

# EMISSION CONTROL SYSTEMS

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**NOTE:** TROUBLESHOOTING (See pages EM-6 to 9)

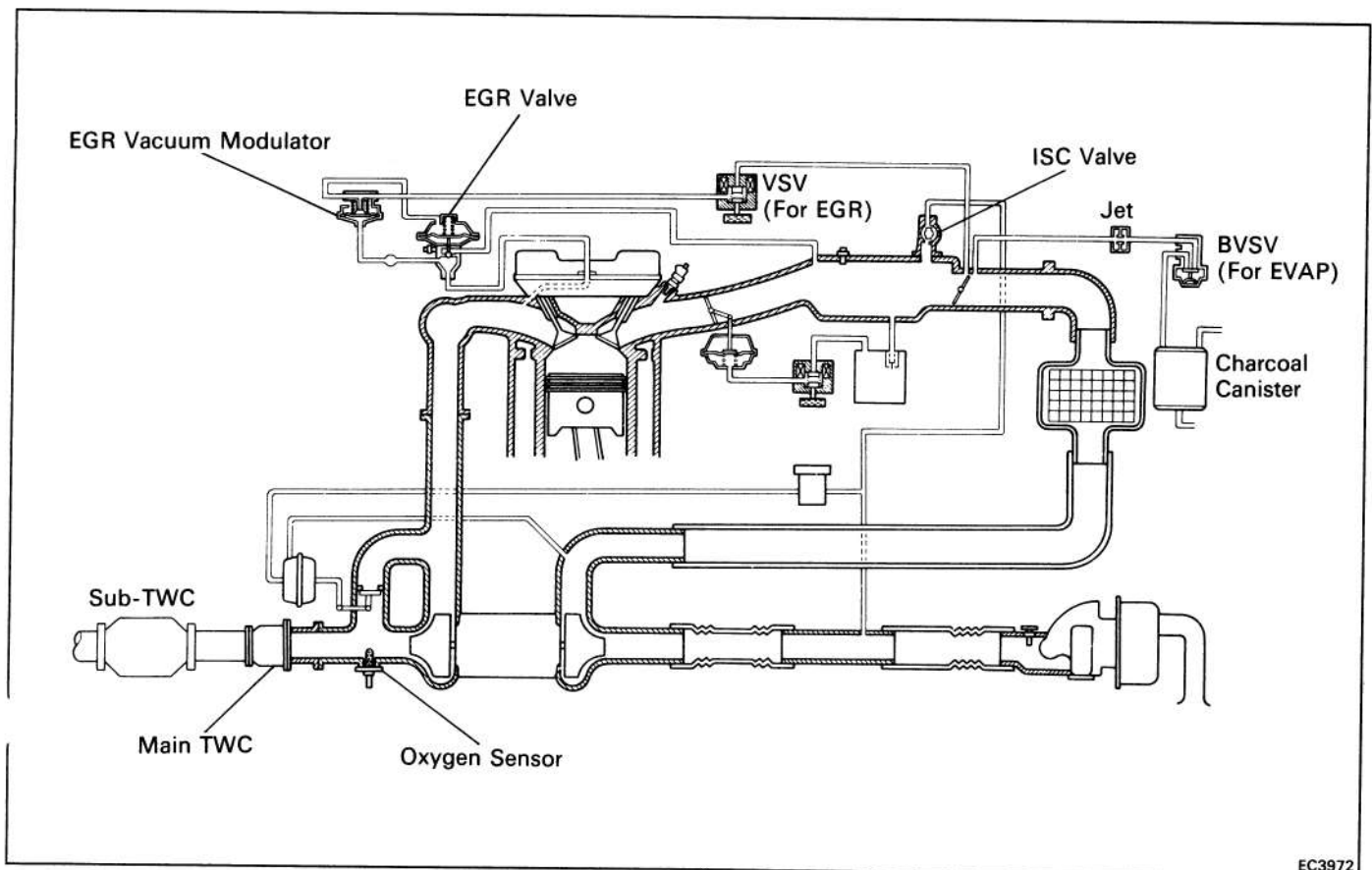
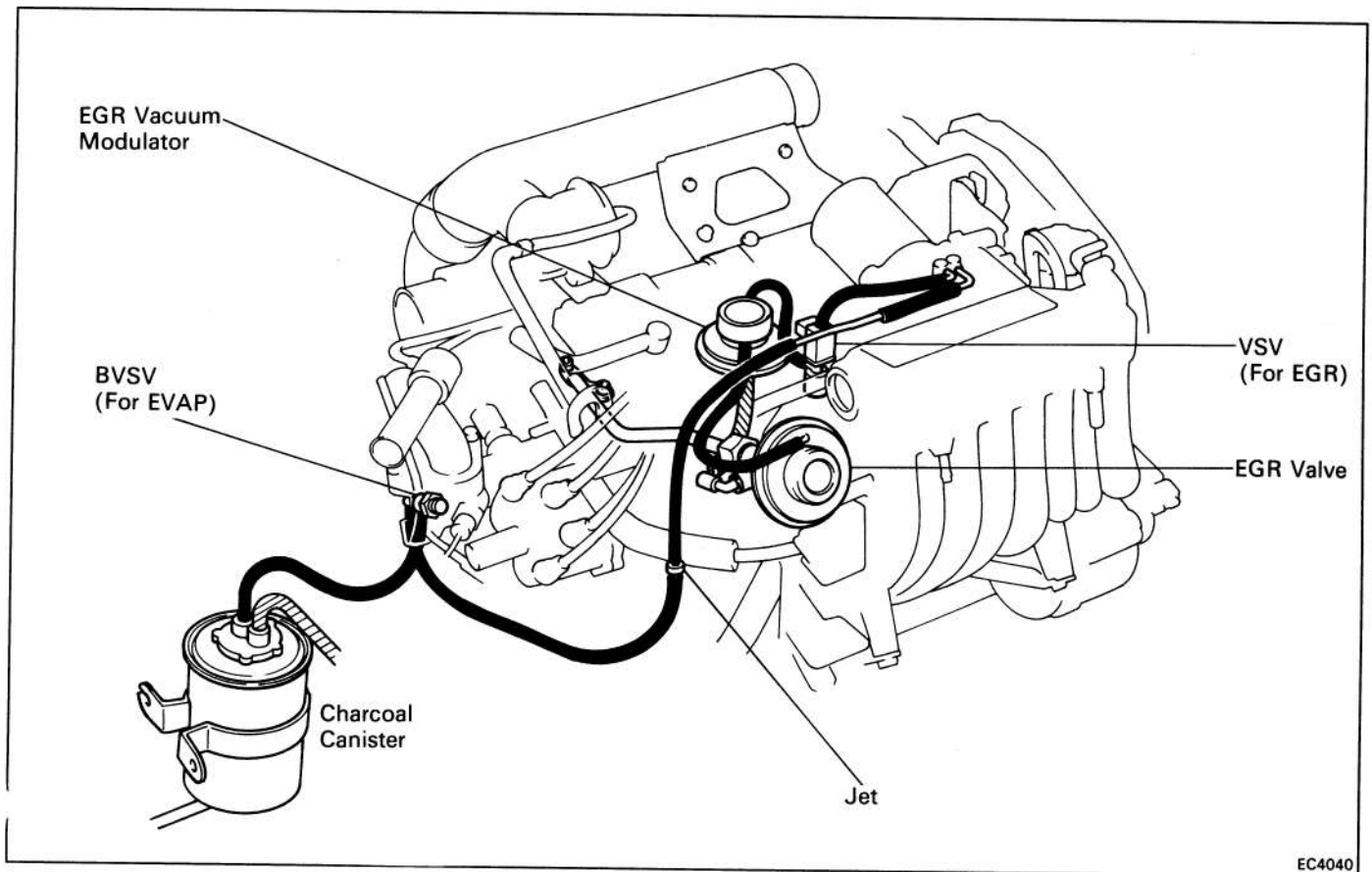
EC

**SYSTEM PURPOSE**

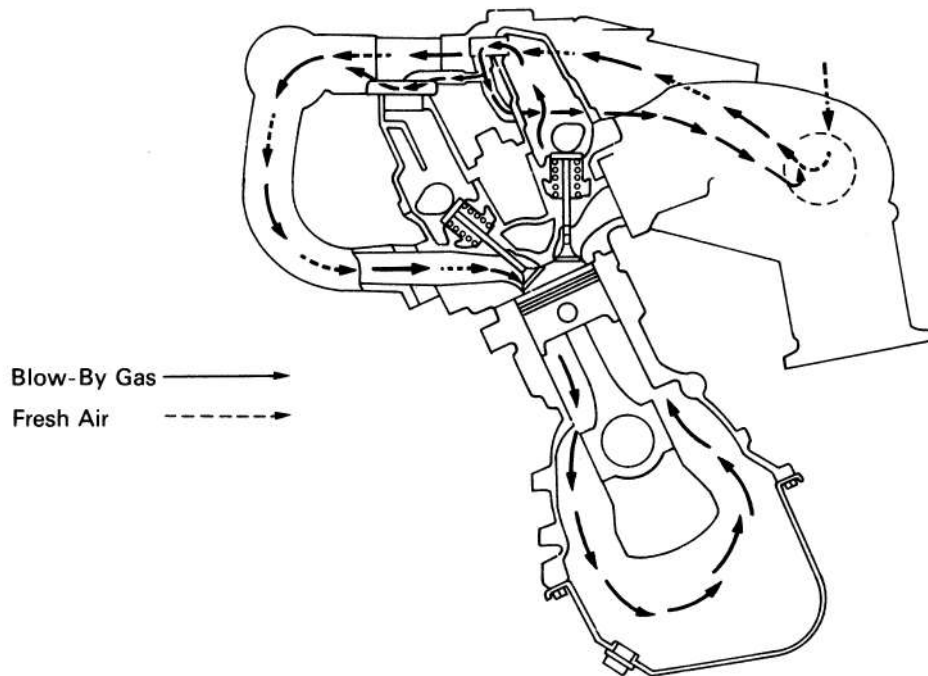
| System                            | Abbreviation | Purpose                                                             |
|-----------------------------------|--------------|---------------------------------------------------------------------|
| Positive Crankcase ventilation    | PCV          | Reduces blow-by gas (HC)                                            |
| Fuel evaporative emission control | EVAP         | Reduces evaporative HC                                              |
| Exhaust gas recirculation         | EGR          | Reduces Nox                                                         |
| Three-way catalyst                | TWC          | Reduces HC, CO and NOx                                              |
| Electronic fuel injection*        | EFI          | Regulates all engine conditions for reduction of exhaust emissions. |

Remarks \* For inspection and repair of the EFI system, refer to EFI section of this manual.

## COMPONENT LAYOUT AND SCHEMATIC DRAWING

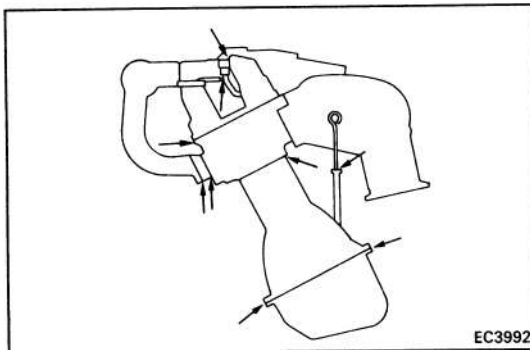


## POSITIVE CRANKCASE VENTILATION (PCV) SYSTEM



EC2829

To reduce HC emissions, crankcase blow-by gas (HC) is routed to the intake manifold for combustion in the cylinders.

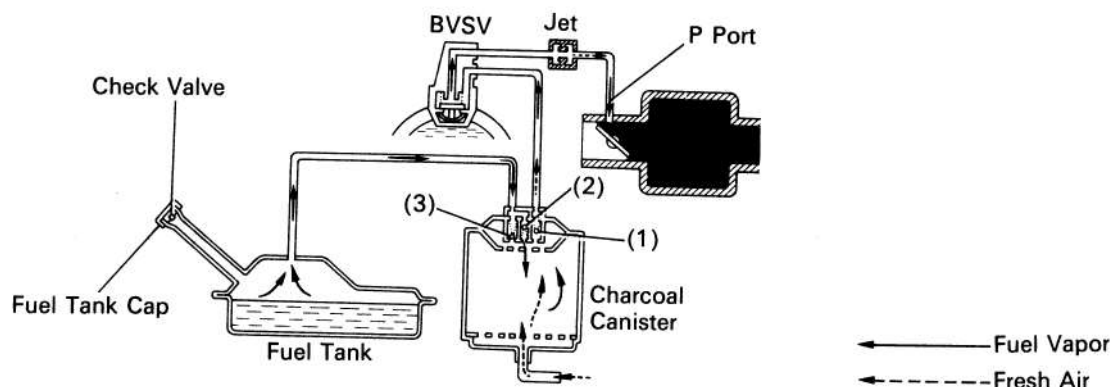


### INSPECTION OF PCV HOSE AND CONNECTIONS

#### VISUALLY INSPECT HOSE AND CONNECTIONS

Check for cracks, leaks or damage.

## FUEL EVAPORATIVE EMISSION CONTROL (EVAP) SYSTEM



EC1572

To reduce HC emission, evaporated fuel from the fuel tank is routed through the charcoal canister to the intake manifold for combustion in the cylinders.

| Coolant Temp.         | BVS    | Throttle Valve Opening  | Canister Check Valve |        |        | Check valve in Cap | Evaporated Fuel (HC)                             |
|-----------------------|--------|-------------------------|----------------------|--------|--------|--------------------|--------------------------------------------------|
|                       |        |                         | (1)                  | (2)    | (3)    |                    |                                                  |
| Below 35°C (95°F)     | CLOSED | —                       | —                    | —      | —      | —                  | HC from tank is absorbed into the canister.      |
| Above 54°C (129°F)    | OPEN   | Positioned below P port | CLOSED               | —      | —      | —                  |                                                  |
|                       |        | Positioned above P port | OPEN                 | —      | —      | —                  | HC from canister is led into air intake chamber. |
| High pressure in tank | —      | —                       | —                    | OPEN   | CLOSED | CLOSED             | HC from tank is absorbed into the canister.      |
| High vacuum in take   | —      | —                       | —                    | CLOSED | OPEN   | OPEN               | Air is led into the fuel tank.                   |

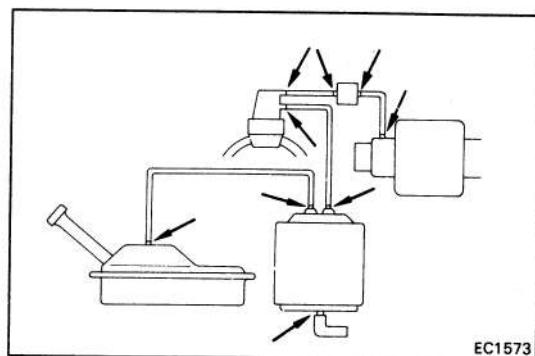
### INSPECTION OF FUEL VAPOR LINES, FUEL TANK AND TANK CAP

- 1. VISUALLY INSPECT LINES AND CONNECTIONS**  
Look for loose connections, sharp bends or damage.
- 2. VISUALLY INSPECT FUEL TANK**  
Look for deformation, cracks or fuel leakage.

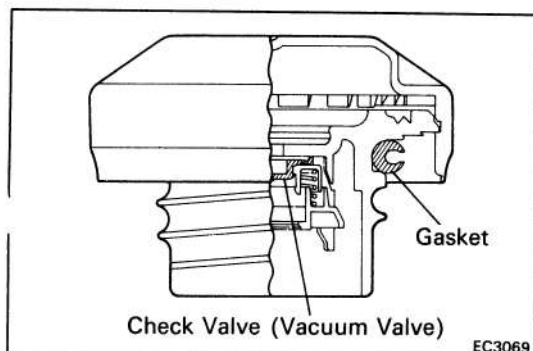
### 3. VISUALLY INSPECT FUEL TANK CAP

Check if the cap and/or gasket are deformed or damaged.

If necessary, repair or replace the cap.

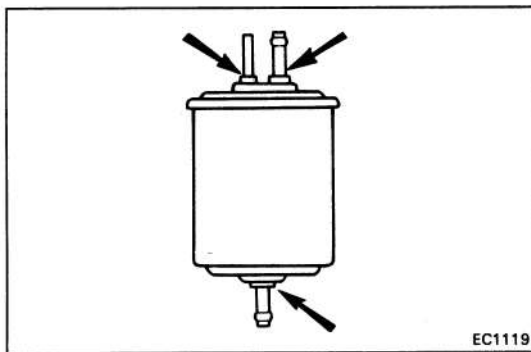


EC1573



Check Valve (Vacuum Valve)

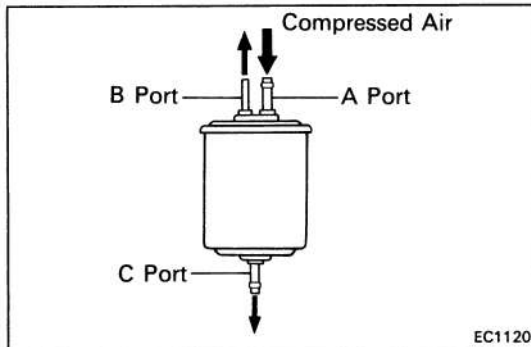
EC3069



## INSPECTION OF CHARCOAL CANISTER

1. REMOVE CHARCOAL CANISTER
2. VISUALLY INSPECT CHARCOAL CANISTER

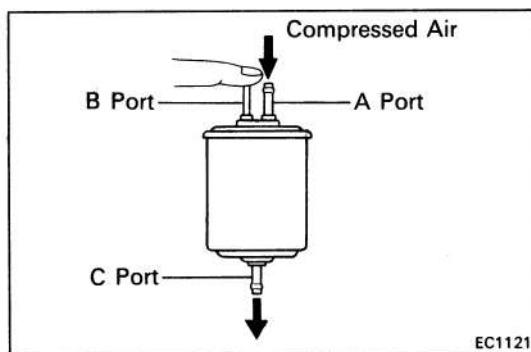
Look for cracks or damage.



3. CHECK FOR CLOGGED FILTER AND STUCK CHECK VALVE

- (a) Using low pressure compressed air, blow into the A port and check that air flows without resistance from the other ports.
- (b) Blow into the B port and check that air does not flow from the other ports.

If a problem is found, replace the charcoal canister.



4. CLEAN FILTER IN CANISTER

Clean the filter by blowing 3 kg/cm<sup>2</sup> (43 psi, 294 kPa) of compressed air into the A port while holding the B port closed.

### NOTICE:

- Do not attempt to wash the canister.
- No activated carbon should come out.

5. REINSTALL CHARCOAL CANISTER

## INSPECTION OF BVSFV

### CHECK BVSFV BY BLOWING AIR INTO PIPE

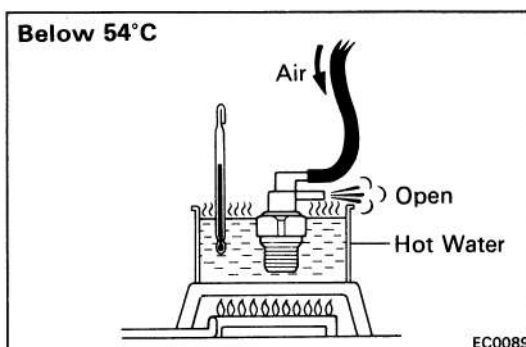
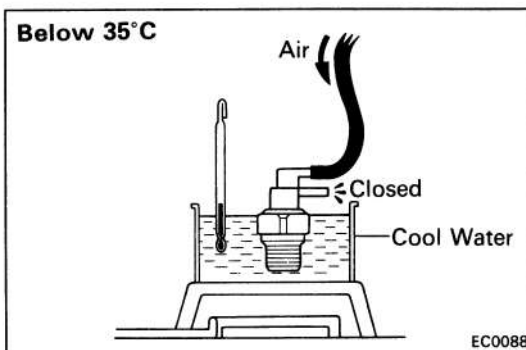
- (a) Drain the coolant from the radiator into a suitable container.
- (b) Remove the BVSFV from the water outlet.
- (c) Cool the BVSFV to below 35°C (95°F) with cool water.
- (d) Blow air into a pipe and check that the BVSFV is closed.
- (e) Heat the BVSFV to above 54°C (129°F) with hot water.
- (f) Blow air into a pipe and check that the BVSFV is open.

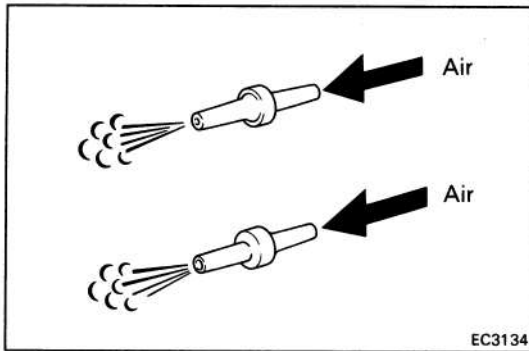
If a problem is found, replace the BVSFV.

- (g) Apply adhesive to two or three threads of the BVSFV, and reinstall.

**Adhesive:** Part No. 08833-00070, THREE BOND 1324 or equivalent

- (h) Refill the radiator with coolant.

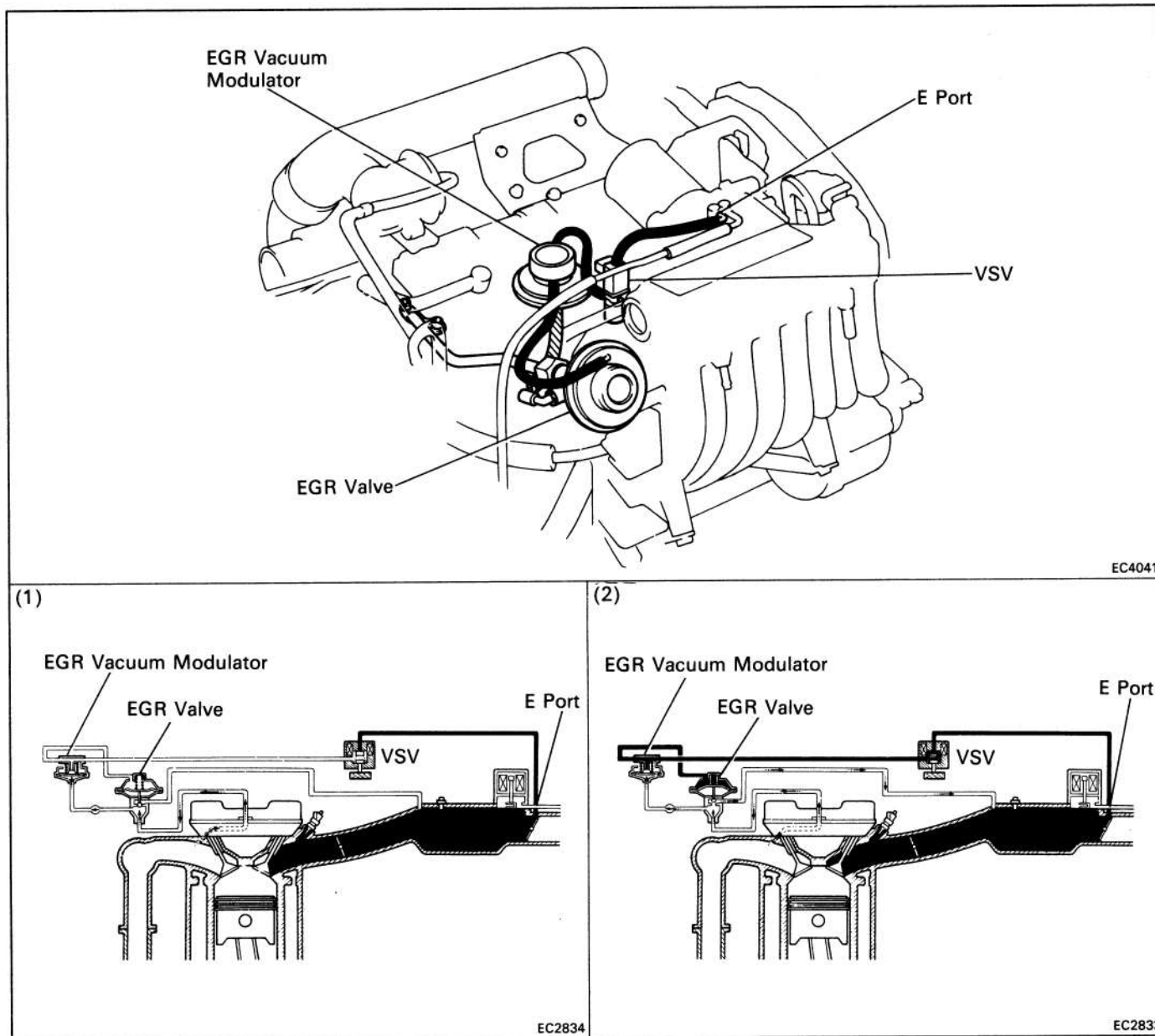




## **INSPECTION OF JET**

- 1. INSPECT JET BY BLOWING AIR FROM EACH SIDE**  
Check for stoppage.

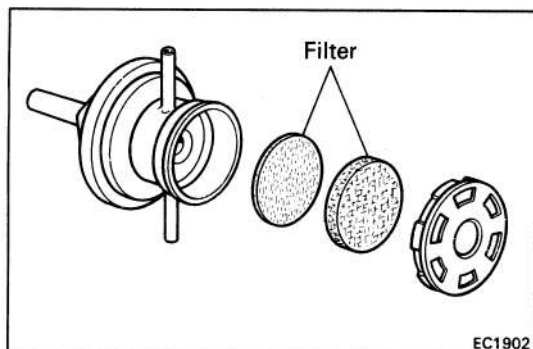
## EXHAUST GAS RECIRCULATION (EGR) SYSTEM



To reduce NO<sub>x</sub> emissions, part of the exhaust gases are recirculated through the EGR valve to the intake manifold to lower the maximum combustion temperature.

| Coolant temp.      | VSV    | Throttle Valve Opening Angle | Pressure in the EGR Valve Pressure Chamber |   | EGR Vacuum Modulator         | EGR Valve | Exhaust Gas             |
|--------------------|--------|------------------------------|--------------------------------------------|---|------------------------------|-----------|-------------------------|
| Below 54°C (129°F) | CLOSED | —                            | —                                          |   | —                            | CLOSED    | Not recirculated        |
| Above 60°C (140°F) | OPEN   | Positioned above E port      | (1)                                        | — | —                            | CLOSED    | Not recirculated        |
|                    |        | Positioned below E port      | (2)                                        | * | CLOSED passage to atmosphere | OPEN      | Recirculated (increase) |

Remarks: \* When the throttle valve is positioned above the E port, the EGR vacuum modulator will close the atmosphere passage and open the EGR valve to increase the EGR gas, even if the exhaust pressure is insufficiently low.

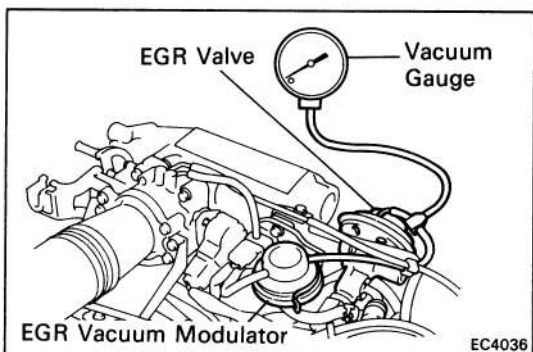


## INSPECTION OF EGR SYSTEM

### 1. CHECK AND CLEAN FILTERS IN EGR VACUUM MODULATOR

- Check the filters for contamination or damage.
- Using compressed air, clean the filters.

**HINT:** Install the filters with the coarser surface facing the atmospheric side (outward).



### 2. PREPARATION

Using a 3-way connector, connect a vacuum gauge to the hose between the EGR valve and vacuum modulator.

### 3. CHECK SEATING OF EGR VALVE

Start the engine and check that the engine starts and runs at idle.

#### COLD

2,500 rpm

Zero Vacuum



Tachometer

Vacuum Gauge

EC0137 EC0128

### 4. CHECK VSV WITH COLD ENGINE

- The coolant temperature should be below 54°C (129°F).
- Check that the vacuum gauge indicates zero vacuum at 2,500 rpm.

#### HOT

2,500 rpm

Low Vacuum



Tachometer

Vacuum Gauge

EC0137 EC0129

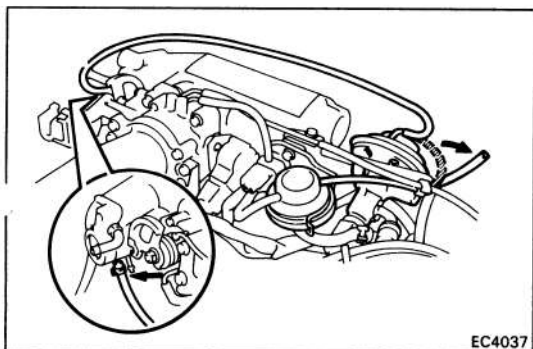
### 5. CHECK VSV WITH HOT ENGINE

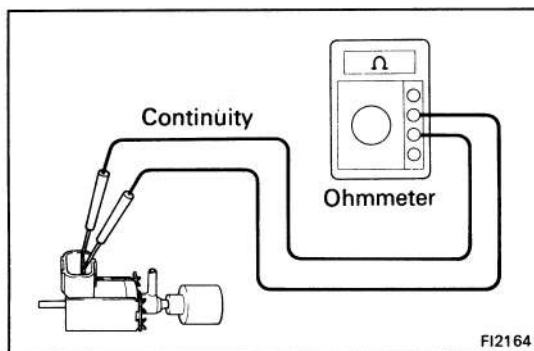
- Warm up the engine.
- Check that the vacuum gauge indicates low vacuum at 2,500 rpm.

### 6. CHECK EGR VALVE

- Apply vacuum directly to the EGR valve with the engine idling.
- Check that the engine runs rough or dies.
- Reconnect the vacuum hoses to the proper locations.

**IF NO PROBLEM IS FOUND WITH THIS INSPECTION, SYSTEM IS NORMAL; OTHERWISE INSPECT EACH PART**





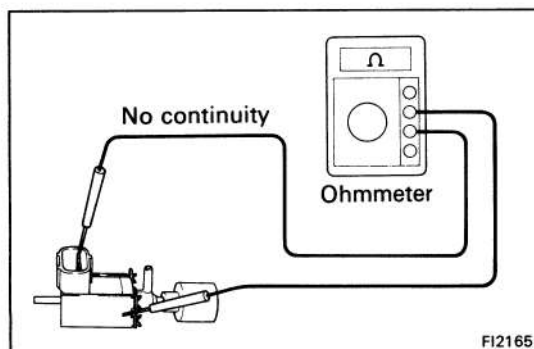
## INSPECTION OF VSV

### 1. CHECK VSV FOR OPEN CIRCUIT

Using an ohmmeter, check that there is continuity between the terminals.

**Resistance (Cold): 33 – 39  $\Omega$**

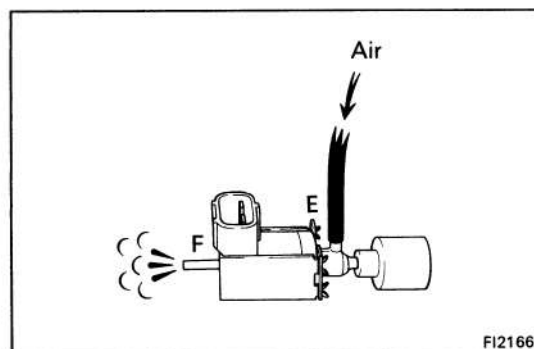
If there is no continuity, replace the VSV.



### 2. CHECK VSV FOR GROUND

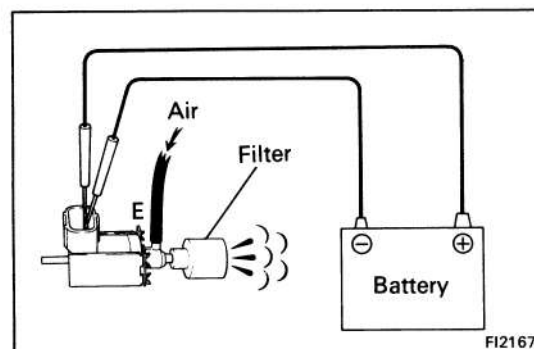
Using an ohmmeter, check that there is no continuity between each terminal and the body.

If there is continuity, replace the VSV.



### 3. CHECK VSV OPERATION

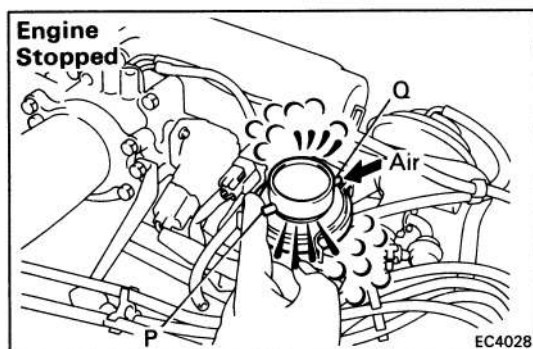
- (a) Check that air flows from ports E to F.



- (b) Apply battery voltage across the terminals.

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

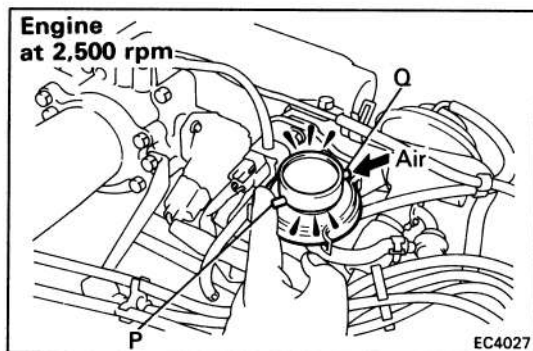
If operation is not as specified, replace the VSV.



## INSPECTION OF EGR VACUUM MODULATOR

### CHECK EGR VACUUM MODULATOR OPERATION

- Disconnect the vacuum hoses from ports P and Q of the EGR vacuum modulator.
- Block port one side with your finger.
- Blow air into another port, and check that the air passes through to the air filter side freely.



- (d) Start the engine, and maintain speed at 2,500 rpm.
- (e) Repeat the above test. Check that there is a strong resistance to air flow.
- (f) Reconnect the vacuum hoses to the proper locations.

## INSPECTION OF EGR VALVE

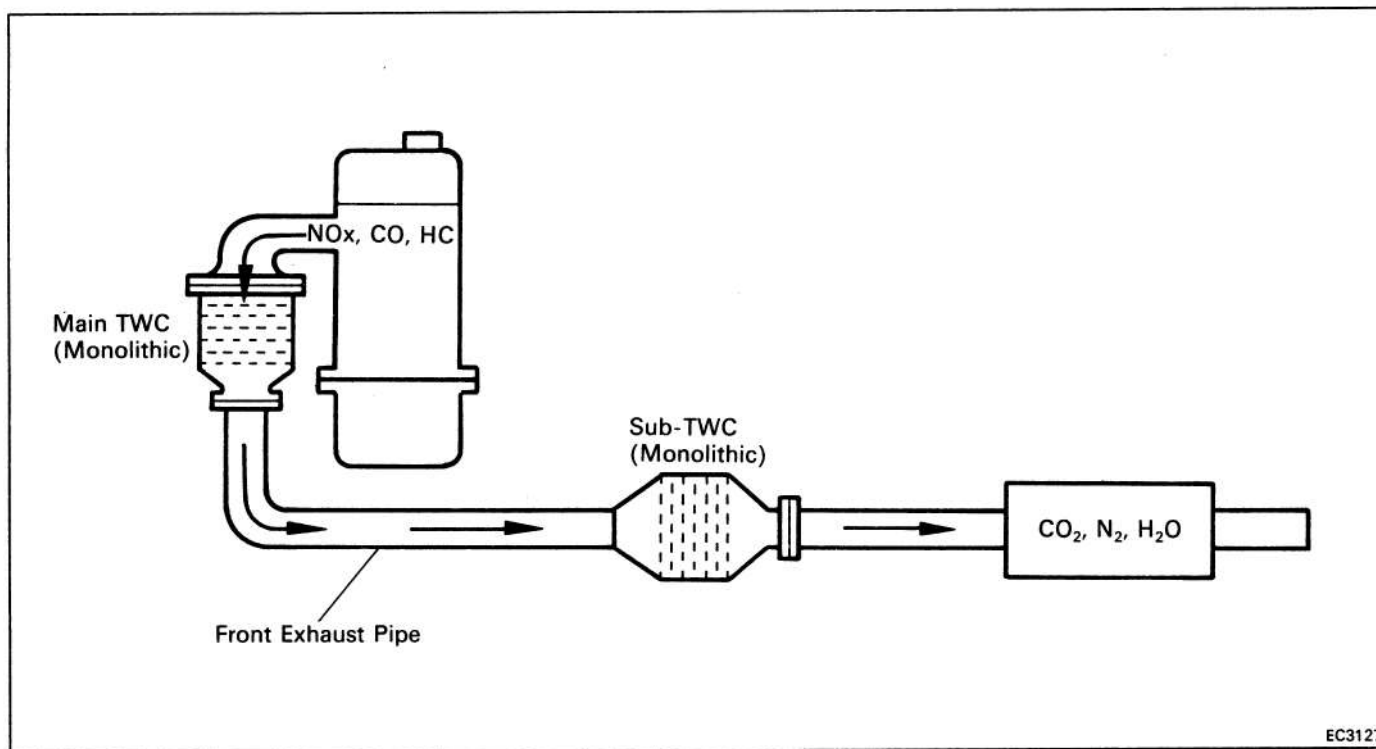
### 1. REMOVE EGR VALVE

Check for sticking and heavy carbon deposits.  
If a problem is found, replace the valve.

### 2. REINSTALL EGR VALVE

Install a new gasket.

## THREE-WAY CATALYST (TWC) SYSTEM

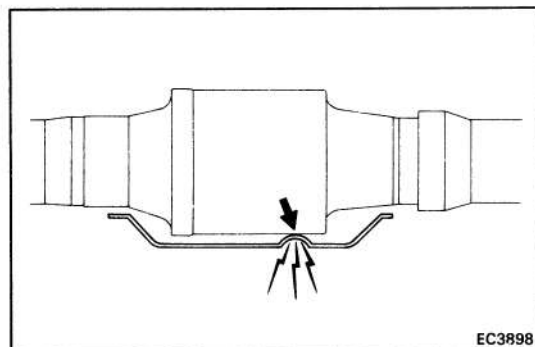


To reduce HC, CO and NO<sub>x</sub> emissions, they are oxidized, reduced and converted to nitrogen (N<sub>2</sub>), carbon dioxide (CO<sub>2</sub>) and water (H<sub>2</sub>O) by the catalyst.

| Exhaust Port               |   | Main TWC                |   | Sub-TWC                 |   | Exhaust Gas                                           |
|----------------------------|---|-------------------------|---|-------------------------|---|-------------------------------------------------------|
| HC, CO AND NO <sub>x</sub> | → | OXIDATION AND REDUCTION | → | OXIDATION AND REDUCTION | → | CO <sub>2</sub><br>H <sub>2</sub> O<br>N <sub>2</sub> |

### INSPECTION OF EXHAUST PIPE ASSEMBLY

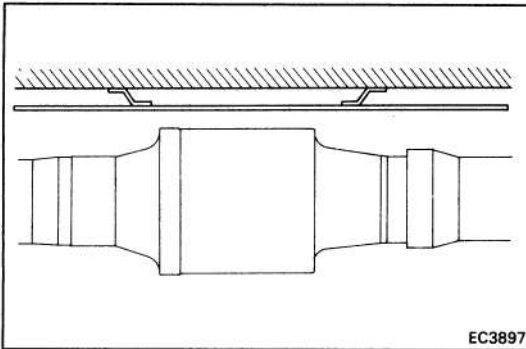
1. CHECK CONNECTIONS FOR LOOSENESS OR DAMAGE
2. CHECK CLAMPS FOR WEAKNESS, CRACKS OR DAMAGE



### INSPECTION OF CATALYTIC CONVERTER (Sub-Catalytic Converter)

#### CHECK FOR DENTS OR DAMAGE

If any part of protector is damaged or dented to the extent that it contacts the converter, repair or replace it.



## INSPECTION OF HEAT INSULATOR (Sub-Catalytic Converter)

1. CHECK HEAT INSULATOR FOR DAMAGE
2. CHECK FOR ADEQUATE CLEARANCE BETWEEN CATALYTIC CONVERTER AND HEAT INSULATOR

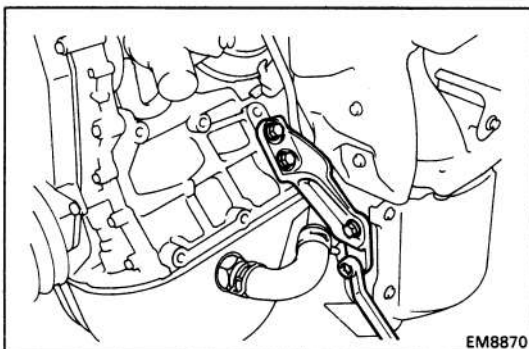
## REPLACEMENT OF CATALYTIC CONVERTERS

### (Main Catalytic Converter)

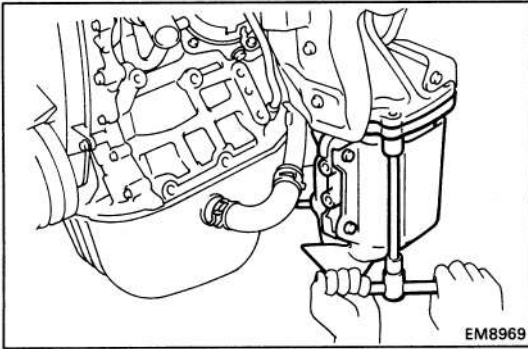
1. DISCONNECT CABLE FROM NEGATIVE TERMINAL OF BATTERY

**CAUTION:** Work must be started after approx. 20 seconds or longer from the time the ignition switch is turned to the "LOCK" position and the negative (-) terminal cable is disconnected from the battery.

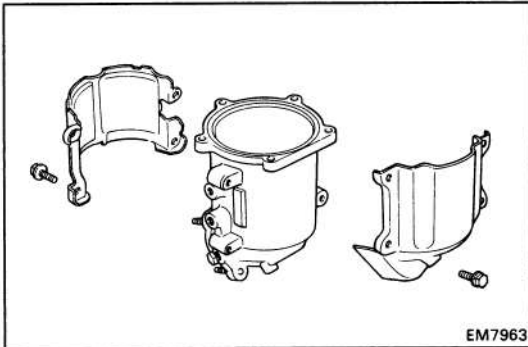
2. REMOVE ENGINE UNDER COVERS
3. REMOVE NO.1 AND NO.2 AIR INTAKE CONNECTORS  
(See steps 10 and 11 on page EM-134)
4. REMOVE TAILPIPE  
(See step 1 on page EC-15)
5. REMOVE FRONT EXHAUST PIPE  
(See step 2 on page EC-16)
6. REMOVE IDLER PULLEY BRACKET AND A/C COMPRESSOR WITHOUT DISCONNECTING HOSES  
(See step 33 on pages EM-139 and 140)
7. REMOVE MAIN CATALYTIC CONVERTER
  - (a) Check that the converter is cool.
  - (b) Remove the four bolts and RH converter stay.



- (c) Remove the three bolts and LH converter stay.

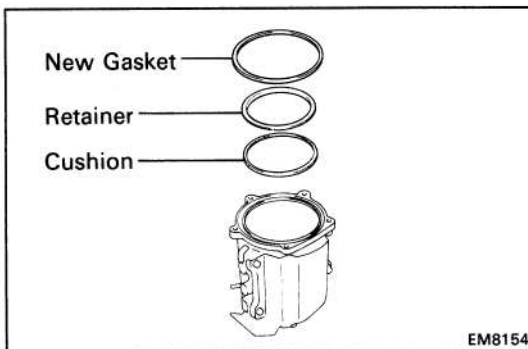


- (d) Remove the three bolts, two nuts, converter, gasket, retainer and cushion.
- (e) Remove the nine bolts and two heat insulator from the converter.

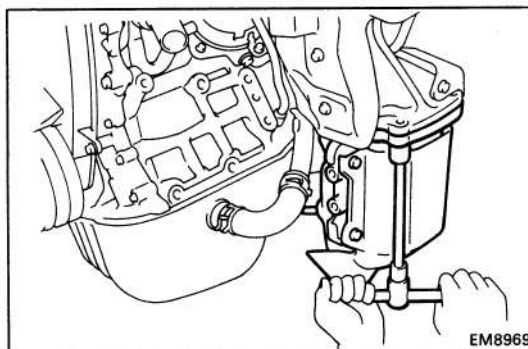


## 8. REINSTALL MAIN CATALYTIC CONVERTER

- (a) Install the two heat insulators to a new converter with the nine bolts.

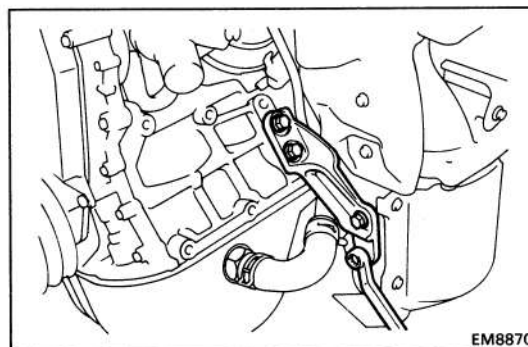


- (b) Place the cushion, retainer and a new gasket on the converter.



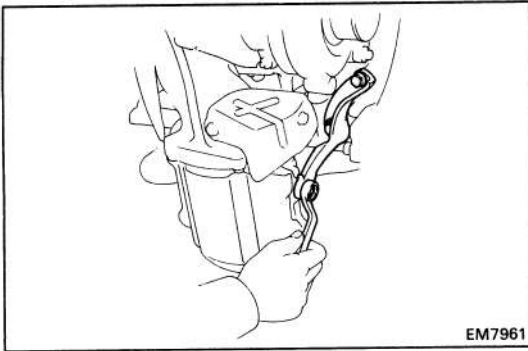
- (c) Install the converter with the three bolts and two new nuts.

**Torque: 300 kg-cm (21 ft-lb, 29 N·m)**



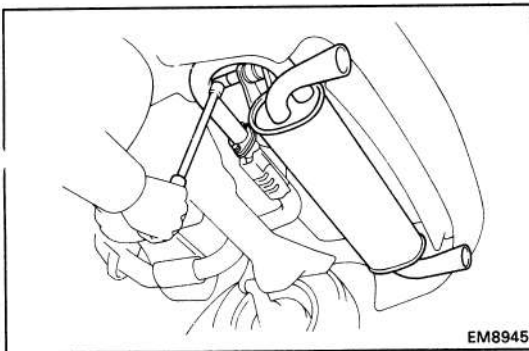
- (d) Install the RH converter stay with the four bolts.

**Torque: 600 kg-cm (43 ft-lb, 59 N·m)**



(e) Install the LH converter stay with the three bolts.  
Torque: 600 kg-cm (43 ft-lb, 59 N·m)

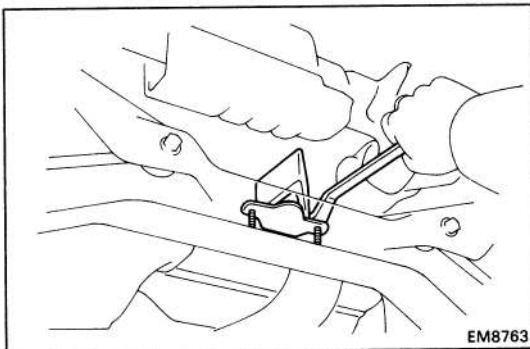
9. **REINSTALL IDLER PULLEY BRACKET AND A/C COMPRESSOR WITHOUT DISCONNECTING HOSES**  
(See step 16 on pages EM-173 and 174)
10. **REINSTALL FRONT EXHAUST PIPE**  
(See step 3 on page EC-17)
11. **REINSTALL TAILPIPE**  
(See step 4 on page EC-18)
12. **REINSTALL NO.1 AND NO.2 AIR INTAKE CONNECTORS**  
(See steps 38 and 39 on page EM-179)
13. **REINSTALL ENGINE UNDER COVERS**
14. **CONNECT CABLE TO NEGATIVE TERMINAL OF BATTERY**



### (Sub-Catalytic Converter)

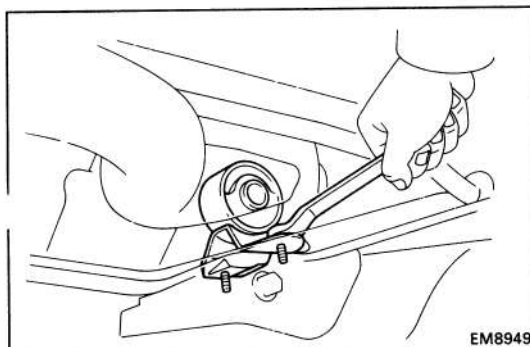
#### 1. REMOVE TAILPIPE

- (a) Remove the two bolts holding the front exhaust pipe to the tailpipe stopper bracket.
- (b) Remove the two bolts holding the front exhaust pipe to the tailpipe. Remove the gasket.
- (c) Remove the two through bolts and tailpipe.

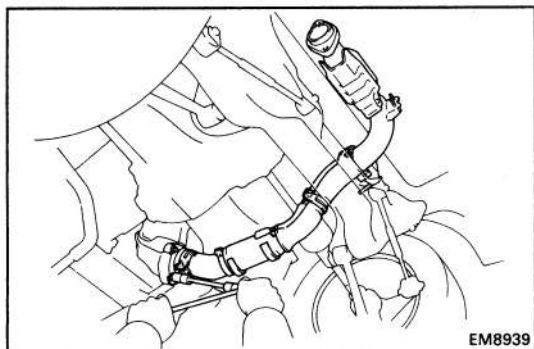


#### 2. REMOVE FRONT EXHAUST PIPE (SUB-CATALYTIC CONVERTER)

- (a) Remove the two bolts and damper.

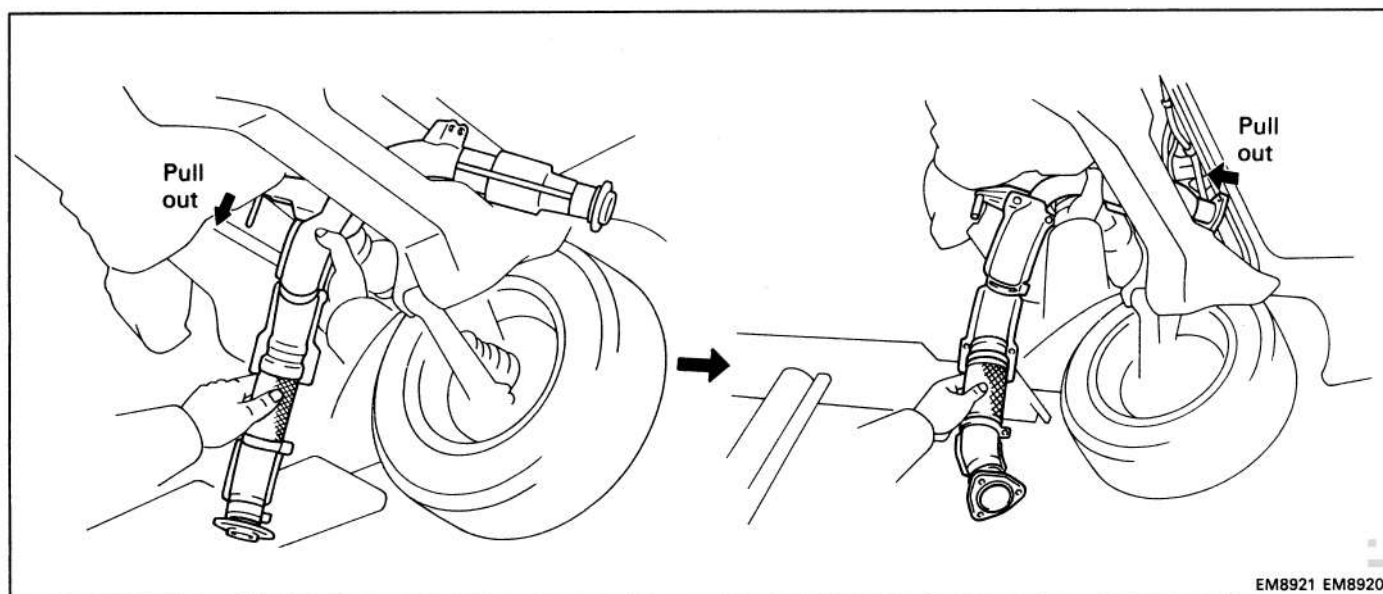


- (b) Remove the two bolts and support bracket.



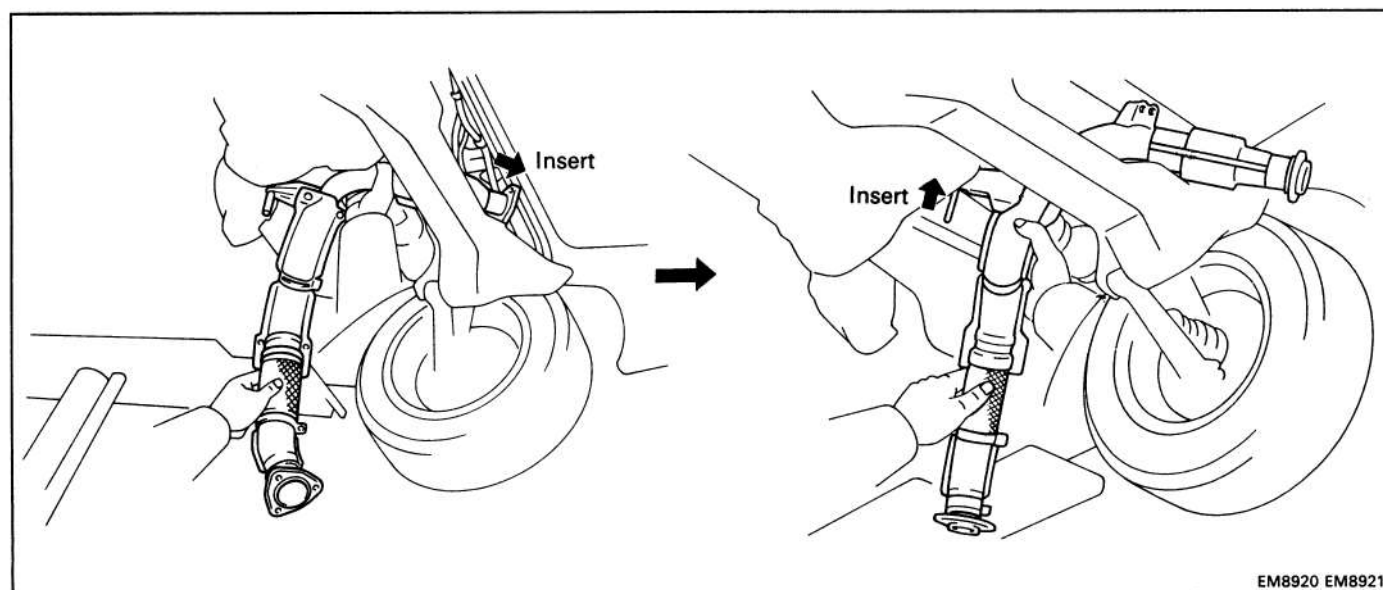
- (c) Using a 14 mm deep socket wrench, remove the three nuts, front exhaust pipe and gasket.

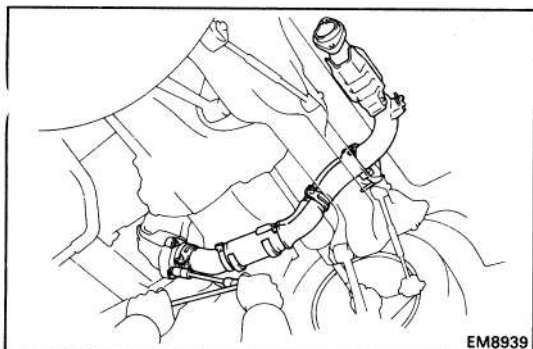
**HINT:** Passing the exhaust pipe rear side between the body and suspension crossmember is not easy, so follow the method in the illustration.



### 3. REINSTALL FRONT EXHAUST PIPE (SUB-CATALYTIC CONVERTER)

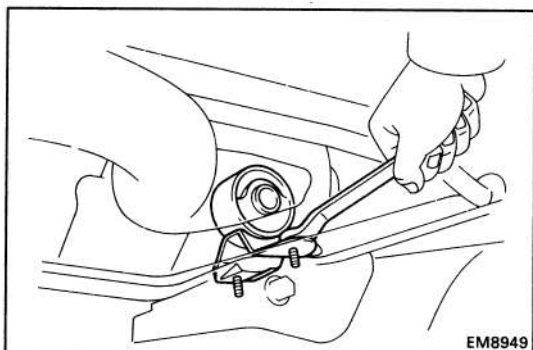
**HINT:** Passing the exhaust pipe rear side between the body and suspension crossmember is not easy, so follow the method in the illustration.



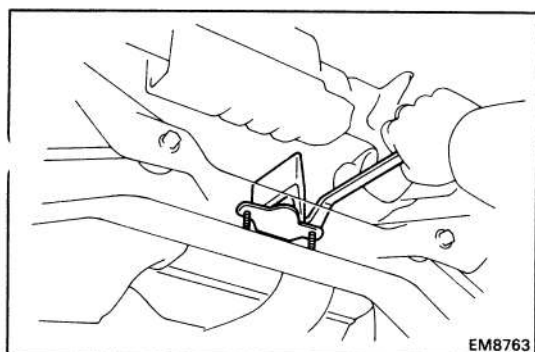


- (a) Place a new gasket on the front of the front exhaust pipe.
- (b) Using a 14 mm deep socket wrench, install the front exhaust pipe with three new nuts.

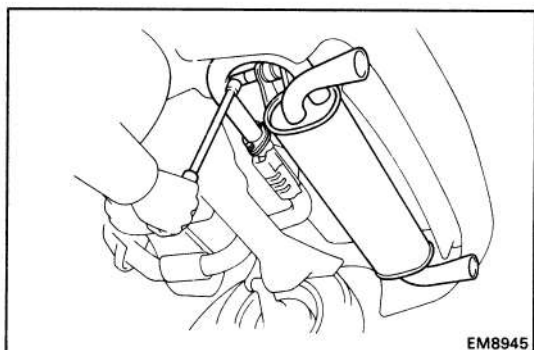
**Torque: 630 kg-cm (46 ft-lb, 62 N·m)**



- (c) Install the support bracket with the two bolts.
- Torque: 210 kg-cm (15 ft-lb, 21 N·m)**



- (d) Install the damper with the two bolts.
- Torque: 210 kg-cm (15 ft-lb, 21 N·m)**



#### 4. INSTALL TAILPIPE

- (a) Install the tailpipe with the two through bolts.
- (b) Place a new gasket between the exhaust pipe and tailpipe.
- (c) Temporarily install the two bolts holding the front exhaust pipe to the tailpipe.
- (d) Install the two bolts holding the stopper bracket of the front exhaust pipe to the tailpipe stopper bracket.

**Torque: 190 kg-cm (14 ft-lb, 19 N·m)**

- (e) Tighten the two bolts holding the front exhaust pipe to the tail pipe.

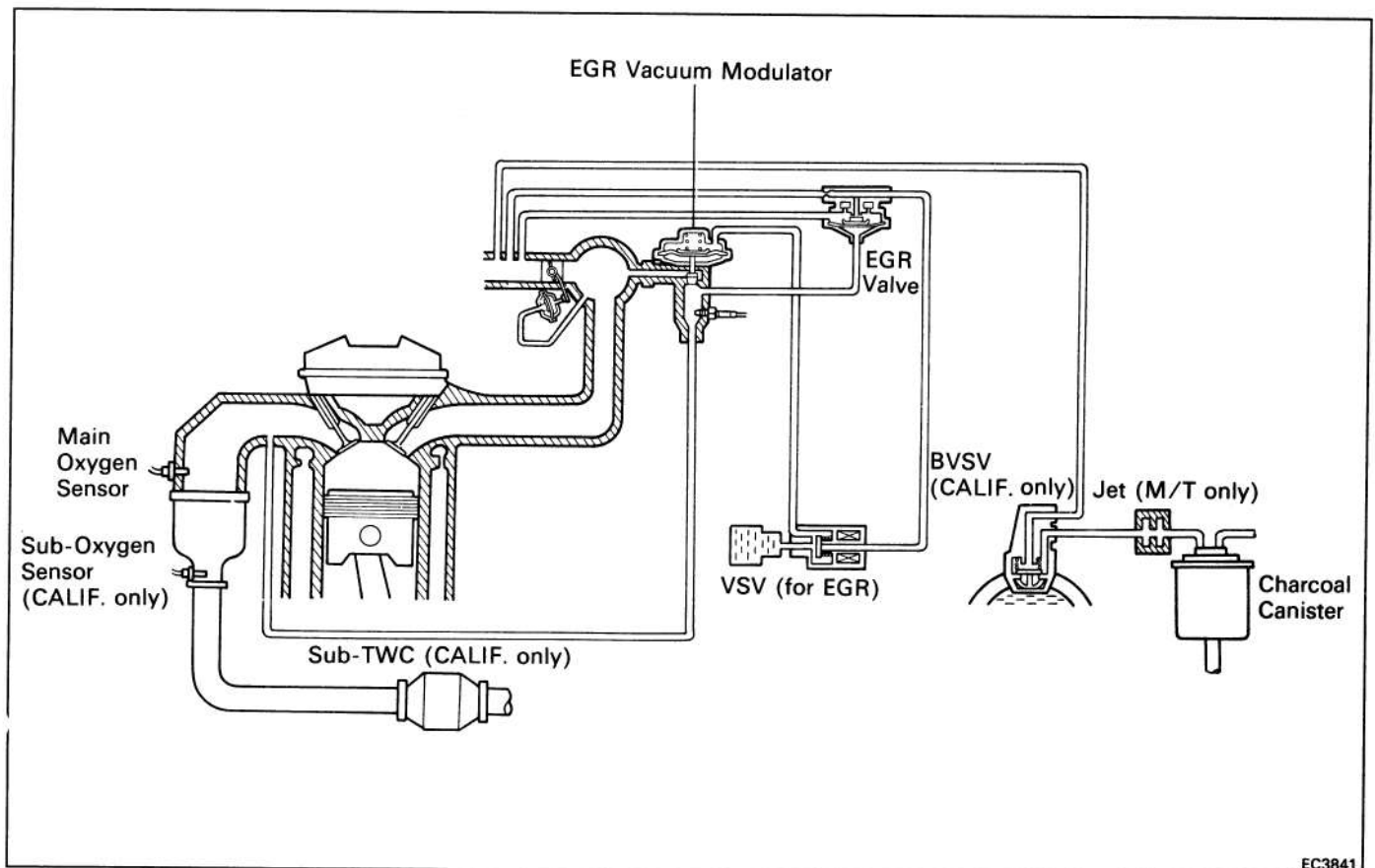
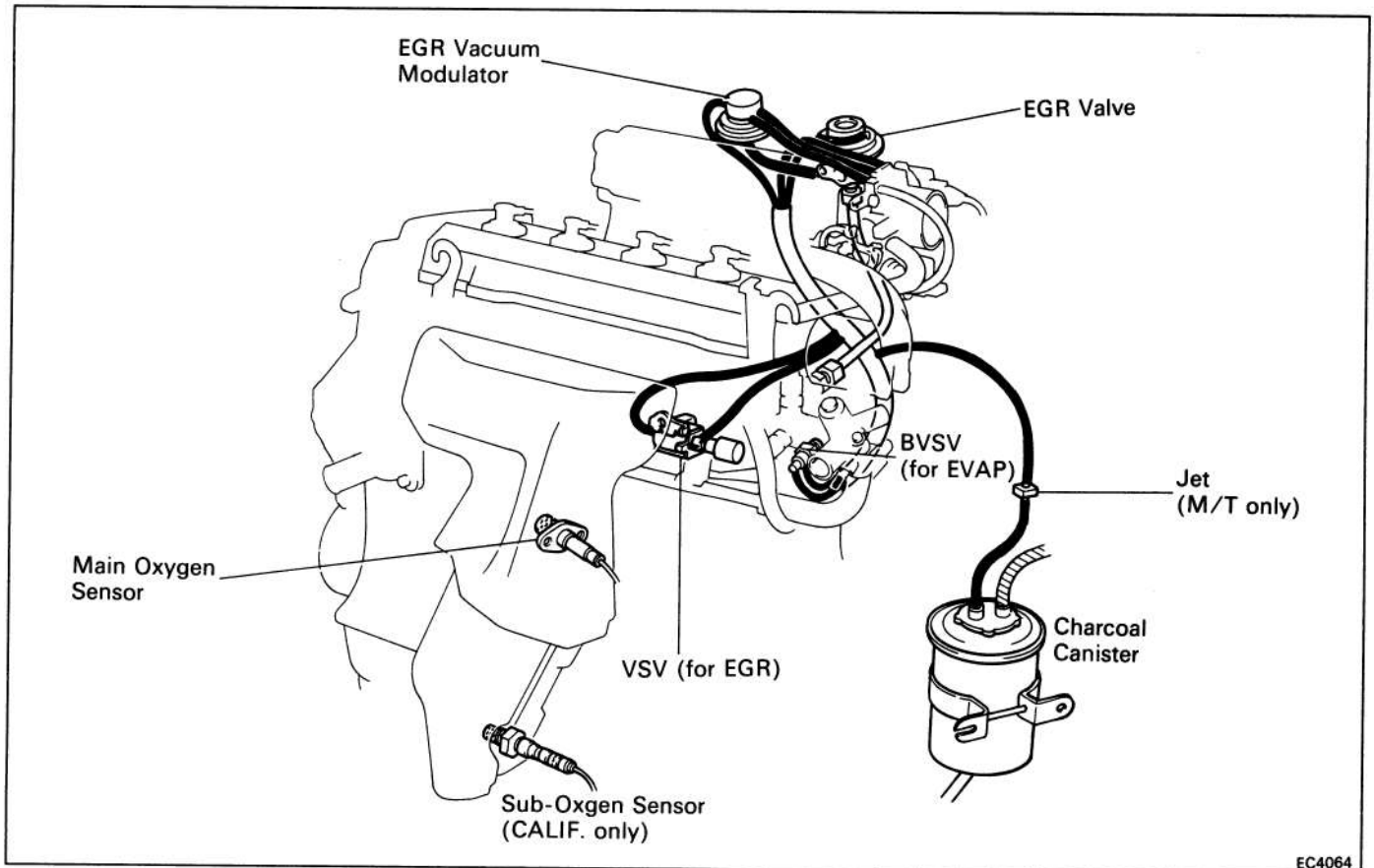
**Torque: 440 kg-cm (32 ft-lb, 43 N·m)**

**SYSTEM PURPOSE**

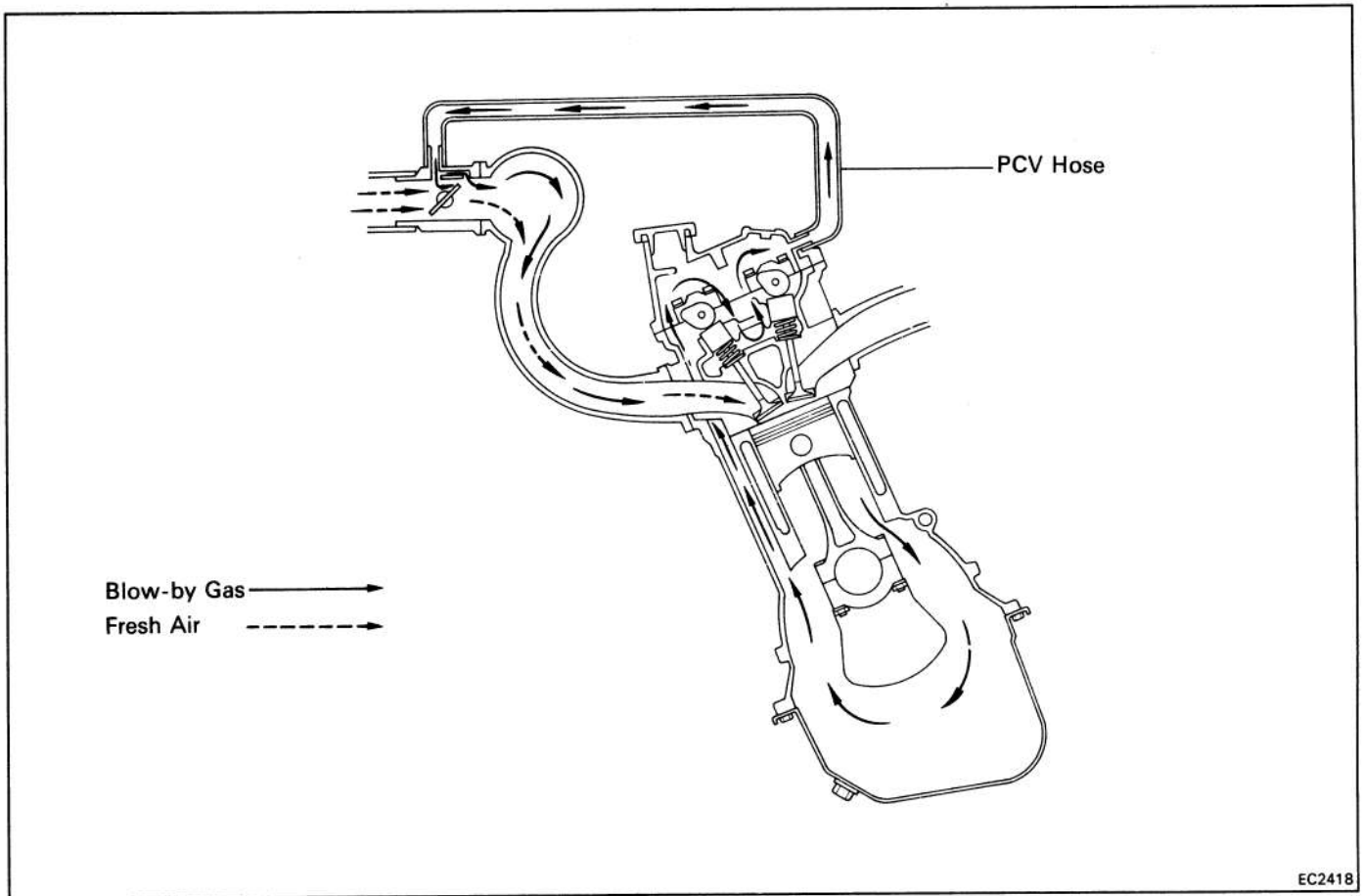
| System                            | Abbreviation | Purpose                                                             |
|-----------------------------------|--------------|---------------------------------------------------------------------|
| Positive Crankcase ventilation    | PCV          | Reduces blow-by gas (HC)                                            |
| Fuel evaporative emission control | EVAP         | Reduces evaporative HC                                              |
| Exhaust gas recirculation         | EGR          | Reduces NOx                                                         |
| Three-way catalyst                | TWC          | Reduces HC, CO and NOx                                              |
| Electronic fuel injection*        | EFI          | Regulates all engine conditions for reduction of exhaust emissions. |

Remarks \* For inspection and repair of the EFI system, refer to EFI section of this manual.

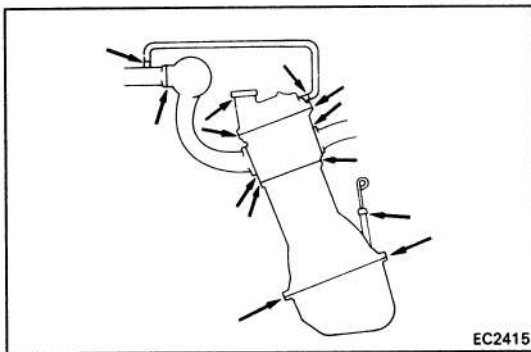
# COMPONENT LAYOUT AND SCHEMATIC DRAWING



## POSITIVE CRANKCASE VENTILATION (PCV) SYSTEM



To reduce HC emission, crankcase blow-by gas (HC) is routed to the intake manifold for combustion in the cylinders.

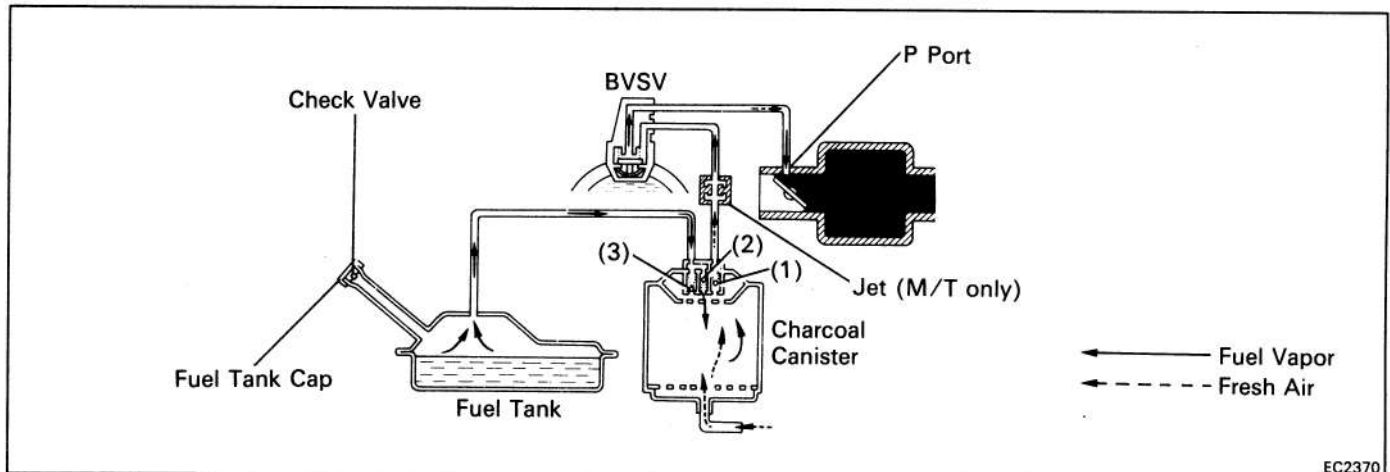


### INSPECTION OF PCV HOSE AND CONNECTIONS

#### VISUALLY INSPECT HOSE AND CONNECTIONS

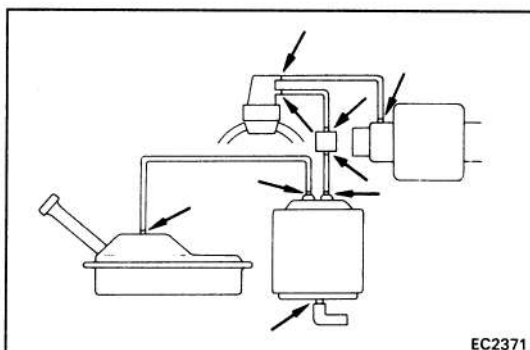
Check for cracks, leaks or damage.

## FUEL EVAPORATIVE EMISSION CONTROL (EVAP) SYSTEM



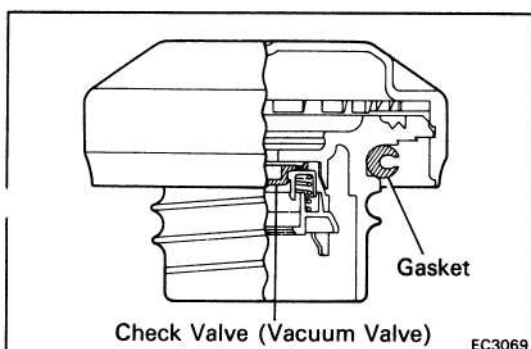
To reduce HC emission, evaporated fuel from the fuel tank is routed through the charcoal canister to the intake manifold for combustion in the cylinders.

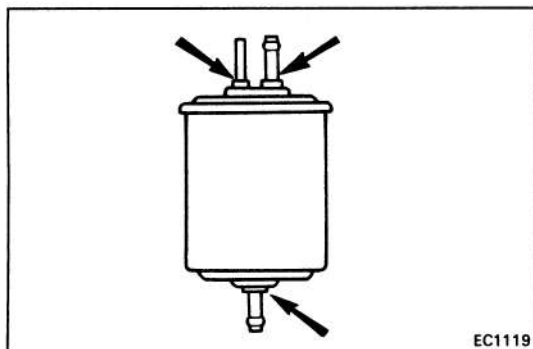
| Coolant Temp.         | BVS    | Throttle Valve Opening  | Canister Check Valve |        |        | Check Valve in Cap | Evaporated Fuel (HC)                              |
|-----------------------|--------|-------------------------|----------------------|--------|--------|--------------------|---------------------------------------------------|
|                       |        |                         | (1)                  | (2)    | (3)    |                    |                                                   |
| Below 35°C (95°F)     | CLOSED | —                       | —                    | —      | —      | —                  | HC from tank is absorbed into the canister.       |
| Above 54°C (129°F)    | OPEN   | Positioned below P Port | CLOSED               | —      | —      | —                  |                                                   |
|                       |        | Positioned above P Port | OPEN                 | —      | —      | —                  | HC from canister is led into air intake canister. |
| High pressure in tank | —      | —                       | —                    | OPEN   | CLOSED | CLOSED             | HC from tank is absorbed into the canister.       |
| High vacuum intake    | —      | —                       | —                    | CLOSED | OPEN   | OPEN               | Air is led into the fuel tank.                    |



### INSPECTION OF FUEL VAPOR LINES, FUEL TANK AND TANK CAP

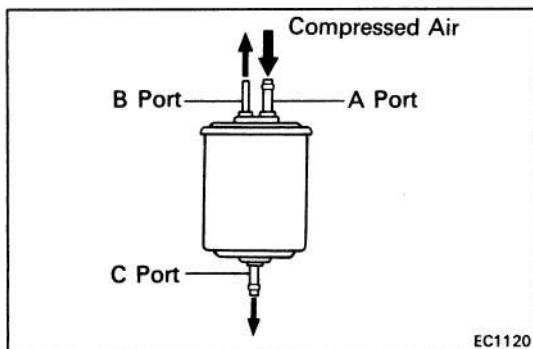
- 1. VISUALLY INSPECT LINES AND CONNECTIONS**  
Look for loose connections, sharp bends or damage.
- 2. VISUALLY INSPECT FUEL TANK**  
Look for deformation, cracks or fuel leakage.
- 3. VISUALLY INSPECT FUEL TANK CAP**  
Check if the cap and/or gasket are deformed or damaged.  
If necessary, repair or replace the cap.





## INSPECTION OF CHARCOAL CANISTER

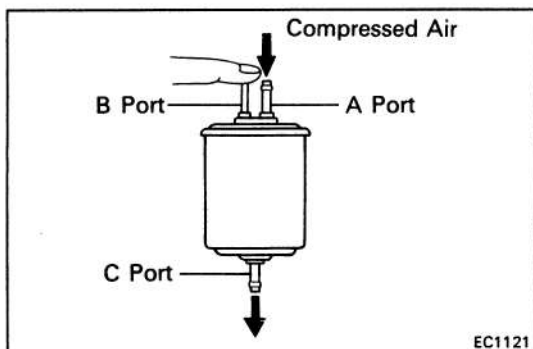
1. REMOVE CHARCOAL CANISTER
2. VISUALLY INSPECT CHARCOAL CANISTER  
Look for cracks or damage.



### 3. CHECK FOR CLOGGED FILTER AND STUCK CHECK VALVE

- (a) Using low pressure compressed air, blow into the A port and check that air flows without resistance from the other ports.
- (b) Blow into the B port and check that air does not flow from the other ports.

If a problem is found, replace the charcoal canister.



### 4. CLEAN FILTER IN CANISTER

Clean the filter by blowing  $3 \text{ kg/cm}^2$  (43 psi, 294 kPa) of compressed air into the A port while holding the B port closed.

#### NOTICE:

- Do not attempt to wash the canister.
- No activated carbon should come out.

### 5. REINSTALL CHARCOAL CANISTER

## INSPECTION OF BVSV

### CHECK BVSV BY BLOWING AIR INTO PIPE

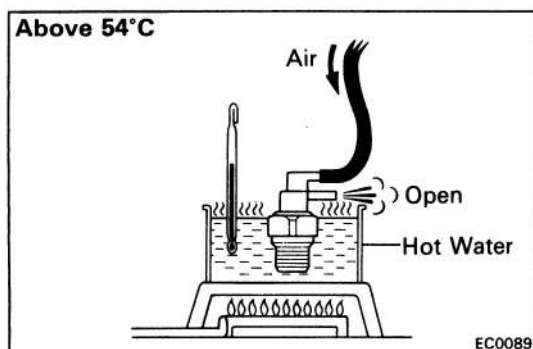
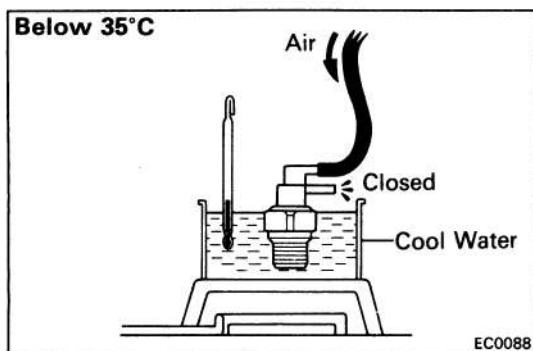
- (a) Drain the coolant from the radiator into a suitable container.
- (b) Remove the BVSV from the water outlet.
- (c) Cool the BVSV to below  $35^\circ\text{C}$  ( $95^\circ\text{F}$ ) with cool water.
- (d) Blow air into a pipe and check that the BVSV is closed.
- (e) Heat the BVSV to above  $54^\circ\text{C}$  ( $129^\circ\text{F}$ ) with hot water.
- (f) Blow air into a pipe and check that the BVSV is open.

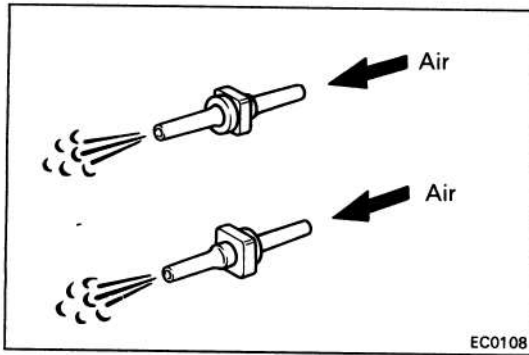
If a problem is found, replace the BVSV.

- (g) Apply adhesive to two or three threads of the BVSV, and reinstall.

**Adhesive:** Part No. 08833-00070, THREE BOND 1324 or equivalent

- (h) Refill the radiator with coolant.

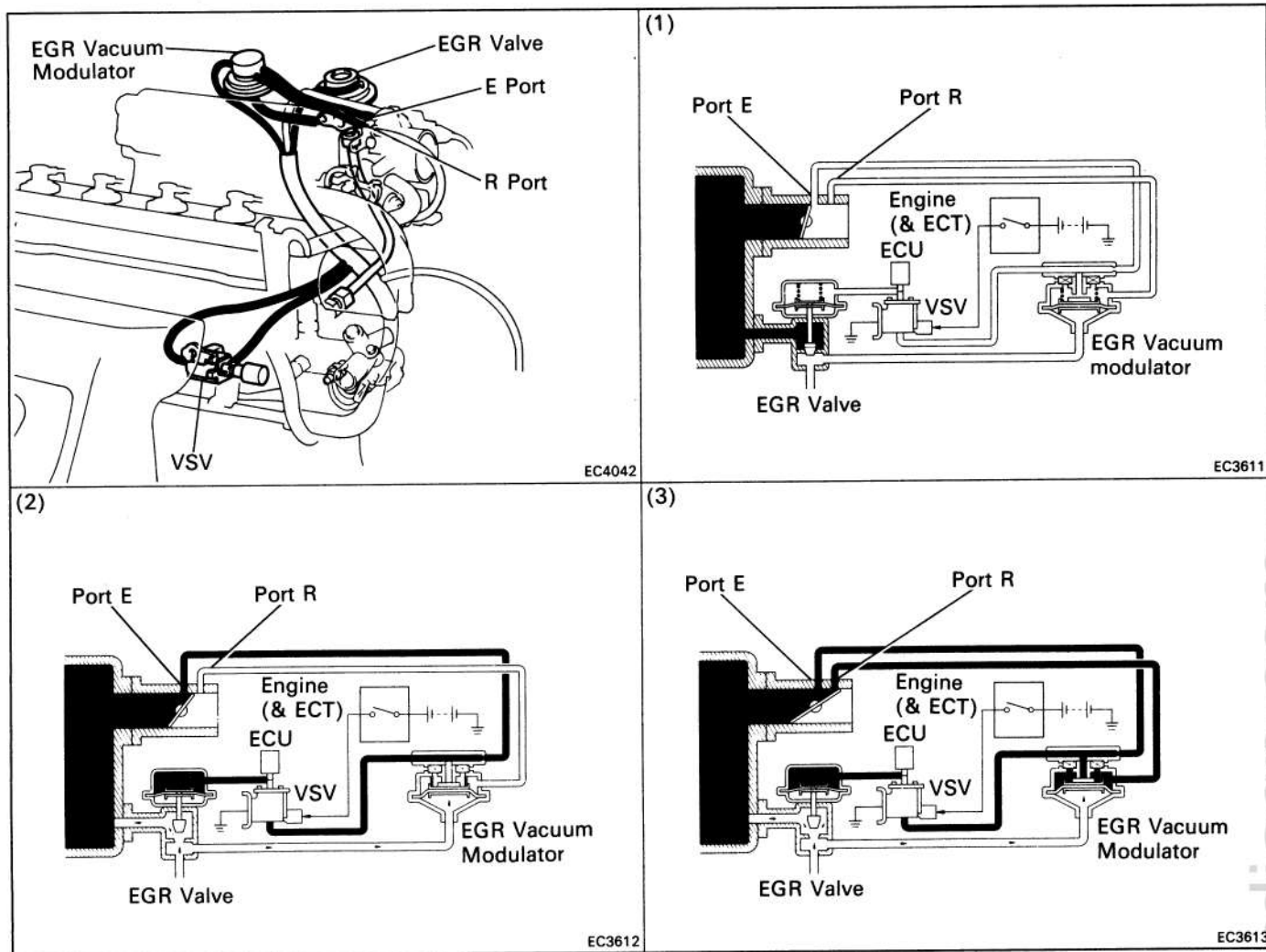




### INSPECTION OF JET (M/T only)

1. **INSPECT JET BY BLOWING AIR FROM EACH SIDE**  
Check for stoppage.

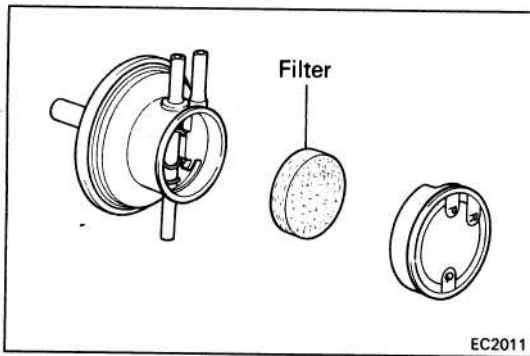
## EXHAUST GAS RECIRCULATION (EGR) SYSTEM



| Coolant Temp.      | Engine RPM      | PIM (ECU) | VSV    | Throttle Valve Opening Angle         | Pressure in the EGR Valve Pressure Chamber |      | EGR Vacuum Modulator         | EGR Valve | Exhaust Gas             |
|--------------------|-----------------|-----------|--------|--------------------------------------|--------------------------------------------|------|------------------------------|-----------|-------------------------|
| Below 55°C (131°F) | —               | —         | CLOSED | —                                    | —                                          |      | —                            | CLOSED    | Not recirculated        |
| Above 60°C (140°F) | Below 4,000 rpm | OFF       | CLOSED | Positioned below E port              | —                                          |      | —                            | CLOSED    | Not recirculated        |
|                    |                 |           | CLOSED | positioned below E port              | (1)                                        | —    | —                            | CLOSED    | Not recirculated        |
|                    |                 | ON        | OPEN   | Positioned between E port and R port | (2)                                        | HIGH | CLOSES passage to atmosphere | OPEN      | Recirculated            |
|                    |                 |           |        | Positioned above R port              | (3)                                        | HIGH | CLOSES passage to atmosphere | OPEN      | Recirculated (increase) |
|                    | Above 4,000 rpm | OFF       | CLOSED | —                                    | —                                          |      | —                            | CLOSED    | Not Recirculated        |

\* Pressure increase → Modulator closes → EGR valve opens → Pressure drops

- \*\* when the throttle valve is positioned above R port, the EGR vacuum modulator will close the atmosphere passage and open the EGR valve to increase the exhaust gas, even if the exhaust pressure is insufficiently low.
- \*\*\* If terminals TE1 and E1 of check connector are connected, the VSV switches ON.

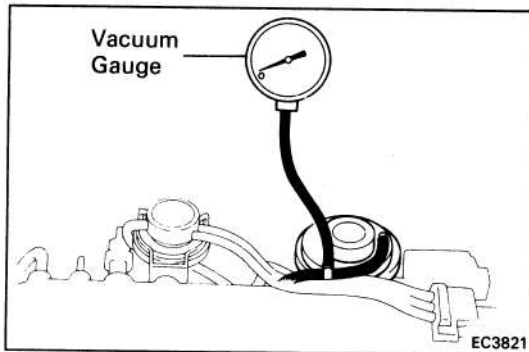


## INSPECTION OF EGR SYSTEM

### 1. CHECK AND CLEAN FILTERS IN EGR VACUUM MODULATOR

- Check the filters for contamination or damage.
- Using compressed air, clean the filters.

**HINT:** Install the filters with the coarser surface facing the atmospheric side (outward).

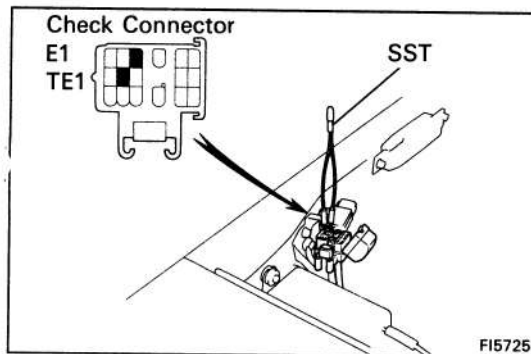


### 2. PREPARATION

Using a 3-way connector, connect a vacuum gauge to the hose between the EGR valve and VSV.

### 3. CHECK SEATING OF EGR VALVE

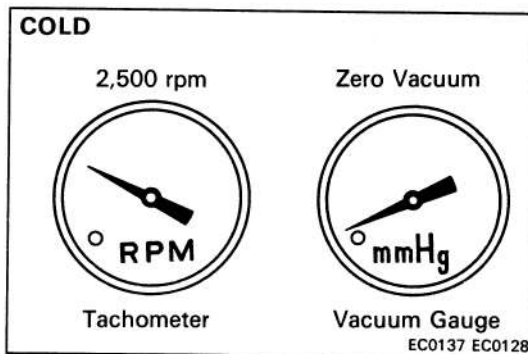
Start the engine and check that the engine starts and runs at idle.



### 4. CONNECT TERMINALS TE1 AND E1

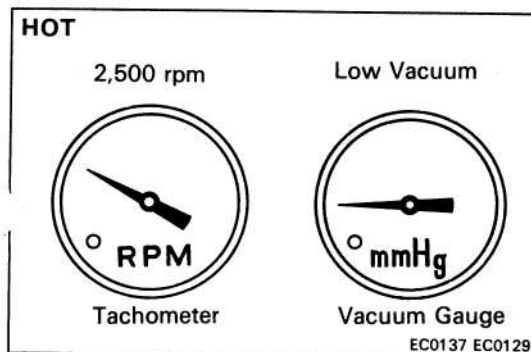
Using SST, connect the terminals TE1 and E1 of the check connector.

SST 09843-18020



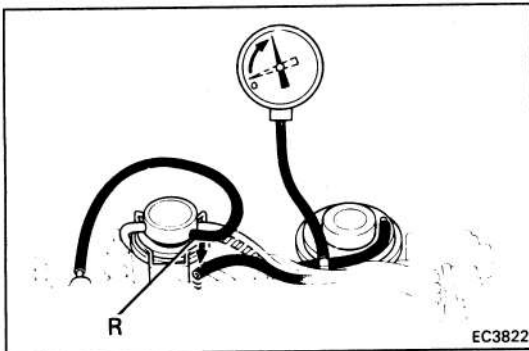
### 5. CHECK VSV

- The coolant temperature should be below 55°C (131°F).
- Check that the vacuum gauge indicates zero at 2,500 rpm.



### 6. CHECK VSV AND EGR VACUUM MODULATOR WITH HOT ENGINE

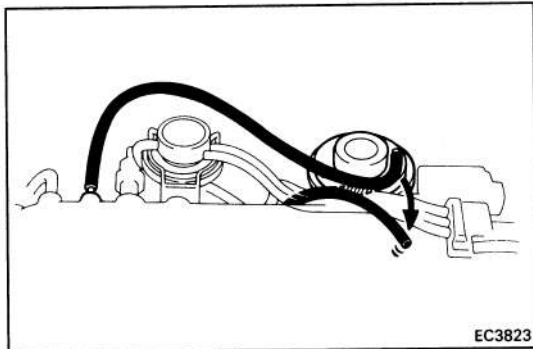
- Warm up the engine.
- Check that the vacuum gauge indicates low vacuum at 2,500 rpm.



- (c) Disconnect the vacuum hose R port of the EGR vacuum modulator and connect R port directly to the intake manifold with another hose.
- (d) Check that the vacuum gauge indicates high vacuum at 2,500 rpm.

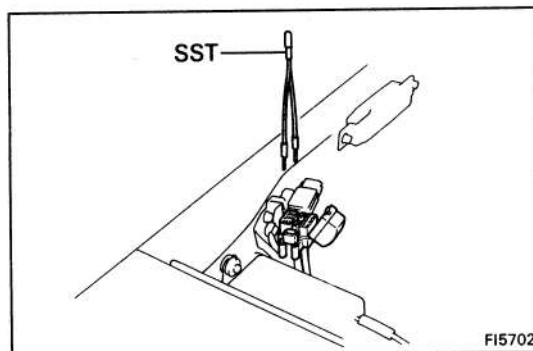
**HINT:** As a large amount of exhaust gas enters, the engine will misfire slightly.

- (e) Remove the vacuum gauge, and reconnect the vacuum hoses to the proper locations.



## 7. CHECK EGR VALVE

- (a) Apply vacuum directly to the EGR valve with the engine idling.
- (b) Check that the engine runs rough or dies.
- (c) Reconnect the vacuum hoses to the proper locations.

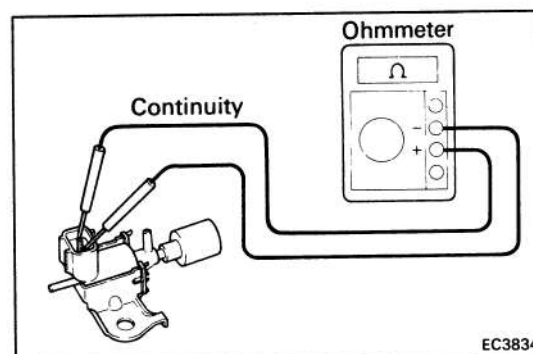


## 8. DISCONNECT TERMINALS TE1 AND E1

Remove the SST.

SST 09843-18020

**IF NO PROBLEM IS FOUND WITH THIS INSPECTION, SYSTEM IS NORMAL; OTHERWISE INSPECT EACH PART**



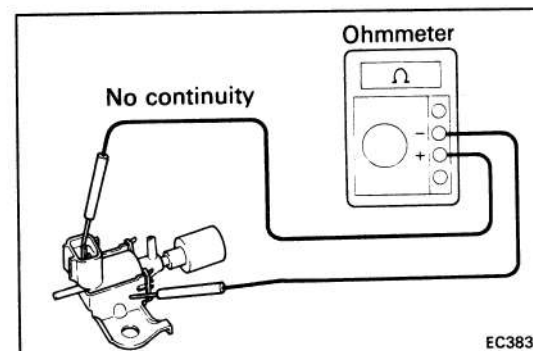
## INSPECTION OF VSV

### 1. CHECK VSV FOR OPEN CIRCUIT

Using an ohmmeter, check that there is continuity between the terminals.

**Resistance (Cold):** 33 – 39  $\Omega$

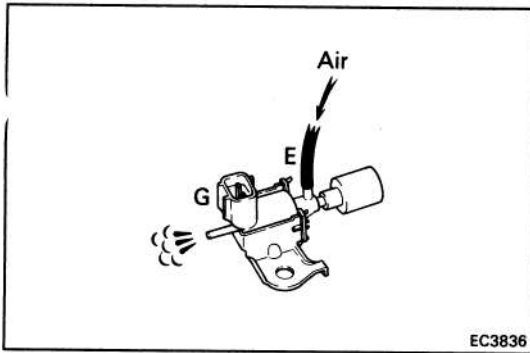
If there is no continuity, replace the VSV.



### 2. CHECK VSV FOR GROUND

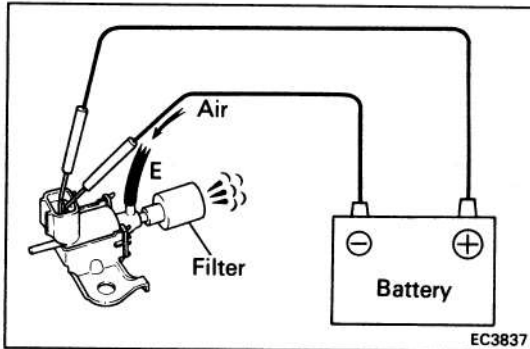
Using an ohmmeter, check that there is no continuity between each terminal and the body.

If there is continuity, replace the VSV.

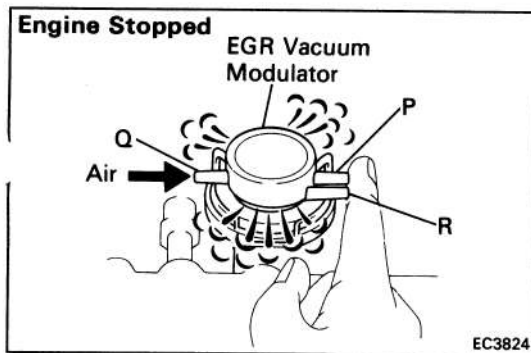


### 3. CHECK VSV OPERATION

- (a) Check that air flows from ports E to G.



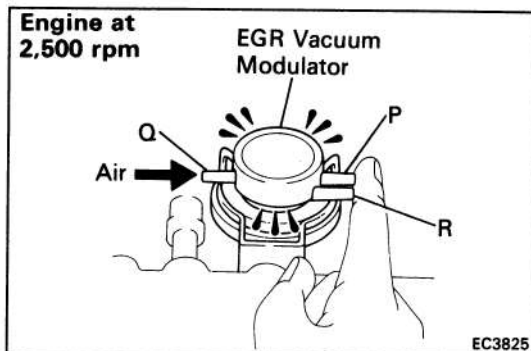
- (b) Apply battery voltage across the terminals.
  - (c) Check that air flows from port E to the filter.
- If operation is not as specified, replace the VSV.



## INSPECTION OF EGR VACUUM MODULATOR

### CHECK EGR VACUUM MODULATOR OPERATION

- (a) Disconnect the vacuum hoses from ports P, Q and R of the EGR vacuum modulator.
- (b) Block ports P and R with your finger.
- (c) Blow air into port Q, and check that the air passes through to the air filter side freely.
- (d) Start the engine, and maintain speed at 2,500 rpm.
- (e) Repeat the above test. Check that there is a strong resistance to air flow.
- (f) Reconnect the vacuum hoses to the proper locations.



## INSPECTION OF EGR VALVE

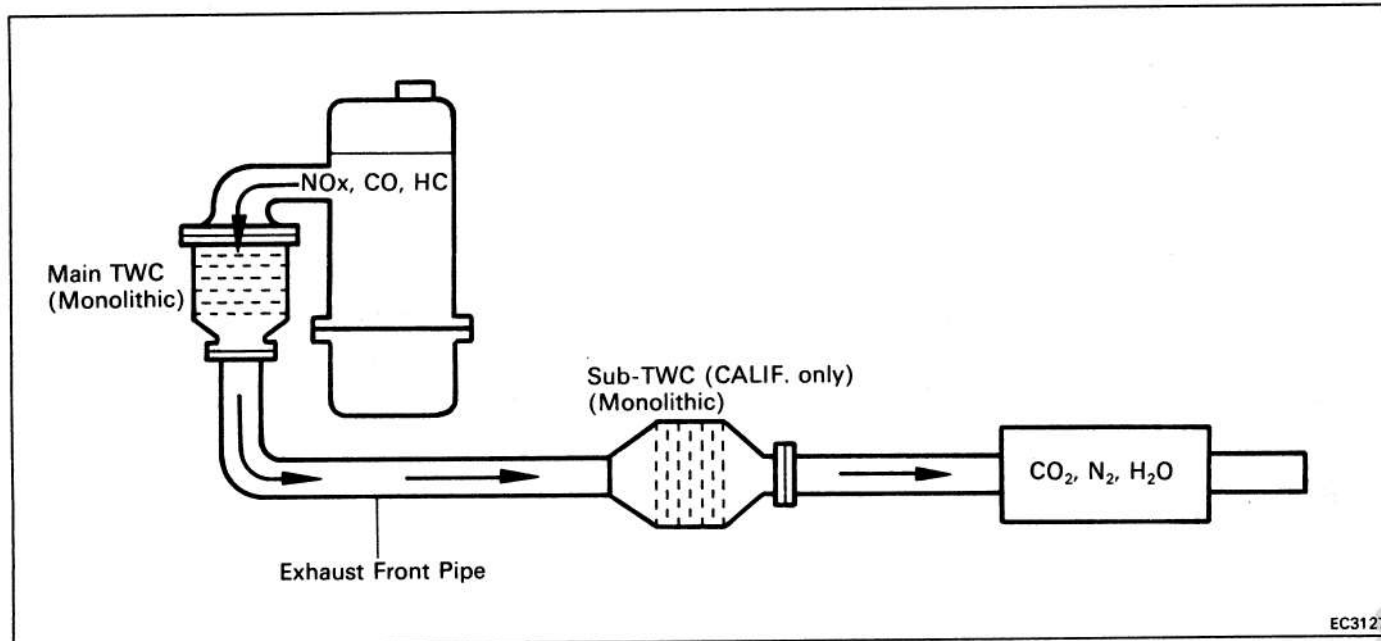
### 1. REMOVE EGR VALVE

Check for sticking and heavy carbon deposits.  
If a problem is found, replace the valve.

### 2. REINSTALL EGR VALVE

Install a new gasket.

## THREE-WAY CATALYST (TWC) SYSTEM

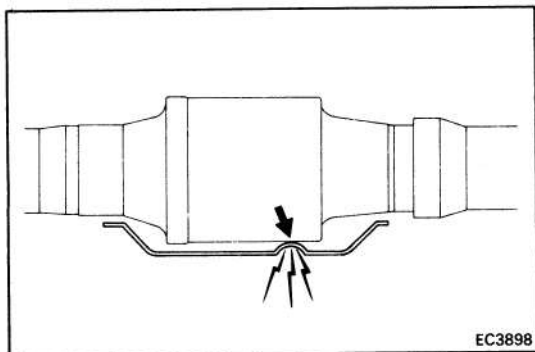


To reduce HC, CO and NO<sub>x</sub> emissions, they are oxidized, reduced and converted to nitrogen (N<sub>2</sub>), carbon dioxide (CO<sub>2</sub>) and water (H<sub>2</sub>O) by the catalyst.

| Exhaust Port               |   | Main TWC                |   | Sub-TWC (CALIF. only)   |   | Exhaust Gas                                           |
|----------------------------|---|-------------------------|---|-------------------------|---|-------------------------------------------------------|
| HC, CO AND NO <sub>x</sub> | → | OXIDATION AND REDUCTION | → | OXIDATION AND REDUCTION | → | CO <sub>2</sub><br>H <sub>2</sub> O<br>N <sub>2</sub> |

### INSPECTION OF EXHAUST PIPE ASSEMBLY

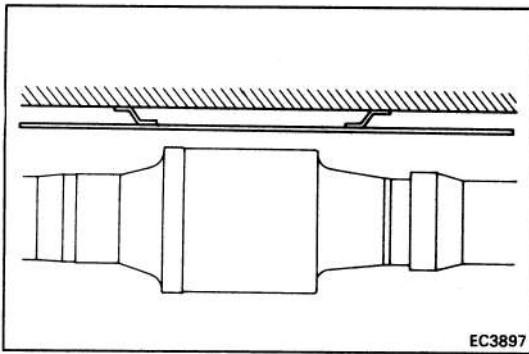
1. CHECK CONNECTIONS FOR LOOSENESS OR DAMAGE
2. CHECK CLAMPS FOR WEAKNESS, CRACKS OR DAMAGE



### INSPECTION OF CATALYTIC CONVERTER (Sub-Catalytic Converter (CALIF. only))

#### CHECK FOR DENTS OR DAMAGE

If any part of protector is damaged or dented to the extent that it contacts the converter, repair or replace it.



EC3897

## INSPECTION OF HEAT INSULATOR (Sub-Catalytic Converter (CALIF. only))

1. CHECK HEAT INSULATOR FOR DAMAGE
2. CHECK FOR ADEQUATE CLEARANCE BETWEEN CATALYTIC CONVERTER AND HEAT INSULATOR

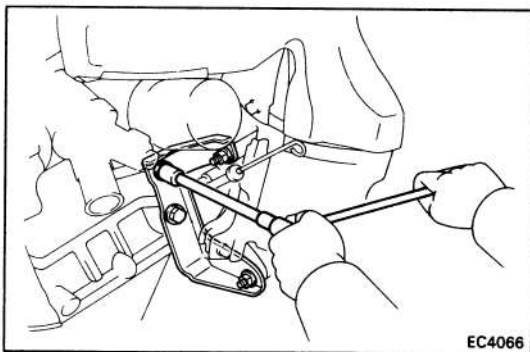
## REPLACEMENT OF CATALYTIC CONVERTER(S)

### (Main Catalytic Converter)

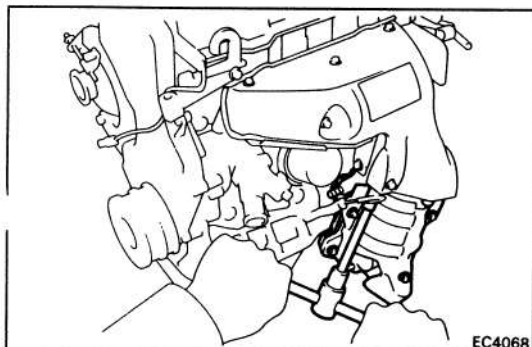
1. DISCONNECT CABLE FROM NEGATIVE TERMINAL OF BATTERY

**CAUTION:** Work must be started after approx. 20 seconds or longer from the time the ignition switch is turned to the "LOCK" position and the negative (-) terminal cable is disconnected from the battery.

2. REMOVE ENGINE UNDER COVERS
3. REMOVE FRONT EXHAUST PIPE  
(See step 1 on page EC-31)
4. REMOVE MAIN CATALYTIC CONVERTER
  - (a) Check that the converter is cool.
  - (b) Disconnect the main oxygen sensor connector.
  - (c) (CALIF. only)  
Disconnect the sub-oxygen sensor connector.
  - (d) Remove the two bolts, two nuts and converter stay.

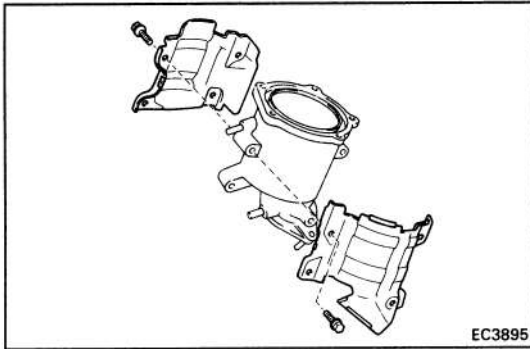


EC4066

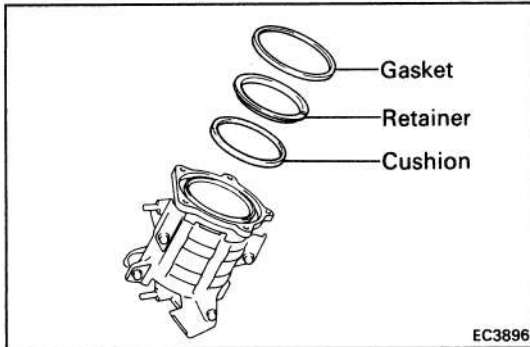


EC4068

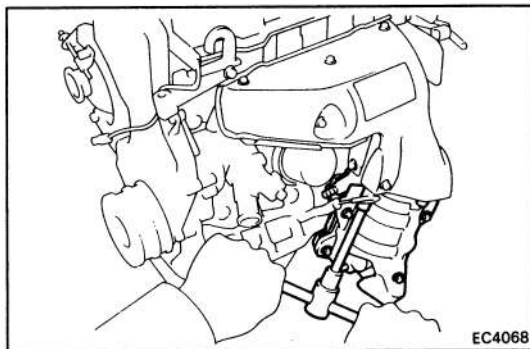
- (e) Remove the three bolts, two nuts, converter, gasket, retainer and cushion.
- (f) Remove the eight bolts and two heat insulators from the converter.

**5. REINSTALL MAIN CATALYTIC CONVERTER**

- (a) Install the two heat insulators to a new converter with the eight bolts.

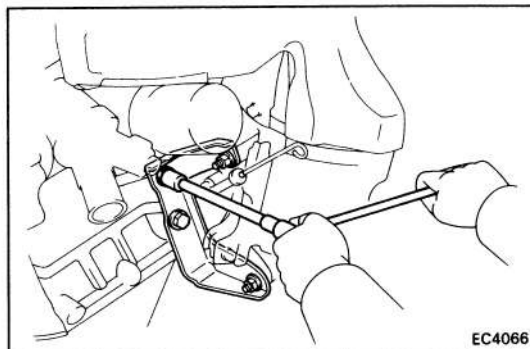


- (b) Place the cushion, retainer and a new gasket on the converter.



- (c) Install the converter with the three bolts and two new nuts.

**Torque: 300 kg-cm (21 ft-lb, 29 N·m)**



- (d) Install the converter stay with the two bolts and two nuts.

**Torque: 425 kg-cm (31 ft-lb, 42 N·m)**

- (e) Connect the main oxygen sensor connector.

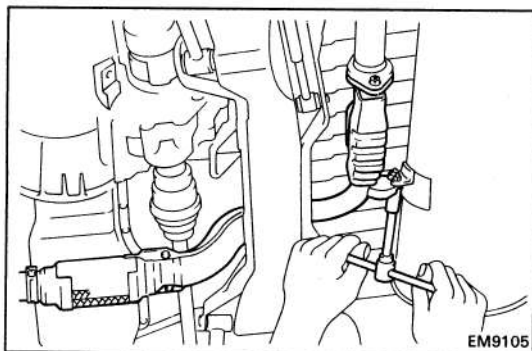
- (f) (CALIF. only)

Connect the sub-oxygen sensor connector.

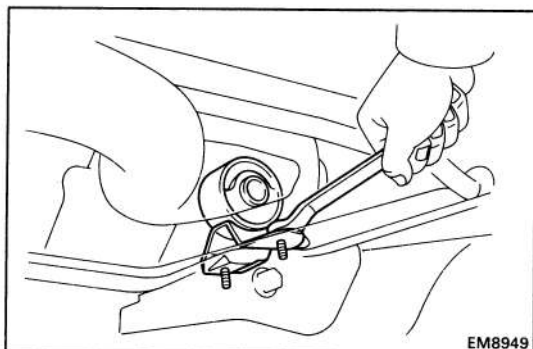
**6. REINSTALL FRONT EXHAUST PIPE**  
(See step 2 on pages EC-32 and 33)**7. REINSTALL ENGINE UNDER COVERS****8. CONNECT CABLE TO NEGATIVE TERMINAL OF BATTERY**

**(Sub-Catalytic Converter (CALIF. only))****1. REMOVE FRONT EXHAUST PIPE (SUB-CATALYTIC CONVERTER)**

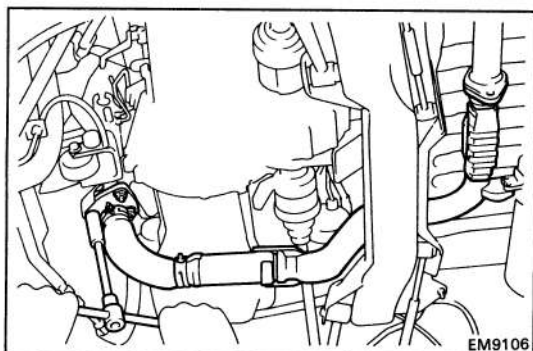
- (a) Remove the two bolts holding the front exhaust pipe to the tailpipe stopper bracket.
- (b) Remove the two bolts holding the front exhaust pipe to the tailpipe. Remove the gasket.



- (c) Remove the two bolts and support bracket.

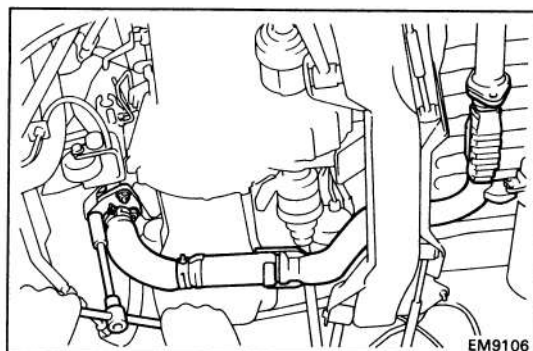


- (d) Using a 14 mm deep socket wrench, remove the three nuts, front exhaust pipe and gasket.

**2. REINSTALL FRONT EXHAUST PIPE (SUB-CATALYTIC CONVERTER)**

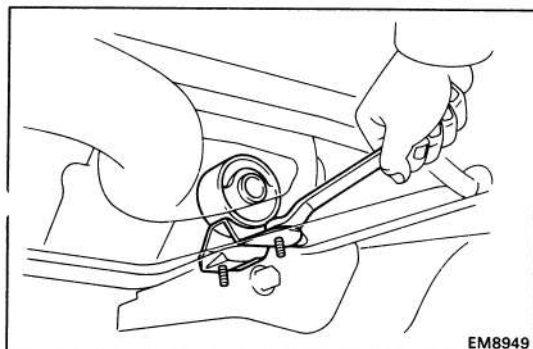
- (a) Place a new gasket on the front of the front exhaust pipe.
- (b) Using a 14 mm deep socket wrench, install the front exhaust pipe with three new nuts.

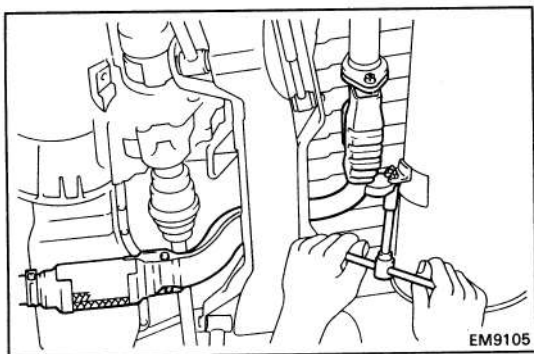
**Torque: 630 kg-cm (46 ft-lb, 62 N·m)**



- (c) Install the support bracket with the two bolts.

**Torque: 210 kg-cm (15 ft-lb, 21 N·m)**





- (d) Place a new gasket between the exhaust pipe and tailpipe.
- (e) Temporarily install the two bolts holding the front exhaust pipe to the tailpipe.
- (f) Install the two bolts holding the stopper bracket of the front exhaust pipe to the tailpipe stopper bracket.

**Torque: 190 kg-cm (14 ft-lb, 19 N·m)**

- (g) Tighten the two bolts holding the front exhaust pipe to the tail pipe.

**Torque: 440 kg-cm (32 ft-lb, 43 N·m)**