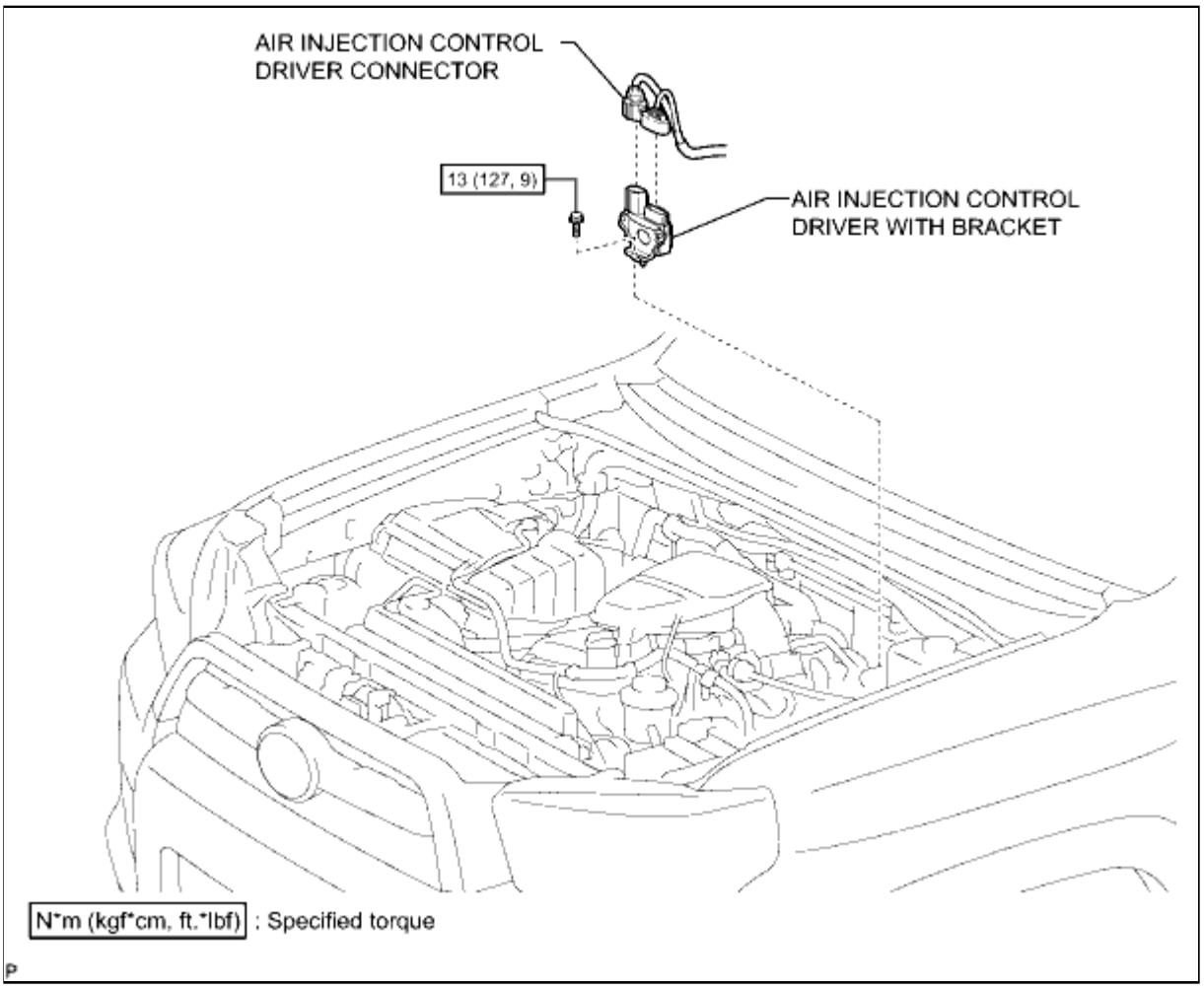
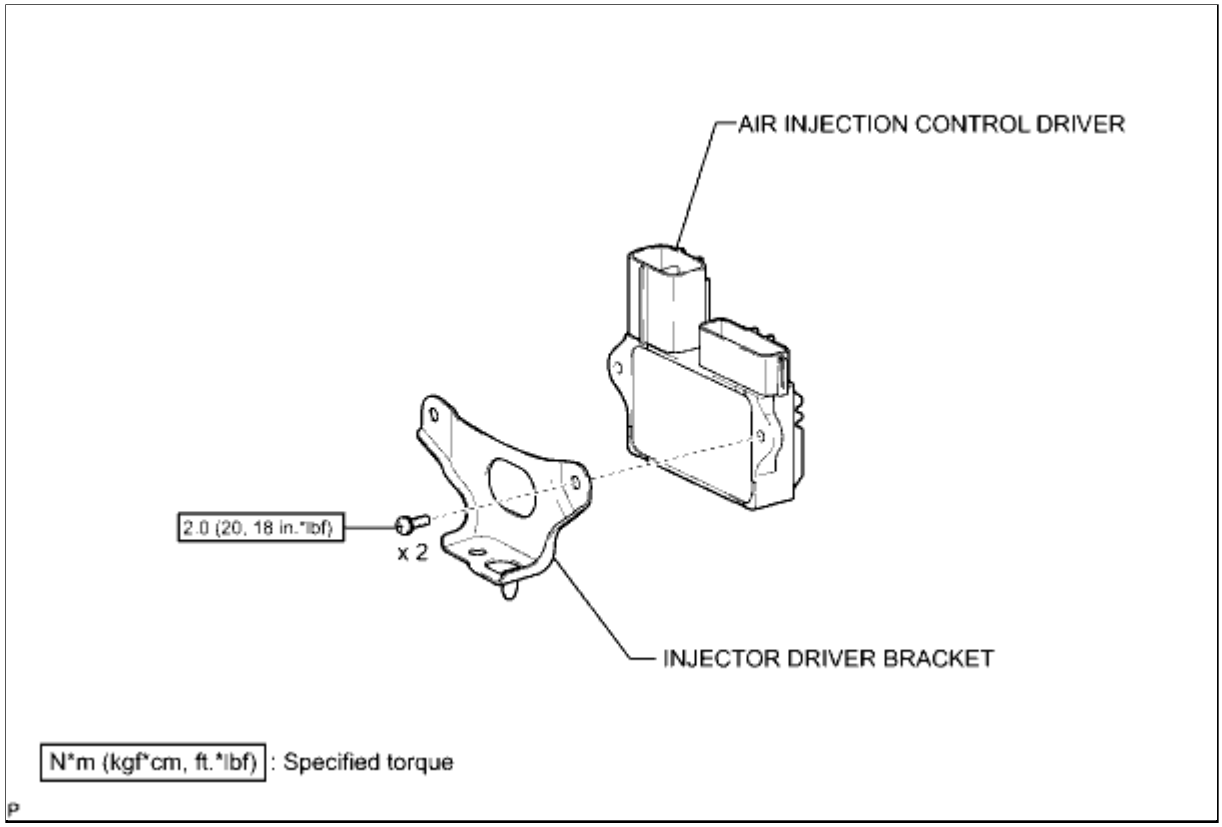
Last Modified: 5-10-2010	6.4 K	**From:** 200908
Model Year: 2010	**Model:** 4Runner	**Doc ID:** RM0000045FB002X
Title: 2TR-FE EMISSION CONTROL: AIR INJECTION DRIVER: COMPONENTS (2010 4Runner)		

COMPONENTS

ILLUSTRATION



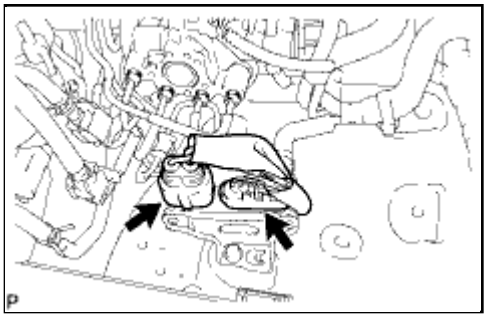
ILLUSTRATION



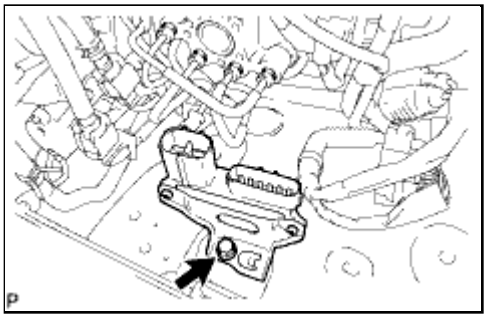
Last Modified: 5-10-2010	6.4 A	**From:** 200908
Model Year: 2010	**Model:** 4Runner	**Doc ID:** RM0000030JC012X
Title: 2TR-FE EMISSION CONTROL: AIR INJECTION DRIVER: REMOVAL (2010 4Runner)		

REMOVAL

1. REMOVE AIR INJECTION CONTROL DRIVER WITH BRACKET

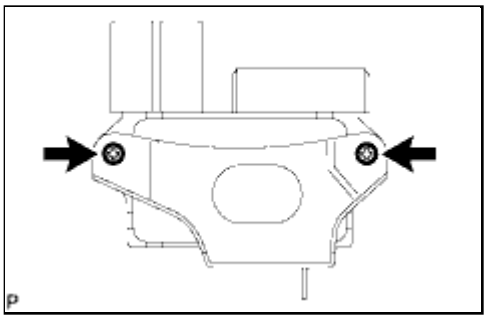


(a) Disconnect the 2 air injection control driver connectors.



(b) Remove the bolt and air injection control driver with bracket.

2. REMOVE AIR INJECTION CONTROL DRIVER



(a) Remove the 2 screws and air injection control driver.

Last Modified: 5-10-2010	6.4 A	**From:** 200908
Model Year: 2010	**Model:** 4Runner	**Doc ID:** RM0000030JA012X
Title: 2TR-FE EMISSION CONTROL: AIR INJECTION DRIVER: INSTALLATION (2010 4Runner)		

INSTALLATION

1. INSTALL AIR INJECTION CONTROL DRIVER

(a) Install the air injection control driver with the 2 screws.

Torque: 2.0 N·m (20 kgf·cm, 18in·lbf)

2. INSTALL AIR INJECTION CONTROL DRIVER WITH BRACKET

(a) Install the air injection control driver with bracket with the bolt.

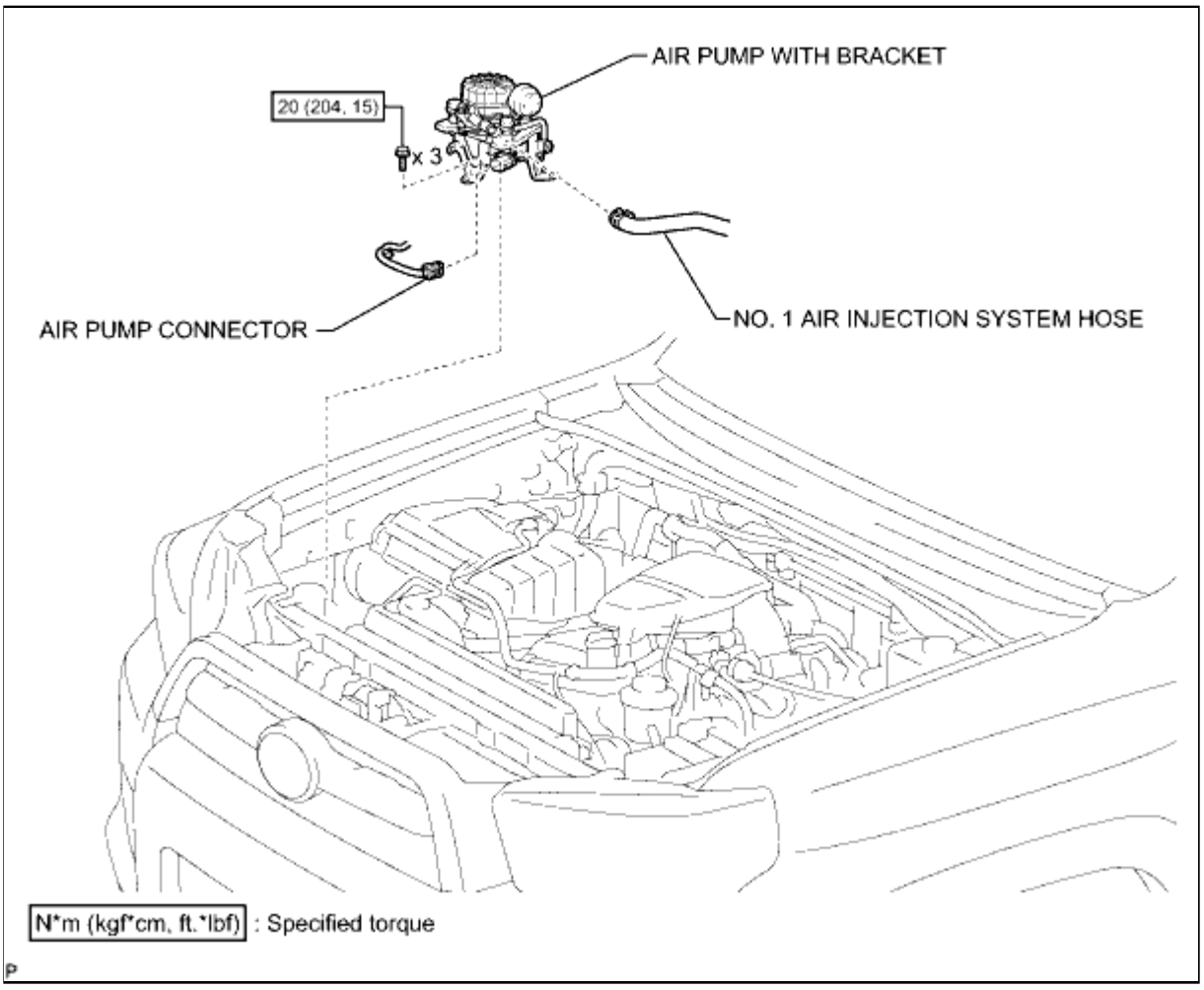
Torque: 13 N·m (127 kgf·cm, 9ft·lbf)

(b) Connect the 2 air injection control driver connectors.

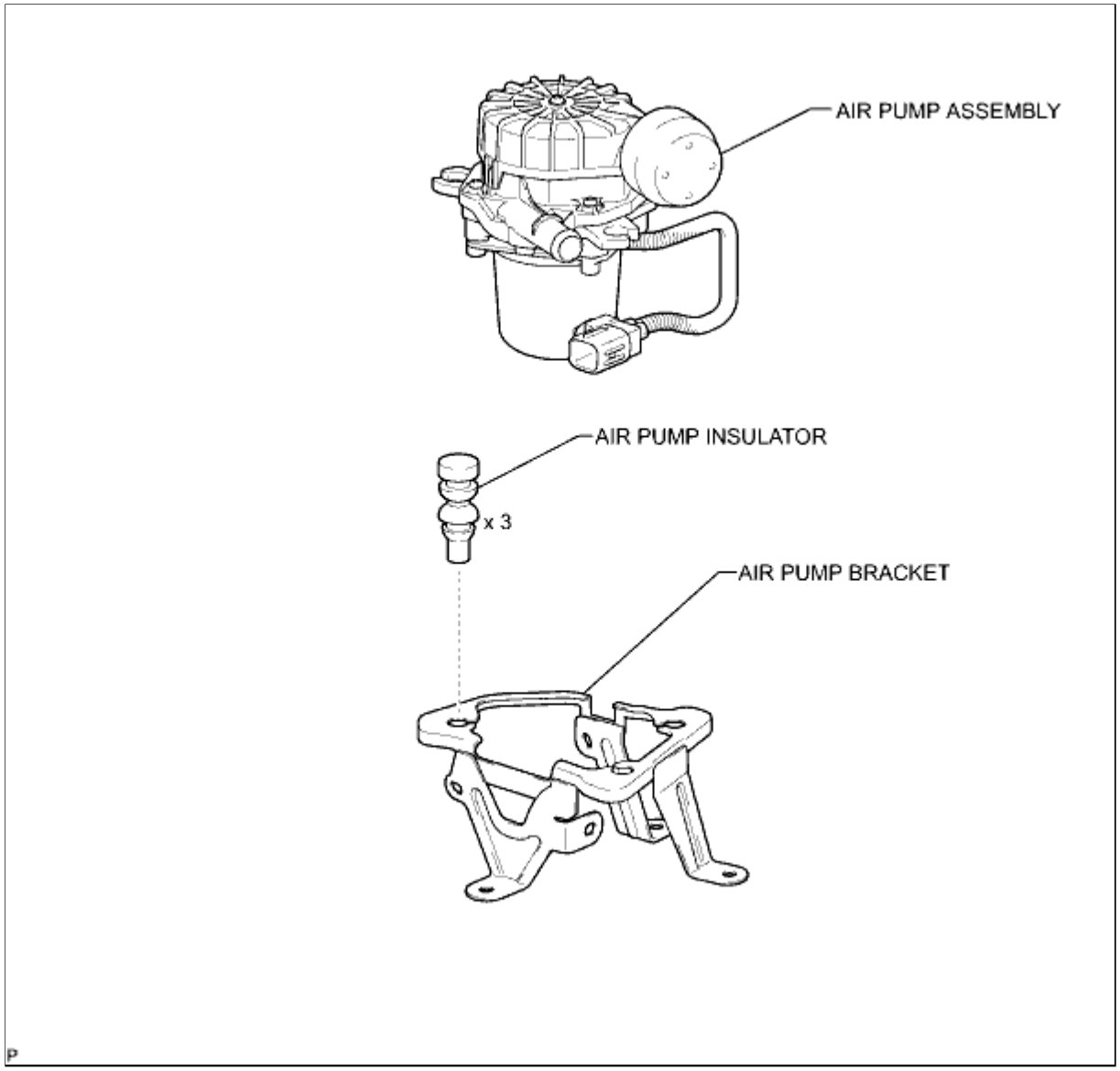
Last Modified: 5-10-2010	6.4 K	**From:** 200908
Model Year: 2010	**Model:** 4Runner	**Doc ID:** RM0000045FA002X
Title: 2TR-FE EMISSION CONTROL: AIR PUMP: COMPONENTS (2010 4Runner)		

COMPONENTS

ILLUSTRATION



ILLUSTRATION



P

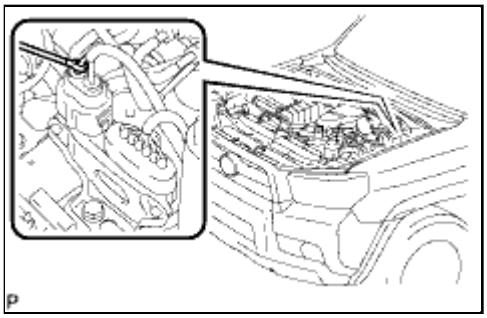
Last Modified: 5-10-2010	6.4 G	**From:** 200908
Model Year: 2010	**Model:** 4Runner	**Doc ID:** RM0000040K200DX
Title: 2TR-FE EMISSION CONTROL: AIR PUMP: ON-VEHICLE INSPECTION (2010 4Runner)		

ON-VEHICLE INSPECTION

1. INSPECT AIR PUMP ASSEMBLY

(a) Start the engine and warm it up.

(b) Turn the ignition switch off.



(c) Connect the 400 A probe of an ammeter to the positive (+) wire of the air pump.

(d) Connect the Techstream to the DLC3.

(e) Turn the ignition switch to ON and turn the Techstream on.

(f) Enter the following menus: Powertrain / Engine and ECT / Utility / Air Injection Check / Manual Mode / AIR PUMP: ON, ASV: OPEN.

HINT:

When Manual Mode is selected, Techstream initialization (atmospheric pressure measurement) is performed automatically. Initialization takes 10 seconds. After initialization, AIR PUMP and ASV operation can be selected.

(g) Measure the current while the air pump is operating.

Standard Current:

TESTER OPERATION	AIR PUMP	ASV	SPECIFIED CONDITION
AIR PUMP: ON, ASV: OPEN	ON	OPEN	10 to 40 A
AIR PUMP: OFF, ASV: CLOSE	OFF	CLOSE	Below 1 A

If the result is not as specified, replace the air pump assembly.

(h) Turn the ignition switch off.

NOTICE:

- Air Injection Check only allows technicians to operate the AIR system for a maximum of 5 seconds.

  Furthermore, the check can only be performed up to 4 times per trip. If the test is repeated, intervals of at least 30 seconds are required between checks.

While AIR system operation using the Techstream prohibited, the Techstream display indicates the prohibition (WAIT or ERROR).

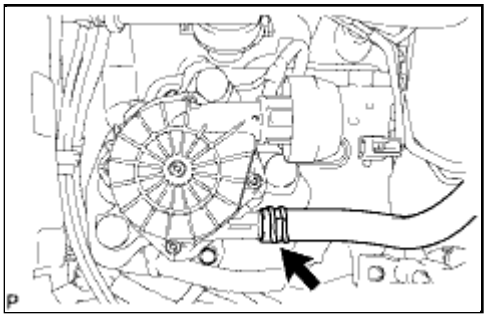
If ERROR is displayed on the Techstream during the test, stop the engine for 10 minutes, and then try again.

- Performing Air Injection Check repeatedly may cause damage to the AIR system. If necessary, leave an interval of several minutes between Air Injection Check operations to prevent the system from overheating.
- When performing the Air Injection Check operation after the battery cable has been reconnected, wait for 7 minutes with the ignition switch turned to ON or the engine running.
- Turn the ignition switch off when the Air Injection Check operation finishes.

Last Modified: 5-10-2010	6.4 A	**From:** 200908
Model Year: 2010	**Model:** 4Runner	**Doc ID:** RM00000175O009X
Title: 2TR-FE EMISSION CONTROL: AIR PUMP: REMOVAL (2010 4Runner)		

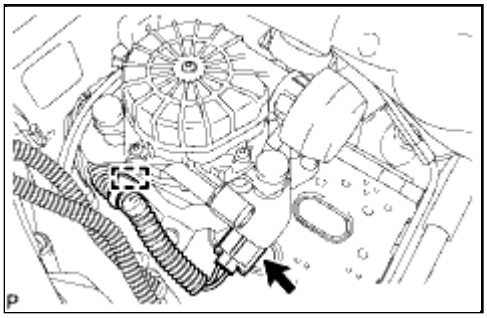
REMOVAL

1. DISCONNECT NO. 1 AIR INJECTION SYSTEM HOSE

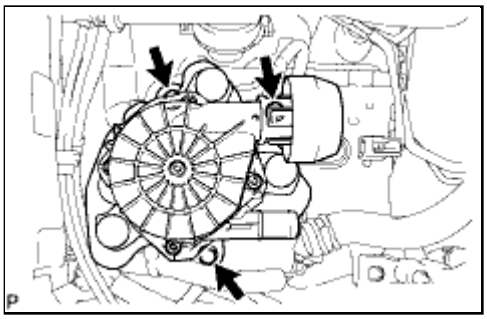


(a) Disconnect the No. 1 air injection system hose from the air pump.

2. REMOVE AIR PUMP WITH BRACKET



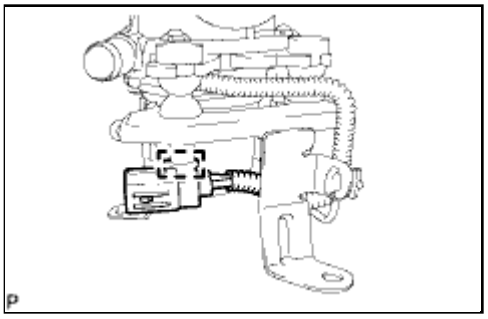
(a) Disconnect the air pump connector and detach the wire harness clamp.

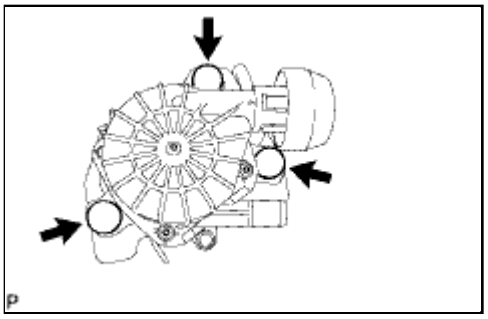


(b) Remove the 3 bolts and air pump with bracket.

3. REMOVE AIR PUMP ASSEMBLY

(a) Detach the air pump connector clamp.





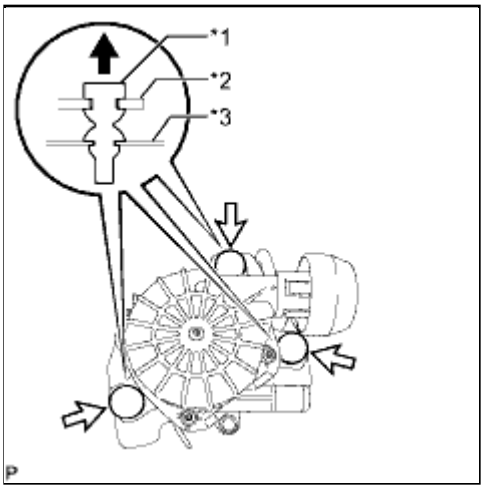
(b) Detach the 3 fittings of the air pump insulator and remove the air pump assembly from the air pump bracket.

Last Modified: 5-10-2010	6.4 A	**From:** 200908
Model Year: 2010	**Model:** 4Runner	**Doc ID:** RM00000175M009X
Title: 2TR-FE EMISSION CONTROL: AIR PUMP: INSTALLATION (2010 4Runner)		

INSTALLATION

1. INSTALL AIR PUMP ASSEMBLY

(a) Attach the 3 fittings of the air pump insulator to install the air pump assembly to the air pump bracket.



Text in Illustration

*1	Air Pump Insulator
*2	Air Pump Assembly
*3	Air Pump Bracket
➡	Upper

(b) Attach the air pump connector clamp.

2. INSTALL AIR PUMP WITH BRACKET

(a) Install the air pump with bracket with the 3 bolts.

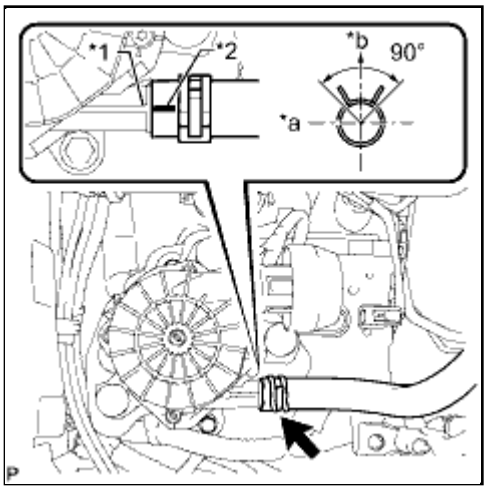
Torque: 20 N·m (204 kgf·cm, 15ft·lbf)

(b) Connect the air pump connector and attach the wire harness clamp.

3. CONNECT NO. 1 AIR INJECTION SYSTEM HOSE

(a) Connect the No. 1 air injection system hose so that its paint mark aligns with the rib of the air pump as shown in the illustration.

Text in Illustration



*1	Rib
*2	Paint Mark
*a	Front
*b	Upper

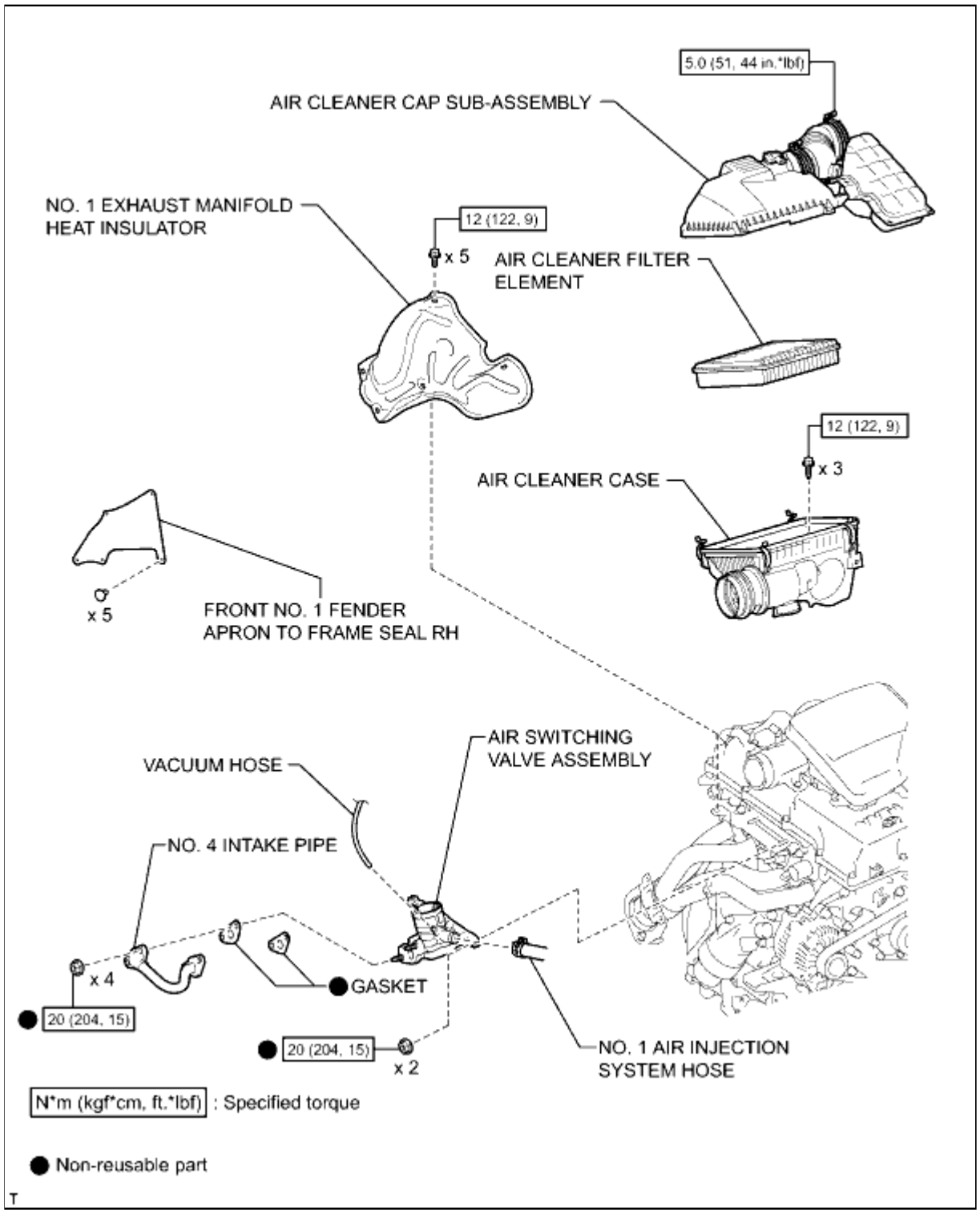
HINT:

- Make sure the paint mark of the No. 1 air injection system hose is facing upward.
- Make sure the direction of the hose clamp is as shown in the illustration.

Last Modified: 5-10-2010	6.4 K	**From:** 200908
Model Year: 2010	**Model:** 4Runner	**Doc ID:** RM0000045FU002X
Title: 2TR-FE EMISSION CONTROL: AIR SWITCHING VALVE: COMPONENTS (2010 4Runner)		

COMPONENTS

ILLUSTRATION



Last Modified: 5-10-2010	6.4 A	**From:** 200908
Model Year: 2010	**Model:** 4Runner	**Doc ID:** RM000001I5V007X
Title: 2TR-FE EMISSION CONTROL: AIR SWITCHING VALVE: REMOVAL (2010 4Runner)		

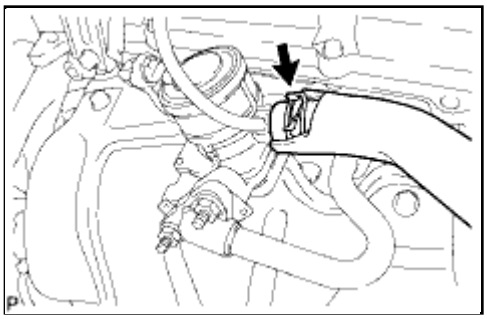
REMOVAL

1. REMOVE AIR CLEANER CAP SUB-ASSEMBLY INFO

2. REMOVE AIR CLEANER CASE INFO

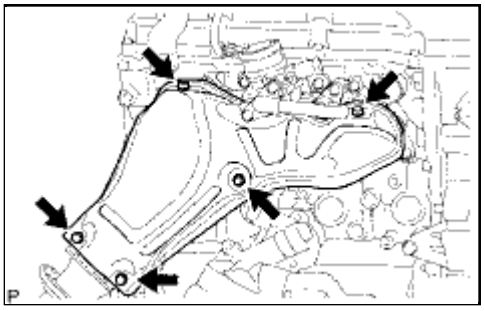
3. REMOVE FRONT NO. 1 FENDER APRON TO FRAME SEAL RH INFO

4. DISCONNECT NO. 1 AIR INJECTION SYSTEM HOSE



(a) Disconnect the No. 1 air injection system hose.

5. REMOVE NO. 1 EXHAUST MANIFOLD HEAT INSULATOR



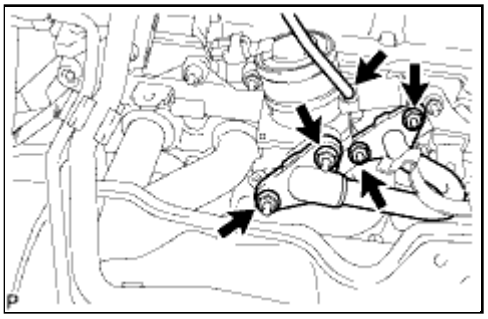
(a) Remove the 5 bolts and No. 1 exhaust manifold heat insulator.

HINT:

- It is only necessary to move the No. 1 exhaust manifold heat insulator so that the intake pipe can be removed in a later step.
- It is not possible to fully remove the No. 1 exhaust manifold heat insulator in this step.

6. REMOVE NO. 4 INTAKE PIPE

(a) Disconnect the vacuum hose.

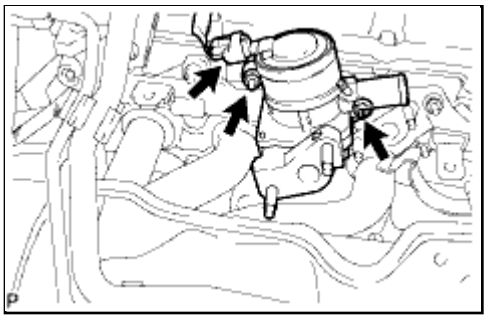


(b) Remove the 4 nuts, No. 4 intake pipe and 2 gaskets.

NOTICE:

Be careful not to damage the installation surface of the gaskets.

7. REMOVE AIR SWITCHING VALVE ASSEMBLY



(a) Disconnect the connector.

(b) Remove the 2 nuts and air switching valve.

(c) Remove the No. 1 exhaust manifold heat insulator.

Last Modified: 5-10-2010	6.4 G	**From:** 200908
Model Year: 2010	**Model:** 4Runner	**Doc ID:** RM000001I5T007X
Title: 2TR-FE EMISSION CONTROL: AIR SWITCHING VALVE: INSPECTION (2010 4Runner)		

INSPECTION

1. INSPECT AIR SWITCHING VALVE ASSEMBLY

(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)	4.5 to 5.5 Ω
1 - Body ground	Always	1 MΩ or higher
2 - Body ground		

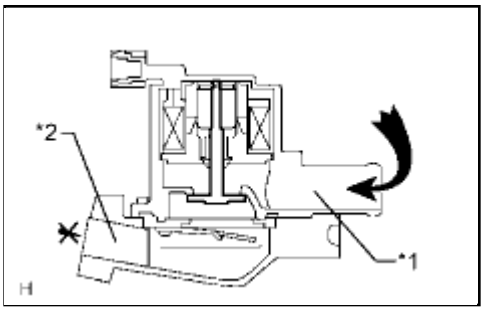
HINT:

When measuring the resistance, make sure that the surface temperature of the air switching valve is 20°C (68°F).

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

(b) Check the operation of the air switching valve.

(1) Check that air does not flow from port A to port B.



Text in Illustration

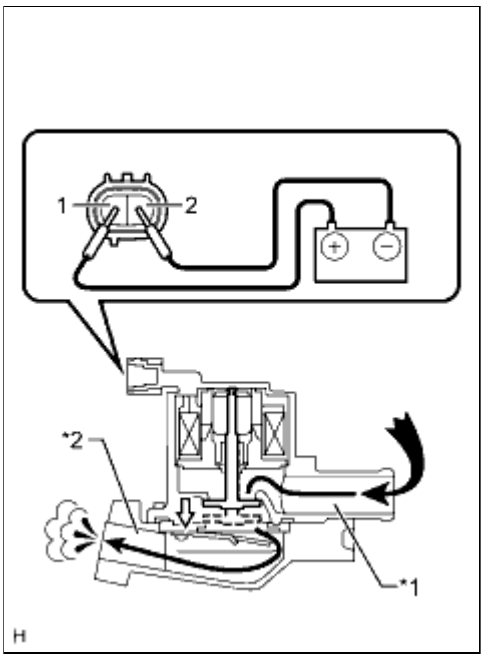
*1	Port A
*2	Port B
➡	Air

NOTICE:

Make sure the applied pressure is 30 kPa (0.3 kgf/cm^2, 4.4 psi) or less.

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

(2) Apply battery voltage across terminals 1 and 2.



Text in Illustration

*1	Port A
*2	Port B
➡	Air

NOTICE:

Apply voltage for 2 minutes or less.

(3) Check that air flows from port A to port B.

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

Last Modified: 5-10-2010	6.4 A	**From:** 200908
Model Year: 2010	**Model:** 4Runner	**Doc ID:** RM000001I5S007X
Title: 2TR-FE EMISSION CONTROL: AIR SWITCHING VALVE: INSTALLATION (2010 4Runner)		

INSTALLATION

1. INSTALL AIR SWITCHING VALVE ASSEMBLY

(a) Set the No. 1 exhaust manifold heat insulator in place.

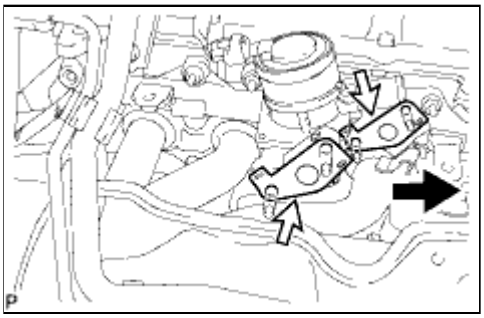
(b) Install the air switching valve with 2 new nuts.

Torque: 20 N·m (204 kgf·cm, 15ft·lbf)

(c) Connect the connector.

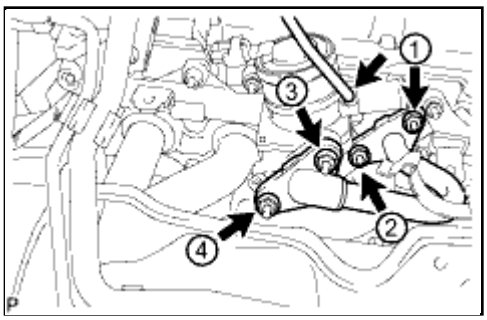
2. INSTALL NO. 4 INTAKE PIPE

(a) Install the 2 new gaskets as shown in the illustration.



Text in Illustration

➡	Front



(b) Install the No. 4 intake pipe with 4 new nuts in the order shown in the illustration. Tighten the nuts labeled 1 and 3 to the torque specification again.

Torque: 20 N·m (204 kgf·cm, 15ft·lbf)

(c) Check that the nuts are tightened to the torque specification.

(d) Connect the vacuum hose.

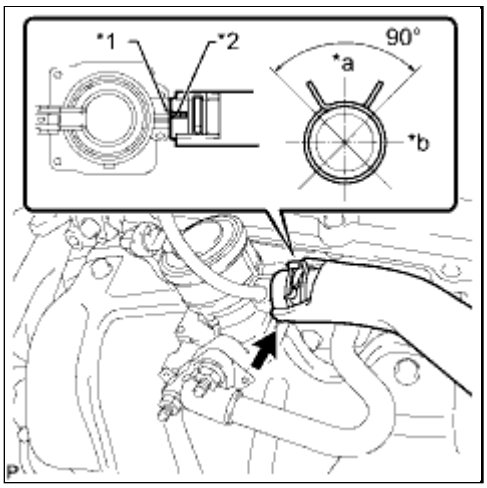
3. INSTALL NO. 1 EXHAUST MANIFOLD HEAT INSULATOR

(a) Install the No. 1 exhaust manifold heat insulator with the 5 bolts.

Torque: 12 N·m (122 kgf·cm, 9ft·lbf)

4. CONNECT NO. 1 AIR INJECTION SYSTEM HOSE

(a) Connect the No. 1 air injection system hose so that its paint mark aligns with the rib of the air switching valve as shown in the illustration.



Text in Illustration

*1	Rib
*2	Paint Mark
*a	Upper
*b	LH Side

HINT:

- Make sure the paint mark of the No. 1 air injection system hose is facing upward.
- Make sure the direction of the hose clamp is as shown in the illustration.

5. INSTALL FRONT NO. 1 FENDER APRON TO FRAME SEAL RH INFO

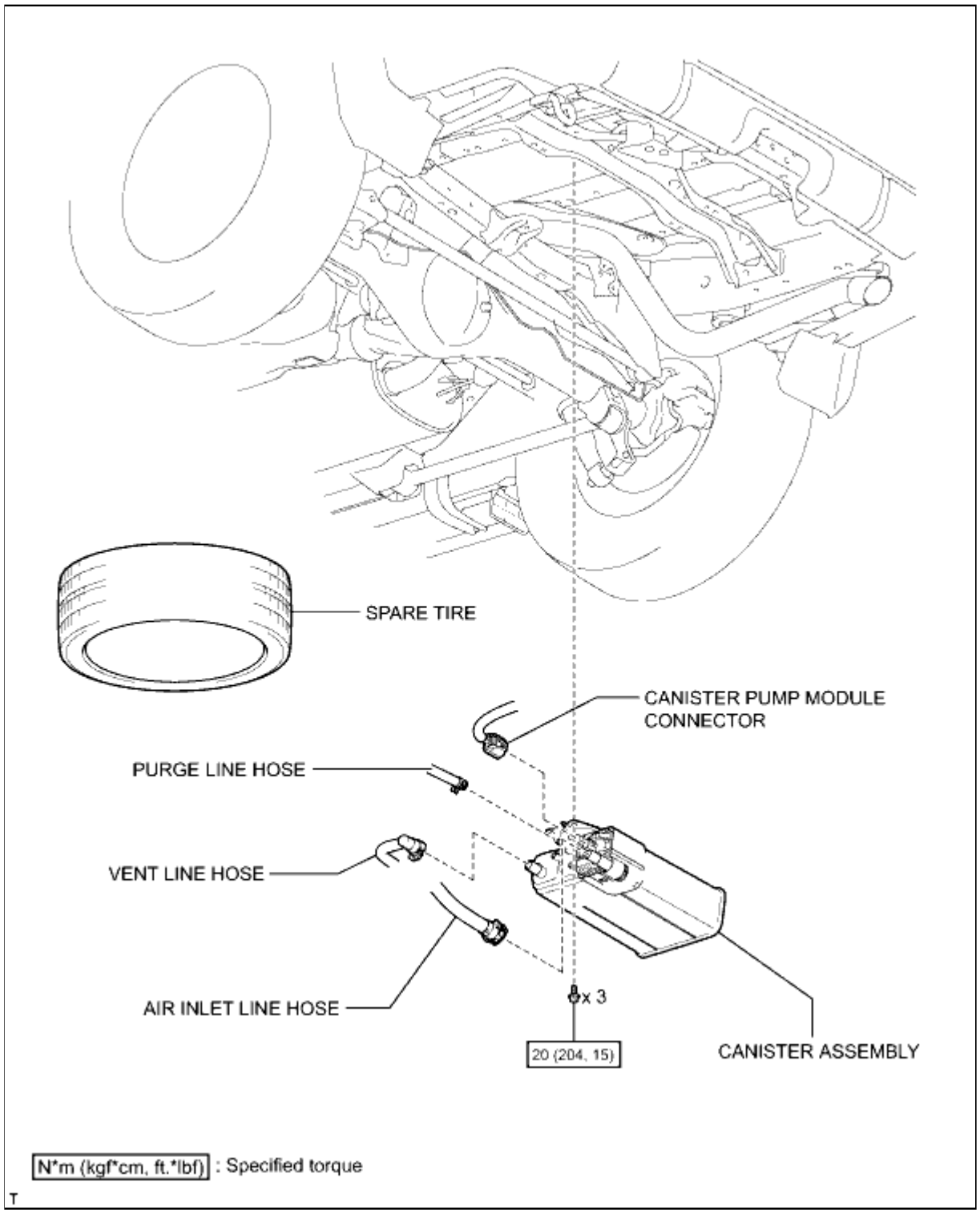
6. INSTALL AIR CLEANER CASE INFO

7. INSTALL AIR CLEANER CAP SUB-ASSEMBLY INFO

Last Modified: 5-10-2010	6.4 K	**From:** 200908
Model Year: 2010	**Model:** 4Runner	**Doc ID:** RM00000313F00PX
Title: 1GR-FE EMISSION CONTROL: CANISTER: COMPONENTS (2010 4Runner)		

COMPONENTS

ILLUSTRATION

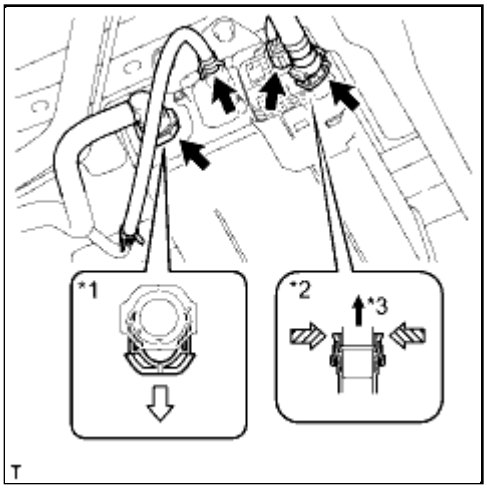


Last Modified: 5-10-2010	6.4 A	**From:** 200908
Model Year: 2010	**Model:** 4Runner	**Doc ID:** RM000002HXS015X
Title: 1GR-FE EMISSION CONTROL: CANISTER: REMOVAL (2010 4Runner)		

REMOVAL

1. REMOVE SPARE TIRE

2. REMOVE CANISTER ASSEMBLY



(a) Disconnect the connector.

(b) Disconnect the purge line hose.

Text in Illustration

*1	Vent Line Hose
*2	Air Inlet Line Hose
*3	Canister
⇨	Pull Out
⇛	Pinch

(c) Disconnect the air inlet line hose.

(1) Push the hose firmly toward the canister side.

(2) Pinch the hose as shown in the illustration.

(3) Pull out the hose.

NOTICE:

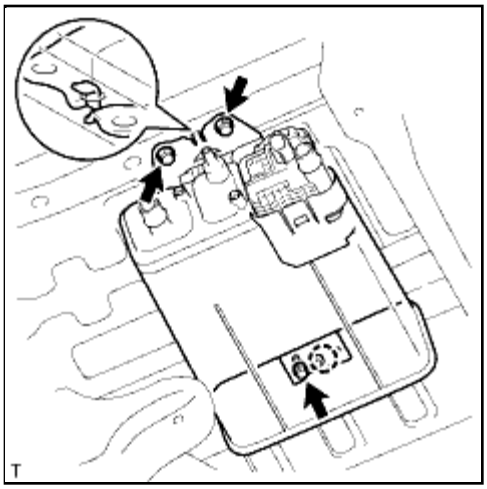
- Do not use any tools in this procedure.
- Check for any dirt and foreign matter contamination in the canister and around the hose. Clean if necessary. Foreign matter may damage the O-rings or cause leaks in the seal between the canister and hose.

(d) Disconnect the vent line hose.

(1) Pinch the retainer and then raise it.

NOTICE:

- Do not use any tools in this procedure.
- Check for any dirt and foreign matter contamination in the valve and around the connector. Clean if necessary. Foreign matter may damage the O-rings or cause leaks in the seal between the valve and connector.

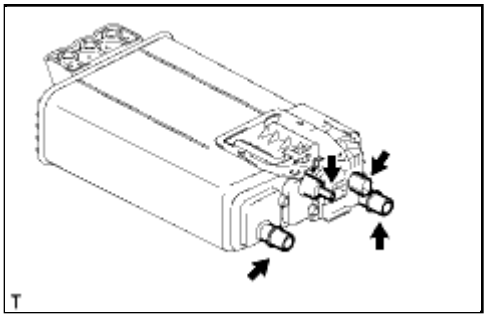


(e) Detach the claw, and remove the 3 bolts and canister.

Last Modified: 5-10-2010	6.4 G	**From:** 200908
Model Year: 2010	**Model:** 4Runner	**Doc ID:** RM000002HXQ013X
Title: 1GR-FE EMISSION CONTROL: CANISTER: INSPECTION (2010 4Runner)		

INSPECTION

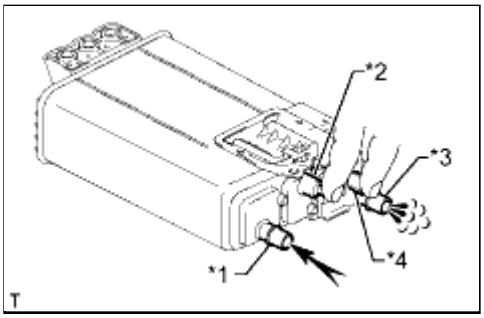
1. INSPECT CANISTER ASSEMBLY



(a) Visually check the canister assembly for cracks or damage.

If cracks or damage is found, replace the canister assembly.

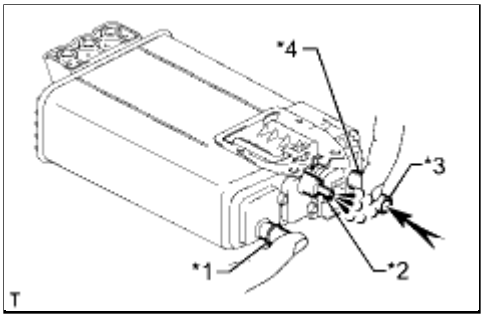
(b) Check the canister operation.



(1) With the purge port and connector closed, blow 5 kPa (0.1 kgf/cm^2, 0.7 psi) of air into the vent port, and check that air flows from the air inlet port.

Text in Illustration

*1	Vent Port
*2	Purge Port
*3	Air Inlet Port
*4	Connector
➡	Air



(2) With the vent port and connector closed, blow 5 kPa (0.1 kgf/cm^2, 0.7 psi) of air into the air inlet port, and check that air flows from the purge port.

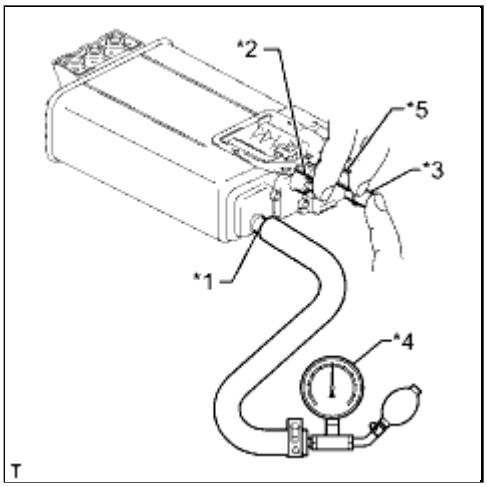
Text in Illustration

*1	Vent Port
*2	Purge Port
*3	Air Inlet Port
*4	Connector
➡	Air

If the result is not as specified, replace the canister assembly.

(c) Check for air leaks.

(1) Connect a pressure gauge to the vent port of the canister.



Text in Illustration

*1	Vent Port
*2	Purge Port
*3	Air Inlet Port
*4	Pressure Gauge
*5	Connector

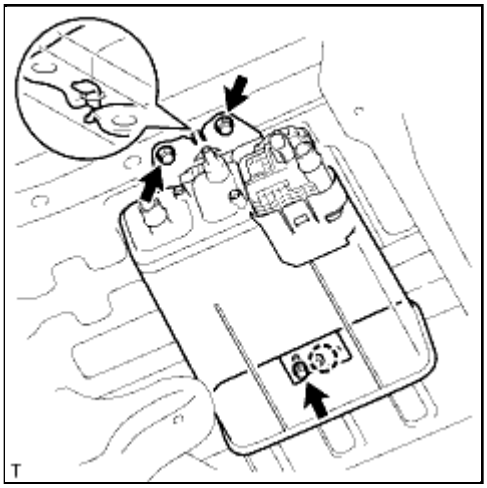
(2) With the purge port, air inlet port and connector closed, apply 19.6 kPa (0.2 kgf/cm2, 2.81 psi) of pressurized air into the vent port, and then confirm that pressure is retained for 1 minute.

If the result is not as specified, replace the canister assembly.

Last Modified: 5-10-2010	6.4 A	**From:** 200908
Model Year: 2010	**Model:** 4Runner	**Doc ID:** RM000002HXP015X
Title: 1GR-FE EMISSION CONTROL: CANISTER: INSTALLATION (2010 4Runner)		

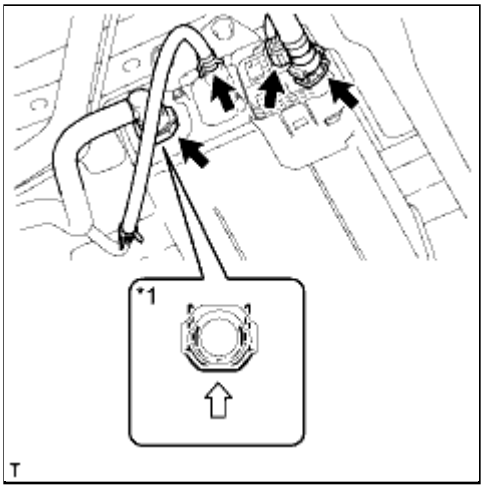
INSTALLATION

1. INSTALL CANISTER ASSEMBLY



(a) Attach the claw and install the canister with the 3 bolts.

Torque: 20 N·m (204 kgf·cm, 15ft·lbf)



(b) Connect the vent line hose.

Text in Illustration

*1	Vent Line Hose
⇨	Push

(1) Push the hose into the port and push the retainer to lock it.

NOTICE:

- Check for damage or foreign objects on the connected part.
- After connecting, check that the vent hose and valve are securely connected by pulling on them.

(c) Connect the air inlet line hose.

NOTICE:

- Check for damage or foreign objects on the connected part.
- After connecting, check that the vent hose and valve are securely connected by pulling on them.

(d) Connect the purge line hose.

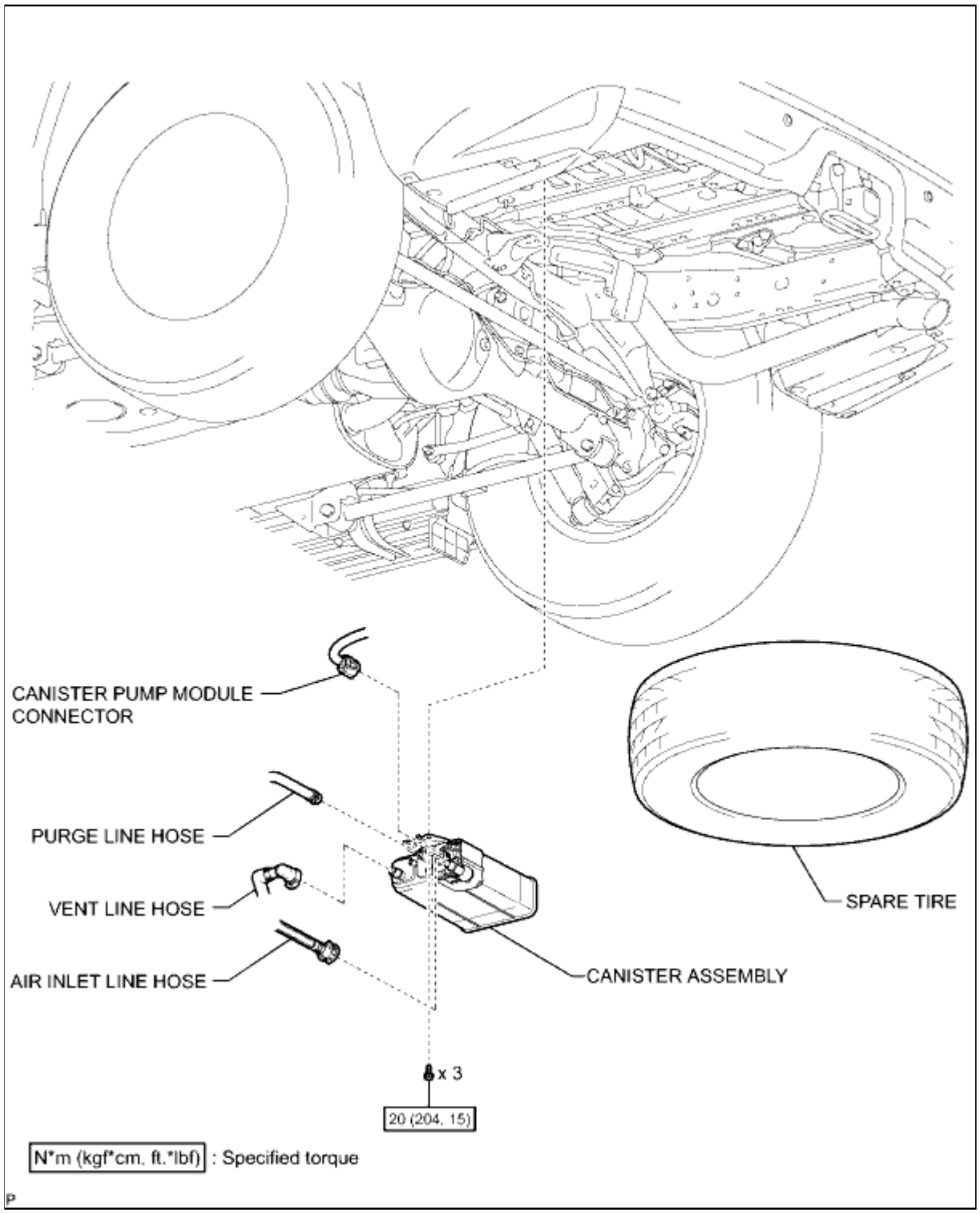
(e) Connect the connector.

2. INSTALL SPARE TIRE

Last Modified: 5-10-2010	6.4 K	**From:** 200908
Model Year: 2010	**Model:** 4Runner	**Doc ID:** RM00000313F00SX
Title: 2TR-FE EMISSION CONTROL: CANISTER: COMPONENTS (2010 4Runner)		

COMPONENTS

ILLUSTRATION



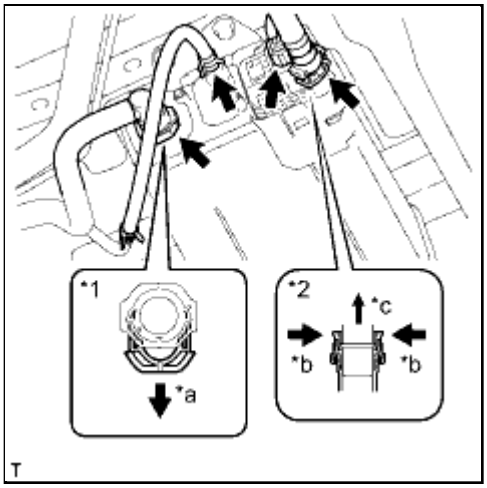
Last Modified: 5-10-2010	6.4 A	**From:** 200908
Model Year: 2010	**Model:** 4Runner	**Doc ID:** RM000002HXS018X
Title: 2TR-FE EMISSION CONTROL: CANISTER: REMOVAL (2010 4Runner)		

REMOVAL

1. REMOVE SPARE TIRE

2. REMOVE CANISTER ASSEMBLY

(a) Disconnect the connector.



(b) Disconnect the purge line hose.

Text in Illustration

*1	Vent Line Hose
*2	Air Inlet Line Hose
*a	Pull
*b	Pinch
*c	Canister Side

(c) Disconnect the air inlet line hose.

(1) Push the hose firmly toward the canister side.

(2) Pinch the hose as shown in the illustration.

(3) Pull out the hose.

NOTICE:

- Do not use any tools in this procedure.
- Check for any dirt and foreign matter contamination in the canister and around the hose. Clean if necessary. Foreign matter may damage the O-rings or cause leaks in the seal between the canister and hose.

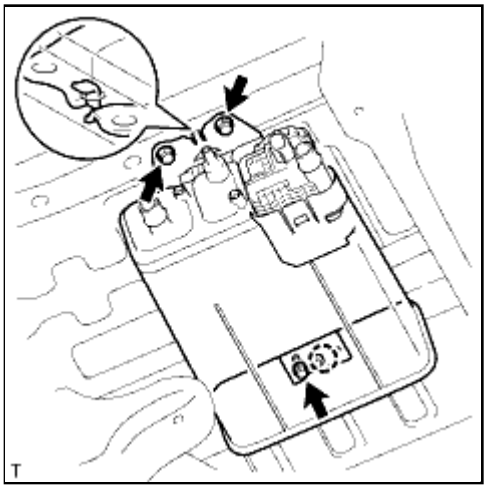
(d) Disconnect the vent line hose.

(1) Pinch the retainer and then raise it.

NOTICE:

- Do not use any tools in this procedure.
- Check for any dirt and foreign matter contamination in the valve and around the connector. Clean if necessary. Foreign matter may damage the O-rings or cause leaks in the seal between the valve and connector.

(e) Detach the claw, and then remove the 3 bolts and

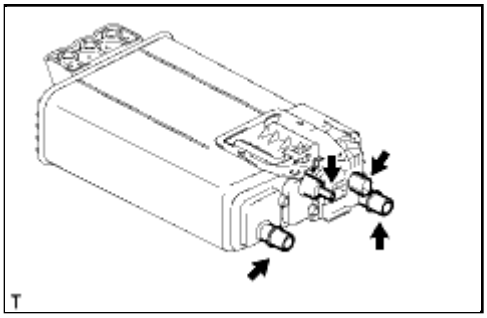


canister.

Last Modified: 5-10-2010	6.4 G	**From:** 200908
Model Year: 2010	**Model:** 4Runner	**Doc ID:** RM000002HXQ016X
Title: 2TR-FE EMISSION CONTROL: CANISTER: INSPECTION (2010 4Runner)		

INSPECTION

1. INSPECT CANISTER ASSEMBLY

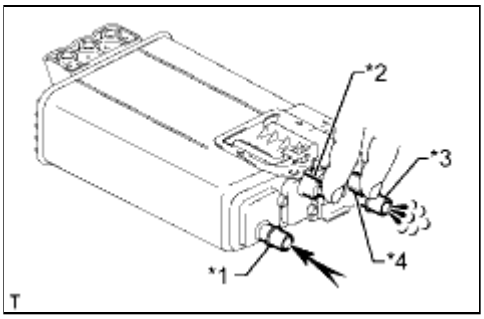


(a) Visually check the canister assembly for cracks or damage.

If cracks or damage is found, replace the canister assembly.

(b) Check the canister operation.

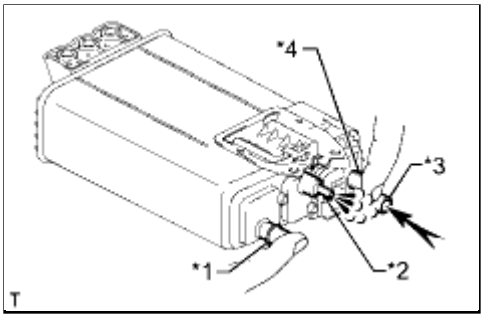
(1) With the purge port and connector closed, blow 5 kPa (0.1 kgf/cm^2, 0.7 psi) of air into the vent port and check that air flows from the air inlet port.



Text in Illustration

*1	Vent Port
*2	Purge Port
*3	Air Inlet Port
*4	Connector
	Air

(2) With the vent port and connector closed, blow 5 kPa (0.1 kgf/cm^2, 0.7 psi) of air into the air inlet port and check that air flows from the purge port.

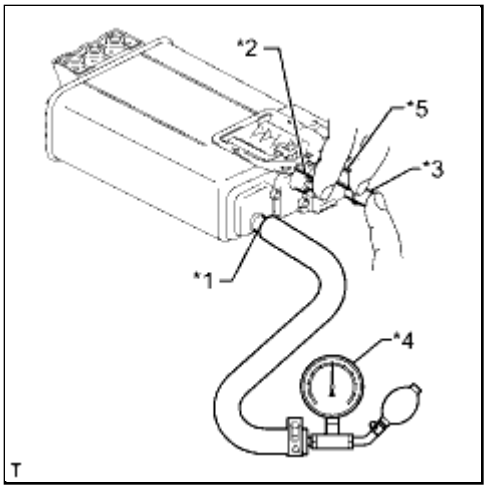


Text in Illustration

*1	Vent Port
*2	Purge Port
*3	Air Inlet Port
*4	Connector
➡	Air

If the result is not as specified, replace the canister assembly.

(c) Check for air leaks.



(1) Connect a pressure gauge to the vent port of the canister.

Text in Illustration

*1	Vent Port
*2	Purge Port
*3	Air Inlet Port
*4	Pressure Gauge
*5	Connector

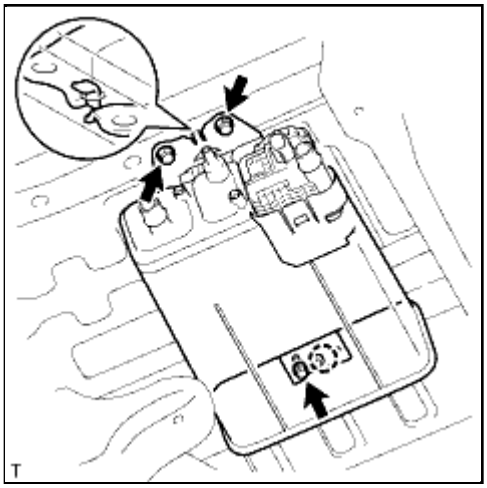
(2) With the purge port, air inlet port and connector closed, apply 19.6 kPa (0.2 kgf/cm^2, 2.8 psi) of pressurized air into the vent port, and then confirm that pressure is retained for 1 minute.

If the result is not as specified, replace the canister assembly.

Last Modified: 5-10-2010	6.4 A	**From:** 200908
Model Year: 2010	**Model:** 4Runner	**Doc ID:** RM000002HXP018X
Title: 2TR-FE EMISSION CONTROL: CANISTER: INSTALLATION (2010 4Runner)		

INSTALLATION

1. INSTALL CANISTER ASSEMBLY

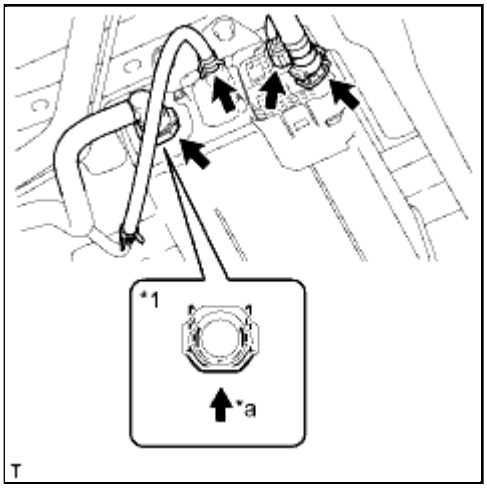


(a) Attach the claw and install the canister with the 3 bolts.

Torque: 20 N·m (204 kgf·cm, 15ft·lbf)

(b) Connect the vent line hose.

(1) Push the hose into the port and push the retainer to lock it.



Text in Illustration

*1	Vent Line Hose
*a	Push

NOTICE:

- Check for damage or foreign objects on the connected part.
- After connecting the hose, check that the vent hose and valve are securely connected by pulling on them.

(c) Connect the air inlet line hose.

NOTICE:

- Check for damage or foreign objects on the connected part.
- After connecting the hose, check that the vent hose and valve are securely connected by pulling on them.

(d) Connect the purge line hose.

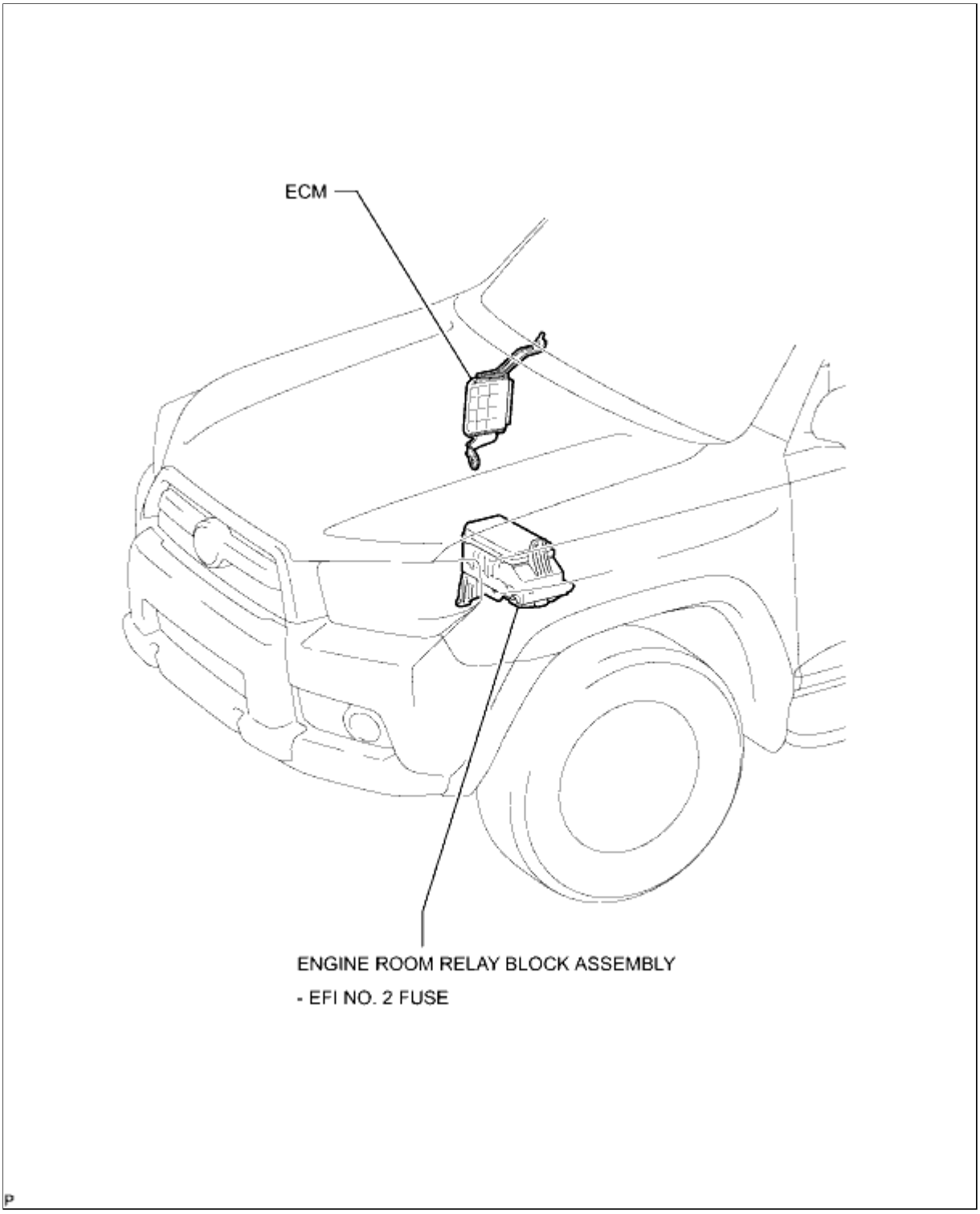
(e) Connect the connector.

2. INSTALL SPARE TIRE

Last Modified: 5-10-2010	6.4 R	**From:** 200908
Model Year: 2010	**Model:** 4Runner	**Doc ID:** RM0000039PH006X
Title: 1GR-FE EMISSION CONTROL: EMISSION CONTROL SYSTEM: PARTS LOCATION (2010 4Runner)		

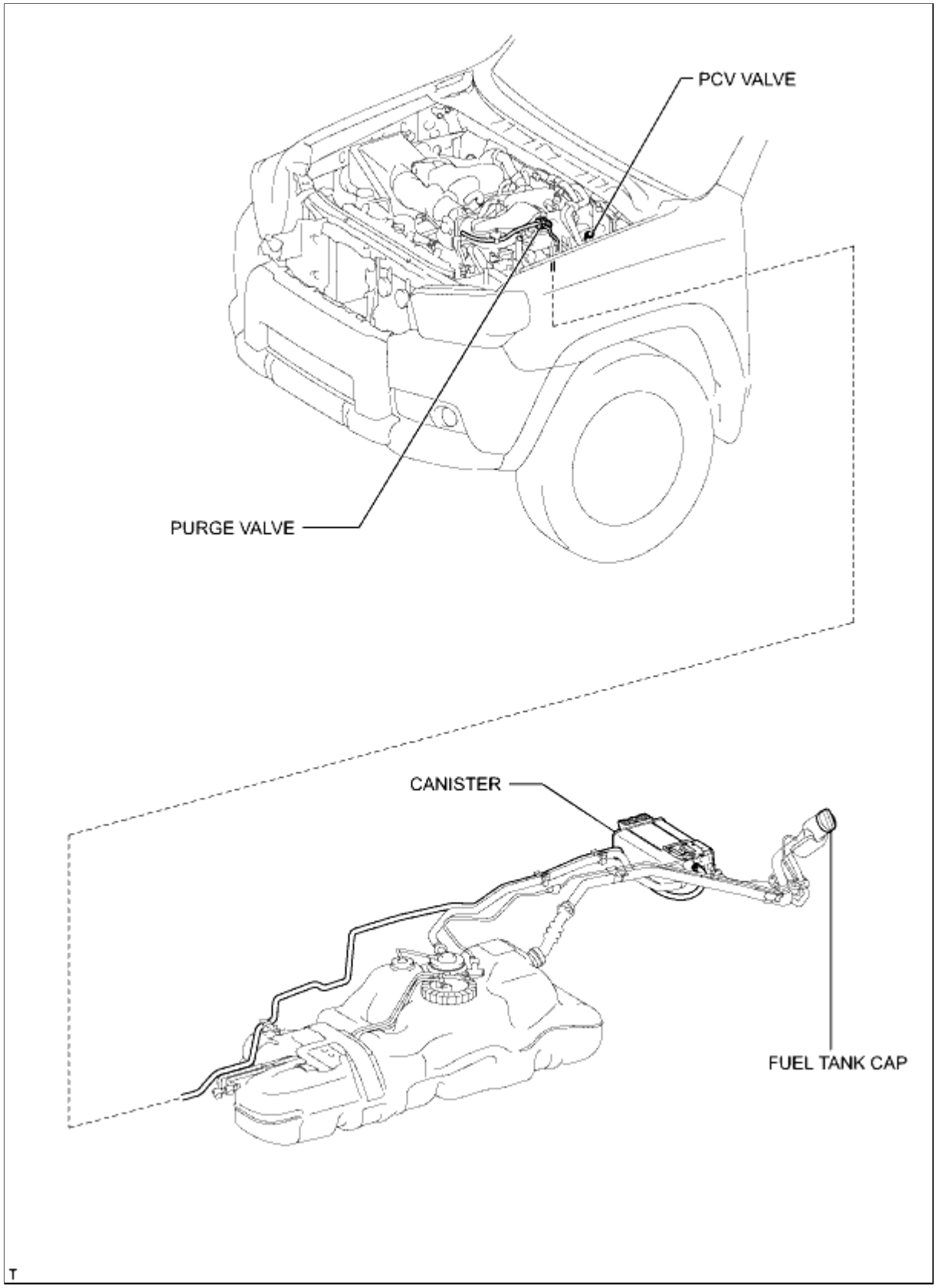
PARTS LOCATION

ILLUSTRATION



P

ILLUSTRATION

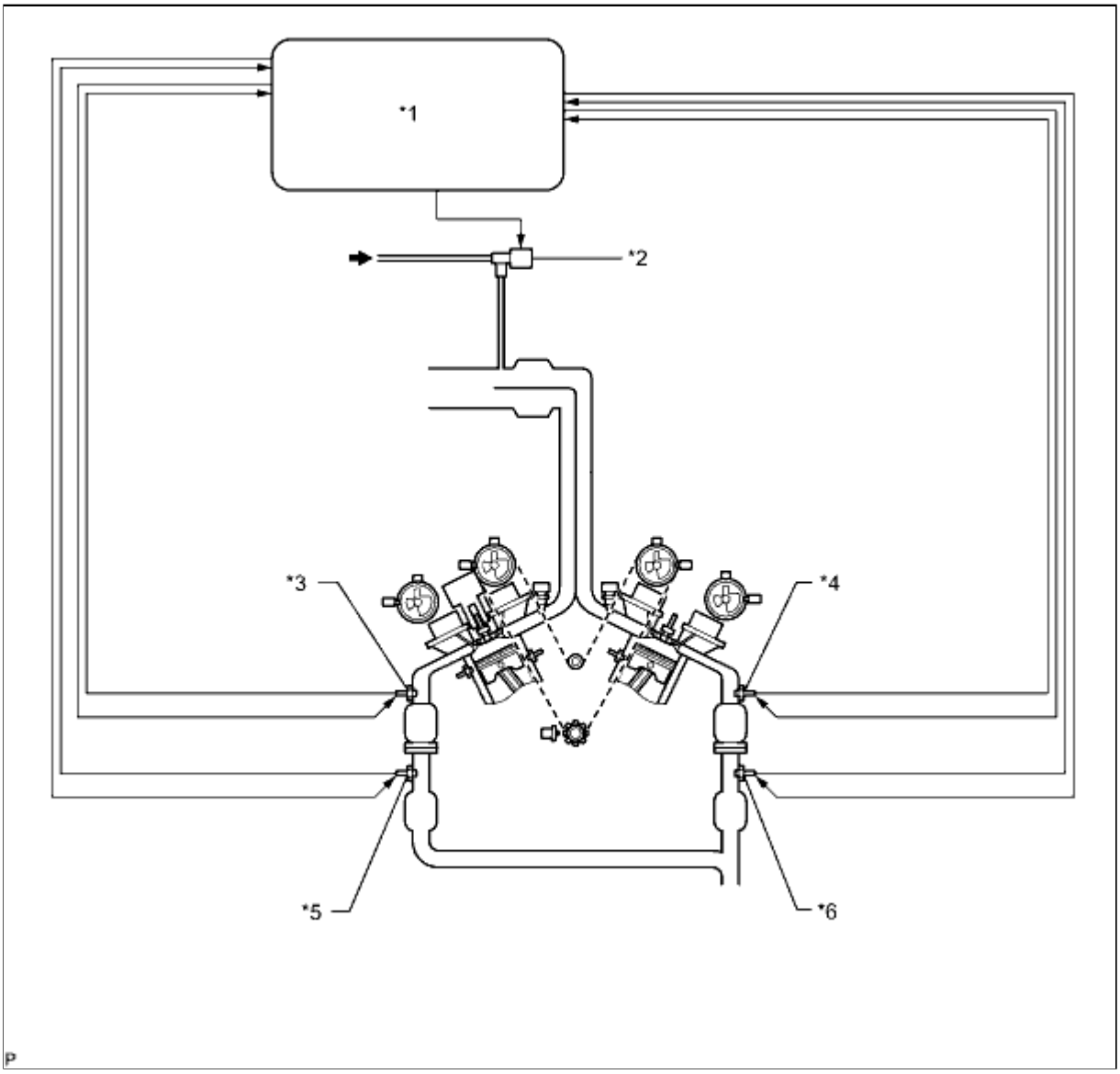


T

Last Modified: 5-10-2010	6.4 U	**From:** 200908
Model Year: 2010	**Model:** 4Runner	**Doc ID:** RM000002XON00AX
Title: 1GR-FE EMISSION CONTROL: EMISSION CONTROL SYSTEM: SYSTEM DIAGRAM (2010 4Runner)		

SYSTEM DIAGRAM

1. EMISSION CONTROL SYSTEM DIAGRAM

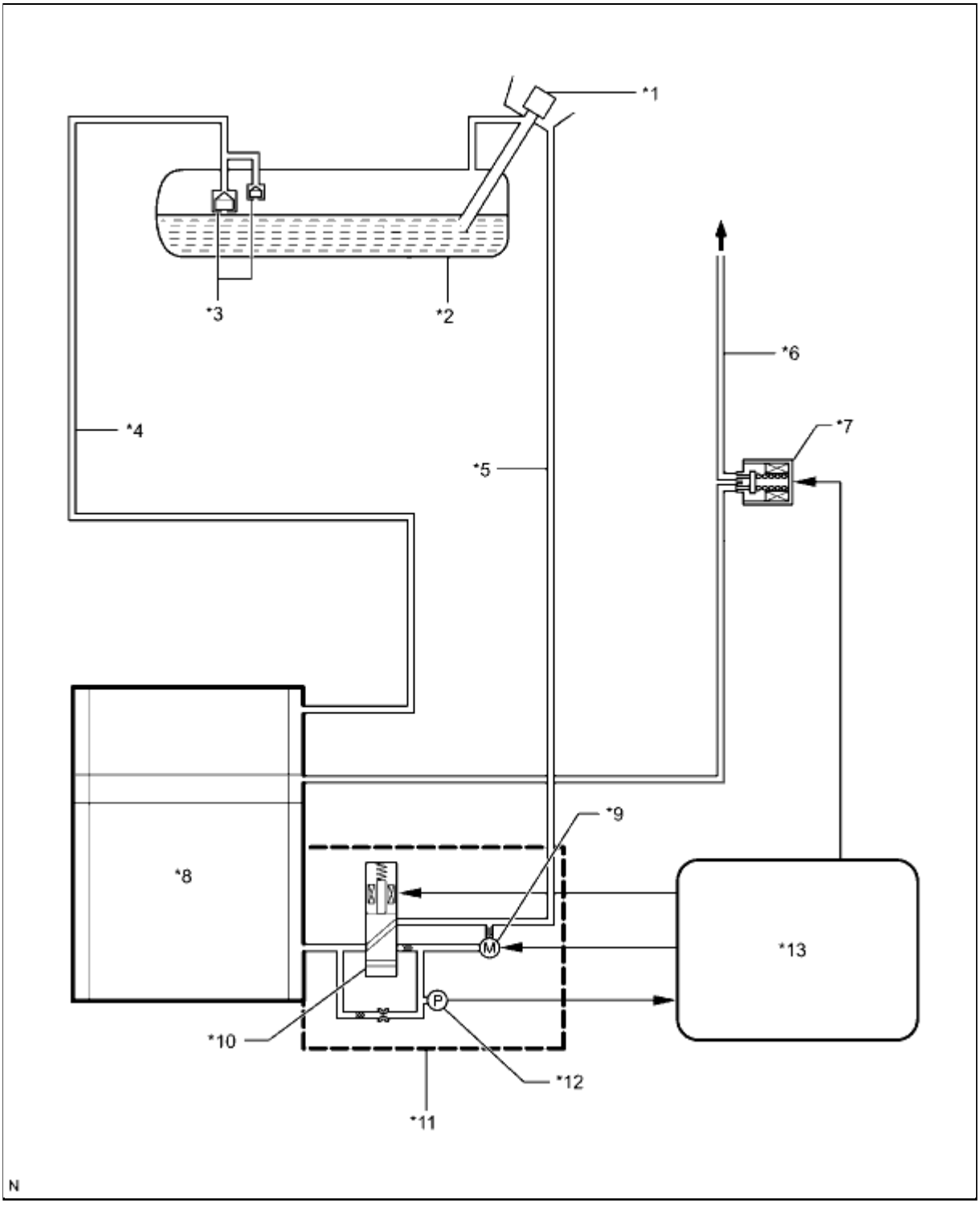


Text in Illustration

*1	ECM	*2	Purge VSV
*3	Air Fuel Ratio Sensor (for Bank 2 Sensor 1)	*4	Air Fuel Ratio Sensor (for Bank 1 Sensor 1)

*5	Heated Oxygen Sensor (for Bank 2 Sensor 2)	*6	Heated Oxygen Sensor (for Bank 1 Sensor 2)
➡	from Canister	-	-

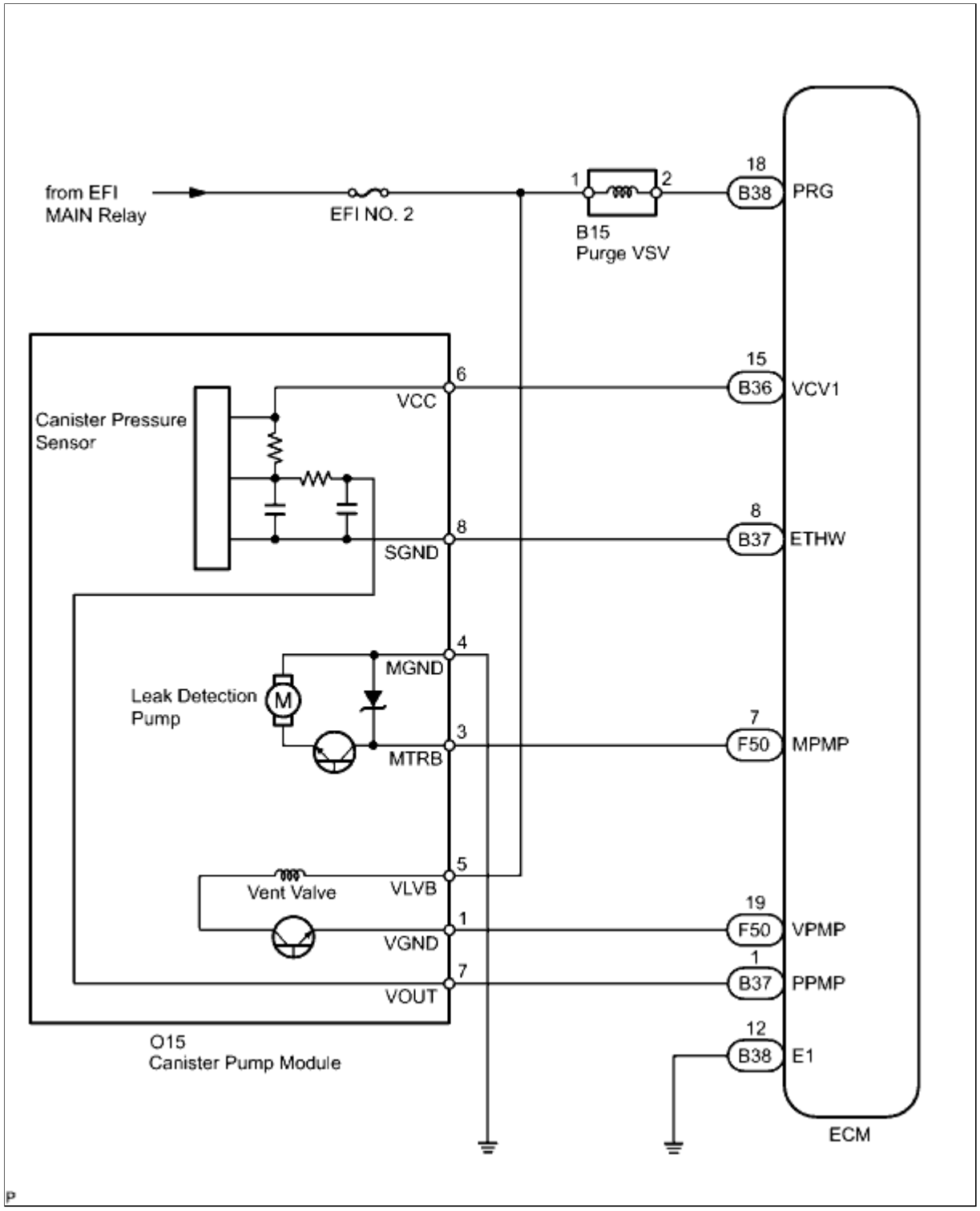
2. EVAP CONTROL SYSTEM DIAGRAM



Text in Illustration

*1	Fuel Tank Cap	*2	Fuel Tank
*3	Fuel Cutoff Valve	*4	Vent Line
*5	Air Inlet Line	*6	Purge Line
*7	Purge VSV	*8	Canister
*9	Pump Motor	*10	Vent Valve
*11	Pump Module	*12	Pressure Sensor
*13	ECM	-	-
	to Intake Manifold	-	-

3. EVAP SYSTEM WIRING DIAGRAM



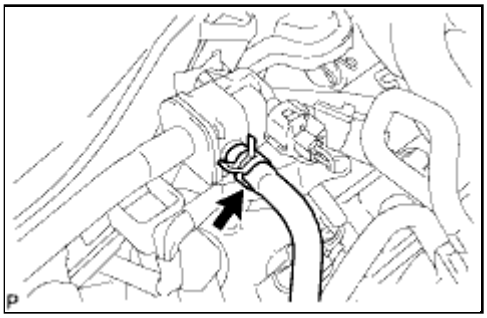
Last Modified: 5-10-2010	6.4 G	**From:** 200908
Model Year: 2010	**Model:** 4Runner	**Doc ID:** RM0000029LP013X
Title: 1GR-FE EMISSION CONTROL: EMISSION CONTROL SYSTEM: ON-VEHICLE INSPECTION (2010 4Runner)		

ON-VEHICLE INSPECTION

1. CHECK PURGE VSV

(a) Connect the Techstream to the DLC3.

(b) Remove the V-bank cover INFO .



(c) Disconnect the hose (connected to the canister) from the purge VSV.

(d) Start the engine and turn the Techstream main switch on.

(e) Enter the following menus: Powertrain / Engine and ECT / Active Test / Activate the VSV for EVAP Control.

OK:

TESTER OPERATION	SPECIFIED CONDITION
EVAP VSV: OFF	Purge VSV has no suction
EVAP VSV: ON	Purge VSV has suction

(f) Connect the hose (connected to the canister) to the purge VSV.

(g) Install the V-bank cover INFO .

2. INSPECT FUEL CUT-OFF RPM

(a) Start and warm up the engine.

(b) Open the throttle valve and keep the engine speed at 3000 rpm.

(c) Use a sound scope to check for injector operating noise.

(d) Check that when the accelerator pedal is released, injector operation noise stops momentarily and then resumes.

If the result is as not specified, check the injector, wiring and ECM.

3. VISUALLY INSPECT HOSES, CONNECTIONS AND GASKETS

(a) Check that there are no cracks, leaks or damage.

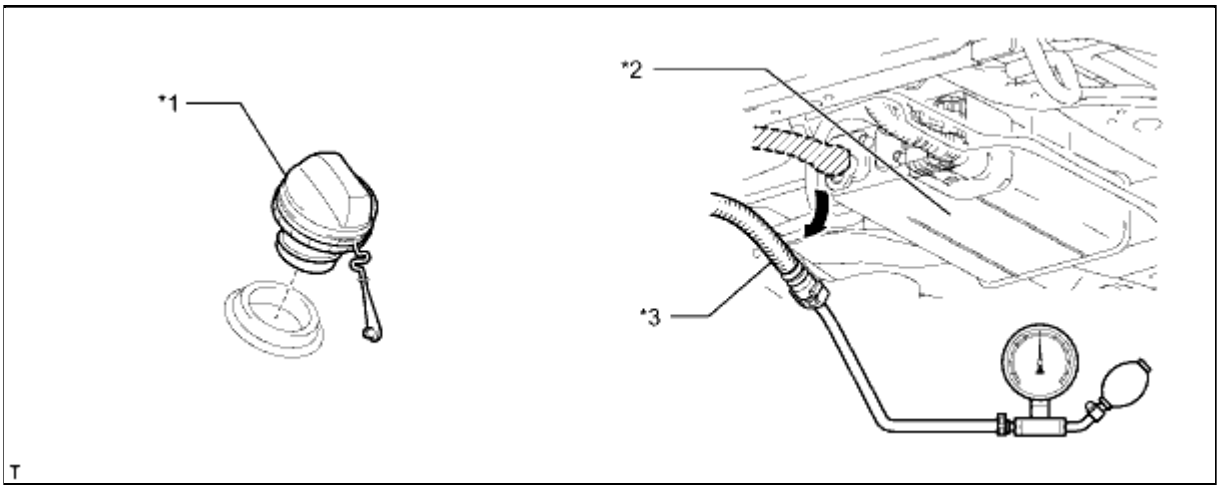
NOTICE:

- Detachment or other problems with the engine oil dipstick, filler cap, PCV hose and other components may cause the engine to run improperly.
- Disconnection, looseness or cracks in the parts of the air induction system between the throttle body and cylinder head will allow air suction and cause an engine failure or engine failure malfunctions.

If the result is not as specified, replace parts as necessary.

4. INSPECT FUEL CUT-OFF VALVE AND FILL CHECK VALVE

(a) Disconnect the vent line hose from the charcoal canister.



Text in Illustration

*1	Fuel Tank Cap	*2	Canister
*3	Vent Line Hose	-	-

(b) Connect a pressure gauge to the vent line hose.

(c) Fill the fuel tank with fuel.

(d) Apply a pressure of 4 kPa (0.04 kgf/cm^2, 0.6 psi) to the vent port of the fuel tank.

HINT:

If the fuel tank is full, it is necessary to check the fuel amount, as the float valve of the fill check valve is closed and there is no ventilation.

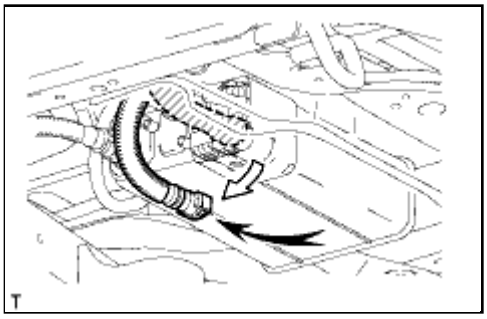
(e) Remove the fuel tank cap, and check that the pressure inside the tank drops.

If the pressure does not drop, replace the fuel tank assembly.

(f) Reconnect the vent line hose to the charcoal canister.

5. CHECK AIR INLET LINE

(a) Disconnect the air inlet line hose from the charcoal canister.



(b) Check that there is ventilation in the air inlet line.

HINT:

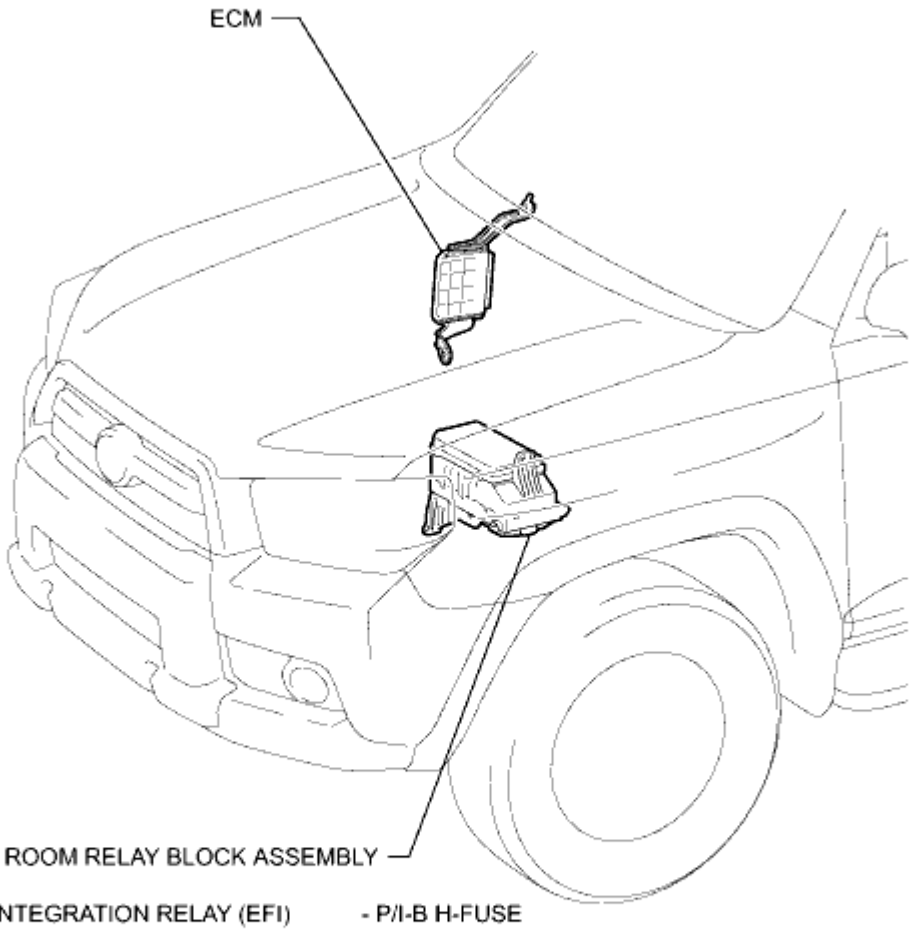
If air cannot flow freely into the air inlet line, repair or replace it.

(c) Reconnect the air inlet line hose to the charcoal canister.

Last Modified: 5-10-2010	6.4 R	**From:** 200908
Model Year: 2010	**Model:** 4Runner	**Doc ID:** RM00000141G00FX
Title: 2TR-FE EMISSION CONTROL: EMISSION CONTROL SYSTEM: PARTS LOCATION (2010 4Runner)		

PARTS LOCATION

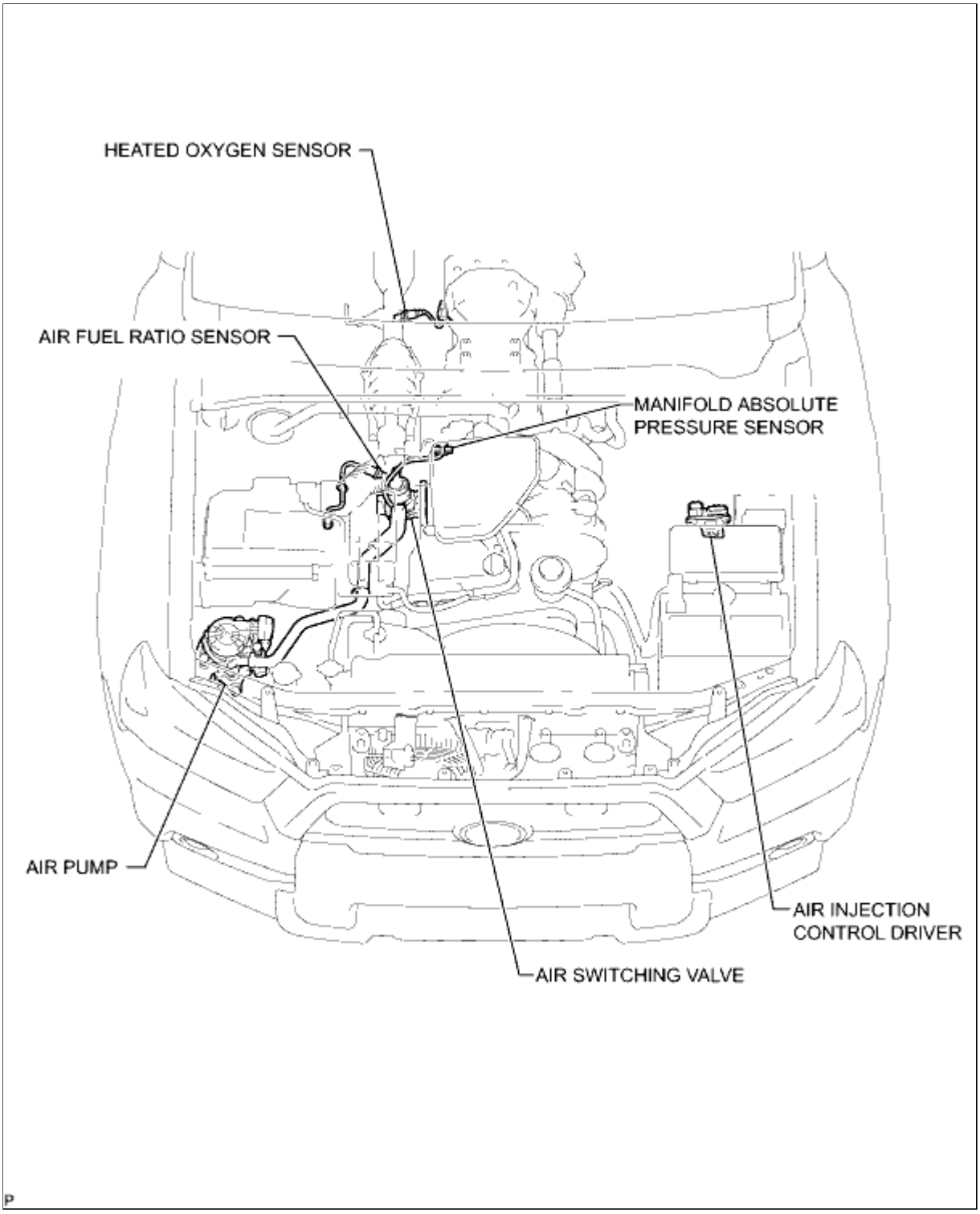
ILLUSTRATION



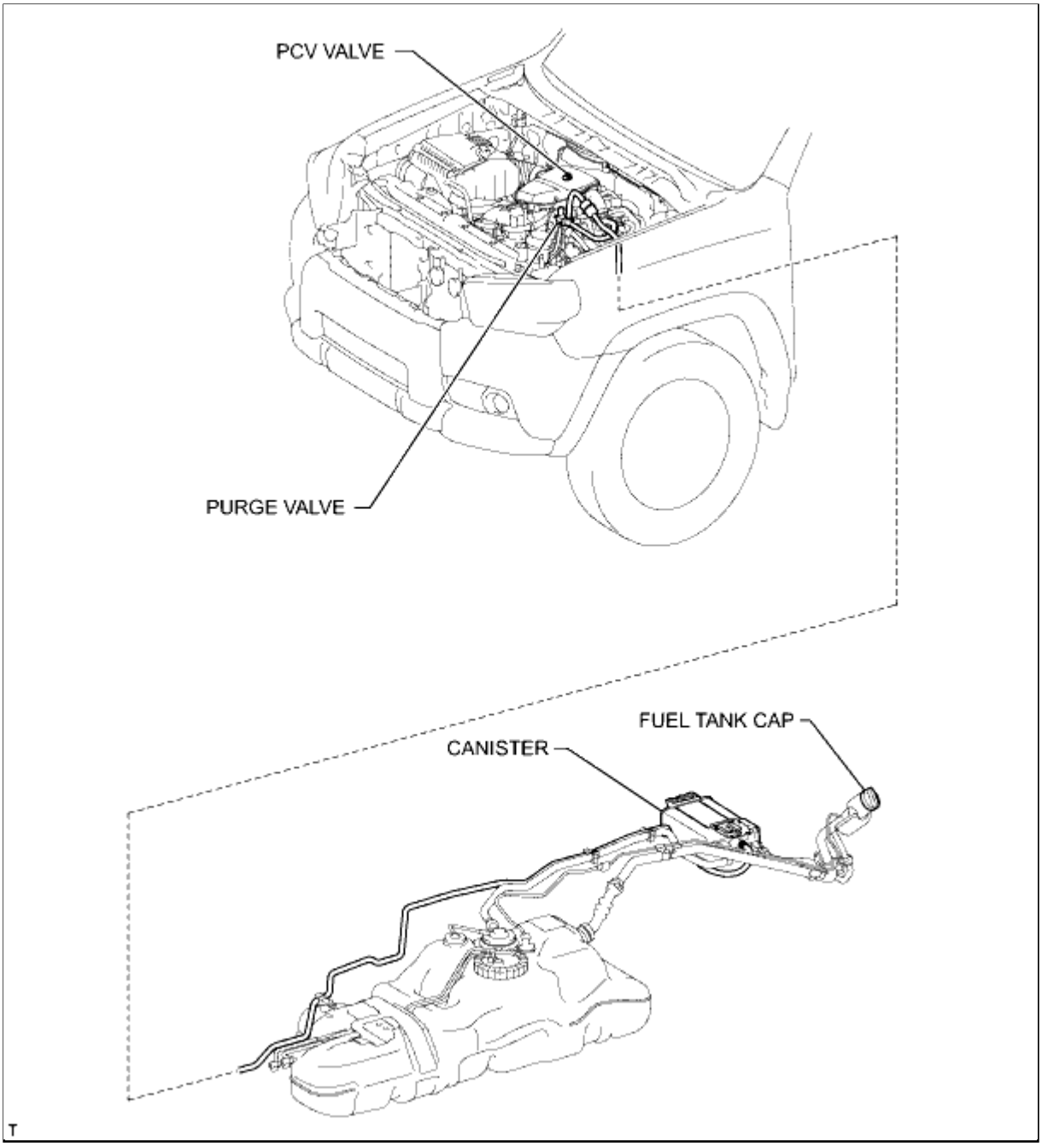
- NO. 1 INTEGRATION RELAY (EFI)
- NO. 1 INTEGRATION RELAY (A/F)
- P/I-B H-FUSE
- AIR PMP H-FUSE
- EFI FUSE
- A/F FUSE
- EFI NO. 2 FUSE

P

ILLUSTRATION



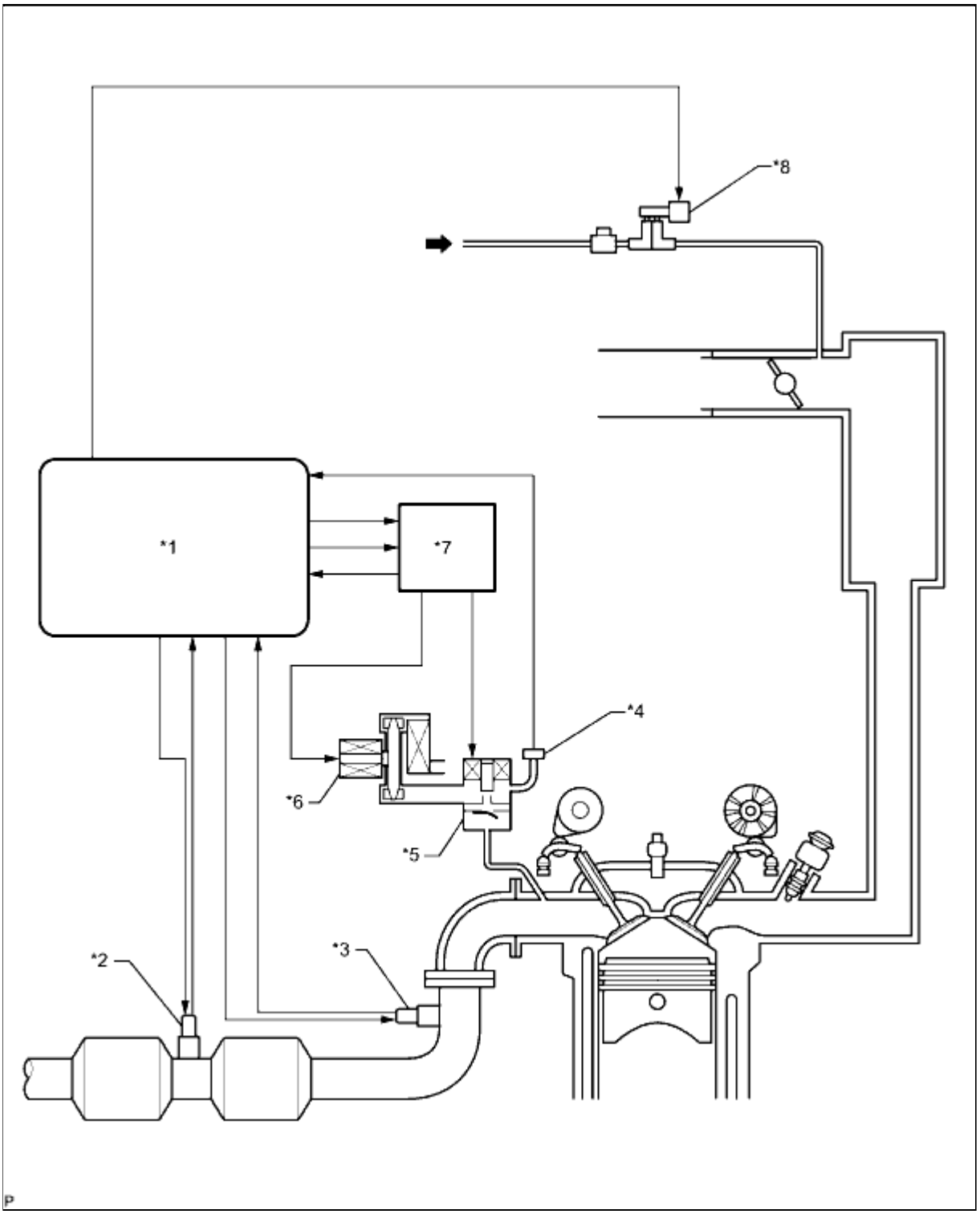
ILLUSTRATION



T

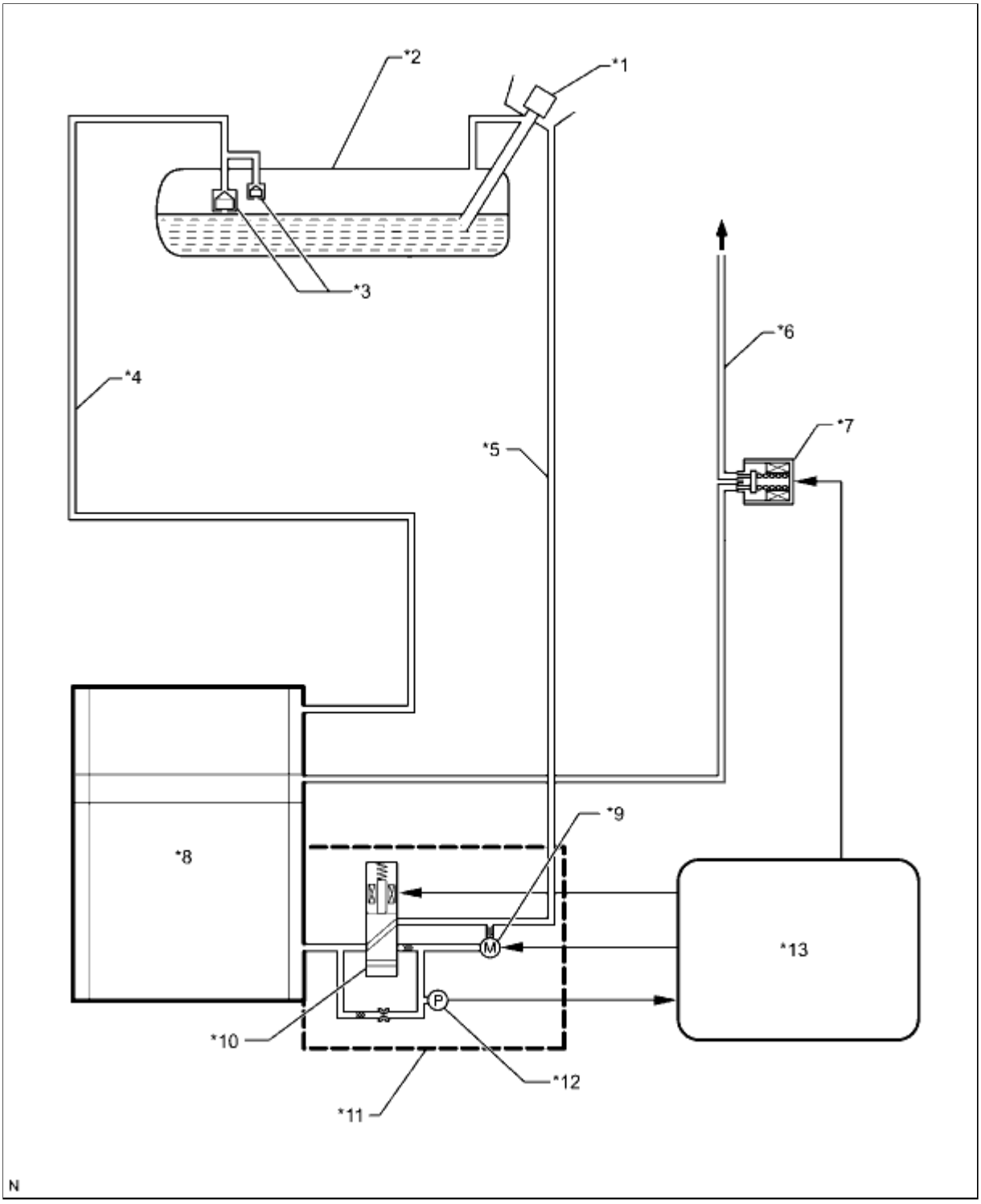
Last Modified: 5-10-2010	6.4 U	**From:** 200908
Model Year: 2010	**Model:** 4Runner	**Doc ID:** RM000004AFE001X
Title: 2TR-FE EMISSION CONTROL: EMISSION CONTROL SYSTEM: SYSTEM DIAGRAM (2010 4Runner)		

SYSTEM DIAGRAM



Text in Illustration

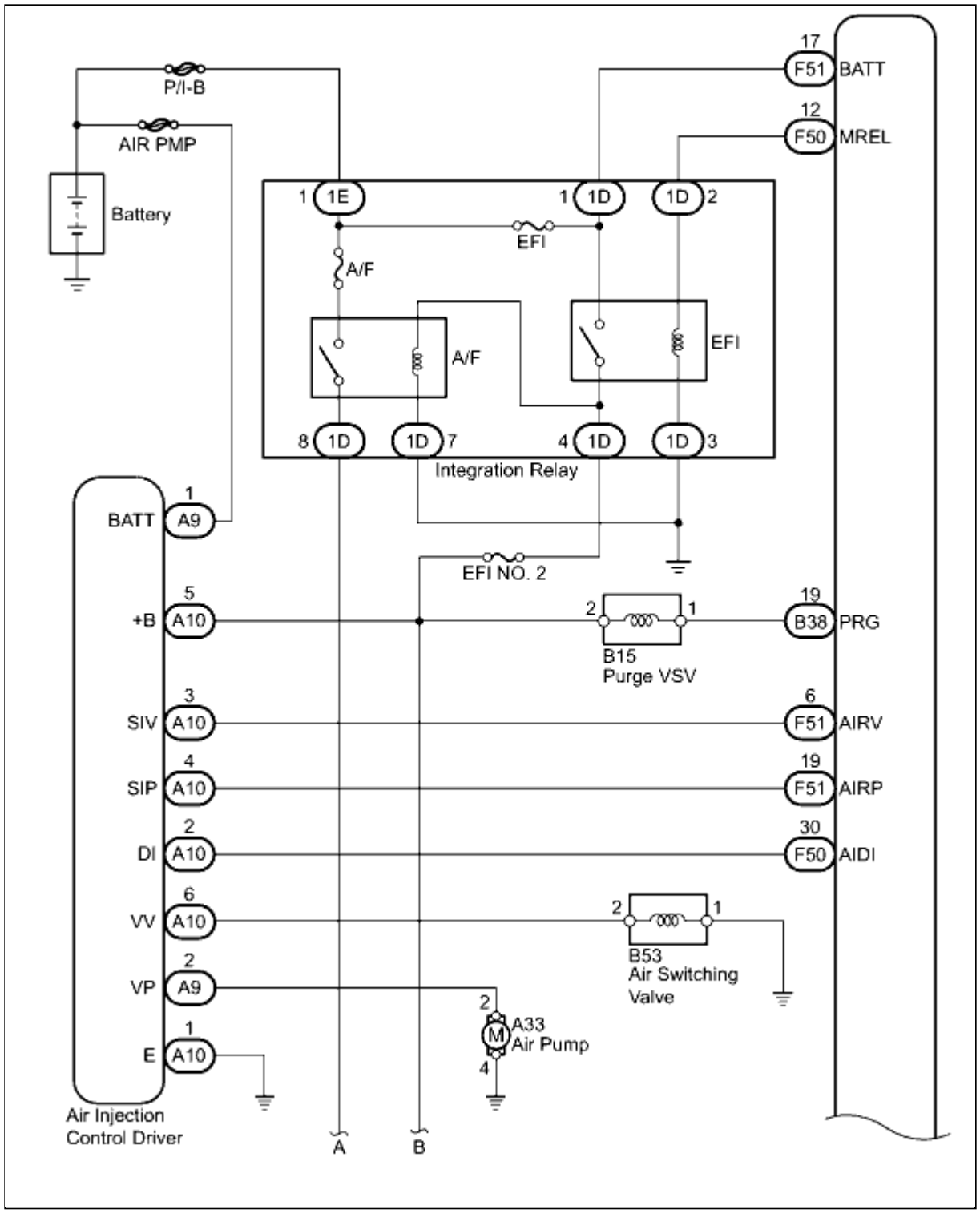
*1	ECM	*2	Heated Oxygen Sensor
*3	Air Fuel Ratio Sensor	*4	Manifold Absolute Pressure Sensor
*5	Air Switching Valve	*6	Air Pump
*7	Air Injection Control Driver	*8	Purge VSV
	from Canister	-	-

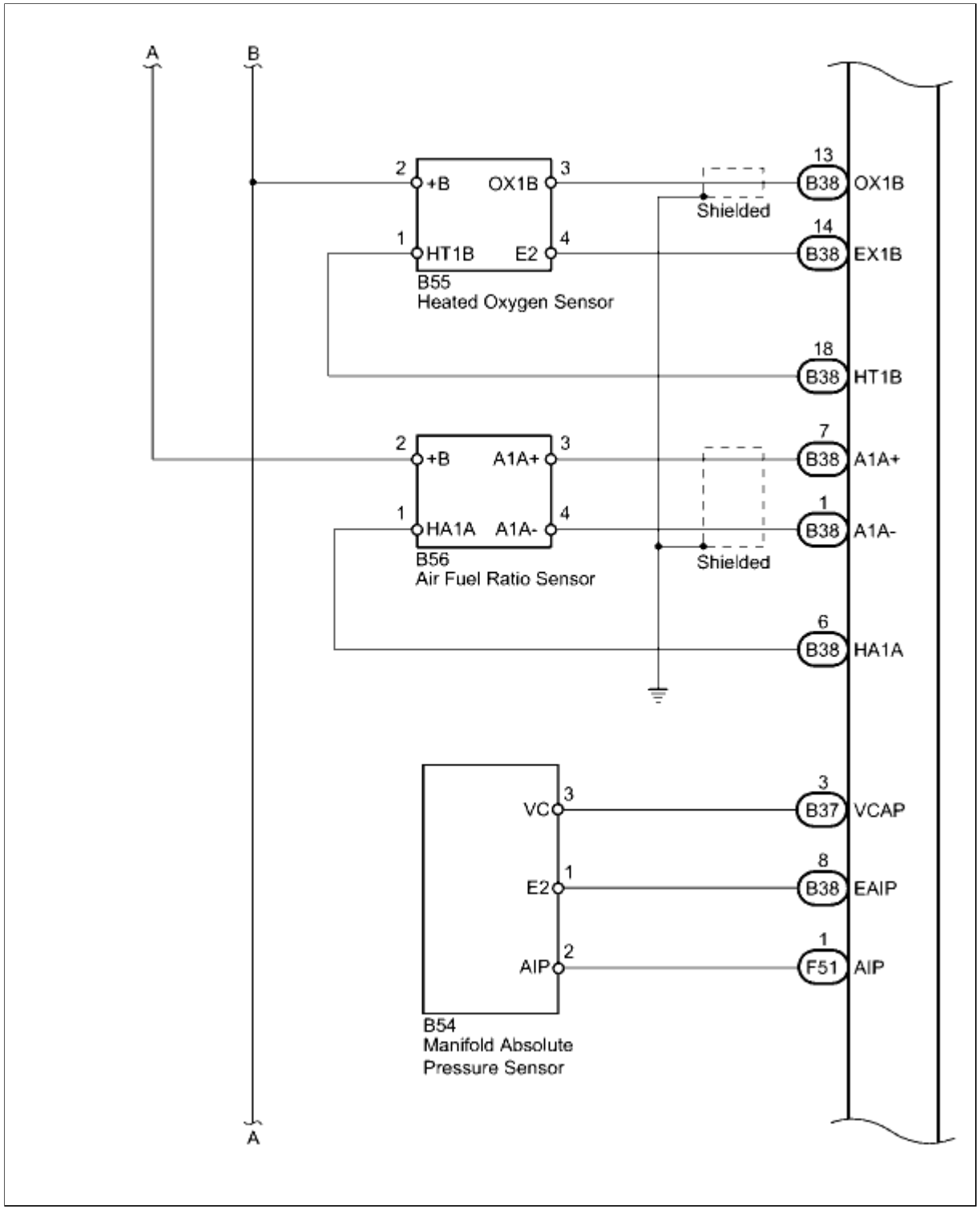


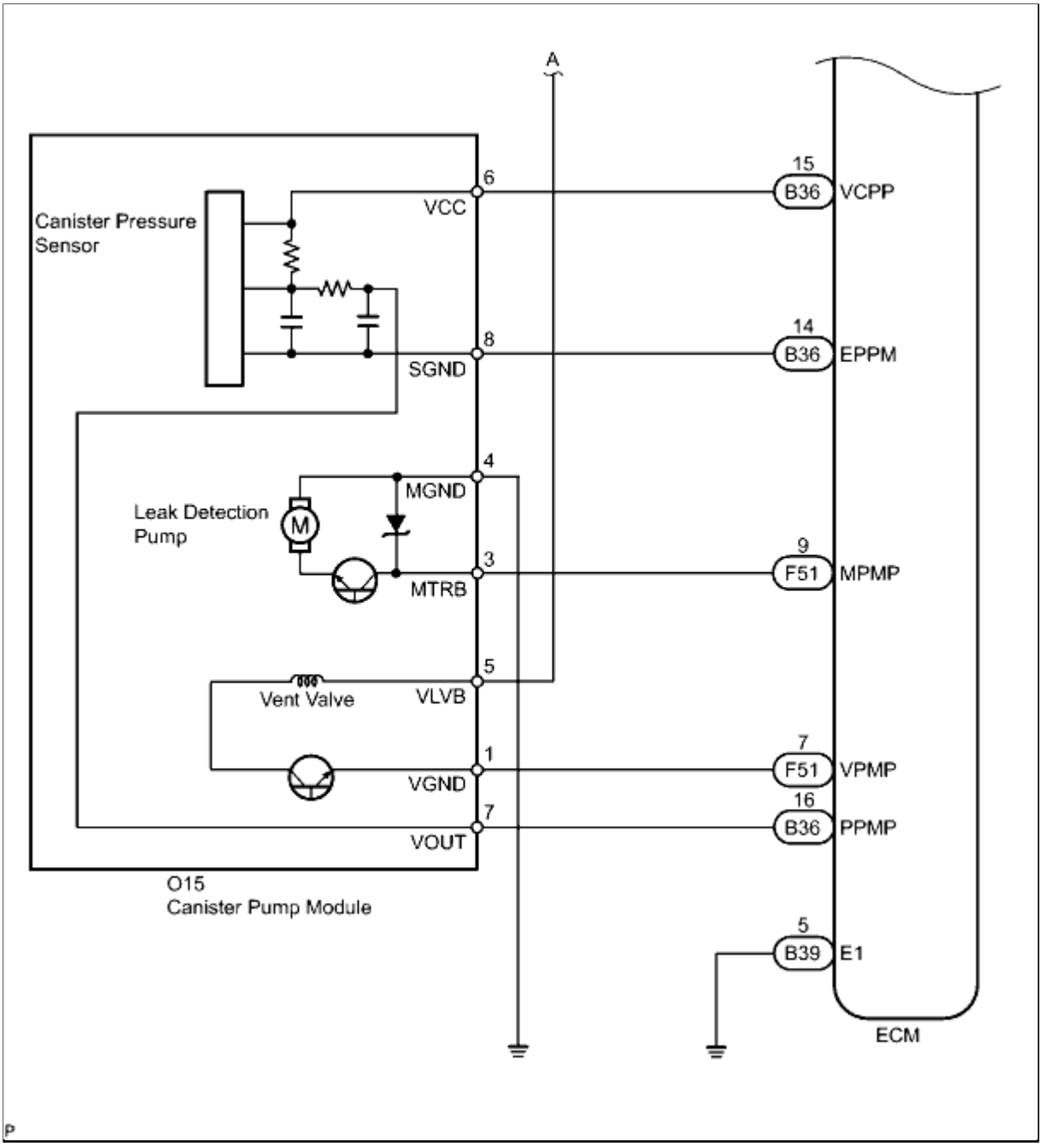
Text in Illustration

*1	Fuel Tank Cap	*2	Fuel Tank
*3	Fuel Cutoff Valve	*4	Vent Line
*5	Air Inlet Line	*6	Purge Line
*7	Purge VSV	*8	Canister
*9	Pump Motor	*10	Vent Valve

*11	Pump Module	*12	Pressure Sensor
*13	ECM	-	-
➡	to Intake Manifold	-	-





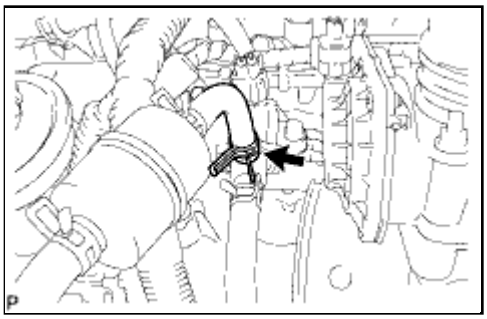


Last Modified: 5-10-2010	6.4 G	**From:** 200908
Model Year: 2010	**Model:** 4Runner	**Doc ID:** RM00000141J00IX
Title: 2TR-FE EMISSION CONTROL: EMISSION CONTROL SYSTEM: ON-VEHICLE INSPECTION (2010 4Runner)		

ON-VEHICLE INSPECTION

1. CHECK PURGE VSV

(a) Check that the purge line hose is connected correctly.



(b) Disconnect the purge line hose (connected to the canister) from the purge VSV and connect a vacuum gauge.

(c) Using the procedure below, perform a purge VSV operation inspection when the engine coolant temperature is 55°C (131°F) or less (while the engine is cold (the purge VSV is closed)).

HINT:

The ECM turns the purge VSV off so that the route between the canister and intake manifold is closed and fuel vapor in the canister is not purged to the intake manifold.

(1) Purge VSV operation inspection procedure.

1. When the engine is idling or running at 2500 rpm, the vacuum gauge indicates 1 kPa (8 mmHg, 0.3 in.Hg) or less.

Result

RESULT	PROCEDURE
Yes	Purge VSV operation normal
No	Go to next step

2. Inspect the purge VSV INFO.

Result

RESULT	PROCEDURE
OK	Check wire harness and ECM
NG	Replace purge VSV

(d) Connect the Techstream to DLC3.

(e) Turn the ignition switch to ON.

(f) Turn the Techstream on.

(g) Enter the following menus: Powertrain / Engine and ECT / Active Test / Activate the VSV for Evap Control.

(h) Using the Techstream, turn on the purge VSV (EVAP VSV: ON).

(1) Purge VSV operation inspection procedure.

1. When the engine is idling, the vacuum gauge indicates 40 kPa (300 mmHg, 11.8 in.Hg) or higher.

Result

RESULT	PROCEDURE
Yes	Purge VSV operation normal
No	Go to next step

2. Inspect the purge VSV INFO.

Result

RESULT	PROCEDURE
OK	Check wire harness, ECM and purge line hose between purge VSV and intake manifold
NG	Replace purge VSV

2. INSPECT FUEL CUT-OFF RPM

(a) Start and warm up the engine.

(b) Maintain the engine speed at 3000 rpm.

(c) Use a sound scope to check for injector operation noise.

(d) Check that when the accelerator pedal is released, injector operation noise stops momentarily and then resumes.

If the result is not as specified, check the injector, wiring and ECM.

3. VISUALLY INSPECT HOSES, CONNECTORS AND GASKETS

(a) Check that there are no cracks, leaks or damage.

NOTICE:

- Detachment or other problems with the engine oil dipstick, filler cap, PCV hose and other components may cause the engine to run improperly.
- Air suction caused by disconnections, looseness or cracks in the parts of the air induction system between the throttle body and cylinder head will cause engine failure or engine malfunctions.

If the result is not as specified, replace parts as necessary.

4. CHECK HOSES AND CONNECTORS

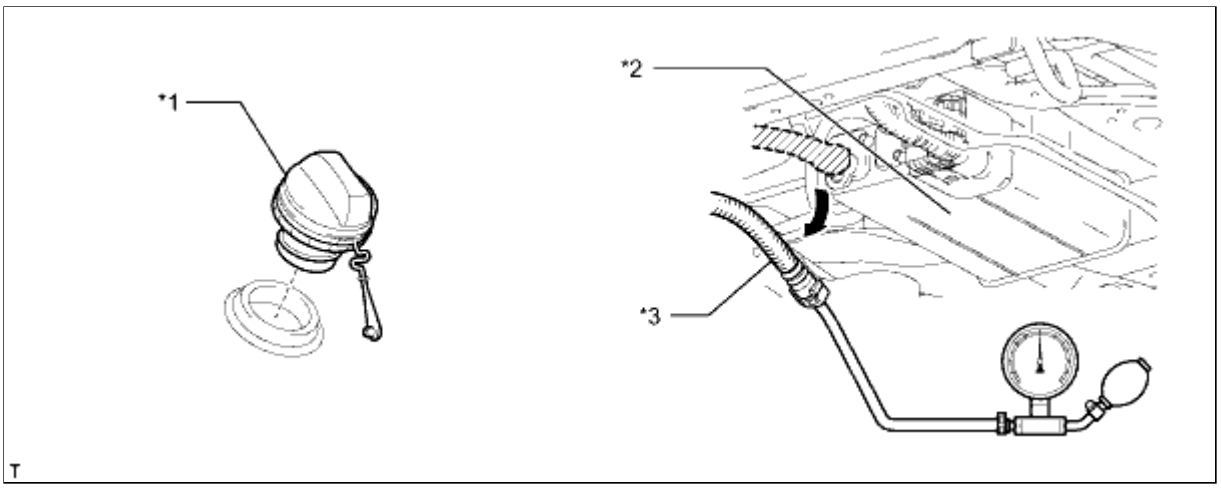
(a) Visually check for loose connections, sharp bends or damage.

5. CHECK FUEL TANK ASSEMBLY

(a) Visually check for deformation, cracks or fuel leakage.

6. INSPECT FUEL CUT-OFF VALVE AND FILL CHECK VALVE

(a) Disconnect the vent line hose from the charcoal canister.



Text in Illustration

*1	Fuel Tank Cap	*2	Canister
*3	Vent Line Hose	-	-

(b) Connect a pressure gauge to the vent line hose.

(c) Fill the fuel tank with fuel.

(d) Apply a pressure of 4 kPa (0.04 kgf/cm^2, 0.6 psi) to the vent port of the fuel tank.

HINT:

If the fuel tank is full, it is necessary to check the fuel amount as the float valve of the fill check valve is closed and there is no ventilation.

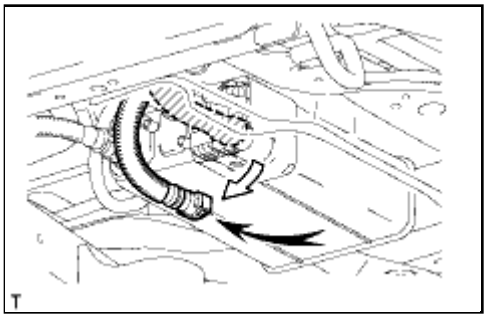
(e) Remove the fuel tank cap and check that the pressure inside the tank drops.

If the pressure does not drop, replace the fuel tank assembly.

(f) Reconnect the vent line hose to the charcoal canister.

7. CHECK AIR INLET LINE

(a) Disconnect the air inlet line hose from the charcoal canister.



(b) Check that there is ventilation in the air inlet line.

HINT:

If air cannot flow freely into the air inlet line, repair or replace it.

(c) Reconnect the air inlet line hose to the charcoal canister.

8. INSPECT SECONDARY AIR INJECTION SYSTEM OPERATION

(a) Start the engine and warm it up.

(b) Turn the ignition switch off.

(c) Connect the Techstream to the DLC3.

(d) Turn the ignition switch to ON and turn the Techstream on.

(e) Enter the following menus: Powertrain / Engine and ECT / Utility / Air Injection Check / Manual Mode / AIR PUMP: ON, ASV: OPEN, and AIR PUMP: OFF, ASV: CLOSE.

HINT:

When Manual Mode is selected, Techstream initialization (atmospheric pressure measurement) is performed automatically. Initialization takes 10 seconds. After initialization, AIR PUMP and ASV operation can be selected.

(f) Start the engine.

(g) Perform the AIR system operation while the engine is idling.

(h) Check that the air pump (AIR PUMP), ASV and pressure in the AIR system passage (PRESSURE) status displayed on the Techstream indicate the conditions shown in the table below.

Standard:

TESTER OPERATION	AIR PUMP	ASV	PRESSURE*1	PULSATION*2
AIR PUMP: ON, ASV: OPEN	ON	ON	2.4 kPa or higher	20 kPa or higher
AIR PUMP: OFF, ASV: CLOSE	OFF	OFF	Below 2.4 kPa	Below 30 kPa

- *1

  This item indicates the average pumping pressure (gauge pressure). The pressure should be 2.4 kPa or higher when the AIR system operates.

- *2

  This item is the cumulative exhaust pulsation calculated by the ECM. If the calculated value

exceeds a certain level, the ECM determines that the exhaust pulsation is in the AIR system.

(i) Turn the Techstream off.

NOTICE:

- Air Injection Check only allows technicians to operate the AIR system for a maximum of 5 seconds.

  Furthermore, the check can only be performed up to 4 times per trip. If the test is repeated, intervals of at least 30 seconds are required between checks.

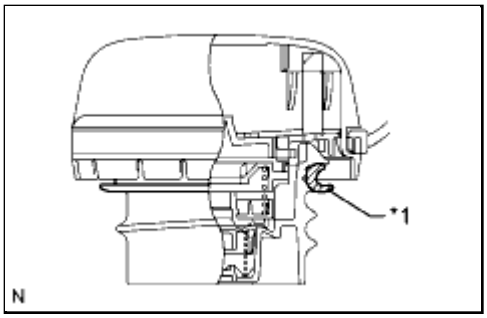
  While AIR system operation using the Techstream is prohibited, the Techstream display indicates the prohibition (WAIT or ERROR).

  If ERROR is displayed on the Techstream during the test, stop the engine for 10 minutes, and then try again.
- Performing Air Injection Check repeatedly may cause damage to the AIR system. If necessary, leave an interval of several minutes between Air Injection Check operations to prevent the system from overheating.
- When performing the Air Injection Check operation after the battery cable has been reconnected, wait for 7 minutes with the ignition switch turned to ON or the engine running.
- Turn the ignition switch off when the Air Injection Check operation finishes.

Last Modified: 5-10-2010	6.4 G	**From:** 200908
Model Year: 2010	**Model:** 4Runner	**Doc ID:** RM0000029LN01DX
Title: 1GR-FE EMISSION CONTROL: FUEL TANK CAP: INSPECTION (2010 4Runner)		

INSPECTION

1. INSPECT FUEL TANK CAP ASSEMBLY



(a) Visually check if the cap and/or gasket are deformed or damaged.

Text in Illustration

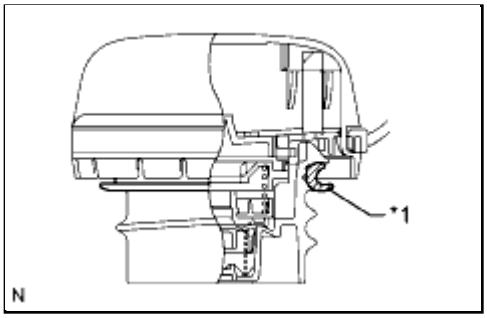
*1	Gasket

If necessary, replace the cap assembly.

Last Modified: 5-10-2010	6.4 G	**From:** 200908
Model Year: 2010	**Model:** 4Runner	**Doc ID:** RM0000029LN01FX
Title: 2TR-FE EMISSION CONTROL: FUEL TANK CAP: INSPECTION (2010 4Runner)		

INSPECTION

1. INSPECT FUEL TANK CAP ASSEMBLY



(a) Visually check that the cap and gasket are not deformed or damaged.

Text in Illustration

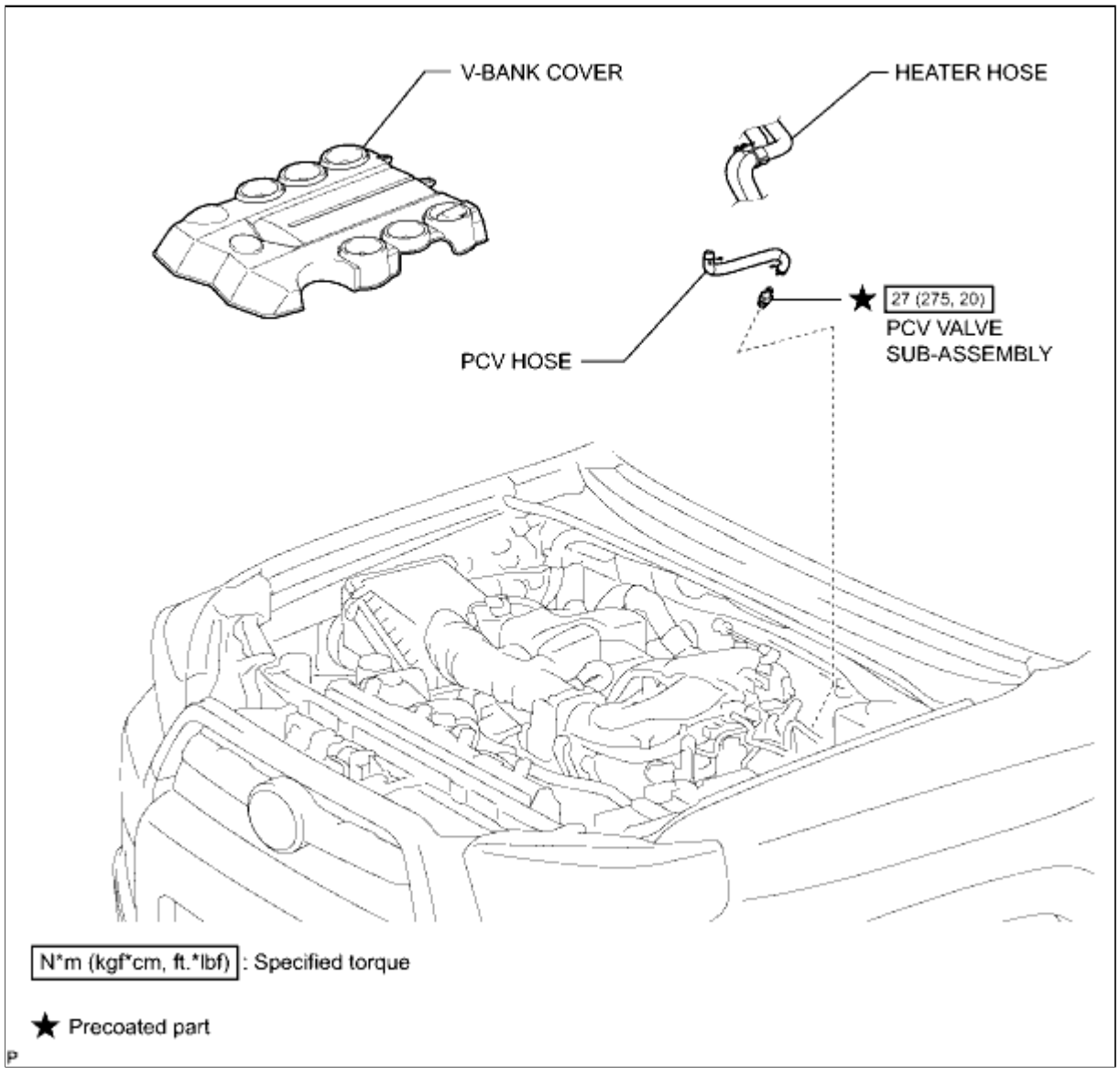
*1	Gasket

If the result is not specified, replace the fuel tank cap assembly.

Last Modified: 5-10-2010	6.4 K	**From:** 200908
Model Year: 2010	**Model:** 4Runner	**Doc ID:** RM0000039PF006X
Title: 1GR-FE EMISSION CONTROL: PCV VALVE: COMPONENTS (2010 4Runner)		

COMPONENTS

ILLUSTRATION

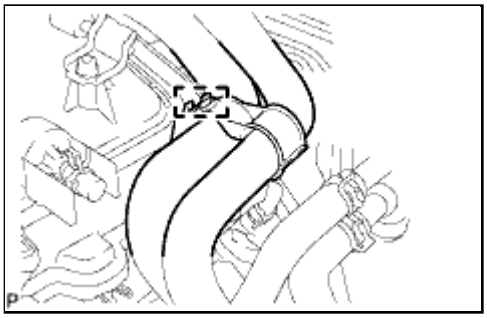


Last Modified: 5-10-2010	6.4 A	**From:** 200908
Model Year: 2010	**Model:** 4Runner	**Doc ID:** RM000002WP100CX
Title: 1GR-FE EMISSION CONTROL: PCV VALVE: REMOVAL (2010 4Runner)		

REMOVAL

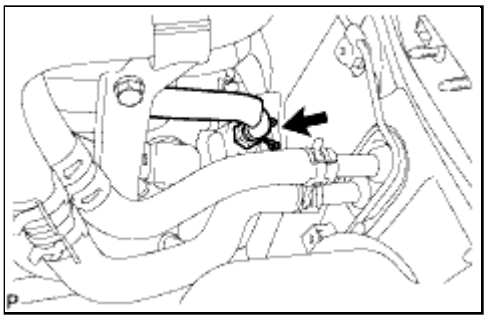
1. REMOVE V-BANK COVER INFO

2. DISCONNECT HEATER HOSE

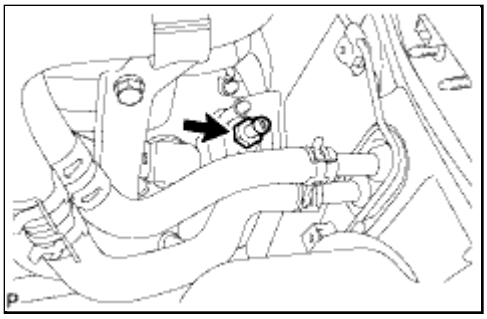


(a) Disconnect the heater hose clamp.

3. REMOVE PCV VALVE SUB-ASSEMBLY



(a) Loosen the hose clamp and disconnect the PCV hose from the valve.



(b) Remove the valve.

Last Modified: 5-10-2010	6.4 G	**From:** 200908
Model Year: 2010	**Model:** 4Runner	**Doc ID:** RM0000029LL01HX
Title: 1GR-FE EMISSION CONTROL: PCV VALVE: INSPECTION (2010 4Runner)		

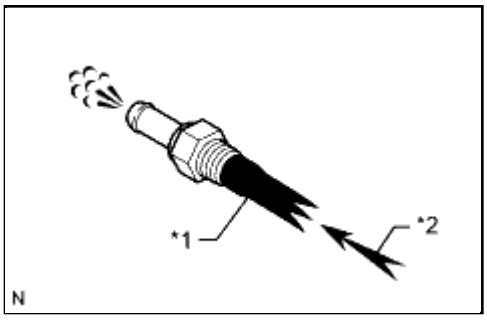
INSPECTION

1. INSPECT PCV VALVE SUB-ASSEMBLY

(a) Install a clean hose to the PCV valve.

(b) Check the PCV valve operation.

(1) Blow air into the cylinder head side, and check that air passes through easily.



Text in Illustration

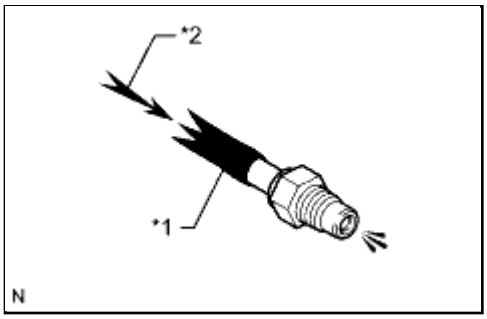
*1	Hose
*2	Air

CAUTION:

Do not suck air through the valve.

Petroleum substances inside the valve are hazardous to your health.

(2) Blow air into the intake manifold side, and check that air passes through with difficulty.



Text in Illustration

*1	Hose
*2	Air

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

(c) Remove the clean hose from the PCV valve.

Last Modified: 5-10-2010	6.4 A	**From:** 200908
Model Year: 2010	**Model:** 4Runner	**Doc ID:** RM000002WOZ00CX
Title: 1GR-FE EMISSION CONTROL: PCV VALVE: INSTALLATION (2010 4Runner)		

INSTALLATION

1. INSTALL PCV VALVE SUB-ASSEMBLY

(a) Apply adhesive to 2 or 3 threads of the PCV valve.

Adhesive:
Toyota Genuine Adhesive 1324, Three Bond 1324 or equivalent

(b) Install the PCV valve.

Torque: 27 N·m (275 kgf·cm, 20ft·lbf)

(c) Connect the PCV hose to the valve.

(d) Secure the hose with the clamp.

2. CONNECT HEATER HOSE

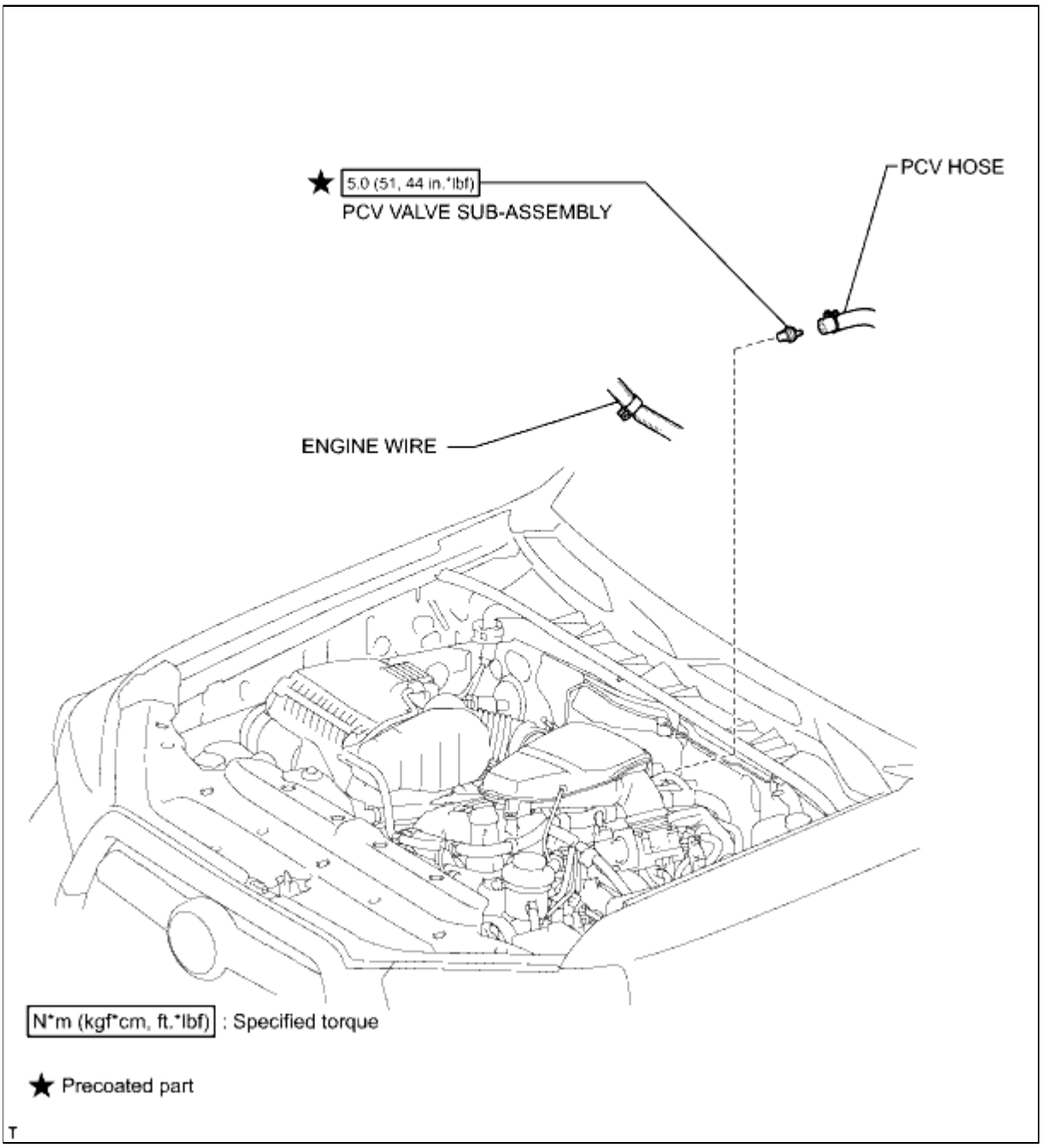
(a) Connect the heater hose clamp.

3. INSTALL V-BANK COVER

Last Modified: 5-10-2010	6.4 K	**From:** 200908
Model Year: 2010	**Model:** 4Runner	**Doc ID:** RM0000045FT002X
Title: 2TR-FE EMISSION CONTROL: PCV VALVE: COMPONENTS (2010 4Runner)		

COMPONENTS

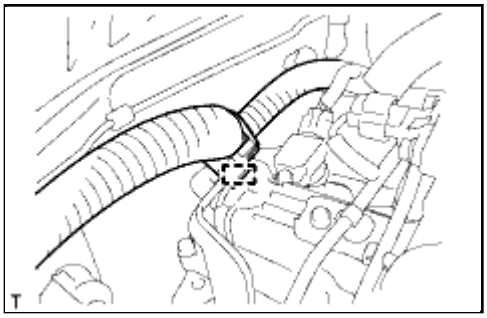
ILLUSTRATION



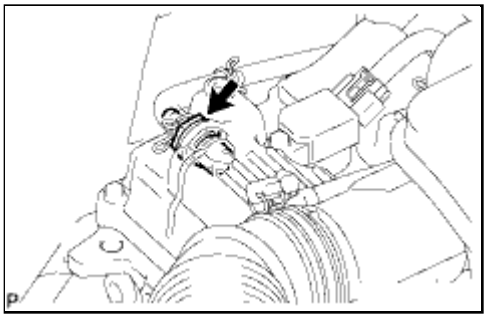
Last Modified: 5-10-2010	6.4 A	**From:** 200908
Model Year: 2010	**Model:** 4Runner	**Doc ID:** RM000000W9M005X
Title: 2TR-FE EMISSION CONTROL: PCV VALVE: REMOVAL (2010 4Runner)		

REMOVAL

1. REMOVE PCV VALVE SUB-ASSEMBLY



(a) Detach the engine wire clamp.



(b) Disconnect the PCV hose from the ventilation valve.

(c) Using a 22 mm ball joint lock nut wrench, remove the PCV valve.

Last Modified: 5-10-2010	6.4 G	**From:** 200908
Model Year: 2010	**Model:** 4Runner	**Doc ID:** RM000000W9K006X
Title: 2TR-FE EMISSION CONTROL: PCV VALVE: INSPECTION (2010 4Runner)		

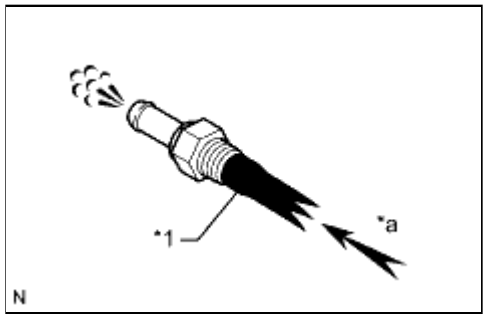
INSPECTION

1. INSPECT PCV VALVE SUB-ASSEMBLY

(a) Install a clean hose to the PCV valve.

(b) Check the PCV valve operation.

(1) Blow air into the cylinder head side and check that air passes through easily.



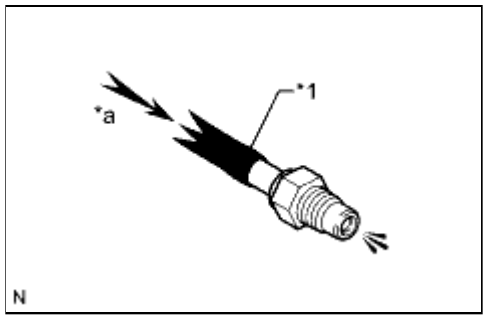
Text in Illustration

*1	Clean Hose
*a	Cylinder Head Cover Side
➡	Air

CAUTION:

Do not suck air through the valve. Petroleum substances inside the valve are hazardous to your health.

(2) Blow air into the intake manifold side and check that air passes through with difficulty.



Text in Illustration

*1	Clean Hose

*a	Intake Manifold Side
	Air

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

(c) Remove the clean hose from the PCV valve.

Last Modified: 5-10-2010	6.4 A	**From:** 200908
Model Year: 2010	**Model:** 4Runner	**Doc ID:** RM000000W9J005X
Title: 2TR-FE EMISSION CONTROL: PCV VALVE: INSTALLATION (2010 4Runner)		

INSTALLATION

1. INSTALL PCV VALVE SUB-ASSEMBLY

(a) Apply adhesive to 2 or 3 threads of the valve.

Adhesive:
Toyota genuine adhesive 1324, three bond 1324 or equivalent

(b) Using a 22 mm ball joint lock nut wrench, install the PCV valve.

Torque: 5.0 N·m (51 kgf·cm, 44in·lbf)

NOTICE:

Use the formula to calculate special torque values for situations where a ball joint lock nut wrench is combined with a torque wrench INFO **.**

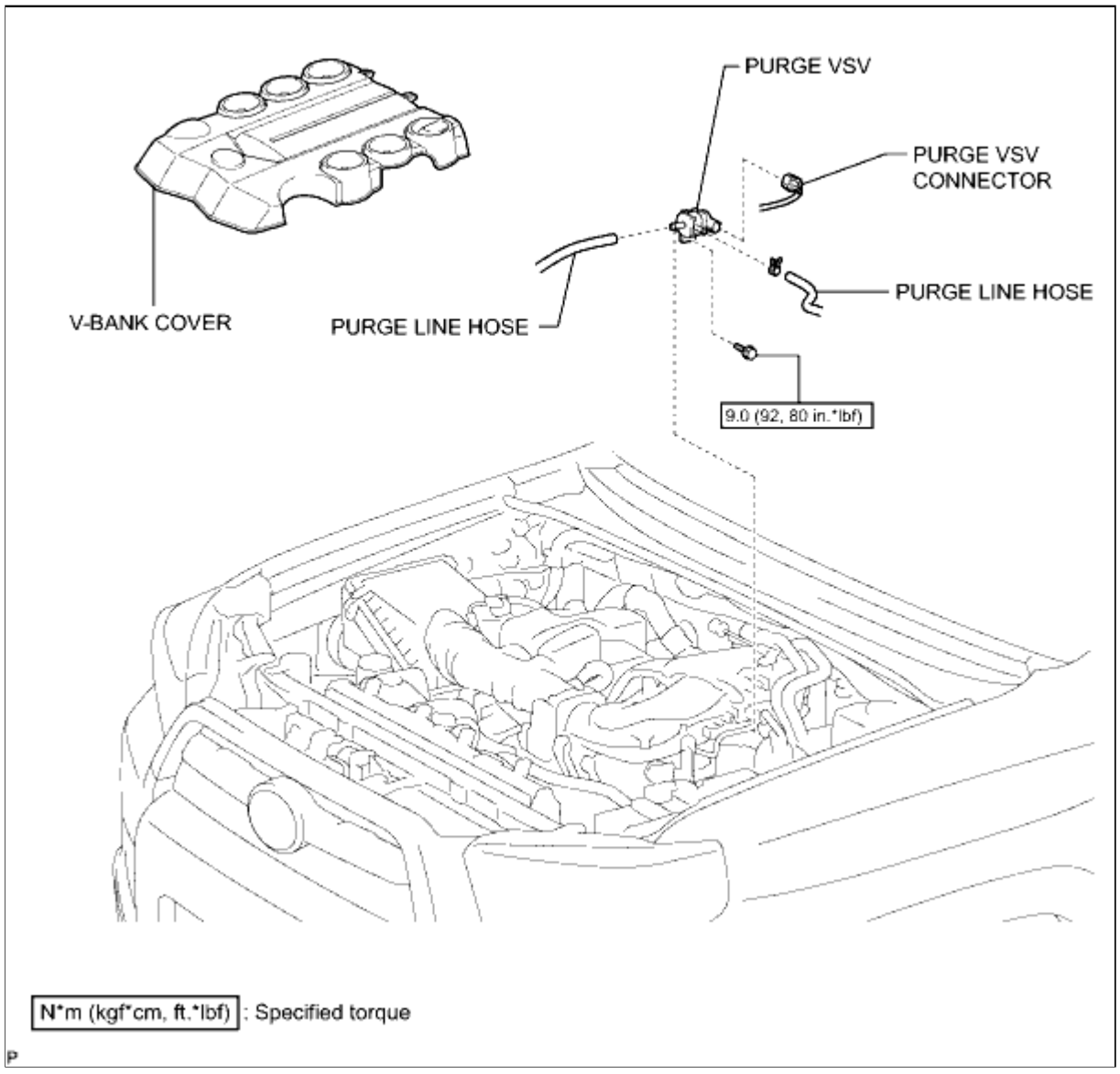
(c) Connect the PCV hose.

(d) Attach the engine wire clamp.

Last Modified: 5-10-2010	6.4 K	**From:** 200908
Model Year: 2010	**Model:** 4Runner	**Doc ID:** RM0000039PE006X
Title: 1GR-FE EMISSION CONTROL: PURGE VALVE: COMPONENTS (2010 4Runner)		

COMPONENTS

ILLUSTRATION

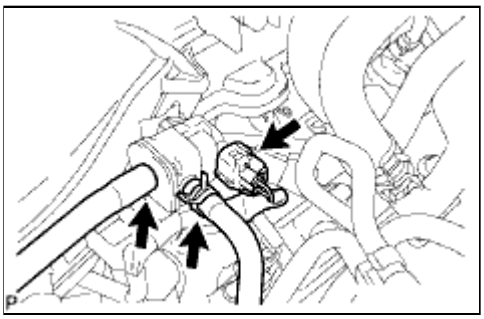


Last Modified: 5-10-2010	6.4 A	**From:** 200908
Model Year: 2010	**Model:** 4Runner	**Doc ID:** RM000002WOT00CX
Title: 1GR-FE EMISSION CONTROL: PURGE VALVE: REMOVAL (2010 4Runner)		

REMOVAL

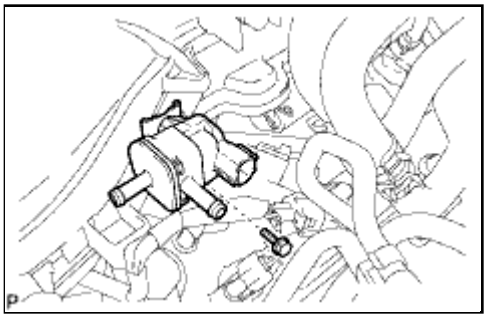
1. REMOVE V-BANK COVER INFO

2. REMOVE PURGE VSV



(a) Disconnect the purge VSV connector.

(b) Disconnect the 2 purge line hoses.

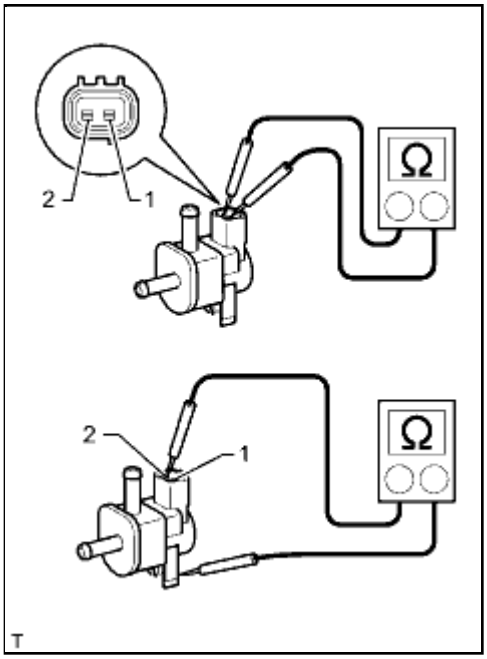


(c) Remove the bolt and purge VSV.

Last Modified: 5-10-2010	6.4 G	**From:** 200908
Model Year: 2010	**Model:** 4Runner	**Doc ID:** RM0000029LK01IX
Title: 1GR-FE EMISSION CONTROL: PURGE VALVE: INSPECTION (2010 4Runner)		

INSPECTION

1. INSPECT PURGE VSV



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

Standard Resistance:

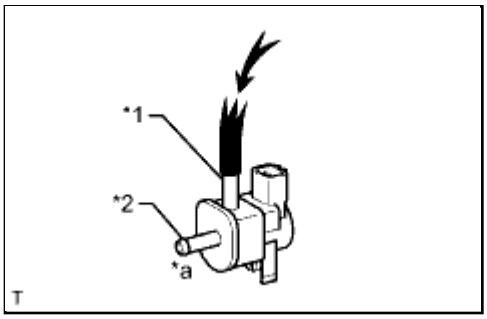
TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
1 - 2	20°C (68°F)	23 to 26 Ω
1 - Body ground	Always	10 MΩ or higher
2 - Body ground	Always	10 MΩ or higher

HINT:

When measuring the coil resistance make sure that the surface temperature of the purge VSV is 20°C.

(b) Check the operation of the purge VSV.

(1) Check that air does not flow from port E to port F.

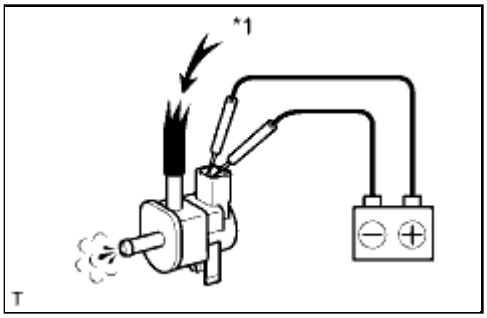


Text in Illustration

*1	Port E
*2	Port F
*a	Does not flow

(2) Apply battery voltage to the connector and check the VSV operation.

OK:



MEASUREMENT CONDITION	SPECIFIED CONDITION
Battery positive (+) → Terminal 1 Battery negative (-) → Terminal 2	Air flows from port E to port F

Text in Illustration

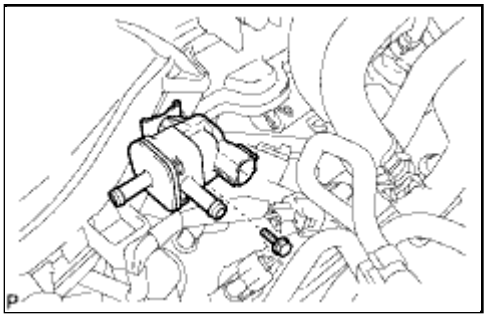
*1	Air

If the result is not as specified, replace the purge VSV.

Last Modified: 5-10-2010	6.4 A	**From:** 200908
Model Year: 2010	**Model:** 4Runner	**Doc ID:** RM000002WOR00CX
Title: 1GR-FE EMISSION CONTROL: PURGE VALVE: INSTALLATION (2010 4Runner)		

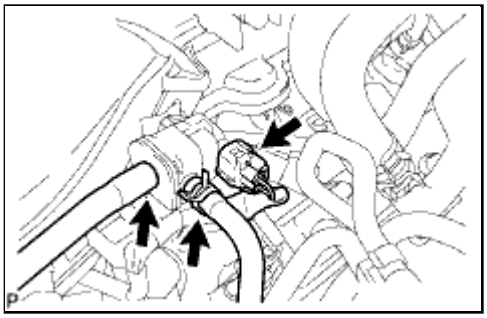
INSTALLATION

1. INSTALL PURGE VSV



(a) Install the purge VSV with the bolt.

Torque: 9.0 N·m (92 kgf·cm, 80in·lbf)



(b) Connect the 2 purge line hoses.

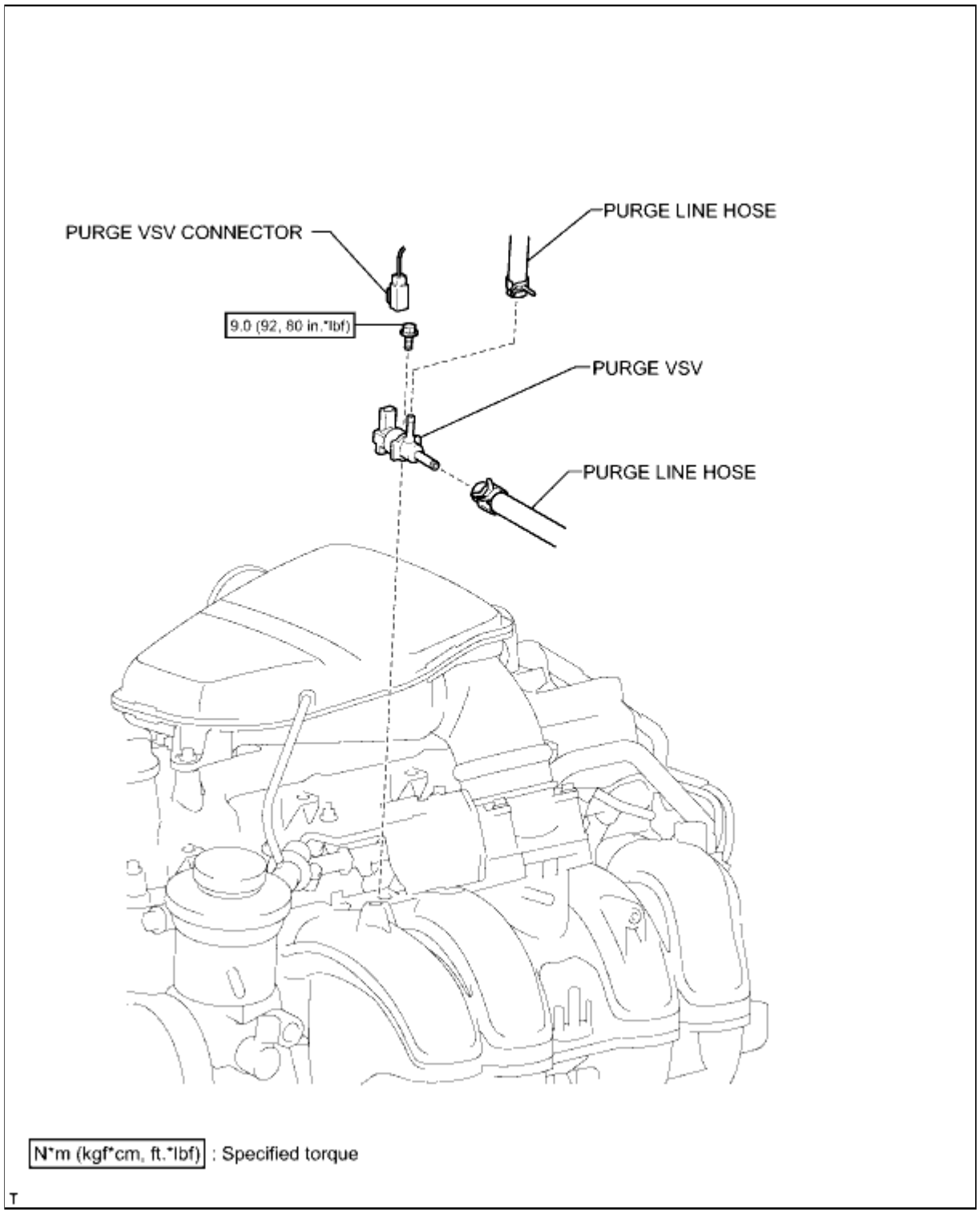
(c) Connect the purge VSV connector.

2. INSTALL V-BANK COVER INFO

Last Modified: 5-10-2010	6.4 K	**From:** 200908
Model Year: 2010	**Model:** 4Runner	**Doc ID:** RM0000045FS002X
Title: 2TR-FE EMISSION CONTROL: PURGE VALVE: COMPONENTS (2010 4Runner)		

COMPONENTS

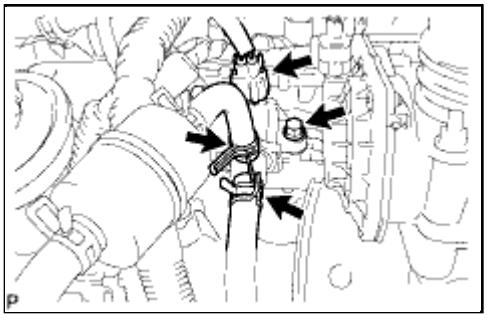
ILLUSTRATION



Last Modified: 5-10-2010	6.4 A	**From:** 200908
Model Year: 2010	**Model:** 4Runner	**Doc ID:** RM0000030BQ005X
Title: 2TR-FE EMISSION CONTROL: PURGE VALVE: REMOVAL (2010 4Runner)		

REMOVAL

1. REMOVE PURGE VSV



(a) Disconnect the purge VSV connector.

(b) Disconnect the 2 purge line hoses from the purge VSV.

(c) Remove the bolt and purge VSV.

Last Modified: 5-10-2010	6.4 G	**From:** 200908
Model Year: 2010	**Model:** 4Runner	**Doc ID:** RM000001CK0013X
Title: 2TR-FE EMISSION CONTROL: PURGE VALVE: INSPECTION (2010 4Runner)		

INSPECTION

1. INSPECT PURGE VSV

(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)	26 to 30 Ω
1 - Body ground	Always	10 MΩ or higher
2 - Body ground		

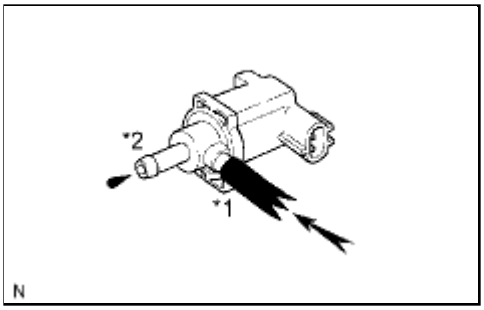
HINT:

When measuring the coil resistance, make sure that the surface temperature of the purge VSV is 20°C (68°F).

If the result is not as specified, replace the purge VSV.

(b) Check the operation.

(1) Check that air does not flow from port E to port F.

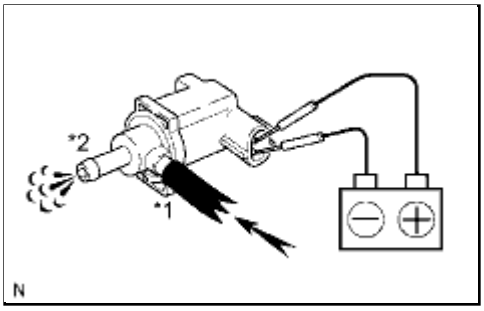


Text in Illustration

*1	Port E
*2	Port F
➡	Air

(2) Apply battery voltage across the terminals.

(3) Check that air flows from port E to port F.



Text in Illustration

*1	Port E
*2	Port F
➡	Air

If the result is not as specified, replace the purge VSV.

Last Modified: 5-10-2010	6.4 A	**From:** 200908
Model Year: 2010	**Model:** 4Runner	**Doc ID:** RM0000030BN005X
Title: 2TR-FE EMISSION CONTROL: PURGE VALVE: INSTALLATION (2010 4Runner)		

INSTALLATION

1. INSTALL PURGE VSV

(a) Install the purge VSV with the bolt.

Torque: 9.0 N·m (92 kgf·cm, 80in·lbf)

(b) Connect the 2 purge line hoses to the purge VSV.

(c) Connect the purge VSV connector.