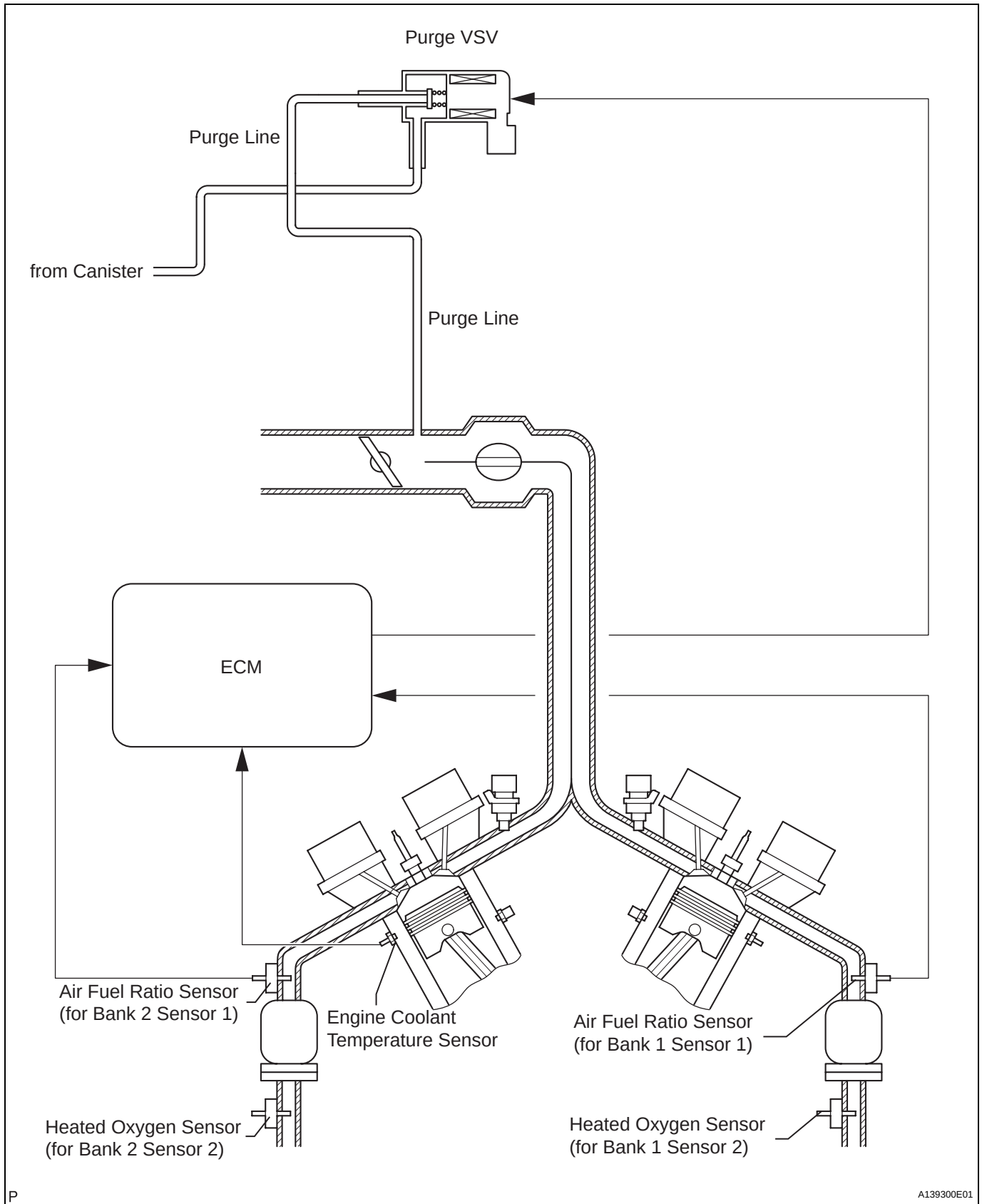
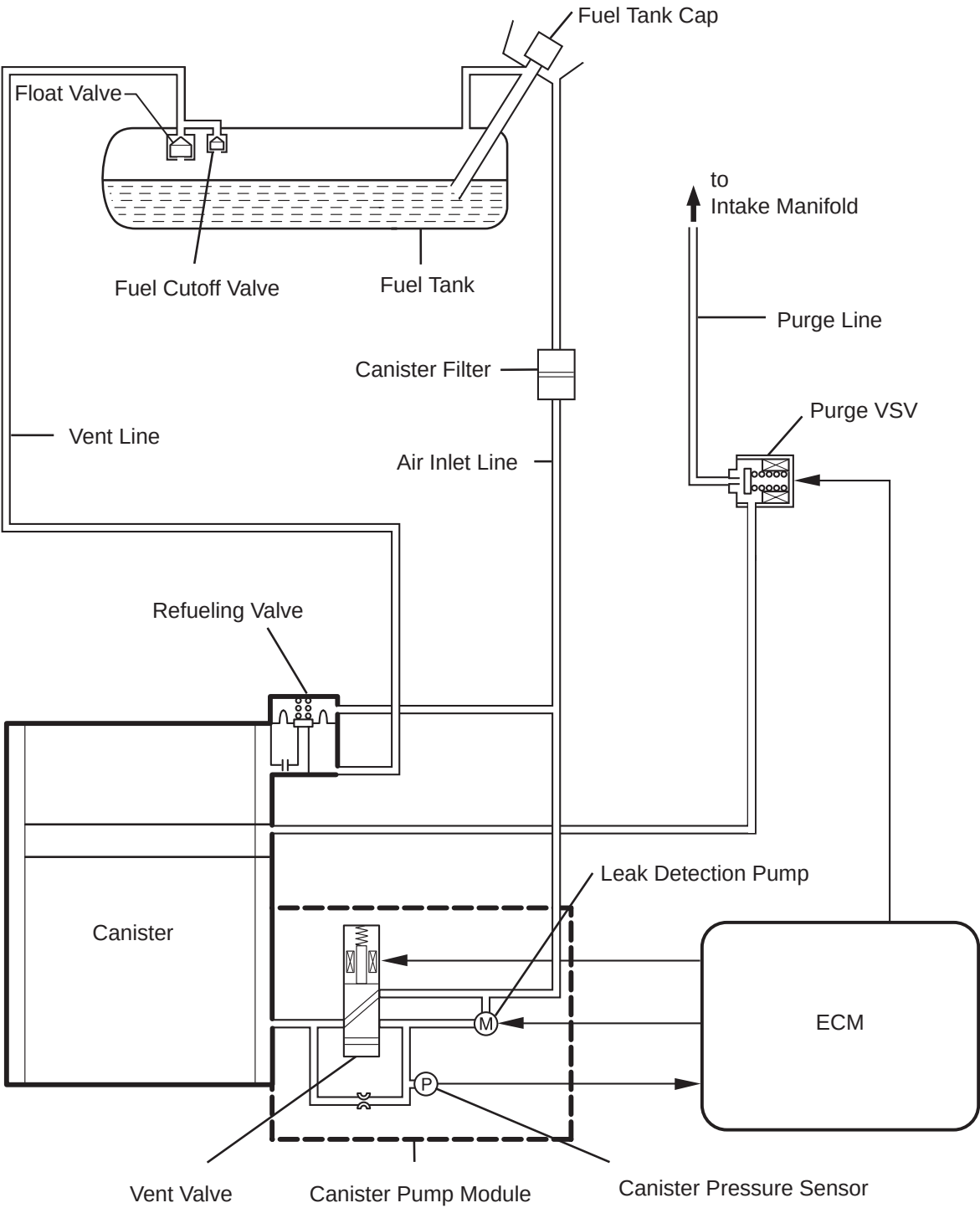
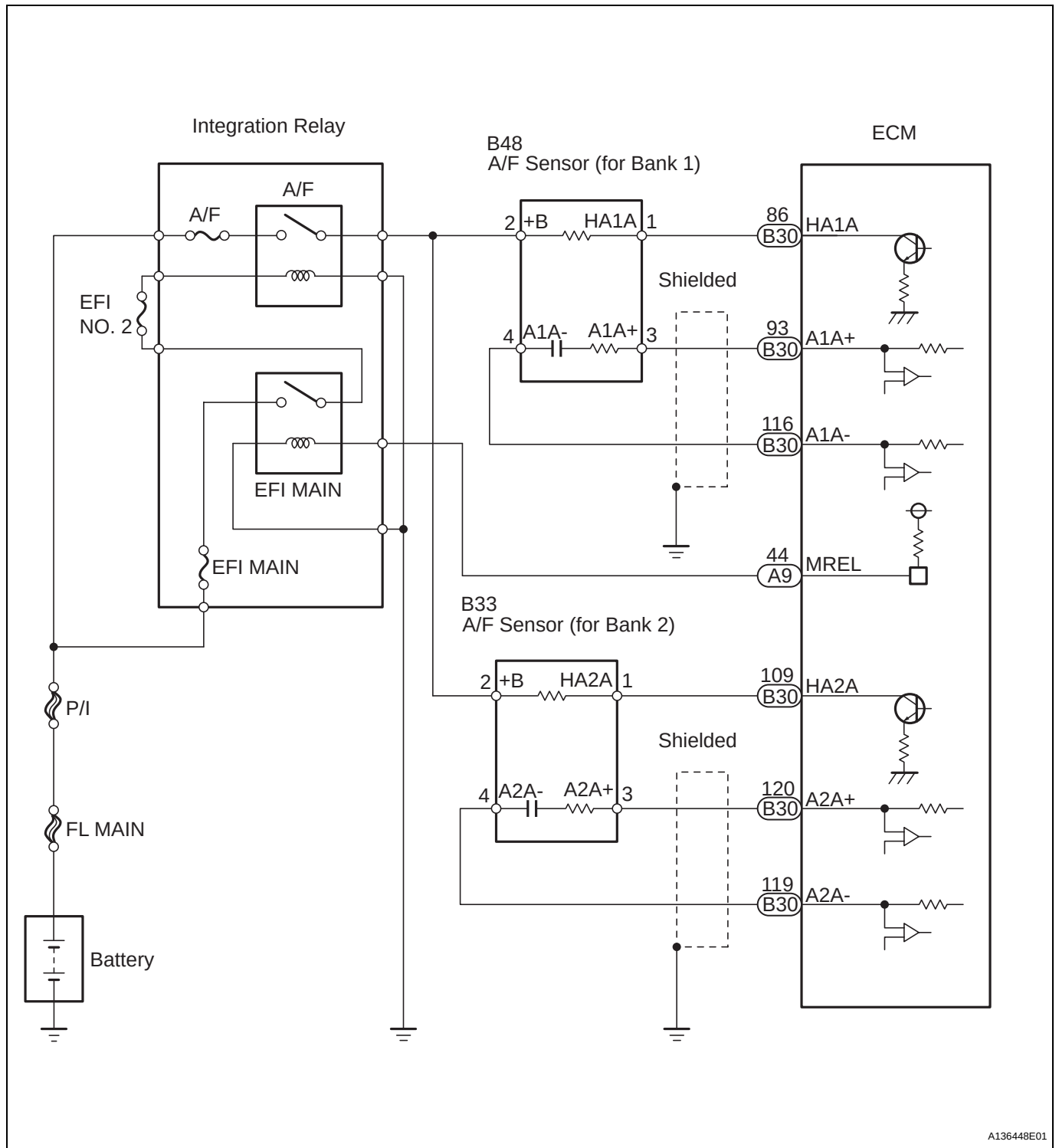


SYSTEM DIAGRAM



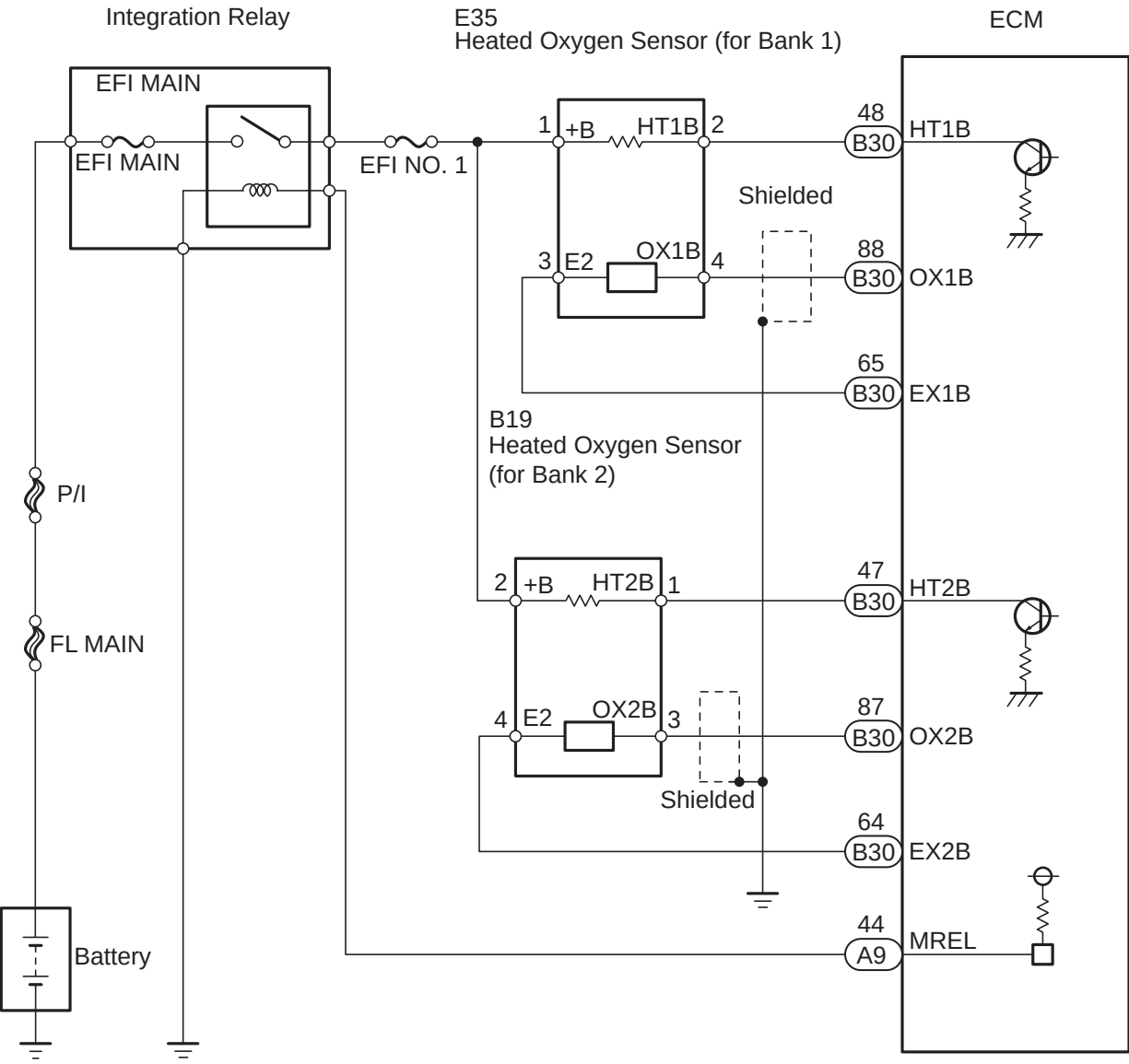


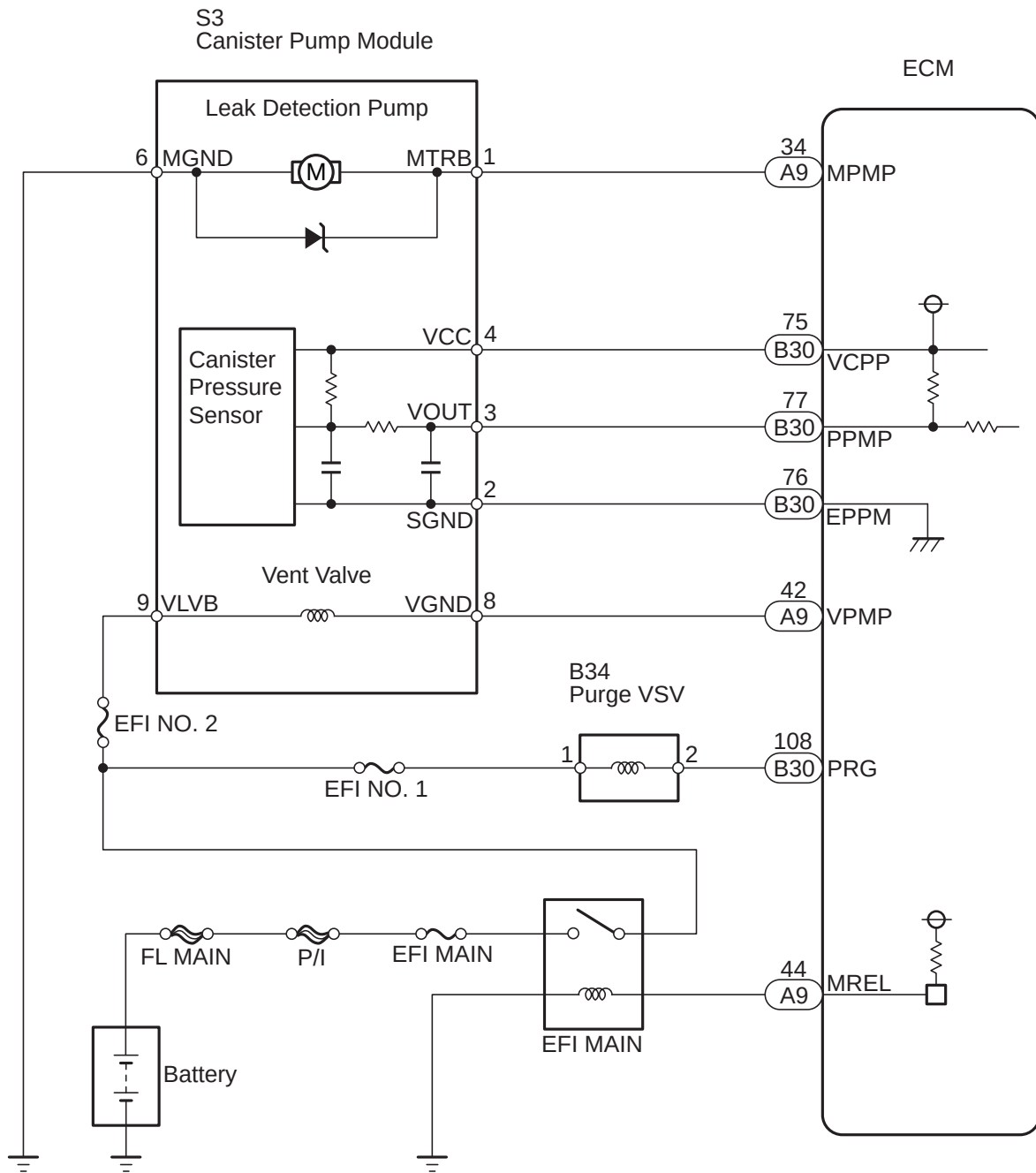
EC



A136448E01

EC





EC

Y

ON-VEHICLE INSPECTION

1. CHECK FUEL CUT RPM

- Increase the engine speed to at least 3,500 rpm.
- Use a sound scope to check for injector operating noise.
- Check that the operating sounds stop momentarily and then resume when the throttle lever is released.

HINT:

Measure with the A/C OFF.

Fuel return rpm:

1,400 rpm

2. CHECK FOR LEAKS

- Visually check that the hoses, connections and gaskets have 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 malfunctions.

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

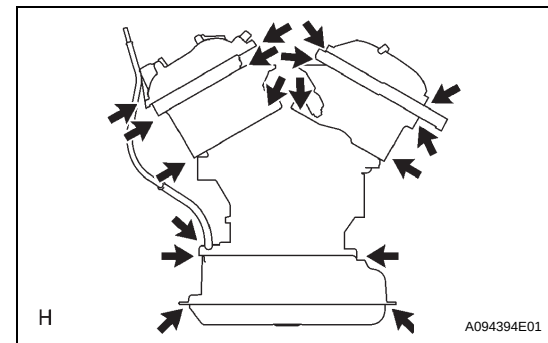
3. CHECK LINE AND CONNECTORS

- Visually check for loose connections, sharp bends or damage.

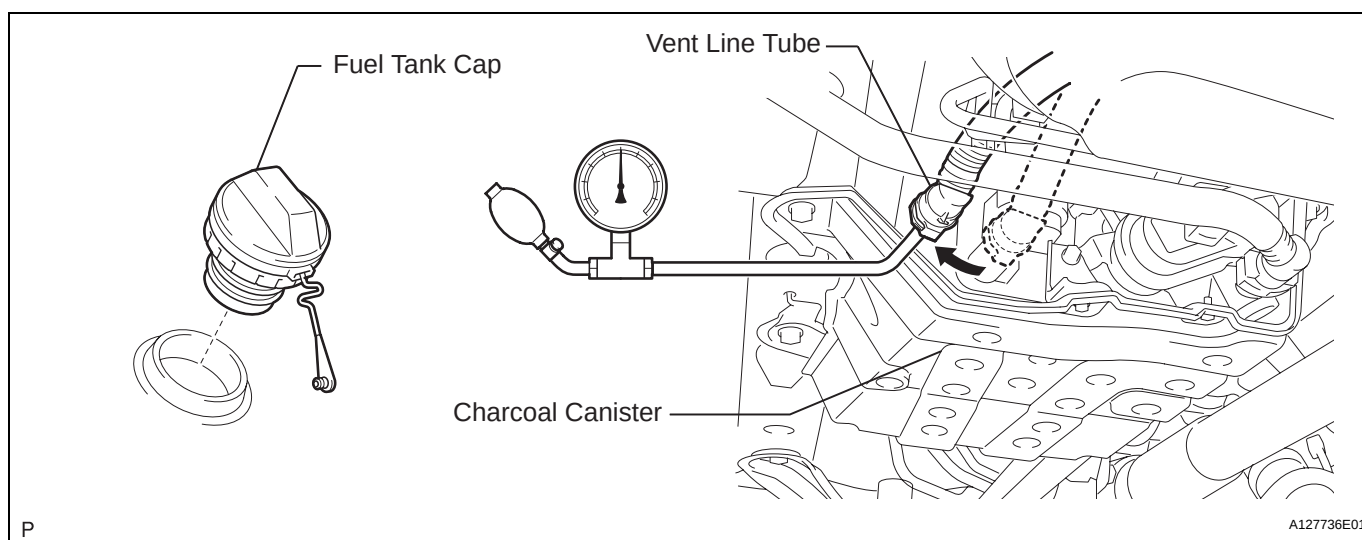
4. CHECK FUEL TANK ASSEMBLY

- Visually check for deformation, cracks or fuel leakage.

5. CHECK FUEL TANK AND VENT LINE



EC



- Disconnect the vent line tube from the canister.
- Connect a pressure gauge to the vent line tube.

- (c) Apply 4 kPa (41 kgf/cm², 30 mmHg) of pressure to the vent line of the fuel tank.

HINT:

Perform this inspection with the fuel tank less than 90% full. When the fuel tank is full, the fuel cutoff valve closes and pressure is released through the 1.5 mm orifice. As a result, when the fuel tank cap is removed, the pressure does not decrease smoothly.

- (d) Check that the fuel tank pressure is maintained for some time, and does not decrease immediately.

HINT:

If the pressure decreases immediately, one of the following may be the cause:

- The fuel tank cap is not completely tightened.
- The fuel tank cap is damaged.
- Air is leaking from the vent line.
- The fuel tank is damaged.

- (e) When the fuel tank cap is removed, check that pressure is released smoothly.

HINT:

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

- (f) Reconnect the vent line tube to the canister.

6. CHECK AIR INLET LINE

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

- (b) Check that air flows freely into the air inlet line.

HINT:

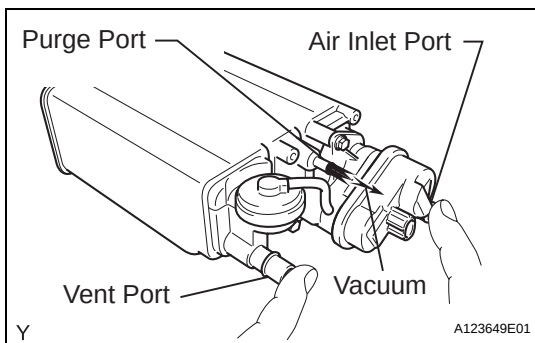
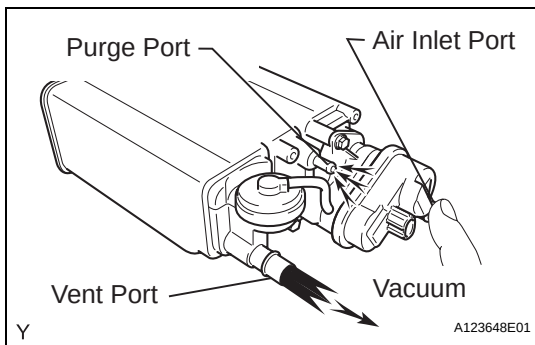
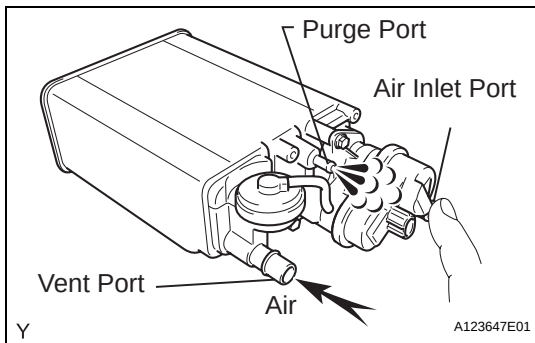
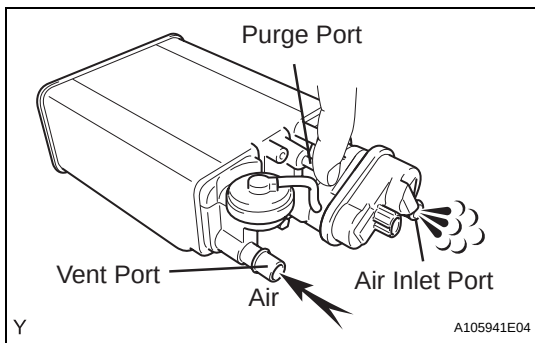
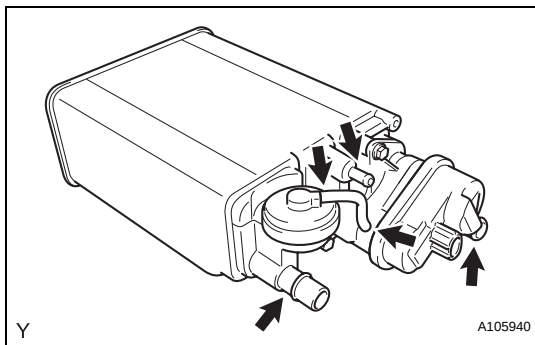
If air does not flow freely into the air inlet line, repair or replace it.

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

INSPECTION

1. INSPECT CANISTER

- (a) Visually check the canister for cracks or damage.
If cracks or damage is found, replace the canister.



- (b) Check the canister operation.

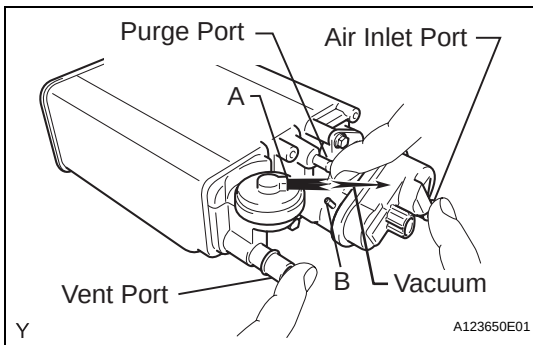
- (1) While holding the purge port closed, blow air 0.39 kPa (4.0 kgf/cm², 3 mmHg) into the vent port, and check that air flows from the air inlet port.
If the result is not as specified, replace the canister.

- (2) While holding the air inlet port closed, blow air 0.39 kPa (4.0 kgf/cm², 3 mmHg) into the vent port, and check that air flows from the purge port.
If the result is not as specified, replace the canister.

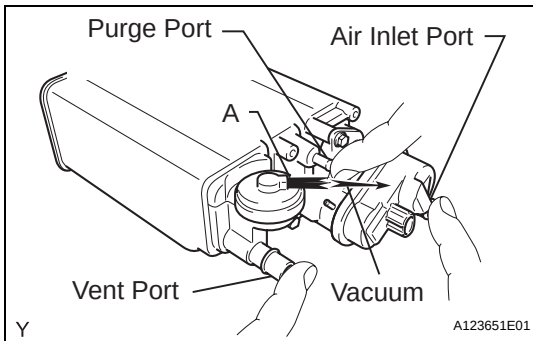
- (3) While holding the air inlet port closed, apply vacuum 3.43 kPa (35.0 kgf/cm², 25.7 mmHg) to the vent port, and check that air is sucked into the purge port.
If the result is not as specified, replace the canister.

- (c) Check the airtightness.

- (1) While holding the vent and air inlet ports closed, apply vacuum 3.43 kPa (35.0 kgf/cm², 25.7 mmHg) to the purge port, and check that the vacuum is maintained for 1 minute.
If the result is not as specified, replace the canister.



- (d) Check the diaphragm.
- (1) Remove the air hose between ports A and B.
 - (2) While holding the vent, purge and air inlet ports closed, apply vacuum 1.42 kPa (14.5 kgf/cm², 10.6 mmHg) to port A, and check that air is not sucked into port B.

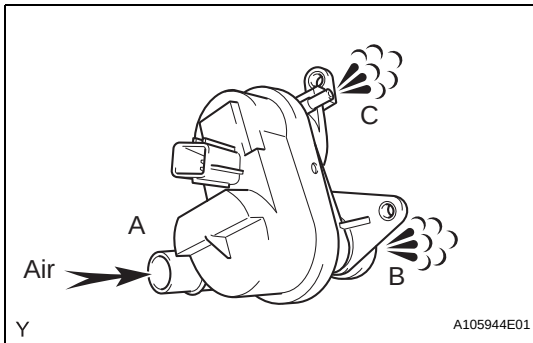


- (3) While holding the vent, purge and air inlet ports closed, apply vacuum 1.42 kPa (14.5 kgf/cm², 10.6 mmHg) to port A, and measure how long it takes for the vacuum to drop.

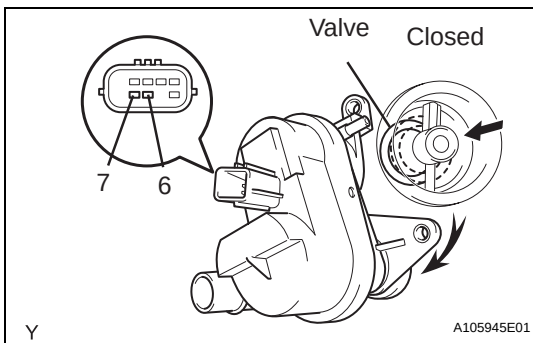
Vacuum drop time:

10 seconds or more

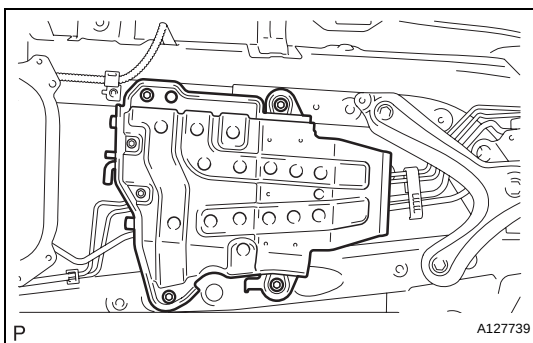
If the result is not as specified, replace the canister.



- (e) Check the leak detection pump.
- (1) Check that air flows from port A to port B and C.
If the result is not as specified, replace the canister.



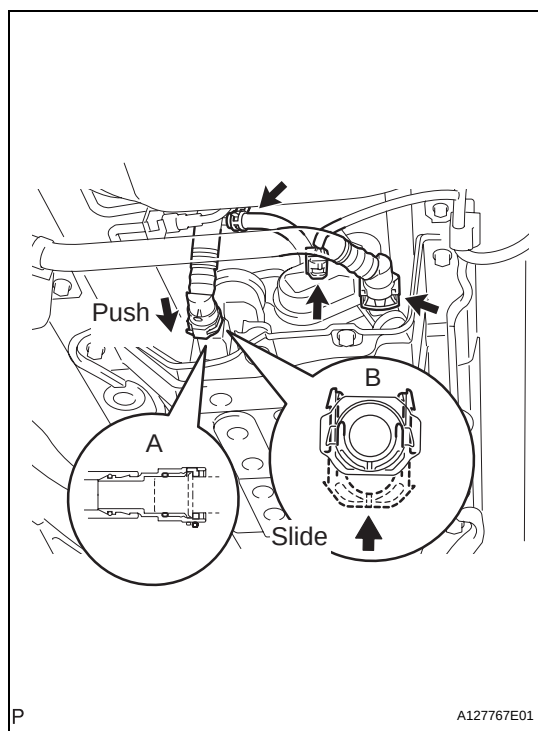
- (2) Connect the positive (+) lead of the battery to terminal 7 and the negative (-) lead to terminal 6.
- (3) Check that the valve closes.
If the result is not as specified, replace the canister.
- (4) Install the canister pump module.



INSTALLATION

1. INSTALL CANISTER

- (a) Install the canister with the 4 bolts and clip.
Torque: 20 N*m (204 kgf*cm, 15 ft.*lbf)
- (b) Connect the air inlet line tube to the canister (leak detection pump).



(c) Install the vent line tube.

- (1) Connect the pipe to the fuel tube connector, as shown in A in the illustration. Then push up the retainer to lock the claws, as shown in B in the illustration.

NOTICE:

- Check that there are no scratches or foreign objects around the connected part of the fuel tube connector and pipe before performing this work.
- After connecting the fuel tank vent line tube, check that the fuel tank vent line tube is securely connected by pulling the fuel tube connector and pipe.

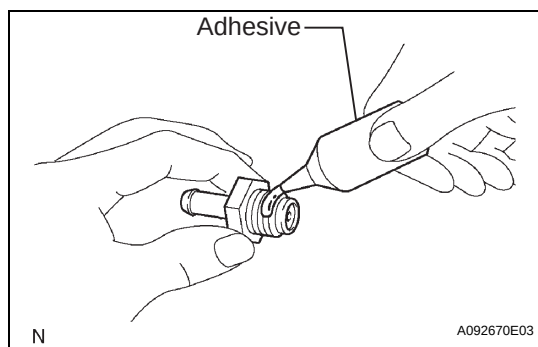
(d) Connect the purge line hose.

HINT:

Install the hose to the canister, and then attach the retainer.

(e) Connect the connector to the canister (leak detection pump).

2. CONNECT CABLE TO NEGATIVE BATTERY TERMINAL



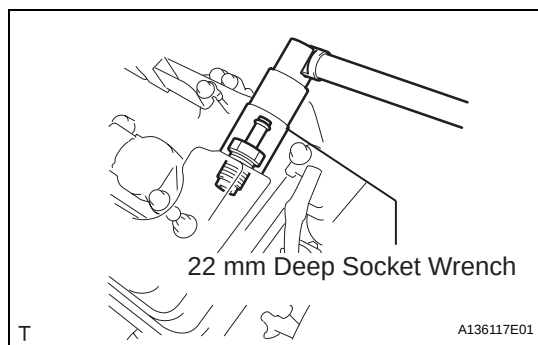
INSTALLATION

1. INSTALL VENTILATION VALVE SUB-ASSEMBLY

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

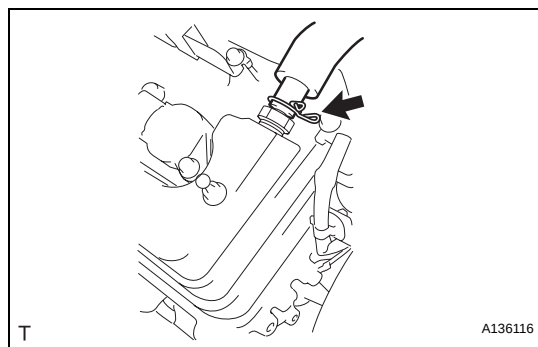
Adhesive:

Toyota genuine adhesive 1324, three bond 1324 or equivalent



- (b) Using a 22 mm deep socket wrench, install the ventilation valve.

Torque: 27 N*m (275 kgf*cm, 20 ft.*lbf)

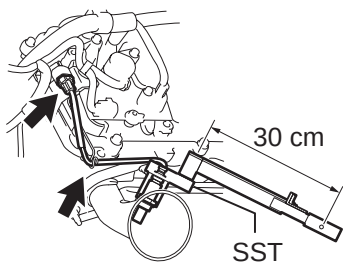


- (c) Connect the ventilation hose.

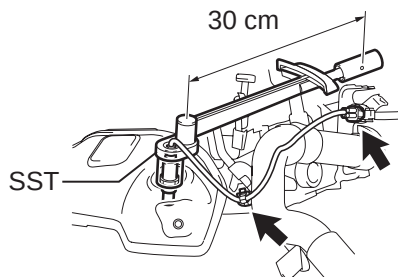
2. INSTALL V-BANK COVER SUB-ASSEMBLY (See page [EM-43](#))

3. CHECK FOR ENGINE OIL LEAKS

Bank 1 Sensor 1



Bank 2 Sensor 1



T

A136120E01

INSTALLATION

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

- (a) Using SST, install the sensor to the exhaust manifold.

SST 09224-00010

Torque: 40 N*m (408 kgf*cm, 30 ft.*lbf) for use with SST

44 N*m (449 kgf*cm, 32 ft.*lbf) for use without SST

HINT:

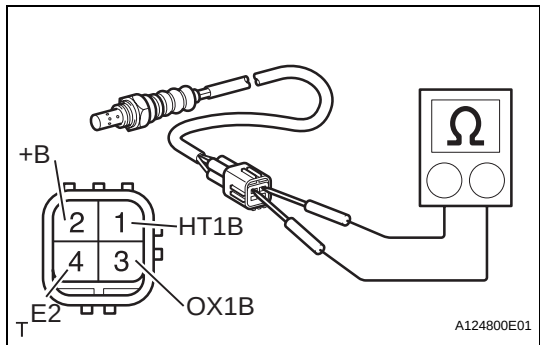
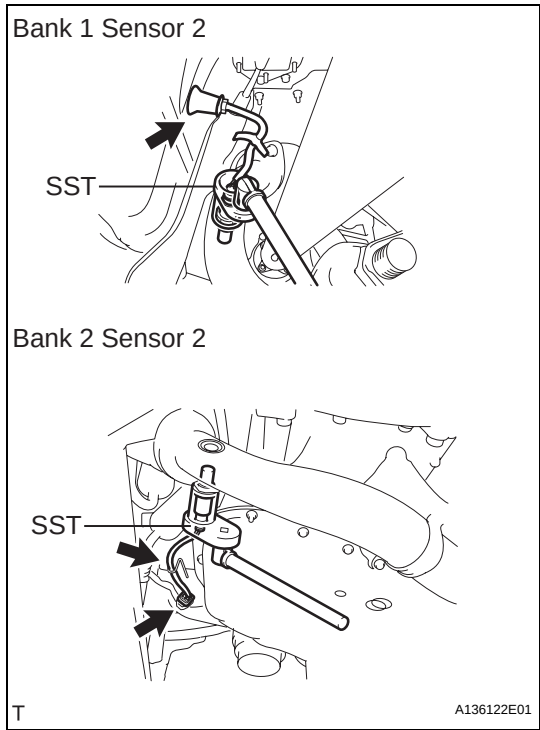
- Use a torque wrench with a fulcrum length of 30 cm (11.81 in.).
 - Make sure SST and a wrench are connected in a straight line.
- (b) Connect the sensor connector.

2. CONNECT CABLE TO NEGATIVE BATTERY TERMINAL

3. CHECK FOR EXHAUST GAS LEAKS

REMOVAL

1. DISCONNECT CABLE FROM NEGATIVE BATTERY
TERMINAL
CAUTION:
Wait at least 90 seconds after disconnecting the
cable from the negative (-) battery terminal to
prevent airbag and seat belt pretensioner activation.
2. REMOVE HEATED OXYGEN SENSOR (for Sensor 2)
(a) Bank 1 Sensor 2:
Remove the rear console box (see page IP-16).
(b) Disconnect the sensor connector.
(c) Using SST, remove the sensor from the exhaust
pipe.
SST 09224-00010



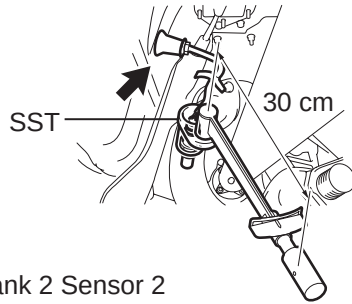
INSPECTION

1. INSPECT HEATED OXYGEN SENSOR (for Sensor 2)
(a) Measure the resistance of the sensor.
Standard resistance

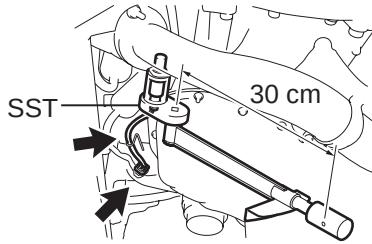
Tester Connection	Specified Condition	Specified Condition
1 (HT1B) - 2 (+B)	20°C (68°F)	11 to 16 Ω
1 (HT1B) - 4 (E2)	-	10 kΩ or higher

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

Bank 1 Sensor 2



Bank 2 Sensor 2



T

A136123E01

INSTALLATION

1. INSTALL HEATED OXYGEN SENSOR (for Sensor 2)

- (a) Using SST, install the sensor to the exhaust pipe.

SST 09224-00010

Torque: 40 N*m (408 kgf*cm, 30 ft.*lbf) for use with SST

44 N*m (449 kgf*cm, 32 ft.*lbf) for use without SST

HINT:

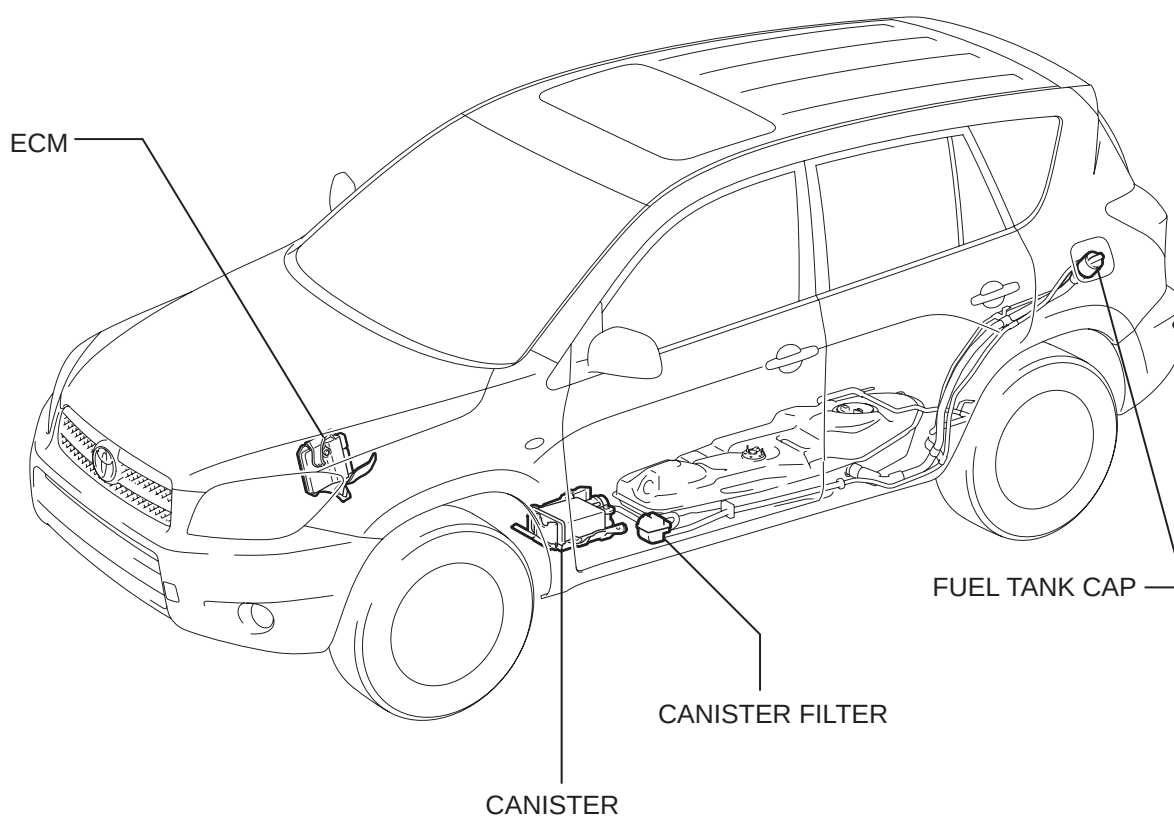
- Use a torque wrench with a fulcrum length of 30 cm (11.81 in.).
 - Make sure SST and a wrench are connected in a straight line.
- (b) Connect the sensor connector.
- (c) Bank 1 Sensor 2:
Install the rear console box (see page [IP-23](#)).

2. CONNECT CABLE TO NEGATIVE BATTERY TERMINAL

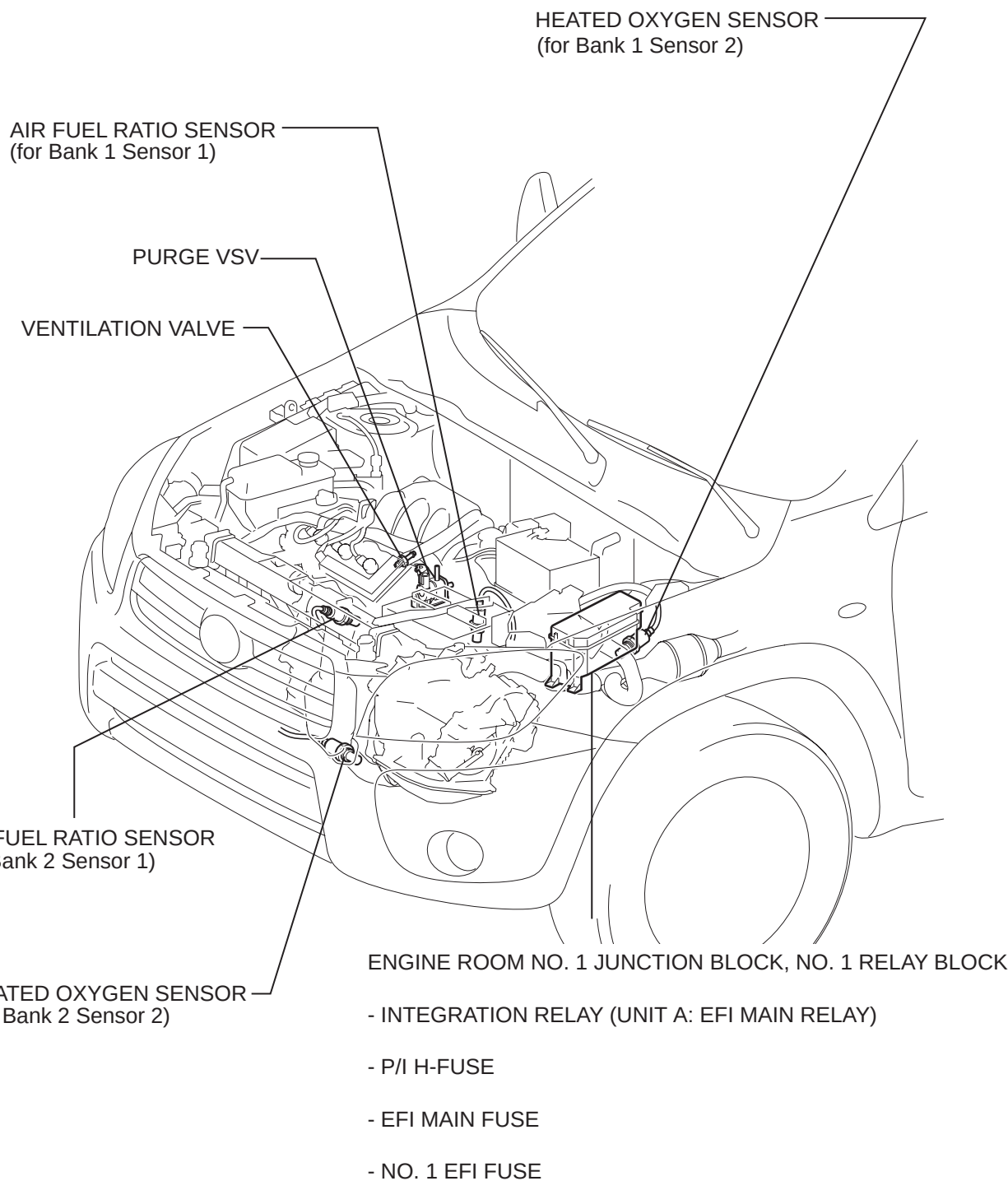
3. CHECK FOR EXHAUST GAS LEAKS

EMISSION CONTROL SYSTEM

PARTS LOCATION



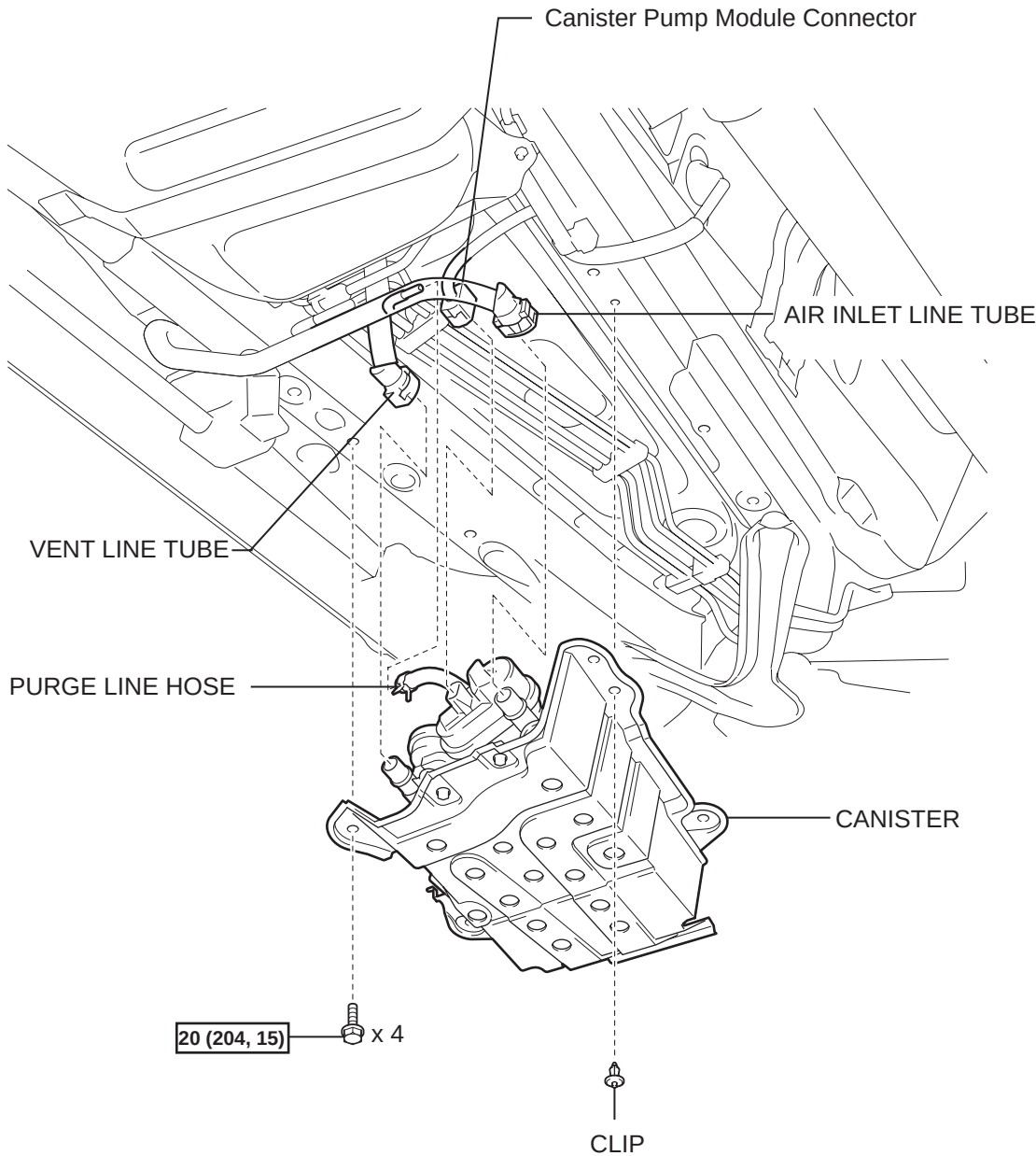
EC



EC

CANISTER

COMPONENTS



EC

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

REMOVAL

1. DISCONNECT CABLE FROM NEGATIVE BATTERY TERMINAL

CAUTION:

Wait at least 90 seconds after disconnecting the cable from the negative (-) battery terminal to prevent airbag and seat belt pretensioner activation.

2. REMOVE CANISTER

NOTICE:

Remove any dirt or foreign objects before performing this work.

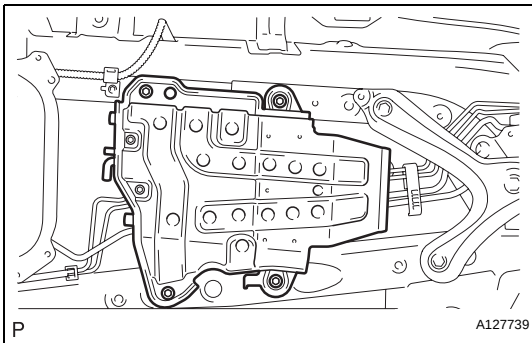
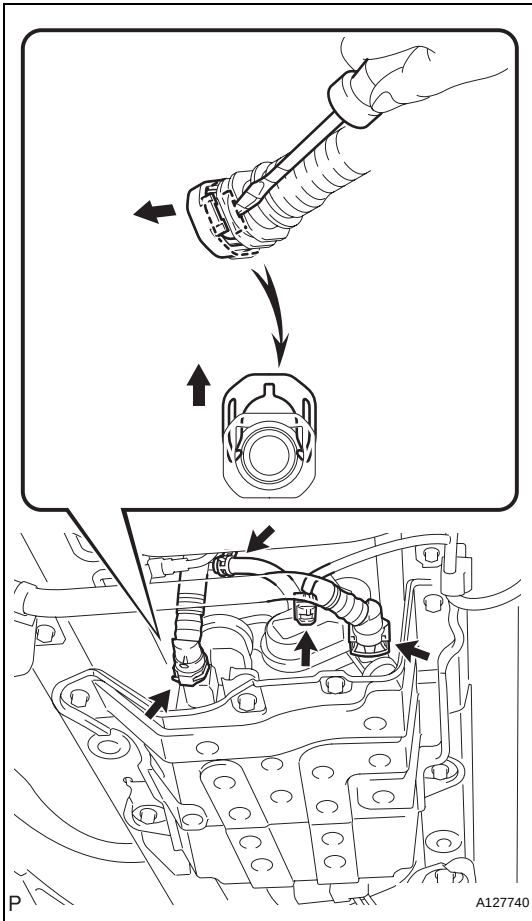
- (a) Disconnect the 2 tubes, hose and connector.

- (1) Using a screwdriver, pry up the retainer.

HINT:

Do not remove the retainer.

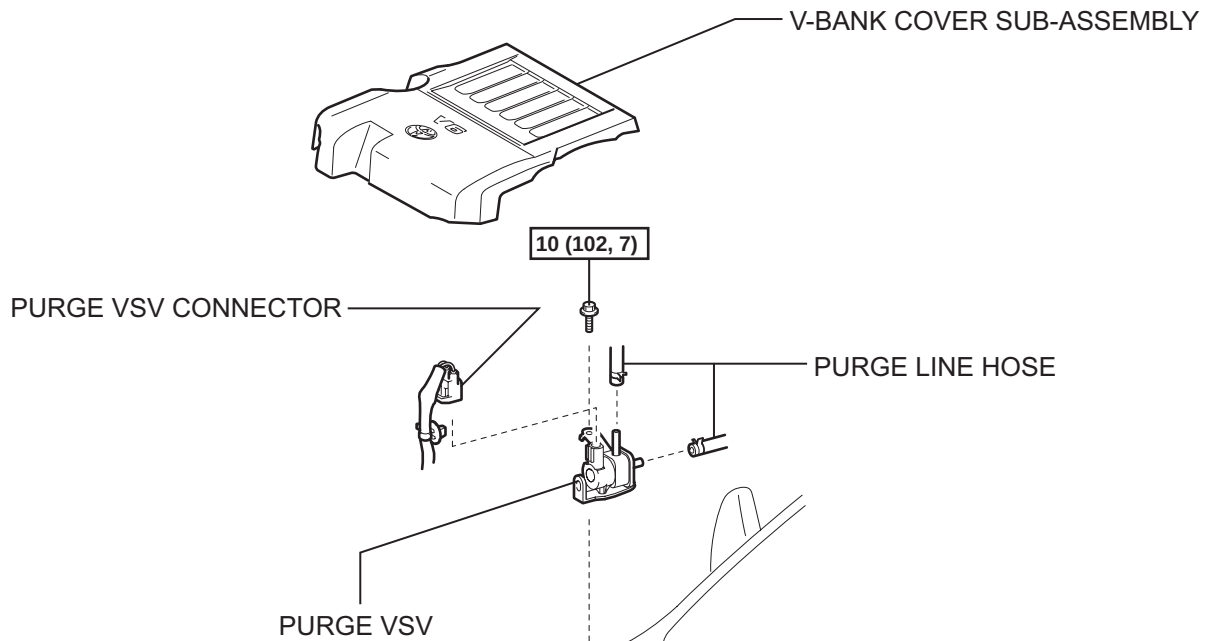
- (2) Disconnect the purge line hose.
- (3) Disconnect the air inlet line tube from the canister.
- (4) Disconnect the vent line tube from the canister (leak detection pump).
- (5) Disconnect the connector from the canister (leak detection pump).



- (b) Remove the 4 bolts, clip and canister.

VACUUM SWITCHING VALVE

COMPONENTS

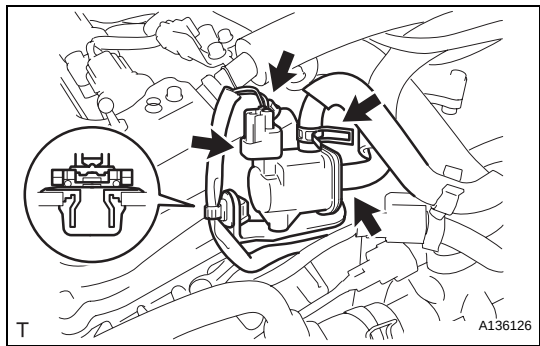


N*m (kgf*cm, ft.*lbf) : Specified torque

EC

REMOVAL

1. DISCONNECT CABLE FROM NEGATIVE BATTERY
TERMINAL
- CAUTION:
Wait at least 90 seconds after disconnecting the
cable from the negative (-) battery terminal to
prevent airbag and seat belt pretensioner activation.
2. REMOVE V-BANK COVER SUB-ASSEMBLY (See
page EM-21)
3. REMOVE PURGE VSV
- (a) Disconnect the purge VSV connector.
- (b) Disconnect the wire harness clamp.
- (c) Disconnect the 2 purge line hoses from the purge
VSV.
- (d) Remove the bolt and purge VSV.

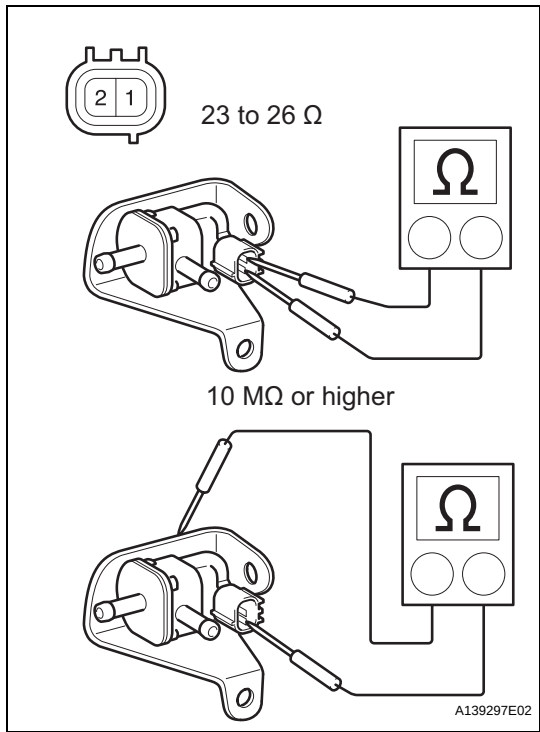


INSPECTION

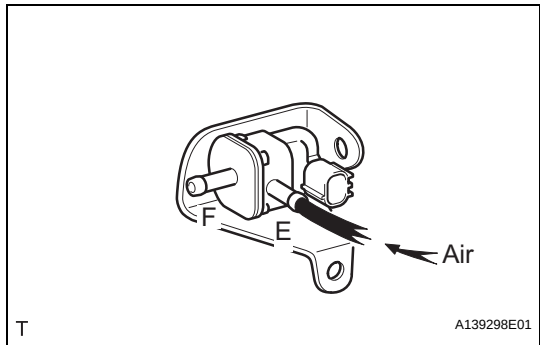
1. INSPECT PURGE VSV
- (a) Measure the resistance of the purge VSV.
- Standard resistance

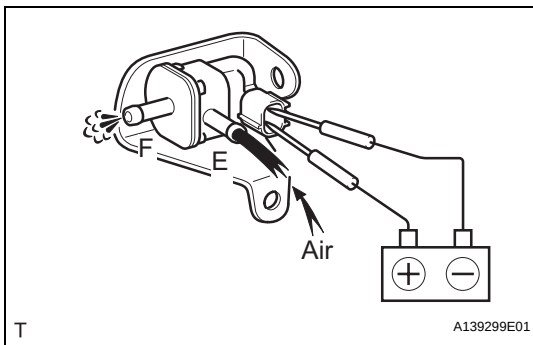
Tester Connection	Condition	Specified Condition
1 - 2	20°C (68°F)	23 to 26 Ω
1 - Body ground 2 - Body ground	-	10 MΩ or higher

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



- (b) Check the operation of the purge VSV.
- (1) Check that air does not flow from port E to port F.





- (2) Apply battery voltage across the terminals.
- (3) Check that air flows from port E to port F.
If the result is not as specified, replace the purge VSV.

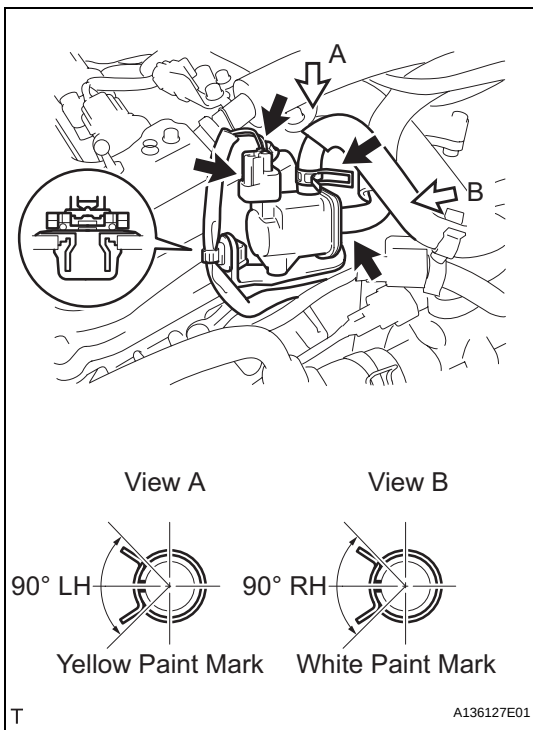
INSTALLATION

1. INSTALL PURGE VSV

- (a) Install the purge VSV with the bolt.
Torque: 10 N*m (102 kgf*cm, 7 in.*lbf)
- (b) Connect the 2 purge line hoses to the purge VSV.
- (c) Connect the wire harness clamp.
- (d) Connect the purge VSV connector.

2. INSTALL V-BANK COVER SUB-ASSEMBLY (See page [EM-42](#))

3. CONNECT CABLE TO NEGATIVE BATTERY TERMINAL

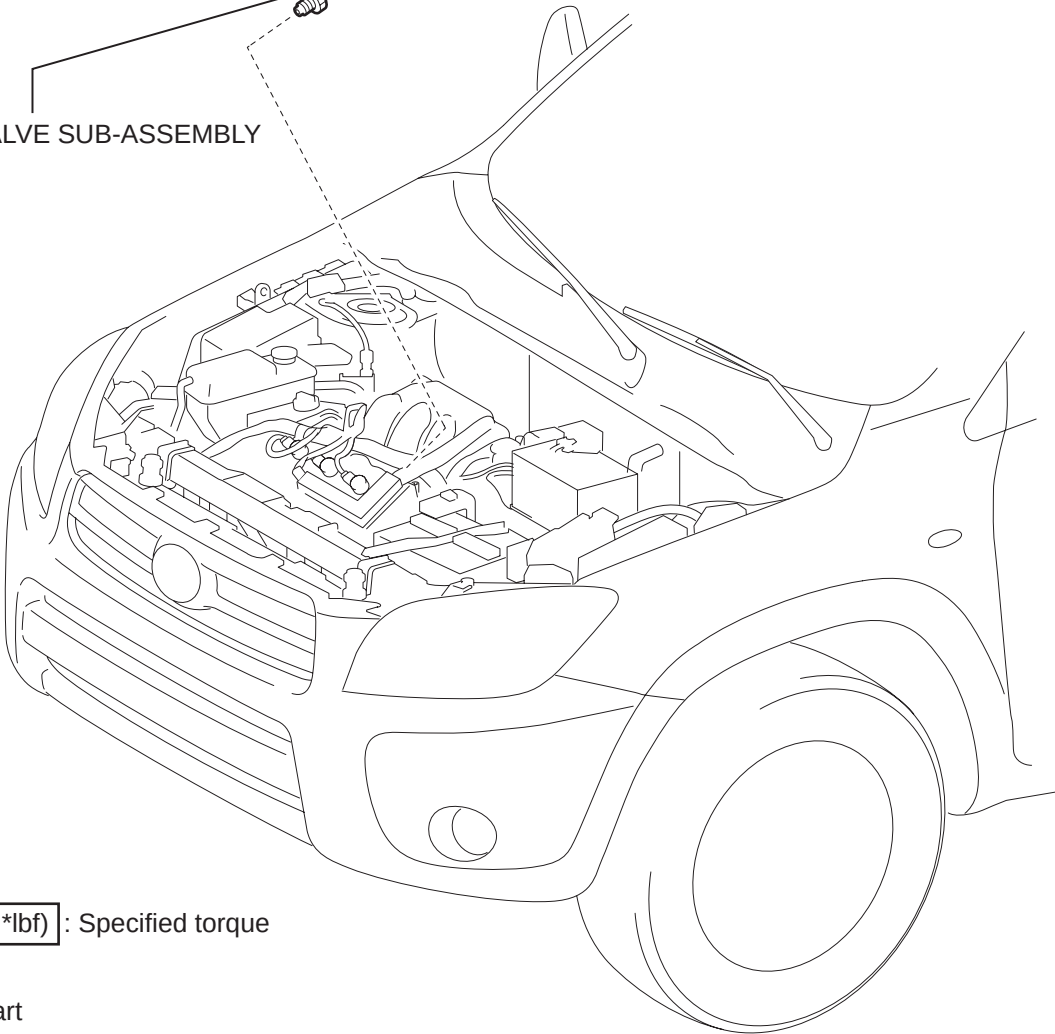


VENTILATION VALVE

COMPONENTS



VENTILATION VALVE SUB-ASSEMBLY

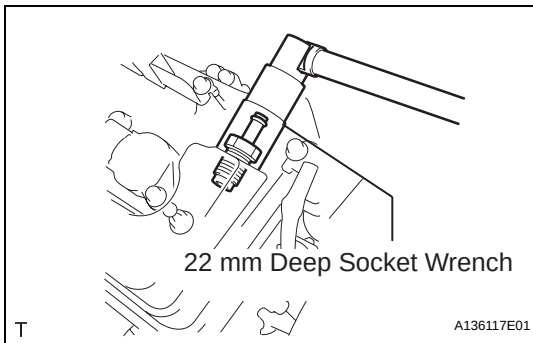
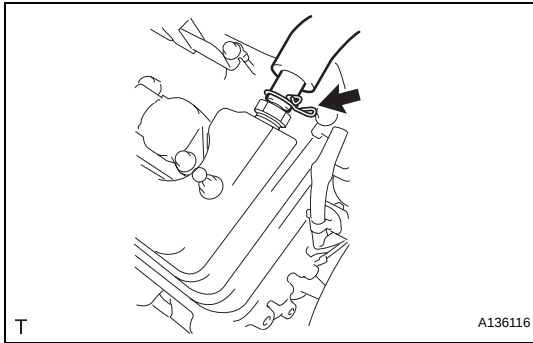


N*m (kgf*cm, ft.*lbf) : Specified torque

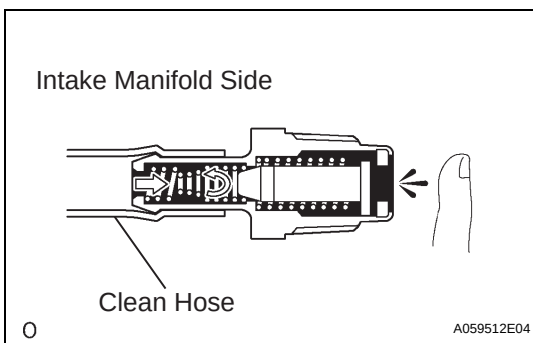
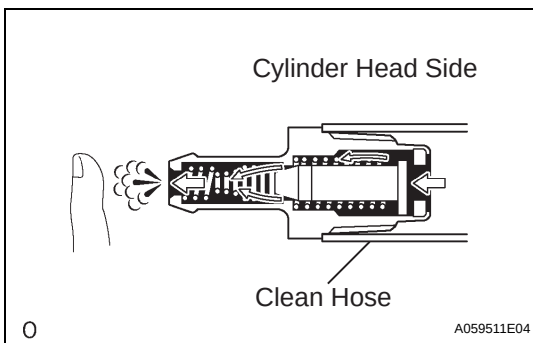
★ Precoated part

REMOVAL

1. REMOVE V-BANK COVER SUB-ASSEMBLY (See page [EM-21](#))
2. REMOVE VENTILATION VALVE SUB-ASSEMBLY
 - (a) Disconnect the ventilation hose from the ventilation valve.



- (b) Using a 22 mm deep socket wrench, remove the ventilation valve.



INSPECTION

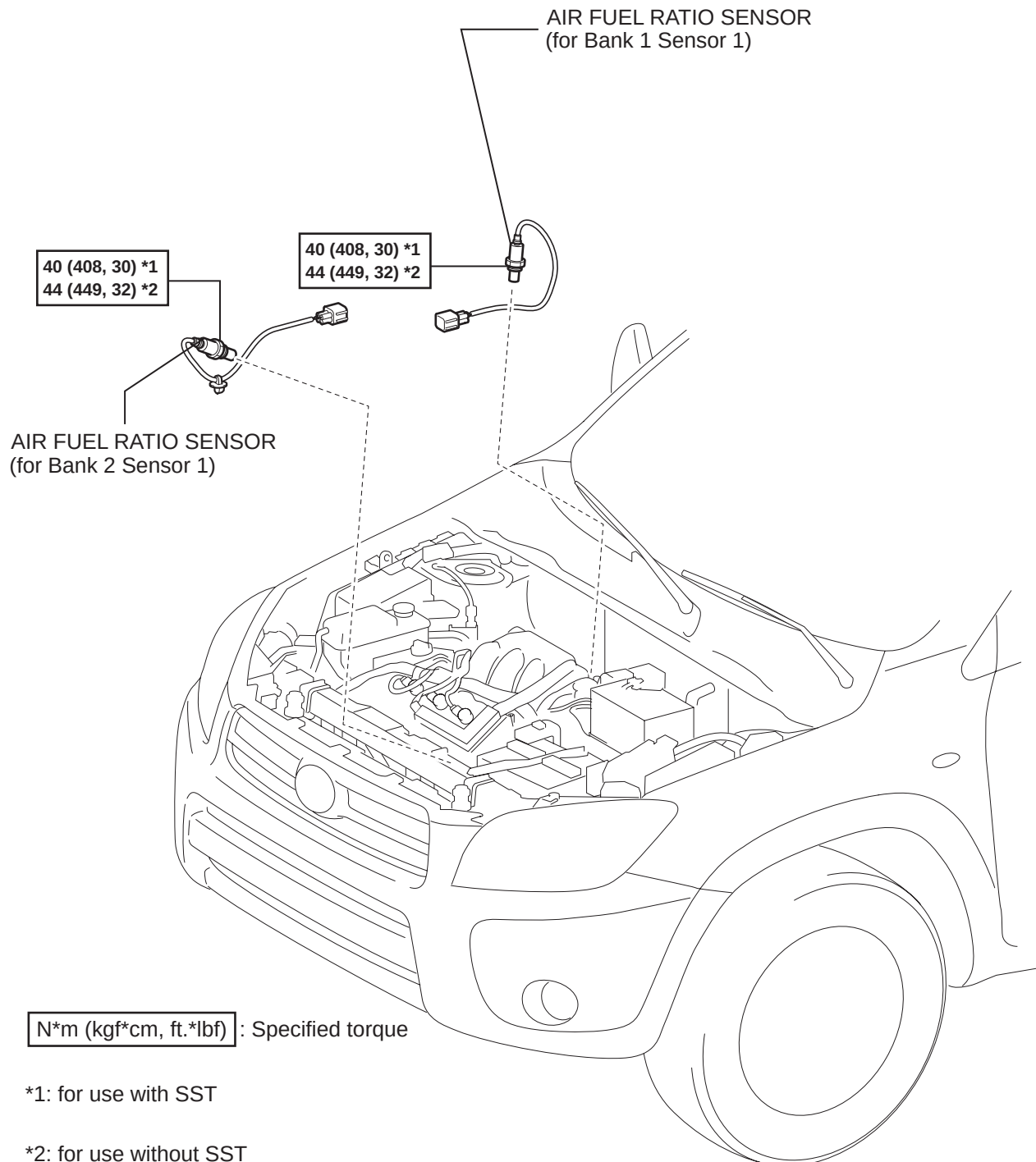
1. INSPECT VENTILATION VALVE SUB-ASSEMBLY
 - (a) Install a clean hose to the ventilation valve.
 - (b) Check the ventilation valve operation.
 - (1) Blow air into the cylinder head side, and check that air passes through easily.

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. If the result is not as specified, replace the ventilation valve sub-assembly.
 - (c) Remove the clean hose from the ventilation valve.

AIR FUEL RATIO SENSOR

COMPONENTS

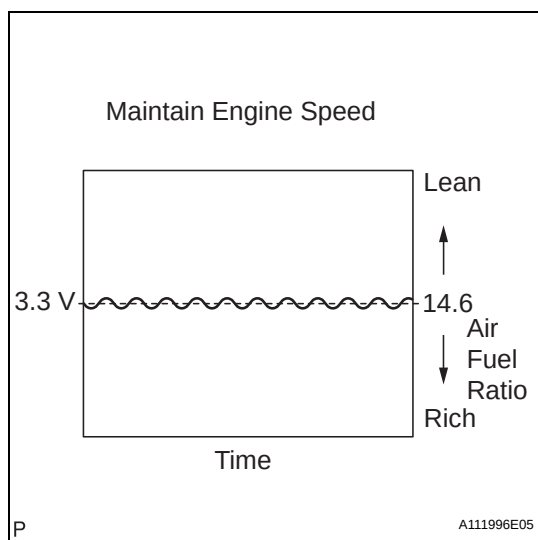
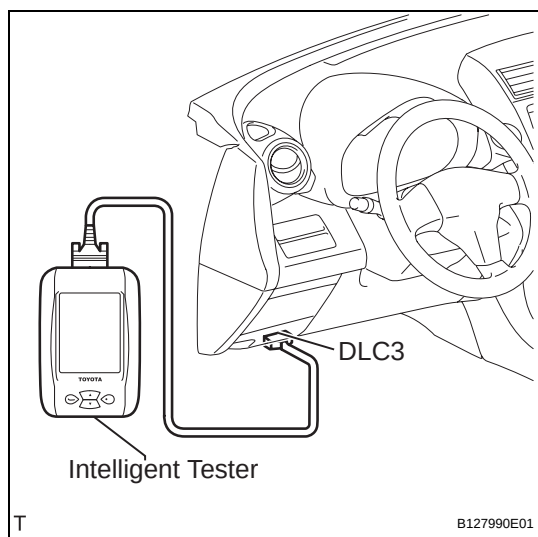


EC

ON-VEHICLE INSPECTION

1. CHECK AIR FUEL RATIO COMPENSATION SYSTEM

- Connect the intelligent tester to the DLC3.
- Turn the ignition switch ON.
- Select the following menu items: Data List / A/F S B1 S1, A/F S B2 S1, O2S B1 S2 and O2S B2 S2.
- Warm up the A/F sensor with the engine speed at 2,500 rpm for approximately 2 minutes.



- Maintain the engine speed at 2,500 rpm and confirm that the display of "A/F S B1 S1" and "A/F S B2 S1" is as shown in the illustration.

HINT:

- The illustration may slightly differ from the display on the intelligent tester.
- Only the intelligent tester displays the waveform of the A/F sensor.

- Confirm that the display of "O2S B1 S2" and "O2S B2 S2" changes between 0 to 1 V with the engine speed at 2,500 rpm.

OK:

The voltage output oscillates more than 8 times in 10 seconds.

NOTICE:

- Perform the check immediately after warming the engine up.
- If the voltage variation could not be verified, warm up the A/F sensor again. If it could not be verified even after warming up the sensor again, check for DTCs (see page [ES-334](#)).

REMOVAL

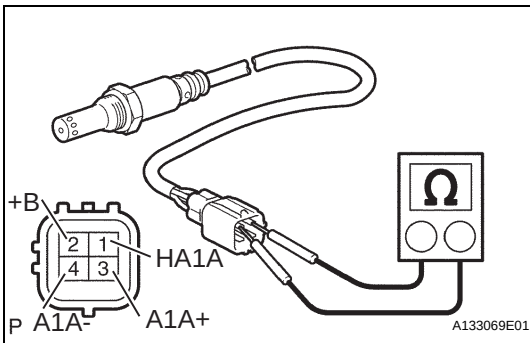
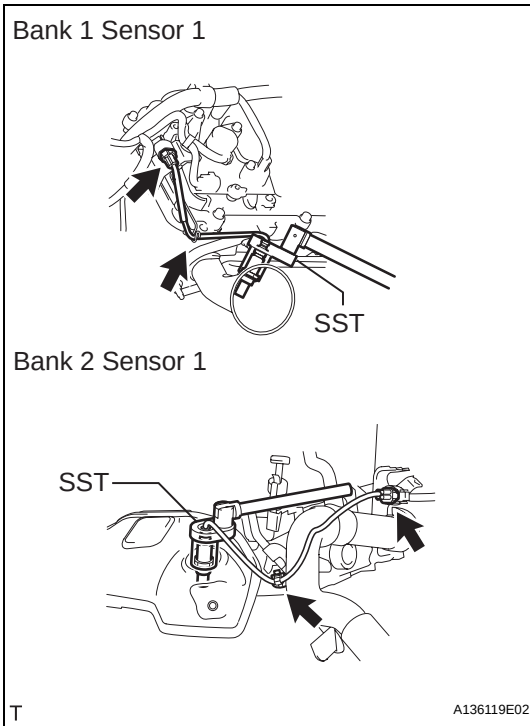
1. **DISCONNECT CABLE FROM NEGATIVE BATTERY TERMINAL**

CAUTION:

Wait at least 90 seconds after disconnecting the cable from the negative (-) battery terminal to prevent airbag and seat belt pretensioner activation.

2. **REMOVE AIR FUEL RATIO SENSOR (for Sensor 1)**
 - (a) Disconnect the sensor connector.
 - (b) Using SST, remove the sensor from the exhaust manifold.

SST 09224-00010



INSPECTION

1. **INSPECT AIR FUEL RATIO SENSOR (for Sensor 1)**
 - (a) Measure the resistance of the sensor.

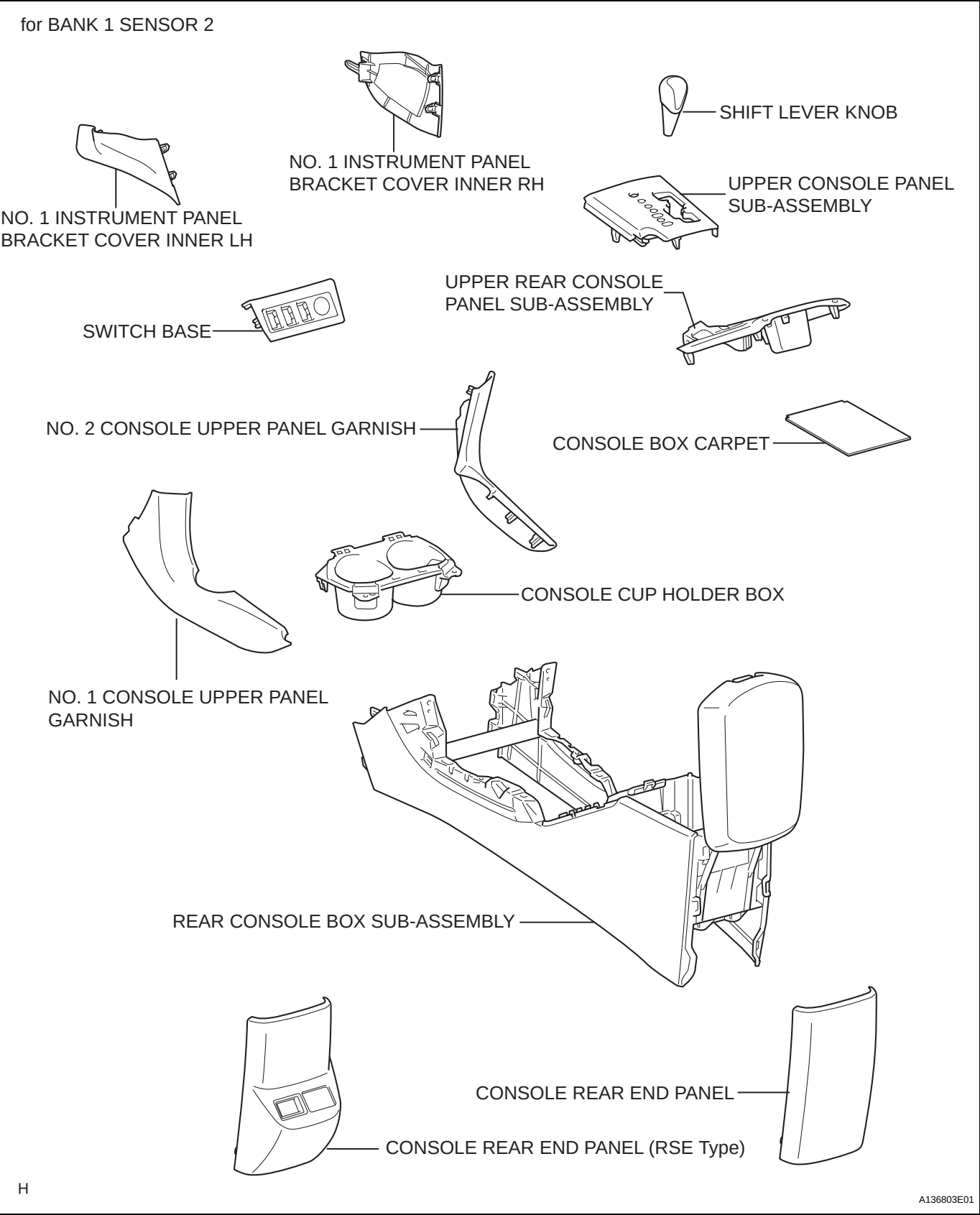
Standard resistance

Tester Connection	Condition	Specified Condition
1 (HA1A) - 2 (+B)	20°C (68°F)	1.8 to 3.4 Ω
1 (HA1A) - 4 (A1A-)	-	10 kΩ or higher

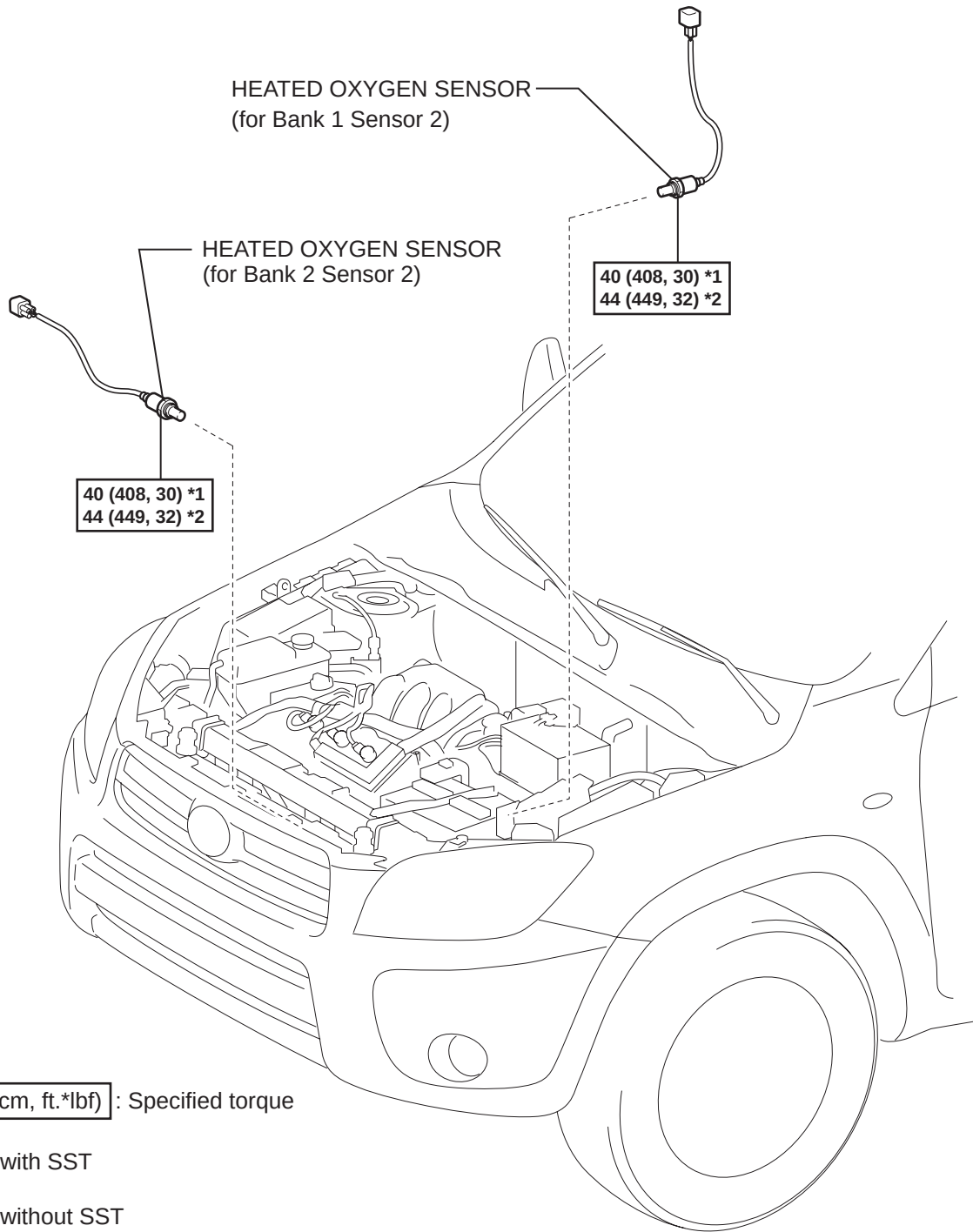
If the resistance is not as specified, replace the sensor.

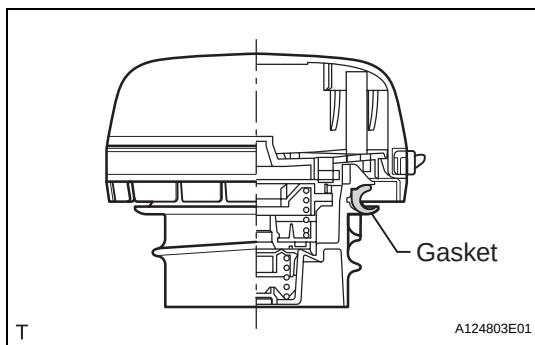
HEATED OXYGEN SENSOR

COMPONENTS



EC





FUEL TANK CAP

INSPECTION

1. **INSPECT FUEL TANK CAP ASSEMBLY**
 - (a) Visually check that the cap and gasket are not deformed or damaged.
If the result is not as specified, replace the cap assembly or gasket.