOSE

(a) Disconnect the hose from the cylinder head.



(b) Disconnect the No. 1 radiator hose from the No. 1 water by-pass pipe.

11. DISCONNECT NO. 2 RADIATOR HOSE



(a) Disconnect the hose from the water inlet housing.

12. REMOVE NO. 1 WATER BY-PASS HOSE

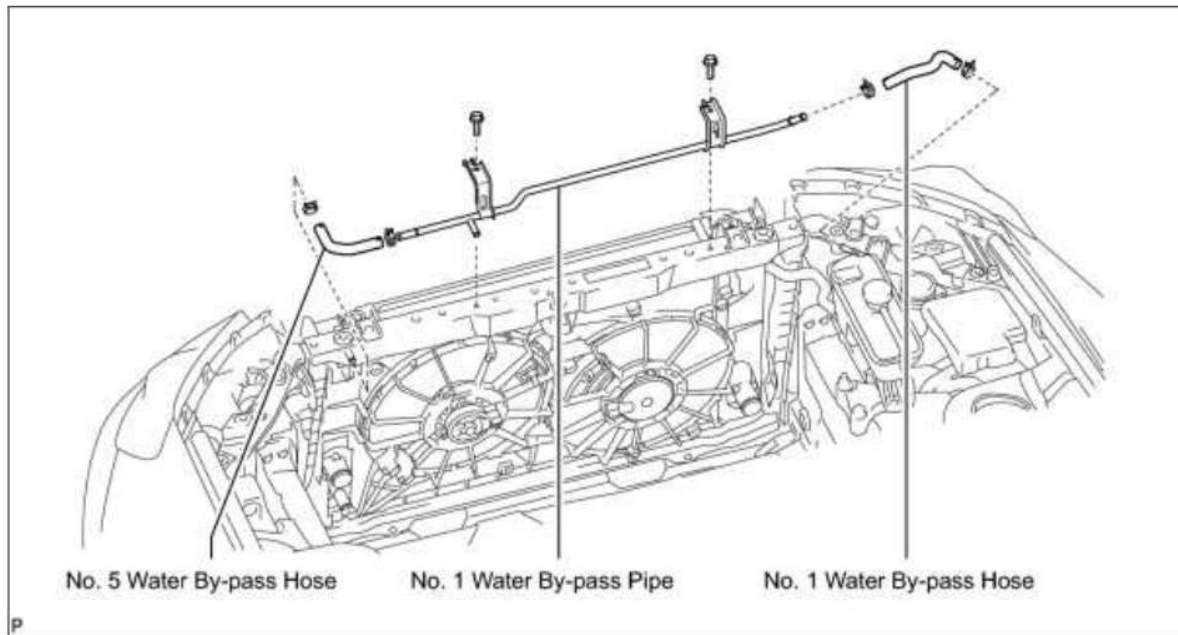
(a) Remove the No. 1 water by-pass hose from the radiator reservoir and No. 1 water by-pass pipe.

13. REMOVE NO. 5 WATER BY-PASS HOSE

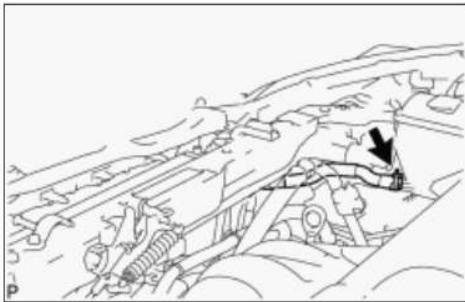
(a) Remove the No. 5 water by-pass hose from the radiator and No. 1 water by-pass pipe.

14. REMOVE NO. 1 WATER BY-PASS PIPE

(a) Remove the 2 bolts and pipe.



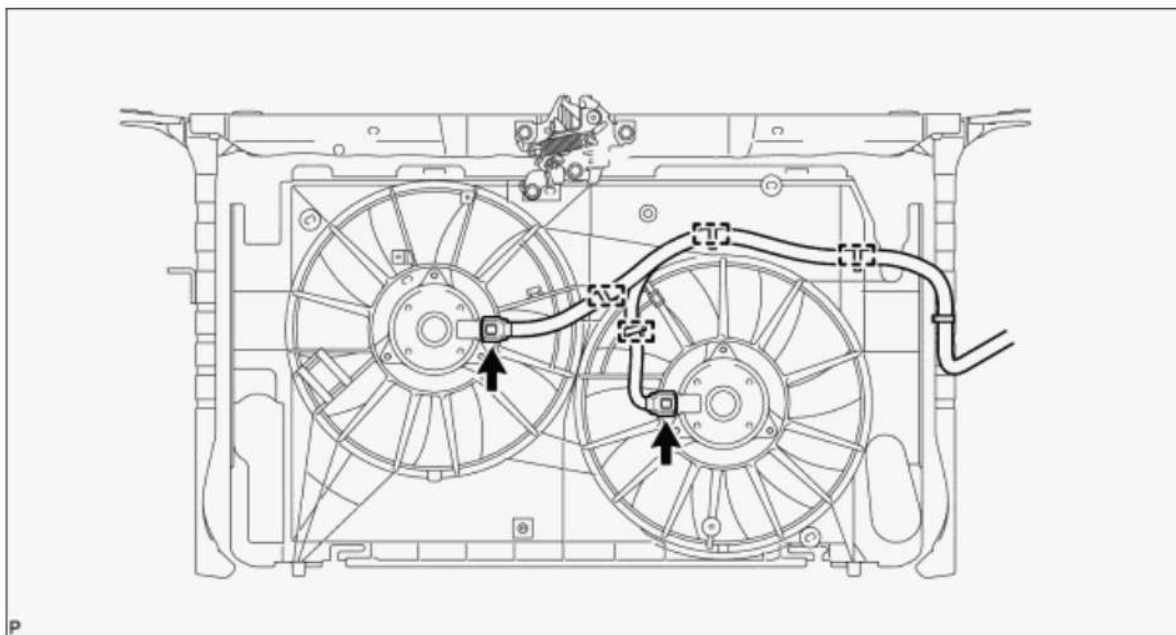
15. DISCONNECT NO. 2 WATER BY-PASS HOSE



(a) Disconnect the No. 2 water by-pass hose from the radiator reservoir.

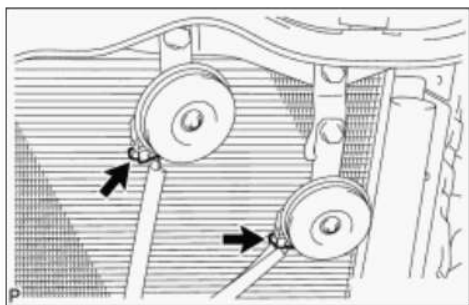
16. DISCONNECT WIRE HARNESS

(a) Disconnect the 2 fan motor connectors from the 2 fan motors.



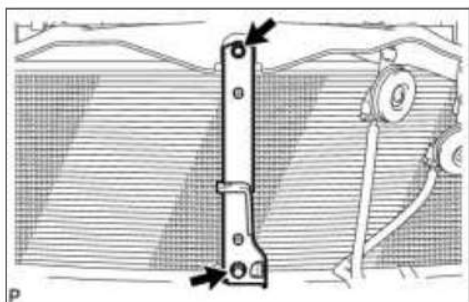
(b) Detach the 4 wire harness clamps from the fan shroud.

17. DISCONNECT HORN CONNECTOR



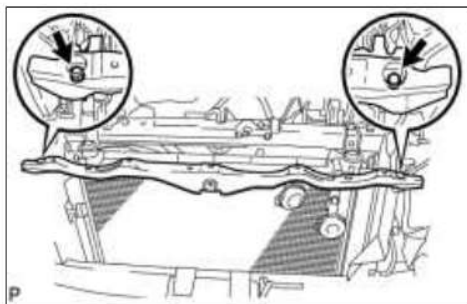
(a) Disconnect the 2 horn connectors.

18. REMOVE FRONT BUMPER CENTER STAY SUB-ASSEMBLY



(a) Remove the 2 bolts and stay.

19. REMOVE FRONT BUMPER UPPER REINFORCEMENT SUB-ASSEMBLY



(a) Remove the 2 bolts and reinforcement.

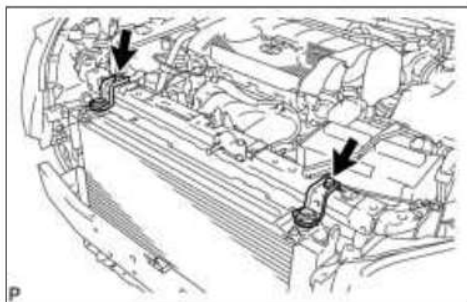
20. DISCONNECT NO. 1 COOLER REFRIGERANT DISCHARGE HOSE

[INFO](#)

21. DISCONNECT COOLER REFRIGERANT LIQUID PIPE

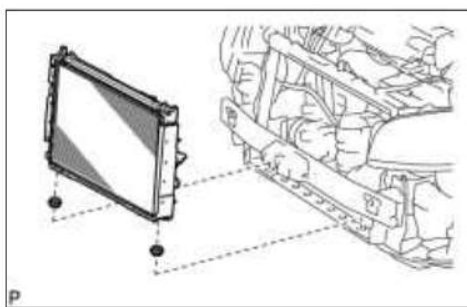
[INFO](#)

22. REMOVE UPPER RADIATOR SUPPORT BRACKET



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

23. REMOVE RADIATOR ASSEMBLY

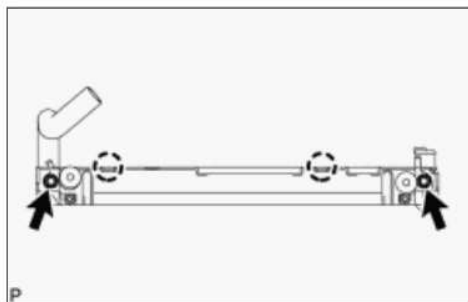


(a) Remove the radiator together with the 2 lower radiator supports.

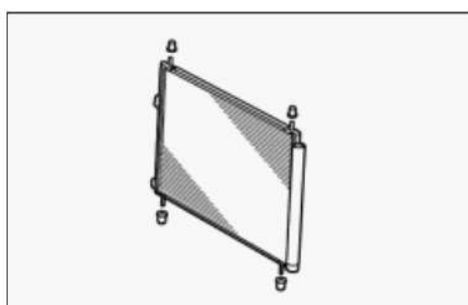
HINT:

After removing the radiator, make sure that both lower radiator supports are attached to the fan shroud.

(b) Remove the 2 bolts.



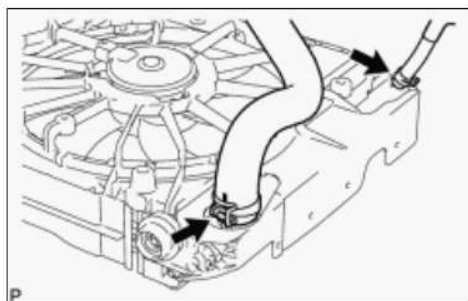
(c) Detach the 2 claws and remove the No. 2 fan shroud.



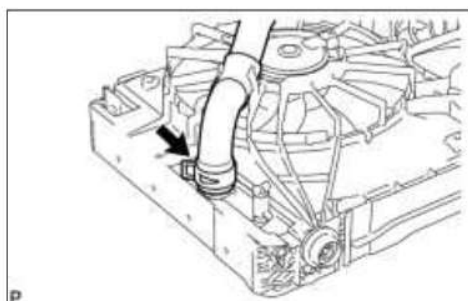
(d) Remove the cooler condenser from the fan shroud with cooling fan.

HINT:

After removing the condenser, make sure that the all 4 cooler condenser cushions are attached to the condenser.

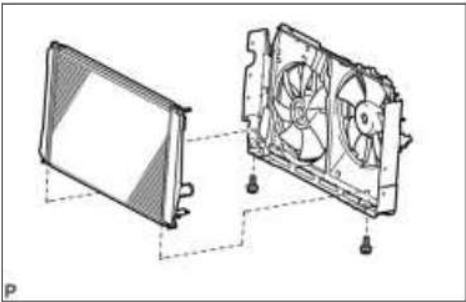


(e) Remove the No. 2 water by-pass hose and No. 2 radiator hose from the radiator.

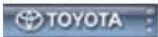


(f) Remove the No. 1 radiator hose from the radiator.

(g) Remove the 2 bolts and radiator from the fan shroud with



cooling fan.

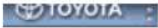


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COMPONENTS

ILLUSTRATION



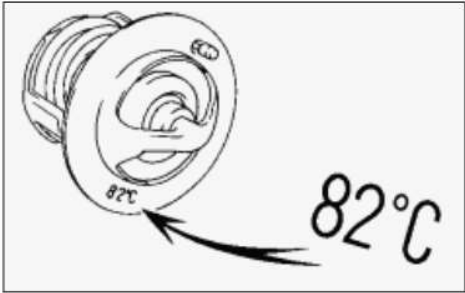


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Last Modified: 9-7-2011	6.4 G	From: 201008
Model Year: 2011	Model: RAV4	Doc ID: RM0000017WC024X
Title: 2AR-FE COOLING: THERMOSTAT: INSPECTION (2011 RAV4)		

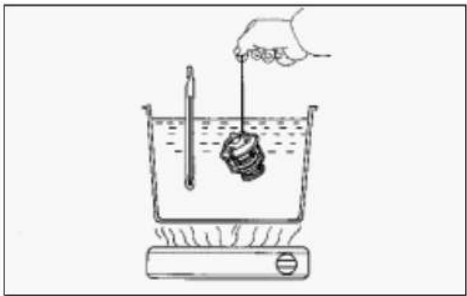
INSPECTION

1. INSPECT THERMOSTAT



HINT:

The valve opening temperature is inscribed on the thermostat.

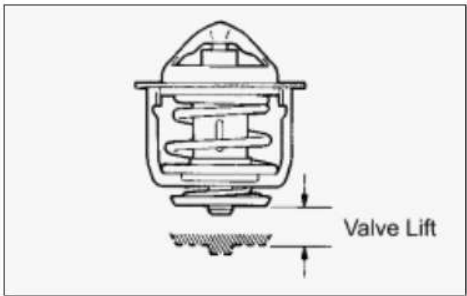


(a) Immerse the thermostat in water, and then gradually heat the water.

(b) Check that the valve of the thermostat opens at the specified temperature.

Standard valve opening temperature:
80 to 84°C (176 to 183°F)

If the valve does not open as specified, replace the thermostat.



(c) Check the valve lift.

Standard valve lift:
10 mm (0.39 in.) or more at 95°C (203°F)

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

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

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

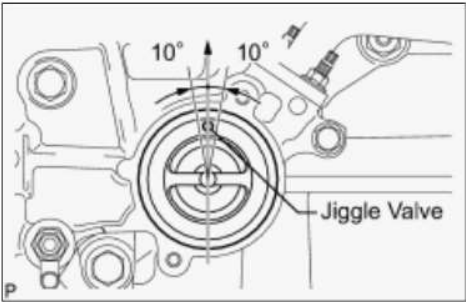


Last Modified: 9-7-2011	6.4 A	From: 201008
Model Year: 2011	Model: RAV4	Doc ID: RM0000017WB02JX
Title: 2AR-FE COOLING: THERMOSTAT: INSTALLATION (2011 RAV4)		

INSTALLATION

1. INSTALL THERMOSTAT

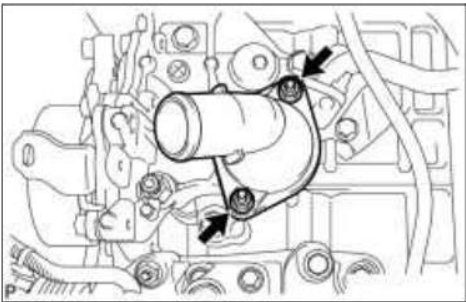
(a) Install a new gasket to the thermostat.



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

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

2. INSTALL WATER INLET



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

Torque: 10 N·m (102 kgf·cm, 7ft·lbf)

3. CONNECT NO. 2 RADIATOR HOSE INFO

4. INSTALL GENERATOR ASSEMBLY

(a) Install the generator assembly INFO .

5. INSTALL FAN & GENERATOR V BELT INFO

6. ADD ENGINE COOLANT INFO

7. INSPECT FOR COOLANT LEAK INFO

8. CONNECT CABLE FROM NEGATIVE BATTERY TERMINAL

9. INSTALL REAR ENGINE UNDER COVER RH INFO

10. INSTALL NO. 1 ENGINE UNDER COVER INFO

11. INSTALL NO. 1 ENGINE COVER SUB-ASSEMBLY

INFO



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Last Modified: 9-7-2011	6.4 A	From: 201008
Model Year: 2011	Model: RAV4	Doc ID: RM0000017WE02JX
Title: 2AR-FE COOLING: THERMOSTAT: REMOVAL (2011 RAV4)		

REMOVAL

1. DISCONNECT CABLE FROM NEGATIVE BATTERY TERMINAL

CAUTION:

Wait at least 90 seconds after disconnecting the cable from the negative (-) battery terminal to disable the SRS system.

2. REMOVE NO. 1 ENGINE COVER SUB-ASSEMBLY

3. REMOVE NO. 1 ENGINE UNDER COVER

4. REMOVE REAR ENGINE UNDER COVER RH

5. REMOVE FAN & GENERATOR V BELT

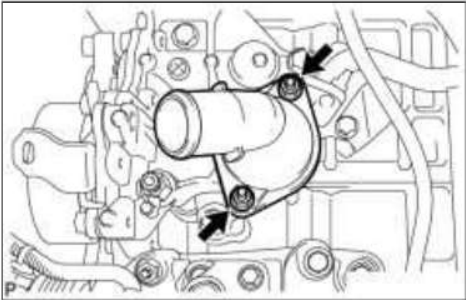
6. DRAIN ENGINE COOLANT

7. REMOVE GENERATOR ASSEMBLY

(a) Remove the generator assembly .

8. DISCONNECT NO. 2 RADIATOR HOSE

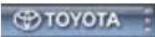
9. REMOVE WATER INLET



(a) Remove the 2 nuts and water inlet.

10. REMOVE THERMOSTAT

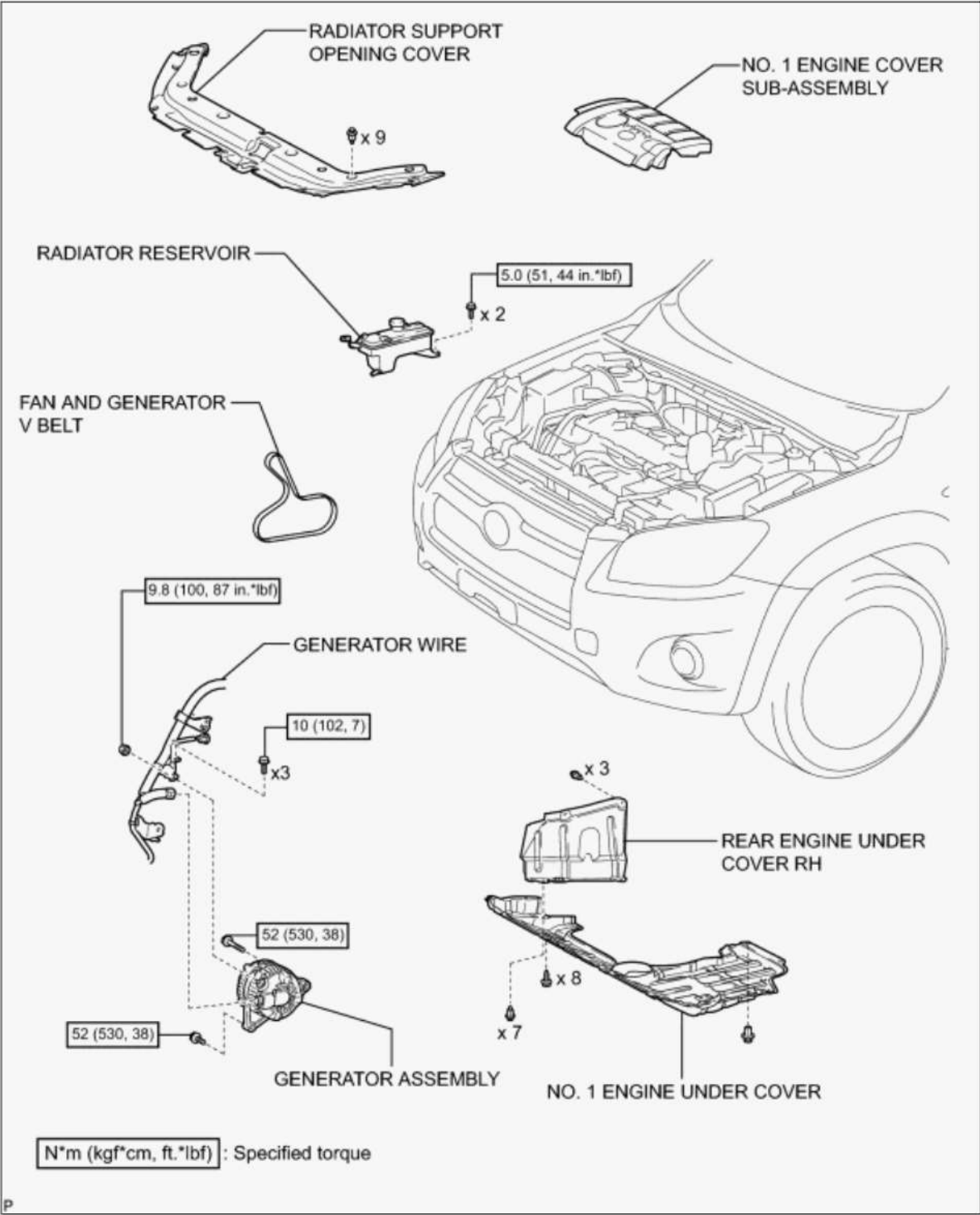
- (a) Remove the thermostat.
- (b) Remove the gasket from the thermostat.



Last Modified: 9-7-2011	6.4 K	From: 201008
Model Year: 2011	Model: RAV4	Doc ID: RM000001X9601KX
Title: 2AR-FE COOLING: WATER PUMP: COMPONENTS (2011 RAV4)		

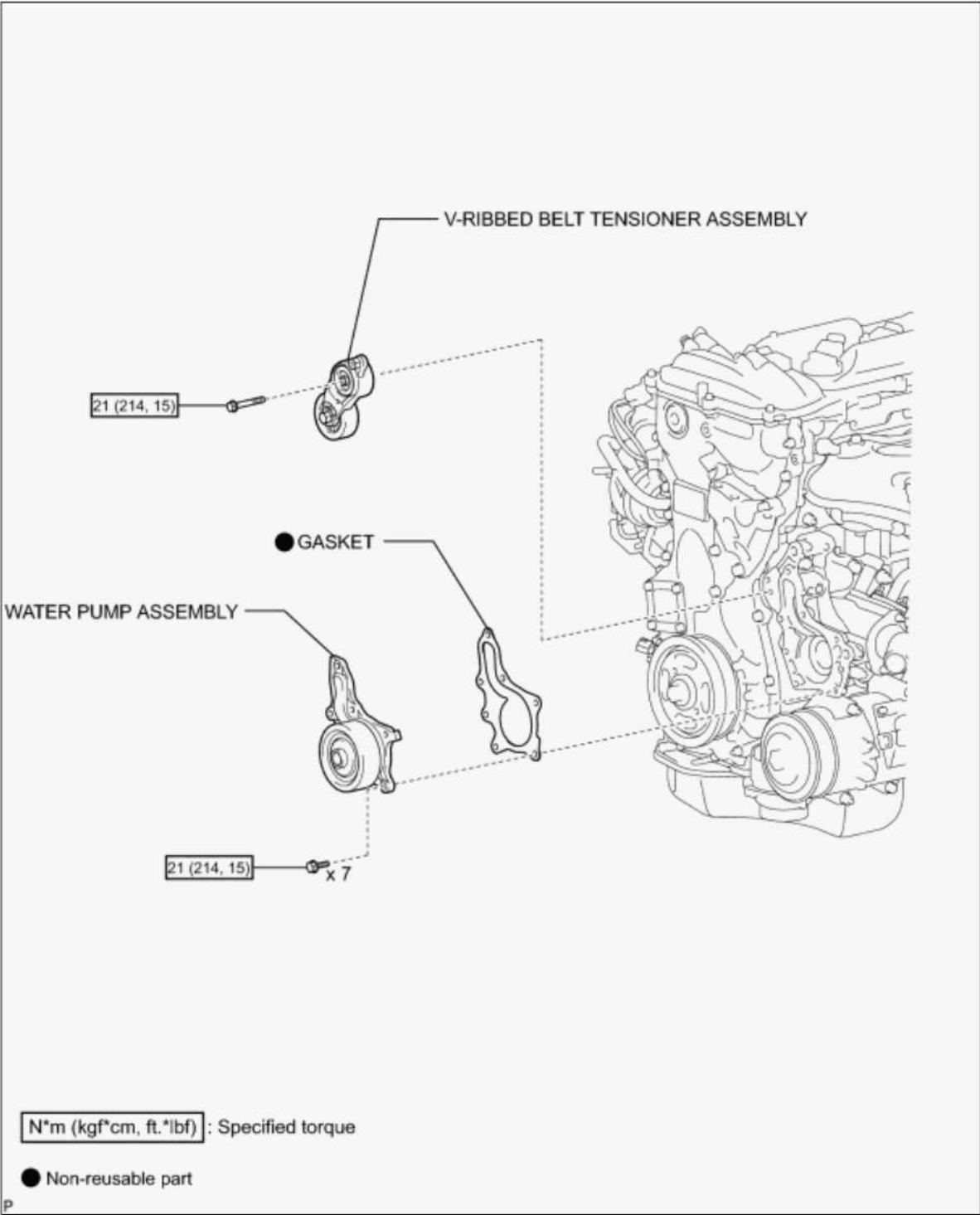
COMPONENTS

ILLUSTRATION

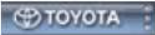


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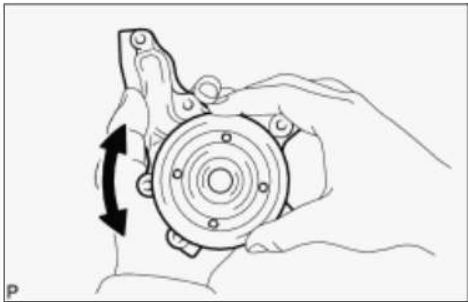


Last Modified: 9-7-2011	6.4 G	From: 201008
Model Year: 2011	Model: RAV4	Doc ID: RM0000017W801QX
Title: 2AR-FE COOLING: WATER PUMP: INSPECTION (2011 RAV4)		

INSPECTION

1. INSPECT WATER PUMP ASSEMBLY

- (a) Visually check the drain hole for coolant leakage.
- If leakage is found, replace the water pump assembly.



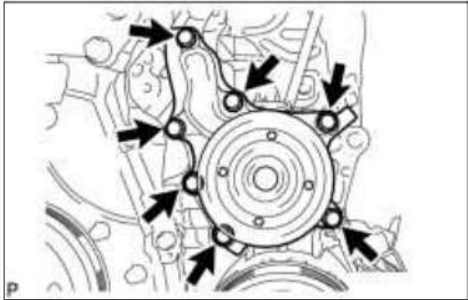
- (b) Turn the pulley and check that the water pump bearing moves smoothly without making a clicking noise.
- If the bearing does not move smoothly, replace the water pump assembly.



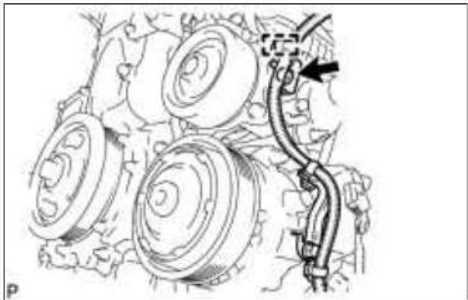
Last Modified: 9-7-2011	6.4 A	From: 201008
Model Year: 2011	Model: RAV4	Doc ID: RM0000017W7020X
Title: 2AR-FE COOLING: WATER PUMP: INSTALLATION (2011 RAV4)		

INSTALLATION

1. INSTALL WATER PUMP ASSEMBLY



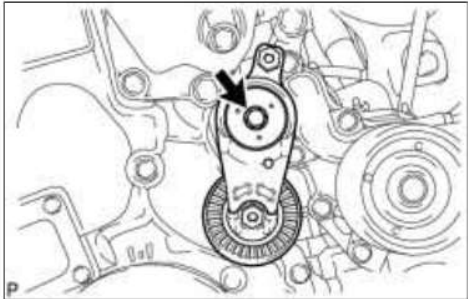
- (a) Install a new gasket and the water pump with the 7 bolts.
Torque: 21 N·m (214 kgf·cm, 15ft·lbf)



- (b) Install the wire harness bracket with the bolt.

- (c) Attach the clamp of the wire harness to the wire harness bracket.

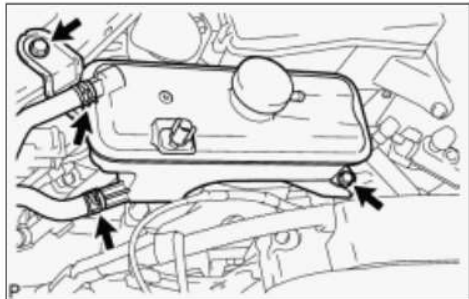
2. INSTALL V-RIBBED BELT TENSIONER ASSEMBLY



- (a) Install the V-ribbed belt tensioner with the bolt.
Torque: 21 N·m (214 kgf·cm, 15ft·lbf)

3. INSTALL GENERATOR ASSEMBLY

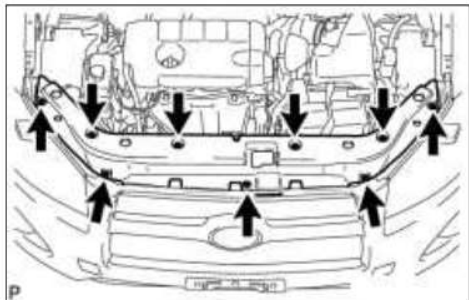
- (a) Install the generator assembly  .

4. INSTALL FAN & GENERATOR V BELT INFO**5. INSTALL RADIATOR RESERVOIR**

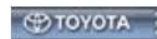
(a) Install the radiator reservoir with the 2 bolts.

Torque: 5.0 N·m (51 kgf·cm, 44in·lbf)

(b) Connect the No. 1 and No. 2 water by-pass hoses.

6. INSTALL REAR ENGINE UNDER COVER RH INFO**7. CONNECT CABLE FROM NEGATIVE BATTERY TERMINAL****8. ADD ENGINE COOLANT** INFO**9. INSPECT FOR COOLANT LEAK** INFO**10. INSTALL NO. 1 ENGINE UNDER COVER** INFO**11. INSTALL RADIATOR SUPPORT OPENING COVER**

(a) Install the support opening cover with the 9 clips.

12. INSTALL NO. 1 ENGINE COVER SUB-ASSEMBLY INFO

Last Modified: 9-7-2011	6.4 A	From: 201008
Model Year: 2011	Model: RAV4	Doc ID: RM0000017WA02KX
Title: 2AR-FE COOLING: WATER PUMP: REMOVAL (2011 RAV4)		

REMOVAL

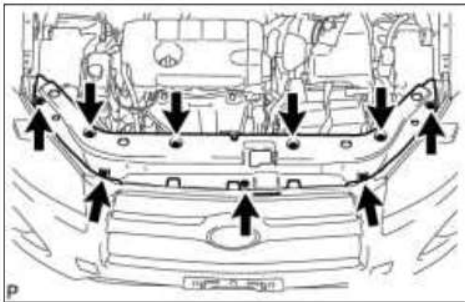
1. DISCONNECT CABLE FROM NEGATIVE BATTERY TERMINAL

CAUTION:

Wait at least 90 seconds after disconnecting the cable from the negative (-) battery terminal to disable the SRS system.

2. REMOVE NO. 1 ENGINE COVER SUB-ASSEMBLY INFO

3. REMOVE RADIATOR SUPPORT OPENING COVER



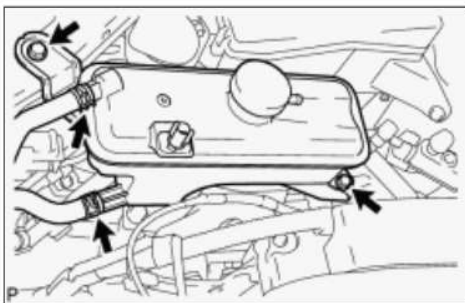
(a) Using a clip remover, remove the 9 clips and radiator support opening cover.

4. REMOVE NO. 1 ENGINE UNDER COVER INFO

5. DRAIN ENGINE COOLANT INFO

6. REMOVE REAR ENGINE UNDER COVER RH INFO

7. REMOVE RADIATOR RESERVOIR



(a) Disconnect the No. 1 and No. 2 water by-pass hoses.

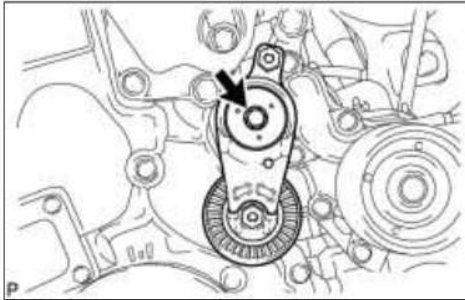
(b) Remove the 2 bolts and radiator reservoir.

8. REMOVE FAN & GENERATOR V BELT INFO

9. REMOVE GENERATOR ASSEMBLY

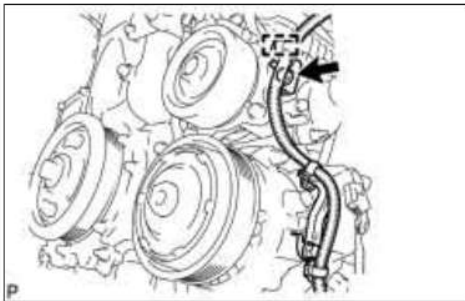
(a) Remove the generator assembly INFO .

10. REMOVE V-RIBBED BELT TENSIONER ASSEMBLY



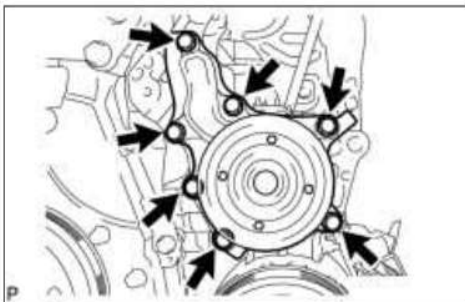
(a) Remove the bolt and V-ribbed belt tensioner.

11. REMOVE WATER PUMP ASSEMBLY



(a) Detach the clamp of the wire harness from the wire harness bracket.

(b) Remove the bolt and wire harness bracket.



(c) Remove the 7 bolts, water pump and water pump gasket.

