

EFI SYSTEM PRECAUTION

FI0W8-01

1. BEFORE WORKING ON FUEL SYSTEM, DISCONNECT NEGATIVE (–) TERMINAL CABLE FROM BATTERY

HINT:

Any diagnostic trouble code retained by the computer will be erased when the negative (–) terminal cable is removed from the battery.

Therefore, if necessary, read the diagnosis before removing the negative (–) terminal cable from the battery.

2. DO NOT SMOKE OR WORK NEAR AN OPEN FLAME WHEN WORKING ON THE FUEL SYSTEM

3. KEEP GASOLINE AWAY FROM RUBBER OR LEATHER PARTS

4. MAINTENANCE PRECAUTIONS

(a) In event of engine misfire, these precautions should be taken.

- (1) Check proper connection to battery terminals, etc.
- (2) After repair work, check that the ignition coil terminals and all other ignition system lines are reconnected securely.
- (3) When cleaning the engine compartment, be especially careful to protect the electrical system from water.

(b) Precautions when handling the oxygen sensor.

- (1) Do not allow oxygen sensor to drop or hit against an object.
- (2) Do not allow the sensor to come into contact with water.

5. IF VEHICLE IS EQUIPPED WITH MOBILE RADIO SYSTEM (HAM, CB, ETC.)

If the vehicle is equipped with a mobile communication system, refer to the precaution in the IN section.

6. AIR INDUCTION SYSTEM

- (a) Separation of the engine oil dipstick, oil filler cap, PCV hose, etc. may cause the engine to run out of tune.
- (b) 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 the engine to run out of tune.

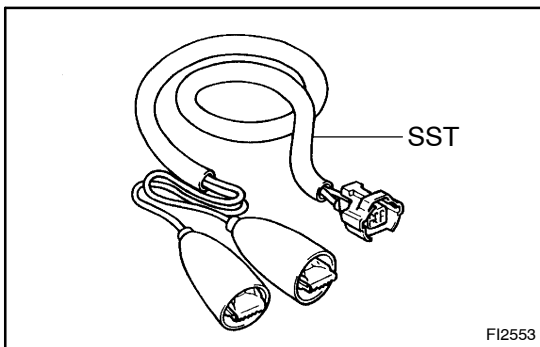
7. ELECTRONIC CONTROL SYSTEM

- (a) Before removing EFI wiring connectors, terminals, etc., first disconnect the power by either turning the ignition switch OFF or disconnecting the negative (–) terminal cable from the battery.

HINT:

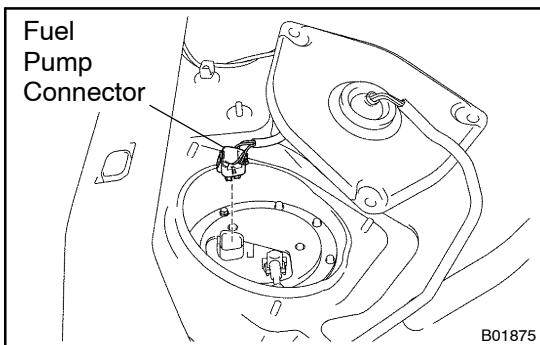
Always check the diagnostic trouble code before disconnecting the negative (–) terminal cable from the battery.

- (b) When installing the battery, be especially careful not to incorrectly connect the positive (+) and negative (–) cables.
- (c) Do not permit parts to receive a severe impact during removal or installation. Handle all EFI parts carefully, especially the engine and ECT ECU.
- (d) Be careful during troubleshooting as there are numerous transistor circuit, and even slight terminal contact can cause further troubles.
- (e) Do not open the engine and ECT ECU cover.
- (f) When inspecting during rainy weather, take care to prevent entry of water. Also, when washing the engine compartment, prevent water from getting on the EFI parts and wiring connectors.
- (g) Parts should be replaced as an assembly.
- (h) Care should be taken when pulling out and inserting wiring connectors.
 - (1) Release the lock and pull out the connector, pulling on the connectors.
 - (2) Fully insert the connector and check that it is locked.



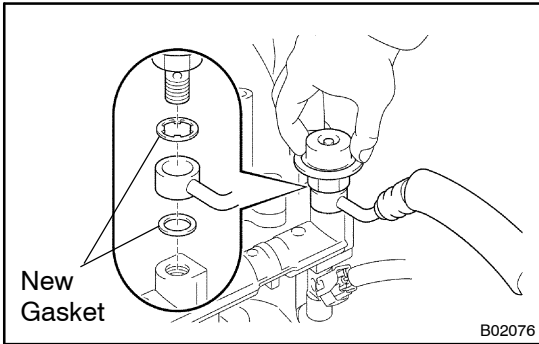
- (i) Use SST for inspection or test of the injector or its wiring connector.

SST 09842–30070



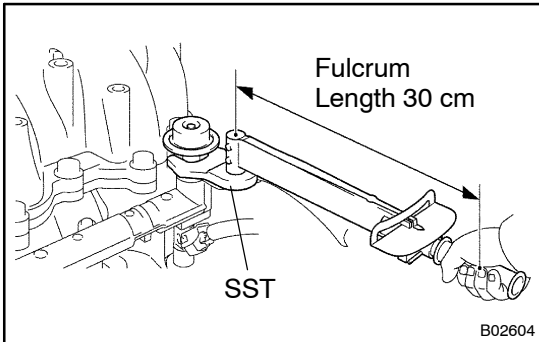
8. FUEL SYSTEM

- (a) When disconnecting the high fuel pressure line, a large amount of gasoline will spill out, so observe these procedures:
 - (1) Disconnect the fuel pump connector.
 - (2) Start the engine. After the engine has stopped on its own, turn the ignition switch OFF.
 - (3) Put a container under the connection.
 - (4) Slowly loosen the connection.
 - (5) Disconnect the connection.
 - (6) Plug the connection with a rubber plug.
 - (7) Reconnect the fuel pump connector.



(b) When connecting the union bolt (fuel pressure pulsation damper) on the high pressure pipe union, observe these procedures:

- (1) Always use 2 new gaskets.
- (2) Tighten the union bolt by hand.



(3) Using SST, tighten the union bolt to the specified torque.

SST 09612-24014 (09617-24011)

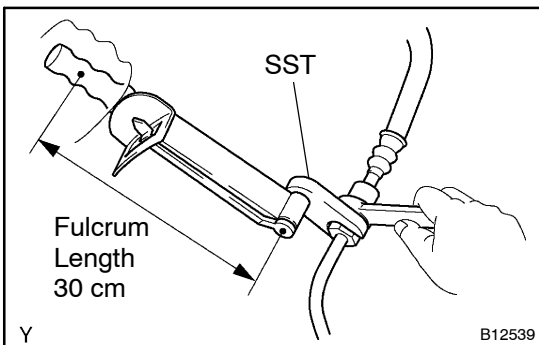
Torque:

33 N·m (340 kgf·cm, 24 ft·lbf) for use with SST

39 N·m (400 kgf·cm, 29 ft·lbf)

HINT:

Use a torque wrench with a fulcrum length of 30 cm (11.81 in.).



(c) When connecting the flare nut on the high pressure pipe union, observe these procedures:

- (1) Apply a light coat of engine oil to the flare nut, and tighten the flare nut by hand.
- (2) Using SST, tighten the flare nut to the specified torque.

SST 09023-12700

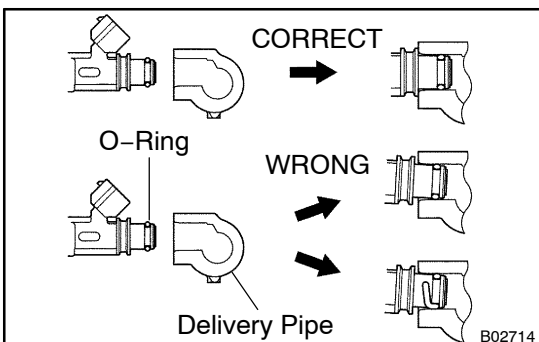
NOTICE:

Do not rotate the fuel main tube, when tightening the flare nut.

Torque: 32 N·m (330 kgf·cm, 24 ft·lbf)

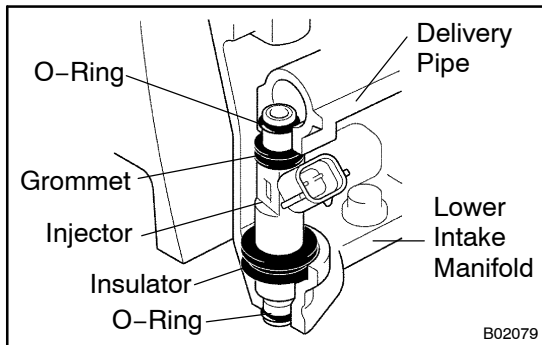
HINT:

Use a torque wrench with a fulcrum length of 30 cm (11.81 in.).



(d) Observe these precautions when removing and installing the injectors.

- (1) Never reuse the O-ring.
- (2) When placing a new O-ring on the injector, take care not to damage it in any way.
- (3) Coat a new O-ring with spindle oil or gasoline before installing—never use engine, gear or brake oil.

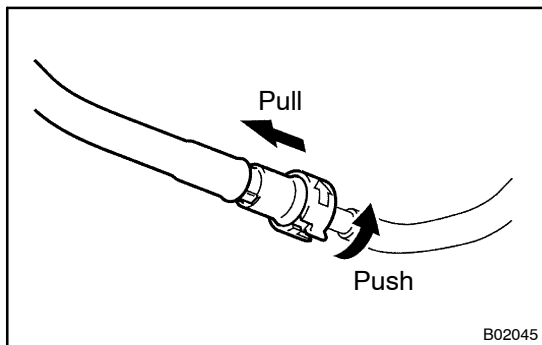


- (e) Install the injector to the delivery pipe and lower intake manifold as shown in the illustration.

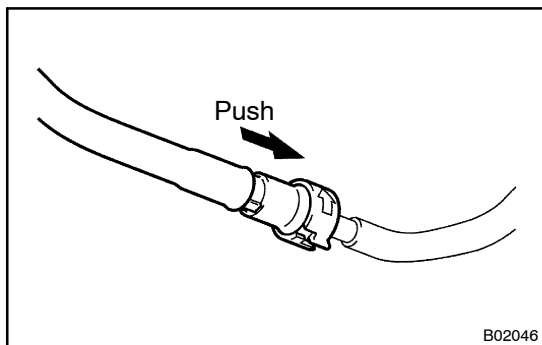
Before installing the injector, must apply spindle oil or gasoline on the place where a delivery pipe or an intake manifold touches an O-ring of the injector.

- (f) Observe these precautions when disconnecting the fuel tube connector (quick type):

- (1) Check if there is any dirt like mud on the pipe and around the connector before disconnecting them and clean the dirt away.
- (2) Be sure to disconnect with hands.

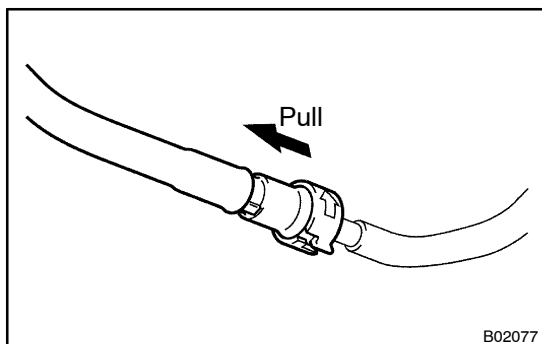


- (3) When the connector and the pipe are stuck, push and pull the connector to free to disconnect and pull it out. Do not use any tool at this time.
- (4) Inspect if there is any dirt or the likes on the seal surface of the disconnected pipe and clean it away.
- (5) Prevent the disconnected pipe and connector from damaging and mixing foreign objects by covering them with a vinyl bag.



- (g) Observe these precautions when connecting the fuel tube connector (quick type):

- (1) Check if there is any damage or foreign objects on the connected part of the pipe.
- (2) Match the axis of the connector with axis of the pipe, and push in the connector until the connector makes a "click" sound. In case that the connections is tight, apply little amount of new engine oil on the tip of the pipe.

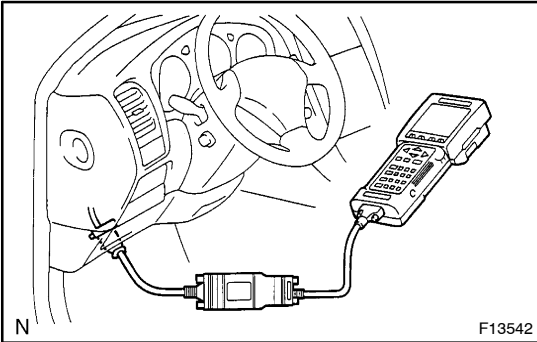


- (3) After having finished the connection, check if the pipe and the connector are securely connected by pulling them.
- (4) Check if there is any fuel leakage.

- (h) Observe these precautions when handling nylon tube.

- (1) Pay attention not to turn the connected part of the nylon tube and the quick connector with force when connecting them.
- (2) Pay attention not to kink the nylon tube.

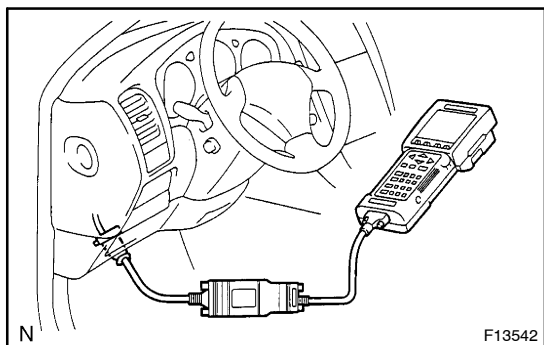
- (3) Do not remove the EPDM protector on the outside of the nylon tube.
- (4) Must not close the piping with the nylon tube by bending it.



- (i) Check that there are no fuel leaks after doing maintenance anywhere on the fuel system.
 - (1) Connect a hand-held tester to the DLC3.
 - (2) Turn the ignition switch ON and push the hand-held tester main switch ON.

NOTICE:**Do not start the engine.**

- (3) Select the active test mode on the hand-held tester.
- (4) Please refer to the hand-held tester operator's manual for further details.
- (5) If you have no hand-held tester, connect the positive (+) and negative (–) leads from the battery to the fuel pump connector.
(See [page FI-6](#))
- (6) Check that there are no leaks from any part of the fuel system.
- (7) Turn the ignition switch OFF.
- (8) Disconnect the hand-held tester from the DLC3.



FUEL PUMP

ON-VEHICLE INSPECTION

F10X6-01

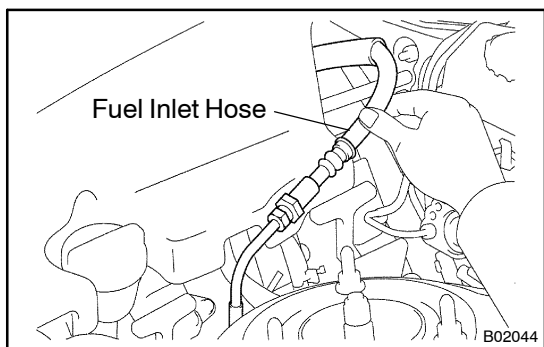
1. CHECK FUEL PUMP OPERATION

- Connect a hand-held tester to the DLC3.
- Turn the ignition switch ON, and push the hand-held tester main switch ON.

NOTICE:

Do not start the engine.

- Select the active test mode on the hand-held tester.
- Please refer to the hand-held tester operator's manual for further details.
- If you have no hand-held tester, connect the positive (+) and negative (-) leads from the battery to the fuel pump connector. (See step 3)



- Check that there is pressure in the fuel inlet hose from the fuel filter.

HINT:

If there is fuel pressure, you will hear the sound of fuel flowing.

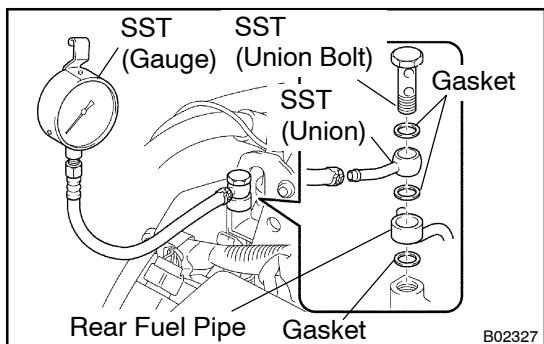
If there is no pressure, check these parts:

- Fusible link
- Fuses
- EFI main relay
- Fuel pump
- Engine and ECT ECU
- Wiring connections

- Turn the ignition switch OFF.
- Disconnect the hand-held tester from the DLC3.

2. CHECK FUEL PRESSURE

- Check the battery positive voltage is above 12 V.
- Disconnect the negative (-) terminal cable from the battery.
- Remove the fuel pressure pulsation damper from the RH delivery pipe. (See page FI-29)



- Install the rear fuel pipe and SST (pressure gauge) to the delivery pipe with 3 lower gaskets and SST (union bolt). SST 09268-45014 (09268-41190, 90405-06167)

Torque: 39 N·m (400 kgf·cm, 29 ft·lbf)

- Wipe off any splattered gasoline.
- Reconnect the negative (-) terminal cable to the battery.
- Connect a hand-held tester to the DLC3. (See step 1 in check fuel pump operation (a) to (e))
- Measure the fuel pressure.

Fuel pressure:**304 – 343 kPa (3.1 – 3.5 kgf/cm², 44 – 50 psi)**

If pressure is high, replace the fuel pressure regulator.

If pressure is low, check these parts:

- Fuel hoses and connections
- Fuel pump
- Fuel filter
- Fuel pressure regulator

(i) Disconnect the hand-held tester from the DLC3.

(j) Start the engine.

(k) Measure the fuel pressure at idle.

Fuel pressure:**304 – 343 kPa (3.1 – 3.5 kgf/cm², 44 – 50 psi)**

(l) Stop the engine.

(m) Check that the fuel pressure remains as specified for 5 minutes after the engine has stopped.

Fuel pressure: 147 kPa (1.5 kgf/cm², 21 psi) or more

If pressure is not as specified, check the fuel pump, pressure regulator and/or injectors.

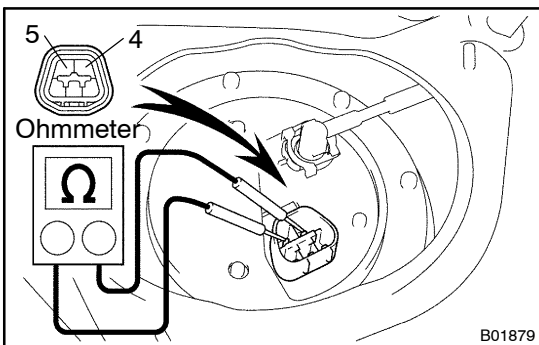
(n) After checking fuel pressure, disconnect the negative (–) terminal cable from the battery and carefully remove the SST to prevent gasoline from splashing.

SST 09268–45014

(o) Reinstall the fuel pressure pulsation damper to the RH delivery pipe. (See page FI-30)

(p) Reconnect the negative (–) terminal cable to the battery.

(q) Check for fuel leaks.

**3. INSPECT FUEL PUMP**

(a) Remove the rear seat cushion.

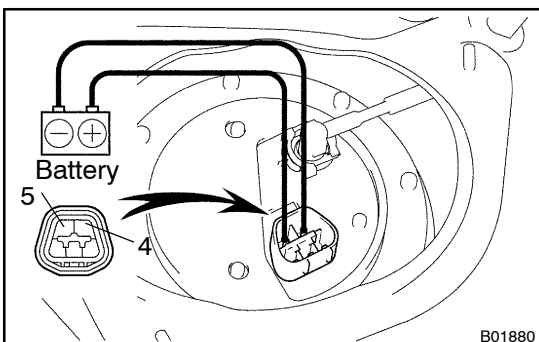
(b) Remove the 3 cap nuts and floor service hole cover.

(c) Disconnect the fuel pump & sender gauge connector.

(d) Using an ohmmeter, measure the resistance between terminals 4 and 5.

Resistance: 0.2 – 3.0 Ω at 20°C (68°F)

If the resistance is not as specified, replace the fuel pump.



(e) Inspect the fuel pump operation.

Connect the positive (+) lead from the battery to terminal 4 of the connector, and the negative (–) lead to terminal 5. Check that the fuel pump operates.

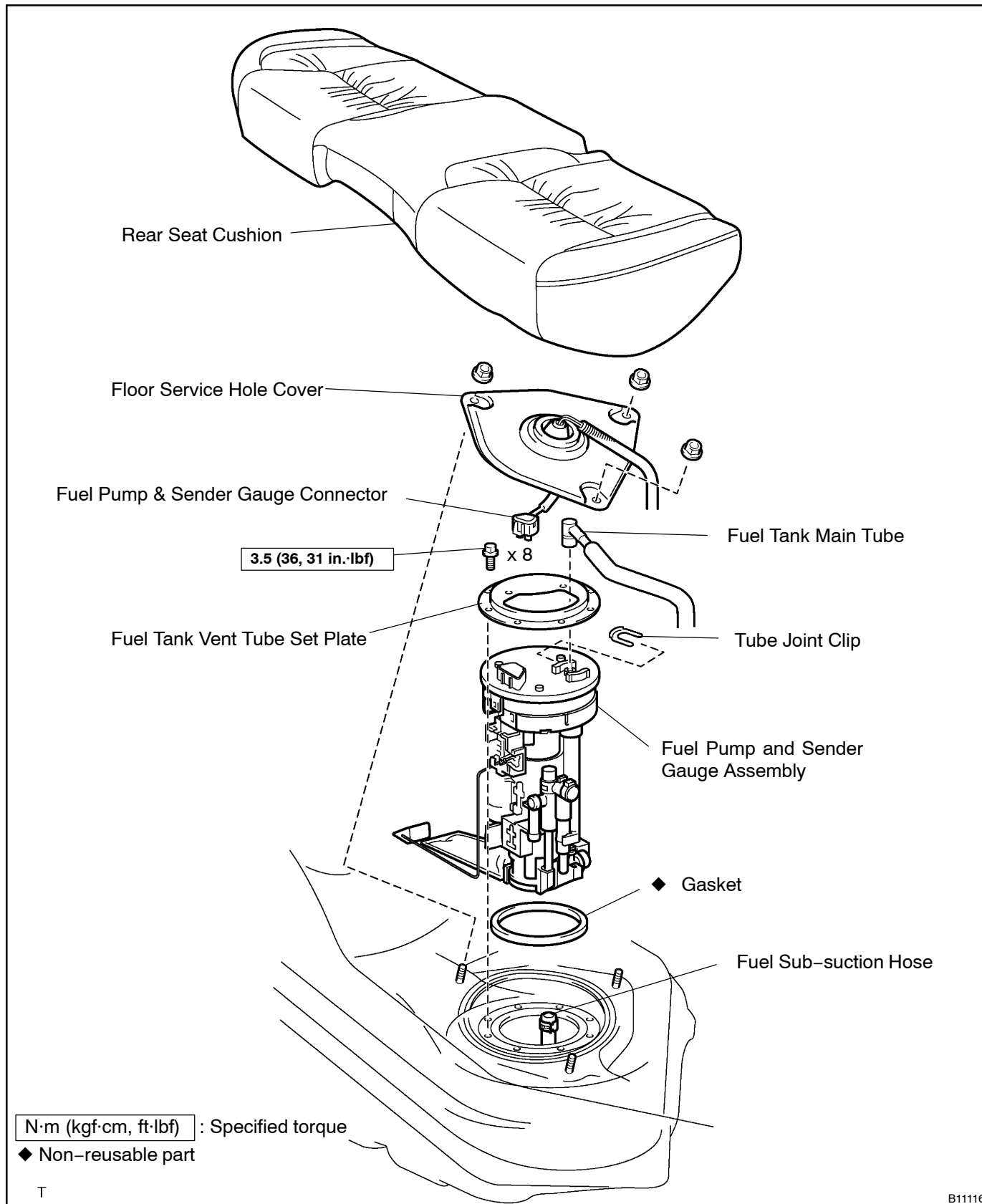
NOTICE:

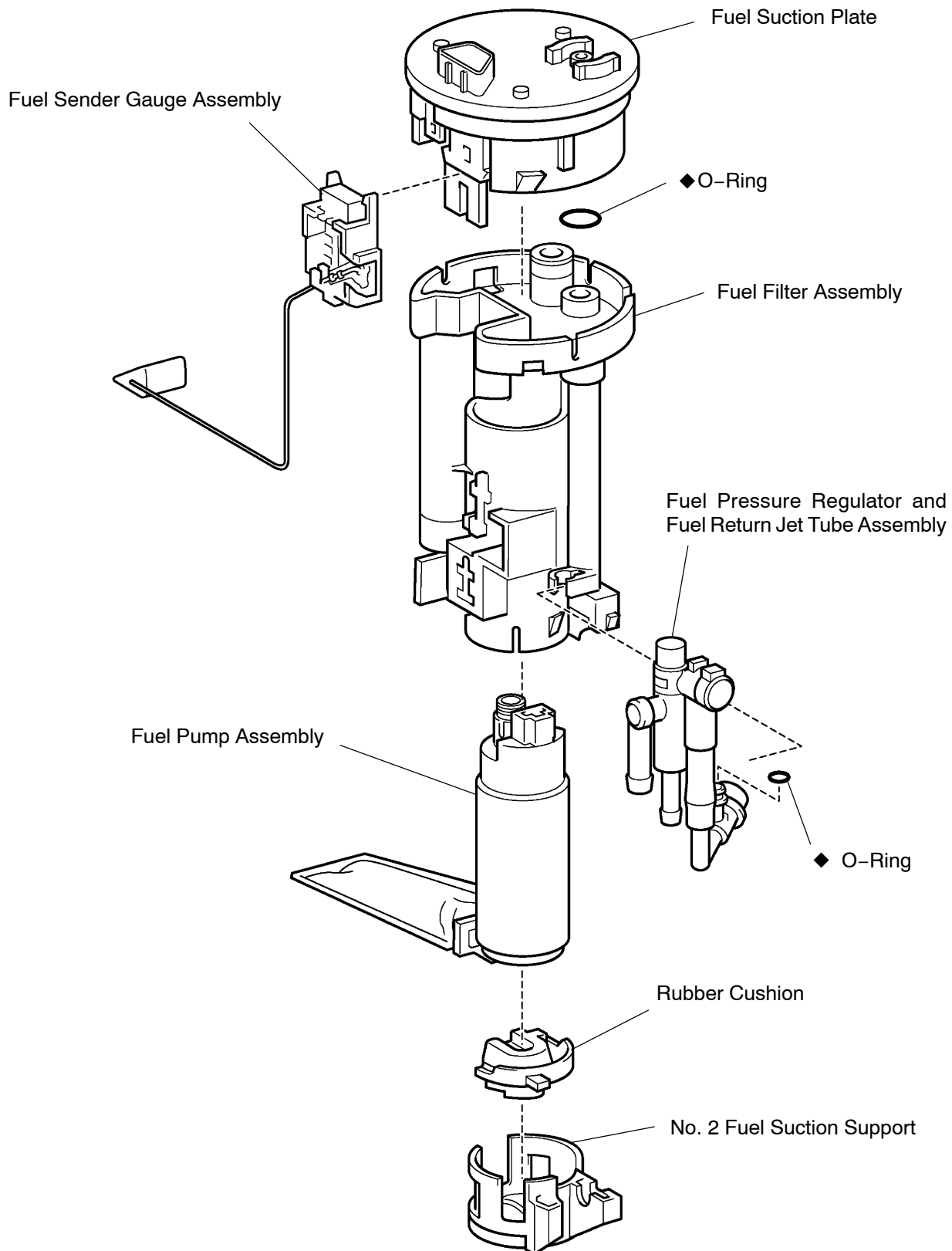
- **These tests must be done quickly (within 10 seconds) to prevent the coil burning out.**
- **Keep the fuel pump as far away from the battery as possible.**
- **Always do the switching at the battery side.**

If operation is not as specified, replace the fuel pump.

- (f) Reconnect the fuel pump & sender gauge connector.
- (g) Reinstall the floor service hole cover with the cap nuts.
- (h) Reinstall the rear seat cushion.

COMPONENTS

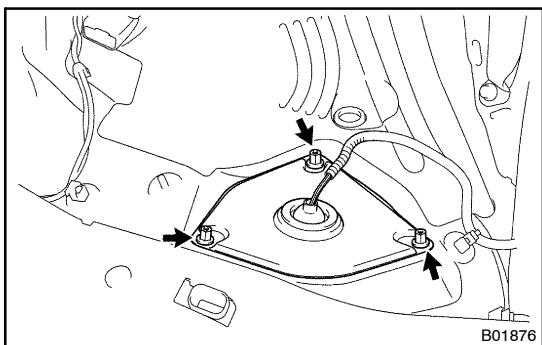




T

◆ Non-reusable part

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REMOVAL

CAUTION:

Do not smoke or work near an open flame when working the fuel pump.

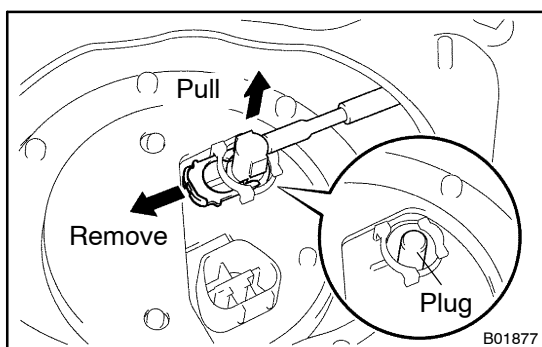
1. REMOVE REAR SEAT CUSHION
2. REMOVE FLOOR SERVICE HOLE COVER

Remove the 3 cap nuts and service hole cover.

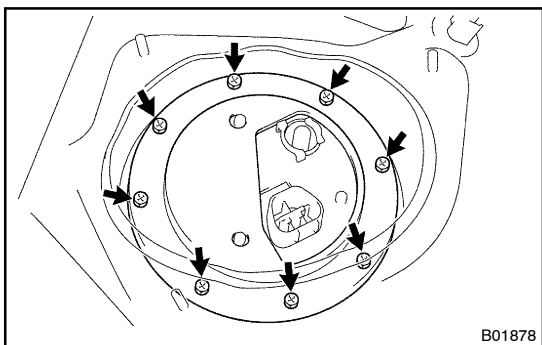
3. DISCONNECT FUEL PUMP & SENDER GAUGE CONNECTOR
4. DISCONNECT FUEL TANK MAIN TUBE (FUEL TUBE CONNECTOR) FROM FUEL SECTION PLATE

CAUTION:

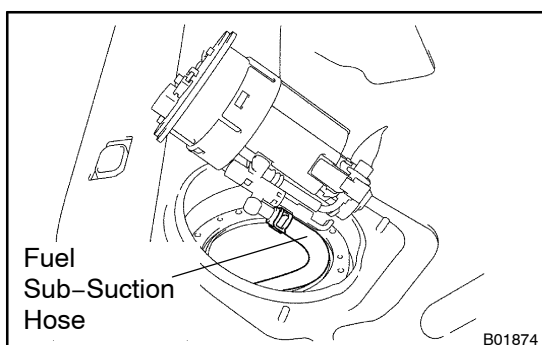
- Perform disconnecting operation of the fuel tube connector (quick type) after observing precaution. (See page FI-1)
- As there is retained pressure in the fuel line, prevent it from splashing inside the vehicle compartment.



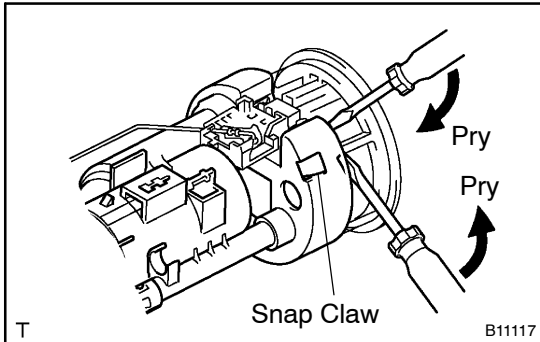
- (a) Remove the tube joint clip.
- (b) Pull out the fuel main tube.
- (c) Plug the port of the fuel suction plate with a clean rubber cap.



5. REMOVE FUEL PUMP AND SENDER GAUGE ASSEMBLY FROM FUEL TANK
- (a) Remove the 8 bolts and fuel tank vent tube set plate.



- (b) Lift up the fuel pump and sender gauge assembly, and disconnect the fuel sub-suction hose from the fuel return jet tube and remove the fuel pump, sender gauge assembly and gasket.
6. REMOVE NO.2 FUEL SUCTION SUPPORT (See page FI-17)
7. REMOVE FUEL PRESSURE REGULATOR AND FUEL RETURN JET TUBE ASSEMBLY (See page FI-17)



8. REMOVE FUEL FILTER ASSEMBLY AND FUEL PUMP ASSEMBLY WITH FILTER

- (a) Using 2 screwdrivers, disconnect the 4 snap claws from the claw holes and remove the fuel filter assembly.

NOTICE:

Be careful not to damage the filter assembly and suction plate.

- (b) Disconnect the fuel pump connector.
(c) Remove the O-ring from the fuel port of the fuel suction plate.
(d) Pull out the fuel pump assembly with filter.

9. REMOVE FUEL SENDER GAUGE ASSEMBLY

Disconnect the connector and slide the fuel sender gauge assembly out of the fuel suction plate.

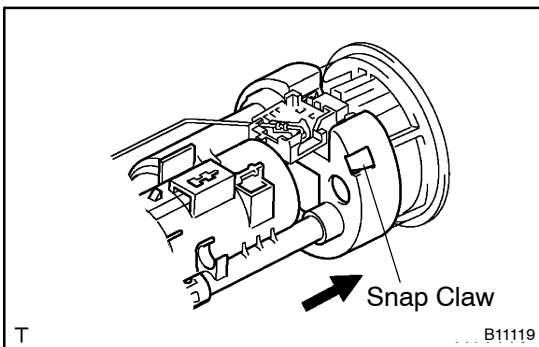
INSTALLATION

1. INSTALL FUEL SENDER GAGE ASSEMBLY

Slide the fuel sender gage assembly into the fuel suction plate, and connect the connector.

2. INSTALL FUEL FILTER ASSEMBLY AND FUEL PUMP ASSEMBLY WITH FILTER

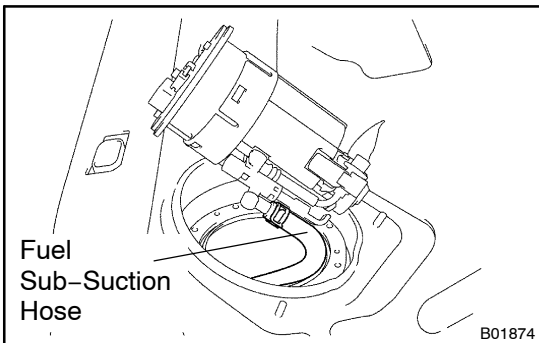
- Push in the fuel pump assembly with filter.
- Apply a light coat of gasoline to a new O-ring, and install it to the fuel port of the fuel suction plate.
- connect the fuel pump connector.



- Push the fuel filter assembly, and attach the 4 snap claws to the claw holes.

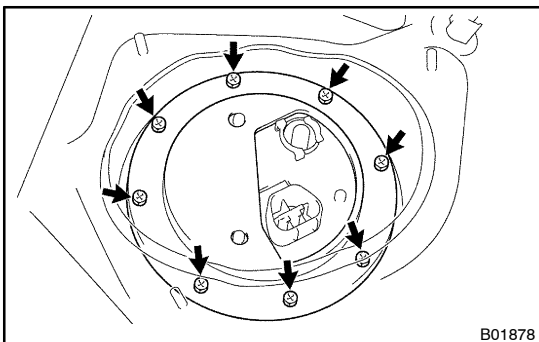
3. INSTALL FUEL PRESSURE REGULATOR AND FUEL RETURN JET TUBE ASSEMBLY (See page FI-18)

4. INSTALL NO.2 FUEL SUCTION SUPPORT (See page FI-18)

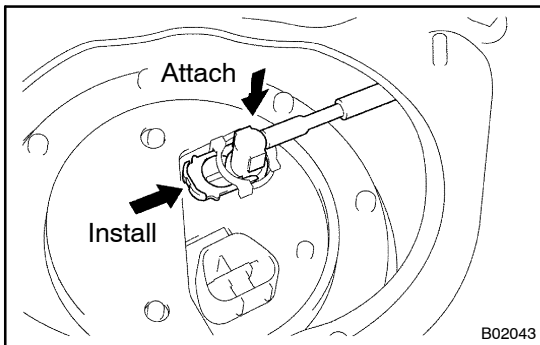


5. INSTALL FUEL PUMP AND SENDER GAUGE ASSEMBLY TO FUEL TANK

- Install a new gasket to the fuel suction plate.
- Connect the fuel sub-suction hose to the fuel return jet tube.
- Attach the fuel pump and sender gauge assembly to the fuel tank.



- Install the fuel tank vent tube set plate with the 8 bolts.
Torque: 3.5 N·m (36 kgf·cm, 31 in·lbf)

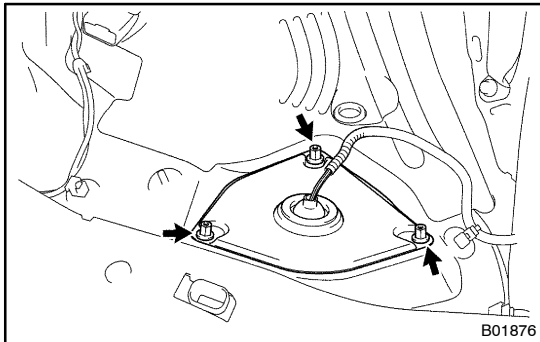


6. CONNECT FUEL TANK MAIN TUBE (FUEL TUBE CONNECTOR) TO FUEL SUCTION PLATE

- (a) Attach the fuel tube connector to the port of the fuel suction plate.
- (b) Install the tube joint clip.

7. CONNECT FUEL PUMP & SENDER GAUGE CONNECTOR

8. CHECK FOR FUEL LEAKS (See page FI-1)



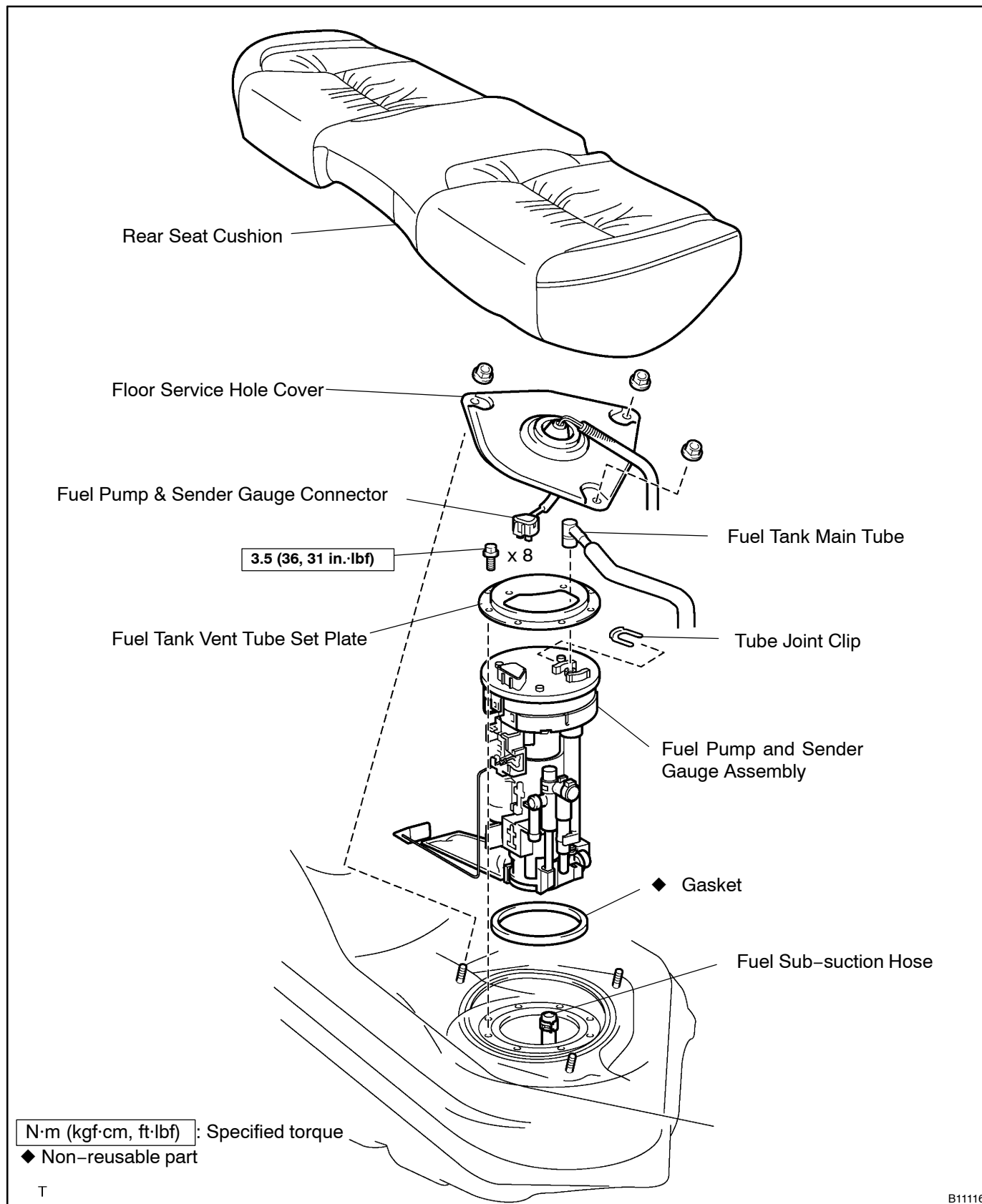
9. INSTALL FLOOR SERVICE HOLE COVER

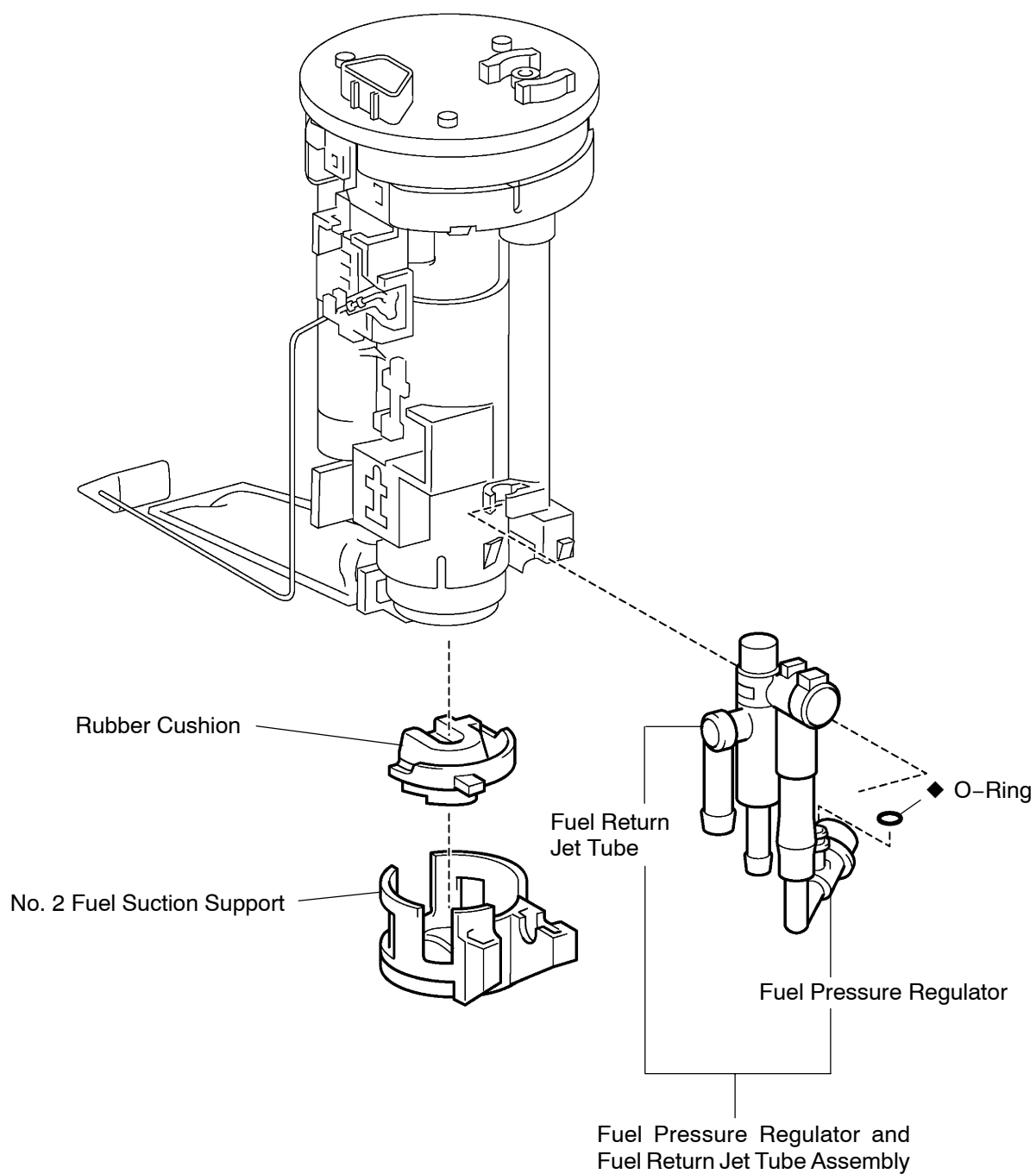
Install the service hole cover with the 3 cap nuts.

10. INSTALL REAR SEAT CUSHION

FUEL PRESSURE REGULATOR COMPONENTS

F10XA-01

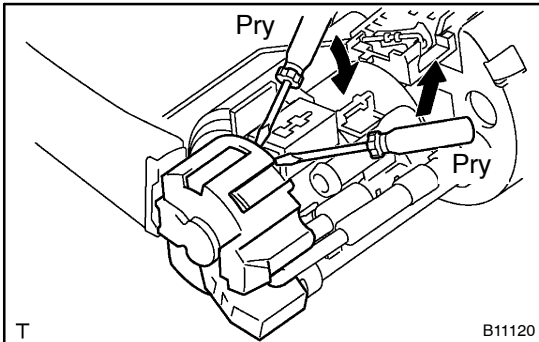




T ◆ Non-reusable part

REMOVAL

1. REMOVE FUEL PUMP AND SENDER GAUGE ASSEMBLY FROM FUEL TANK (See page FI-11)



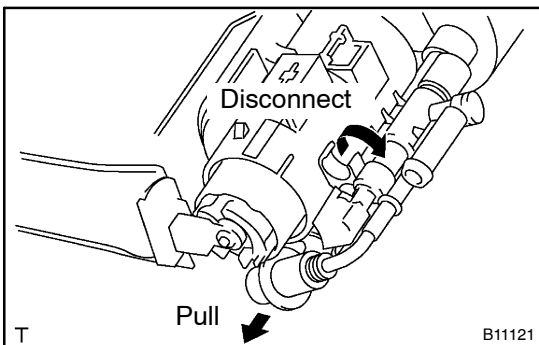
2. REMOVE NO.2 FUEL SUCTION SUPPORT

- (a) Using 2 screwdrivers, disconnect the 3 snap claws from the claw holes and remove the fuel suction support.

NOTICE:

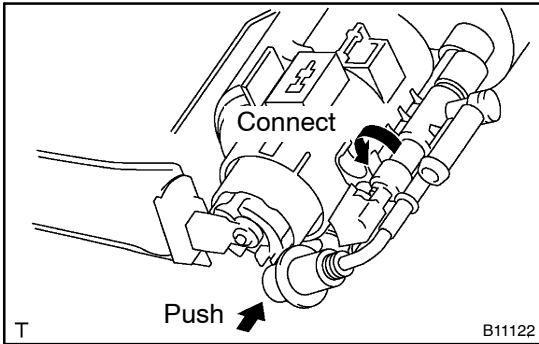
Be careful not to damage the suction support and fuel filter.

- (b) Remove the rubber cushion.



3. REMOVE FUEL PRESSURE REGULATOR AND FUEL RETURN JET TUBE ASSEMBLY

- (a) Disconnect the fuel return jet tube from the clamp of the fuel filter.
- (b) Pull out the fuel pressure regulator from the fuel filter, and remove the fuel pressure regulator and fuel return jet tube assembly.
- (c) Remove the O-ring from the fuel pressure regulator.



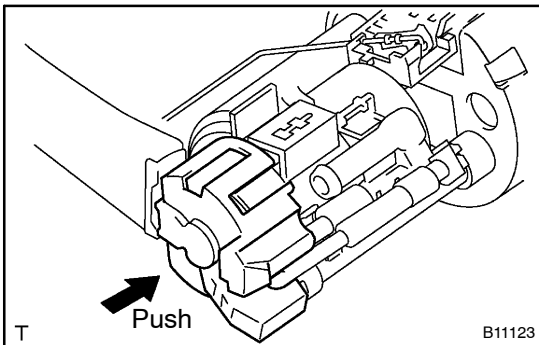
INSTALLATION

1. INSTALL FUEL PRESSURE REGULATOR AND FUEL RETURN JET TUBE ASSEMBLY

- (a) Apply a light coat of gasoline to a new O-ring, and install it to the fuel pressure regulator.
- (b) Push in the fuel pressure regulator to the fuel filter.
- (c) Check that the fuel pressure regulator rotates smoothly. If it does not rotate smoothly, the O-ring may be pinched, so remove the fuel pressure regulator and perform again steps (b) and (c) above.
- (d) Connect the fuel return jet tube to the clamp of the fuel filter.

2. INSTALL NO.2 FUEL SUCTION SUPPORT

- (a) Install the rubber cushion to the fuel pump.



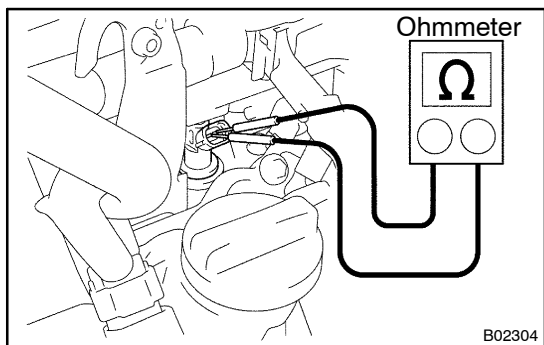
- (b) Push the fuel suction support, and attach the 3 snap claws to the claw holes.

3. INSTALL FUEL PUMP AND SENDER GAUGE ASSEMBLY TO FUEL TANK (See page FI-19)

INJECTOR ON-VEHICLE INSPECTION

FI0W9-01

1. REMOVE V-BANK COVER
2. REMOVE INTAKE AIR CONNECTOR PIPE



3. INSPECT INJECTOR RESISTANCE

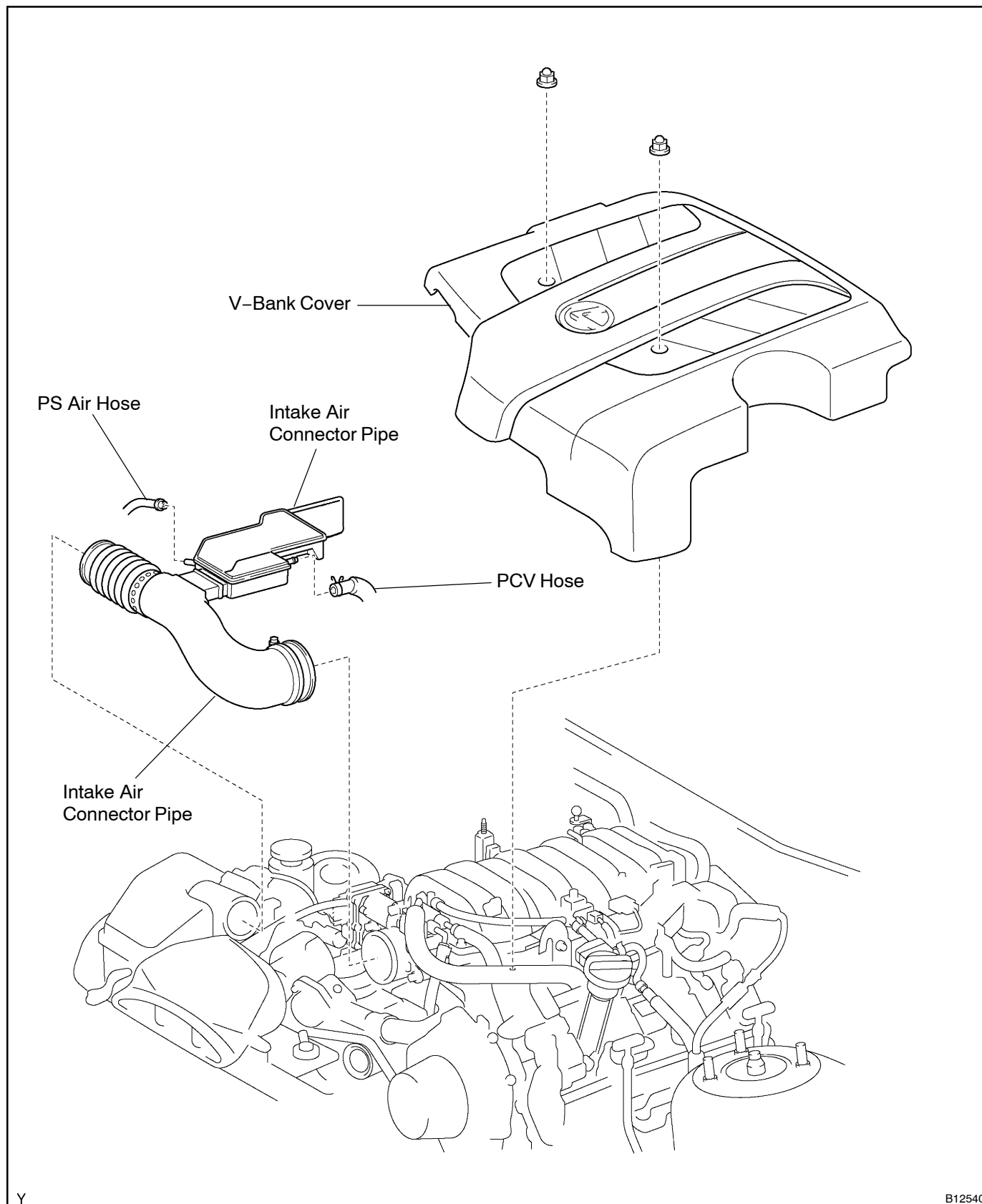
- (a) Disconnect the 8 injector connectors.
- (b) Using an ohmmeter, measure the resistance between the terminals.

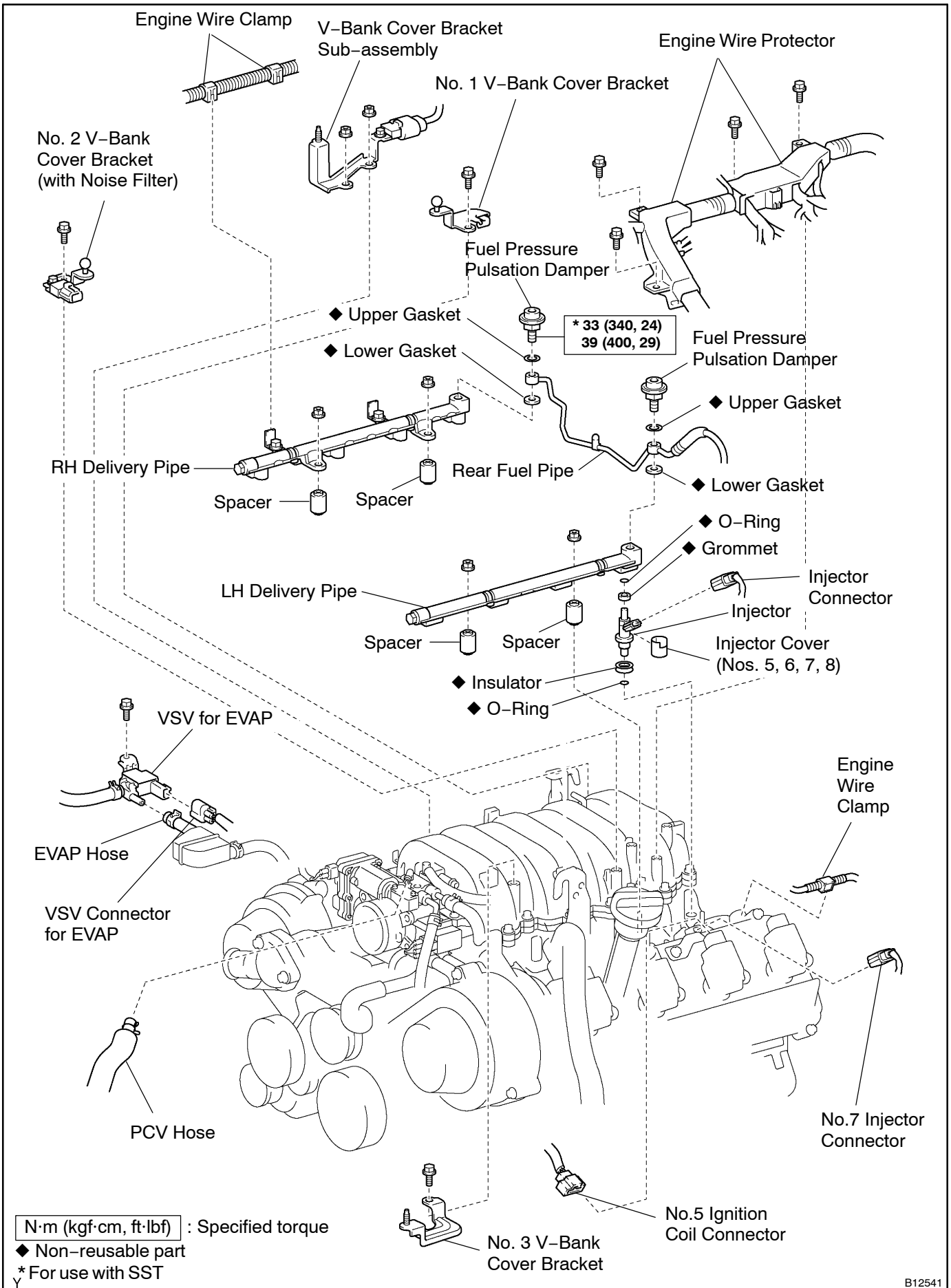
Resistance: 13.4 – 14.2 Ω at 20°C (68°F)

If the resistance is not as specified, replace the injector.

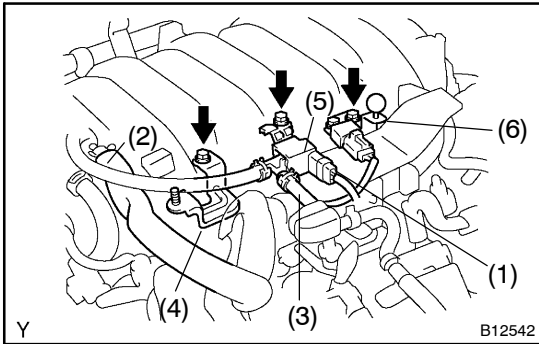
- (c) Reconnect the 8 injector connectors.
4. REINSTALL INTAKE AIR CONNECTOR PIPE
5. REINSTALL V-BANK COVER

COMPONENTS



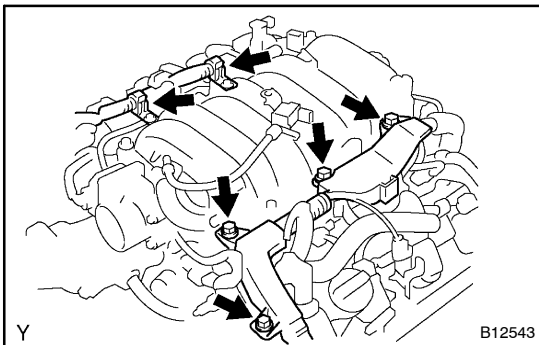


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REMOVAL

1. REMOVE V-BANK COVER
2. REMOVE INTAKE AIR CONNECTOR PIPE
3. DISCONNECT ENGINE WIRE PROTECTOR FROM UPPER INTAKE MANIFOLD AND BEARING CAP
 - (a) Remove and disconnect these parts:
 - (1) VSV connector for EVAP
 - (2) PCV hose from upper intake manifold
 - (3) EVAP hose from VSV for EVAP
 - (4) No. 3 V-bank cover bracket from No.1 engine hanger
 - (5) VSV for EVAP from upper intake manifold
 - (6) No. 2 V-bank cover bracket from upper intake manifold



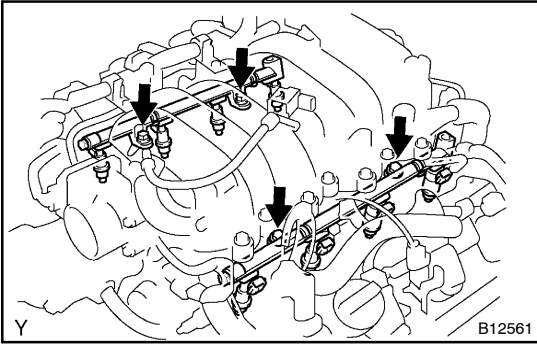
- (b) Remove the 4 bolts, and disconnect the engine wire protector from the upper intake manifold and camshaft bearing cap.
4. DISCONNECT ENGINE WIRE FROM RH DELIVERY PIPE

Disconnect the 2 wire clamps on the engine wire from the brackets on the delivery pipe

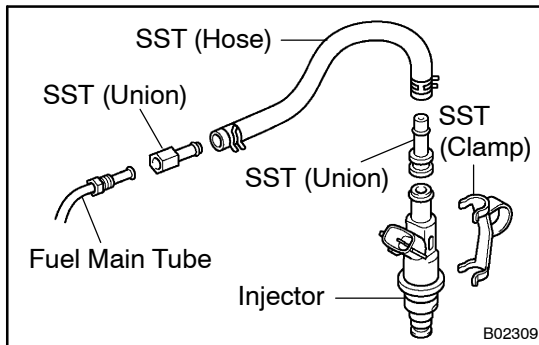
5. REMOVE FUEL PRESSURE PULSATION DAMPERS
(See [page FI-29](#))
6. REMOVE DELIVERY PIPES AND INJECTORS

NOTICE:

- Be careful not to drop the injectors when removing the delivery pipes.
 - Pay attention to put any hung load on the injector to and from the side direction.
- (a) Remove the bolt, and disconnect the No. 1 V-bank cover bracket from the upper intake manifold.
 - (b) Remove the 2 nuts and V-bank cover bracket sub-assembly.
 - (c) Disconnect the 8 injector connectors.



- (d) Remove the 4 nuts holding the delivery pipes to the lower intake manifold.
- (e) Remove the 2 delivery pipes, 8 injectors and 4 spacers.
- (f) No.5, No.6, No.7 and No.8 Injectors:
Remove the injector cover from each injector.
- (g) Remove the 2 O-rings, grommet and insulator from each injector.

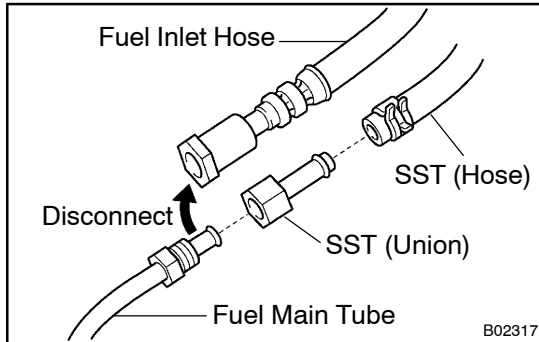


INSPECTION

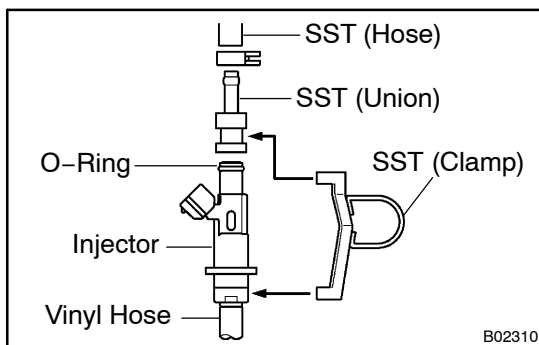
1. INSPECT INJECTOR INJECTION

CAUTION:

Keep injector clean of sparks during the test.



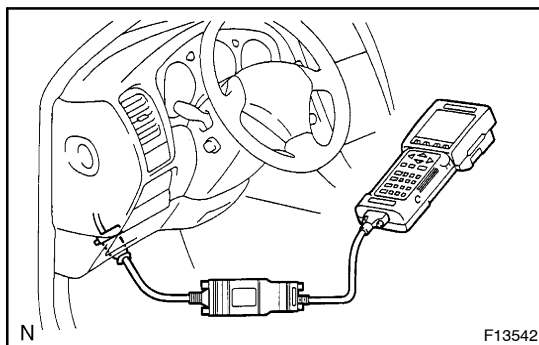
- (a) Disconnect the fuel inlet hose (rear fuel pipe) from the fuel main tube.
- (b) Temporarily install SST (union) to the fuel main tube.
SST 09268-41047 (09268-52011)
- (c) Tighten the flare nut on the fuel main tube.
(See [page FI-1](#))
- (d) Connect SST (hose) to the SST (union).
SST 09268-41047



- (e) Install the O-ring to the injector.
- (f) Connect SST (union and hose) to the injector, and hold the injector and union with SST (clamp).
SST 09268-41047 (09268-41110, 09268-41300)
- (g) Put the injector into the graduated cylinder.

CAUTION:

Install a suitable vinyl hose onto the injector to prevent gasoline from splashing out.

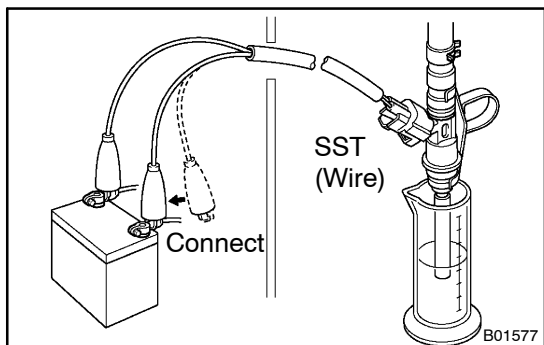


- (h) Connect a hand-held tester to the DLC3.
- (i) Connect the battery negative (-) cable to the battery.
- (j) Turn the ignition switch ON, and push the hand-held tester main switch ON.

NOTICE:

Do not start the engine.

- (k) Select the active test mode on the hand-held tester.
- (l) Please refer to the hand-held tester operator's manual for further details.
- (m) If you have no hand-held tester, connect the positive (+) and negative (-) leads from the battery to the fuel pump connector. (See [page FI-6](#))



- (n) Connect SST (wire) to the injector and battery for 15 seconds, and measure the injection volume with a graduated cylinder. Test each injector 2 or 3 times.

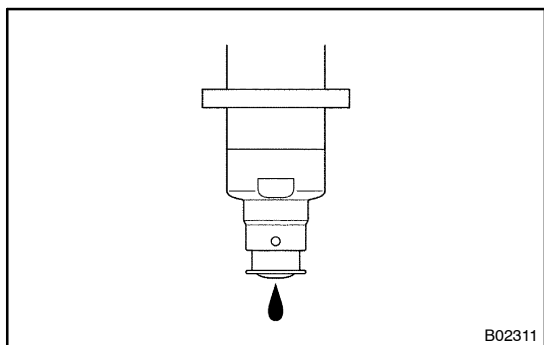
SST 09842-30070

Volume: 60 – 73 cm³ (3.7 – 4.5 cu in.) per 15 seconds

Difference between each injector:

13 cm³ (0.8 cu in.) or less

If the injection volume is not as specified, replace the injector.



2. INSPECT LEAKAGE

- (a) In the condition above, disconnect the tester probes of SST (wire) from the battery and check the fuel leakage from the injector.

SST 09842-30070

Fuel drop: 1 drop or less per 12 minutes

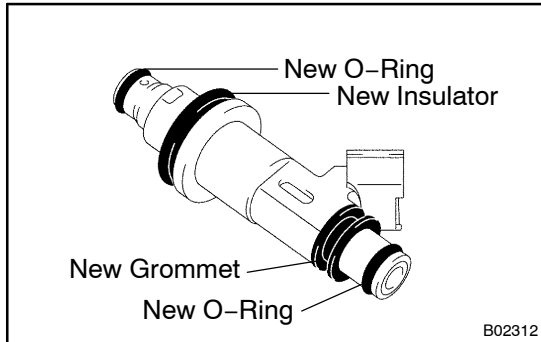
- (b) Turn the ignition switch OFF.
- (c) Disconnect the negative (-) terminal cable from the battery.
- (d) Remove the SST.
SST 09268-41047, 09842-30070
- (e) Disconnect the hand-held tester from the DLC3.
- (f) Reconnect the fuel inlet hose (rear fuel pipe) to the fuel main tube. (See page FI-1)

INSTALLATION

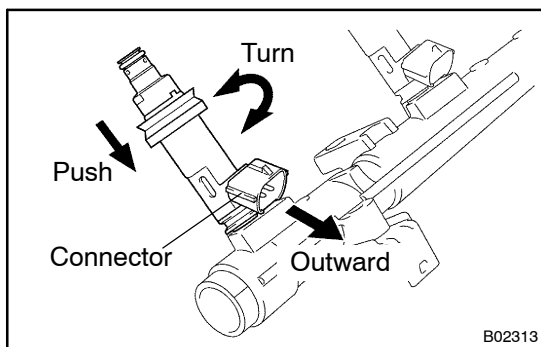
1. INSTALL INJECTORS AND DELIVERY PIPES

NOTICE:

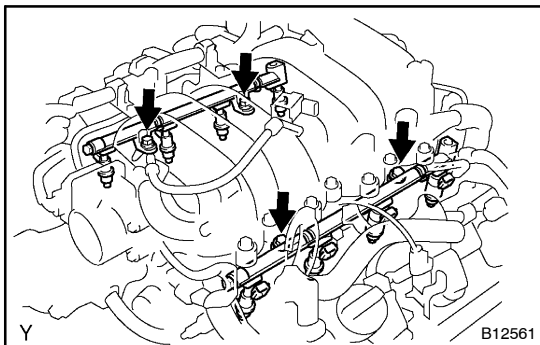
- Be careful not to drop the injectors when installing the delivery pipes.
- Pay attention to put any hung load on the injector to and from the side direction.



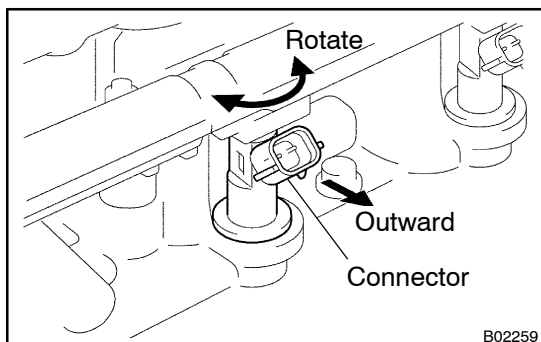
- Install a new grommet and new insulator to each injector.
- Apply a light coat of gasoline to 2 new O-rings and install them to each injector.



- While turning the injector clockwise and counterclockwise, push it to the delivery pipes. Install the 8 injectors.
- Position injector connector outward.



- Place the 4 spacers on the intake manifold.
- Place the 2 delivery pipes and injectors assemblies on the lower intake manifold.
- Temporarily install the 4 nuts.



- Check that the injectors rotate smoothly.

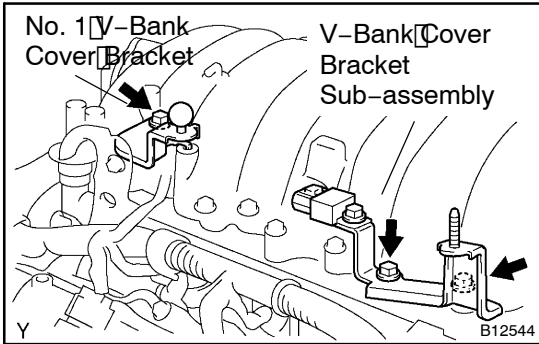
HINT:

If injectors do not rotate smoothly, the probable cause is incorrect installation of O-rings. Replace the O-rings.

- Position injector connector outward.
- Tighten the 4 nuts holding the delivery pipes to the lower intake manifold.

Torque: 18 N·m (185 kgf·cm, 13 ft·lbf)

- Connect the 8 injectors connectors.

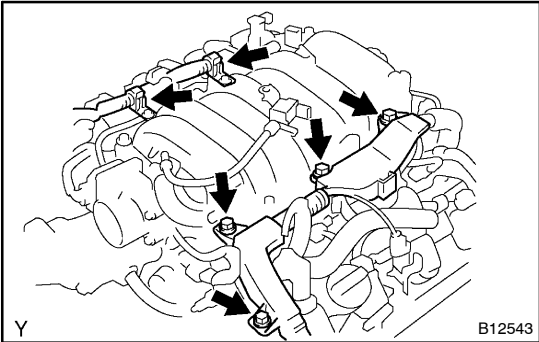


- (l) Install the V-bank cover bracket sub-assembly with the 2 nuts.

Torque: 18 N·m (185 kgf·cm, 13 ft·lbf)

- (m) Install the No. 1 V-bank cover bracket with the bolt.

2. INSTALL FUEL PRESSURE PULSATION DAMPERS (See page FI-30)

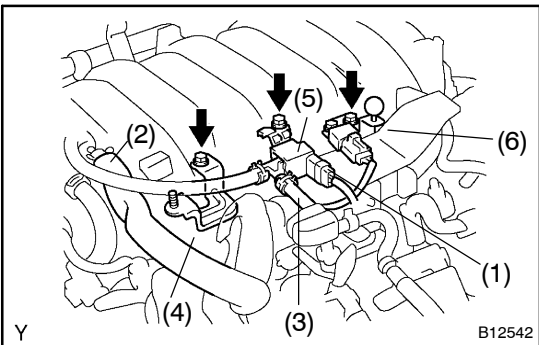


3. INSTALL ENGINE WIRE TO LH DELIVERY PIPE

Install the 2 wire clamps on the engine wire to the brackets on the delivery pipe.

4. INSTALL ENGINE WIRE PROTECTOR

- (a) Install the engine wire protector with the 4 bolts.



- (b) Install and connect these parts:

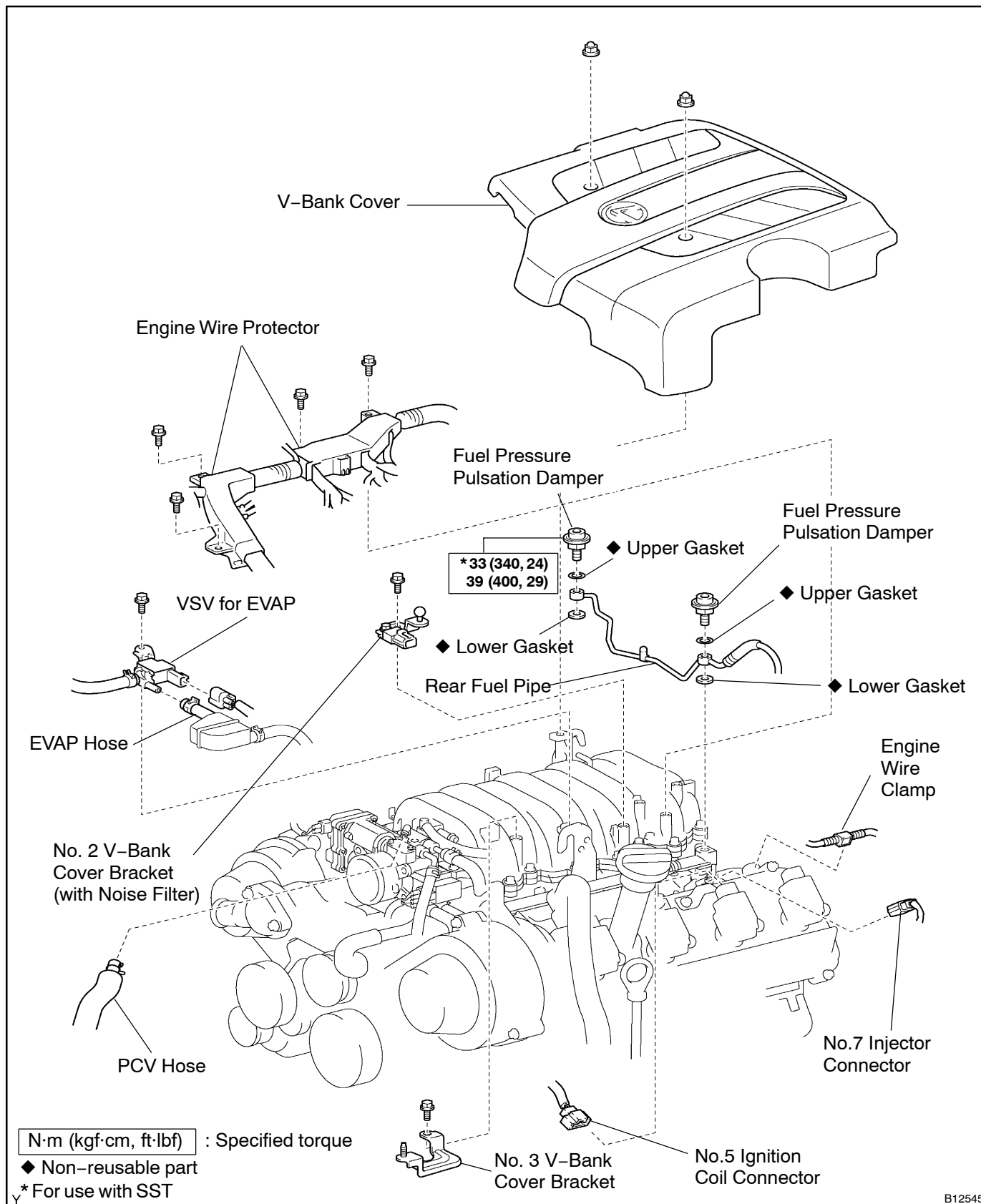
- (1) VSV connector for EVAP
- (2) PCV hose to upper intake manifold
- (3) EVAP hose to VSV for EVAP
- (4) No. 3 V-bank cover bracket to No. 1 engine hanger
- (5) VSV for EVAP to upper intake manifold
- (6) No. 2 V-bank cover bracket to upper intake manifold

5. INSTALL INTAKE AIR CONNECTOR PIPE

6. INSTALL V-BANK COVER

FUEL PRESSURE PULSATION DAMPER COMPONENTS

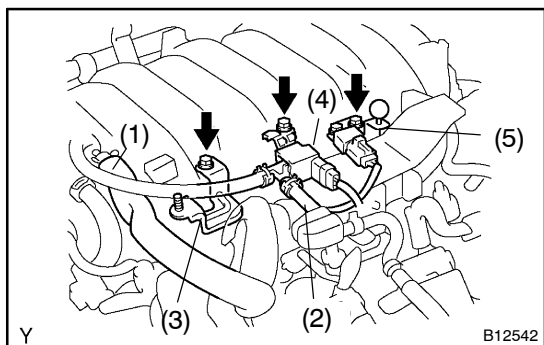
FIGURE-01



B12545

REMOVAL

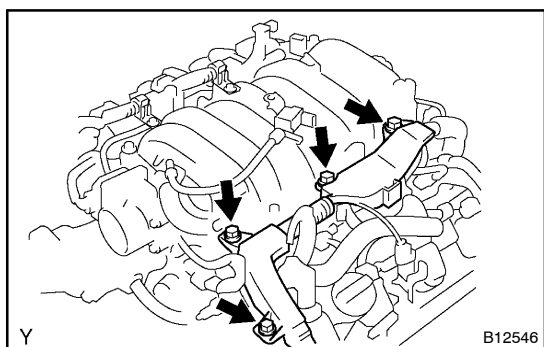
1. REMOVE V-BANK COVER



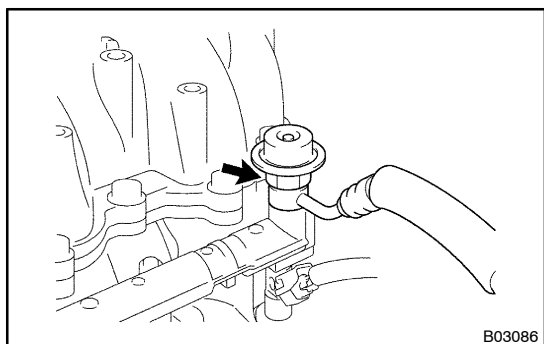
2. DISCONNECT ENGINE WIRE PROTECTOR FROM UPPER INTAKE MANIFOLD AND BEARING CAP

(a) Remove and disconnect these parts:

- (1) PCV hose from upper intake manifold
- (2) EVAP hose from VSV for EVAP
- (3) No. 3 V-bank cover bracket from No.1 engine hanger
- (4) VSV for EVAP from upper intake manifold
- (5) No. 2 V-bank cover bracket from upper intake manifold



(b) Remove the 4 bolts, and disconnect the engine wire protector from the upper intake manifold and camshaft bearing cap.

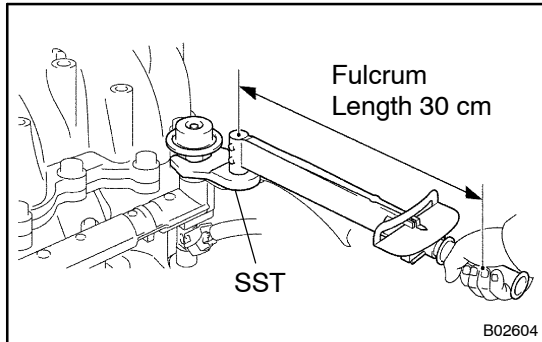
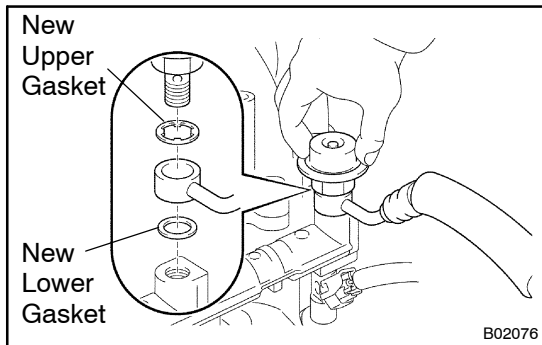


3. REMOVE FUEL PRESSURE PULSATION DAMPERS

Remove the pulsation damper, upper gasket and lower gasket.

CAUTION:

- Put a shop towel under the delivery pipe.
- Slowly loosen the pulsation damper.



INSTALLATION

1. INSTALL FUEL PRESSURE PULSATION DAMPERS

- Temporarily install the lower gasket, rear fuel pipe, upper gasket and pulsation damper. Temporarily install the 2 pulsation dampers.
- Remove the 2 bolts and air tube.
- Disconnect the engine wire clamp from the bracket.
- Disconnect the No.5 ignition coil connector.
- Disconnect the No.7 injector connector.

- Using SST, tighten the pulsation dampers.

SST 09612-24014 (09617-24011)

Torque:

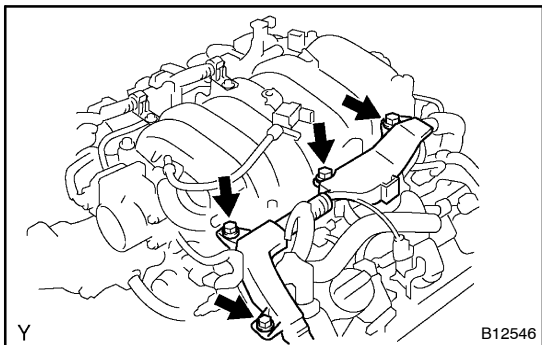
33 N·m (340 kgf·cm, 24 ft·lbf) for use with SST

39 N·m (400 kgf·cm, 29 ft·lbf)

HINT:

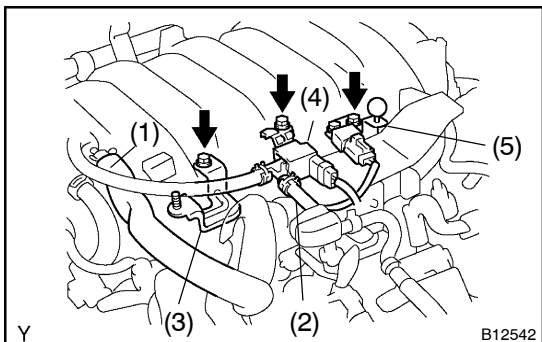
Use a torque wrench with a fulcrum length of 30 cm (11.81 in.).

- Reconnect the No.7 injector connector.
- Reconnect the No.5 ignition coil connector.
- Reinstall the engine wire clamp to the bracket.
- Reinstall the air tube with the 2 bolts.



2. INSTALL ENGINE WIRE PROTECTOR

- Install the engine wire protector with the 4 bolts.



- Install and connect these parts:
 - PCV hose to upper intake manifold
 - EVAP hose to VSV for EVAP
 - No. 3 V-bank cover bracket to No.1 engine hanger
 - VSV for EVAP to upper intake manifold
 - No. 2 V-bank cover bracket to upper intake manifold

3. CHECK FOR FUEL LEAKS (See page FI-1)

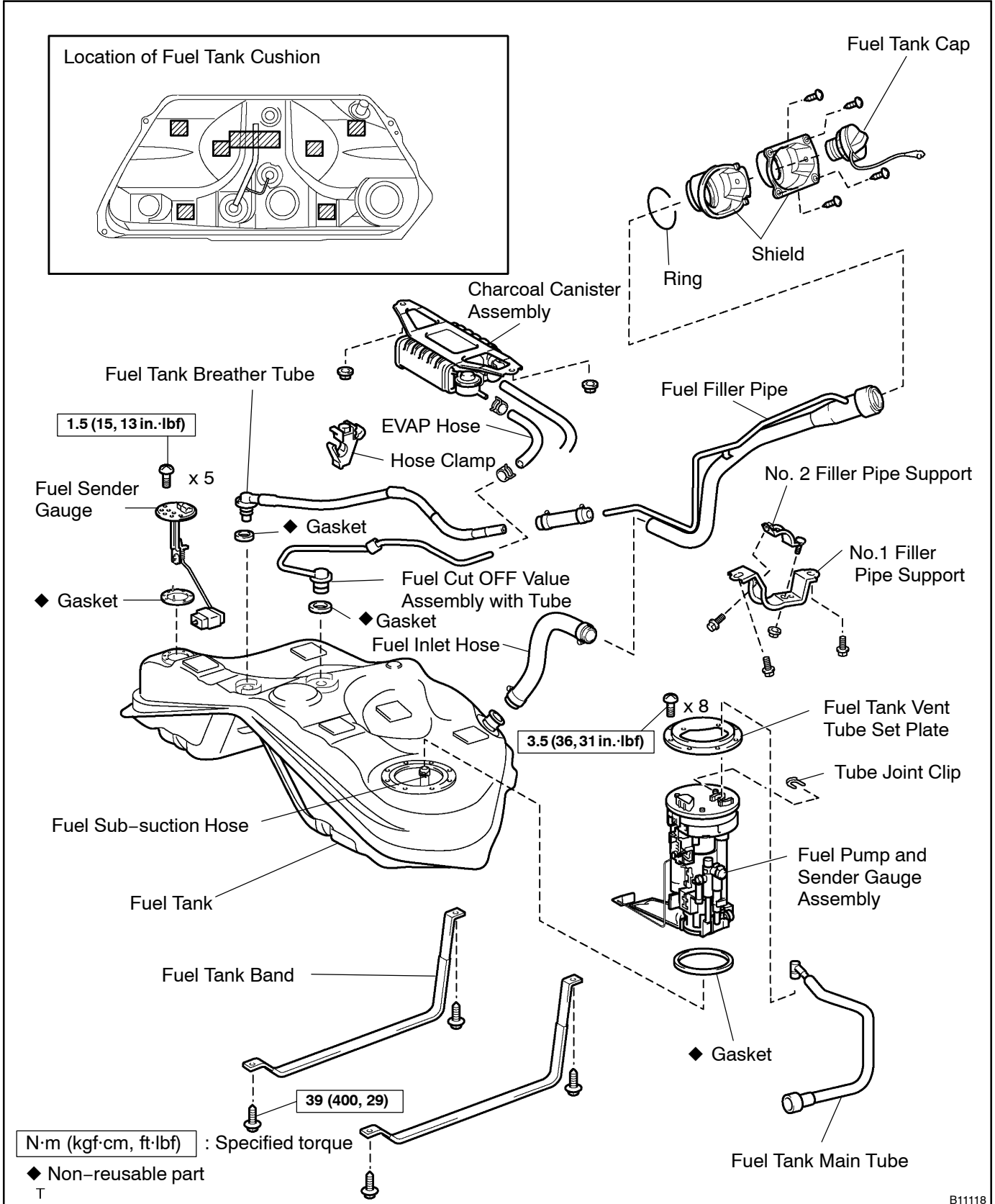
4. INSTALL V-BANK COVER

FUEL TANK AND LINE COMPONENTS

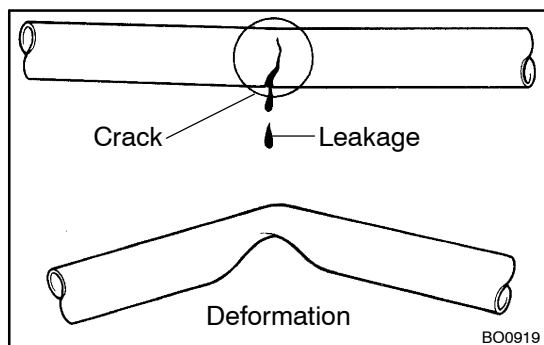
FI0XD-01

CAUTION:

- Always use new gaskets when replacing the fuel tank or component parts.
- Apply the proper torque to all parts tightened



B11118

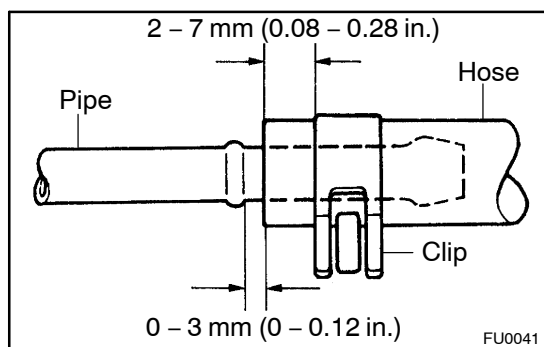
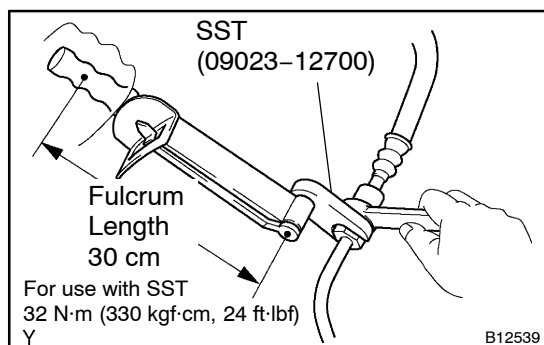


INSPECTION

INSPECT FUEL TANK AND LINE

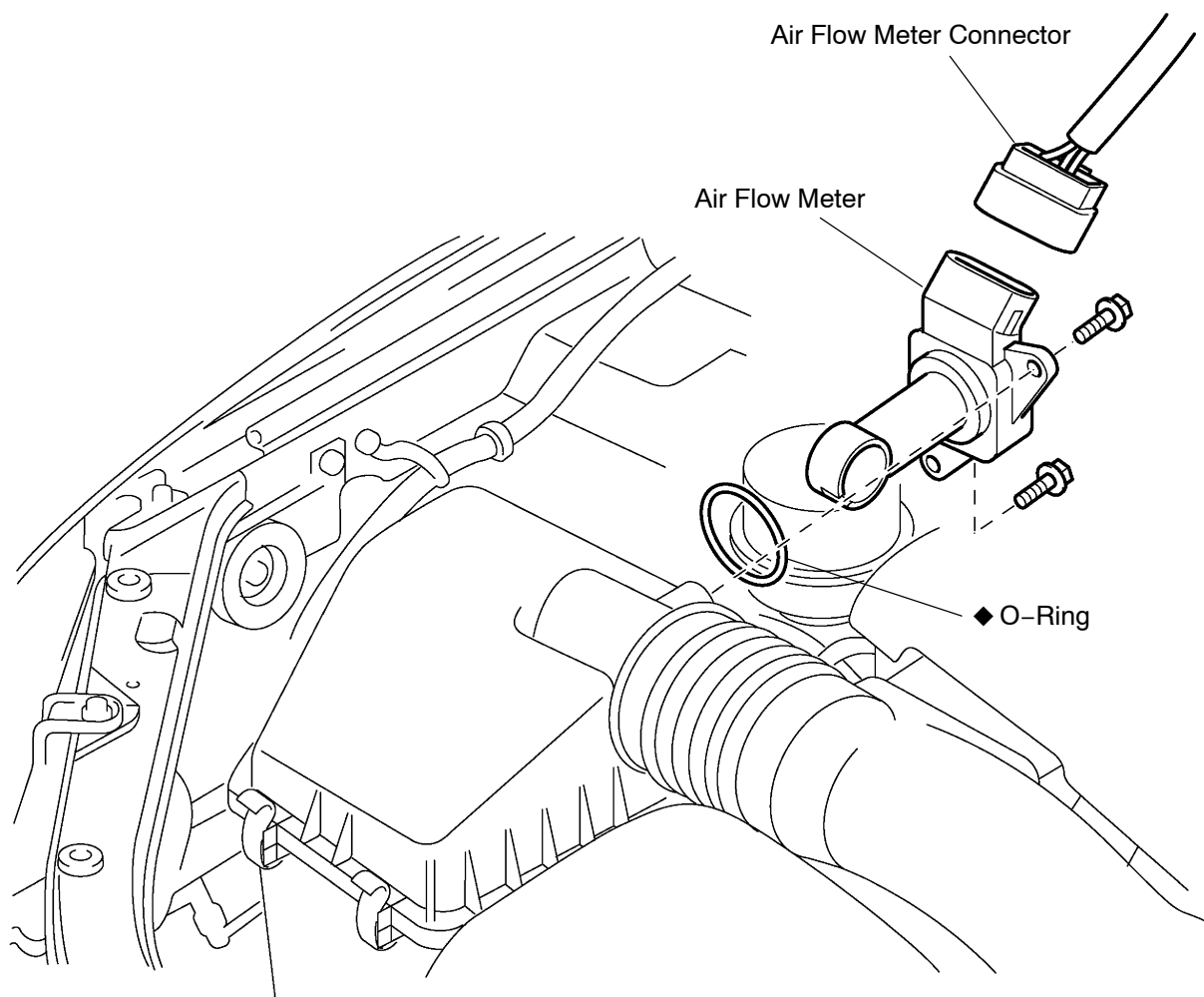
- Check the fuel lines for cracks or leakage, and all connections for deformation.
- Check the fuel tank vapor vent system hoses and connections for looseness, sharp bends or damage.
- Check the fuel tank for deformation, cracks, fuel leakage or tank band looseness.
- Check the filler neck for damage or fuel leakage.
- Hose and pipe connections are as shown in the illustration.

If a problem is found, repair or replace the parts as necessary.



AIR FLOW METER COMPONENTS

FI0XF-01



◆ Non-reusable part

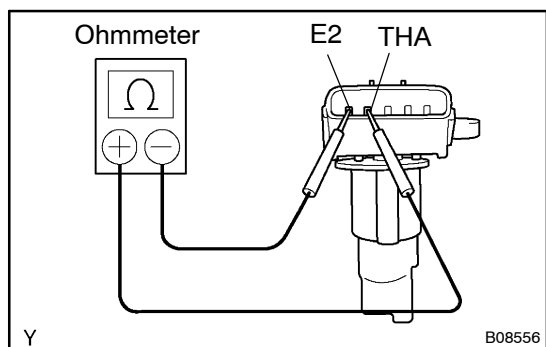
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INSPECTION

1. REMOVE AIR FLOW METER

- Disconnect the air flow meter connector.
- Remove the 2 screws, air flow meter and O-ring.



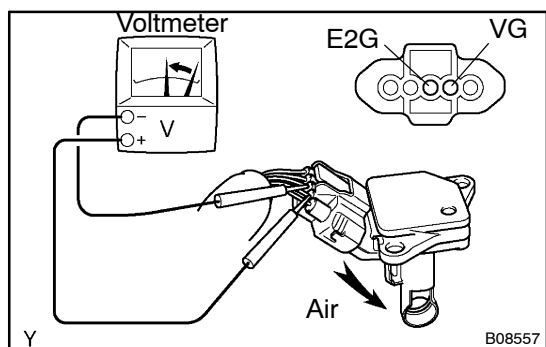
2. INSPECT AIR FLOW METER RESISTANCE

Using an ohmmeter, measure the resistance between terminals THA and E2.

Resistance:

Terminals	Resistance	Temperature
THA – E2	13.6 – 18.4 k Ω	-20°C (-4°F)
THA – E2	2.21 – 2.69 k Ω	20°C (68°F)
THA – E2	0.49 – 0.67 k Ω	60°C (140°F)

If the resistance is not as specified, replace the air flow meter.



3. INSPECT AIR FLOW METER OPERATION

- Connect the air flow meter connector.
- Turn the ignition switch to ON.
- Using a voltmeter, connect the positive (+) tester probe to terminal VG, and negative (-) tester probe to terminal E2G.
- Blow air into the air flow meter, and check that the voltage fluctuates.

If operation is not as specified, replace the air flow meter.

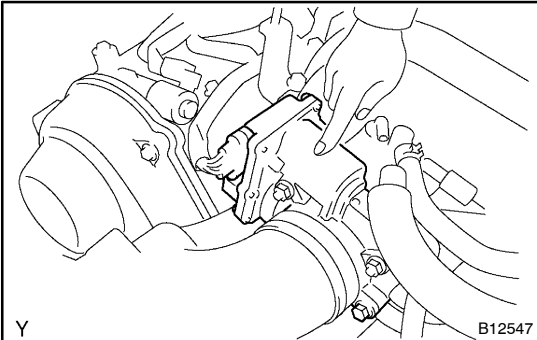
- Turn the ignition switch LOCK.
- Disconnect the air flow meter connector.

4. INSTALL AIR FLOW METER

- Install a new O-ring and the air flow meter with the 2 screws.
- Connect the air flow meter connector.

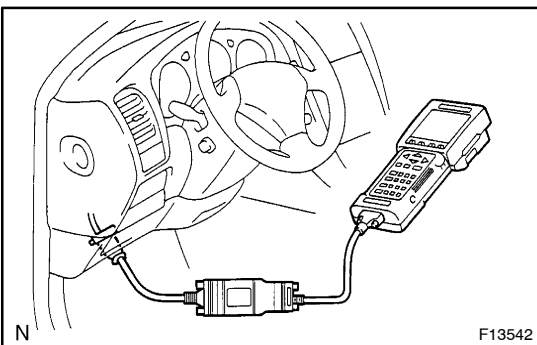
THROTTLE BODY ON-VEHICLE INSPECTION

1. REMOVE V-BANK COVER
2. INSPECT SYSTEM OPERATION



- (a) Inspect the throttle control motor for operating sound.
 - (1) Turn the ignition switch ON.
 - (2) When turning the accelerator pedal position sensor lever, check the running sound of the motor. Also, check that there is no friction sound.

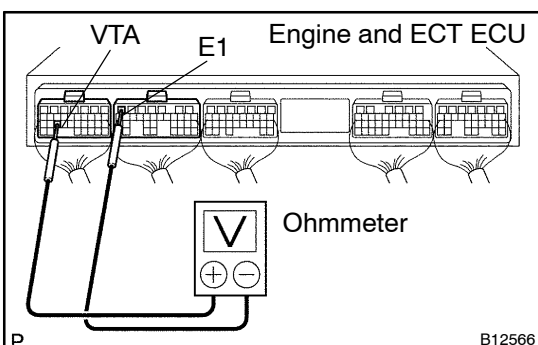
If operation is not as specified, check the throttle control motor (See step 3), wiring and engine and ECT ECU.



- (b) Inspect the accelerator pedal position sensor.
 - (1) Connect the hand-held tester to the DLC3.
 - (2) Check that the MIL does not light up.
 - (3) When turning the accelerator pedal position sensor lever to the full-open position, check that the throttle valve opening percentage (THROTTLE POS) of the CURRENT DATA shows the standard value.

**Standard throttle valve opening percentage:
60 % or more**

If operation is not as specified, check that the accelerator pedal position sensor (See step 5), wiring and engine and ECT ECU.



If you have no hand-held tester, measure voltage between terminals VTA and E1 of the engine and ECT ECU connector.

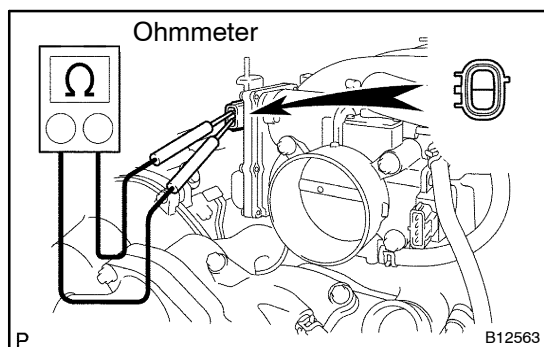
- (c) Inspect the Idle speed.
 - (1) Start the engine and check that the MIL does not light up.
 - (2) Allow the engine to warm up to normal operating temperature.
 - (3) Turn the A/C conditioning ON to OFF, and check the idle speed.

Idle speed (Transmission in neutral): 750 ± 50 rpm

NOTICE:

Perform inspection under condition without electrical load.

- (d) After checking the above (b) to (d), perform the driving test and check that there is no sense of incongruity.

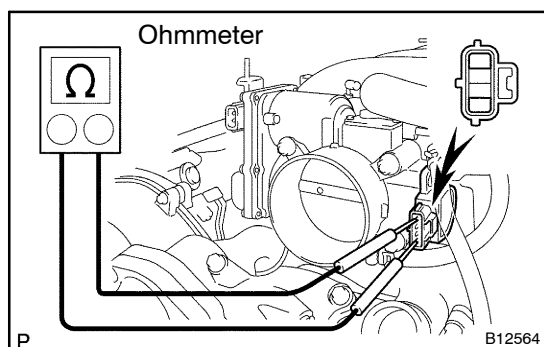
**3. INSPECT THROTTLE CONTROL MOTOR**

- (a) Disconnect the throttle control motor connector.
(b) Using an ohmmeter, measure the motor resistance between terminal 1 (M+) and 2 (M-).

Motor resistance: 0.3 – 100 Ω at 20°C (68°F)

If the resistance is not as specified, replace the throttle body.

- (c) Reconnect the throttle control motor connector.

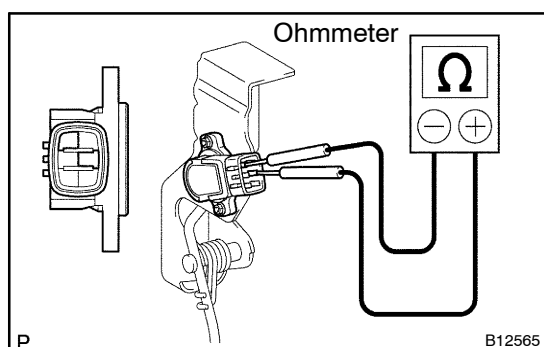
**4. INSPECT THROTTLE POSITION SENSOR**

- (a) Disconnect the throttle position sensor connector.
(b) Using an ohmmeter, measure the resistance between terminals VC and ETA.

Resistance: 1.25 – 2.35 kΩ at 20°C (68°F)

If the resistance is not as specified, replace the throttle body.

- (c) Reconnect the throttle position sensor connector.

**5. INSPECT ACCELERATOR PEDAL POSITION SENSOR**

- (a) Disconnect the accelerator pedal position sensor connector.
(b) Using an ohmmeter, measure the resistance between each terminals.

Resistance: at 20°C (68°F)

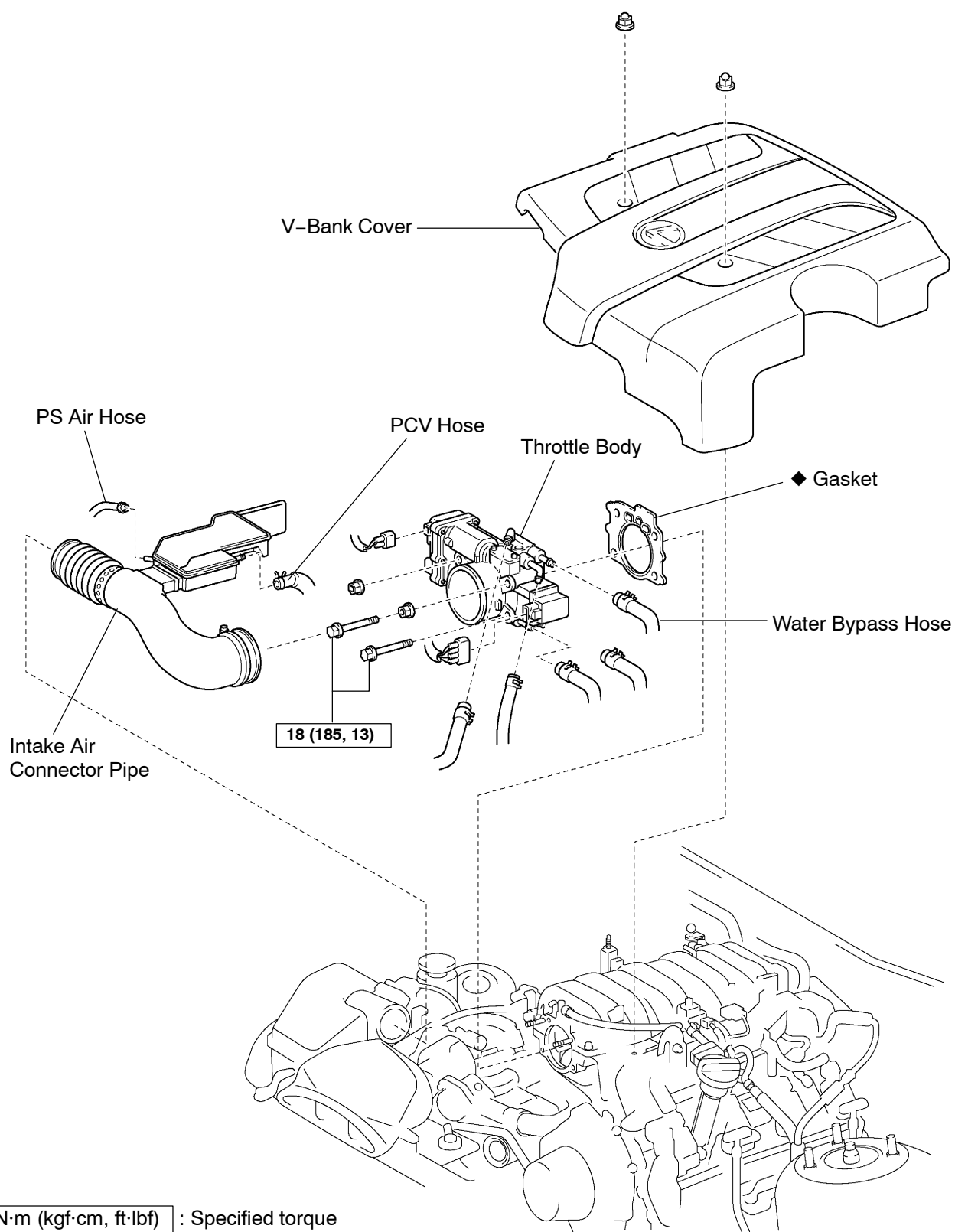
Terminals	Resistance
V _{CP1} – E _{P1} V _{CP2} – E _{P2}	1.5 – 6.0 kΩ

If the resistance is not as specified, replace the accelerator pedal assembly with accelerator pedal position sensor.

- (c) Reconnect the accelerator pedal position sensor connector.

6. REINSTALL V-BANK COVER

COMPONENTS

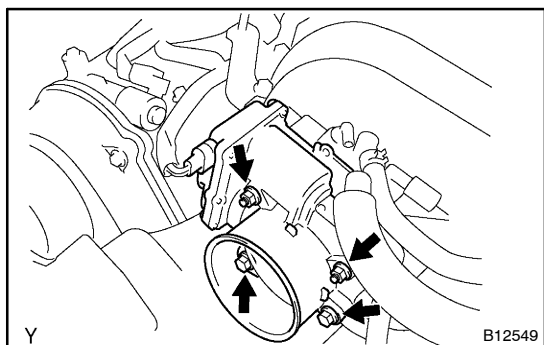


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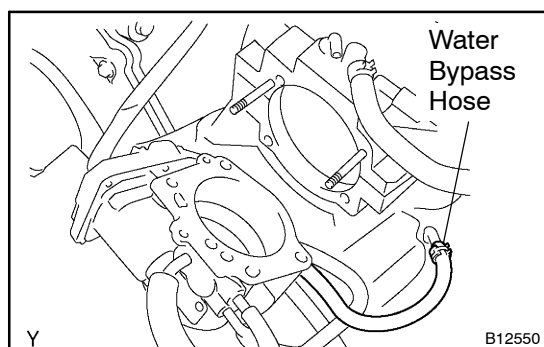
REMOVAL

1. REMOVE V-BANK COVER
2. DRAIN ENGINE COOLANT
3. REMOVE INTAKE AIR CONNECTOR PIPE
4. REMOVE THROTTLE BODY

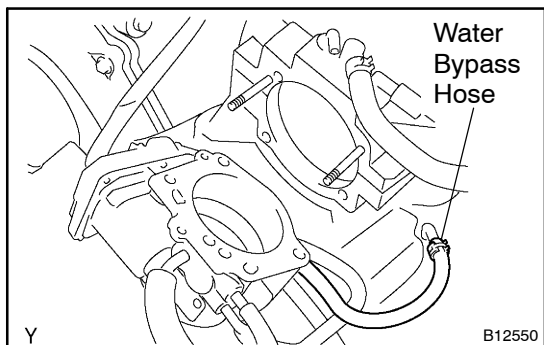
(a) Disconnect the connectors and wire:



- (b) Disconnect the water bypass hose from the No.5 water bypass pipe on the throttle body.
- (c) Remove the 2 bolts and 2 nuts, and disconnect the throttle body from the intake manifold.



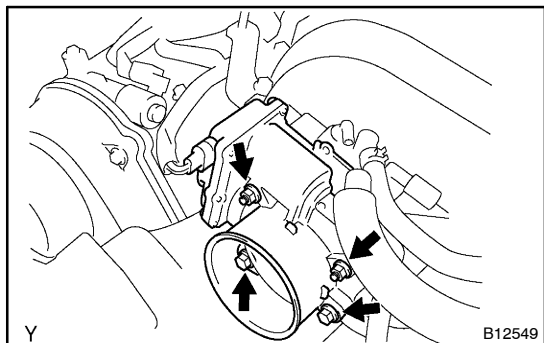
- (d) Disconnect the water bypass hose from the manifold thermostat on the throttle body, and remove the throttle body.
- (e) Remove the gasket.



INSTALLATION

1. INSTALL THROTTLE BODY

- (a) Connect the water bypass hose to the manifold thermostat on the throttle body.



- (b) Install a new gasket and the throttle body with the 2 bolts and 2 nuts.

Torque: 18 N·m (185 kgf·cm, 13 ft·lbf)

- (c) Connect the water bypass hose to the No.5 water bypass pipe on the throttle body.
- (d) Connect the connector.

2. INSTALL INTAKE AIR CONNECTOR PIPE

3. FILL WITH ENGINE COOLANT (See page CO-2)

4. START ENGINE AND CHECK FOR ENGINE COOLANT LEAKS

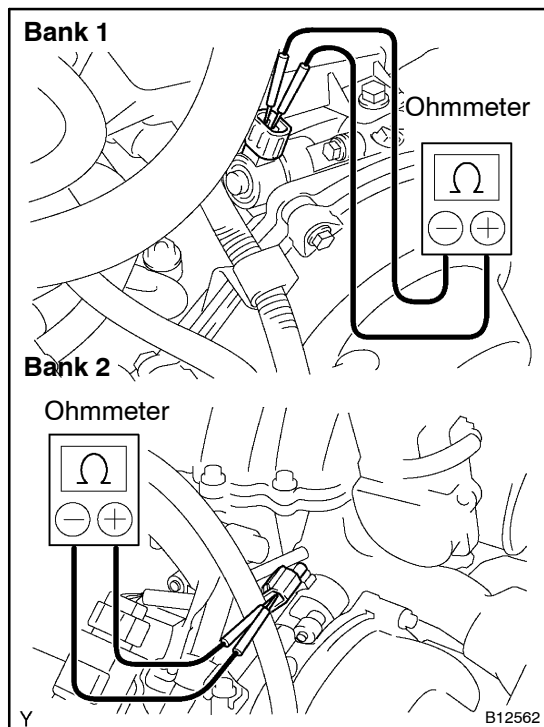
5. INSTALL V-BANK COVER

CAMSHAFT TIMING OIL CONTROL VALVE

ON-VEHICLE INSPECTION

FI0WL-01

1. REMOVE V-BANK COVER
2. Oil Control Valve (Bank 2):
REMOVE INTAKE AIR CONNECTOR PIPE



3. INSPECT CAMSHAFT TIMING OIL CONTROL VALVE RESISTANCE

- (a) Disconnect the oil control valve connectors.
- (b) Using an ohmmeter, measure the resistance between the terminals.

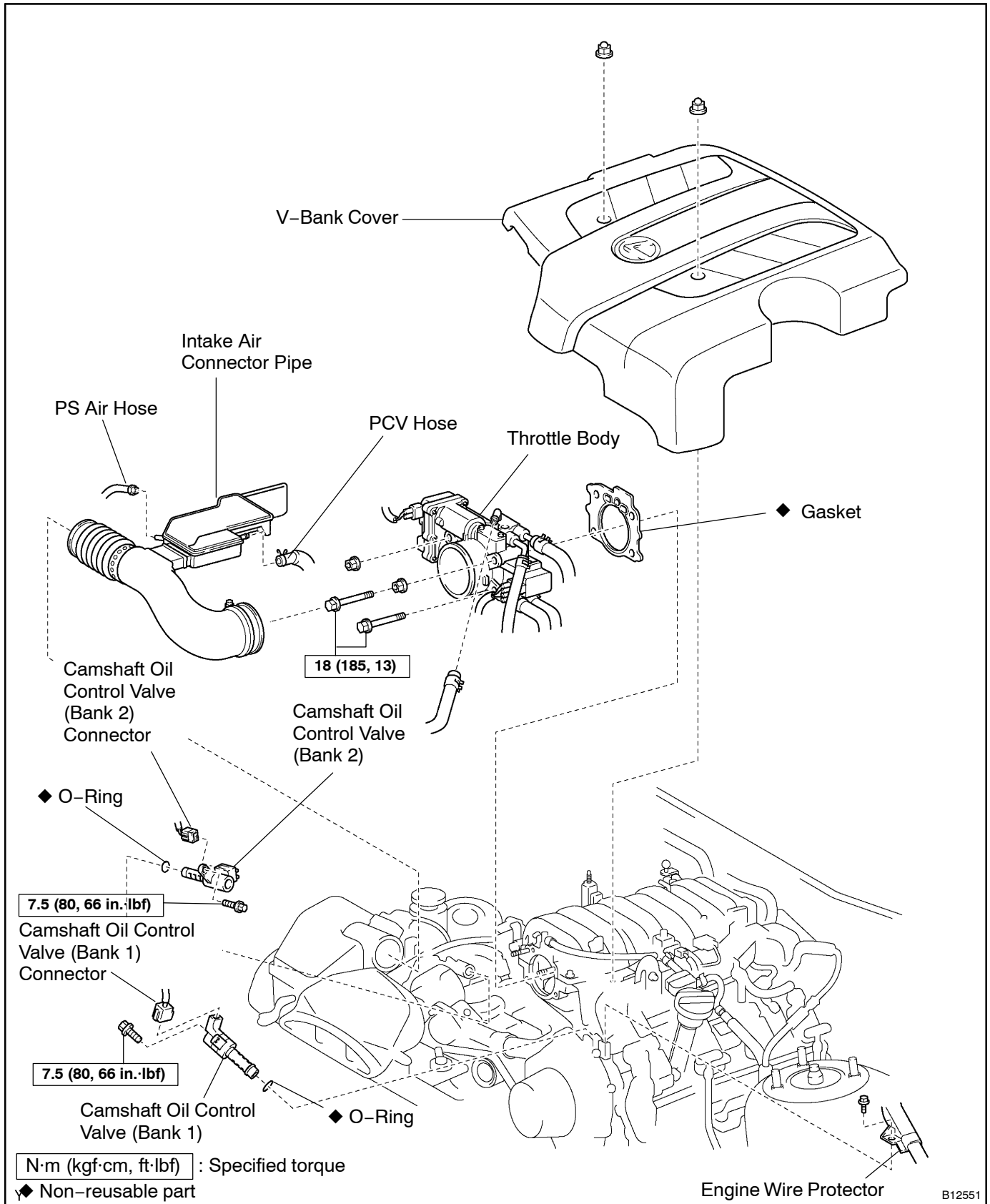
Resistance: 6.9 – 7.9 Ω at 20°C (68°F)

If the resistance is not as specified, replace the valve.

- (c) Reconnect the oil control valve connectors.

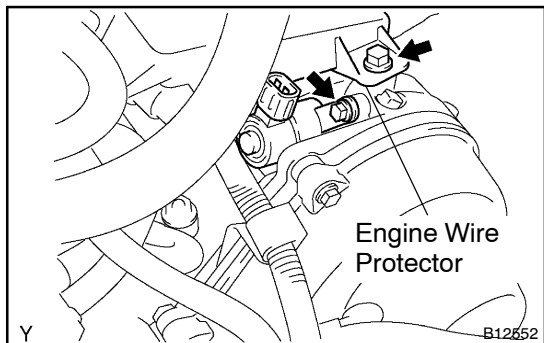
4. Oil Control Valve (Bank 2):
REINSTALL INTAKE AIR CONNECTOR PIPE
5. REINSTALL V-BANK COVER

COMPONENTS



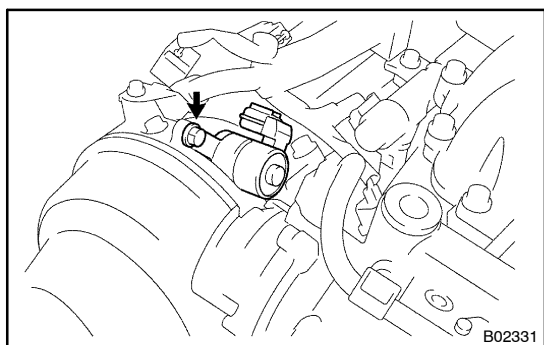
REMOVAL

1. REMOVE V-BANK COVER
2. REMOVE INTAKE AIR CONNECTOR PIPE
3. REMOVE THROTTLE BODY (See page FI-38)



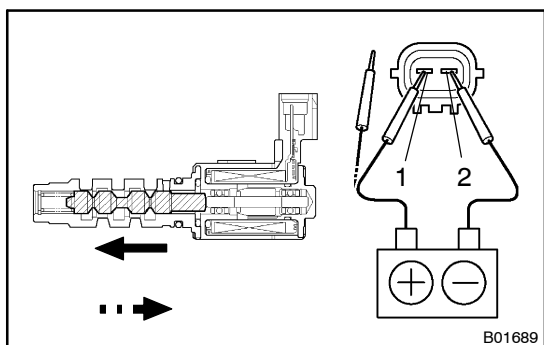
4. REMOVE CAMSHAFT TIMING OIL CONTROL VALVE (BANK 1)

- (a) Remove the bolt, and disconnect the engine wire protector from the camshaft bearing cap.
- (b) Disconnect the oil control valve connector.
- (c) Remove the bolt and oil control valve.
- (d) Remove the O-ring from the oil control valve.



5. REMOVE CAMSHAFT TIMING OIL CONTROL VALVE (BANK 2)

- (a) Disconnect the oil control valve connector.
- (b) Remove the bolt and oil control valve.
- (c) Remove the O-ring from the oil control valve.



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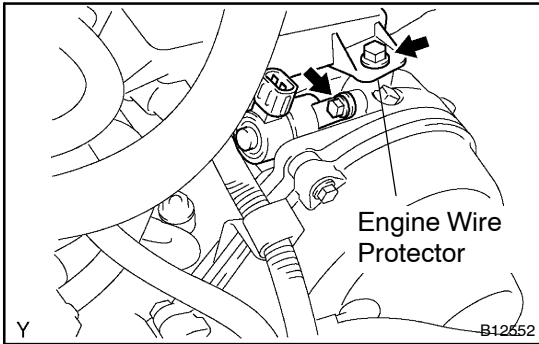
INSPECTION

INSPECT CAMSHAFT OIL CONTROL VALVE OPERATION

Connect the positive (+) lead from the battery to terminal 1 and negative (-) lead to terminal 2, and check the movement of the valve.

Battery positive voltage is applied	Valve moves in  direction
Battery positive voltage is cut off	Valve moves in  direction

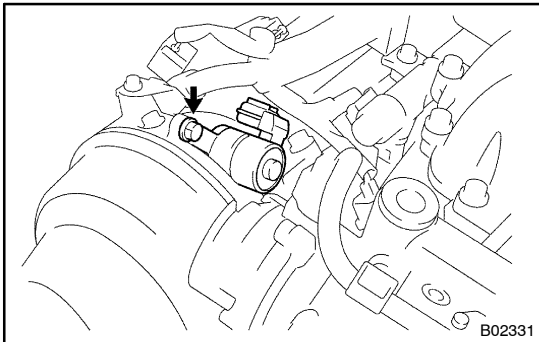
If operation is not as specified, replace the valve.



INSTALLATION

1. INSTALL CAMSHAFT TIMING OIL CONTROL VALE (BANK 1)

- Install a new O-ring to the oil control valve.
- Attach the oil control valve to the camshaft bearing cap.
- Install the oil control valve with the bolt.
Torque: 7.5 N·m (80 kgf·cm, 66 in·lbf)
- Connect the oil control valve connector.
- Install the engine wire protector with the bolt.



2. INSTALL CAMSHAFT TIMING OIL CONTROL VALE (BANK 2)

- Install a new O-ring to the oil control valve.
- Attach the oil control valve to the camshaft bearing cap.
- Install the oil control valve with the bolt.
Torque: 7.5 N·m (80 kgf·cm, 66 in·lbf)
- Connect the oil control valve connector.

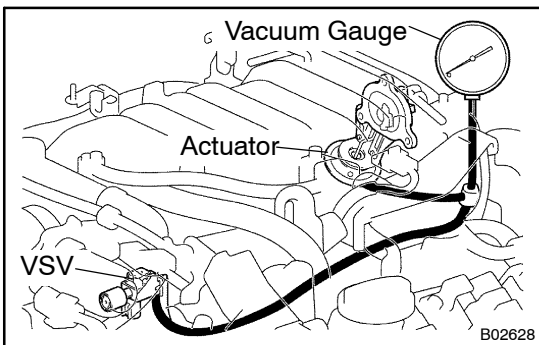
3. □ INSTALL THROTTLE BODY (See page FI-39)

- INSTALL INTAKE AIR CONNECTOR PIPE
- INSTALL V-BANK COVER

ACOUSTIC CONTROL INDUCTION SYSTEM (ACIS) ON-VEHICLE INSPECTION

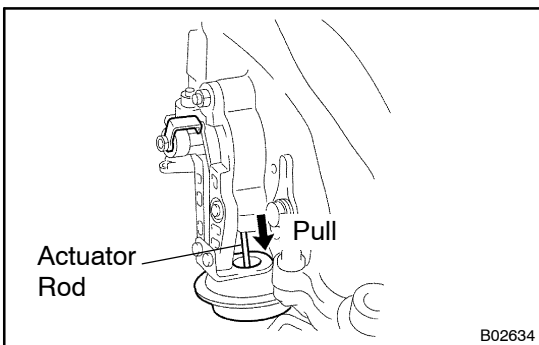
FI0WQ-01

1. REMOVE V-BANK COVER
2. CONNECT VACUUM GAUGE
 - (a) Disconnect the throttle body from the intake manifolds.
(See [page FI-42](#))
 - (b) Remove the upper and lower intake manifolds assembly.
(See [page EM-36](#))



- (c) Using a 3 – way connector, connect vacuum gauge to the vacuum hose between the actuator and VSV.
- (d) Reinstall the upper and lower Intake manifolds assembly.
(See [page EM-60](#))
- (e) Reinstall the throttle body. (See [page FI-44](#))

3. START ENGINE



4. INSPECT ACIS OPERATION

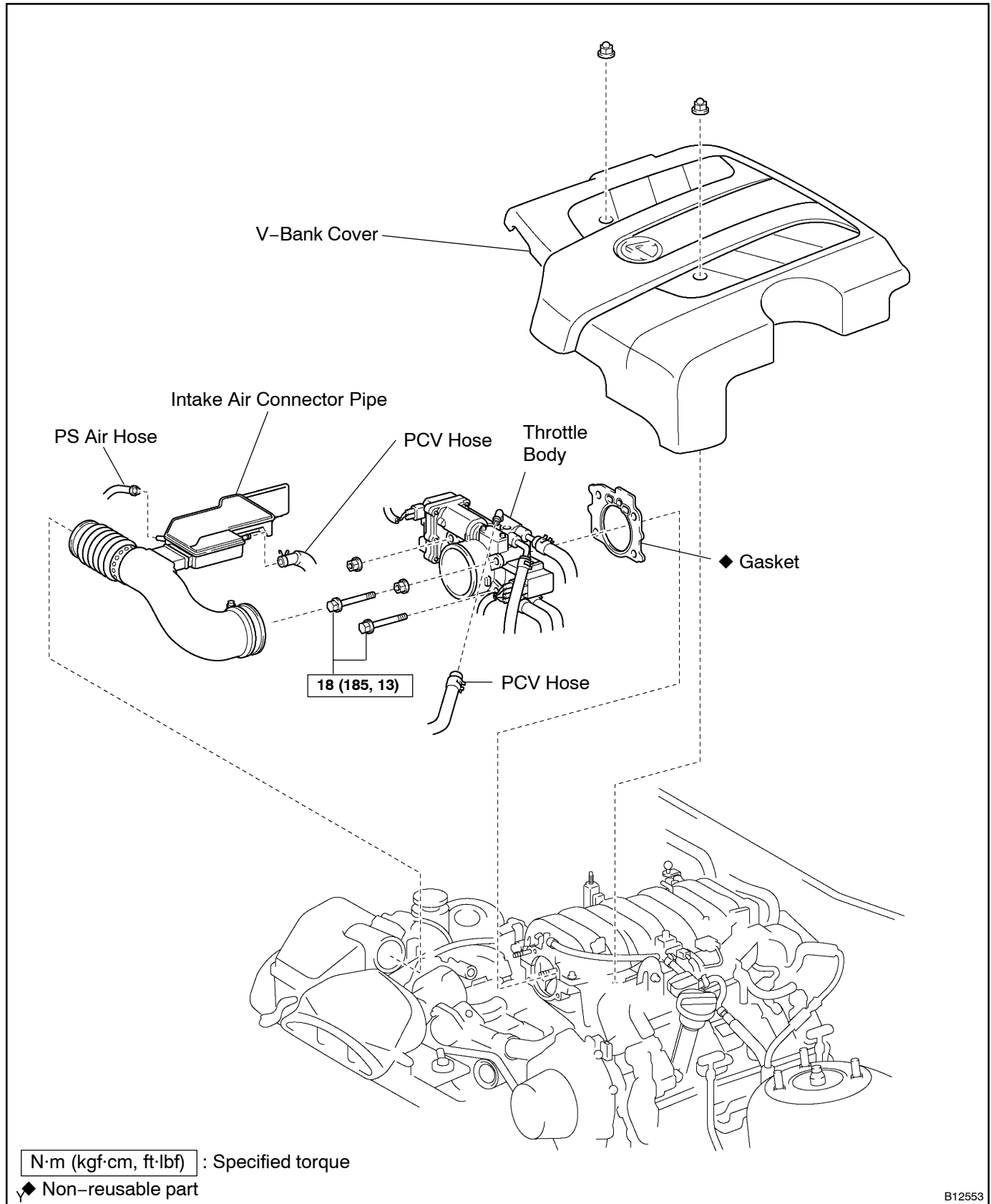
- (a) While the engine is idling, check that the vacuum gauge needle momentarily fluctuates up to approx. 39.9 kpa (300 mmHg, 11.78 in.Hg). (The actuator rod is pulled out.)
- (b) Rapidly depress the accelerator pedal to fully open position and check that the vacuum gauge needle points to 0 kpa (0 mmHg, 0 in.Hg). (The actuator rod is returned.)
If operation is not as specified, check each part.

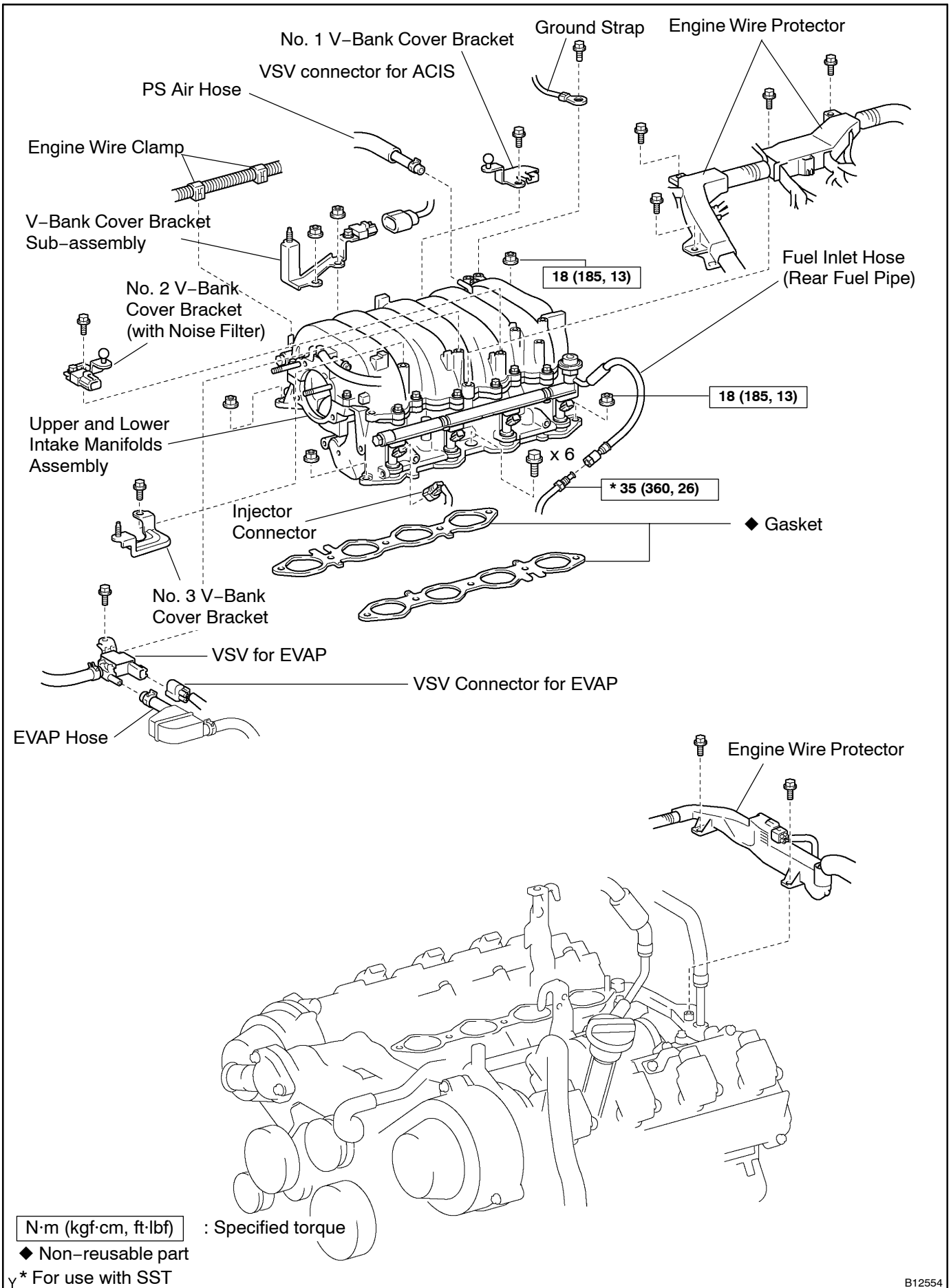
5. REMOVE VACUUM GAUGE

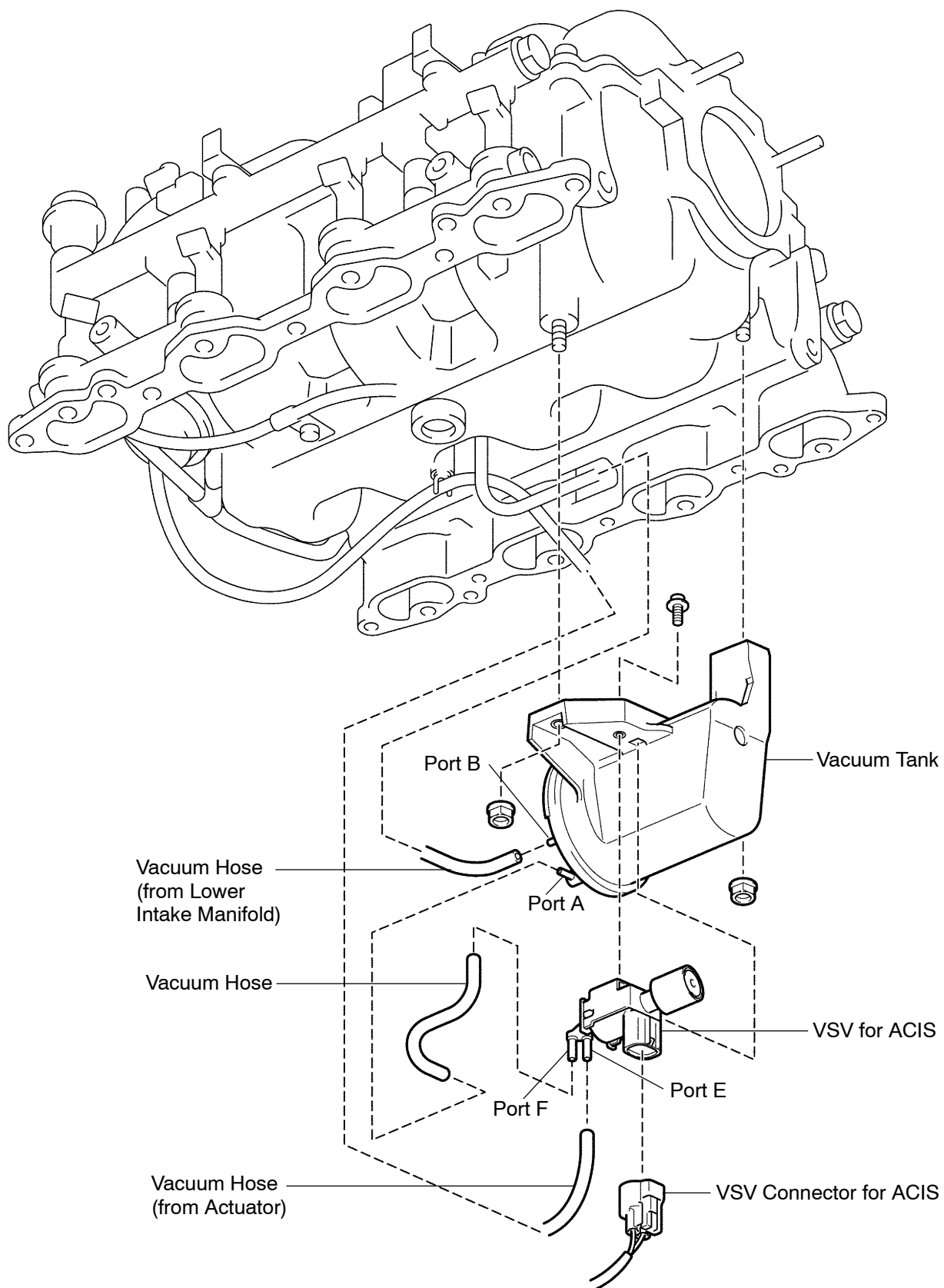
- (a) Disconnect the throttle body from the intake manifolds.
- (b) Remove the upper and lower intake manifolds assembly.
- (c) Remove the vacuum gauge, and reconnect the vacuum hose to their proper locations.
- (d) Reinstall the upper and lower Intake manifolds assembly.
- (e) Reinstall the throttle body.

6. REINSTALL V-BANK COVER

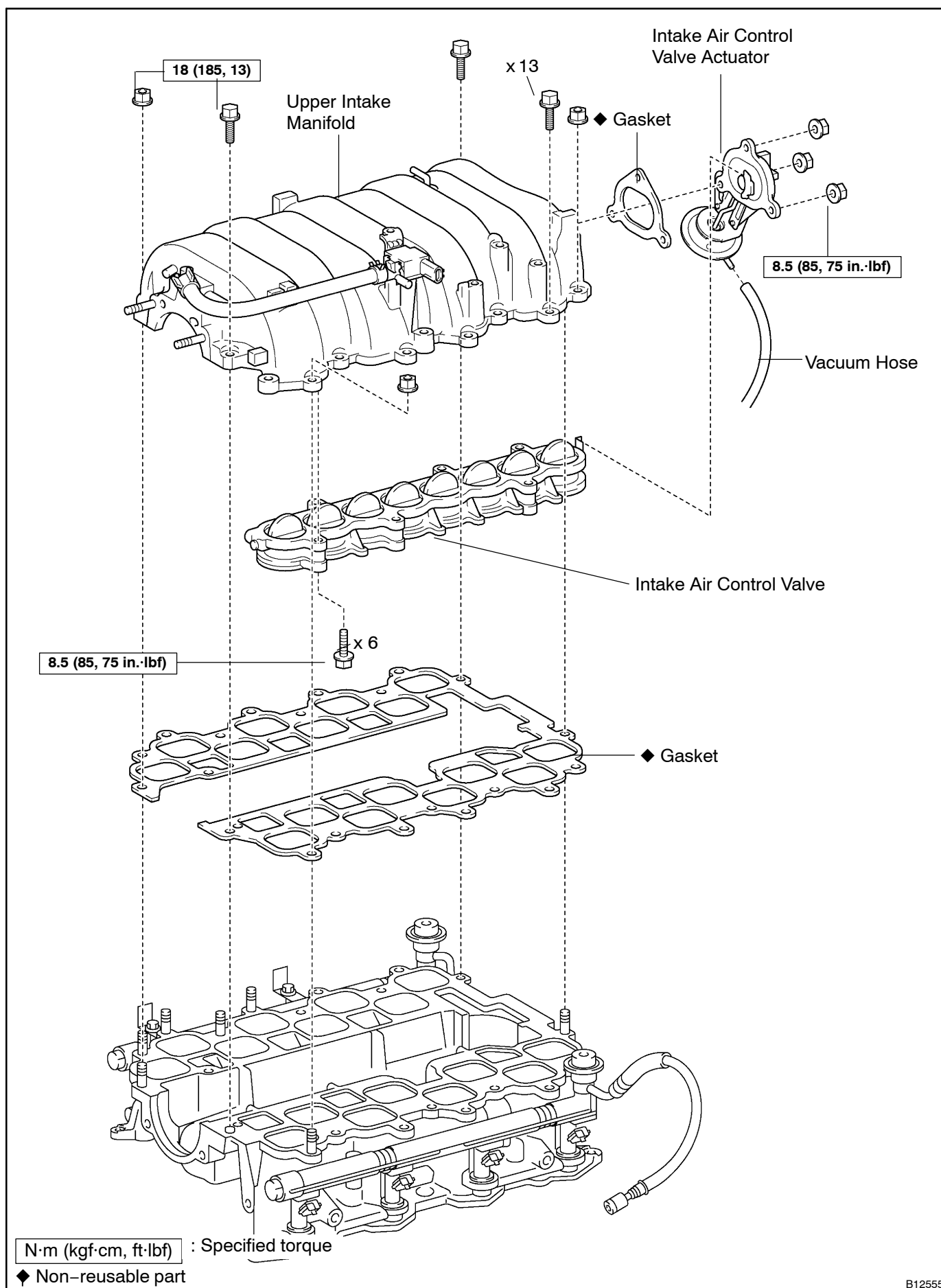
COMPONENTS





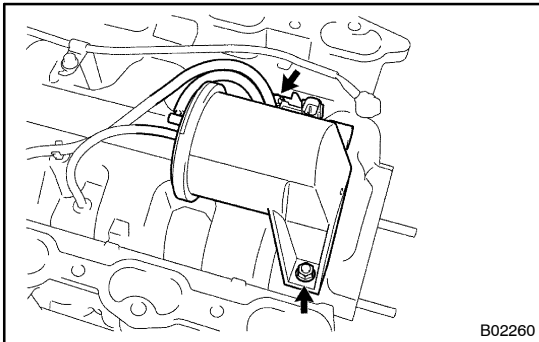


B02263



REMOVAL

1. REMOVE V-BANK COVER
2. REMOVE INTAKE AIR CONNECTOR PIPE
3. DISCONNECT THROTTLE BODY FROM INTAKE MANIFOLDS (See page FI-42)
4. REMOVE UPPER AND LOWER INTAKE MANIFOLDS ASSEMBLY (See page EM-36)



5. REMOVE VACUUM TANK AND VSV ASSEMBLY FOR ACIS FROM LOWER INTAKE MANIFOLD

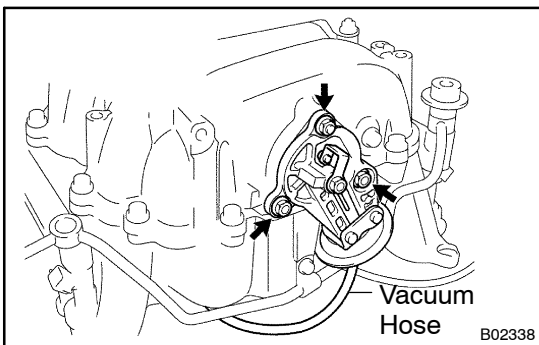
- (a) Disconnect the VSV connector.
- (b) Disconnect these vacuum hoses:
 - (1) Vacuum hose from port E of VSV.
 - (2) Vacuum hose from port B of vacuum tank.
- (c) Remove the 2 nuts, the vacuum tank and VSV assembly.

6. REMOVE VSV FOR ACIS FROM VACUUM TANK

- (a) Remove the vacuum hose.
- (b) Remove the screw and VSV.

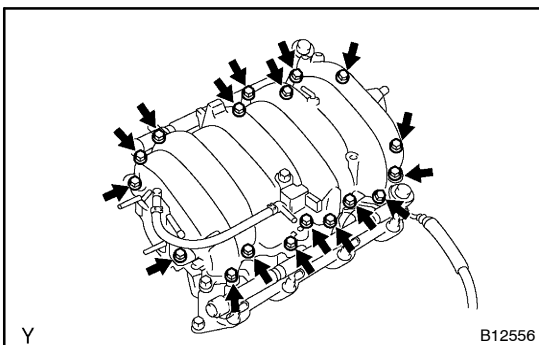
7. REMOVE INTAKE AIR CONTROL VALVE ACTUATOR FROM UPPER INTAKE MANIFOLD

- (a) Disconnect the vacuum hose from the actuator.
- (b) Remove the 3 nuts, actuator and gasket.



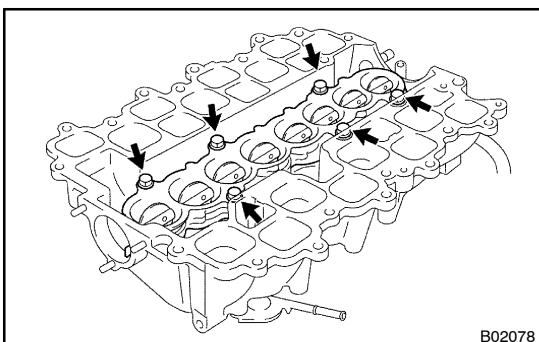
8. REMOVE UPPER INTAKE MANIFOLD FROM LOWER INTAKE MANIFOLD

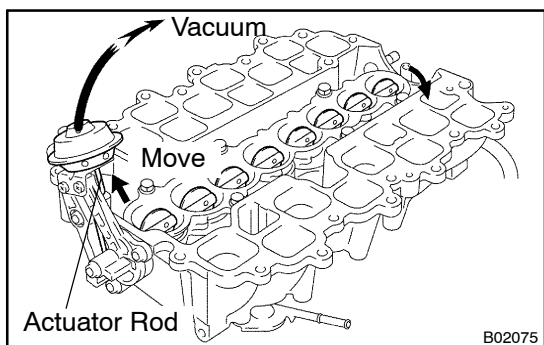
Remove the 15 bolts, 3 nuts, upper intake manifold and gasket.



9. REMOVE INTAKE AIR CONTROL VALVE FROM UPPER INTAKE MANIFOLD

Remove the 6 bolts and air control valve.



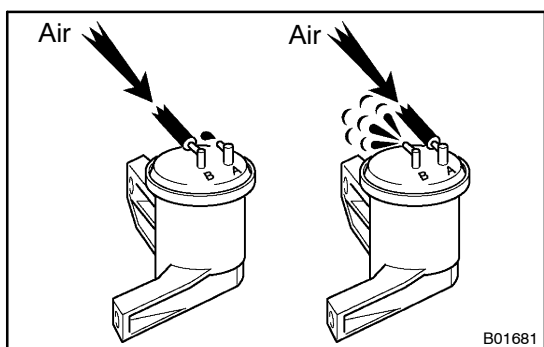


INSPECTION

1. INSPECT INTAKE AIR CONTROL VALVE

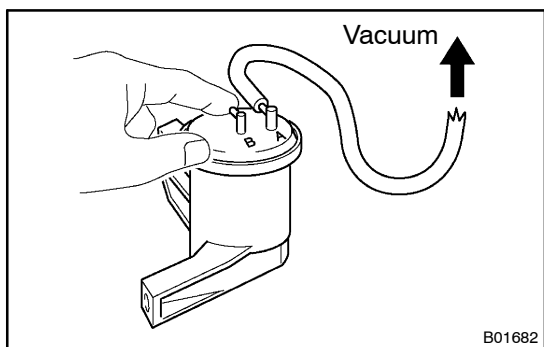
- Install the air control valve and actuator to the upper intake manifold. (See page FI-52)
- Apply 39.9 kPa (300mmHg, 11.78 in.Hg) of vacuum to the actuator.
- Move the actuator rod, and check that the valve is fully closed.
- 1 minute after applying the vacuum in (a), check that the actuator rod does not return.

If operation is not as specified, replace the actuator.



2. INSPECT VACUUM TANK

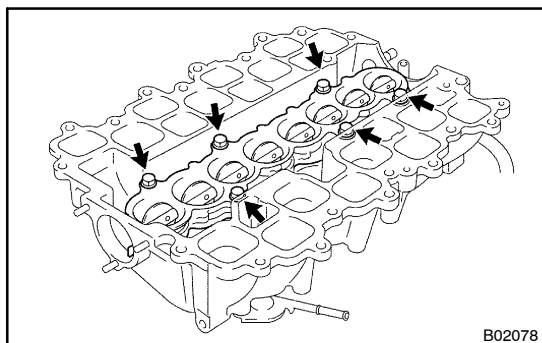
- Check that air does not flow from ports B to A.
- Check that air flows from ports A to B.



- Plug port B with your finger, and apply 39.9 kPa (300 mmHg, 11.78 in.Hg) of vacuum to port A, and check that there is no change in vacuum after 1 minute.

If operation is not as specified, replace the tank.

3. INSPECT VSV (See page FI-59)

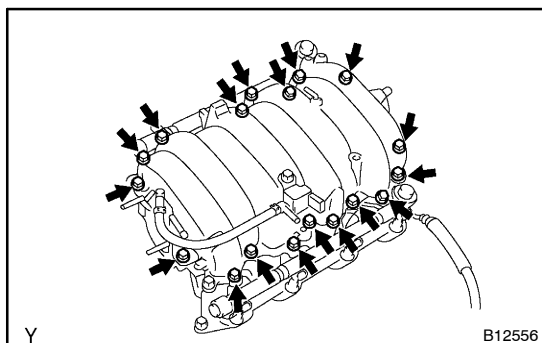


INSTALLATION

1. INSTALL INTAKE AIR CONTROL VALVE TO UPPER INTAKE MANIFOLD

Install the air control valve with the 6 bolts.

Torque: 8.5 N·m (85 kgf·cm, 75 in·lbf)



2. INSTALL UPPER INTAKE MANIFOLD TO LOWER INTAKE MANIFOLD

Install a new gasket and the upper intake manifold with the 15 bolts and 3 nuts.

Torque: 18 N·m (185 kgf·cm, 13 ft·lbf)

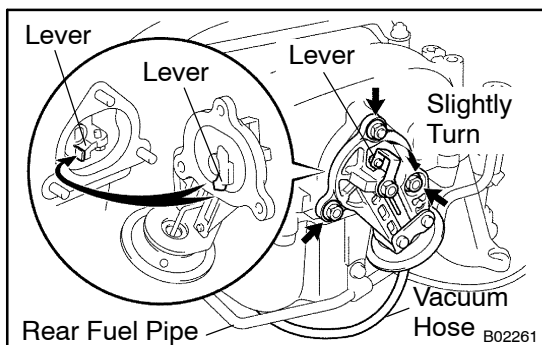
HINT:

Each bolt length is indicated in the illustration.

Bolt length:

20 mm (0.79 in.) for A

30 mm (1.18 in.) for B



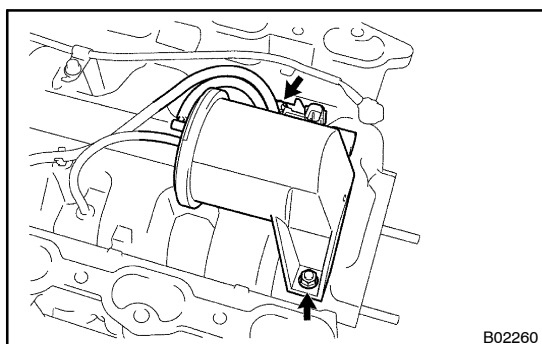
3. INSTALL INTAKE AIR CONTROL VALVE ACTUATOR TO UPPER INTAKE MANIFOLD

- Install a new gasket to the upper intake manifold.
- Slightly turn the actuator lever clockwise, and attach the levers of the actuator and air control valve.
- Install the actuator with the 3 nuts.
- Connect the vacuum hose to the actuator.

Torque: 8.5 N·m (85 kgf·cm, 75 in·lbf)

HINT:

Pass the vacuum hose under the rear fuel pipe.



4. INSTALL VSV FOR ACIS TO VACUUM TANK

- Install the VSV with the screw.
- Install the vacuum hose between port F of the VSV and port A of the vacuum tank.

5. INSTALL VACUUM TANK AND VSV ASSEMBLY FOR ACIS TO LOWER INTAKE MANIFOLD

- Install the vacuum tank and VSV assembly with the 2 nuts.

Torque: 18 N·m (185 kgf·cm, 13 ft·lbf)

- Connect these vacuum hoses:

- Vacuum hose (from actuator) to port E of VSV
- Vacuum hose (from lower intake manifold) to port B of vacuum tank

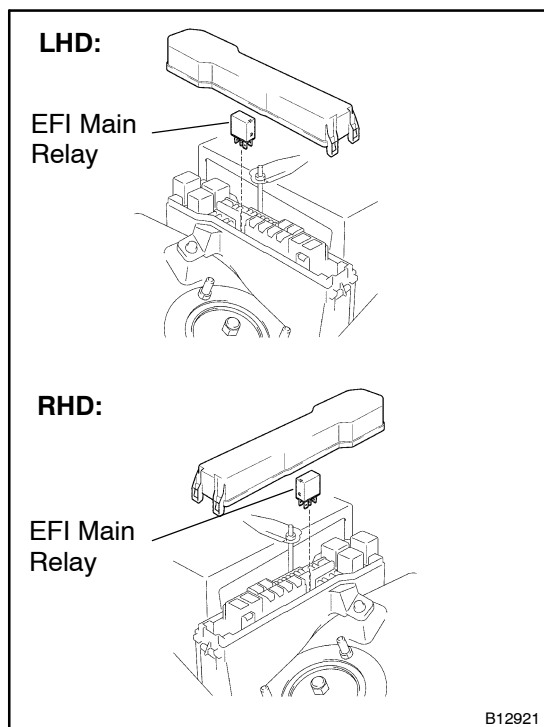
- Connect the VSV connector.

6. INSTALL UPPER AND LOWER INTAKE MANIFOLDS ASSEMBLY (See page EM-60)

7. INSTALL THROTTLE BODY TO INTAKE MANIFOLDS (See page FI-44)

8. INSTALL INTAKE AIR CONNECTOR PIPE

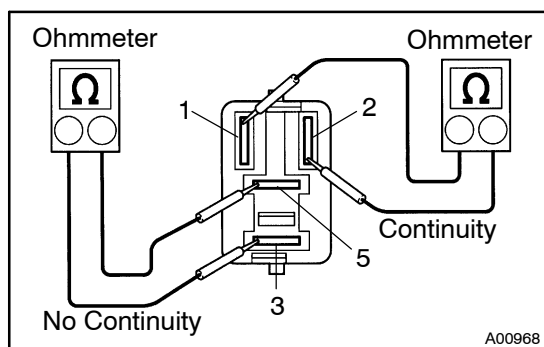
9. INSTALL V-BANK COVER



EFI MAIN RELAY INSPECTION

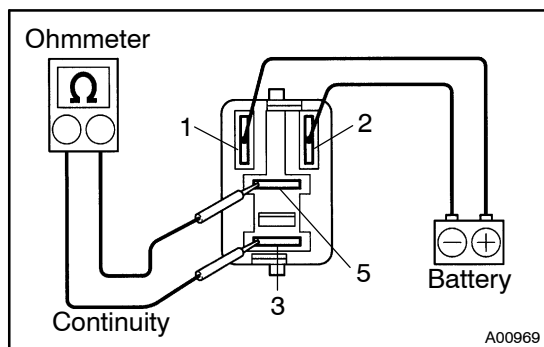
F10XH-01

1. REMOVE RELAY BOX COVER
2. REMOVE EFI MAIN RELAY (Marking: EFI)



3. INSPECT EFI MAIN RELAY

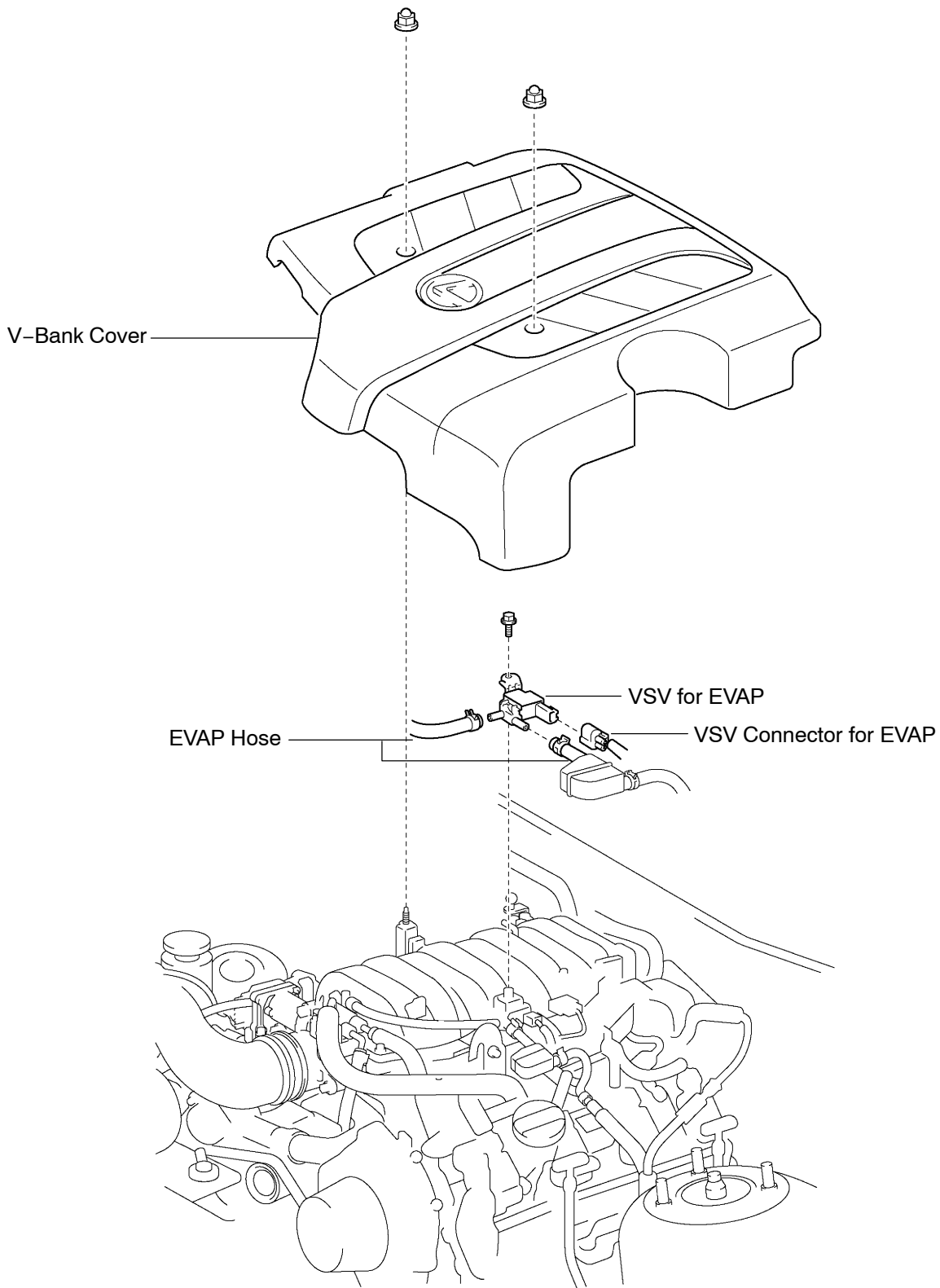
- (a) Inspect the relay continuity.
- (1) Using an ohmmeter, check that there is continuity between terminals 1 and 2.
- If there is no continuity, replace the relay.
- (2) Check that there is no continuity between terminals 3 and 5.
- If there is continuity, replace the relay.



- (b) Inspect the relay operation.
- (1) Apply battery positive voltage across terminals 1 and 2.
 - (2) Using an ohmmeter, check that there is continuity between terminals 3 and 5.
- If there is no continuity, replace the relay.
4. REINSTALL EFI MAIN RELAY
 5. REINSTALL RELAY BOX COVER

VSV FOR EVAPORATIVE EMISSION (EVAP) COMPONENTS

FI0WV-01

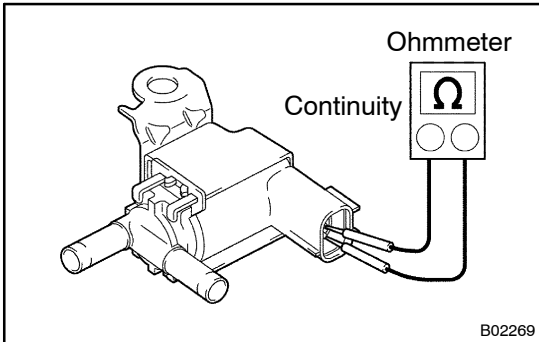


Y

B12557

INSPECTION

1. REMOVE V-BANK COVER
2. REMOVE VSV

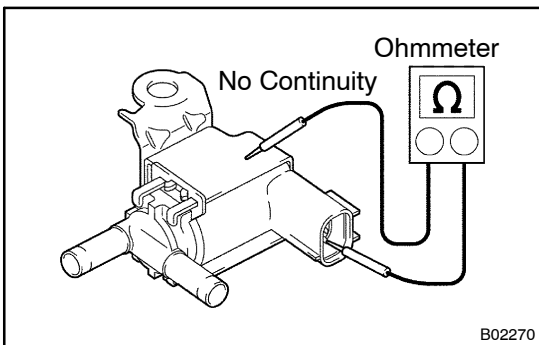


3. INSPECT VSV

- (a) Inspect the VSV for open circuit.
Using an ohmmeter, check that there is continuity between the terminals.

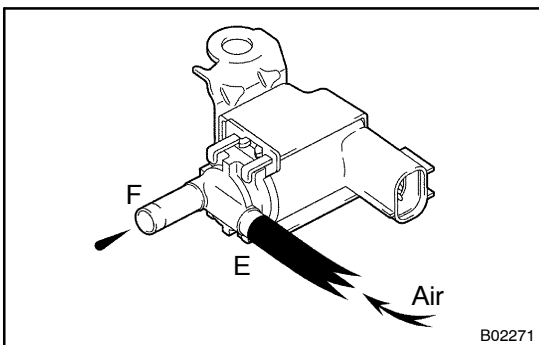
Resistance: 30 – 34 Ω at 20°C (68°F)

If there is no continuity, replace the VSV.



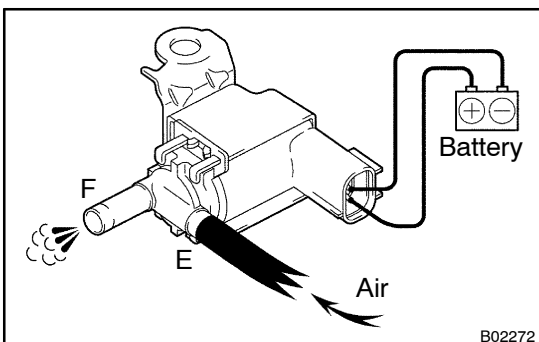
- (b) Inspect the VSV for ground.
Using an ohmmeter, check that there is no continuity between each terminal and the body.

If there is continuity, replace the VSV.



- (c) Inspect the VSV operation.

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



- (2) Apply battery positive voltage across the terminals.

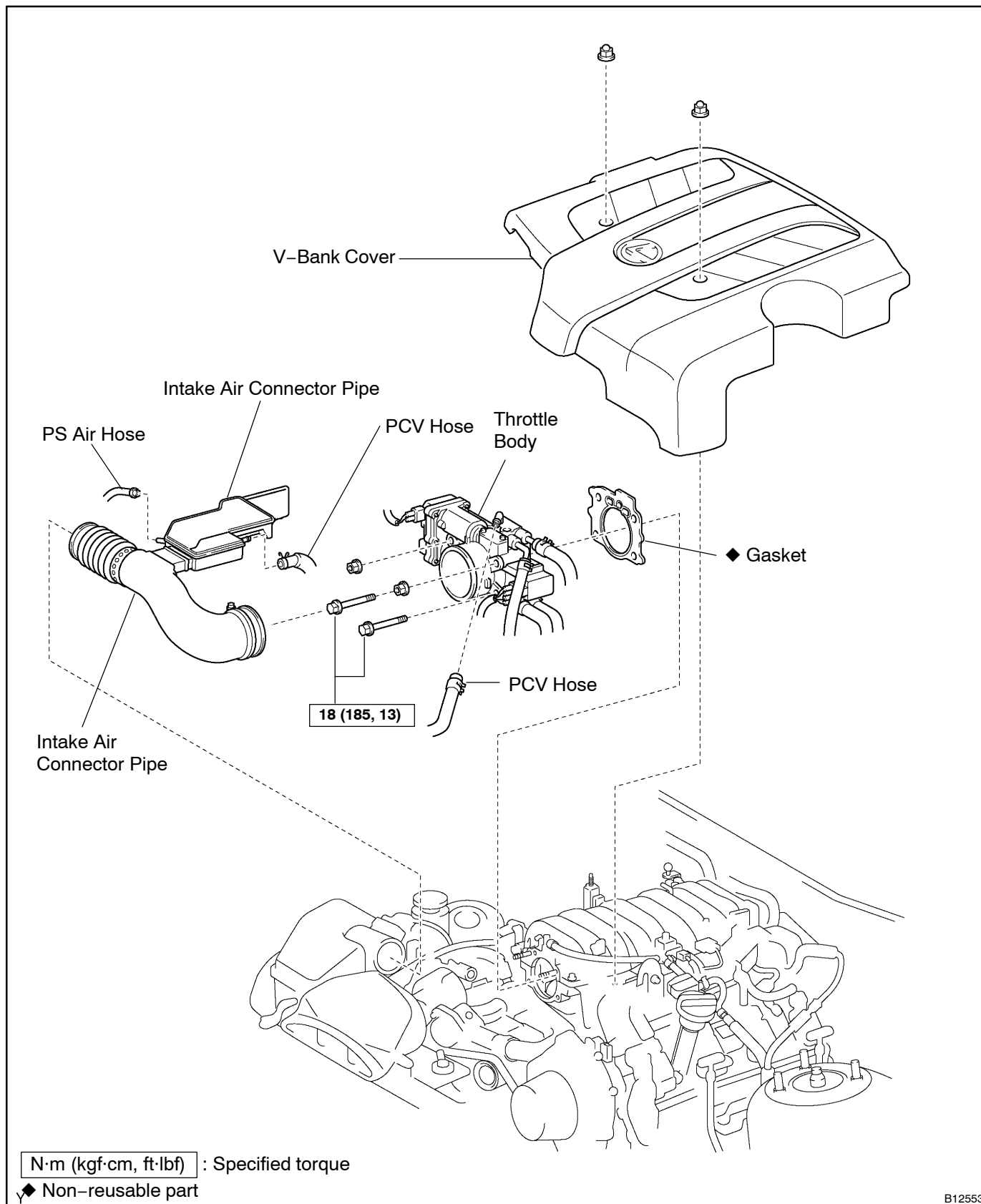
- (3) Check that air flows from ports E to F.

If operation is not as specified, replace the VSV.

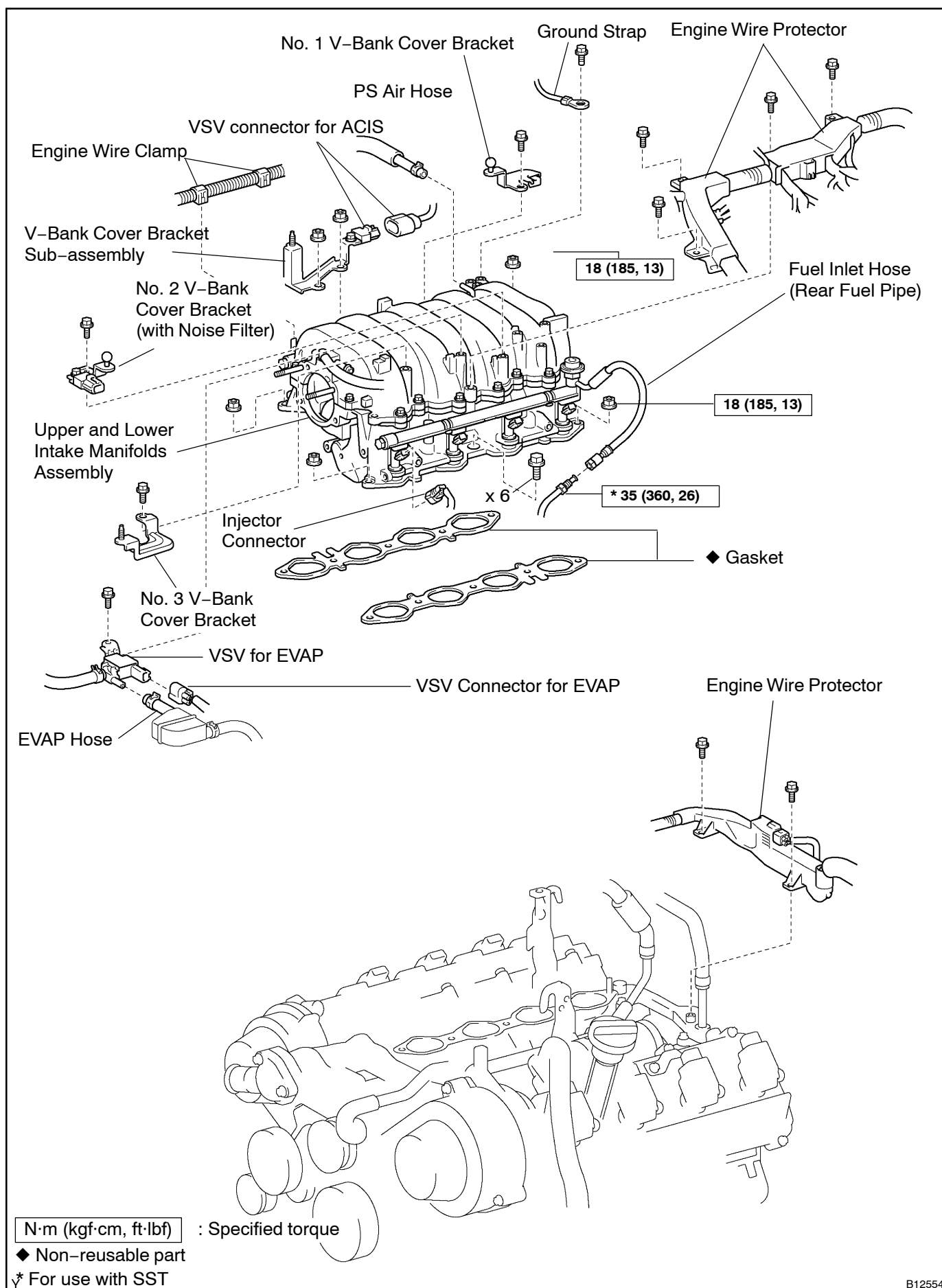
4. REINSTALL VSV
5. REINSTALL V-BANK COVER

VSV FOR ACOUSTIC CONTROL INDUCTION SYSTEM (ACIS) COMPONENTS

FI0WX-01



B12553

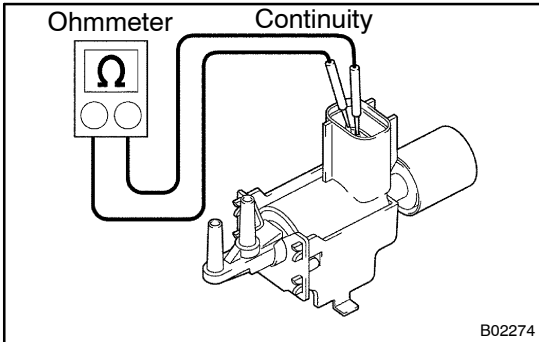


B12554



INSPECTION

1. REMOVE V-BANK COVER
2. REMOVE INTAKE AIR CONNECTOR PIPE
3. DISCONNECT THROTTLE BODY FROM INTAKE MANIFOLDS (See page FI-42)
4. REMOVE UPPER AND LOWER INTAKE MANIFOLDS ASSEMBLY (See page EM-36)
5. REMOVE VSV

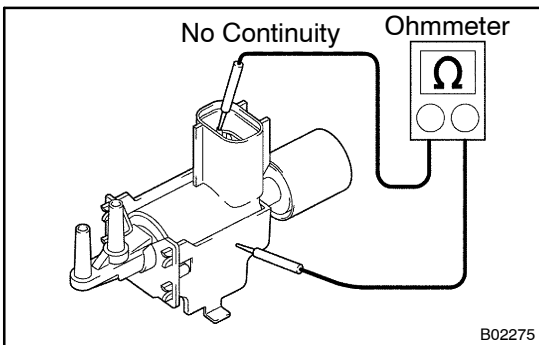


6. INSPECT VSV

- (a) Inspect the VSV for open circuit.
Using an ohmmeter, check that there is continuity between each terminals.

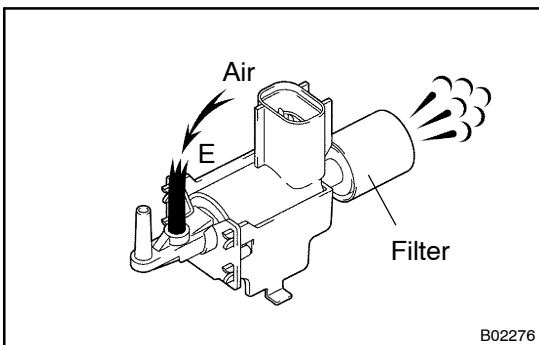
Resistance: 33 – 39 Ω at 20°C (68°F)

If there is no continuity, replace the VSV.



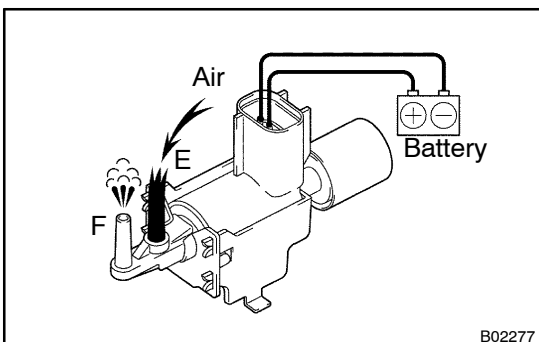
- (b) Inspect the VSV for ground.
Using an ohmmeter, check that there is no continuity between each terminal and the body.

If there is continuity, replace the VSV.



- (c) Inspect the VSV operation.

- (1) Check that air flows from port E to the filter.



- (2) Apply battery positive voltage across the terminals.

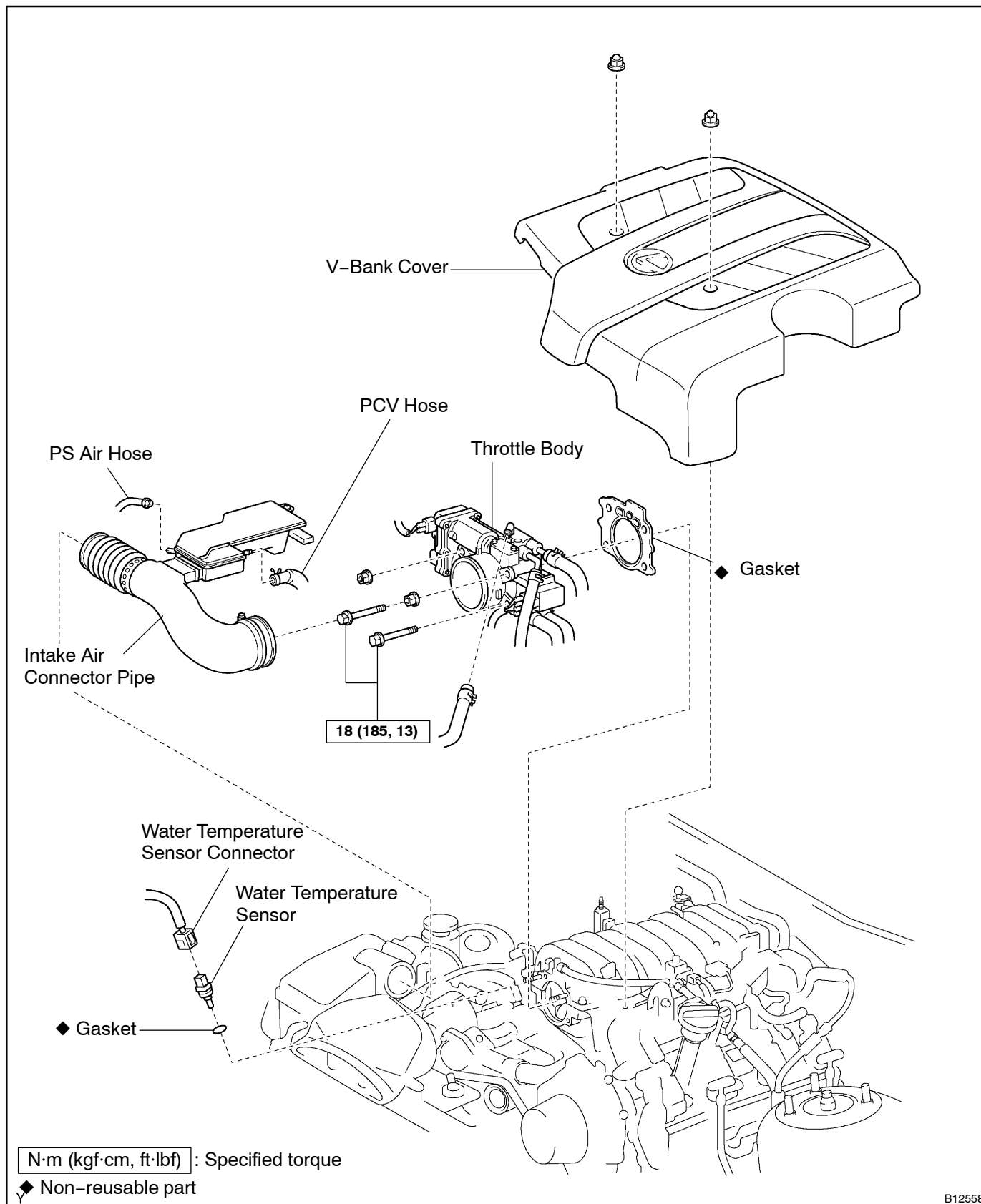
- (3) Check that air flows from ports E to F.

If operation is not as specified, replace the VSV.

7. REINSTALL VSV
8. REINSTALL UPPER AND LOWER INTAKE MANIFOLDS ASSEMBLY (See page EM-60)
9. REINSTALL THROTTLE BODY TO INTAKE MANIFOLDS (See page FI-44)
10. REINSTALL INTAKE AIR CONNECTOR PIPE
11. REINSTALL V-BANK COVER

WATER TEMPERATURE SENSOR COMPONENTS

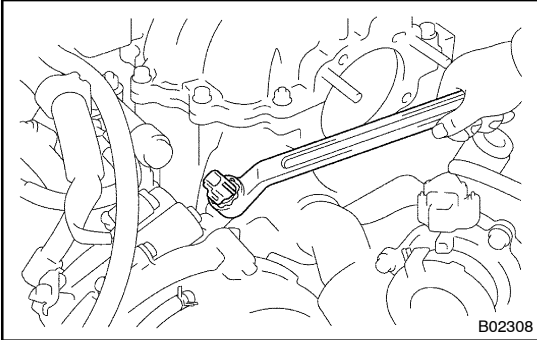
FI0WZ-01



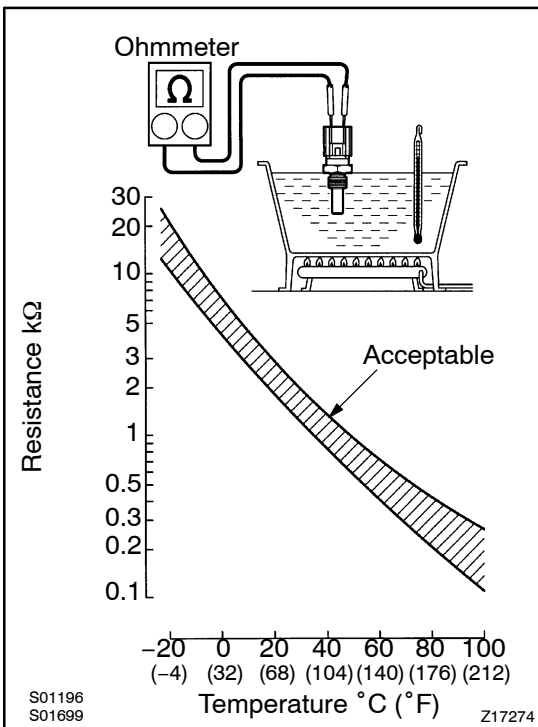
B12558

INSPECTION

1. DRAIN ENGINE COOLANT
2. REMOVE V-BANK COVER
3. REMOVE INTAKE AIR CONNECTOR PIPE
4. □ REMOVE THROTTLE BODY (See page FI-38)



5. REMOVE WATER TEMPERATURE SENSOR
 - (a) Disconnect the water temperature sensor.
 - (b) Remove the water temperature sensor and gasket.



6. INSPECT WATER TEMPERATURE SENSOR

Using an ohmmeter, measure the resistance between the terminals.

Resistance: Refer to the graph

If the resistance is not as specified, replace the water temperature sensor.

7. REINSTALL WATER TEMPERATURE SENSOR

- (a) Install a new gasket and the water temperature sensor.

Torque: 19.6 N·m (200 kgf·cm, 14 ft·lbf)

- (b) Connect the water temperature sensor connector.

8. □ REINSTALL THROTTLE BODY (See page FI-39)

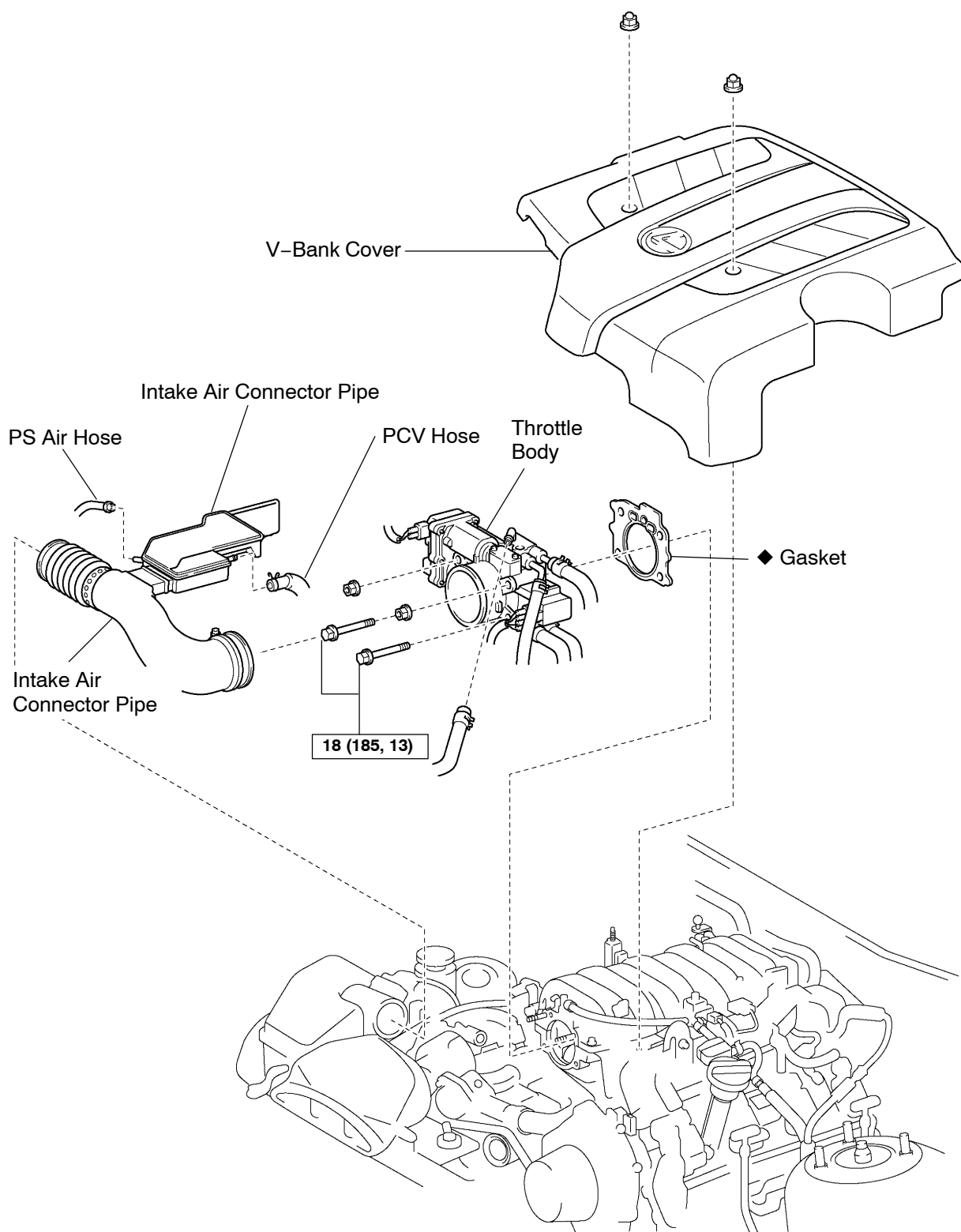
9. REINSTALL INTAKE AIR CONNECTOR PIPE

10. □ REFILL WITH ENGINE COOLANT (See page CO-2)

11. REINSTALL V-BANK COVER

KNOCK SENSOR COMPONENTS

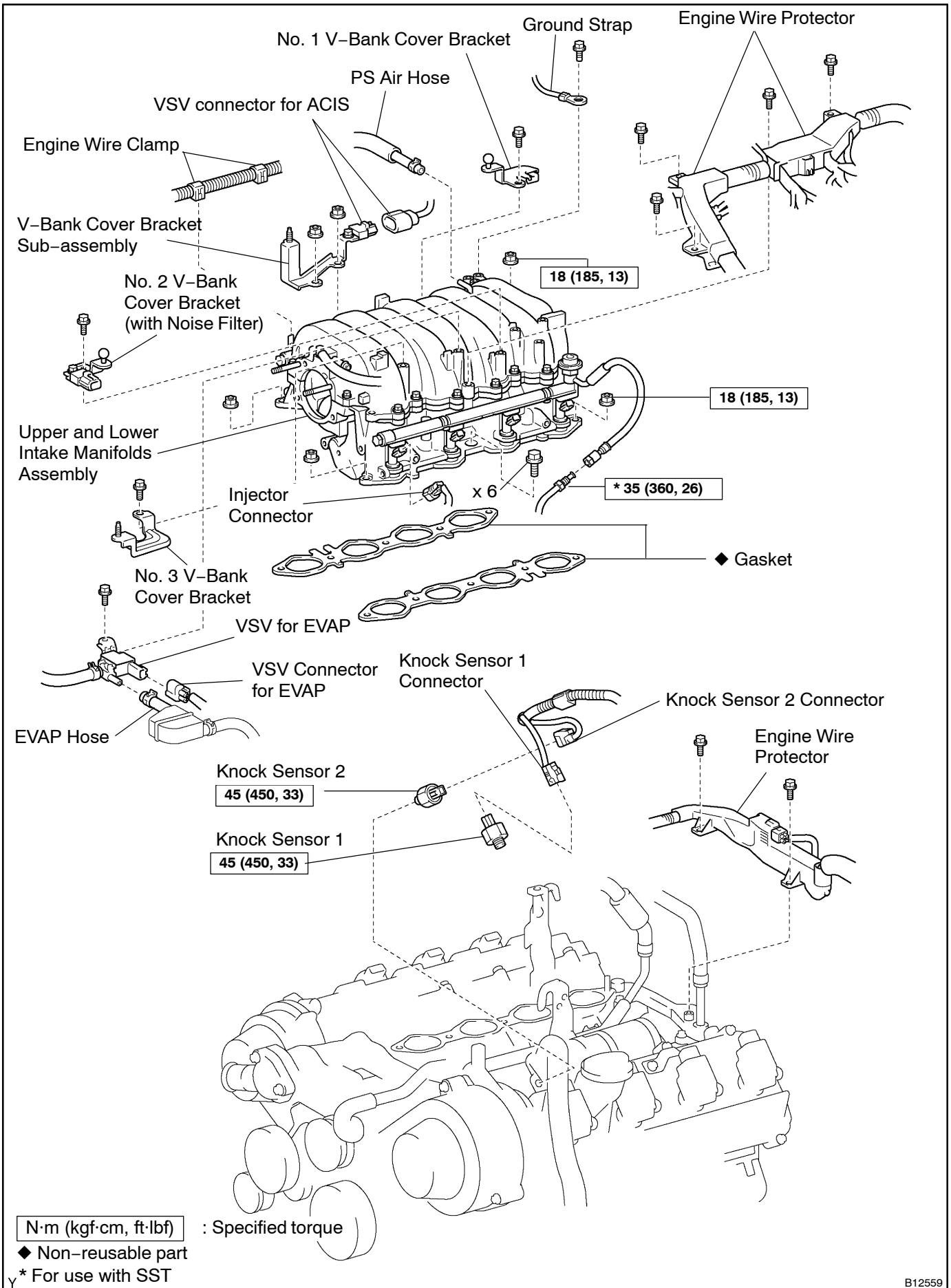
FIG1-01



N·m (kgf·cm, ft·lbf) : Specified torque

◆ Non-reusable part

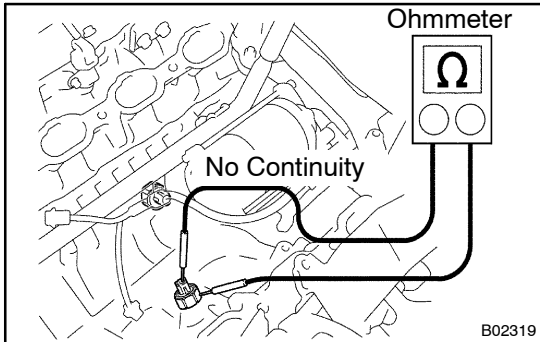
B12553



B12559

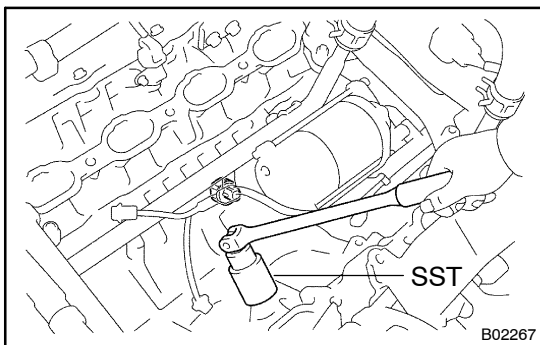
INSPECTION

1. REMOVE V-BANK COVER
2. REMOVE INTAKE AIR CONNECTOR PIPE
3. DISCONNECT THROTTLE BODY FROM INTAKE MANIFOLDS (See page FI-42)
4. REMOVE UPPER AND LOWER INTAKE MANIFOLDS ASSEMBLY (See page EM-36)



5. INSPECT KNOCK SENSOR 1, 2

- (a) Disconnect the knock sensor connectors.
- (b) Using an ohmmeter, check that there is no continuity between the terminal and body.



If there is continuity, replace the sensor with SST.

SST 09816-30010

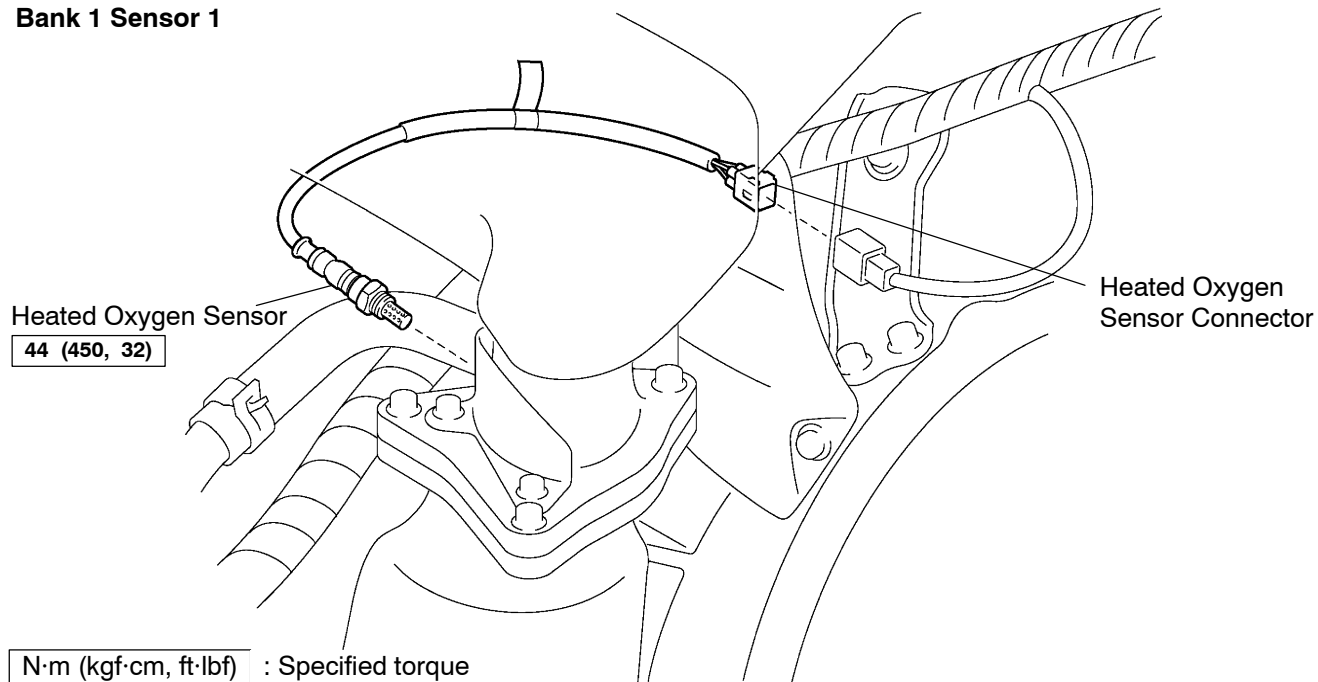
Torque: 45 N·m (450 kgf·cm, 33 ft·lbf)

- (c) Reconnect the knock sensor connectors.
6. REINSTALL UPPER AND LOWER INTAKE MANIFOLDS ASSEMBLY (See page EM-60)
7. REINSTALL THROTTLE BODY TO INTAKE MANIFOLDS (See page FI-44)
8. REINSTALL INTAKE AIR CONNECTOR PIPE
9. REINSTALL V-BANK COVER

OXYGEN SENSOR COMPONENTS

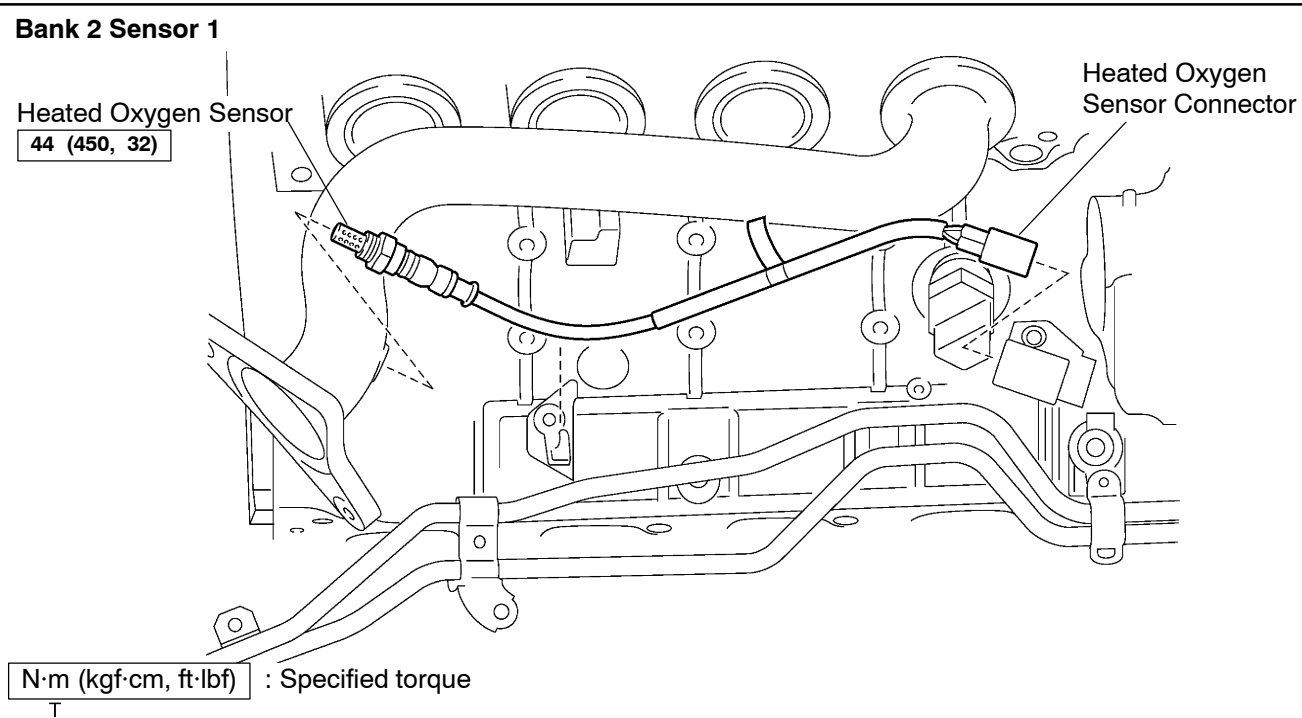
FIG1-01

Bank 1 Sensor 1

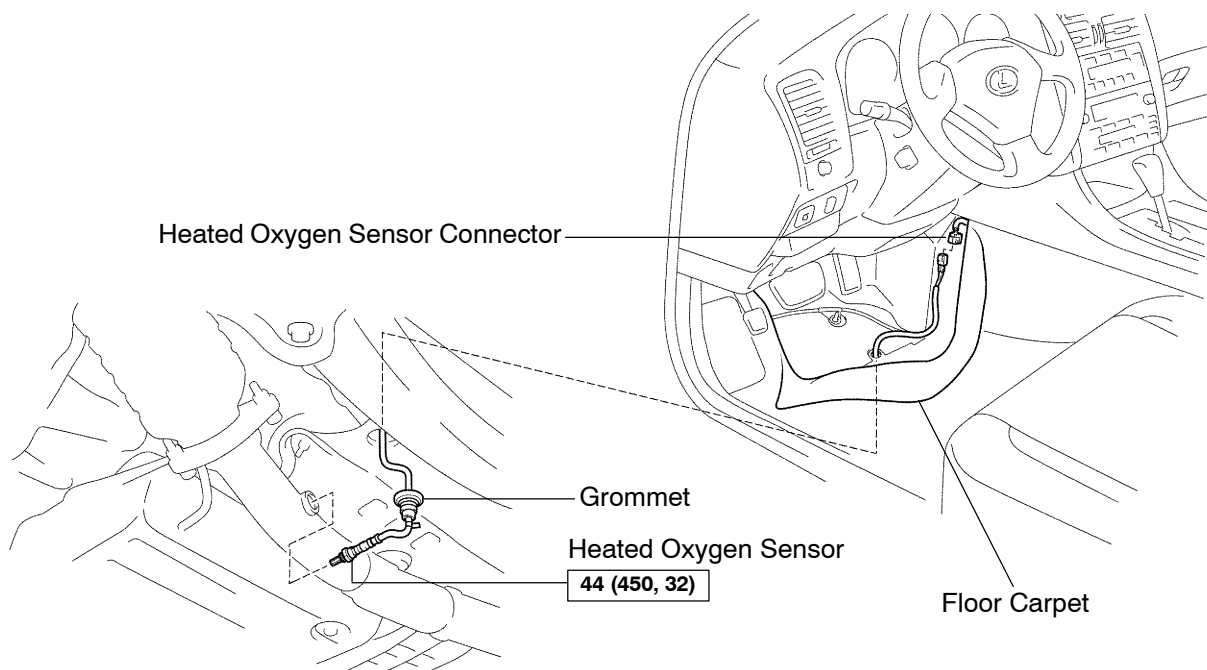


B11128

Bank 2 Sensor 1

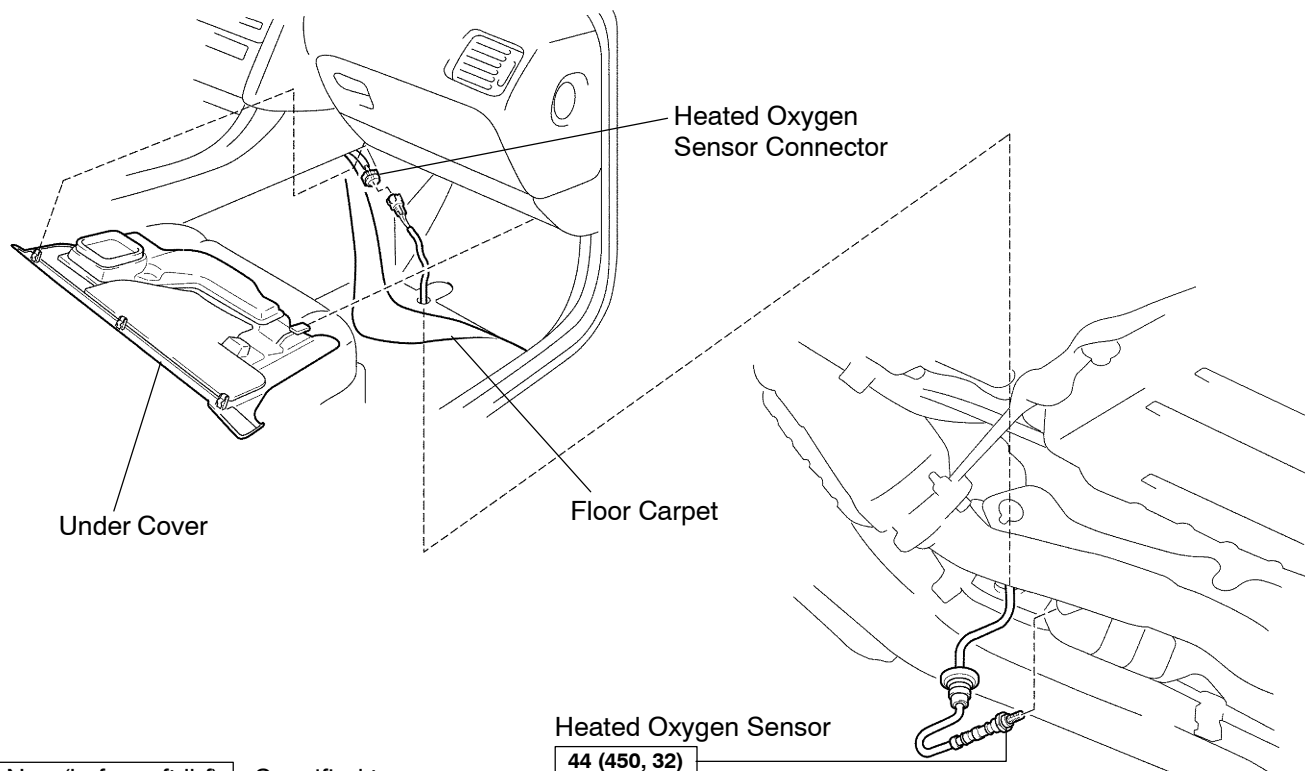


B11129

Bank 1 Sensor 2

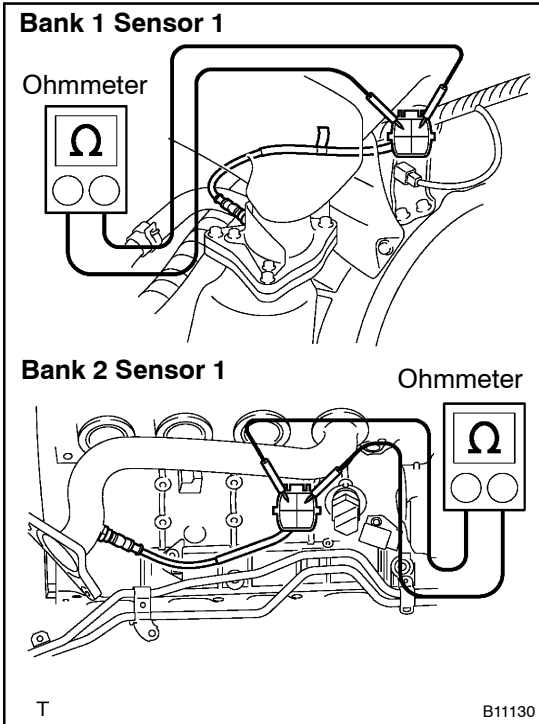
N·m (kgf·cm, ft·lbf) : Specified torque

B02066

Bank 2 Sensor 2

N·m (kgf·cm, ft·lbf) : Specified torque

B02067



INSPECTION

1. Bank 1, 2 Sensor 1:

INSPECT HEATER RESISTANCE OF HEATED OXYGEN SENSOR

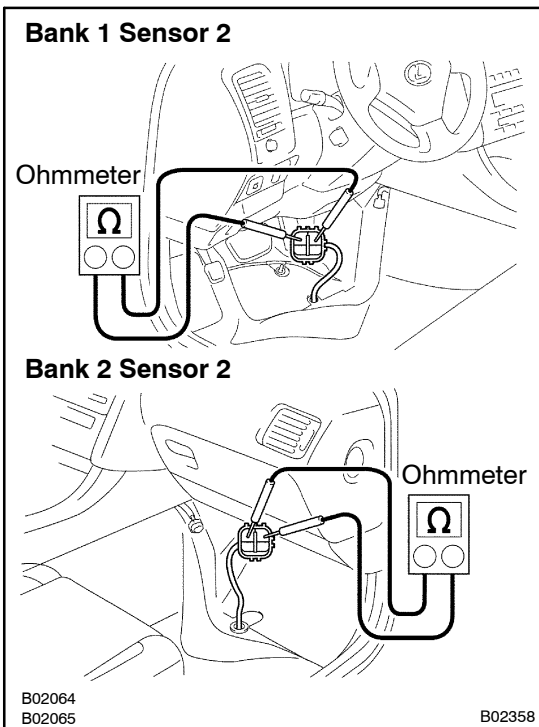
- Disconnect the oxygen sensor connector.
- Using an ohmmeter, measure the resistance between terminals +B and HT.

Resistance: 11 – 16 Ω at 20°C (68°F)

If the resistance is not as specified, replace the sensor.

Torque: 44 N·m (450 kgf·cm, 32 ft·lbf)

- Reconnect the oxygen sensor connector.



2. Bank 1, 2 Sensor 2:

INSPECT HEATER RESISTANCE OF HEATED OXYGEN SENSOR

- Take out the floor carpet.
- Disconnect the oxygen sensor connector.
- Using an ohmmeter, measure the resistance between terminals +B and HT.

Resistance: 11 – 16 Ω at 20°C (68°F)

If the resistance is not as specified, replace the sensor.

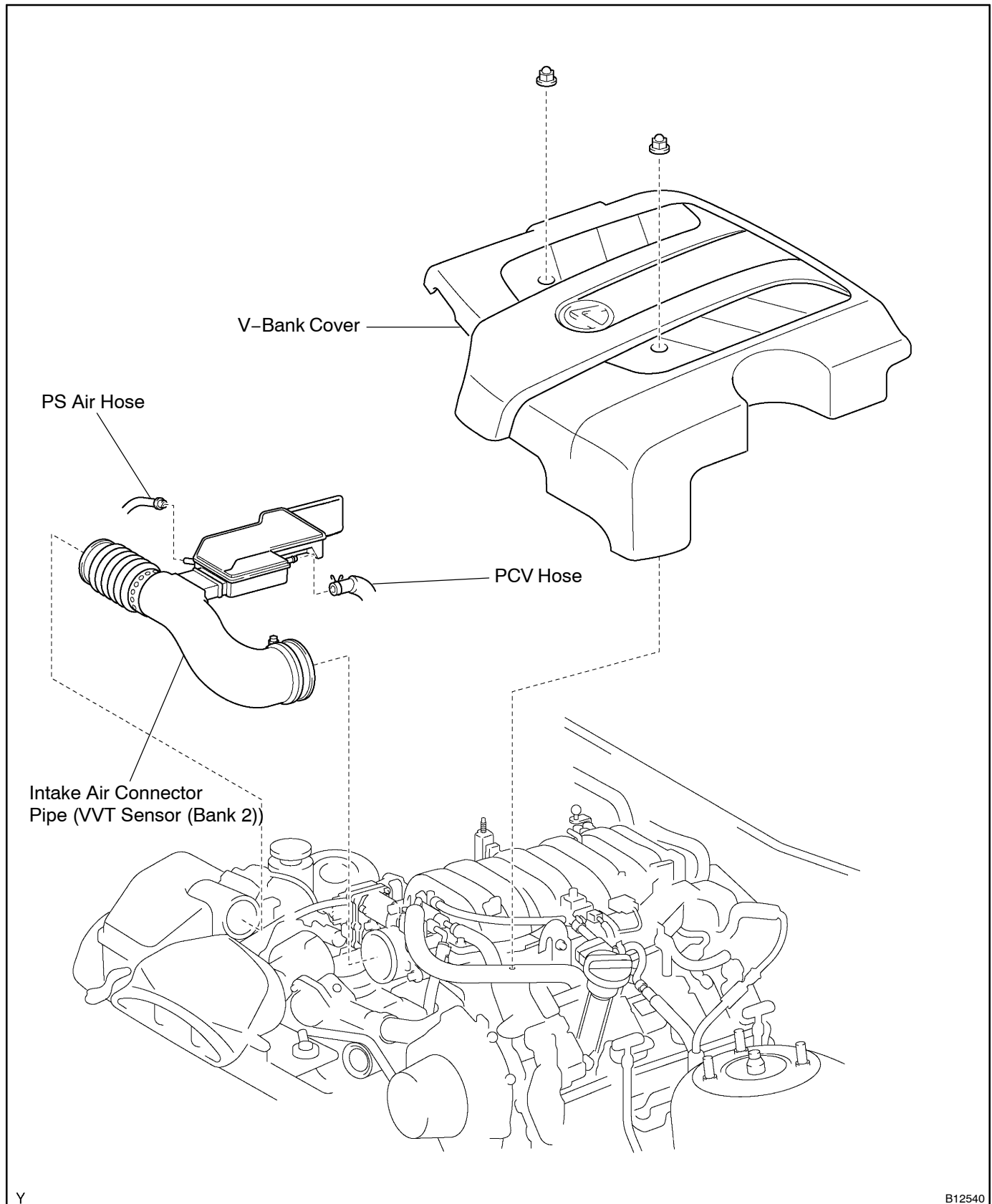
Torque: 44 N·m (450 kgf·cm, 32 ft·lbf)

- Reconnect the oxygen sensor connector.
- Install the floor carpet.

3. INSPECT OPERATION OF HEATED OXYGEN SENSOR [\[See page DI-118\]](#)

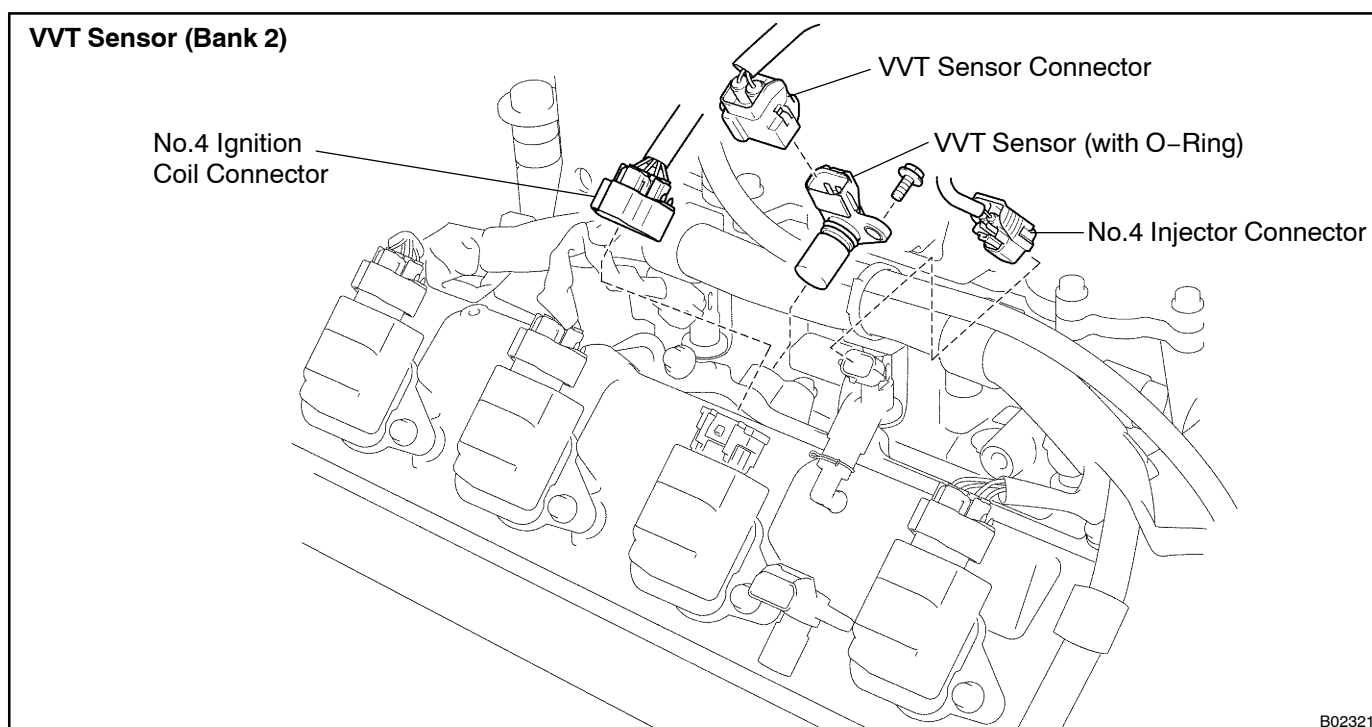
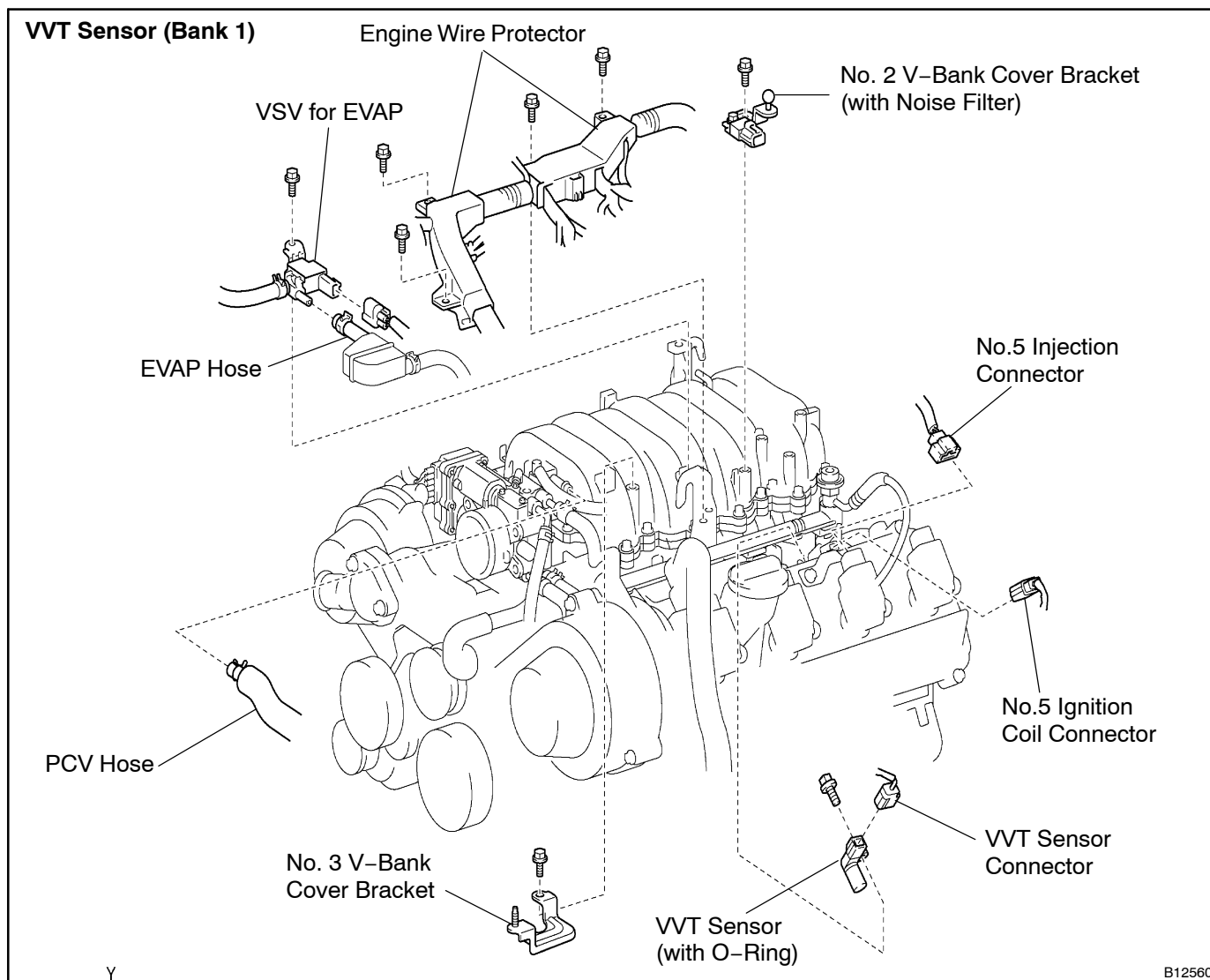
VVT SENSOR COMPONENTS

FIGX3-01



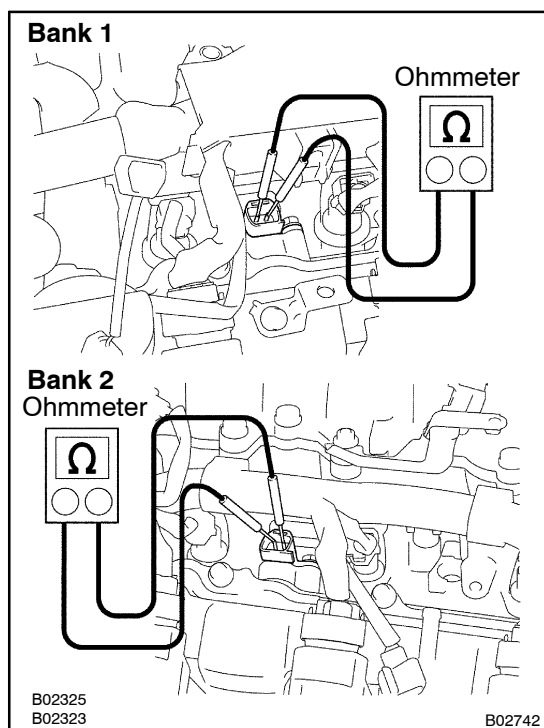
Y

B12540



INSPECTION

1. REMOVE V-BANK COVER
2. VVT Sensor (Bank 2):
REMOVE INTAKE AIR CONNECTOR PIPE
3. VVT Sensor (Bank 1):
DISCONNECT ENGINE WIRE PROTECTOR FROM UPPER INTAKE MANIFOLD AND BEARING CAP
 - (a) Remove and disconnect these parts:
 - No. 3 V-bank cover bracket
 - EVAP hose from VSV for EVAP
 - VSV for EVAP from upper intake manifold
 - No. 2 V-bank cover bracket from upper intake manifold
 - PCV hose from upper intake manifold
 - (b) Remove the 4 bolts, and disconnect the engine wire protector from the upper intake manifold and camshaft bearing cap.



4. INSPECT VVT SENSOR RESISTANCE

NOTICE:

"Cold" and "Hot" in these sentences express the temperature of the sensors themselves. "Cold" is from -10°C (14°F) to 50°C (122°F) and "Hot" is from 50°C (122°F) to 100°C (212°F).

- (a) Disconnect the VVT sensor connectors.
- (b) Using a ohmmeter, measure the resistance between terminals.

Resistance:

Cold	835 – 1,400 Ω
Hot	1,060 – 1,645 Ω

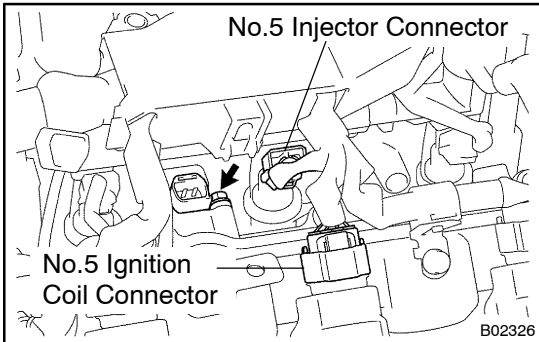
If the resistance is not as specified, replace the sensor.

- (c) Reconnect the VVT sensor connectors.
5. VVT Sensor (Bank 1):
REINSTALL ENGINE WIRE PROTECTOR TO UPPER INTAKE MANIFOLD AND BEARING CAP
6. VVT Sensor (Bank 2):
REINSTALL INTAKE AIR CONNECTOR PIPE
7. REINSTALL V-BANK COVER

REPLACEMENT

1. REPLACE VVT SENSOR (BANK 1)

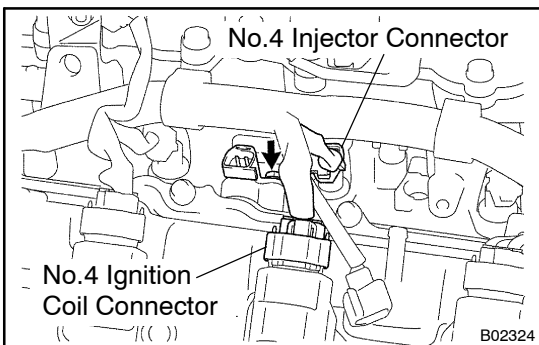
- (a) Remove the 2 cap nuts and V-bank cover.
- (b) Disconnect the engine wire protector from upper intake manifold and camshaft bearing cap. (See page FI-70)
- (c) Disconnect the VVT sensor connector.



- (d) Disconnect the No.5 ignition coil connector.
- (e) Disconnect the No.5 injector connector.
- (f) Remove the bolt, and pry out the VVT sensor.
- (g) Attach a new VVT sensor to the cylinder head.
- (h) Reinstall the VVT sensor with the bolt.
Torque: 6.5 N·m (65 kgf·cm, 58 in.·lbf)
- (i) Reconnect the No.5 injector connector.
- (j) Reconnect the No.5 ignition coil connector.
- (k) Reconnect the VVT sensor connector.
- (l) Reinstall the engine wire protector.
- (m) Reinstall the V-bank cover with the 2 cap nuts and 2 bolts.

2. REPLACE VVT SENSOR (BANK 2)

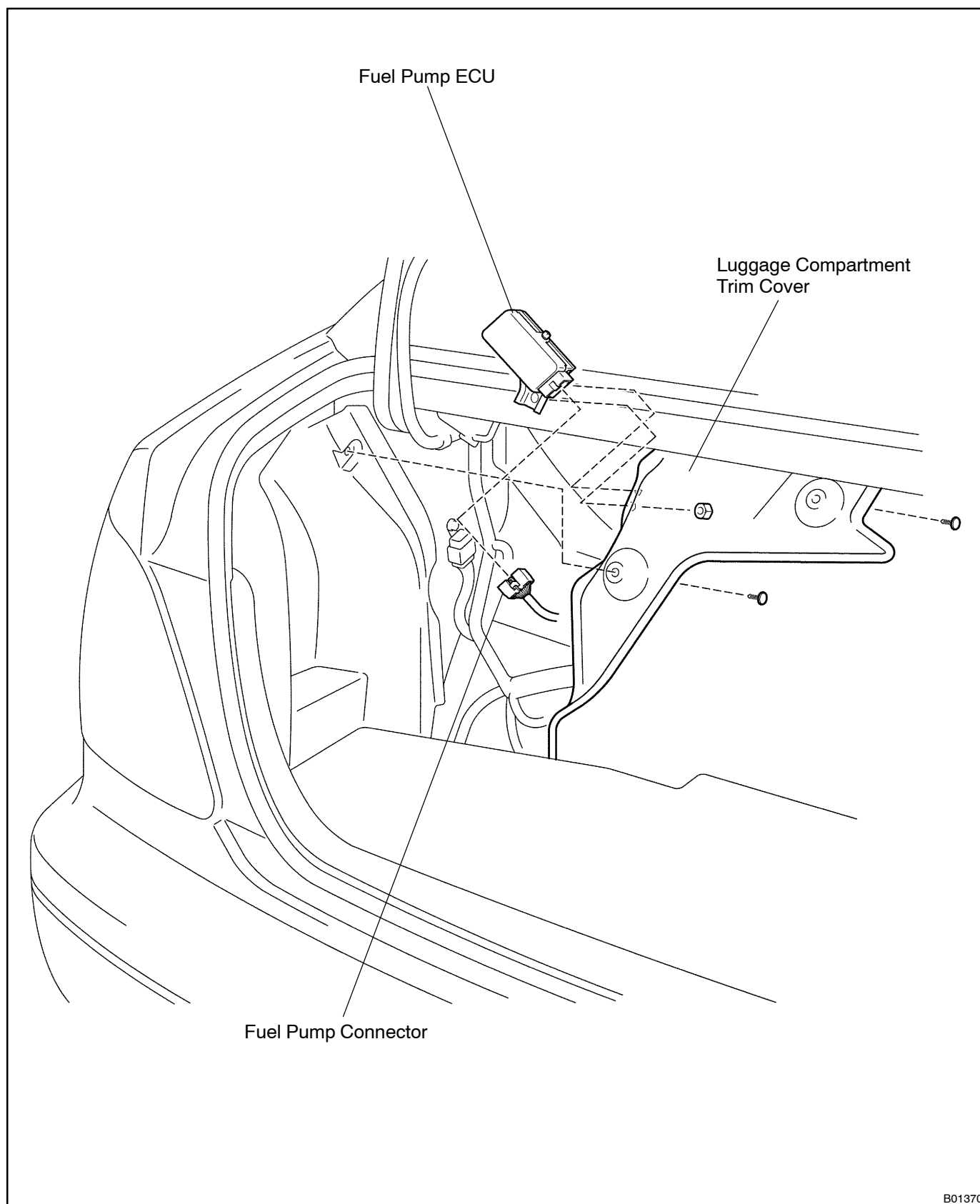
- (a) Remove the 2 cap nuts, 2 bolts and V-bank cover.
- (b) Remove the intake air connector pipe.
- (c) Disconnect the VVT sensor connector.



- (d) Disconnect the No.4 ignition coil connector.
- (e) Disconnect the No.4 injector connector.
- (f) Remove the bolt, and pry out the VVT sensor.
- (g) Attach a new VVT sensor to the cylinder head.
- (h) Reinstall the VVT sensor with the bolt.
Torque: 6.5 N·m (65 kgf·cm, 58 in.·lbf)
- (i) Reconnect the No.4 ignition coil connector.
- (j) Reconnect the No.4 injector connector.
- (k) Reconnect the VVT sensor connector.
- (l) Reinstall the intake air connector pipe.
- (m) Reinstall the V-bank cover with the 2 cap nuts.

FUEL PUMP ECU COMPONENTS

FIOXK-01



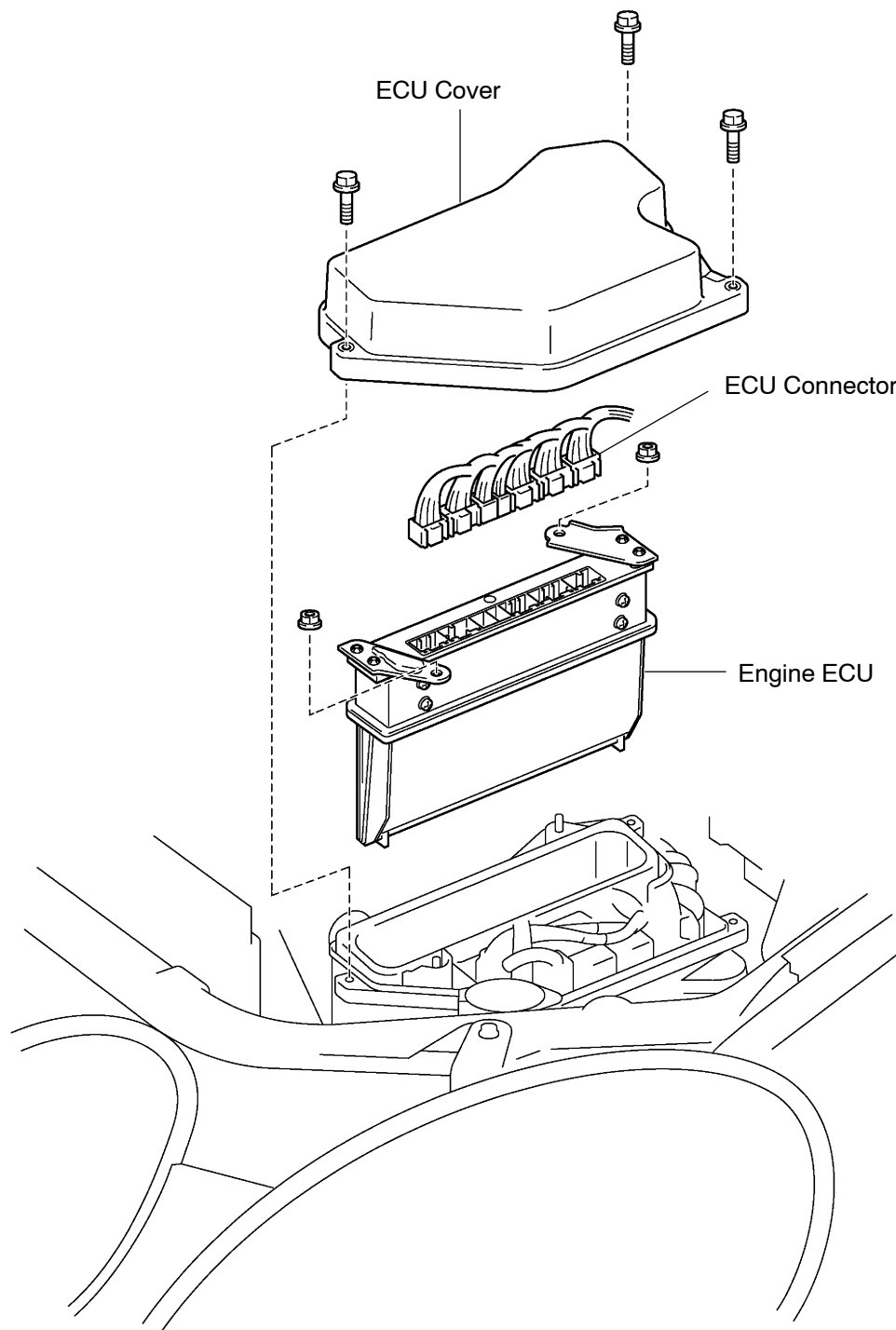
B01370

INSPECTION

1. REMOVE FUEL PUMP ECU
2.  INSPECT FUEL PUMP ECU (See page DI-210)
3. REINSTALL FUEL PUMP ECU

ENGINE ECU COMPONENTS

FIOXM-01



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INSPECTION

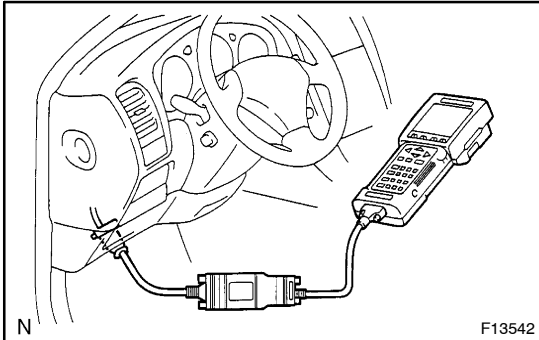
1. REMOVE ENGINE ECU
2. ☐ INSPECT ENGINE ECU (See page DI-90)
3. REINSTALL ENGINE ECU

FUEL CUT RPM INSPECTION

FI0XO-01

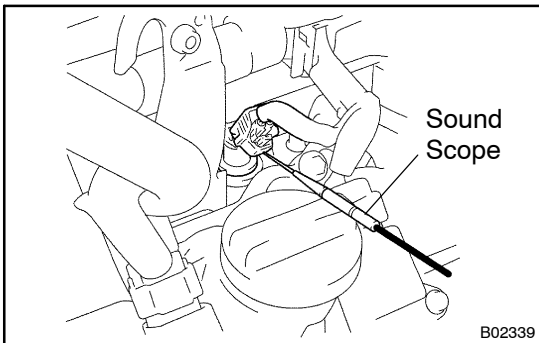
1. WARM UP ENGINE

Allow the engine to warm up to normal operating temperature.



2. CONNECT HAND-HELD TESTER

- Remove the fuse cover on the instrument panel.
- Connect a hand-held tester to the DLC3.
- Please refer to the hand-held tester operator's manual for further details.



3. INSPECT FUEL CUT RPM OPERATION

- Increase the engine speed to at least 2,500 rpm.
- Check for injector operating noise.
- Check that when the throttle lever is released, injector operation noise stops momentarily and then resumes.

HINT:

- The vehicle should be stopped.
- Measure with the A/C OFF.

Fuel return speed: 1,400 rpm

4. DISCONNECT HAND-HELD TESTER