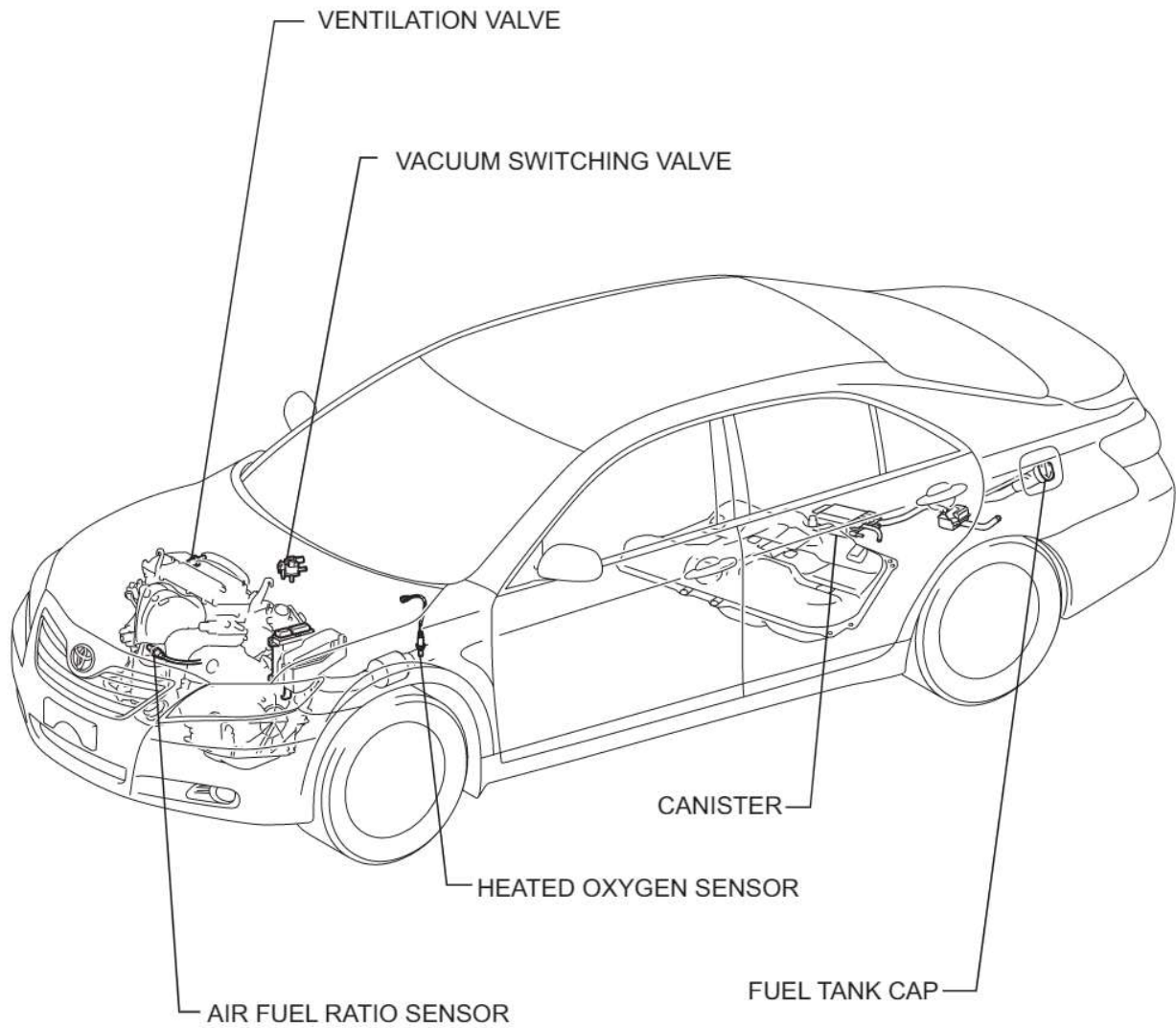


EMISSION CONTROL SYSTEM

PARTS LOCATION

**EC**

T

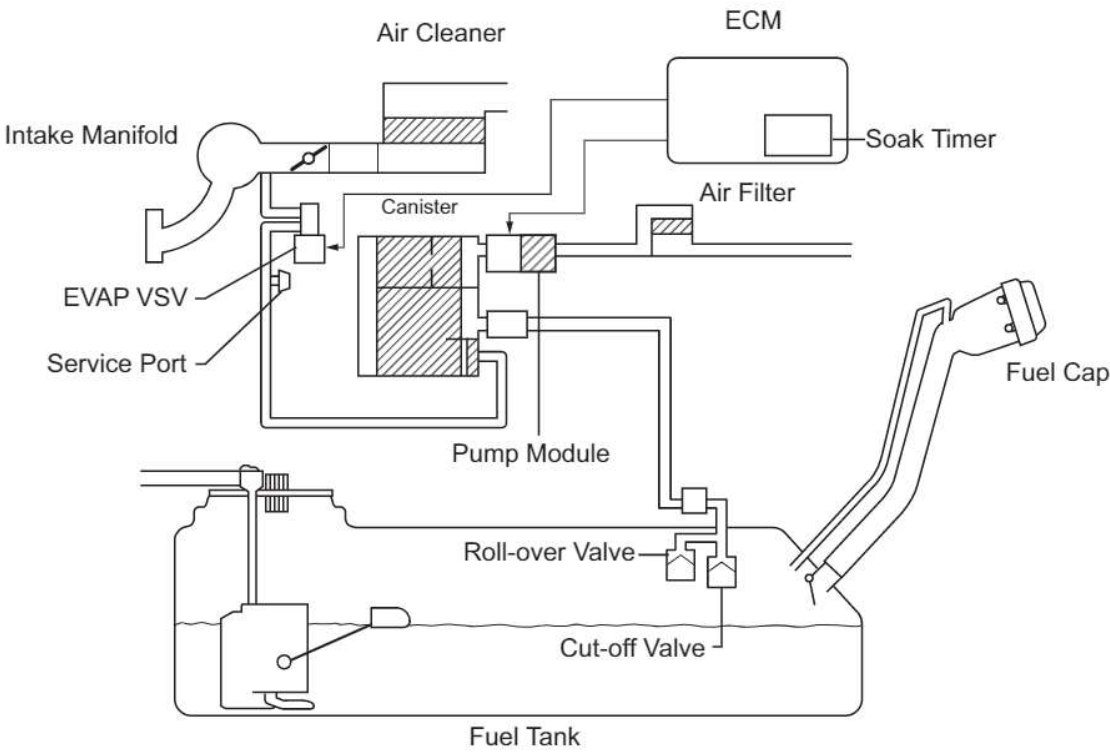
A135546E03

EC-2

2AZ-FE EMISSION CONTROL – EMISSION CONTROL SYSTEM

SYSTEM DIAGRAM

For PZEV :

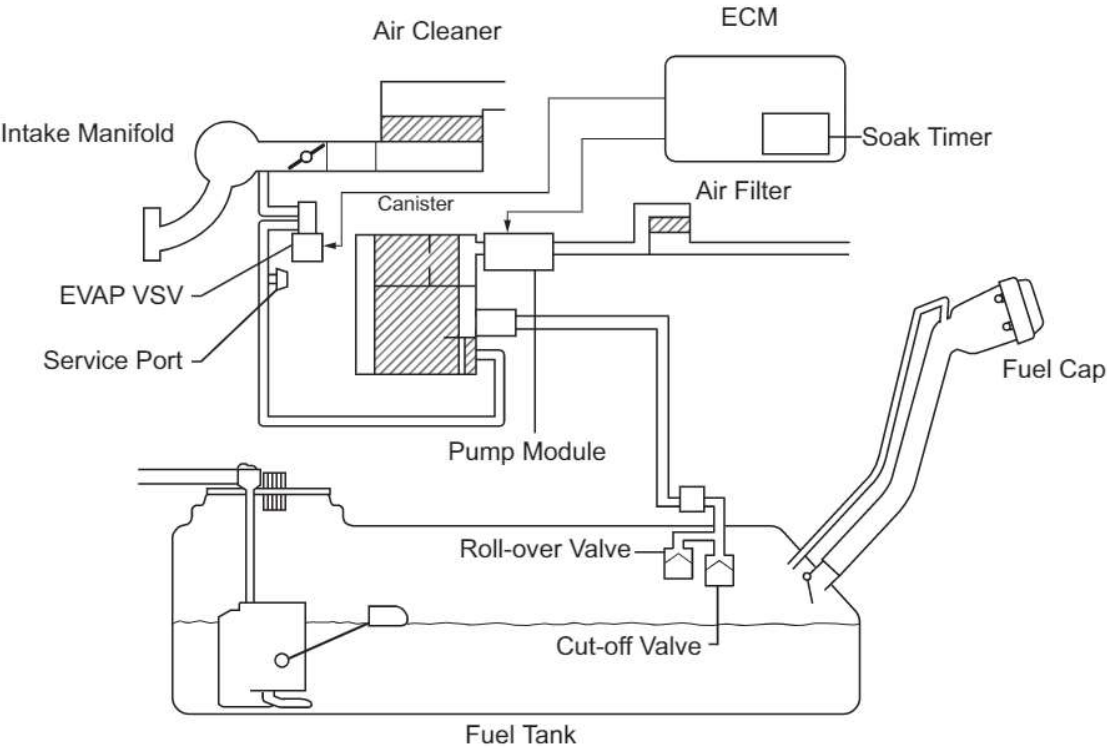


EC

C

A128935E01

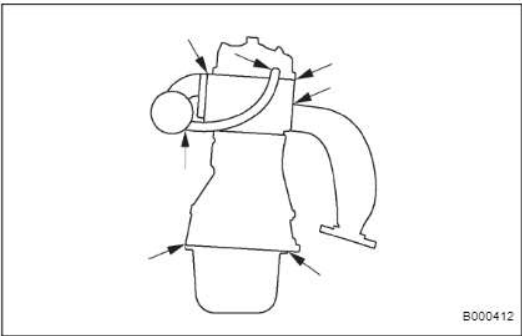
Except PZEV :



EC

2AZ-FE EMISSION CONTROL – EMISSION CONTROL SYSTEM





ON-VEHICLE INSPECTION

1. VISUALLY INSPECT HOSE, CONNECTIONS AND GASKETS

- (a) Check that there are no cracks, leaks or damage.
HINT:
- 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 the parts as necessary.

2. INSPECT FUEL CUT RPM

- (a) Start and warm up the engine.
(b) Open the throttle valve and keep the engine speed at 3,000 rpm.
(c) Use a sound scope to check for injector operating sounds.
(d) Check that when the accelerator pedal is released, injector operating sounds stop momentarily (at 2,500 rpm) and then resume (at 1400 rpm).

Standard

Item	Specified condition
Fuel cut off rpm	2,500 rpm
Fuel return rpm	1,400 rpm

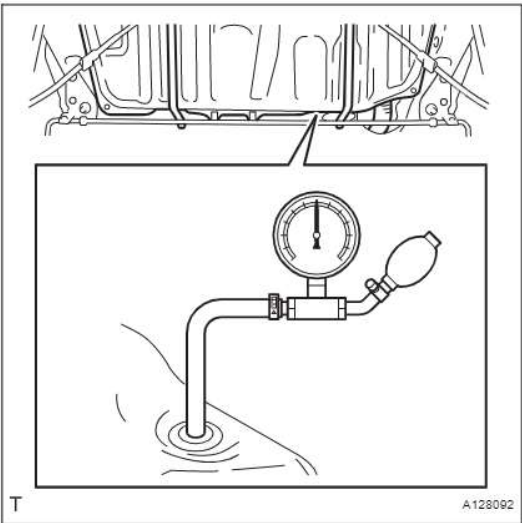
If the result is not specified, check the injectors, wiring and ECM.

3. INSPECT LINE AND CONNECTORS

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

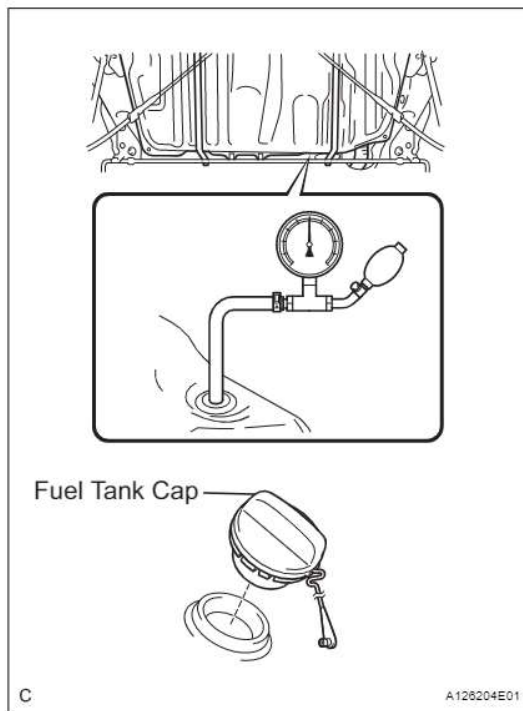
4. CHECK AIR TIGHTNESS IN FUEL TANK AND FILLER PIPE

- (a) Disconnect the vent line hose from the fuel tank.
(b) Connect the pressure gauge to the fuel tank.
(c) Apply pressure to the fuel tank to create an internal pressure of 4 kPa (41 gf/cm², 0.58 psi).
(d) Check that the internal pressure of the fuel tank is maintained for 1 minute.
(e) Check the connected portions of each hose and pipe.
(f) Check the installed parts on the fuel tank.
If any malfunctions, damage or other problems are found, replace the fuel tank and filler pipe.
(g) Reconnect the vent line hose to the fuel tank.



EC-6

2AZ-FE EMISSION CONTROL – EMISSION CONTROL SYSTEM

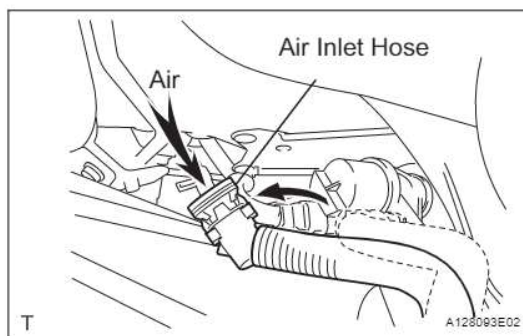
**5. REMOVE FUEL TANK ASSEMBLY**

- (a) Disconnect the vent line hose from the fuel tank.
- (b) Connect the pressure gauge to the fuel tank.
- (c) Fill the fuel tank with fuel.
- (d) Apply pressure of 4 kPa (41 gf/cm², 0.58 psi) to the vent port of the fuel tank.

HINT:

Check the amount of fuel in the fuel tank. When the fuel tank is full, the float valve of the fill check valve is closed and no air can pass through.

- (e) Remove the fuel tank cap, and check that the pressure drops.
If the pressure does not drop, replace the fuel tank assembly.
- (f) Reconnect the vent line hose to the fuel tank.

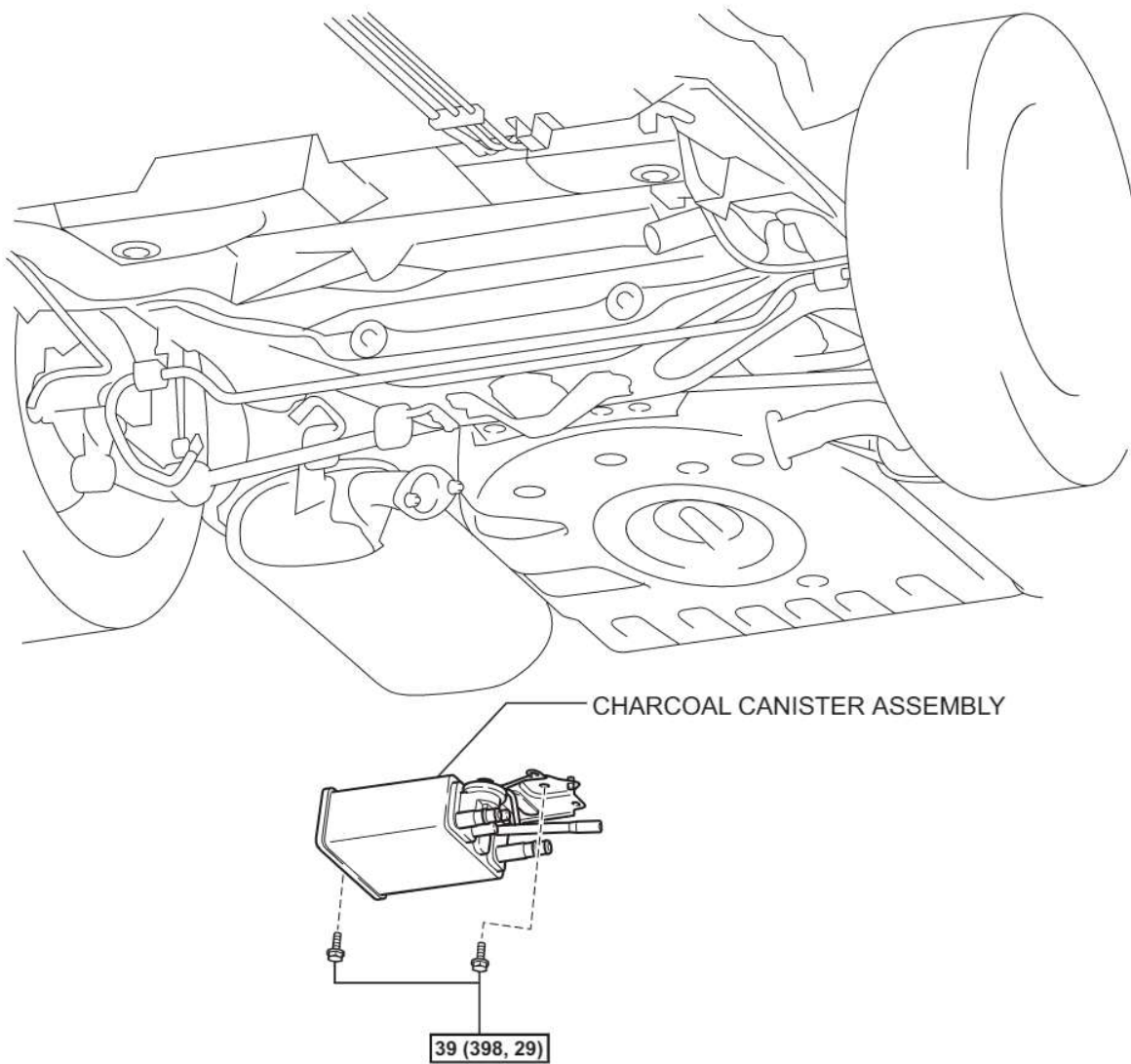
**6. REMOVE AIR INLET LINE**

- (a) Disconnect the air inlet line hose from the charcoal canister.
- (b) Check that air can flow freely into the air inlet line.
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.

EC

CANISTER
COMPONENTS

for PZEV:



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

T

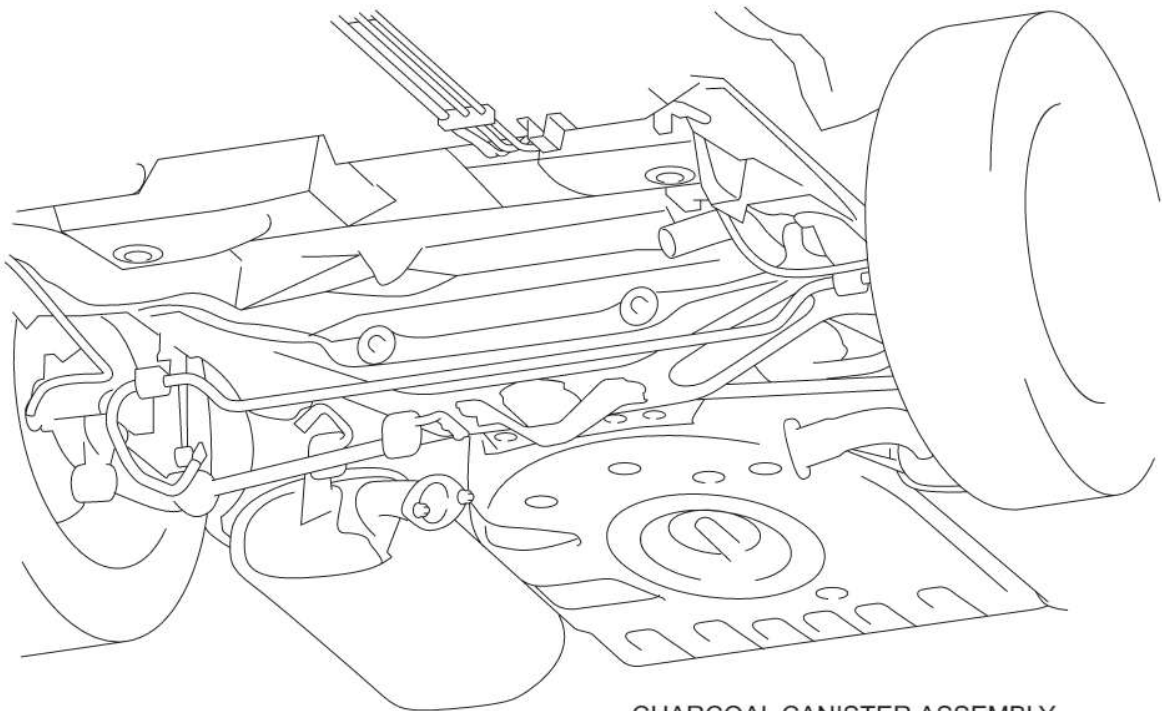
A135549E03

EC

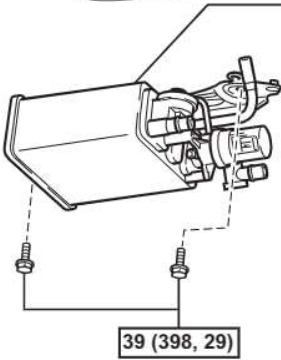
EC-8

2AZ-FE EMISSION CONTROL – CANISTER

except PZEV:



CHARCOAL CANISTER ASSEMBLY



39 (398, 29)

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

T

A135648E06

2AZ-FE EMISSION CONTROL – CANISTER

EC-9

REMOVAL

1. REMOVE FUEL TANK ASSEMBLY

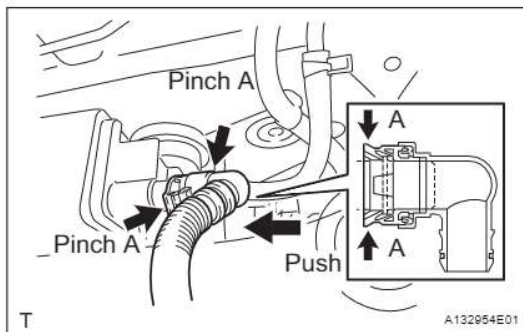
HINT:

(See page [FU-34](#))

2. REMOVE CHARCOAL CANISTER ASSEMBLY

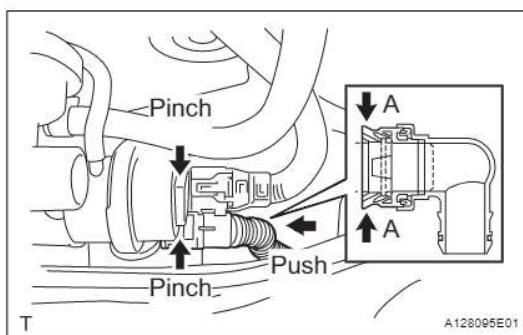
(a) Disconnect the fuel tank vent hose from the charcoal canister.

- (1) Push the connector deep inside.
- (2) Pinch portion A.
- (3) Pull out the connector.



(b) Disconnect the charcoal canister filter sub-assembly from the charcoal canister.

- (1) Push the connector deep inside.
- (2) Pinch portion A.
- (3) Pull out the connector.



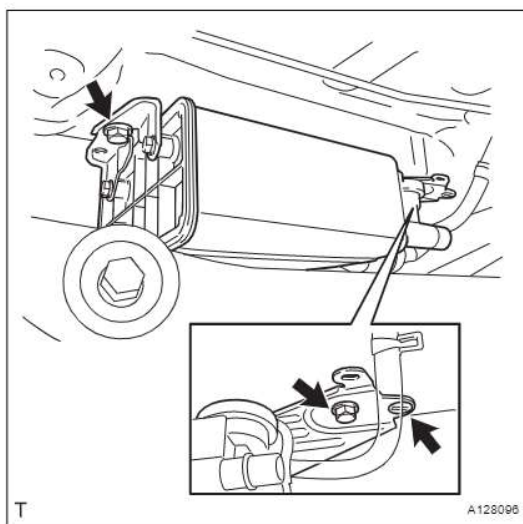
(c) Disconnect the vapor pressure sensor connector.

(d) Disconnect the wire harness clamp.

(e) Disconnect the purge line hose from the charcoal canister.

EC

(f) Remove the 2 bolts, clip and charcoal canister.

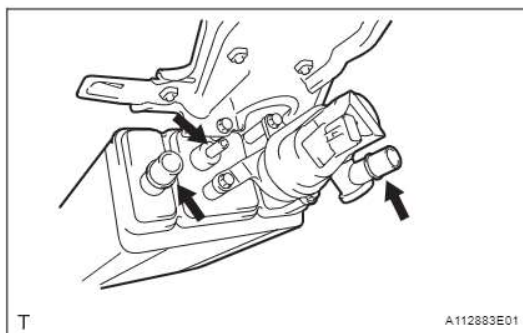


INSPECTION

1. INSPECT CHARCOAL CANISTER ASSEMBLY

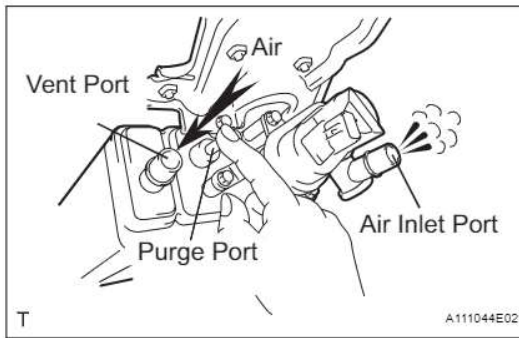
(a) Visually check the charcoal canister for cracks or damage.

If cracks or damage are found, replace the charcoal canister assembly.



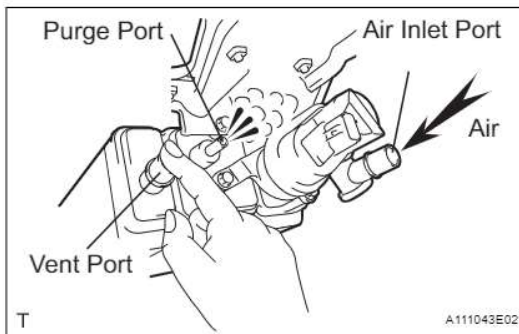
EC-10

2AZ-FE EMISSION CONTROL – CANISTER



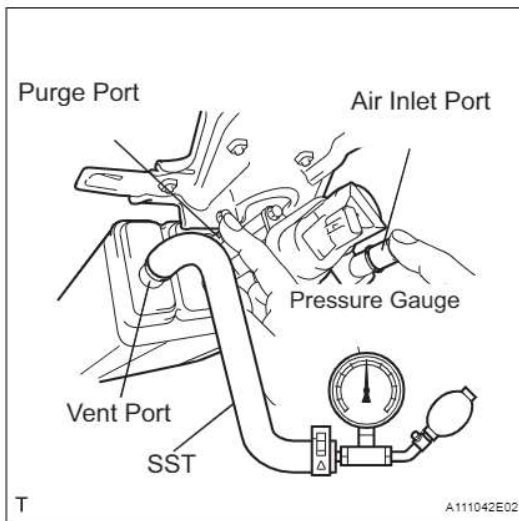
(b) Check charcoal canister operation.

- (1) With the purge port closed, blow 1.10 kPa (11.2 gf/cm², 0.16 psi) of air into the vent port, and check that air flows from the air inlet port. If the result is not as specified, replace the charcoal canister assembly.



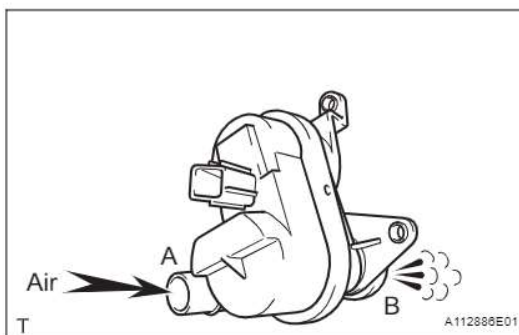
- (2) With the vent port closed, blow 1.10 kPa (11.2 gf/cm², 0.16 psi) of air into the air inlet port, and check that air flows from the purge port. If the result is not as specified, replace the charcoal canister assembly.

EC



(c) Check for air leakage.

- (1) With the purge port and air inlet port closed, apply 19.6 kPa (0.2 kgf/cm², 2.81 psi) of pressurized air into the vent port, then confirm that pressure is retained for 1 minute. If the result is not as specified, replace the charcoal canister assembly.

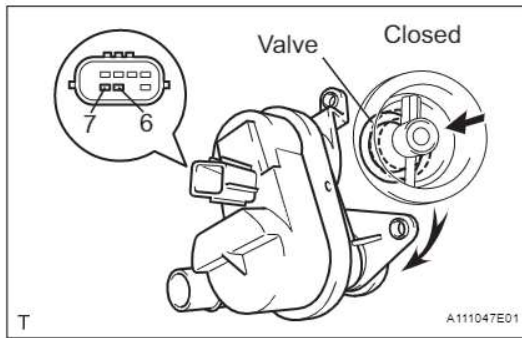


(d) Check the leak detection pump.

- (1) Remove the detection pump from the charcoal canister.
- (2) Check that air flows from port A to B. If the result is not as specified, replace the charcoal canister assembly.

2AZ-FE EMISSION CONTROL – CANISTER

EC-11



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

INSTALLATION

1. INSTALL CHARCOAL CANISTER ASSEMBLY

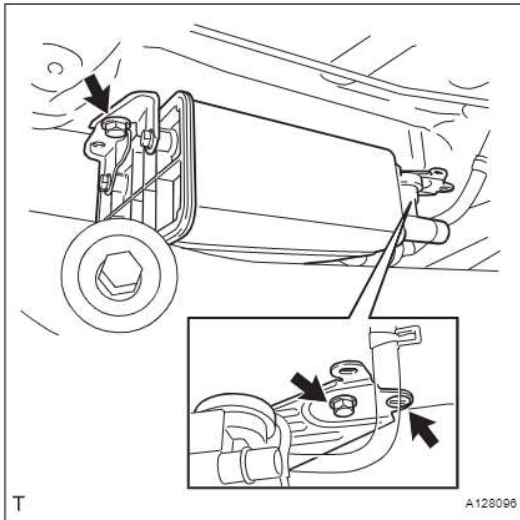
- (a) Install the 2 bolts, clip and charcoal canister.
Torque: 39 N*m (398 kgf*cm, 29 ft.*lbf)
- (b) Connect the purge line hose to the charcoal canister.
- (c) Connect the wire harness clamp.
- (d) Connect the vapor pressure sensor connector.
- (e) Connect the charcoal canister filter sub-assembly to the charcoal canister.
- (f) Connect the fuel tank vent hose to the charcoal canister.

2. INSTALL FUEL TANK ASSEMBLY

HINT:

(See page [FU-39](#))

3. CHECK FOR EXHAUST GAS LEAKS

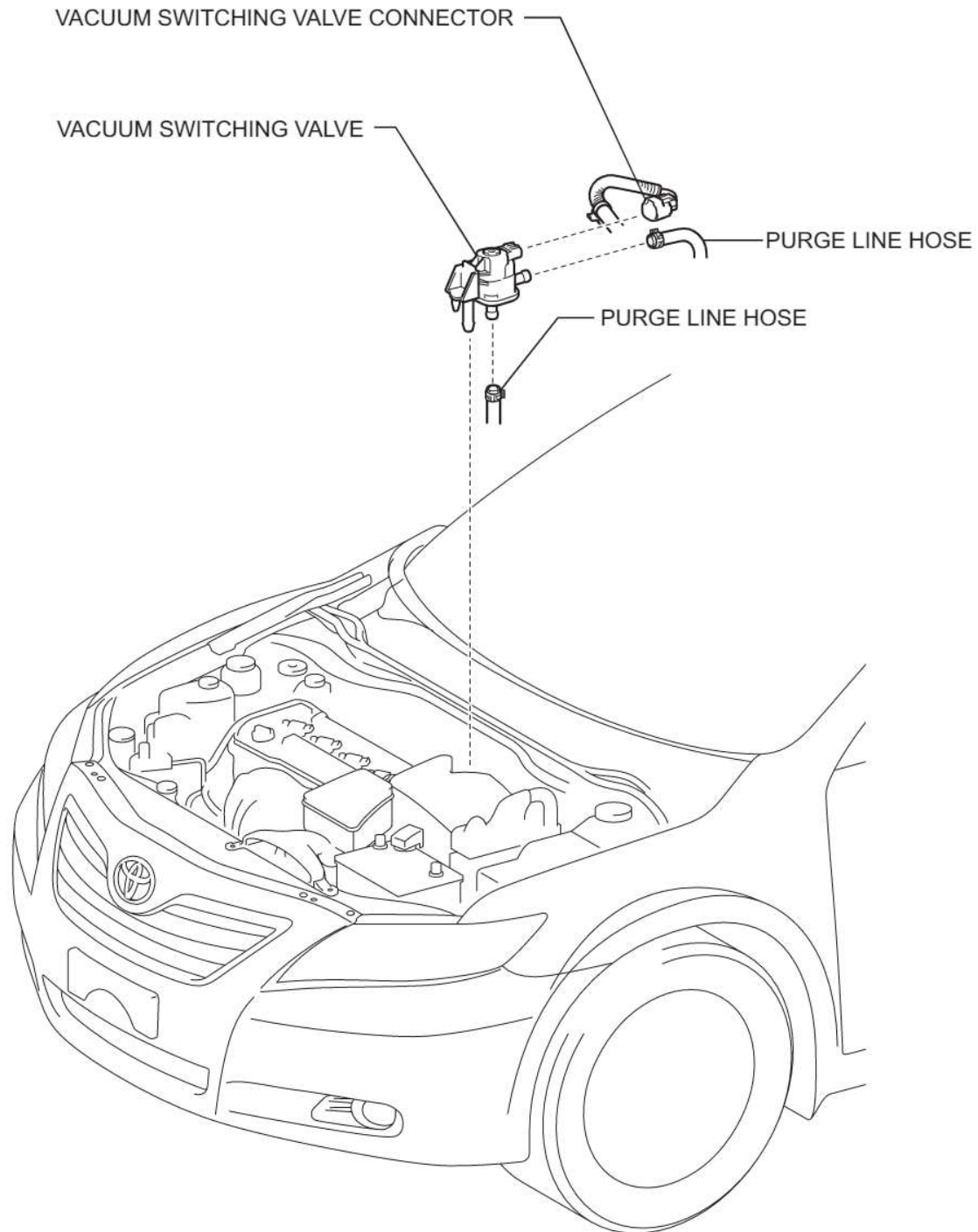


EC

EC-12

2AZ-FE EMISSION CONTROL – VACUUM SWITCHING VALVE

VACUUM SWITCHING VALVE COMPONENTS

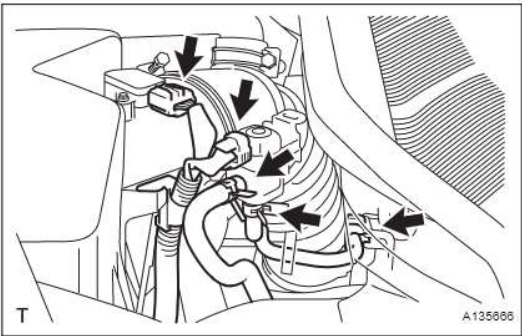


EC

T

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2AZ-FE EMISSION CONTROL – VACUUM SWITCHING VALVE



REMOVAL

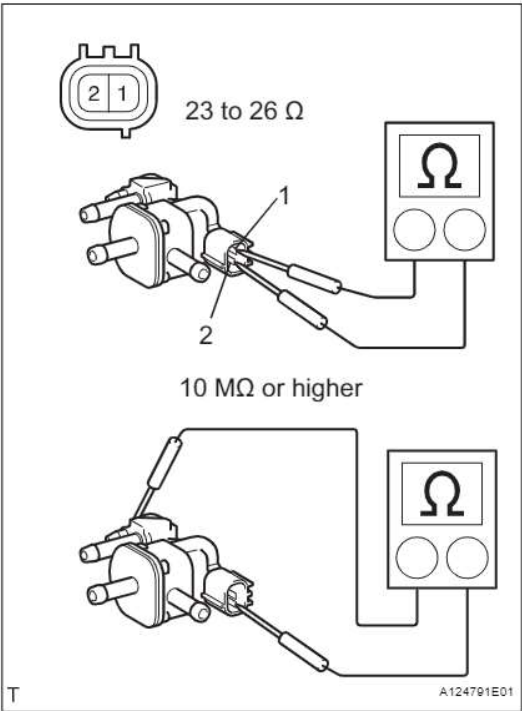
1. REMOVE VACUUM SWITCHING VALVE
- (a)

Disconnect the vacuum switching valve connector.
- (b)

Disconnect the wire harness clamp.
- (c)

Disconnect the 2 purge line hoses from the purge VSV.
- (d)

Remove the vacuum switching valve.



INSPECTION

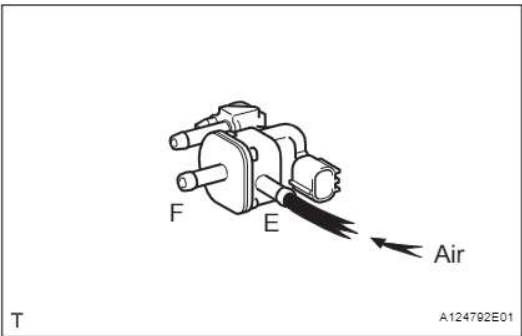
1. INSPECT VACUUM SWITCHING VALVE
- (a)

Measure the resistance of the purge VSV.
- Standard resistance

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

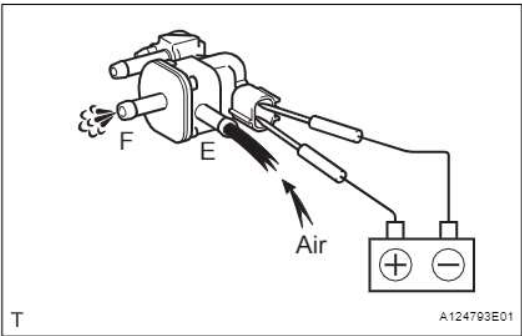
If the result is not as specified, replace the purge VSV.

EC



- (b) Check the operation of the purge VSV.
- (1)

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



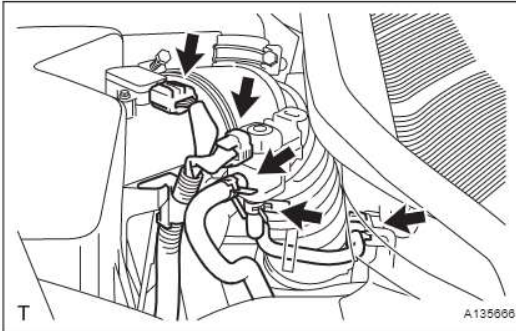
- (2)

Apply battery voltage across the terminals.
- (3)

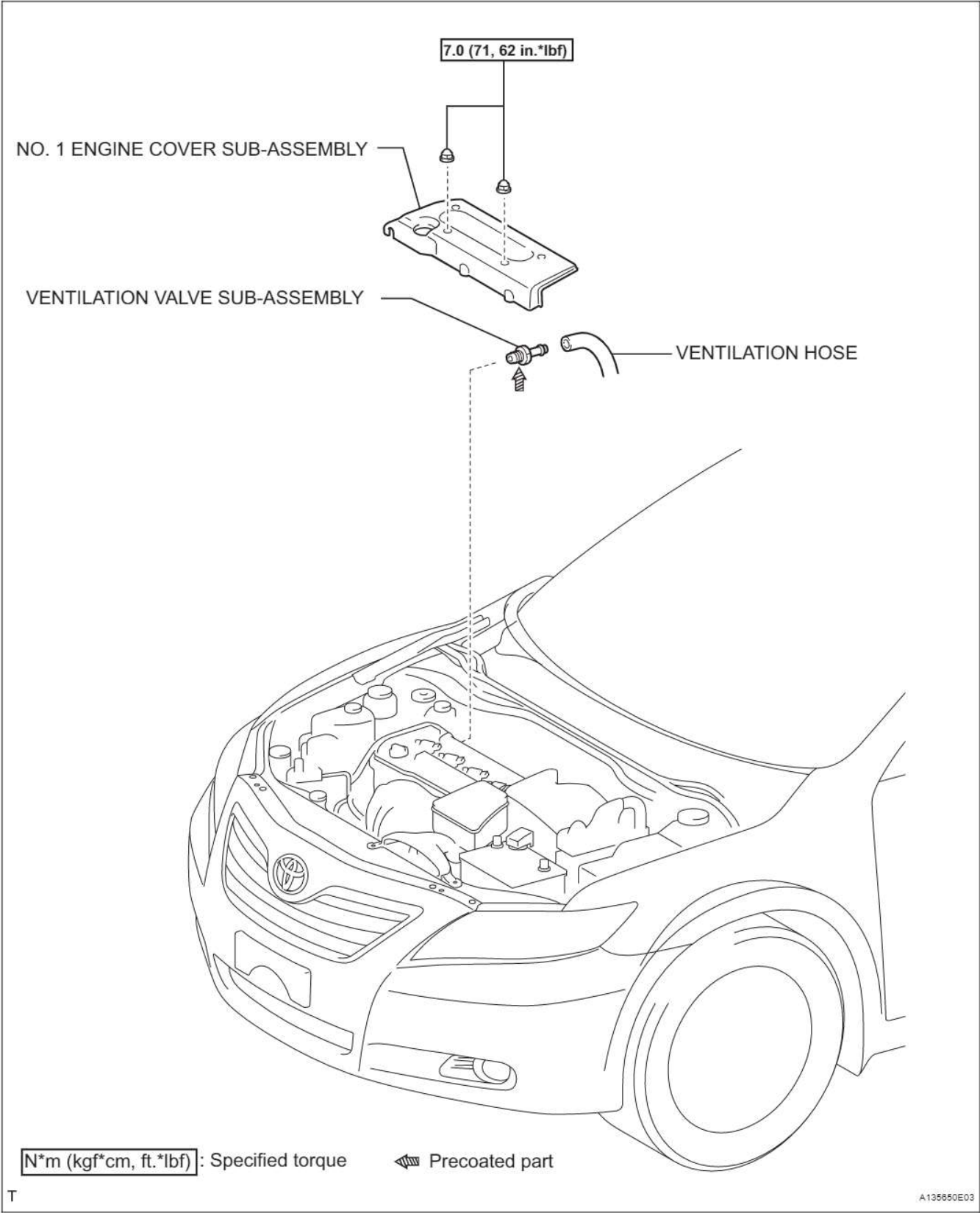
Check that air flows from port E to port F.
- If the result is not as specified, replace the purge VSV.

EC-14**2AZ-FE EMISSION CONTROL – VACUUM SWITCHING VALVE****INSTALLATION****1. REMOVE VACUUM SWITCHING VALVE**

- (a) Install the vacuum switching valve onto the air cleaner hose.
- (b) Connect the 2 purge line hoses to the vacuum switching valve.
- (c) Connect the vacuum switching valve connector.

**EC**

VENTILATION VALVE
COMPONENTS



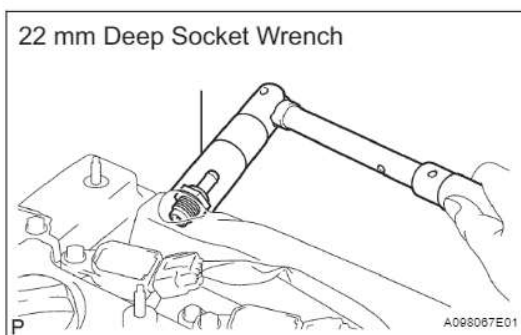
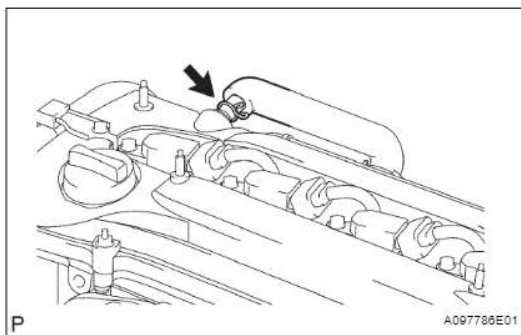
EC

EC-16

2AZ-FE EMISSION CONTROL – VENTILATION VALVE

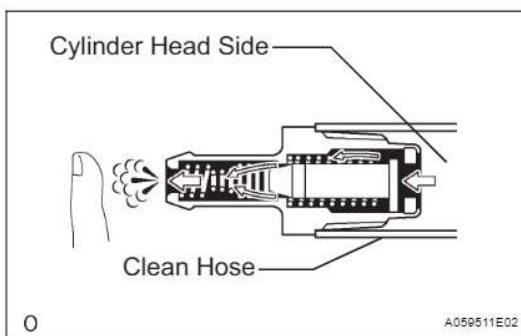
REMOVAL

1. REMOVE NO. 1 ENGINE COVER SUB-ASSEMBLY
2. REMOVE VENTILATION VALVE SUB-ASSEMBLY
 - (a) Disconnect the ventilation hose from the ventilation valve sub-assembly.



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

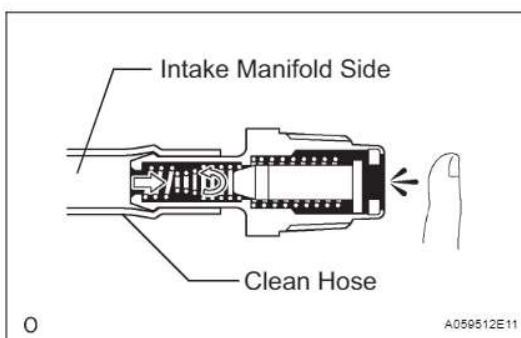
EC



INSPECTION

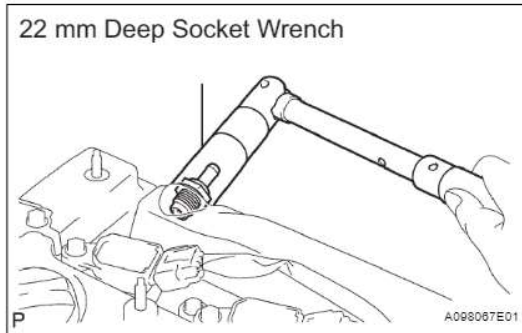
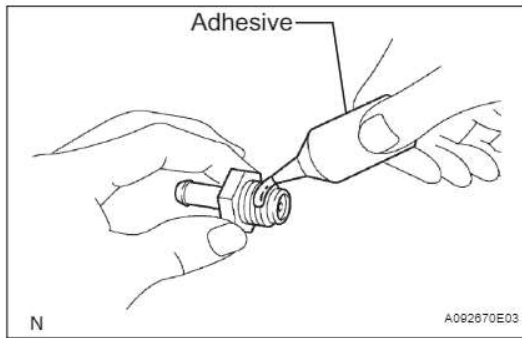
1. INSPECT VENTILATION VALVE SUB-ASSEMBLY
 - (a) Install a clean hose to the ventilation valve.
 - (b) Inspect the ventilation valve operation.
 - (1) Blow air into the cylinder head side, and check that air passes through easily.

NOTICE:
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.
- (c) Remove the clean hose from the ventilation valve.



2AZ-FE EMISSION CONTROL – VENTILATION VALVE

EC-17

**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.

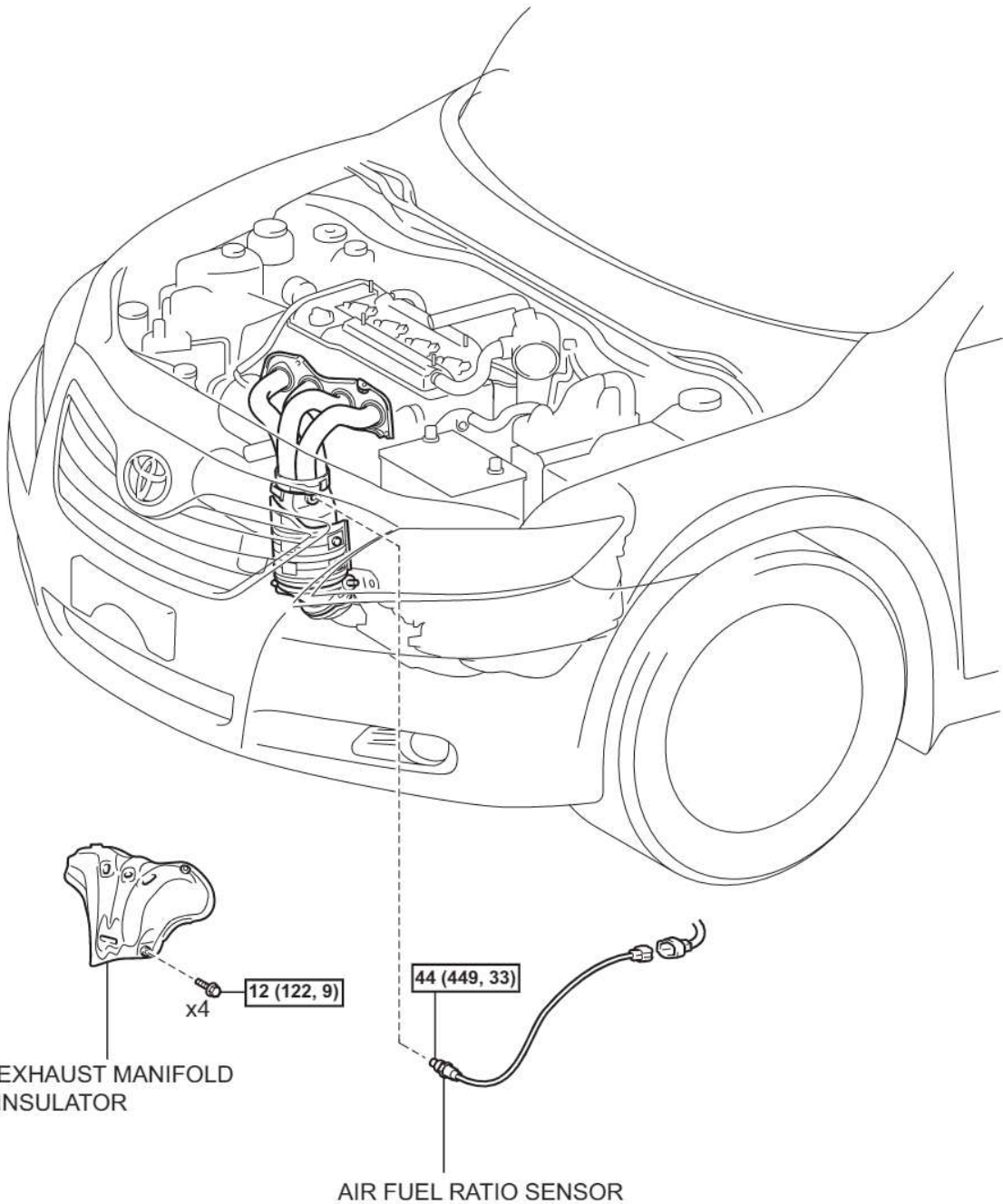
Torque: 19 N*m (194 kgf*cm, 14 ft.*lbf)

- (c) Connect the ventilation hose.

2. INSTALL ENGINE COVER SUB-ASSEMBLY**3. CHECK FOR ENGINE OIL LEAKS****EC**

AIR FUEL RATIO SENSOR
COMPONENTS

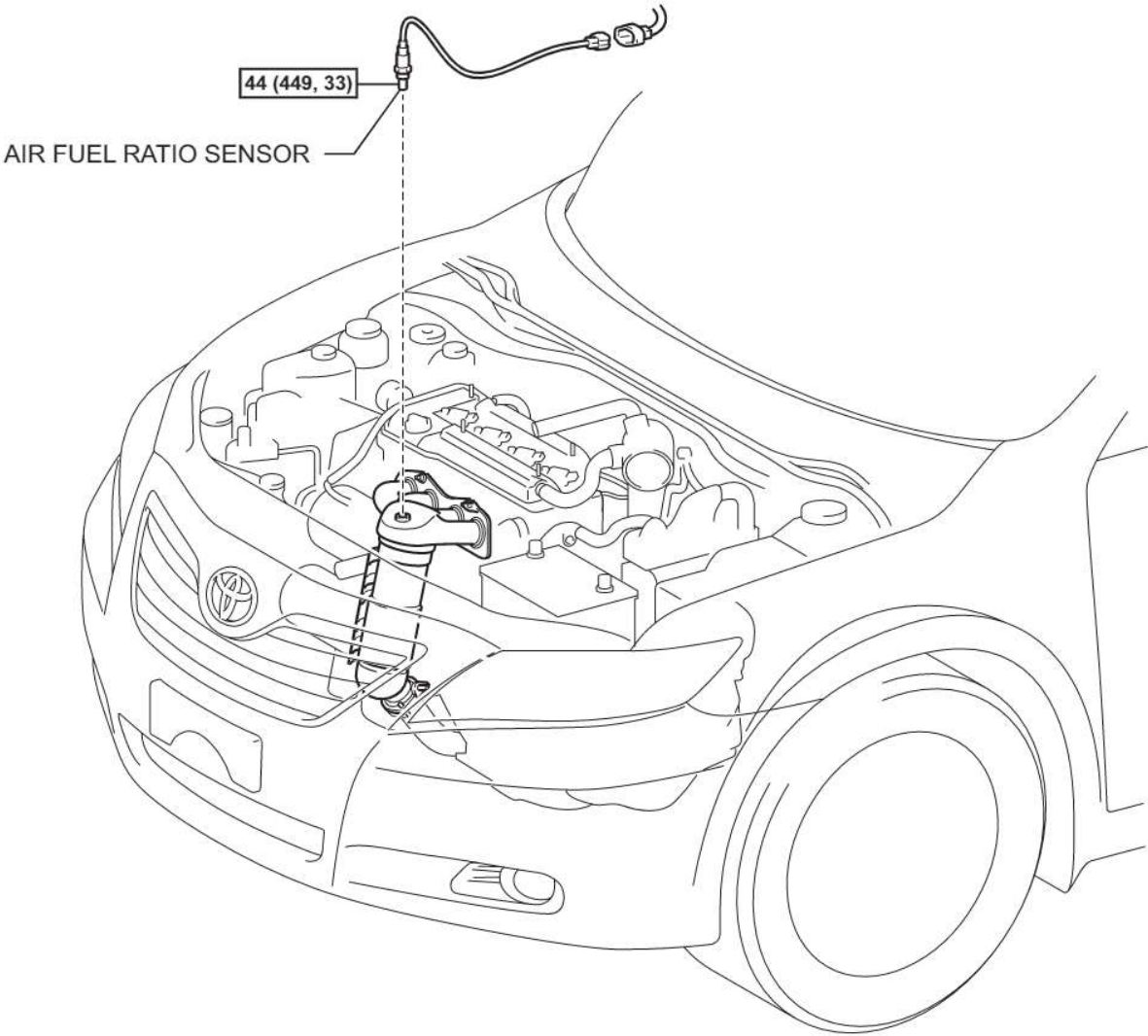
except PZEV :



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

A135854E03

for PZEV :



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

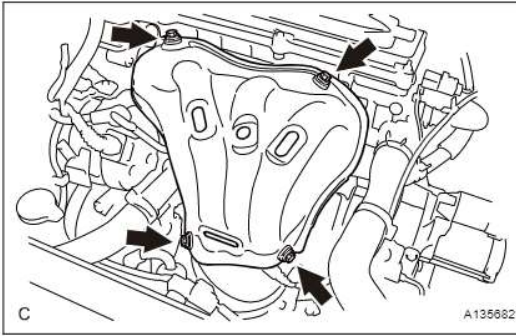
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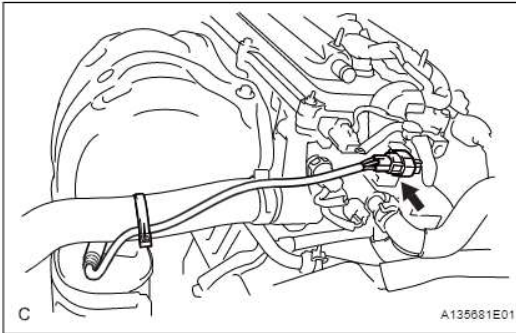
EC

EC-20**2AZ-FE EMISSION CONTROL – AIR FUEL RATIO SENSOR****REMOVAL****1. REMOVE NO. 1 EXHAUST MANIFOLD HEAT INSULATOR (except PZEV)**

- (a) Remove the 4 bolts and No. 1 exhaust manifold heat insulator.

**2. REMOVE AIR FUEL RATIO SENSOR (except PZEV)**

- (a) Disconnect the air fuel ratio sensor connector and clamp.

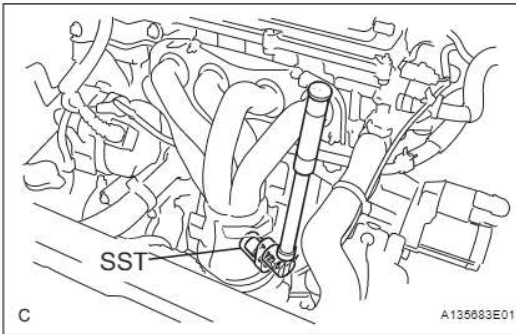


- (b) Using SST, remove the air fuel ratio sensor from the exhaust manifold converter sub-assembly No. 2.

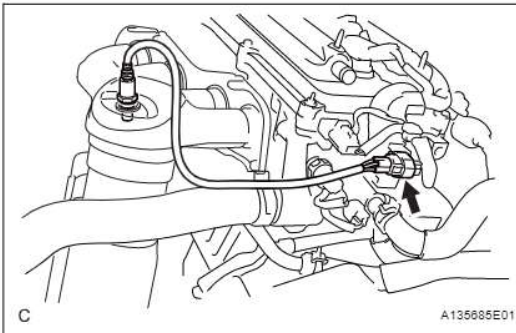
SST 09224-00010

NOTICE:

Do not damage the air fuel ratio sensor.

**3. REMOVE AIR FUEL RATIO SENSOR (for PZEV)**

- (a) Disconnect the air fuel ratio sensor connector.

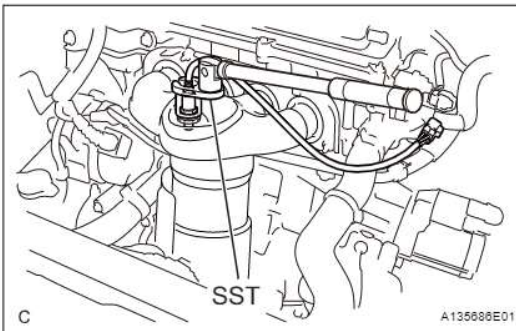


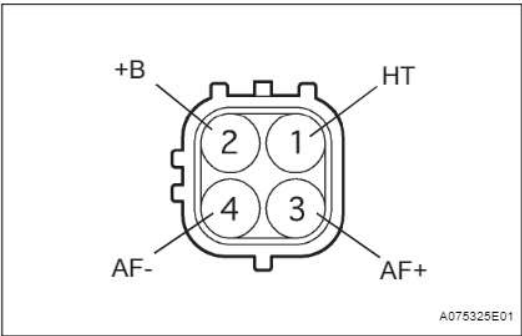
- (b) Using SST, remove the air fuel ratio sensor.

SST 09224-00010

NOTICE:

Do not damage the air fuel ratio sensor.

**EC**

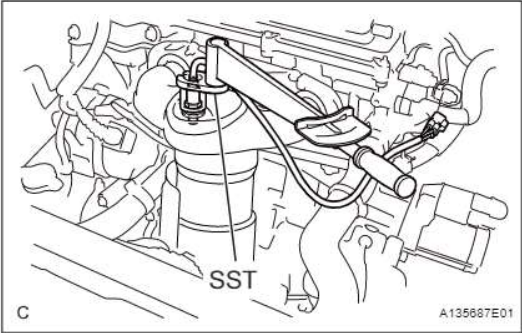


INSPECTION

1. INSPECT AIR FUEL RATIO SENSOR
- (a) Using an ohmmeter, measure the resistance between terminals 1 (HT) and 2 (+B).
- Standard resistance**

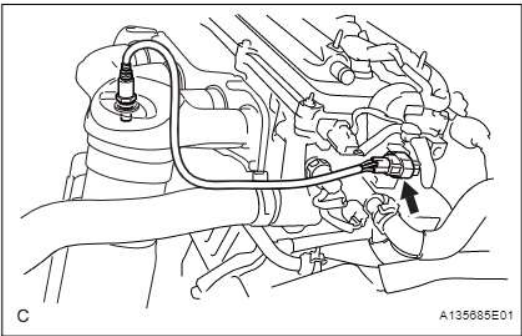
Condition	Specified Condition
20°C (68°F)	1.8 to 3.4 Ω

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

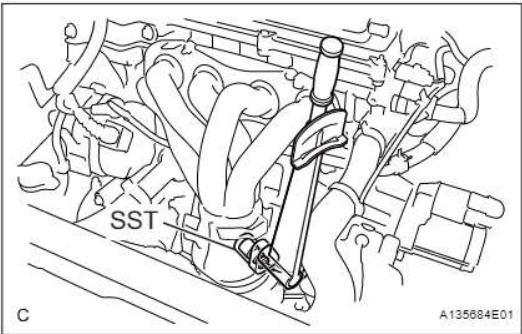


INSTALLATION

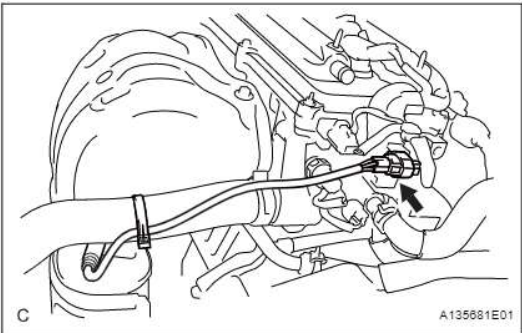
1. INSTALL AIR FUEL RATIO SENSOR (for PZEV)
- (a) Temporarily tighten the air fuel ratio sensor.
- NOTICE:**
- Do not damage the air fuel ratio sensor.**
- (b) Using SST, fully tighten the air fuel ratio sensor.
- SST 09224-00010**
- Torque: 44 N*m (449 kgf*cm, 32 ft.*lbf)**



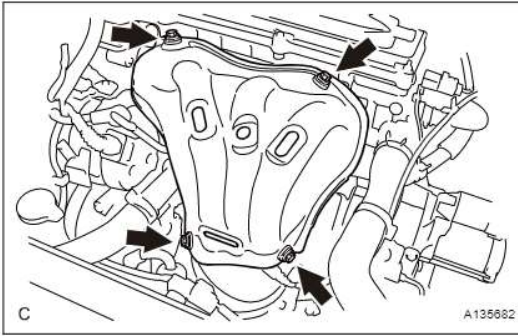
- (c) Connect the air fuel ratio sensor connector and clamp.



2. INSTALL AIR FUEL RATIO SENSOR (except PZEV)
- (a) Temporarily tighten the air fuel ratio sensor.
- NOTICE:**
- Do not damage the air fuel ratio sensor.**
- (b) Using SST, fully tighten the air fuel ratio sensor.
- SST 09224-00010**
- Torque: 44 N*m (449 kgf*cm, 32 ft.*lbf)**



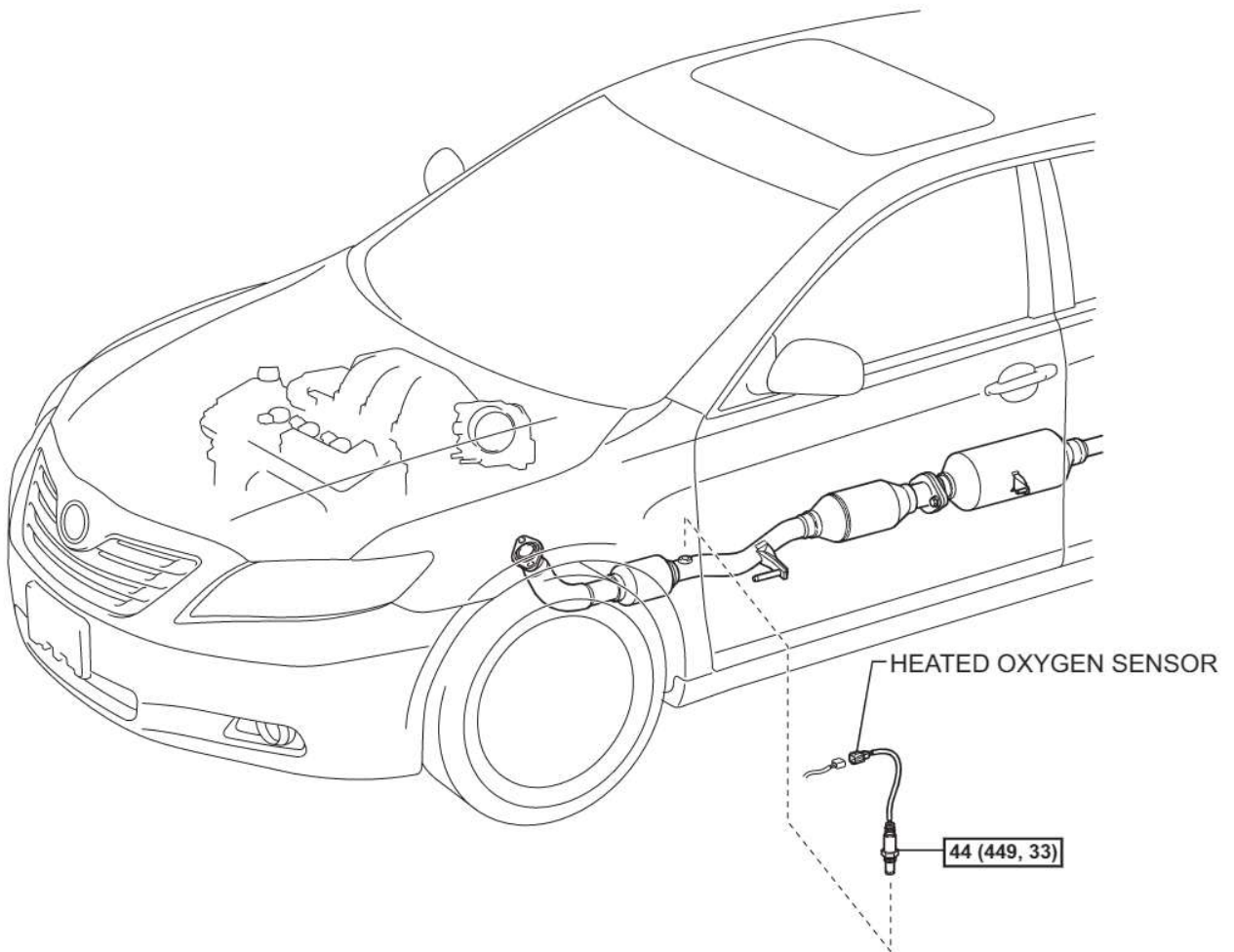
- (c) Connect the air fuel ratio sensor connector and clamp.

EC-22**2AZ-FE EMISSION CONTROL – AIR FUEL RATIO SENSOR****3. INSTALL NO. 1 EXHAUST MANIFOLD HEAT INSULATOR (except PZEV)**

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

Torque: 12 N*m (122 kgf*cm, 9 ft.*lbf)

HEATED OXYGEN SENSOR COMPONENTS



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

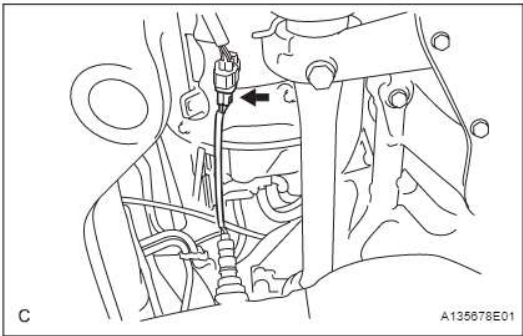
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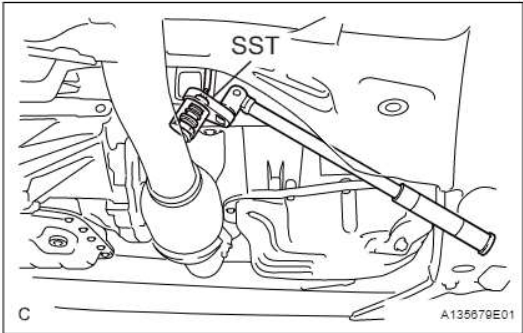
EC-24

2AZ-FE EMISSION CONTROL – HEATED OXYGEN SENSOR



REMOVAL

1. REMOVE HEATED OXYGEN SENSOR
- (a) Disconnect the heated oxygen sensor connector.



- (b) Using SST, remove the heated oxygen sensor from the exhaust pipe assembly front No. 3.

SST 09224-00010

NOTICE:

Do not damage the heated oxygen sensor.

INSPECTION

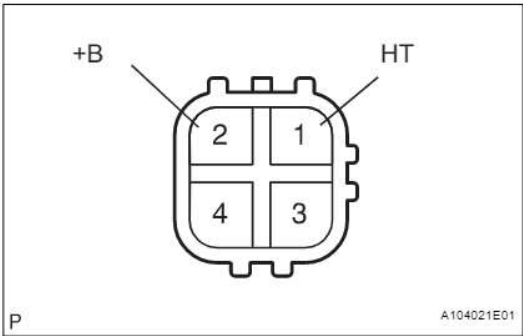
1. INSPECT HEATED OXYGEN SENSOR
- (a) Measure the resistance between terminals 1 (HT) and 2 (+B).

Standard resistance

Condition	Specified Condition
20°C (68°F)	11 to 16 Ω

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

EC



INSTALLATION

1. INSTALL HEATED OXYGEN SENSOR

- (a) Temporarily tighten the heated oxygen sensor.

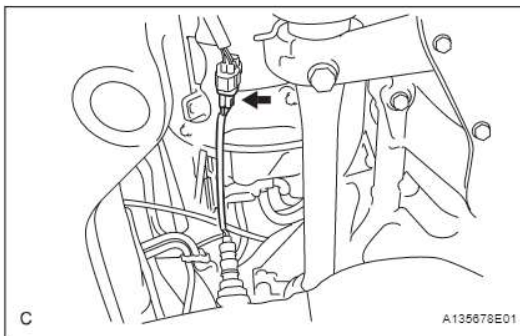
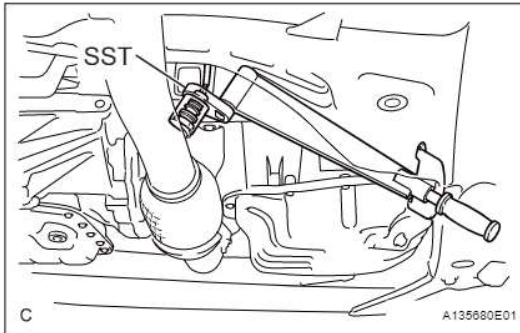
NOTICE:

Do not damage the heated oxygen sensor.

- (b) Using SST, fully tighten the heated oxygen sensor.

SST 09224-00010

Torque: 44 N*m (449 kgf*cm, 32 ft.*lbf)



- (c) Connect the heated oxygen sensor connector.

EC