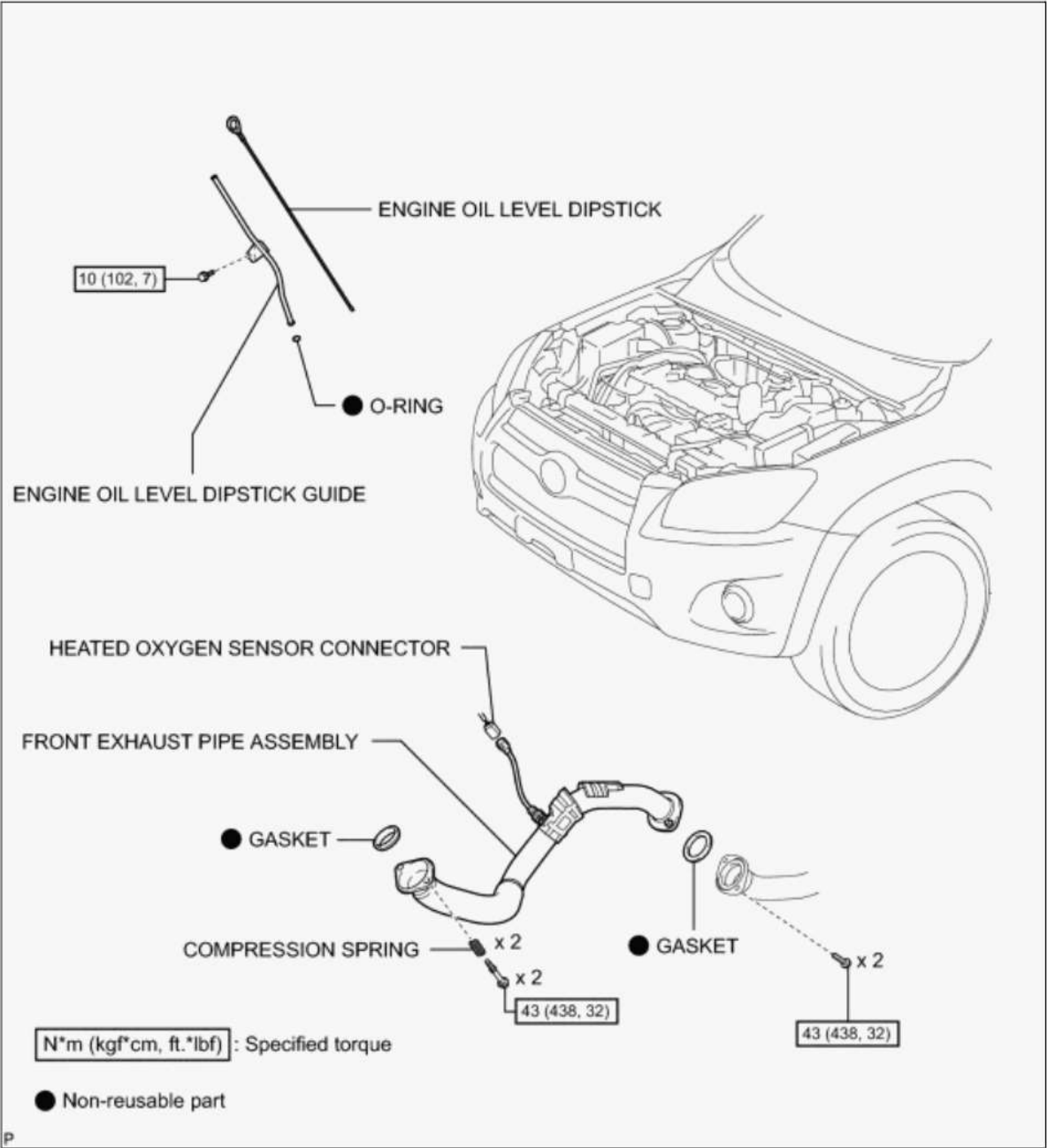


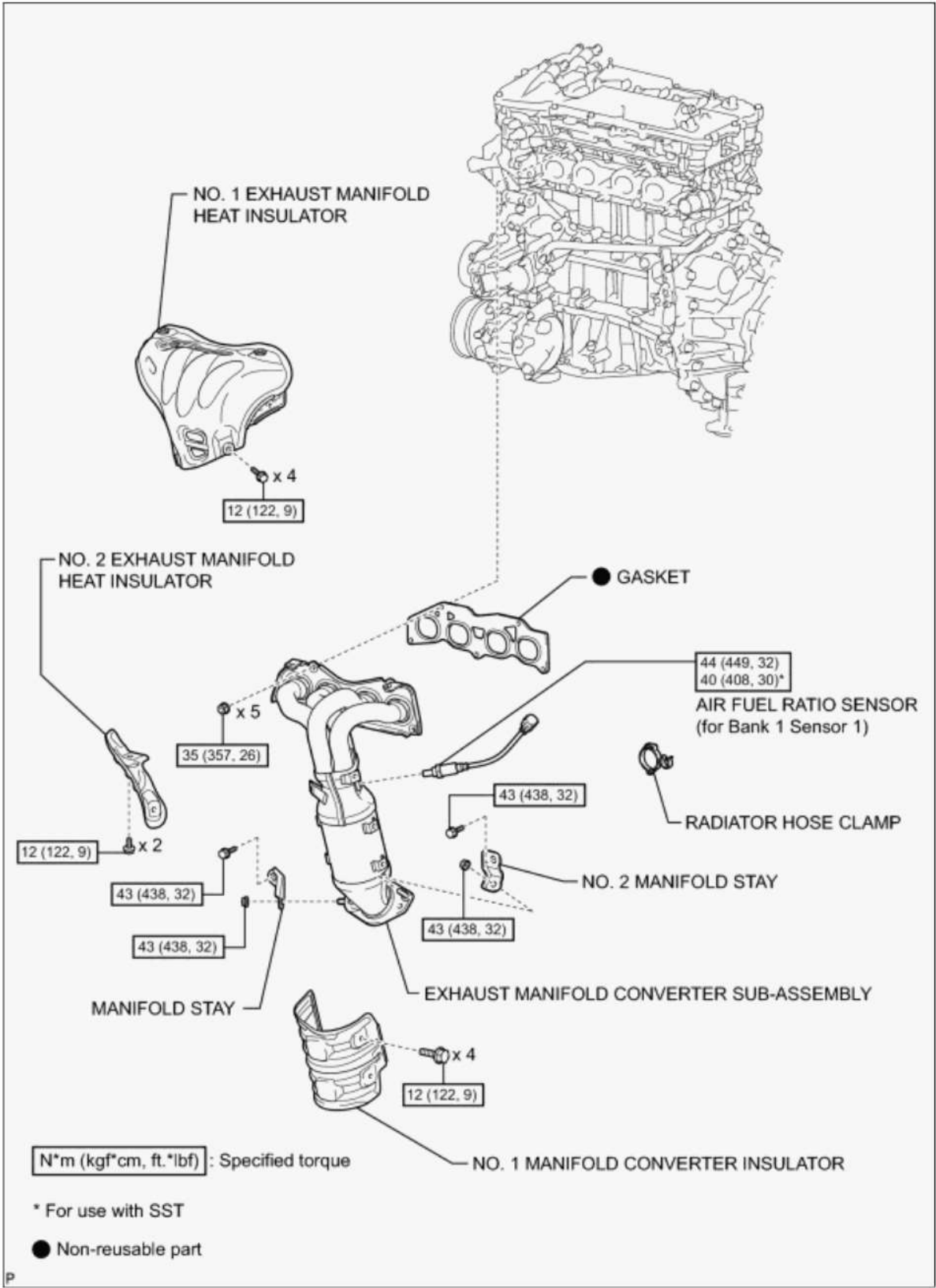
Last Modified: 9-7-2011	6.4 K	From: 201008
Model Year: 2011	Model: RAV4	Doc ID: RM000003PEU00CX
Title: 2AR-FE EXHAUST: EXHAUST MANIFOLD: COMPONENTS (2011 RAV4)		

COMPONENTS

ILLUSTRATION



ILLUSTRATION

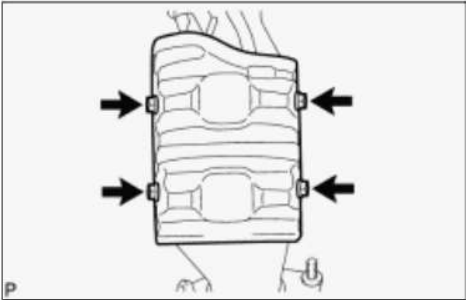


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Last Modified: 9-7-2011	6.4 A	From: 201008
Model Year: 2011	Model: RAV4	Doc ID: RM000001AN501NX
Title: 2AR-FE EXHAUST: EXHAUST MANIFOLD: INSTALLATION (2011 RAV4)		

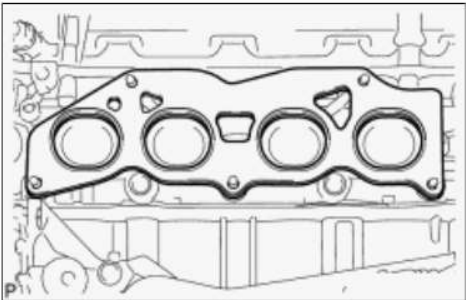
INSTALLATION

1. INSTALL NO. 1 MANIFOLD CONVERTER INSULATOR

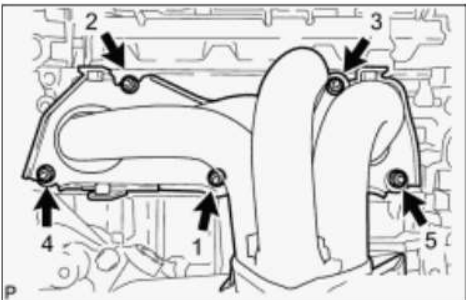


- (a) Install the insulator with the 4 bolts.
Torque: 12 N·m (122 kgf·cm, 9ft·lbf)

2. INSTALL EXHAUST MANIFOLD CONVERTER SUB-ASSEMBLY



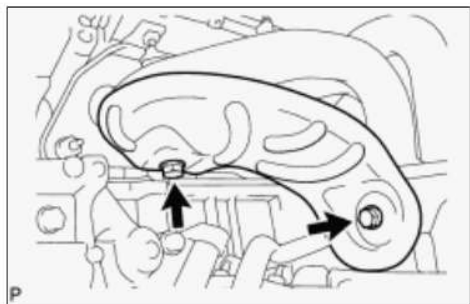
- (a) Install a new gasket onto the cylinder head.



- (b) Temporarily install the exhaust manifold converter with the 5 nuts.

- (c) Tighten the 5 nuts in the sequence shown in the illustration.
Torque: 35 N·m (357 kgf·cm, 26ft·lbf)

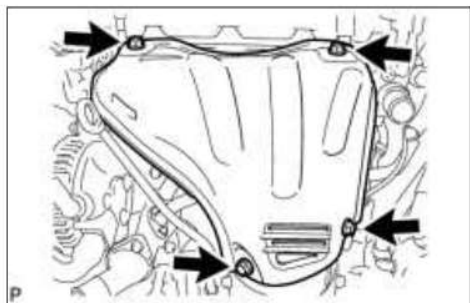
3. INSTALL NO. 2 EXHAUST MANIFOLD HEAT INSULATOR



(a) Install the insulator with the 2 bolts.

Torque: 12 N·m (122 kgf·cm, 9ft·lbf)

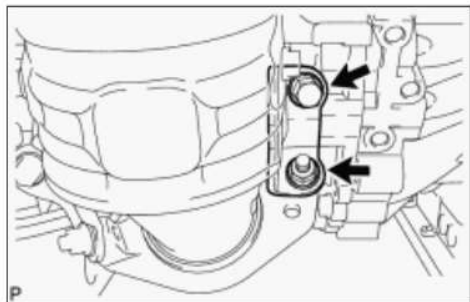
4. INSTALL NO. 1 EXHAUST MANIFOLD HEAT INSULATOR



(a) Install the exhaust manifold heat insulator with the 4 bolts.

Torque: 12 N·m (122 kgf·cm, 9ft·lbf)

5. INSTALL NO. 2 MANIFOLD STAY



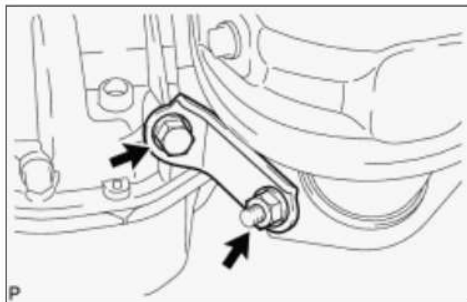
(a) Install the stay with the bolt and nut.

Torque: 43 N·m (438 kgf·cm, 32ft·lbf)

6. INSTALL MANIFOLD STAY

(a) Install the stay with the bolt and nut.

Torque: 43 N·m (438 kgf·cm, 32ft·lbf)



7. INSTALL AIR FUEL RATIO SENSOR (for Bank 1 Sensor 1)

INFO

8. INSTALL RADIATOR HOSE CLAMP

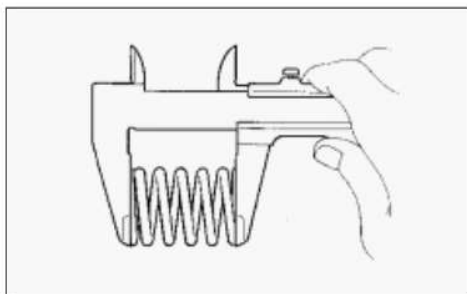
INFO

9. INSTALL ENGINE OIL LEVEL DIPSTICK GUIDE

INFO

10. INSTALL ENGINE OIL LEVEL DIPSTICK

11. INSTALL FRONT EXHAUST PIPE ASSEMBLY



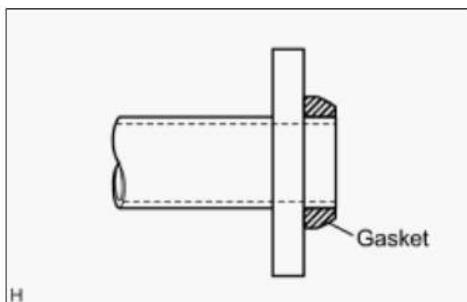
(a) Using a vernier caliper, measure the free length of the compression spring.

Minimum length:

41.5 mm (1.63 in.)

If the length is less than the minimum, replace the compression spring.

(b) Using a wire brush, remove any foreign matter from the gasket installation surface.



(c) Install a new gasket by hand so that its surface is flush with the exhaust manifold converter.

NOTICE:

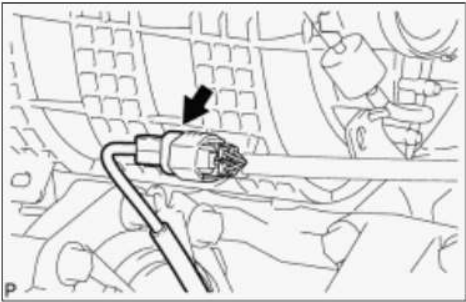
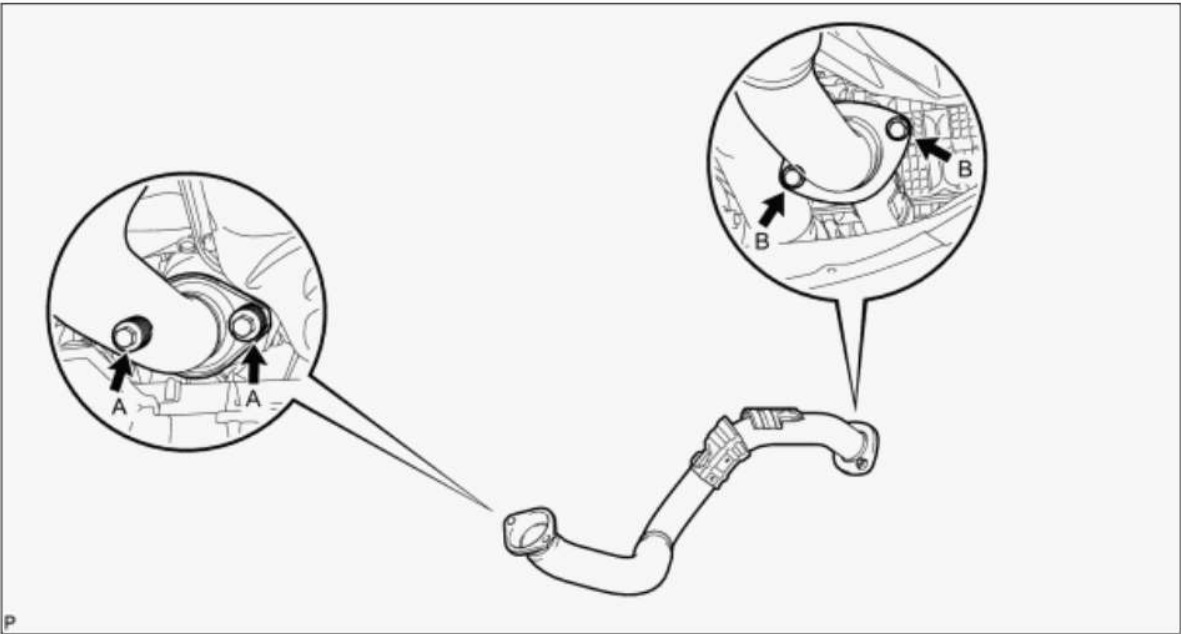
- Make sure the gasket is facing the correct direction.
- Do not reuse the removed gasket.
- Do not push in the gasket while installing the front exhaust pipe.

(d) Install a new gasket to the front exhaust pipe.

(e) Install the front exhaust pipe with the 2 compression springs and 4 bolts.

Torque: 43 N·m (438 kgf·cm, 32ft·lbf) for bolt A

Torque: 43 N·m (438 kgf·cm, 32ft·lbf) for bolt B

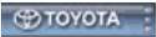


(f) Connect the heated oxygen sensor connector.

12. INSTALL GENERATOR ASSEMBLY

(a) Install the generator assembly [INFO](#) .

13. INSPECT FOR EXHAUST GAS LEAK [INFO](#)



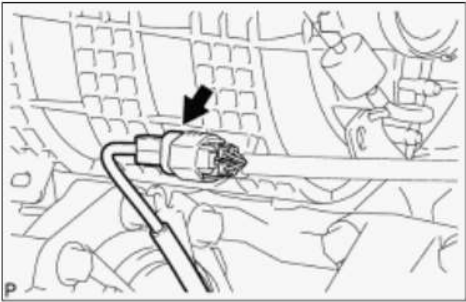
Last Modified: 9-7-2011	6.4 A	From: 201008
Model Year: 2011	Model: RAV4	Doc ID: RM000001AN801OX
Title: 2AR-FE EXHAUST: EXHAUST MANIFOLD: REMOVAL (2011 RAV4)		

REMOVAL

1. REMOVE GENERATOR ASSEMBLY

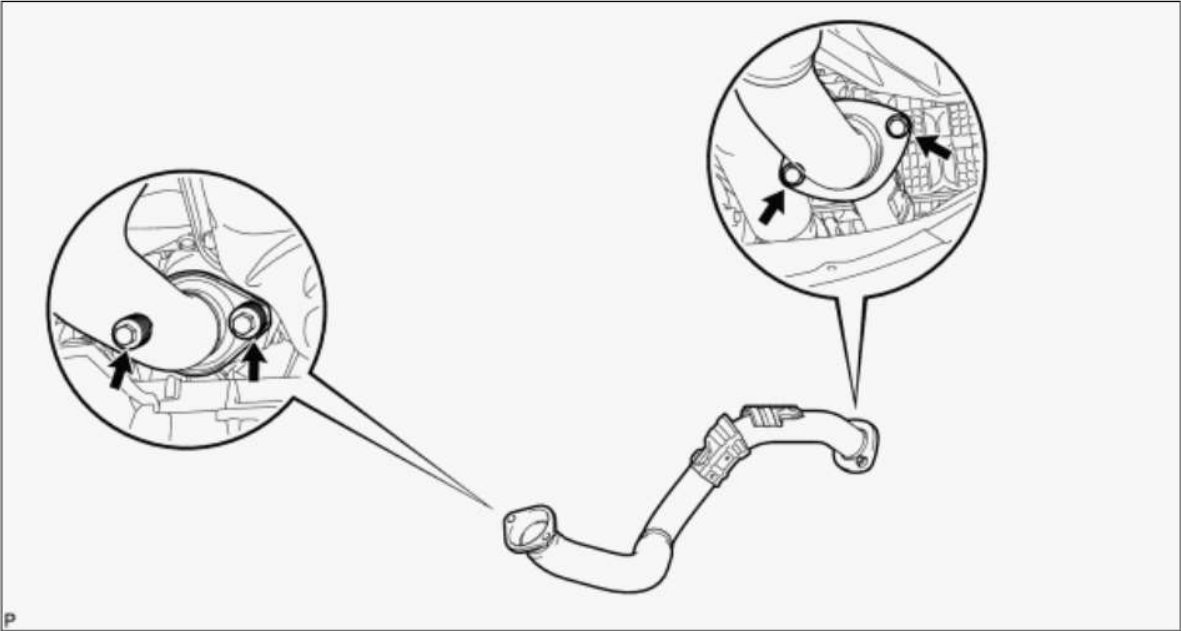
(a) Remove the generator assembly [INFO](#) .

2. REMOVE FRONT EXHAUST PIPE ASSEMBLY



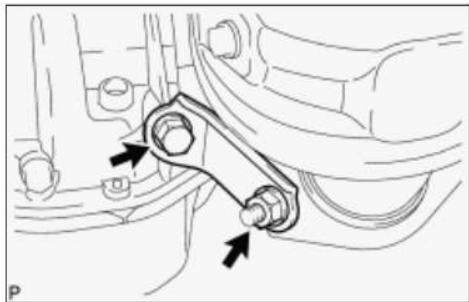
(a) Disconnect the heated oxygen sensor connector.

- (b) Remove the 4 bolts, 2 compression springs and front exhaust pipe.
- (c) Remove the gasket from the front exhaust pipe.
- (d) Remove the gasket from the exhaust manifold converter.

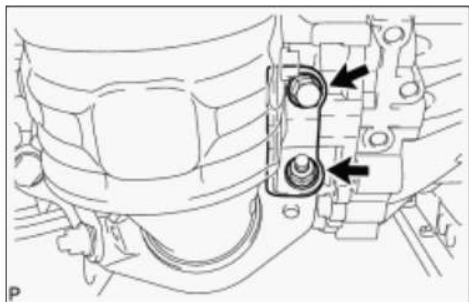


3. REMOVE ENGINE OIL LEVEL DIPSTICK

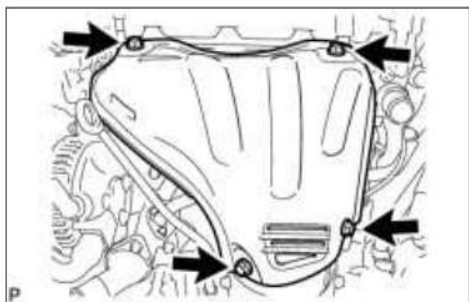
4. REMOVE ENGINE OIL LEVEL DIPSTICK GUIDE [INFO](#)

5. REMOVE RADIATOR HOSE CLAMP INFO**6. REMOVE AIR FUEL RATIO SENSOR (for Bank 1 Sensor 1)** INFO**7. REMOVE MANIFOLD STAY**

(a) Remove the bolt, nut and stay.

8. REMOVE NO. 2 MANIFOLD STAY

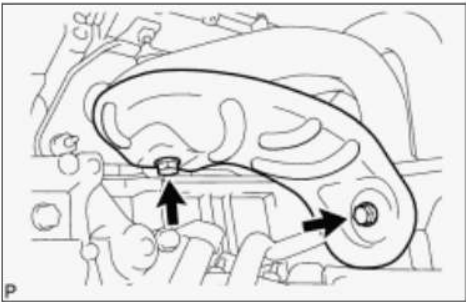
(a) Remove the bolt, nut and stay.

9. REMOVE NO. 1 EXHAUST MANIFOLD HEAT INSULATOR

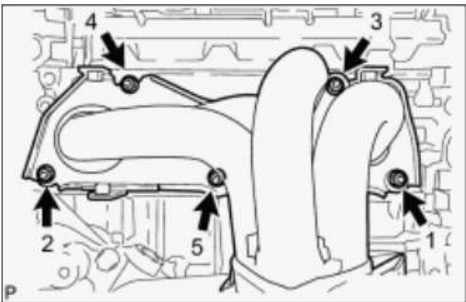
(a) Remove the 4 bolts and heat insulator.

10. REMOVE NO. 2 EXHAUST MANIFOLD HEAT INSULATOR

(a) Remove the 2 bolts and insulator.

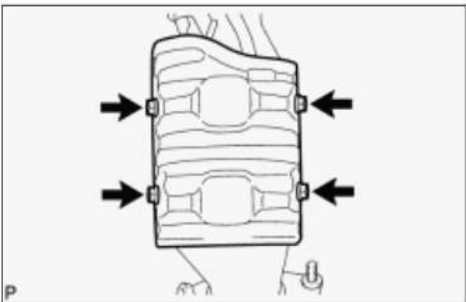


11. REMOVE EXHAUST MANIFOLD CONVERTER SUB-ASSEMBLY

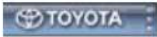


(a) Remove the 5 nuts in the sequence shown in the illustration, and then remove the manifold converter and gasket.

12. REMOVE NO. 1 MANIFOLD CONVERTER INSULATOR



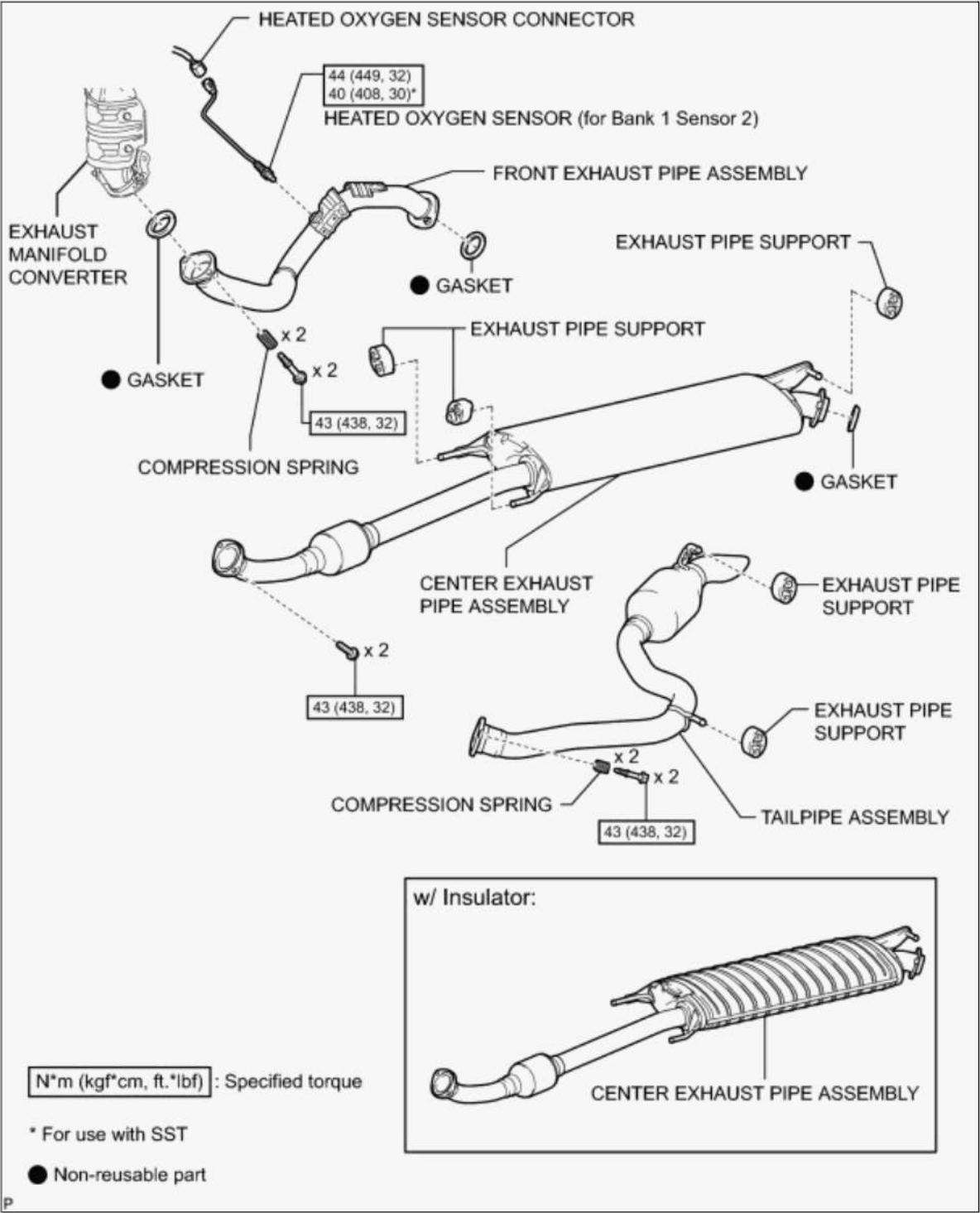
(a) Remove the 4 bolts and insulator.

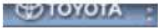


Last Modified: 9-7-2011	6.4 K	From: 201008
Model Year: 2011	Model: RAV4	Doc ID: RM000001XBM016X
Title: 2AR-FE EXHAUST: EXHAUST PIPE: COMPONENTS (2011 RAV4)		

COMPONENTS

ILLUSTRATION



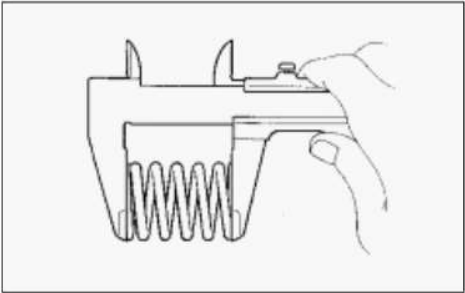


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Last Modified: 9-7-2011	6.4 A	From: 201008
Model Year: 2011	Model: RAV4	Doc ID: RM000001XBL02JX
Title: 2AR-FE EXHAUST: EXHAUST PIPE: INSTALLATION (2011 RAV4)		

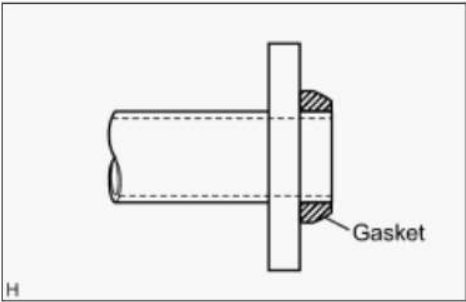
INSTALLATION

1. INSTALL FRONT EXHAUST PIPE ASSEMBLY



- (a) Using a vernier caliper, measure the free length of the compression spring.
- Minimum length:
41.5 mm (1.63 in.)
- If the length is less than the minimum, replace the compression spring.

- (b) Using a wire brush, remove any foreign matter from the gasket installation surface.



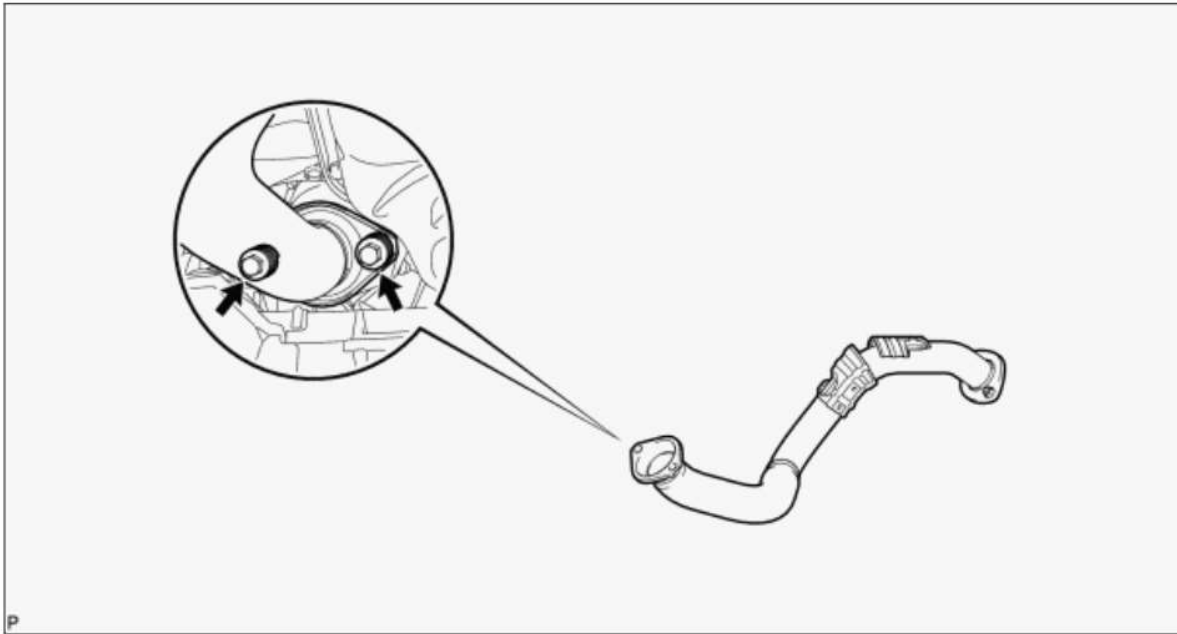
- (c) Install a new gasket by hand so that its surface is flush with the exhaust manifold converter.

NOTICE:

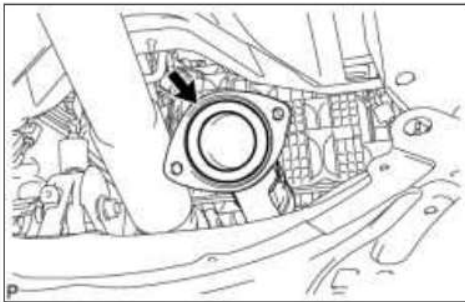
- Make sure the gasket is facing the correct direction.
- Do not reuse the removed gasket.
- Do not push in the gasket while installing the front exhaust pipe.

- (d) Install the front exhaust pipe with the 2 compression springs and 2 bolts.

Torque: 43 N·m (438 kgf·cm, 32ft·lbf)



2. INSTALL CENTER EXHAUST PIPE ASSEMBLY

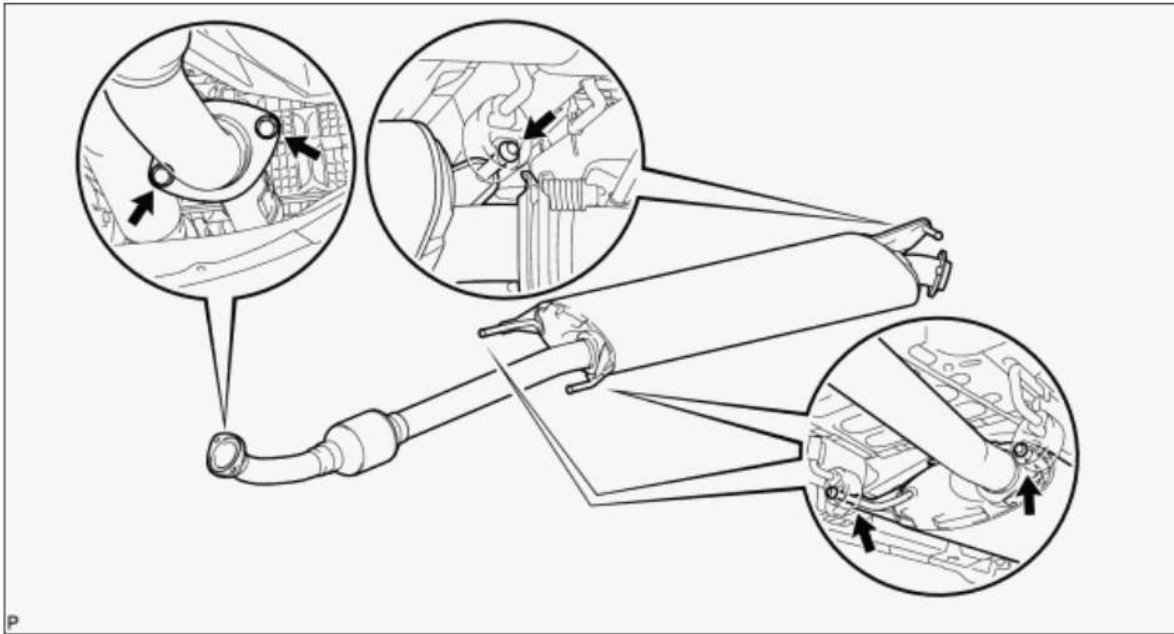


(a) Install a new gasket onto the front exhaust pipe.

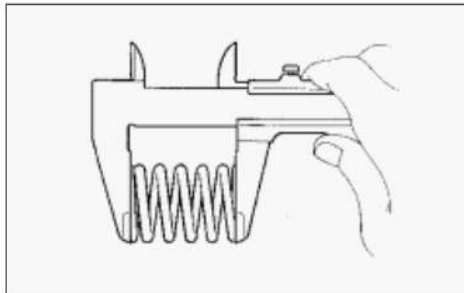
(b) Connect the 3 exhaust pipe supports to install the center exhaust pipe.

(c) Install the 2 bolts.

Torque: 43 N·m (438 kgf·cm, 32ft·lbf)



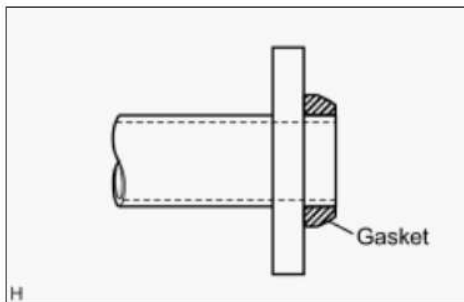
3. INSTALL TAILPIPE ASSEMBLY



- (a) Using a vernier caliper, measure the free length of the compression spring.

Minimum length:
38.5 mm (1.52 in.)

If the length is less than the minimum, replace the compression spring.



- (b) Install a new gasket by hand so that its surface is flush with the center exhaust pipe.

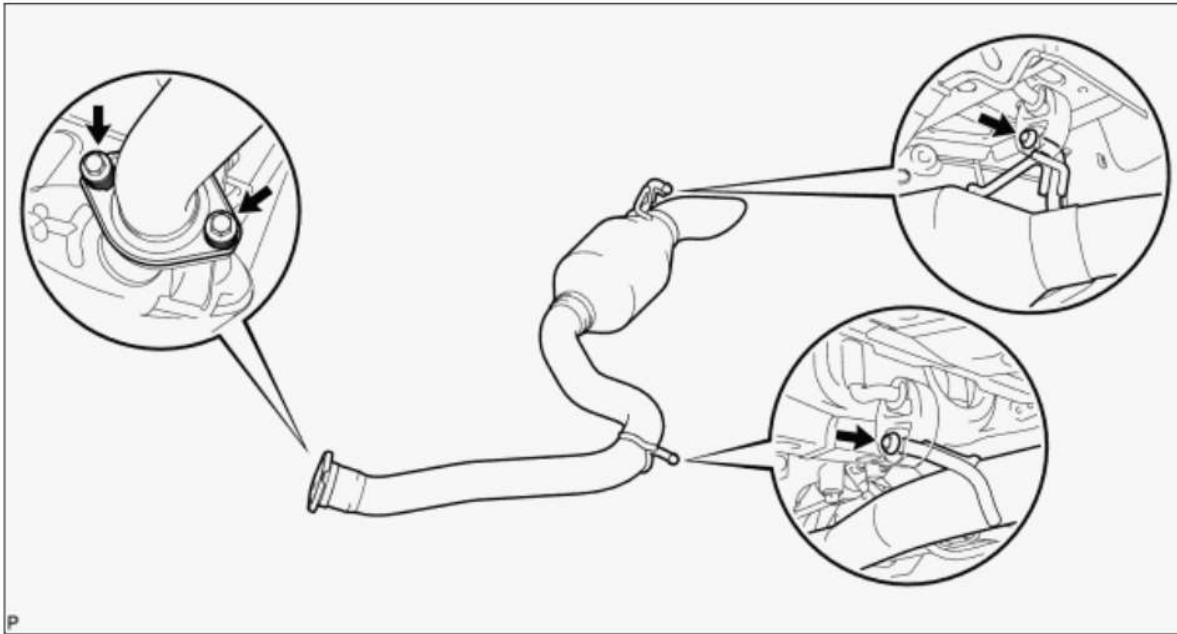
NOTICE:

- Make sure the gasket is facing the correct direction.
- Do not reuse the removed gasket.
- Do not push in the gasket while installing the tailpipe.

- (c) Connect the 2 exhaust pipe supports to install the tailpipe.

- (d) Install the 2 compression springs and 2 bolts.

Torque: 43 N·m (438 kgf·cm, 32ft·lbf)

**4. INSTALL HEATED OXYGEN SENSOR (for Bank 1 Sensor 2)**

INFO

5. CONNECT CABLE TO NEGATIVE BATTERY TERMINAL**6. INSPECT FOR EXHAUST GAS LEAK**

If gas is leaking, tighten the areas necessary to stop the leak. Replace damaged parts as necessary.



Last Modified: 9-7-2011	6.4 A	From: 201008
Model Year: 2011	Model: RAV4	Doc ID: RM000001XBN01YX
Title: 2AR-FE EXHAUST: EXHAUST PIPE: REMOVAL (2011 RAV4)		

REMOVAL

1. DISCONNECT CABLE FROM NEGATIVE BATTERY TERMINAL

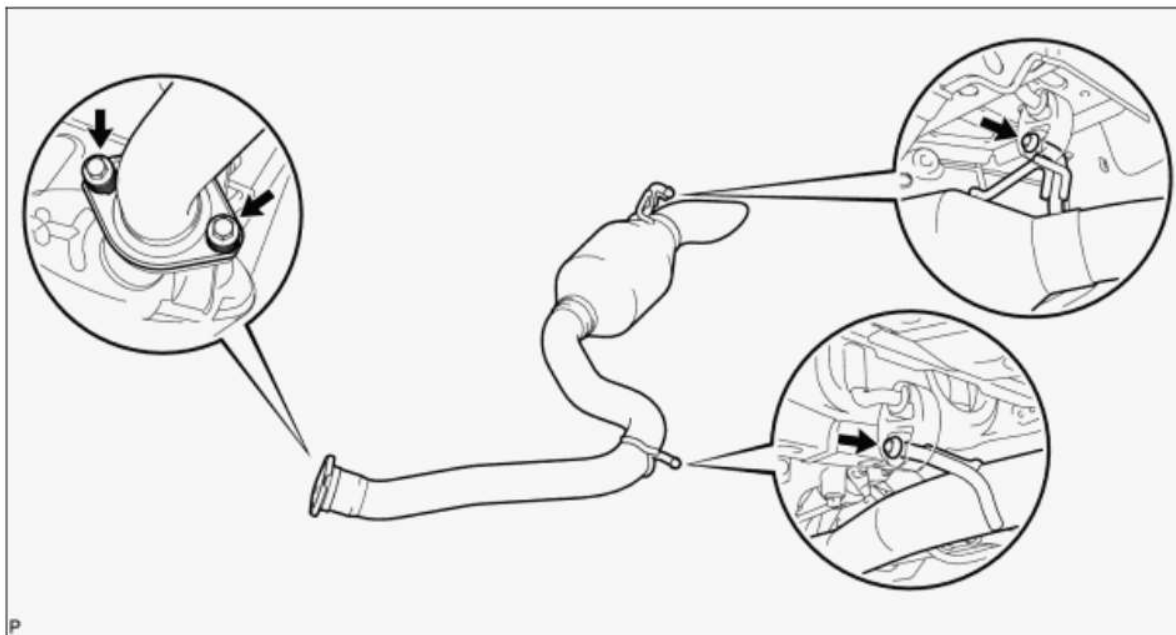
CAUTION:

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

2. REMOVE HEATED OXYGEN SENSOR (for Bank 1 Sensor 2) INFO

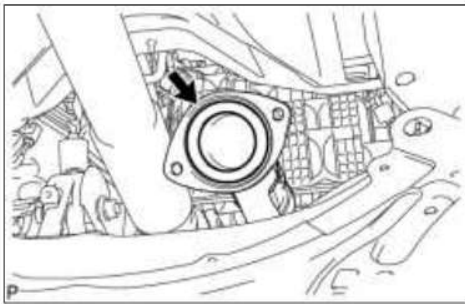
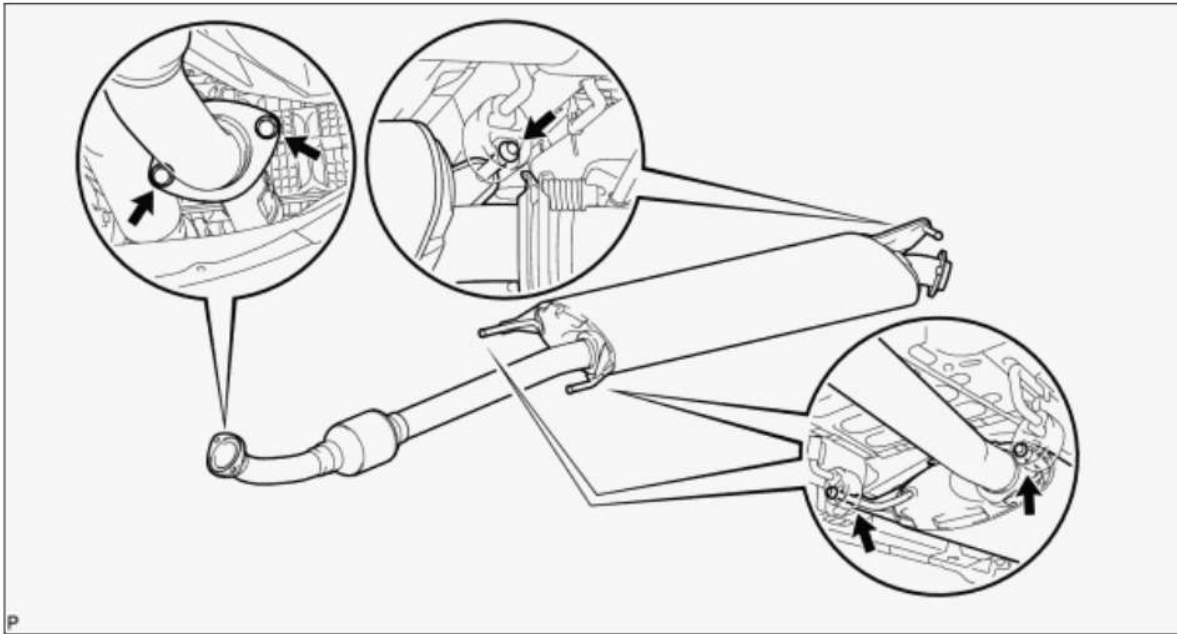
3. REMOVE TAILPIPE ASSEMBLY

- (a) Remove the 2 bolts and 2 compression springs.
- (b) Disconnect the 2 exhaust pipe supports and remove the tailpipe.
- (c) Remove the gasket from the center exhaust pipe.



4. REMOVE CENTER EXHAUST PIPE ASSEMBLY

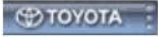
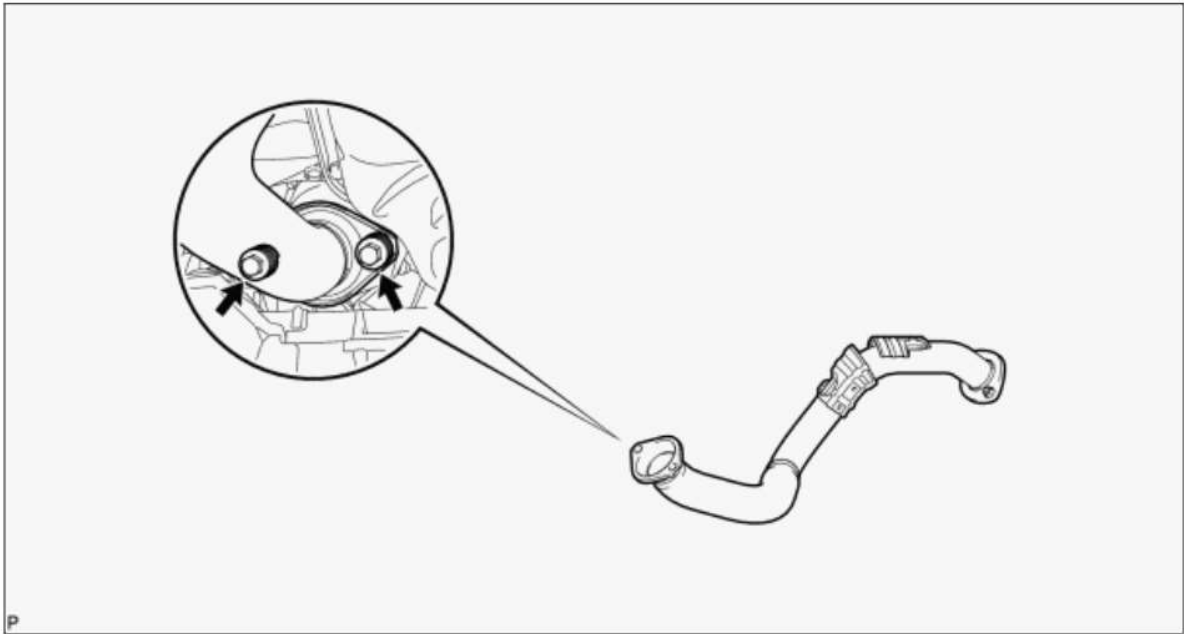
- (a) Remove the 2 bolts.
- (b) Disconnect the 3 exhaust pipe supports and remove the center exhaust pipe.



(c) Remove the gasket from the front exhaust pipe.

5. REMOVE FRONT EXHAUST PIPE ASSEMBLY

- (a) Remove the 2 bolts, 2 compression springs and front exhaust pipe.
- (b) Remove the gasket from the exhaust manifold converter.

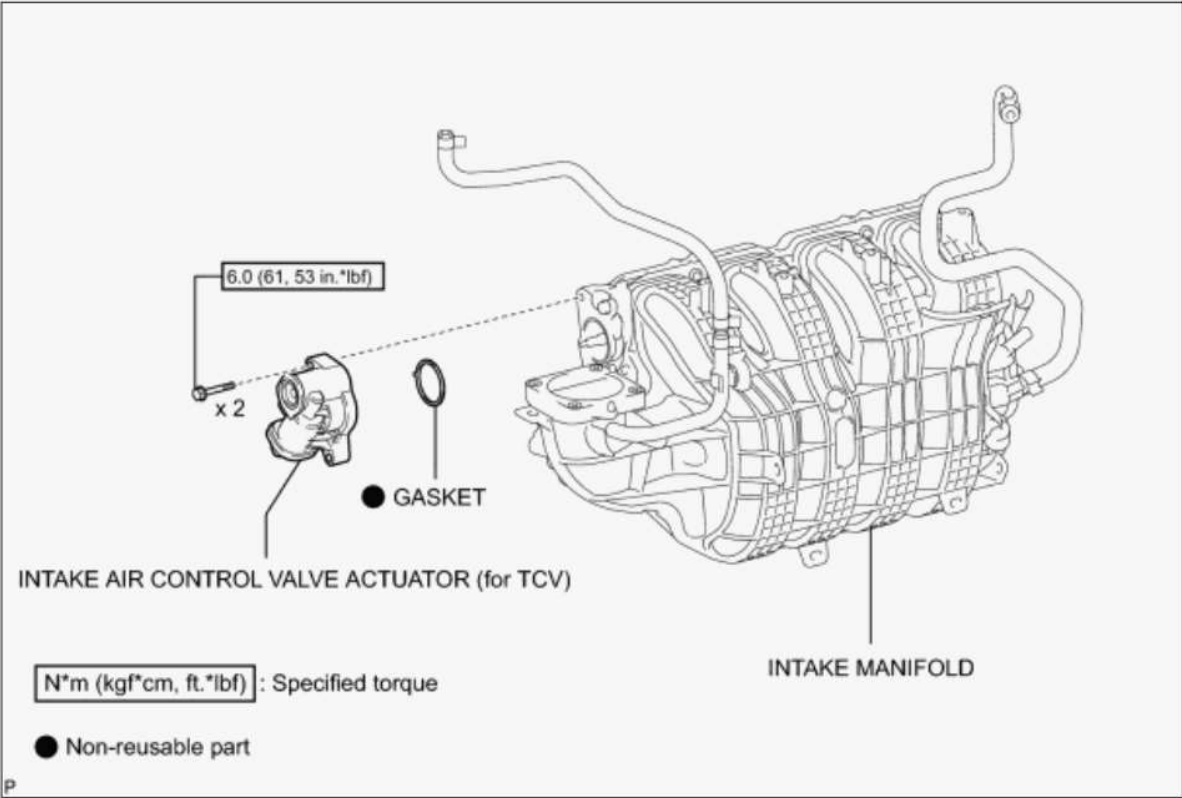


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Last Modified: 9-7-2011	6.4 K	From: 201008
Model Year: 2011	Model: RAV4	Doc ID: RM000002PR600UX
Title: 2AR-FE INTAKE: INTAKE AIR CONTROL VALVE ACTUATOR: COMPONENTS (2011 RAV4)		

COMPONENTS

ILLUSTRATION



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Last Modified: 9-7-2011	6.4 G	From: 201008
Model Year: 2011	Model: RAV4	Doc ID: RM000002PR500UX
Title: 2AR-FE INTAKE: INTAKE AIR CONTROL VALVE ACTUATOR: INSPECTION (2011 RAV4)		

INSPECTION

1. INSPECT INTAKE AIR CONTROL VALVE ACTUATOR (for TCV)

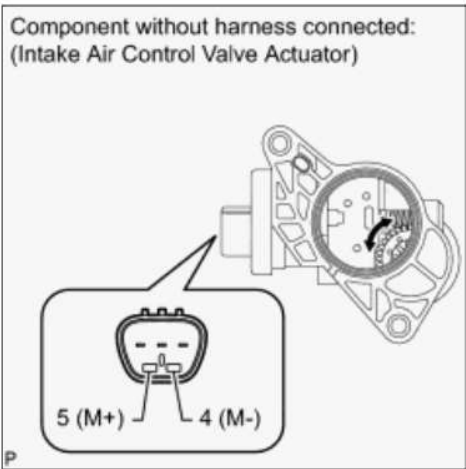
(a) Check the intake air control valve actuator operation.

(1) Check that the motor operates when the battery is connected to the terminals of the intake air control valve actuator.

NOTICE:

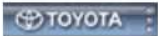
If the positive and negative battery leads contact the terminals for the sensor, the actuator may be damaged.

Standard:



TESTER CONNECTION	SPECIFIED CONDITION
Positive battery voltage applied to terminal 4 (M-), and negative battery voltage applied to terminal 5 (M+)	Motor rotates clockwise
Positive battery voltage applied to terminal 5 (M+), and negative battery voltage applied to terminal 4 (M-)	Motor rotates counterclockwise

If the result is not as specified, replace the intake air control valve actuator.



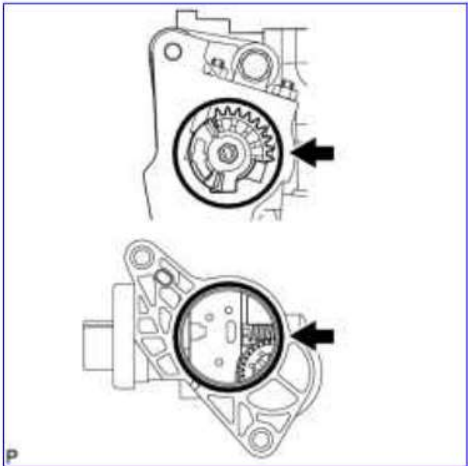
Last Modified: 9-7-2011	6.4 A	From: 201008
Model Year: 2011	Model: RAV4	Doc ID: RM000002PR400XX
Title: 2AR-FE INTAKE: INTAKE AIR CONTROL VALVE ACTUATOR: INSTALLATION (2011 RAV4)		

INSTALLATION

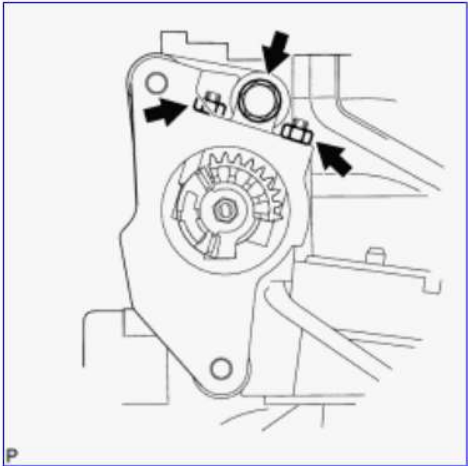
1. INSTALL INTAKE AIR CONTROL VALVE ACTUATOR (for TCV)

NOTICE:

- Make sure that foreign matter, such as water, oil, sand and iron particles, does not enter the gear chamber or actuator at the locations marked by the circles in the illustration.



- Do not loosen or remove the bolt and 2 nuts shown in the illustration.

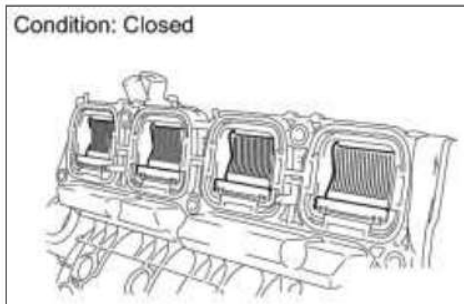


(a) Close the tumble control valves.

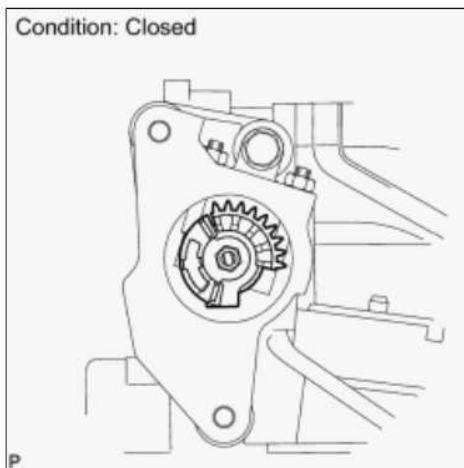
HINT:

If the tumble control valves are not closed, close them by hand.

Condition: Closed



Condition: Closed



- (b) Check that the gear of the tumble control valve is in the position shown in the illustration.

HINT:

Turn the gear clockwise until it contacts the stopper.

- (c) Install a new gasket to the intake air control valve actuator.

- (d) Install the intake air control valve actuator to the intake manifold with the 2 bolts.

Torque: 6.0 N·m (61 kgf·cm, 53in·lbf)

NOTICE:

- If excessive force is applied to the gear in the direction of rotation when installing the actuator, the valves and actuator may be damaged.
- After installing the actuator, make sure the ends of the valves are not protruding from the surface where the intake manifold is installed. If the valves are protruding, remove the reinstall the actuator.

2. INSTALL INTAKE MANIFOLD

- (a) Install the intake manifold INFO.



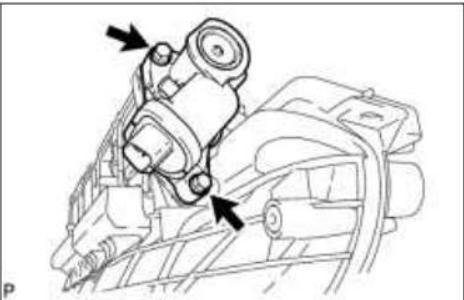
Last Modified: 9-7-2011	6.4 A	From: 201008
Model Year: 2011	Model: RAV4	Doc ID: RM000002PR700XX
Title: 2AR-FE INTAKE: INTAKE AIR CONTROL VALVE ACTUATOR: REMOVAL (2011 RAV4)		

REMOVAL

1. REMOVE INTAKE MANIFOLD

(a) Remove the intake manifold INFO .

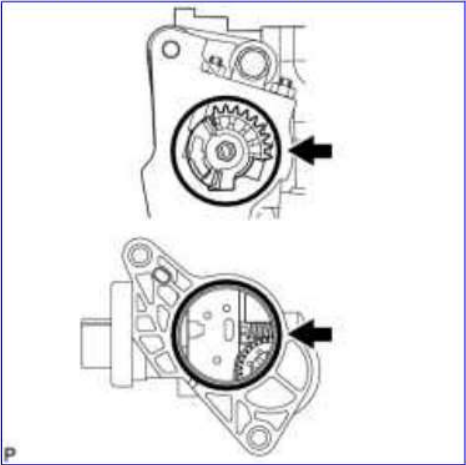
2. REMOVE INTAKE AIR CONTROL VALVE ACTUATOR (for TCV)



(a) Remove the 2 bolts, intake air control valve actuator and gasket from the intake manifold.

NOTICE:

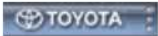
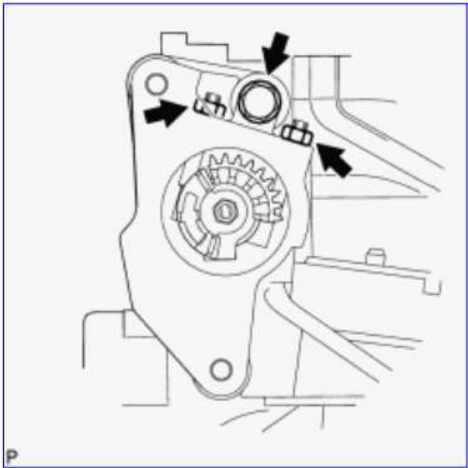
- Make sure that foreign matter, such as water, oil, sand and iron particles, does not enter the gear chamber or actuator at the locations marked by the circles in the illustration.



- Do not loosen or remove the bolt and 2 nuts shown in the illustration.

2AR-FE INTAKE: INTAKE AIR CONTROL VALVE ACTUATOR: ...

<https://techinfo.toyota.com/t3Portal/document/rm/RM16B0U/xhtml/RM...>

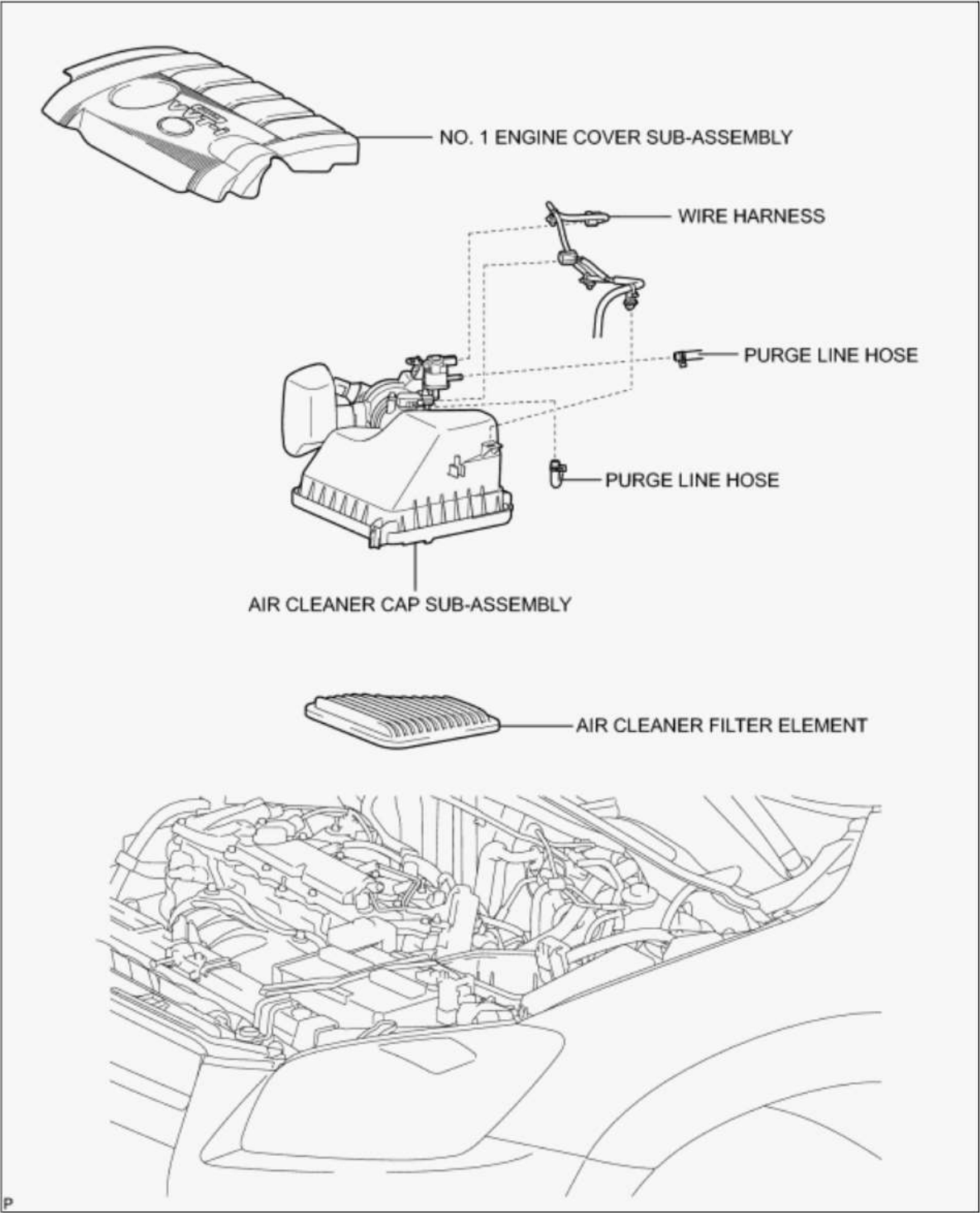


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Last Modified: 9-7-2011	6.4 K	From: 201008
Model Year: 2011	Model: RAV4	Doc ID: RM0000017UH026X
Title: 2AR-FE INTAKE: INTAKE MANIFOLD: COMPONENTS (2011 RAV4)		

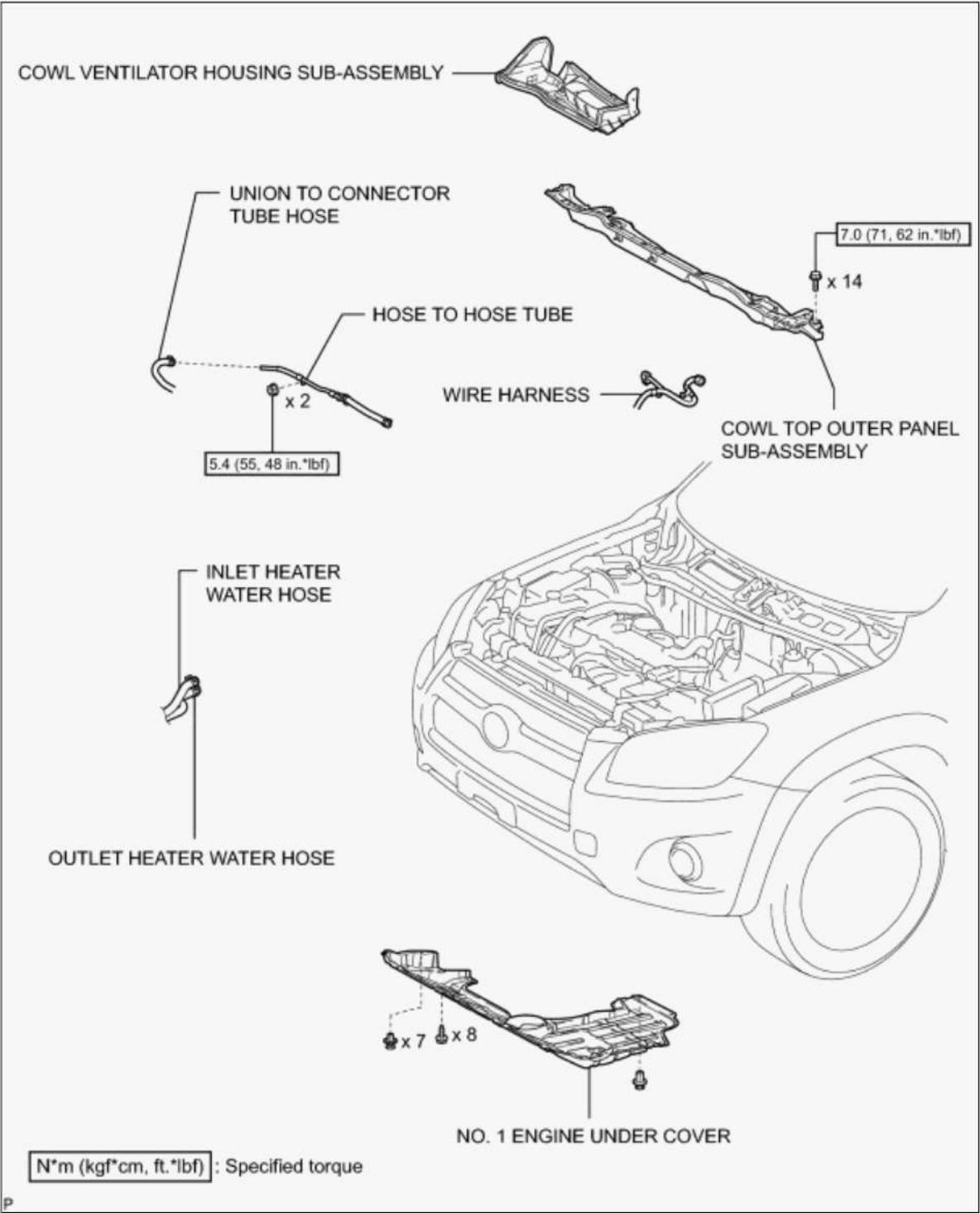
COMPONENTS

ILLUSTRATION

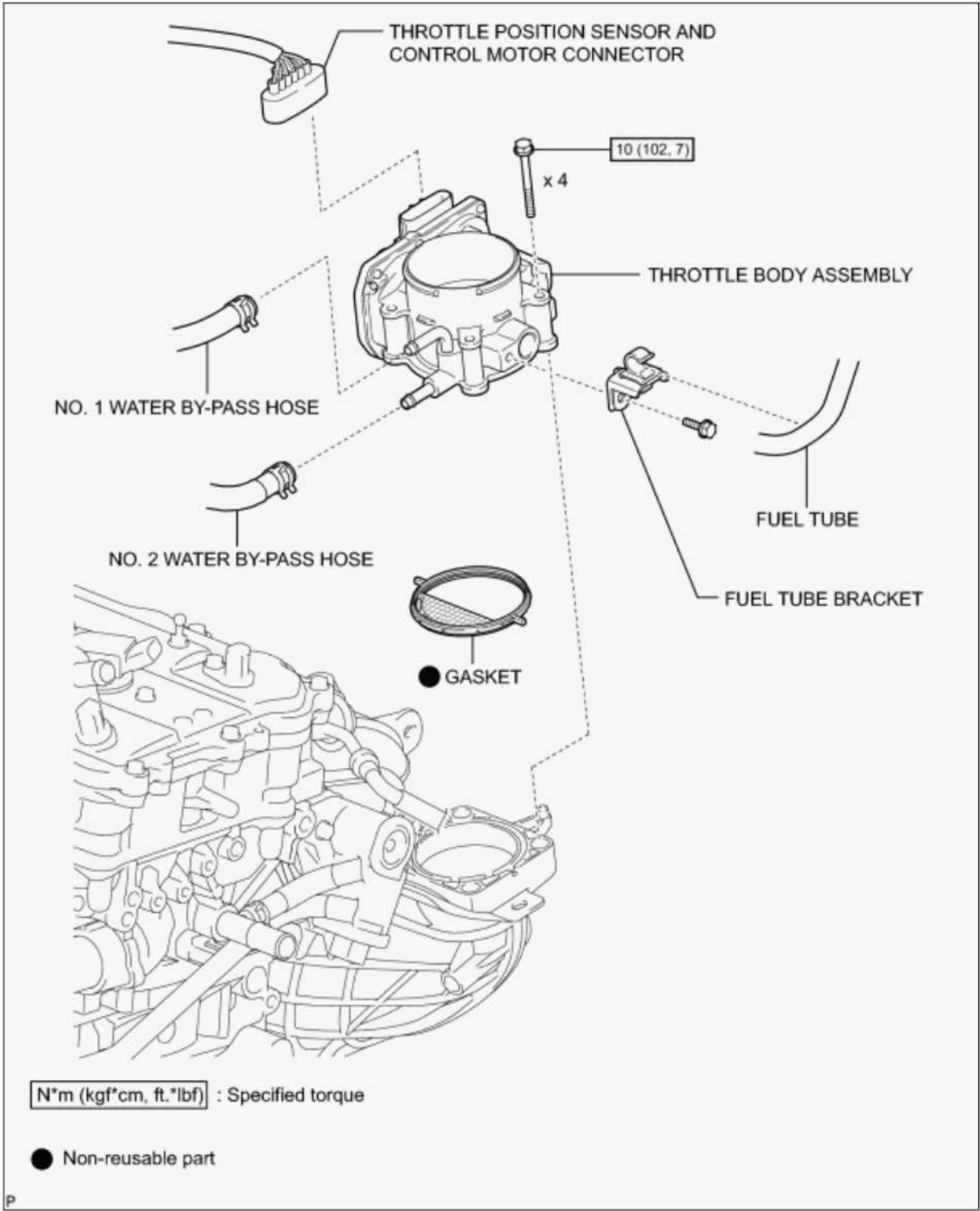


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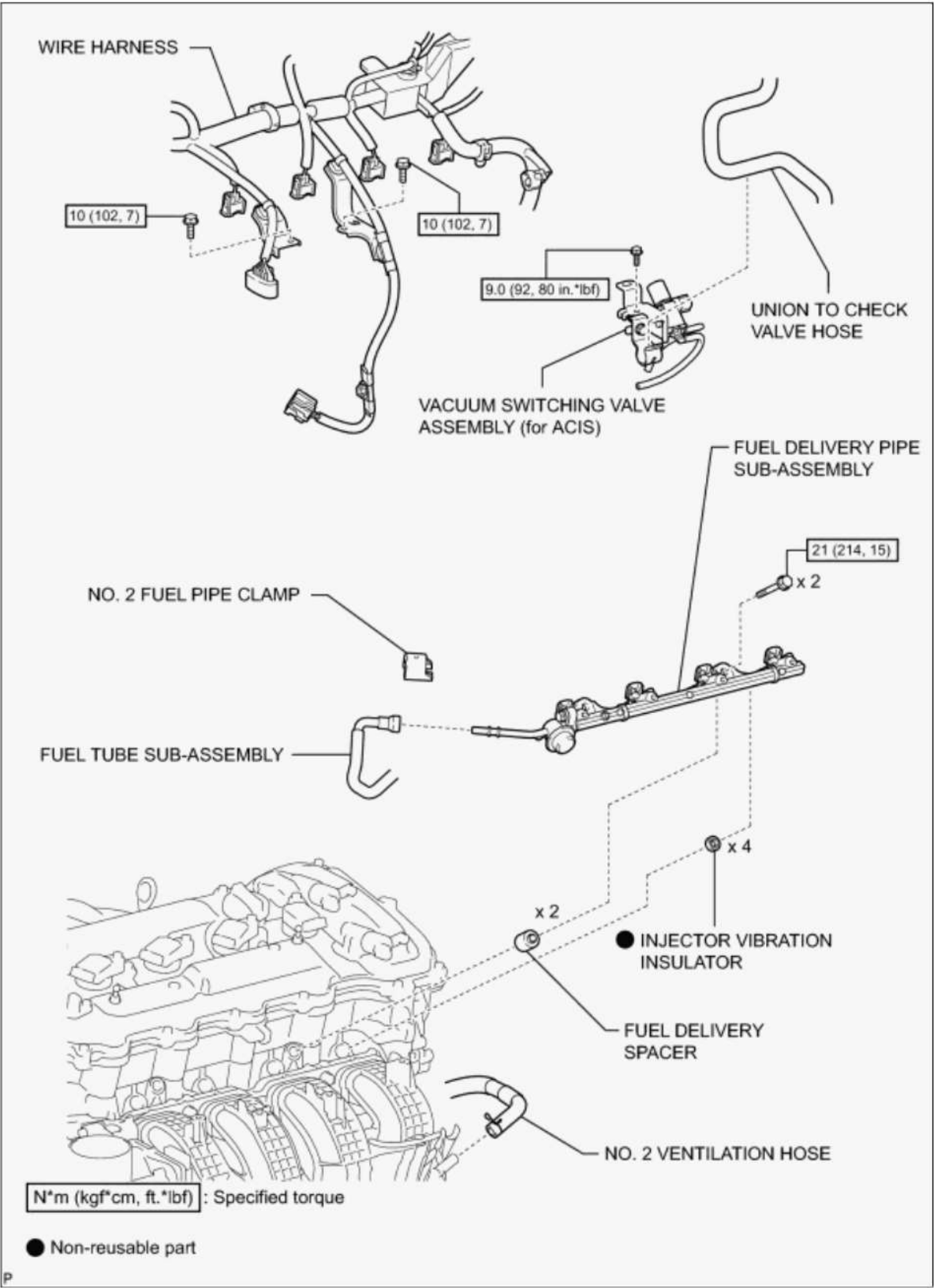
ILLUSTRATION



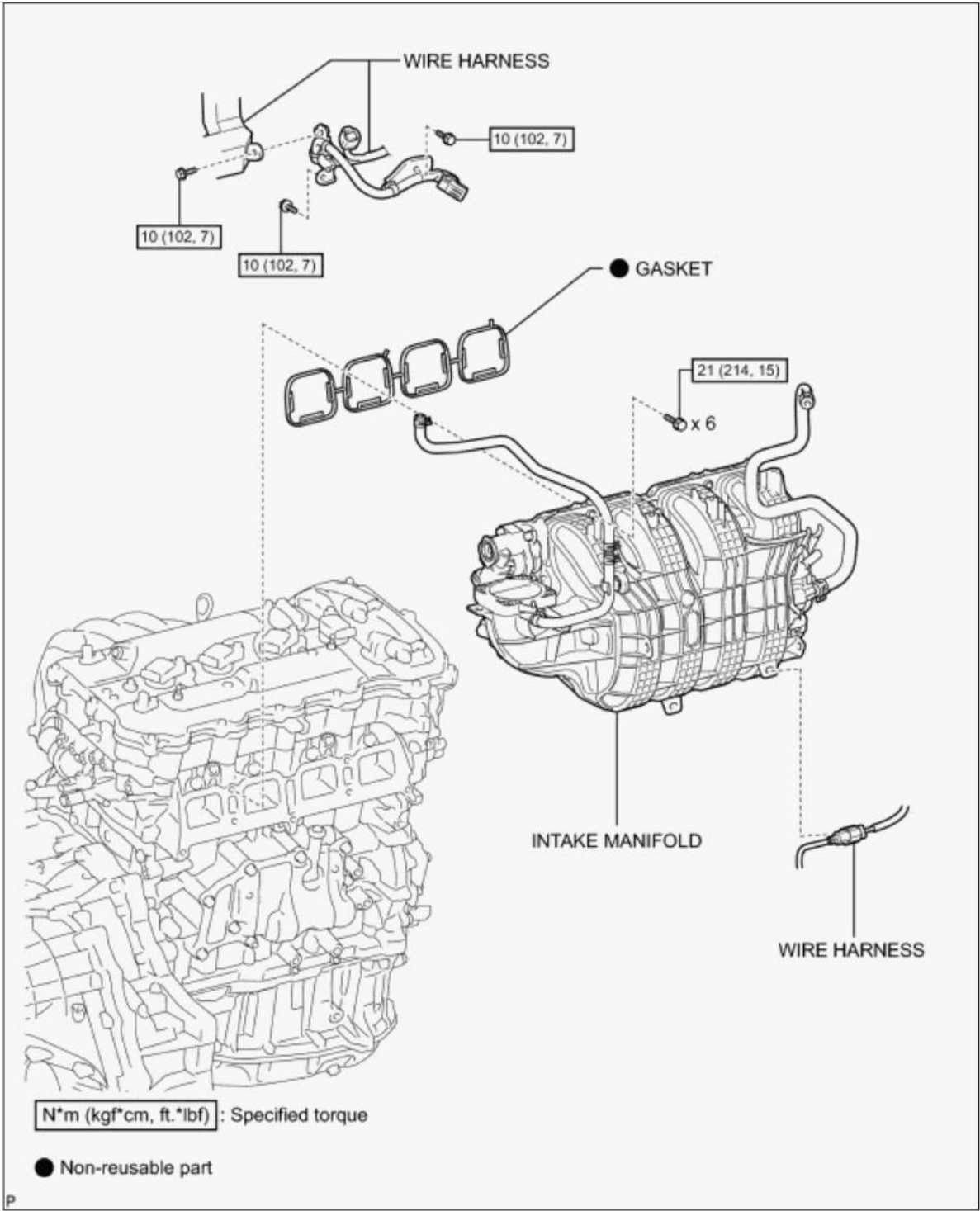
ILLUSTRATION



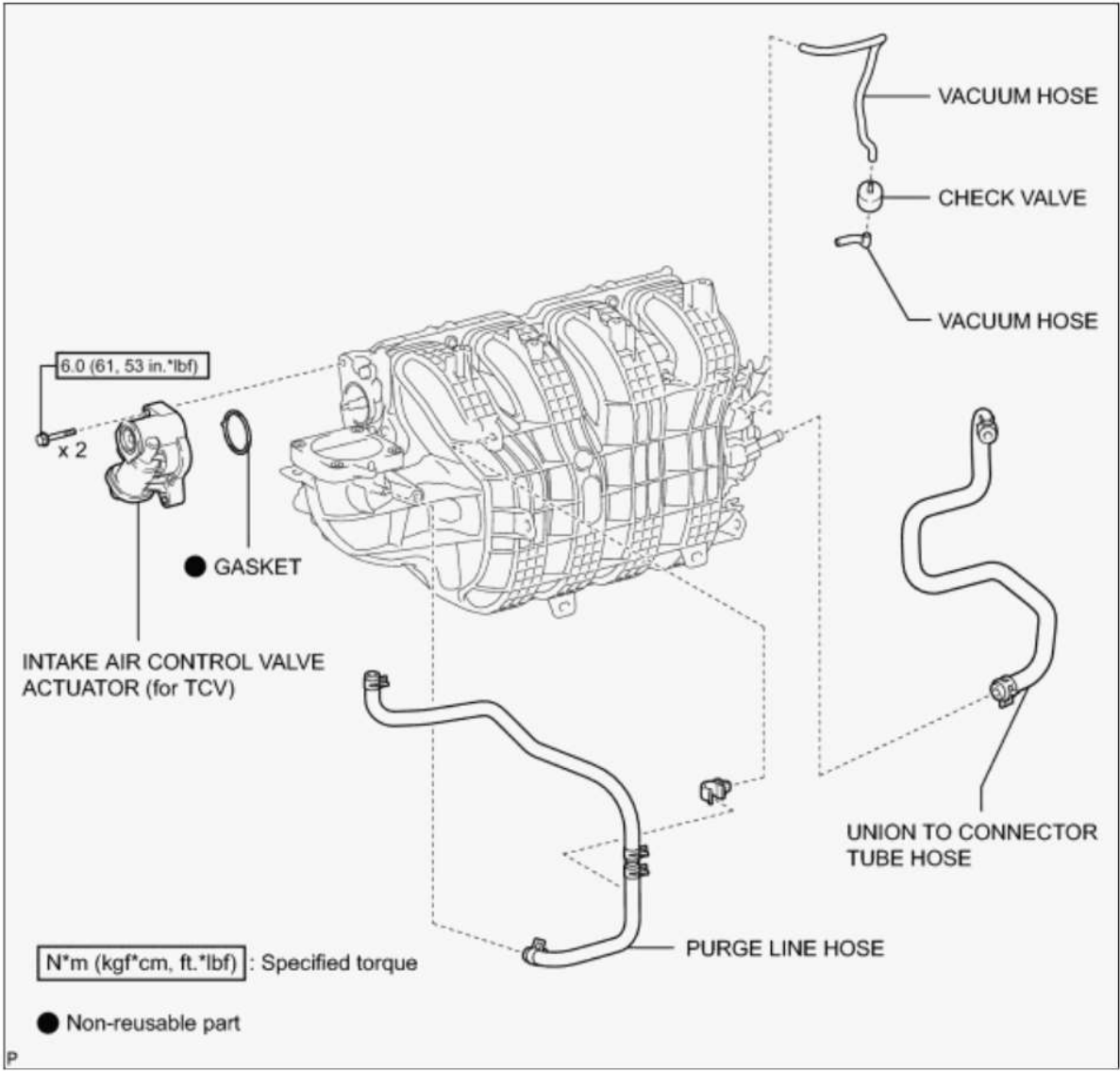
ILLUSTRATION



ILLUSTRATION



ILLUSTRATION

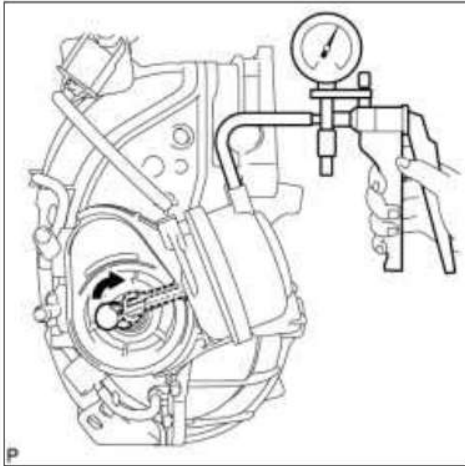


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Last Modified: 9-7-2011	6.4 G	From: 201008
Model Year: 2011	Model: RAV4	Doc ID: RM000003PKR00EX
Title: 2AR-FE INTAKE: INTAKE MANIFOLD: INSPECTION (2011 RAV4)		

INSPECTION

1. INSPECT INTAKE AIR CONTROL VALVE



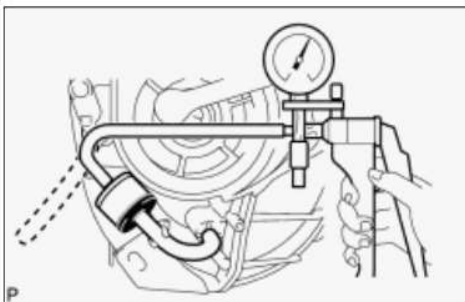
(a) Inspect the diaphragm.

- (1) Using a vacuum pump, apply a vacuum of 60 kPa (450 mmHg, 17.7 in.Hg) or higher to the diaphragm chamber. Wait for 1 minute and check that the needle of the vacuum pump does not lower.

If the result is not as specified, replace the intake manifold.

(b) After applying vacuum in the step above, check that the actuator rod operates.

2. INSPECT VACUUM TANK AND CHECK VALVE



(a) Disconnect the vacuum hose from the check valve.

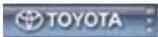
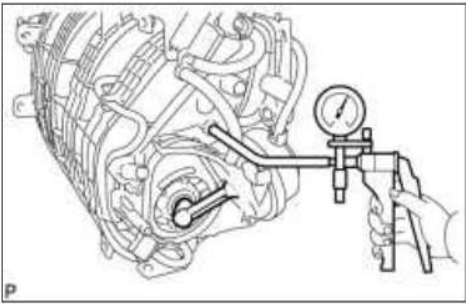
- (b) Using a vacuum pump, apply vacuum to the check valve. Wait 1 minute and check that the needle of the vacuum pump does not lower.

If the result is not as specified, replace the check valve.

(c) Connect the vacuum hose to the check valve.

- (d) Using a vacuum pump, apply a vacuum of 60 kPa (450 mmHg, 17.7 in.Hg) or higher to the vacuum tank. Wait 1 minute and check that the needle of the vacuum pump does not lower.

If the result is not as specified, replace the intake manifold.



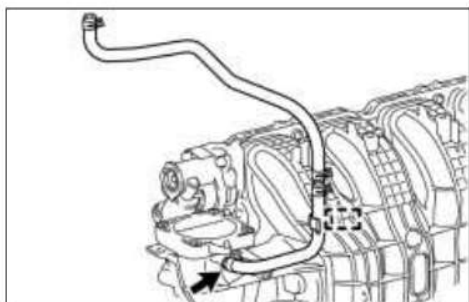
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Last Modified: 9-7-2011	6.4 A	From: 201008
Model Year: 2011	Model: RAV4	Doc ID: RM0000017UF04ZX
Title: 2AR-FE INTAKE: INTAKE MANIFOLD: INSTALLATION (2011 RAV4)		

INSTALLATION

1. INSTALL INTAKE AIR CONTROL VALVE ACTUATOR (for TCV) INFO

2. INSTALL PURGE LINE HOSE

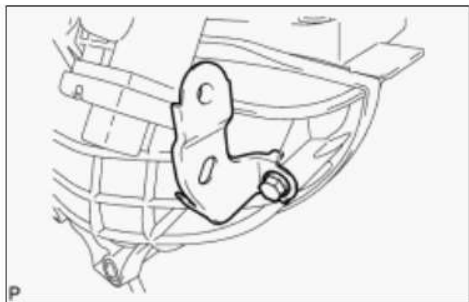


(a) Attach the clamp to the intake manifold.

(b) Install the purge line hose to the intake manifold.

(c) Connect the purge line hose to the clamp.

3. INSTALL WIRING HARNESS CLAMP BRACKET



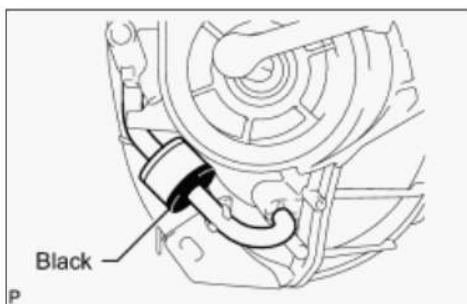
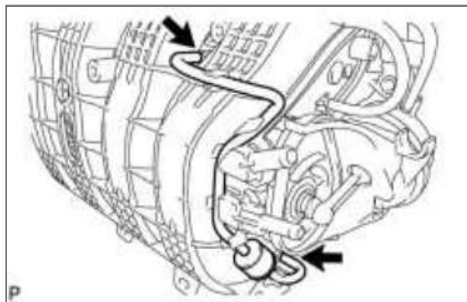
(a) Install the bracket with the bolt.

Torque: 10 N·m (102 kgf·cm, 7ft·lbf)

4. INSTALL CHECK VALVE

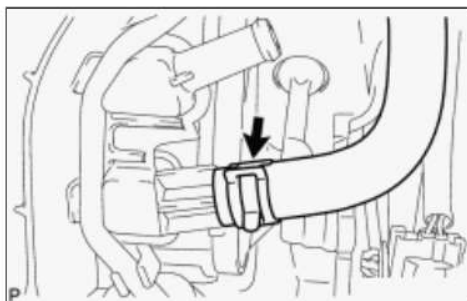
(a) Install the 2 vacuum hoses to the check valve.

(b) Connect the 2 vacuum hoses to the intake manifold to install the check valve.



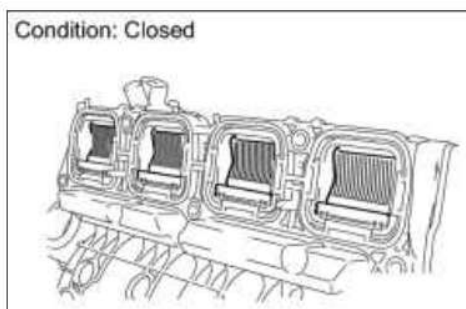
(c) Check that the check valve is installed as shown in the illustration.

5. INSTALL UNION TO CONNECTOR TUBE HOSE



(a) Install the union to connector tube hose to the intake manifold.

6. INSTALL INTAKE MANIFOLD



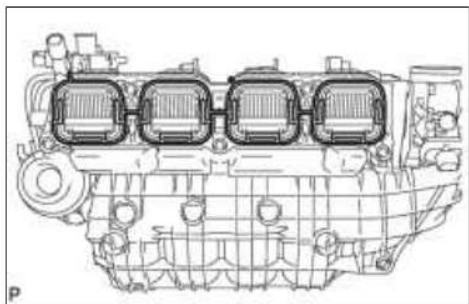
(a) Close the tumble control valves.

NOTICE:

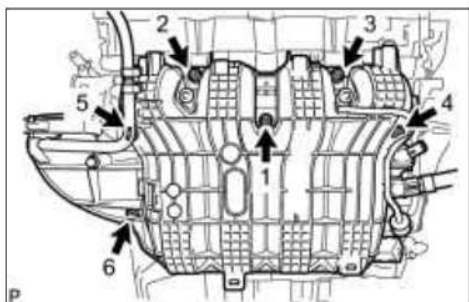
The valves may be damaged if they are not closed before installing the intake manifold.

HINT:

Connect the battery to the terminals of the actuator and operate the motor to close the valves [INFO](#) .



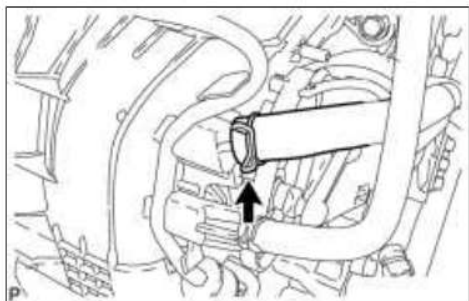
(b) Install a new gasket to the intake manifold.



(c) Install the intake manifold with the 6 bolts in the sequence shown in the illustration.

Torque: 21 N·m (214 kgf·cm, 15ft·lbf)

7. CONNECT NO. 2 VENTILATION HOSE



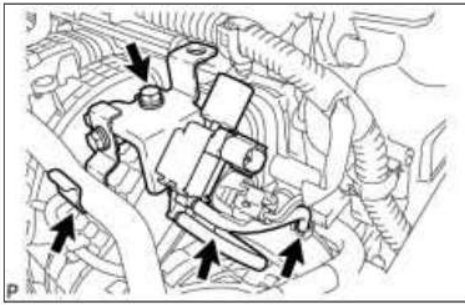
(a) Connect the No. 2 ventilation hose to the intake manifold.

8. INSTALL FUEL DELIVERY PIPE SUB-ASSEMBLY INFO

9. INSTALL VACUUM SWITCHING VALVE ASSEMBLY (for ACIS)

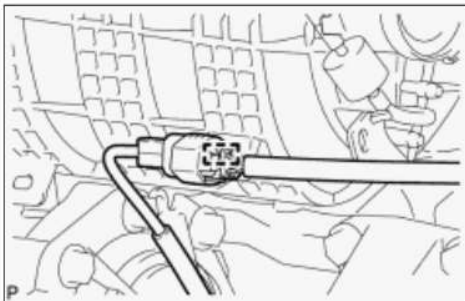
(a) Install the vacuum switching valve with the bolt.

Torque: 9.0 N·m (92 kgf·cm, 80in·lbf)

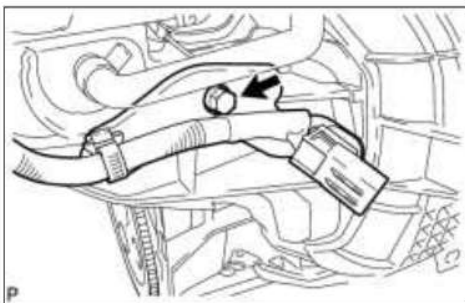


(b) Connect the 2 vacuum hoses and union to connector tube hose.

10. CONNECT WIRE HARNESS

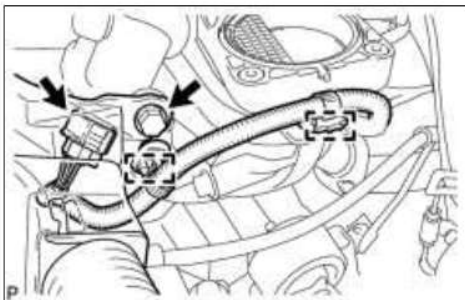


(a) Attach the clamp and wire harness.



(b) Install the bracket with the bolt.

Torque: 10 N·m (102 kgf·cm, 7ft·lbf)

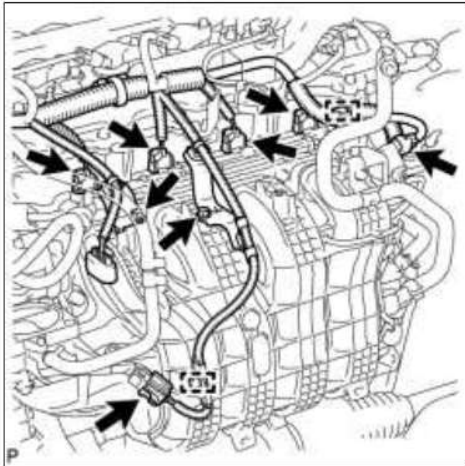


(c) Connect the intake air control actuator connector.

(d) Attach the 2 clamps to the intake manifold and bracket.

(e) Install the wire harness with the bolt.

Torque: 10 N·m (102 kgf·cm, 7ft·lbf)



(f) Attach the 2 clamps.

(g) Connect the 2 wire harness brackets with the 2 bolts.

Torque: 10 N·m (102 kgf·cm, 7ft·lbf)

(h) Connect the 2 connectors.

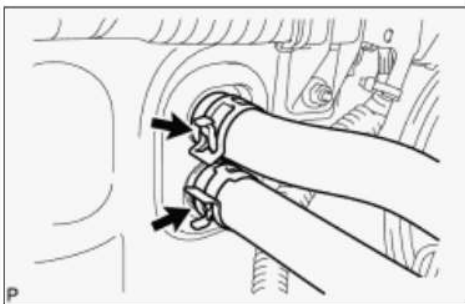
(i) Connect the 4 injector connectors.

11. INSTALL FUEL TUBE SUB-ASSEMBLY INFO

12. INSTALL THROTTLE BODY ASSEMBLY INFO

13. INSTALL AIR CLEANER CAP SUB-ASSEMBLY INFO

14. CONNECT HEATER HOSE



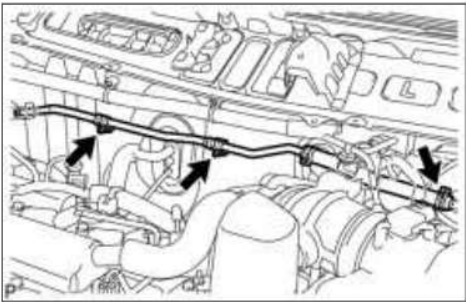
(a) Connect the outlet heater water hose to the water by-pass pipe and heater radiator unit.

(b) Connect the inlet heater water hose to the cylinder head and heater radiator unit.

15. INSTALL HOSE TO HOSE TUBE

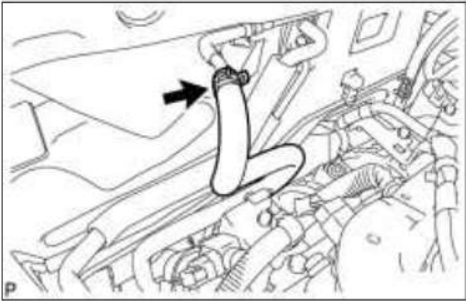
(a) Install the tube with the 2 nuts.

Torque: 5.4 N·m (55 kgf·cm, 48in·lbf)



(b) Connect the hose.

16. CONNECT UNION TO CONNECTOR TUBE HOSE

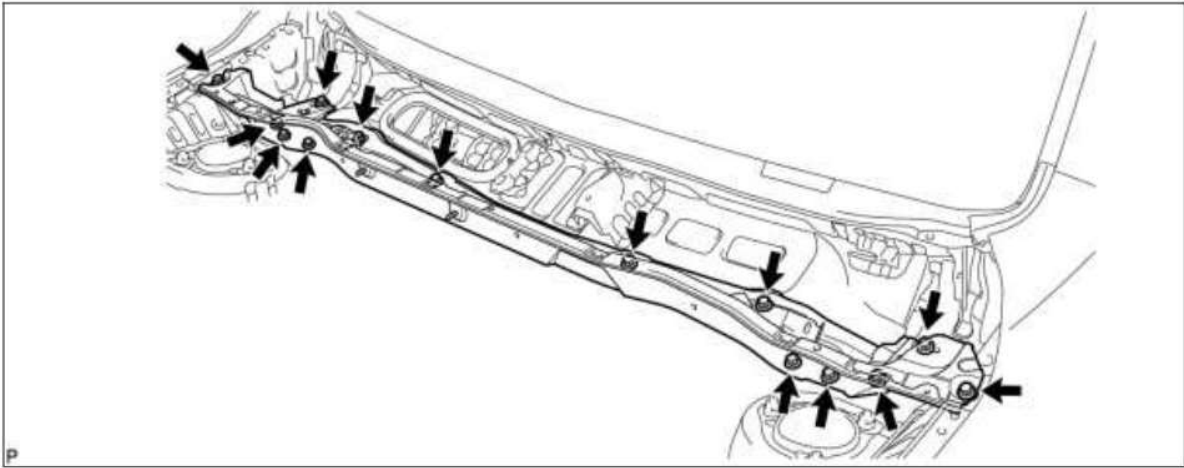


(a) Connect the union to connector tube hose to the tube.

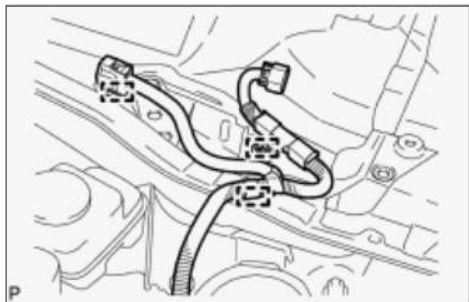
17. INSTALL COWL TOP OUTER PANEL SUB-ASSEMBLY

(a) Install the cowl top outer panel with the 14 bolts.

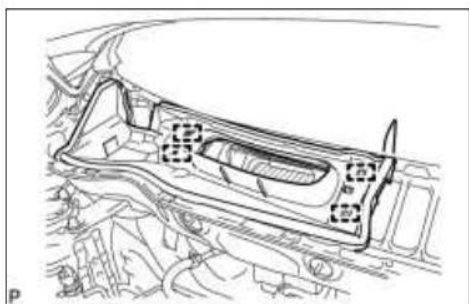
Torque: 7.0 N·m (71 kgf·cm, 62in·lbf)



(b) Attach the 3 clamps.



18. INSTALL COWL VENTILATOR HOUSING SUB-ASSEMBLY



(a) Attach the 4 clamps to install the cowl ventilator housing.

19. INSTALL FRONT WIPER MOTOR AND LINK

(a) Install the front wiper motor and link [INFO](#) .

20. CONNECT CABLE TO NEGATIVE BATTERY TERMINAL

21. ADD ENGINE COOLANT [INFO](#)

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

23. INSPECT FOR FUEL LEAK [INFO](#)

24. INSTALL NO. 1 ENGINE UNDER COVER [INFO](#)

25. INSTALL NO. 1 ENGINE COVER SUB-ASSEMBLY [INFO](#)



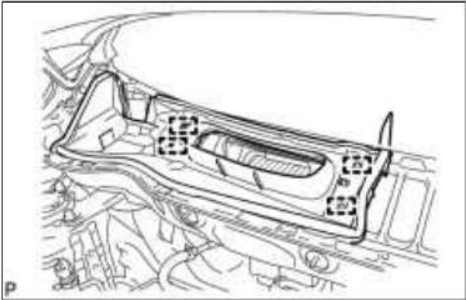
Last Modified: 9-7-2011	6.4 A	From: 201008
Model Year: 2011	Model: RAV4	Doc ID: RM0000017UI051X
Title: 2AR-FE INTAKE: INTAKE MANIFOLD: REMOVAL (2011 RAV4)		

REMOVAL

1. DISCHARGE FUEL SYSTEM PRESSURE
2. REMOVE NO. 1 ENGINE UNDER COVER
3. DRAIN ENGINE COOLANT
4. DISCONNECT CABLE FROM NEGATIVE BATTERY TERMINAL

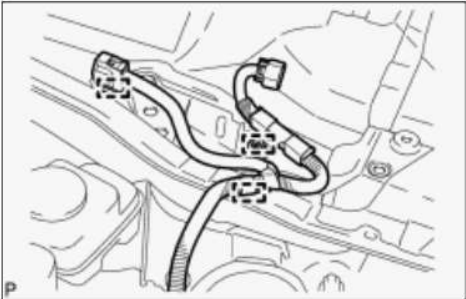
CAUTION:
Wait at least 90 seconds after disconnecting the cable from the negative (-) battery terminal to disable the SRS system.

5. REMOVE FRONT WIPER MOTOR AND LINK
- (a) Remove the front wiper motor and link .
6. REMOVE COWL VENTILATOR HOUSING SUB-ASSEMBLY



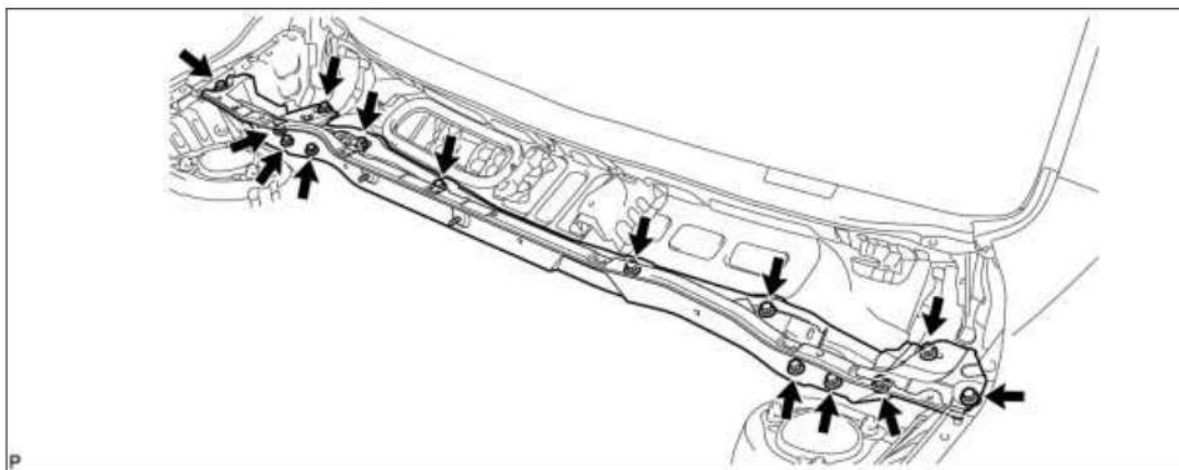
(a) Detach the 4 clamps and remove the cowl ventilator housing.

7. REMOVE COWL TOP OUTER PANEL SUB-ASSEMBLY

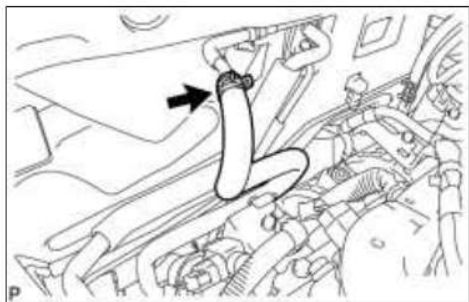


(a) Detach the 3 clamps and disconnect the wire harness.

(b) Remove the 14 bolts and cowl top outer panel.

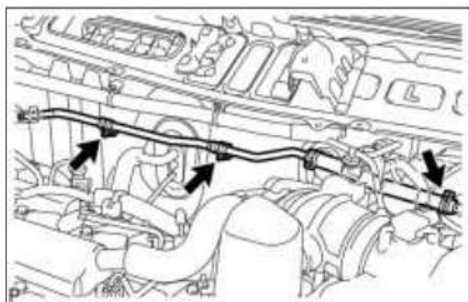


8. DISCONNECT UNION TO CONNECTOR TUBE HOSE



(a) Disconnect the union to connector tube hose from the tube.

9. REMOVE HOSE TO HOSE TUBE

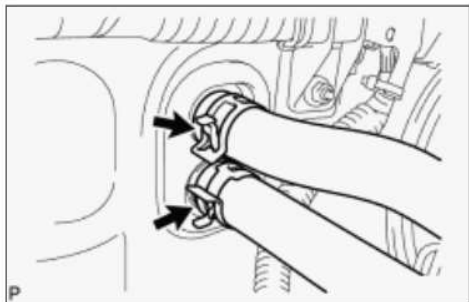


(a) Disconnect the hose.

(b) Remove the 2 nuts and tube.

10. DISCONNECT HEATER HOSE

(a) Disconnect the inlet heater water hose from the heater radiator unit and cylinder head.



(b) Disconnect the outlet heater water hose from the heater radiator unit and water by-pass pipe.

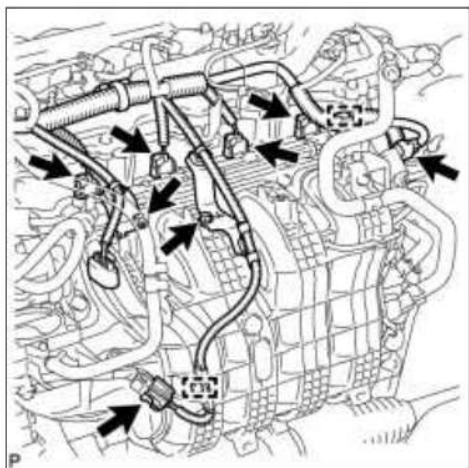
11. REMOVE NO. 1 ENGINE COVER SUB-ASSEMBLY INFO

12. REMOVE AIR CLEANER CAP SUB-ASSEMBLY INFO

13. REMOVE THROTTLE BODY ASSEMBLY INFO

14. DISCONNECT FUEL TUBE SUB-ASSEMBLY INFO

15. DISCONNECT WIRE HARNESS



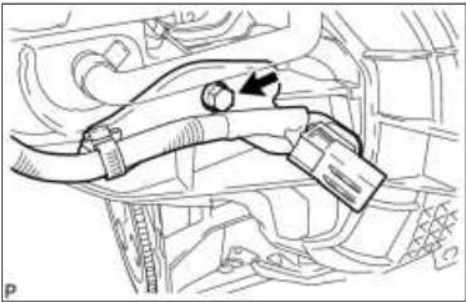
(a) Disconnect the 4 injector connectors.

(b) Disconnect the 2 connectors.

(c) Remove the 2 bolts and disconnect the 2 wire harness brackets.

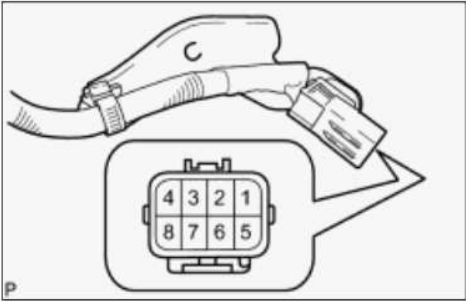
(d) Detach the 2 clamps.

(e) Remove the bolt and bracket.



(f) Apply battery voltage to the terminals of the connector to close the tumble control valves.

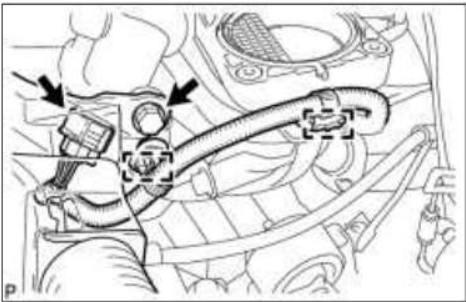
Standard:



TESTER CONNECTION	SPECIFIED CONDITION
Positive battery voltage applied to terminal 8 (M-), and negative battery voltage applied to terminal 4 (M+)	Open → Closed

NOTICE:

- If this procedure is not performed, the valves may be damaged when the intake manifold is removed.
- Apply battery voltage for 1 to 3 seconds.
- If battery voltage is applied for more than 3 seconds, the actuator may be damaged.
- Do not allow the lead wires to contact the other terminals.

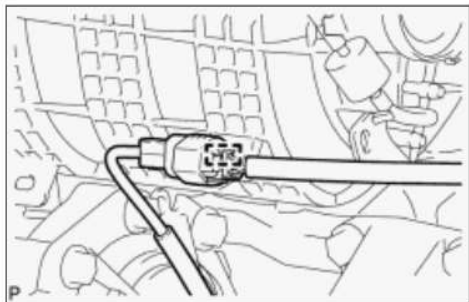


(g) Remove the bolt.

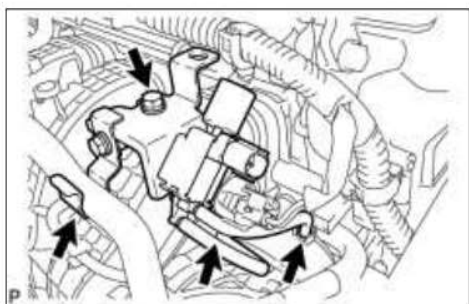
(h) Detach the 2 clamps from the intake manifold and bracket.

(i) Disconnect the intake air control valve actuator connector.

(j) Detach the clamp and wire harness.



16. REMOVE VACUUM SWITCHING VALVE ASSEMBLY (for ACIS)

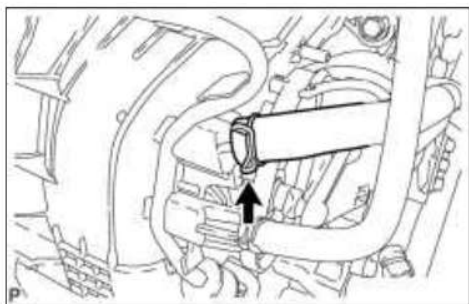


(a) Disconnect the 2 vacuum hoses and union to connector tube hose.

(b) Remove the bolt and vacuum switching valve assembly.

17. REMOVE FUEL DELIVERY PIPE SUB-ASSEMBLY INFO

18. DISCONNECT NO. 2 VENTILATION HOSE



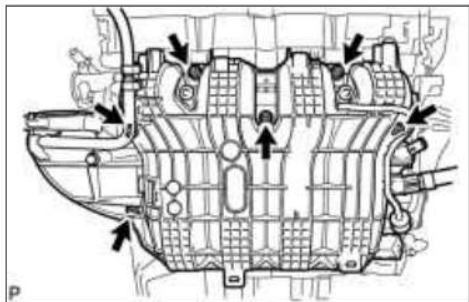
(a) Disconnect the No. 2 ventilation hose from the intake manifold.

19. REMOVE INTAKE MANIFOLD

(a) Remove the 6 bolts and intake manifold.

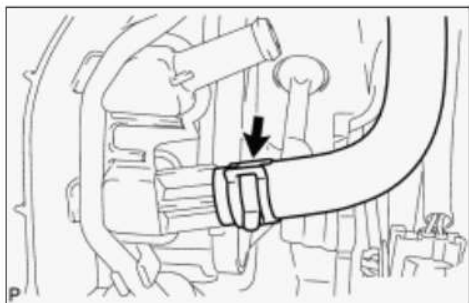
NOTICE:

The valves may be damaged if they are not closed before removing the intake manifold.



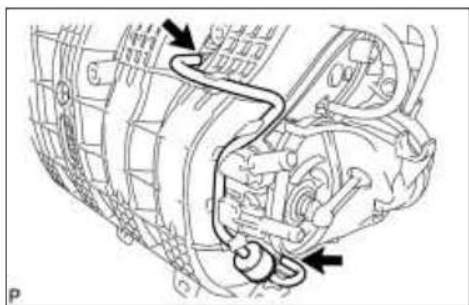
(b) Remove the gasket from the intake manifold.

20. REMOVE UNION TO CONNECTOR TUBE HOSE



(a) Remove the union to connector tube hose from the intake manifold.

21. REMOVE CHECK VALVE

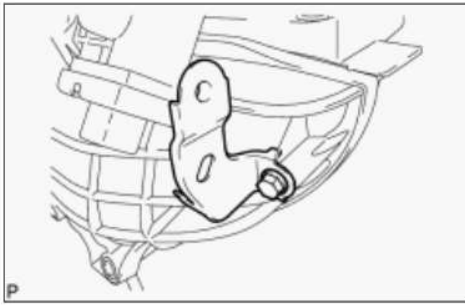


(a) Disconnect the 2 vacuum hoses from the intake manifold and remove the check valve.

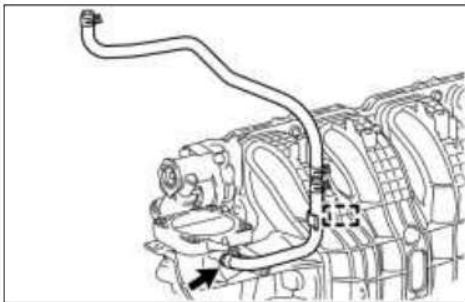
(b) Remove the 2 vacuum hoses from the check valve.

22. REMOVE WIRING HARNESS CLAMP BRACKET

(a) Remove the bolt and bracket.



23. REMOVE PURGE LINE HOSE

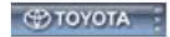


(a) Disconnect the purge line hose from the clamp.

(b) Remove the purge line hose from the intake manifold.

(c) Detach the clamp from the intake manifold.

24. REMOVE INTAKE AIR CONTROL VALVE ACTUATOR (for TCV)

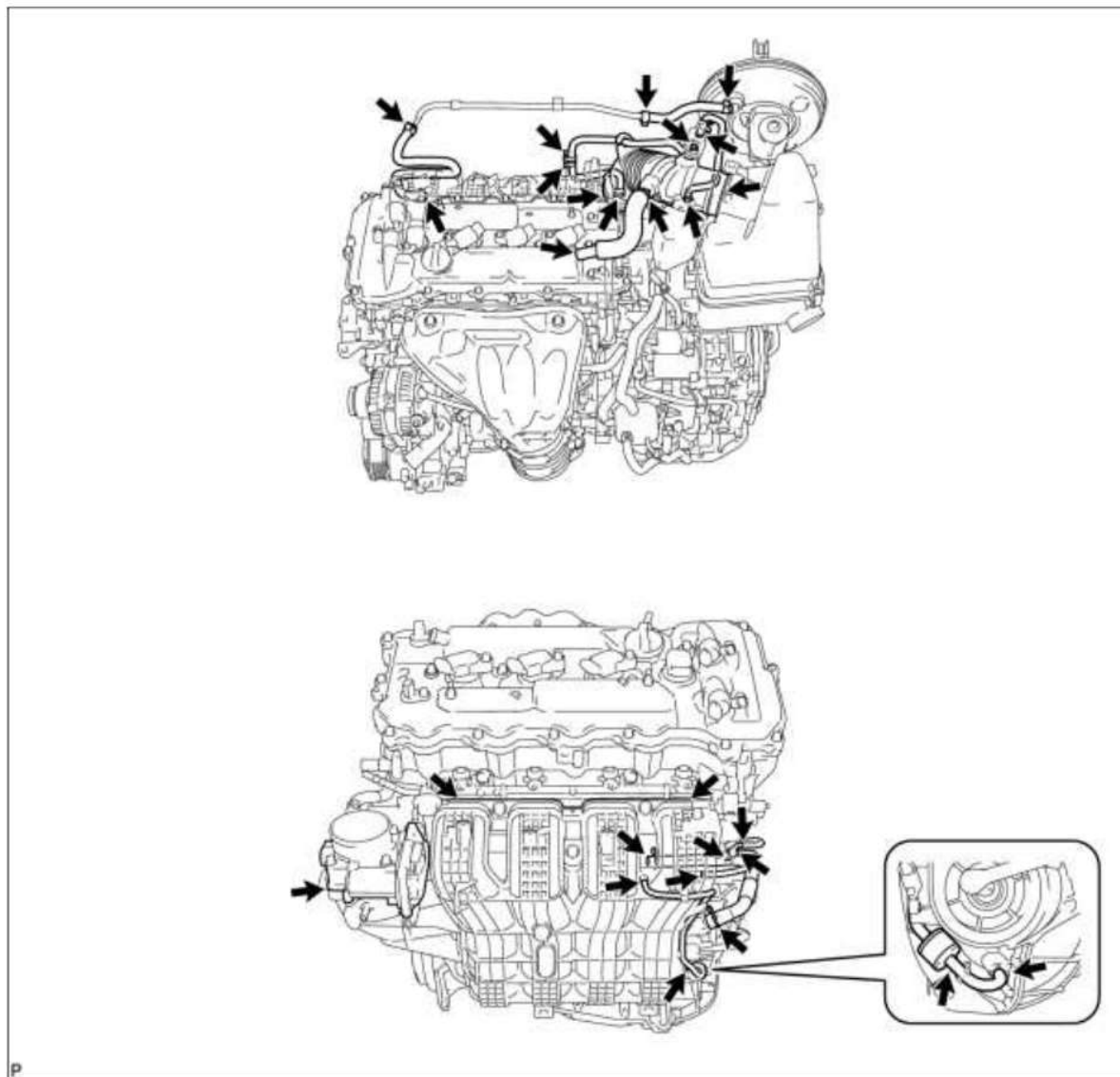
[INFO](#)

Last Modified: 9-7-2011	6.4 G	From: 201008
Model Year: 2011	Model: RAV4	Doc ID: RM0000028LQ01AX
Title: 2AR-FE INTAKE: INTAKE SYSTEM: ON-VEHICLE INSPECTION (2011 RAV4)		

ON-VEHICLE INSPECTION

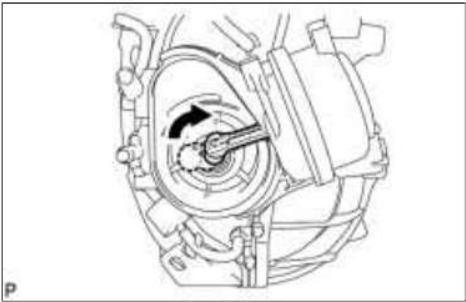
1. INSPECT INTAKE SYSTEM

- (a) Check that there are no vacuum leaks at the points shown in the illustration.



2. INSPECT INTAKE AIR CONTROL VALVE (for ACIS)

- (a) Connect the Techstream to the DLC3.
- (b) Start the engine and turn the Techstream on.
- (c) Warm up the engine.
- (d) Enter the following menus: Powertrain / Engine and ECT / Active Test / Activate the VSV for Intake Control.



- (e) When "ACIS VSV" is turned on, check that the actuator rod operates.
- If the operation is not as specified, inspect the intake air control valve, vacuum tank and check valve [INFO](#) .

- (f) When "ACIS VSV" is turned off, check that the actuator rod returns to its original position.
- If the operation is not as specified, inspect the intake air control valve and vacuum hose [INFO](#) .

3. INSPECT INTAKE AIR CONTROL VALVE (for TCV)

- (a) Remove the No. 1 engine cover sub-assembly [INFO](#) .
- (b) Connect the Techstream to the DLC3.
- (c) Turn the ignition switch to ON (do not run the engine).
- (d) Turn the Techstream on.
- (e) Enter the following menus: Powertrain / Engine and ECT / Active Test / All Data / Intake Air Control Position.
- (1) Set the duty ratio to 60% or -60% for 1 to 3 seconds, and then return the duty ratio to 0%. Check the value in the Data List.

Specified Condition:

CONDITION (ACTIVE TEST)	SPECIFIED CONDITION (DATA LIST)
Control the IAC Duty Ratio set to 60%	Intake Air Control Position 35° or more
Control the IAC Duty Ratio set to -60%	Intake Air Control Position 17° or less

NOTICE:

- Supply power to the intake control valve for 1 to 3 seconds.
- If power is supplied to the intake control valve for less than 1 second, the gear of the tumble control valve does not reach the stopper and the value in the Data List may be incorrect.
- If power is supplied to the intake control valve for more than 3 seconds, the motor may be damaged.
- Do not perform this inspection more than 2 times consecutively.

HINT:

- The standard duty ratio for inspections is 60% or -60%. However, if the value in the Data List is not as specified, set the duty ratio to 100% or -100% for 1 to 3 seconds, and check the value in the Data List again.

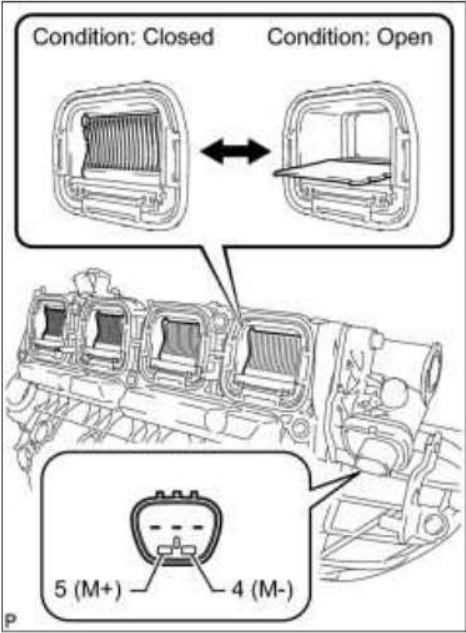
- (f) When the result is not as specified during the Active Test, perform the following procedures.
- (1) Remove the intake manifold [INFO](#) .

HINT:

When the ignition switch is off, the tumble control valves are half open.

(2) Check that the valves move when connecting the battery to the terminals of the intake air control valve actuator.

Standard:



TESTER CONNECTION	SPECIFIED CONDITION
Positive battery voltage applied to terminal 4 (M-), and negative battery voltage applied to terminal 5 (M+)	Open → Closed
Positive battery voltage applied to terminal 5 (M+), and negative battery voltage applied to terminal 4 (M-)	Closed → Open

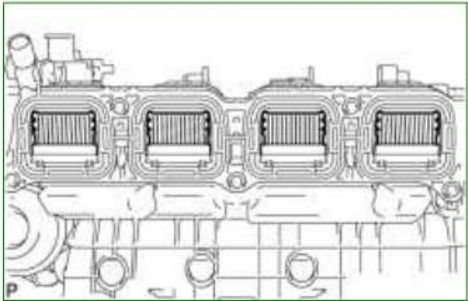
NOTICE:

- Apply battery voltage for 1 to 3 seconds.
- If battery voltage is applied for more than 3 seconds, the actuator may be damaged.
- Do not allow the lead wires to contact the other terminals.

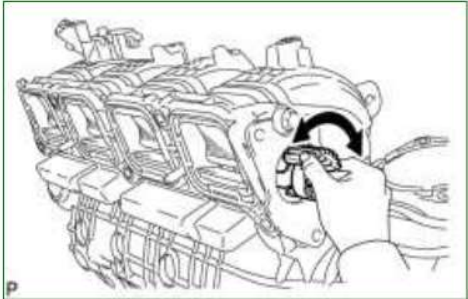
(3) When the results are not as specified, perform the following inspections.

HINT:

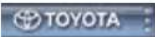
- Check that the valves are not cracked or deformed.



- Remove the intake air control actuator, and check that the valves move smoothly.



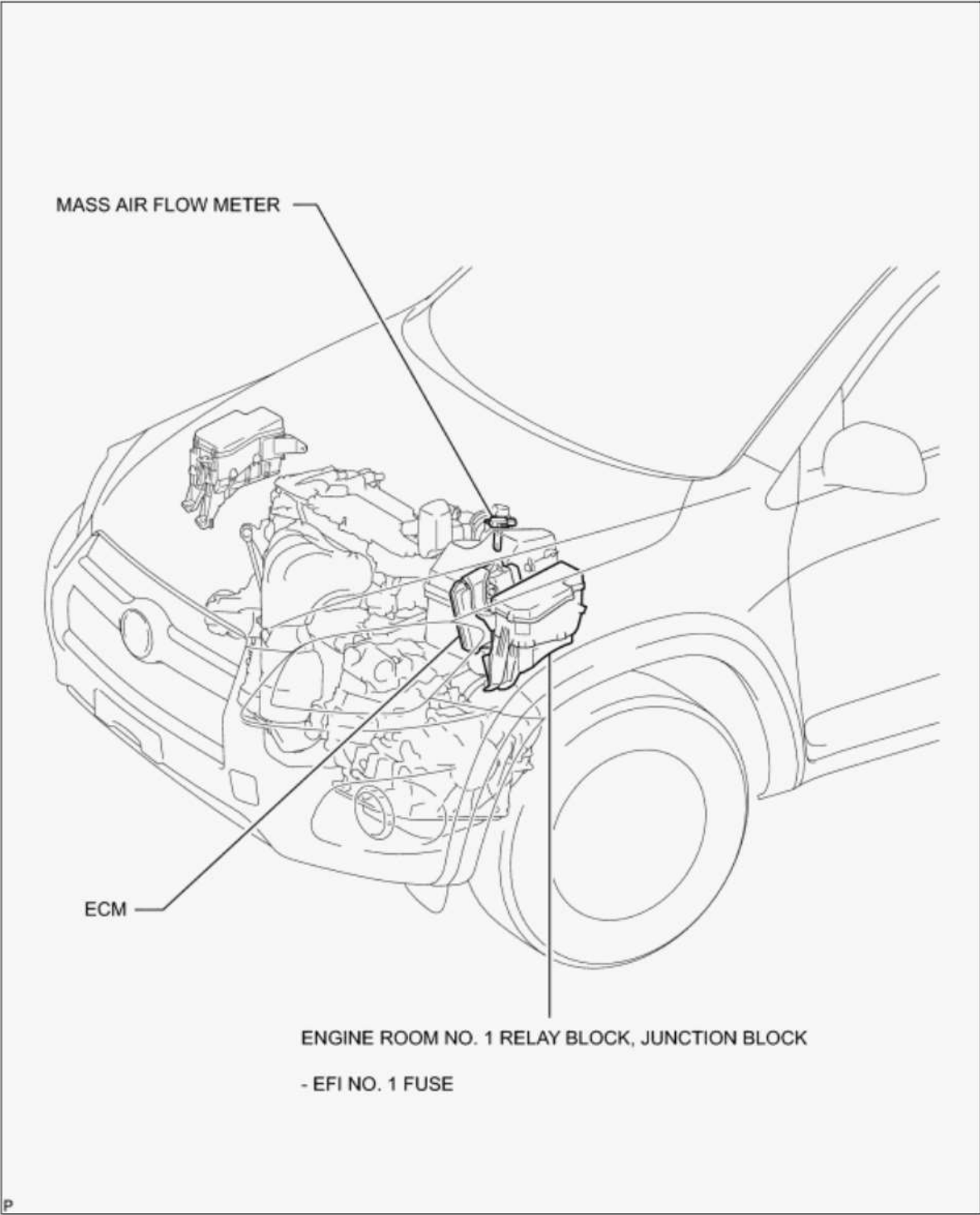
- If there are no problems with the valves, inspect the intake air control valve actuator INFO.



Last Modified: 9-7-2011	6.4 R	From: 201008
Model Year: 2011	Model: RAV4	Doc ID: RM000003PF100DX
Title: 2AR-FE INTAKE: INTAKE SYSTEM: PARTS LOCATION (2011 RAV4)		

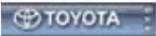
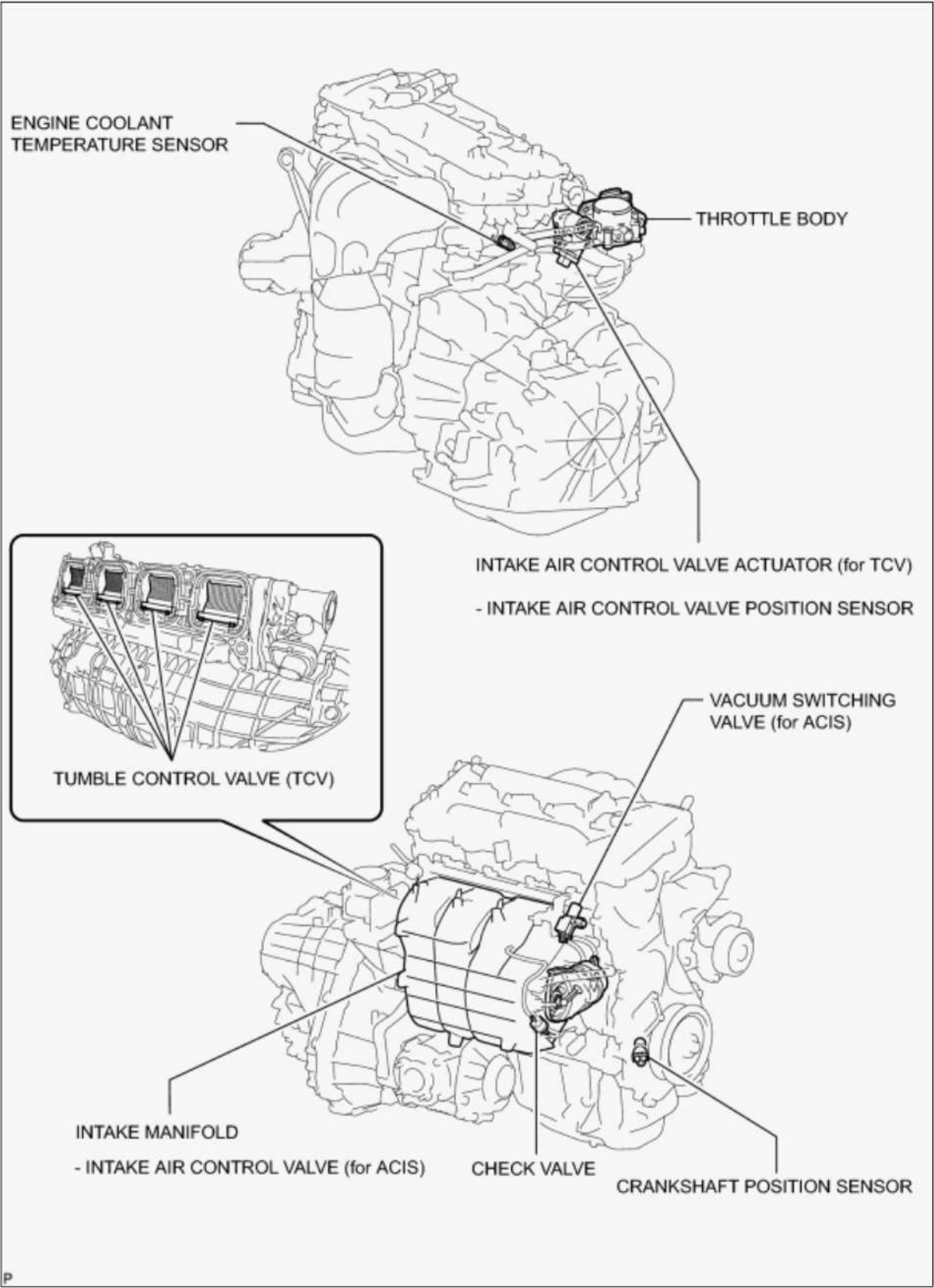
PARTS LOCATION

ILLUSTRATION



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ILLUSTRATION



Last Modified: 9-7-2011	6.4 L	From: 201008
Model Year: 2011	Model: RAV4	Doc ID: RM000003QML005X
Title: 2AR-FE INTAKE: INTAKE SYSTEM: PRECAUTION (2011 RAV4)		

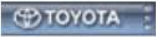
PRECAUTION

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.

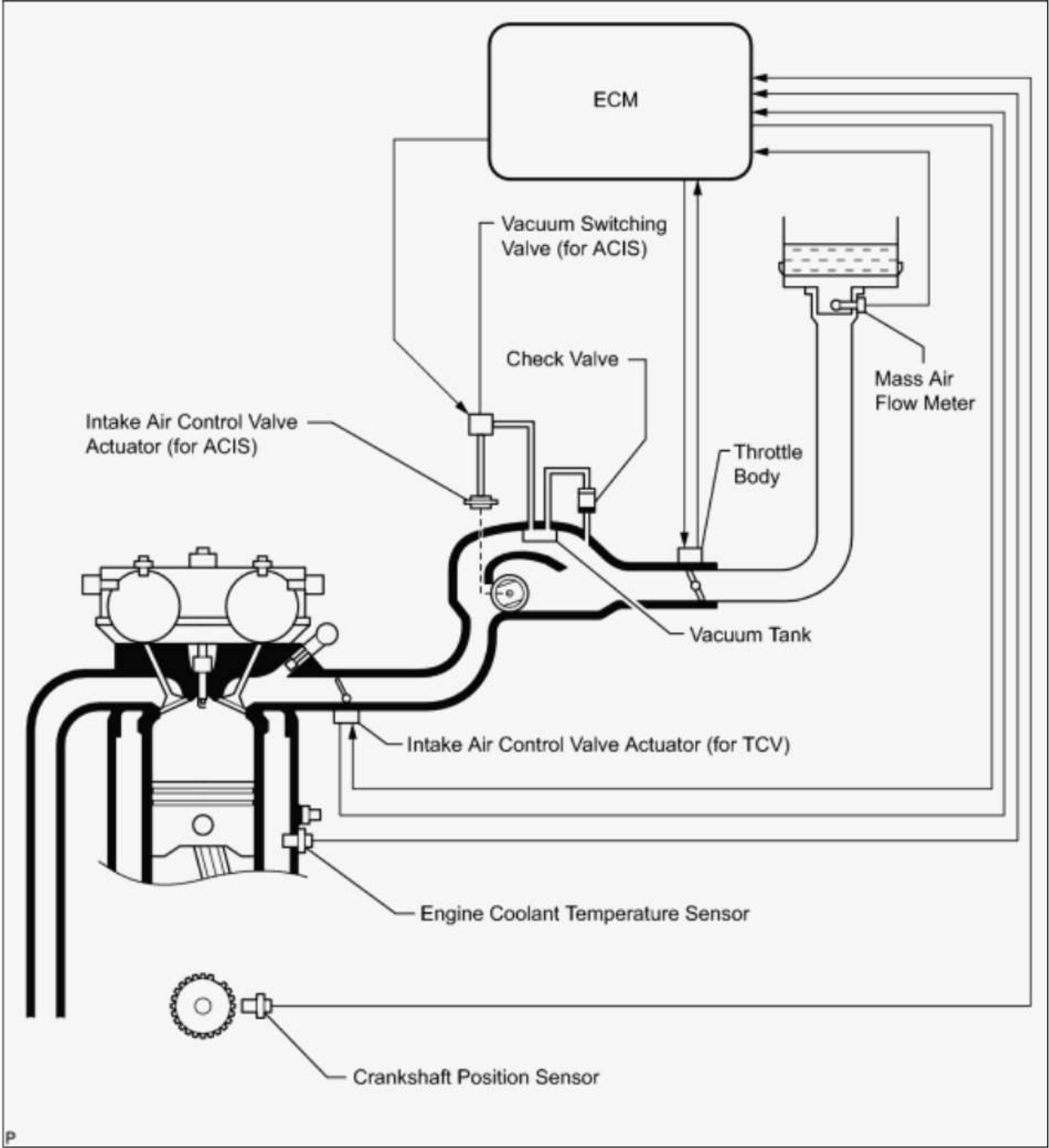
EXPRESSION	IGNITION SWITCH (POSITION)	ENGINE SWITCH (CONDITION)
Ignition Switch off	Off	Off
Ignition Switch ON	ON	On (IG)
Ignition Switch ACC	ACC	On (ACC)
Engine Start	START	Start



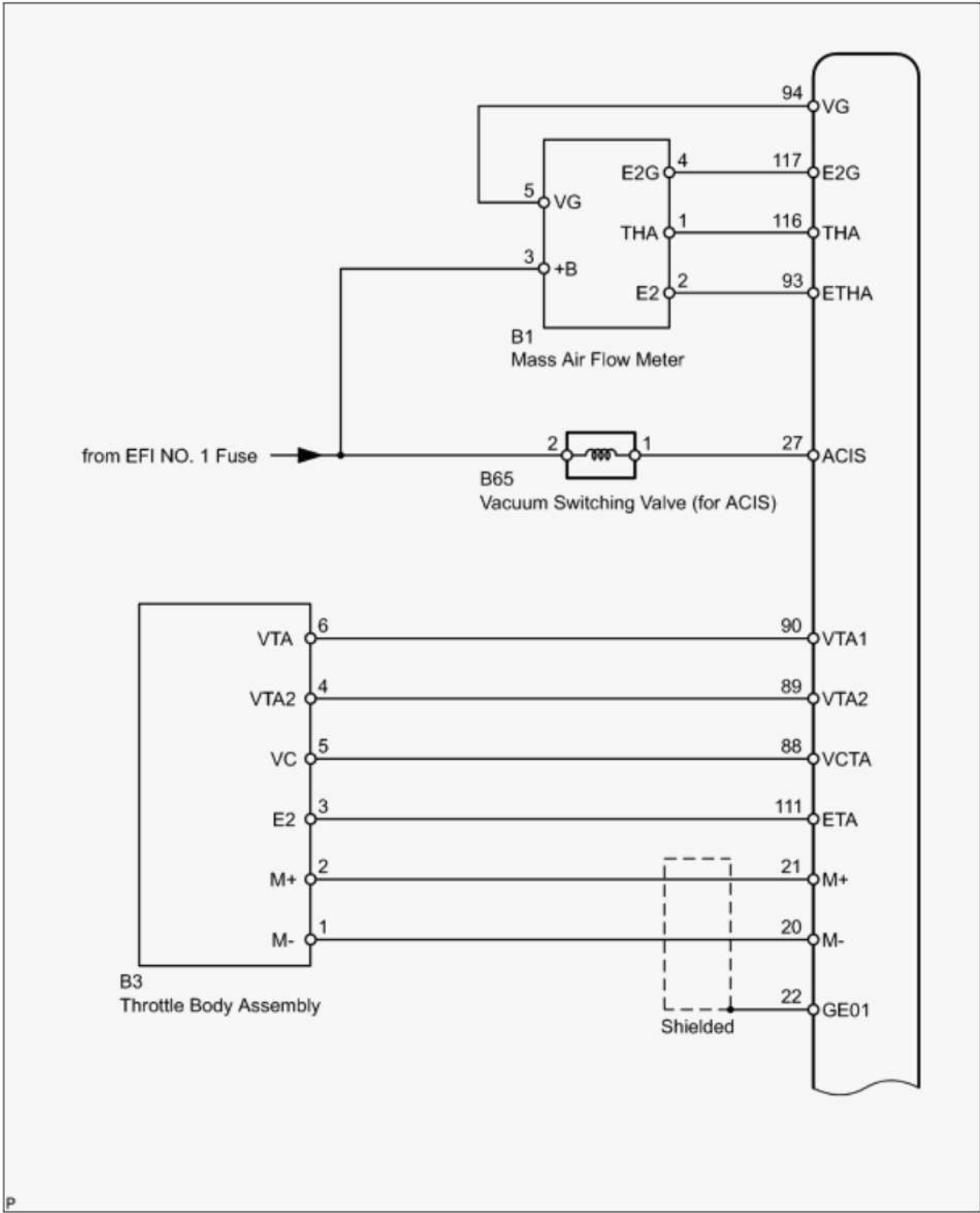
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Last Modified: 9-7-2011	6.4 U	From: 201008
Model Year: 2011	Model: RAV4	Doc ID: RM000003PF200DX
Title: 2AR-FE INTAKE: INTAKE SYSTEM: SYSTEM DIAGRAM (2011 RAV4)		

SYSTEM DIAGRAM

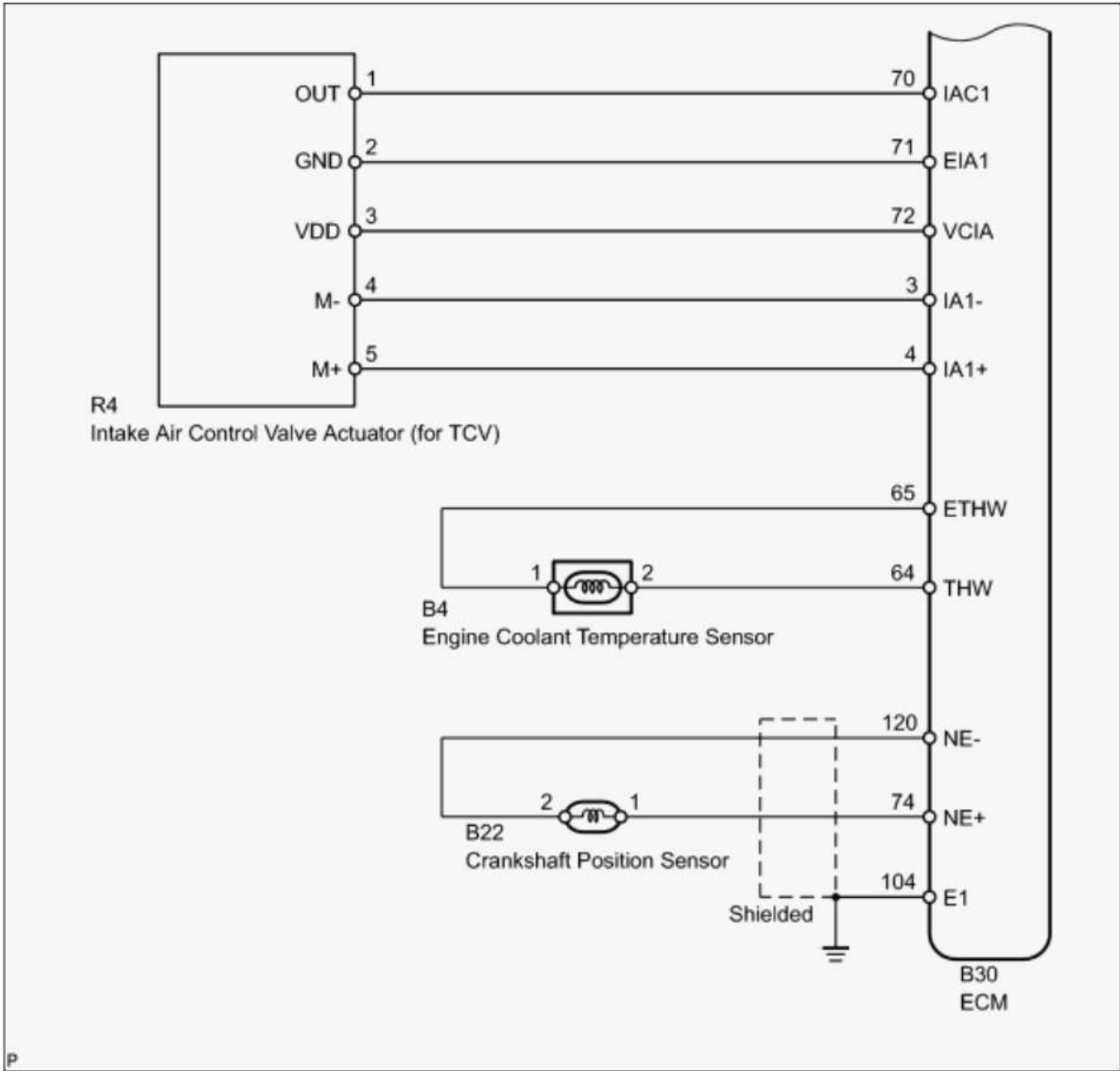


2AR-FE INTAKE: INTAKE SYSTEM: SYSTEM DIAGRAM (2011 RAV4) <https://techinfo.toyota.com/t3Portal/document/rm/RM16B0U/xhtml/RM...>



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2AR-FE INTAKE: INTAKE SYSTEM: SYSTEM DIAGRAM (2011 RAV4) <https://techinfo.toyota.com/t3Portal/document/rm/RM16B0U/xhtml/RM...>

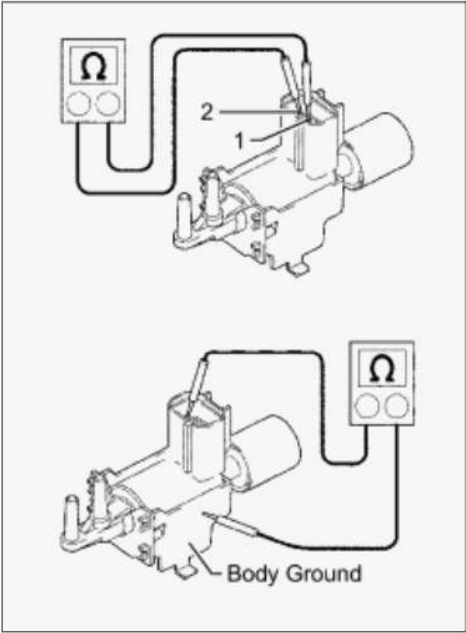


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Last Modified: 9-7-2011	6.4 G	From: 201008
Model Year: 2011	Model: RAV4	Doc ID: RM000003PF3008X
Title: 2AR-FE INTAKE: VACUUM SWITCHING VALVE (for ACIS): ON-VEHICLE INSPECTION (2011 RAV4)		

ON-VEHICLE INSPECTION

1. INSPECT VACUUM SWITCHING VALVE ASSEMBLY (for ACIS)



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

Standard Resistance:

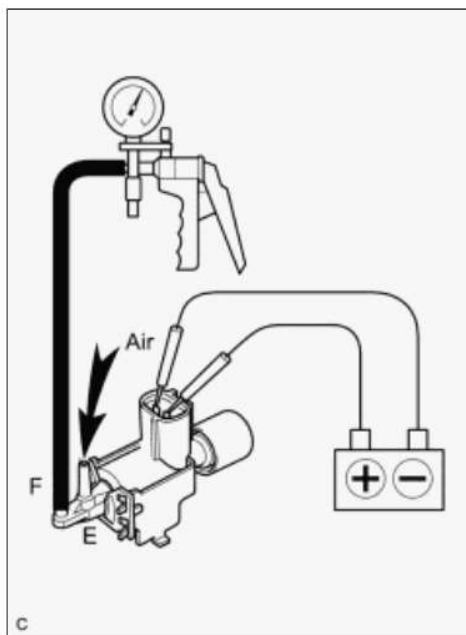
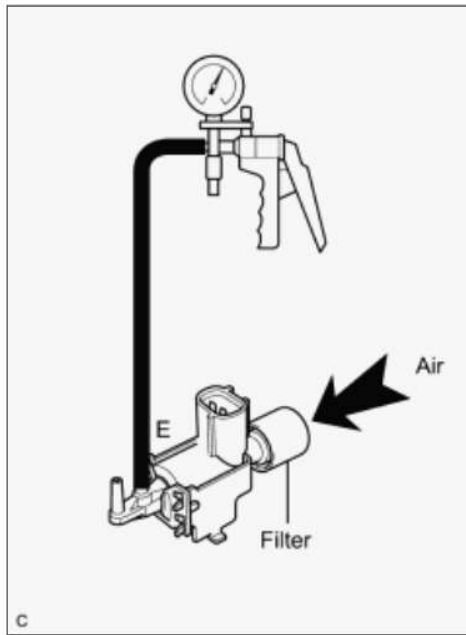
TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
1 - 2	20°C (68°F)	37 to 44 Ω
1 - Body ground	Always	1 MΩ or higher
2 - Body ground		

If the result is not as specified, replace the vacuum switching valve assembly.

(b) Check the VSV operation.

(1) When vacuum is applied to port E, check that air is sucked into the filter.

If the result is not as specified, replace the vacuum switching valve assembly.



- (2) Apply battery voltage across the terminals. When vacuum is applied to port F, check that air is sucked into port E.
- If the result is not as specified, replace the vacuum switching valve assembly.

