

# EMISSION CONTROL SYSTEMS

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## NOTE: TROUBLESHOOTING

See page EM-2 (for EFI Engine)

See page EM-5 (for Carb. Engine)

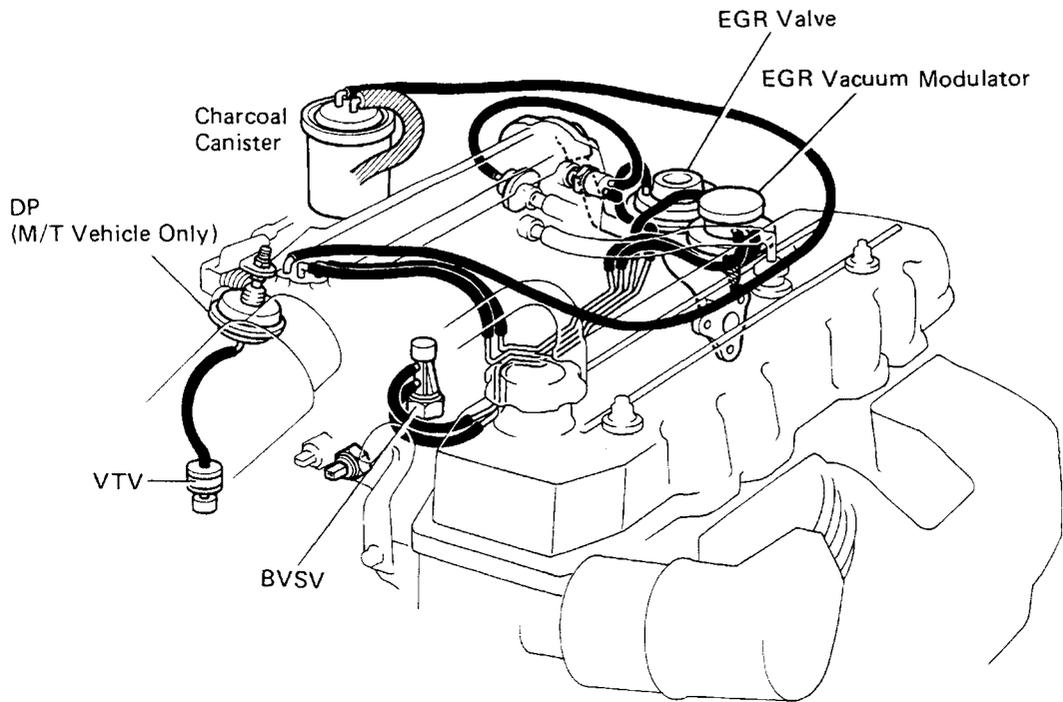
**EC**

**SYSTEM PURPOSE**

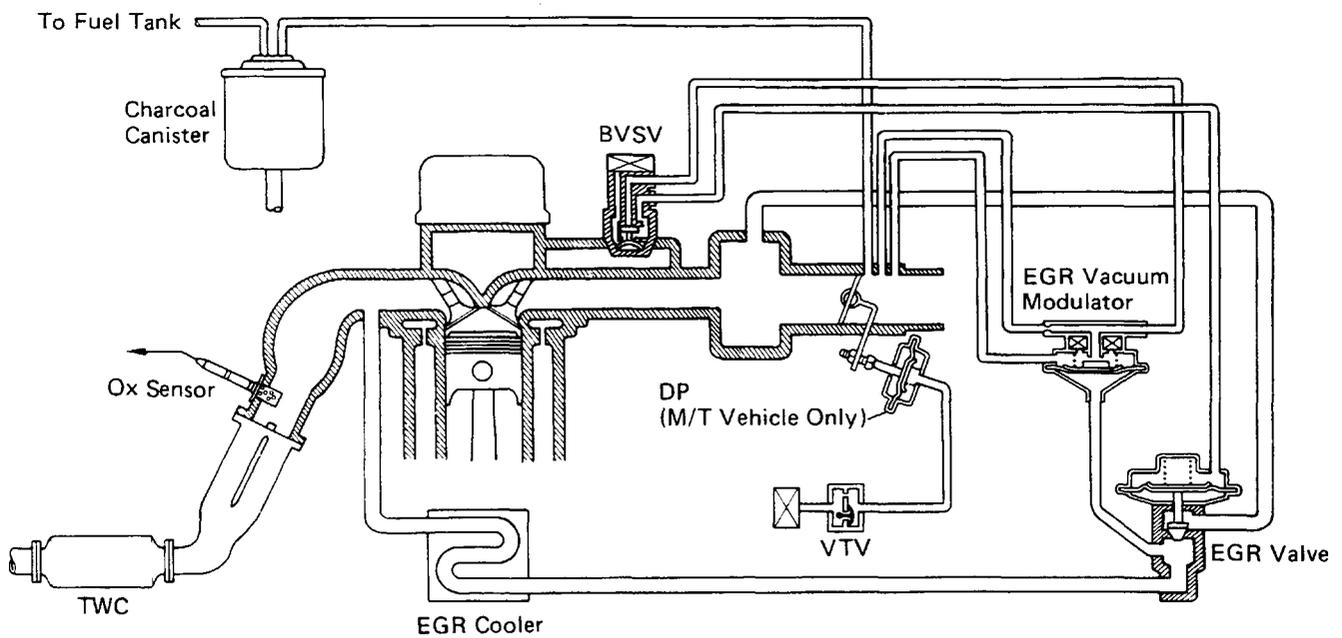
<b>System</b>	<b>Abbreviation</b>	<b>Purpose</b>
Positive crankcase ventilation	PCV	Reduces blow-by gas (HC)
Fuel evaporative emission control	EVAP	Reduces evaporative HC
Dash pot *	DP	Reduces HC and CO performance at idle
Exhaust gas recirculation	EGR	Reduces NOx
Three-way catalyst	TWC	Reduces HC,CO and NOx
Electronic fuel injection	EFI	Regulates all engine conditions for reduction of exhaust emissions.

Remark: \* M/T vehicles only

# COMPONENT LAYOUT AND SCHEMATIC DRAWING

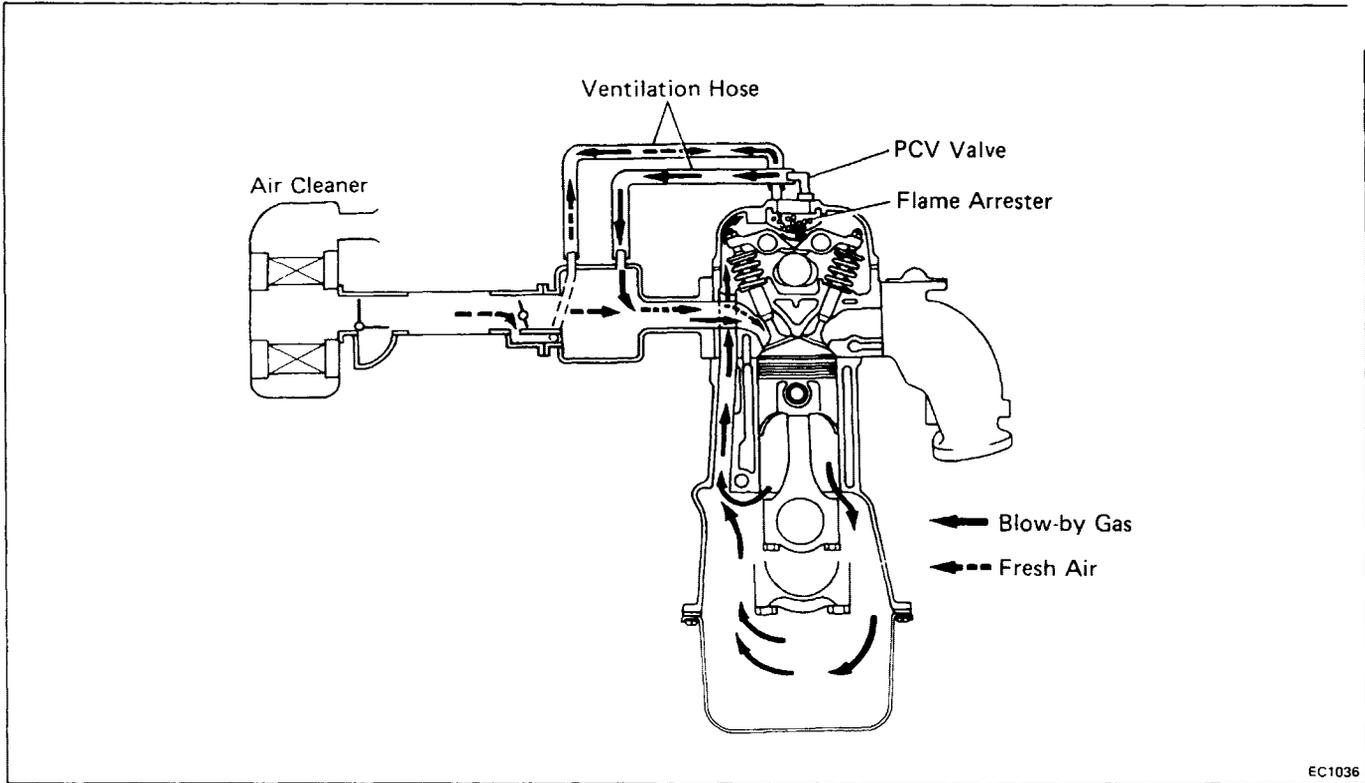


EC0980



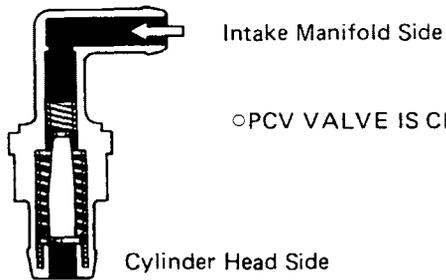
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# POSITIVE CRANKCASE VENTILATION (PCV) SYSTEM

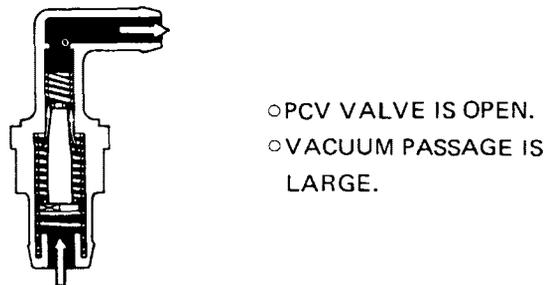


To reduce HC emissions, crankcase blow-by gas (HC) is routed through the PCV valve to the intake manifold for combustion in the cylinders.

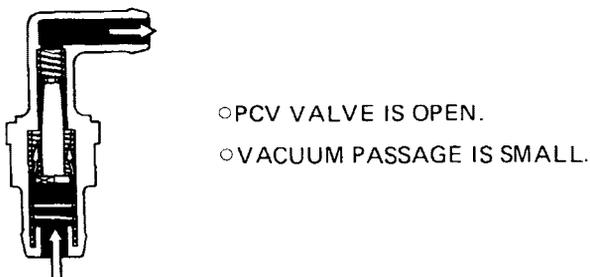
### Engine not Running or Backfiring



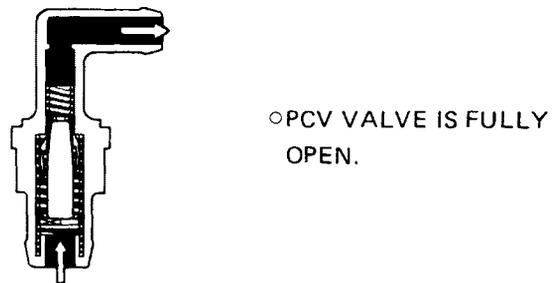
### Normal Operation

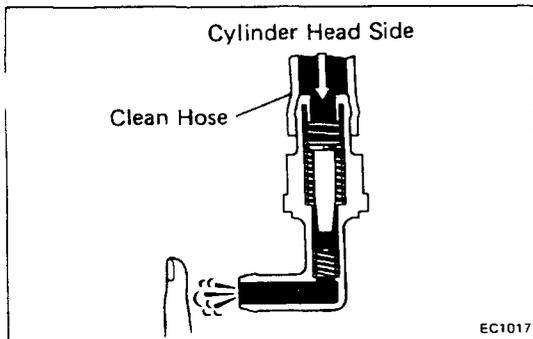


### Idling or Decelerating



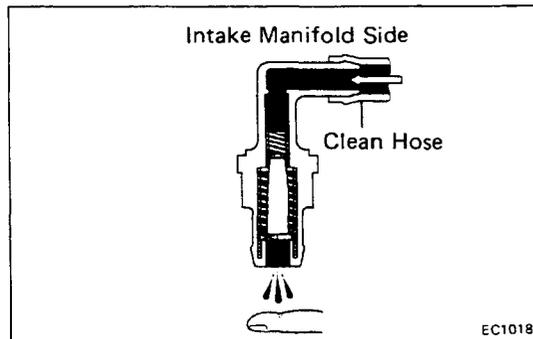
### Acceleration or Heavy Load



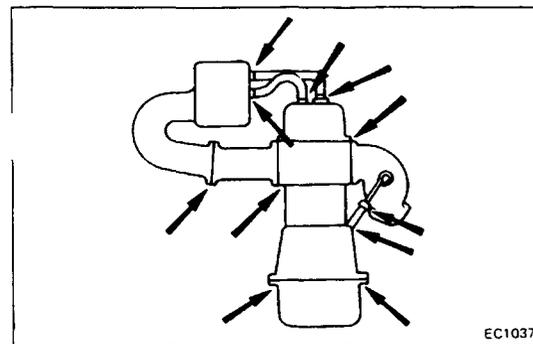


## INSPECTION OF PCV VALVE

1. REMOVE PCV VALVE
2. ATTACH CLEAN HOSE TO PCV VALVE
3. BLOW FROM CYLINDER HEAD SIDE  
Check that air passes through easily.  
**CAUTION:** Do not suck air through the valve. Petroleum substances inside the valve are harmful.



4. BLOW FROM INTAKE MANIFOLD SIDE  
Check that air passes through with difficulty. If the PCV valve fails either check, replace it.
5. REINSTALL PCV VALVE

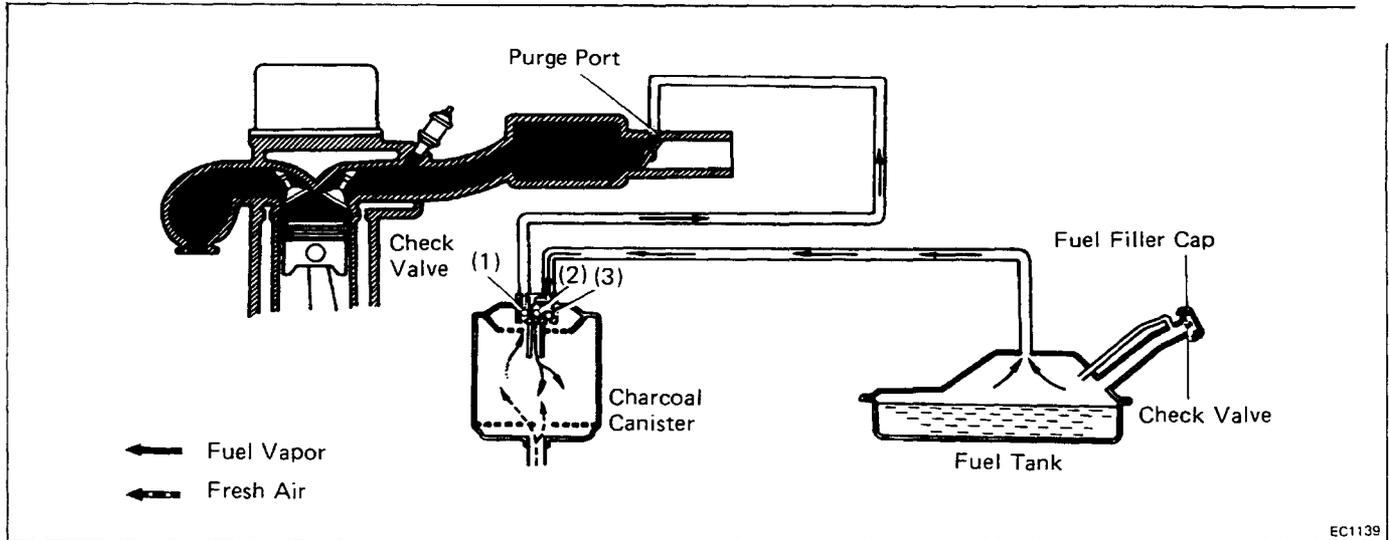


## INSPECTION OF PCV HOSES AND CONNECTIONS

### VISUALLY INSPECT HOSES, CONNECTIONS AND GASKETS

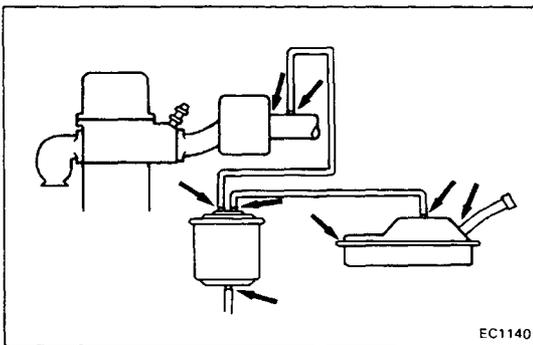
Check for cracks, leaks or damage.

# FUEL EVAPORATIVE EMISSION CONTROL (EVAP) SYSTEM



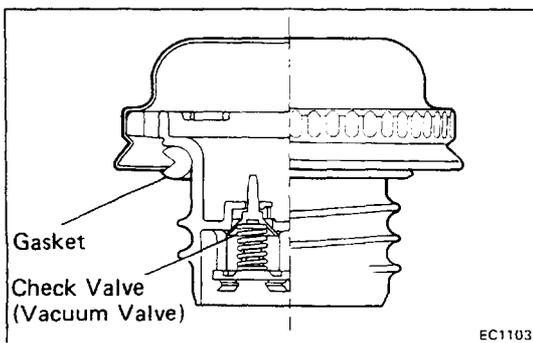
To reduce HC emission, evaporated fuel from the fuel tank is routed through the charcoal canister to the throttle body for combustion in the cylinders.

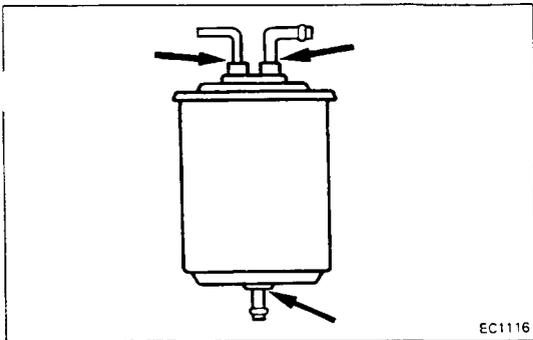
Condition	Check Valve in Charcoal Canister			Check valve in Fuel Filler Cap	Evaporated Fuel (HC)
	(1)	(2)	(3)		
Parking, idling and low speed	CLOSED	—	—	—	HC from tank is absorbed in the canister.
Medium and high speed	OPEN	—	—	—	HC from canister is led into throttle body.
High pressure in tank	—	OPEN	CLOSED	CLOSED	HC from tank is absorbed in the canister.
High vacuum in tank	—	CLOSED	OPEN	OPEN	(Air is led into the tank.)



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

- VISUALLY INSPECT LINES AND CONNECTIONS**  
Look for loose connections, sharp bends or damage.
- VISUALLY INSPECT FUEL TANK**  
Look for deformation, cracks or fuel leakage.
- VISUALLY INSPECT FUEL FILLER CAP**  
Look for a damaged or deformed gasket and cap. If necessary, repair or replace the cap.

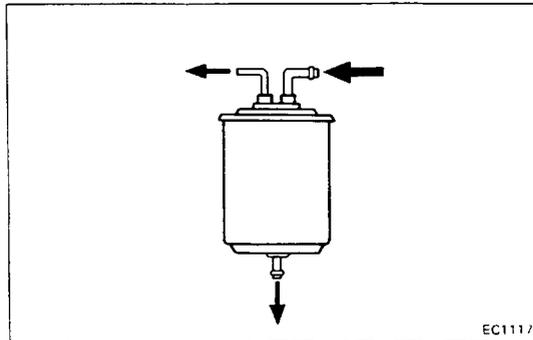




## INSPECTION OF CHARCOAL CANISTER

1. REMOVE CHARCOAL CANISTER
2. VISUALLY INSPECT CHARCOAL CANISTER CASE

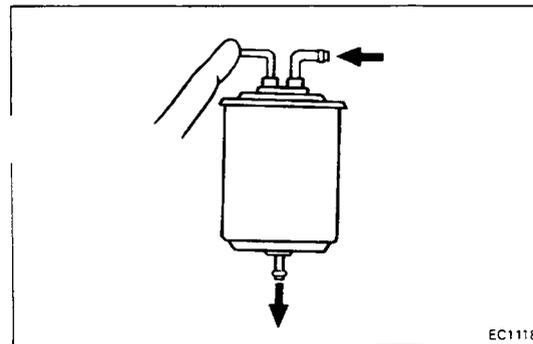
Look for cracks or damage.



3. CHECK FOR CLOGGED FILTER AND STUCK CHECK VALVE

- (a) Using low pressure compressed air, blow into the tank pipe and check that the air flows without resistance from the other pipes.
- (b) Blow into the purge pipe and check that the air does not flow from the other pipes.

If a problem is found, replace the charcoal canister.



4. CLEAN FILTER IN CANISTER

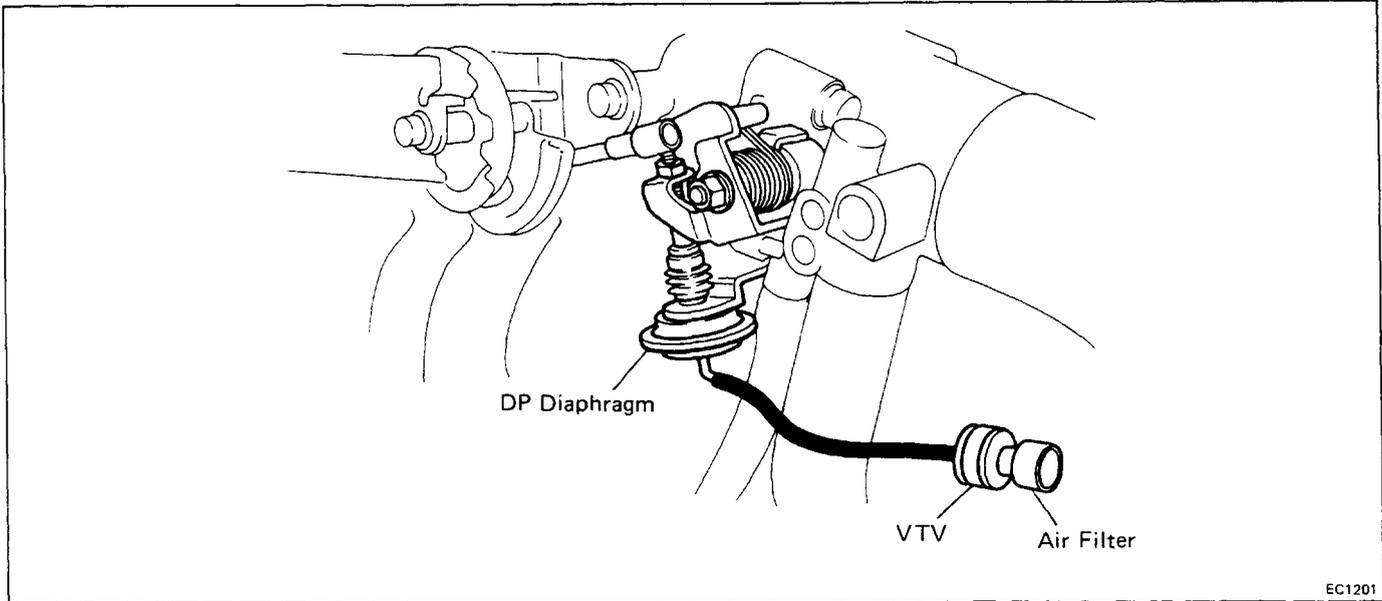
Clean the filter by blowing 3 kg/cm<sup>2</sup> (43 psi, 294 kPa) of compressed air into the tank pipe, while holding the purge pipe closed.

NOTE:

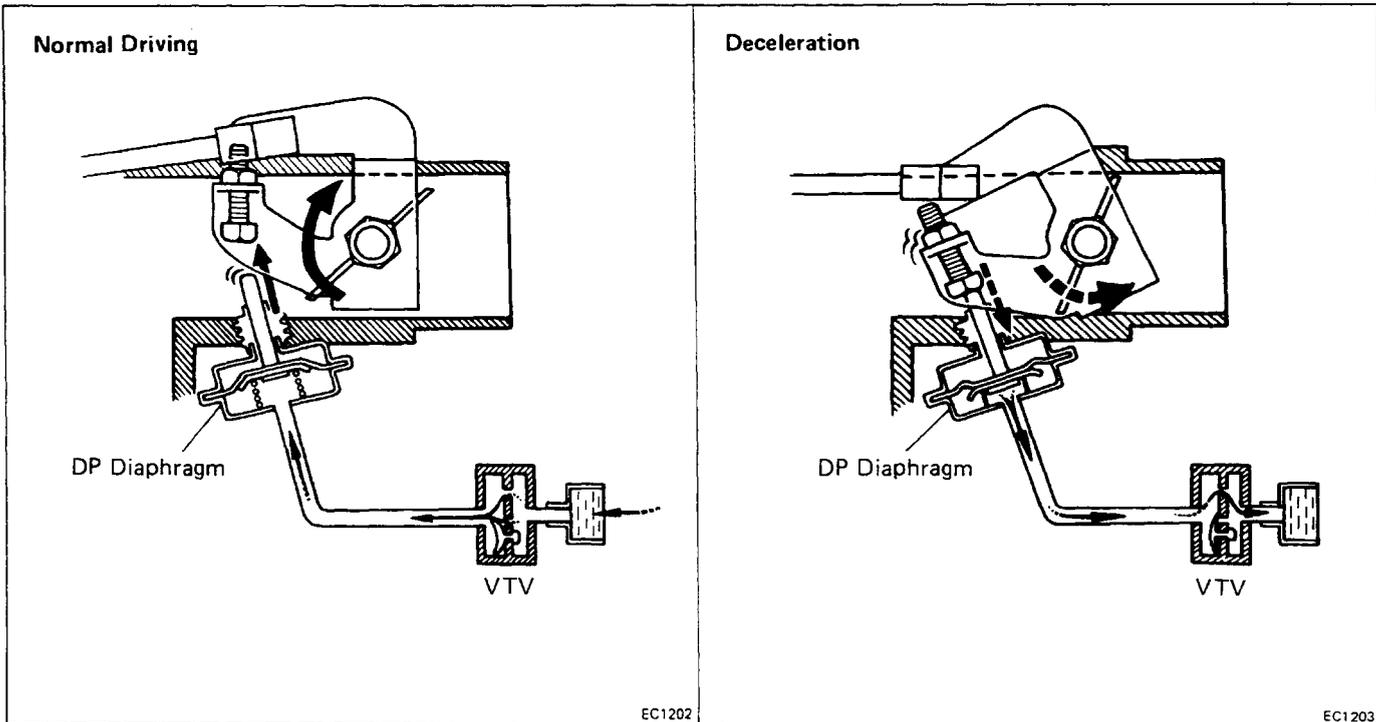
- Do not attempt to wash the canister.
- No activated carbon should come out.

5. INSTALL CHARCOAL CANISTER

## DASH POT (DP) SYSTEM (M/T Vehicles Only)



EC1201



EC1202

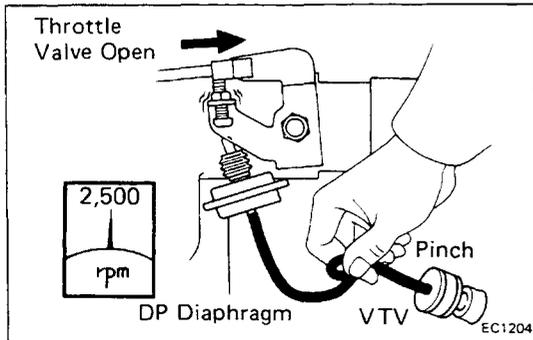
EC1203

To reduce HC and CO emissions, when decelerating the dash pot opens the throttle valve slightly more than at idle. This causes the air-fuel mixture to burn completely.

Condition	DP Diaphragm	VTV	Throttle Valve
Idling	Pushed in by return force of throttle valve	CLOSED	Idle speed position
Normal driving	Pushed out by diaphragm spring	OPEN	High speed position
Deceleration	Pushed in by return force of throttle valve	CLOSED	Slightly opens and then slowly closes to idle position

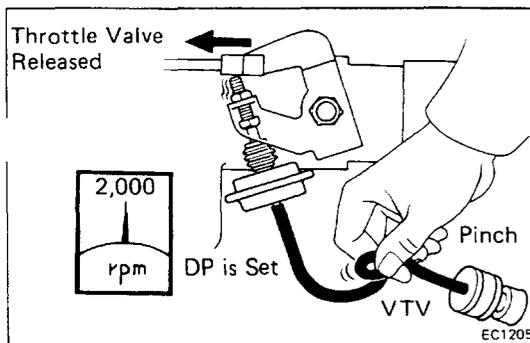
## INSPECTION OF DP SYSTEM

1. WARM UP ENGINE
2. CHECK IDLE SPEED AND ADJUST, IF NECESSARY



## 3. CHECK DP SETTING SPEED

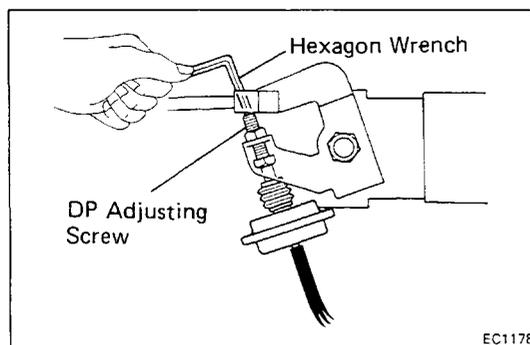
- (a) Maintain the engine speed at 2,500 rpm.
- (b) Pinch the vacuum hose between the DP and VTV.



- (c) Release the throttle valve.

- (d) Check that the DP is set.

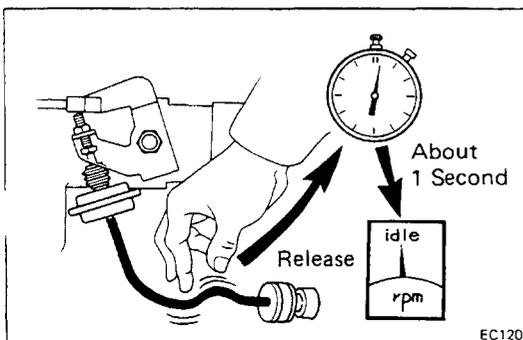
**DP setting speed: 2,000 rpm**



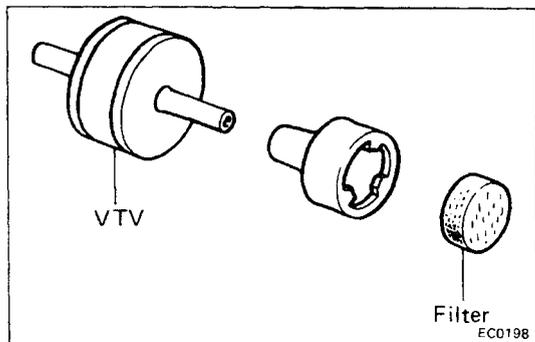
If not at specified speed, adjust with the DP adjusting screw.

## 4. CHECK OPERATION OF VTV

- (a) Set the DP speed in the same procedure as above; 3. (a) to (c).
- (b) Release the pinched hose and check that the engine returns to idle speed in about 1 second.



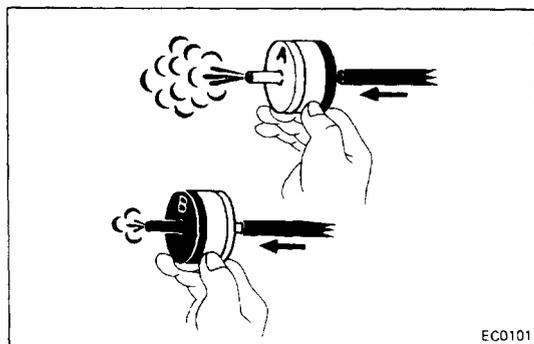
**IF NO PROBLEM IS FOUND WITH THIS INSPECTION, THE SYSTEM IS OKAY; OTHERWISE INSPECT EACH PART**



### **INSPECTION OF VTV**

**1. CHECK AND CLEAN FILTER ON VTV**

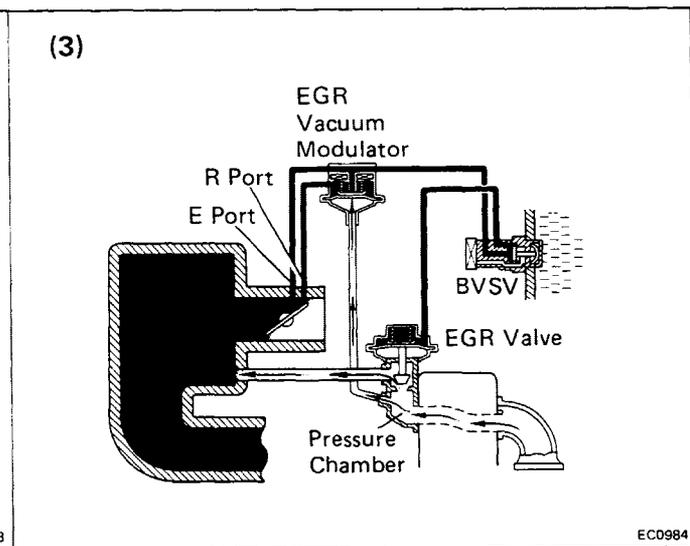
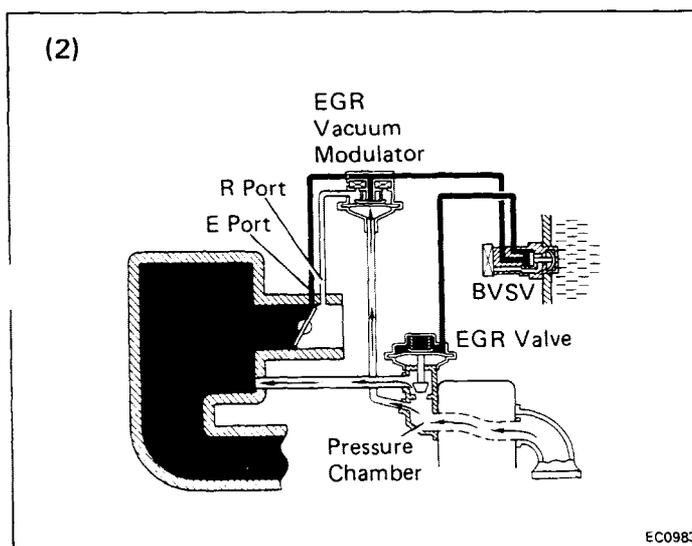
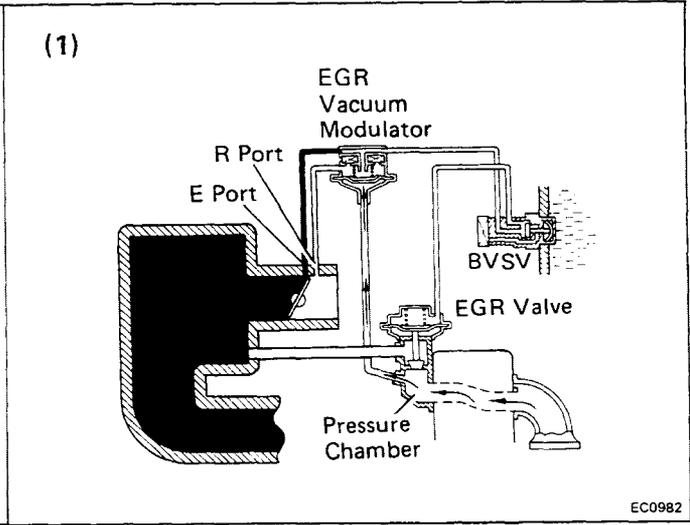
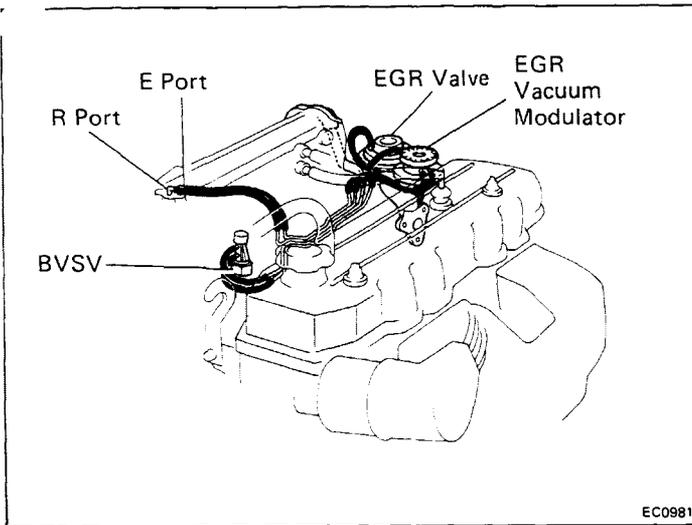
- (a) Check the filter for contamination or damage.
- (b) Using compressed air, clean the filter.



**2. CHECK VTV BY BLOWING AIR INTO EACH SIDE**

- (a) Check that air flows without resistance from B to A.
- (b) Check that air flows with difficulty from A to B.

# EXHAUST GAS RECIRCULATION (EGR) SYSTEM

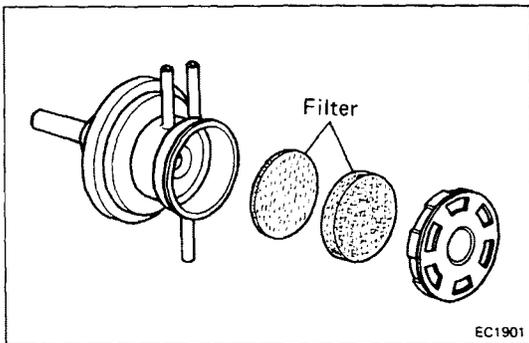


To reduce NOx emission, part of the exhaust gases are recirculated through the EGR valve to the intake manifold to lower the maximum combustion temperature.

Coolant Temp.	BVSV	Throttle Valve Opening Angle	Pressure in the EGR Valve Pressure Chamber		EGR Vacuum Modulator	EGR Valve	Exhaust Gas
Below 30°C (86°F)	CLOSED	—	—		—	CLOSED	Not recirculated
Above 44°C (111°F)	OPEN	Positioned below E port	—		—	CLOSED	Not recirculated
		Positioned between E port & R port	(1) LOW	*Pressure constantly alternating between low and high	OPENS passage to atmosphere	CLOSED	Not recirculated
			(2) HIGH		CLOSES passage to atmosphere	OPEN	Recirculated
Positioned above R port	(3) HIGH	**	CLOSES passage to atmosphere	OPEN	Recirculated (increase)		

Remarks: \*Pressure increase → Modulator closes → EGR valve opens → Pressure drops  
 ← EGR valve closes ← Modulator opens ←

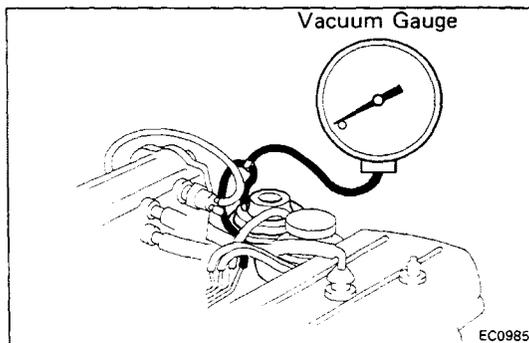
\*\*When the throttle valve is positioned above the R port, the EGR vacuum modulator will close the atmosphere passage and open the EGR valve to increase the EGR gas, even if the exhaust pressure is insufficiently low.



## INSPECTION OF EGR SYSTEM

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

- (a) Check the filter for contamination or damage.
- (b) Using compressed air, clean the filter.

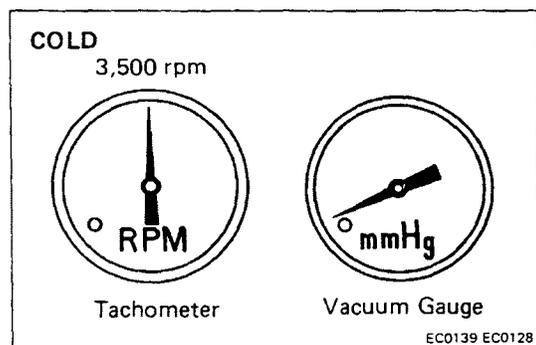


### 2. PREPARATION

Disconnect the vacuum hose from the EGR valve and, using a three way union, connect a vacuum gauge to it.

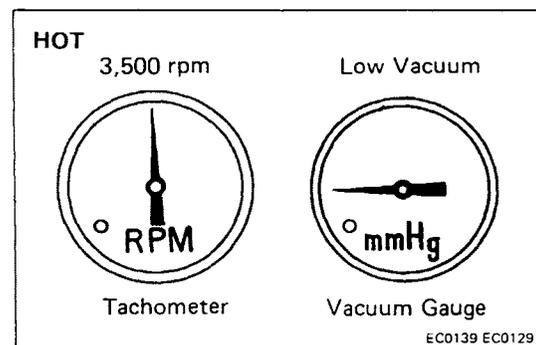
### 3. CHECK SEATING OF EGR VALVE

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



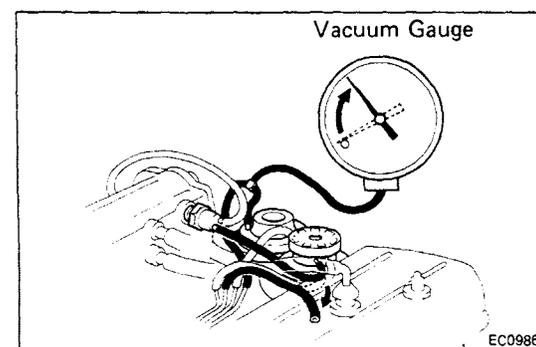
### 4. CHECK BVSV WITH COLD ENGINE

- (a) The coolant temperature should be below 30°C (86°F).
- (b) Check that the vacuum gauge indicates zero at 3,500 rpm.



### 5. CHECK BVSV AND EGR VACUUM MODULATOR WITH HOT ENGINE

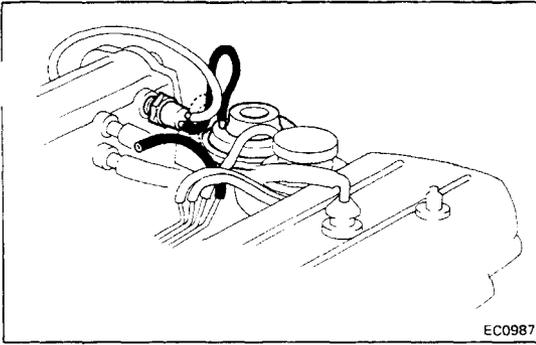
- (a) Warm up the engine.
- (b) Check that the vacuum gauge indicates low vacuum at 3,500 rpm.



- (c) Disconnect the vacuum hose from 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 3,500 rpm.

NOTE: As a large amount of EGR gas enters, the engine will misfire slightly at this time.

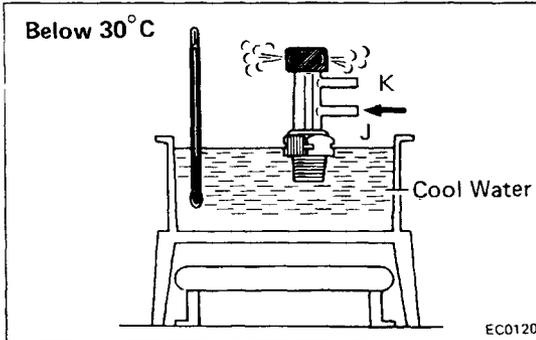
- (e) Disconnect the vacuum gauge and reconnect the vacuum hoses to the proper locations.



## 6. 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 location.

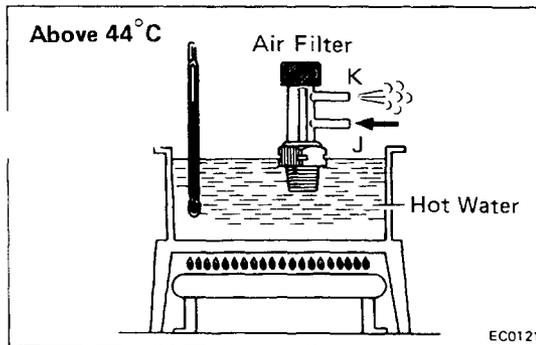
**IF NO PROBLEM IS FOUND WITH THIS INSPECTION, THE SYSTEM IS OKAY; OTHERWISE INSPECT EACH PART**



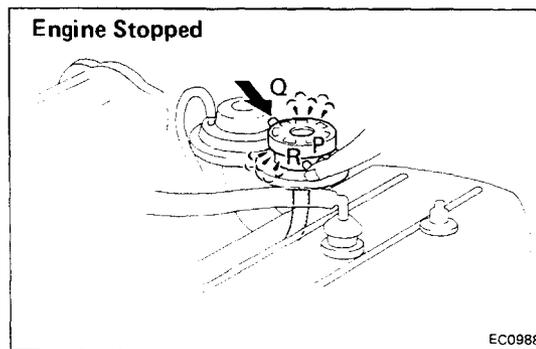
## INSPECTION OF BVSV

### CHECK BVSV BY BLOWING AIR INTO PIPE

- (a) Drain the coolant from the radiator into a suitable container.
- (b) Remove the BVSV.
- (c) Cool the BVSV to below 30°C (86°F).
- (d) Check that air flows from pipe J to the air filter.



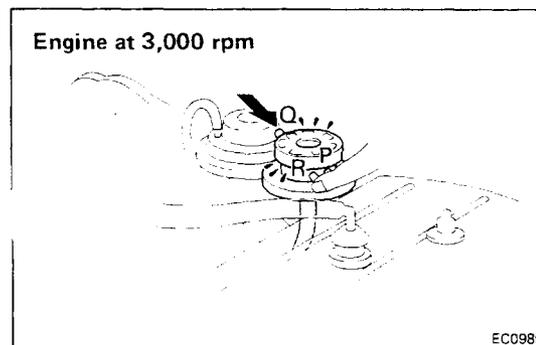
- (e) Heat the BVSV to above 44°C (111°F).
  - (f) Check that air flows from pipe J to pipe K.
  - (g) Apply liquid sealer to the threads of the BVSV and reinstall.
  - (h) Fill the radiator with coolant.
- If a problem is found, replace the BVSV.



## INSPECTION OF EGR VACUUM MODULATOR

### CHECK EGR VACUUM MODULATOR OPERATION

- (a) Disconnect the vacuum hoses from port P, Q and R of the EGR vacuum modulator.
- (b) Plug port P and R with your finger.
- (c) Blow air into port Q. Check that the air passes through to the air filter side freely.
- (d) Start the engine and maintain the speed at 3,000 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.



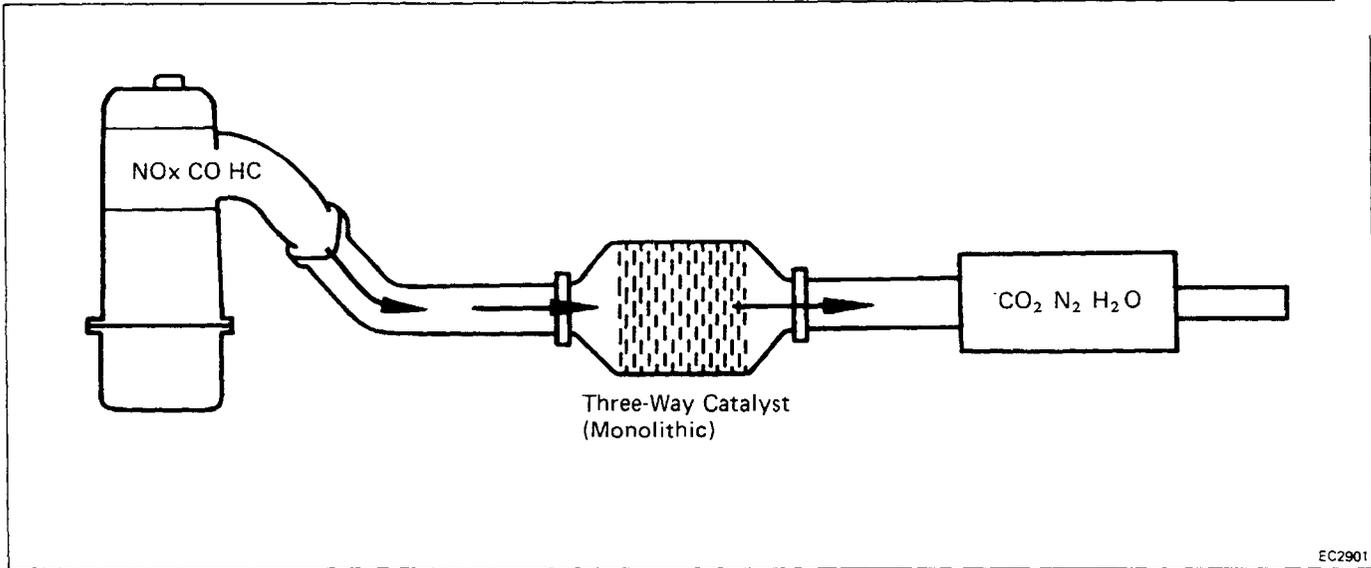
## INSPECTION OF EGR VALVE

### 1. REMOVE EGR VALVE

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

### 2. INSTALL EGR VALVE WITH NEW GASKET

## THREE-WAY CATALYST (TWC) SYSTEM



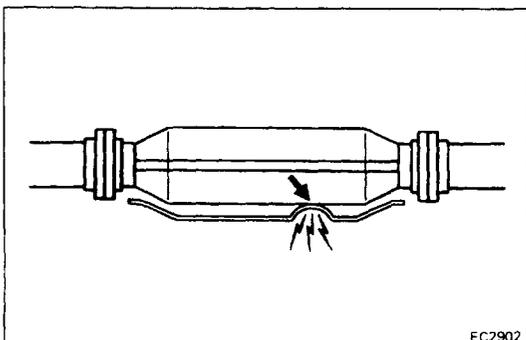
EC2901

To reduce HC, CO and NOx 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		TWC		Exhaust Gas
HC, CO and NOx	→	Oxidation and reduction	→	CO <sub>2</sub> H <sub>2</sub> O N <sub>2</sub>

### INSPECTION OF EXHAUST PIPE ASSEMBLY

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

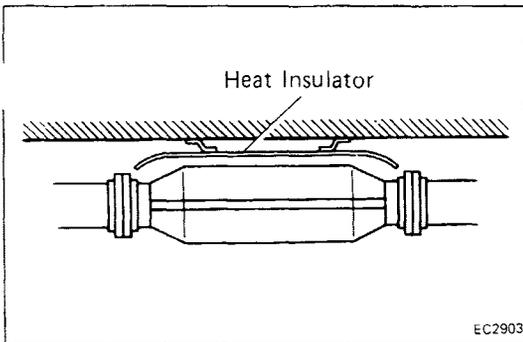


EC2902

### INSPECTION OF CATALYTIC CONVERTER

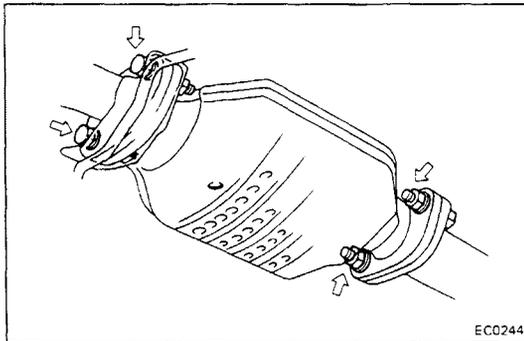
#### CHECK FOR DENTS OR DAMAGE

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



## INSPECTION OF HEAT INSULATOR

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



## REPLACEMENT OF CATALYTIC CONVERTER

1. REMOVE CONVERTER
  - (a) Jack up the vehicle.
  - (b) Check that the converter is cool.
  - (c) Remove the bolts at the front and rear of the converter.
  - (d) Remove the converter and gaskets.
2. INSTALL CONVERTER
  - (a) Place new gaskets on the converter front and rear pipes, and connect the converter to the exhaust pipes.
  - (b) Tighten the bolts.

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

  - (c) Reinstall the bracket bolts and tighten them.

## SYSTEM PURPOSE

System	Abbreviation	Purpose	Federal & Canada	California
Positive crankcase ventilation	PCV	Reduces blow-by gas (HC)	•	•
Fuel evaporative emission control	EVAP	Reduces evaporative HC	•	•
Mixture control* <sup>1</sup>	MC	Reduces HC & CO	•	•
Dash pot* <sup>2</sup>	DP	Reduces HC and CO performance at idle	•	•
Exhaust gas recirculation	EGR	Reduces NO <sub>x</sub>	•	•
Air suction and fuel system feedback control	—	Maintains air-fuel ratio for TWC and reduces HC, CO and NO <sub>x</sub>	—	•
Air suction	AS	Reduces HC & CO	•	—
Three-way catalyst	TWC	Reduces HC, CO & NO <sub>x</sub>	—	•
Oxidation catalyst	OC	Reduces HC & CO	•	—
High altitude compensation	HAC	Insures air-fuel mixture at high altitude	• (OPT)* <sup>3</sup>	—
Auxiliary system:				
Automatic hot air intake	HAI	Improves driveability – cold	•	•
Automatic choke	—	Improves driveability – cold	•	•
Choke breaker	CB	Improves driveability – cold	•	•
Choke opener	—	Improves driveability – hot	•	•
Auxiliary acceleration pump	AAP	Improves driveability – cold	•	•
Deceleration fuel cut	—	Prevents overheating OC or TWC, and after burning	•	•
Idle advance	—	Improves fuel economy at idle	•	•
Cold mixture heater	CMH	Improves driveability – cold	•	•

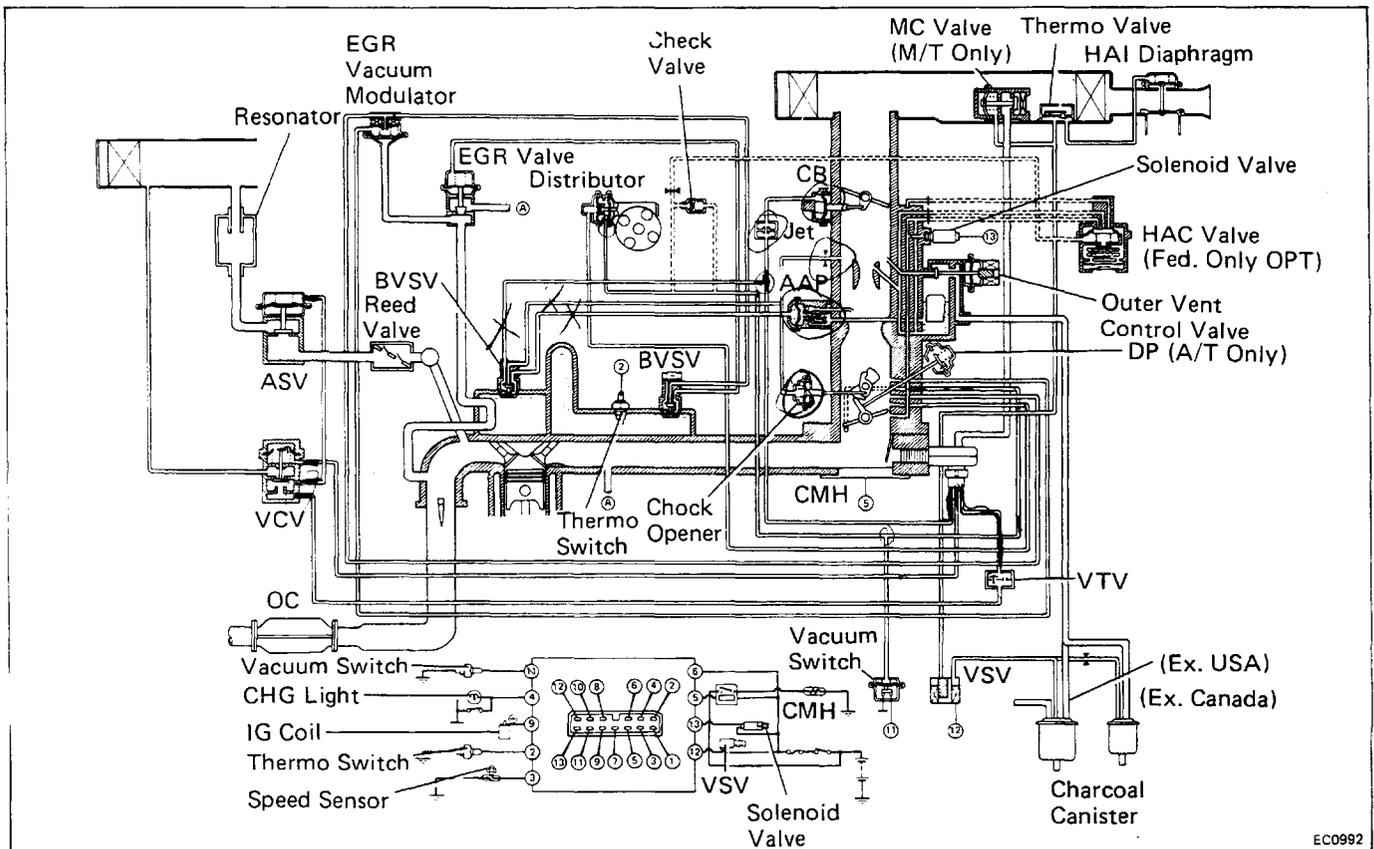
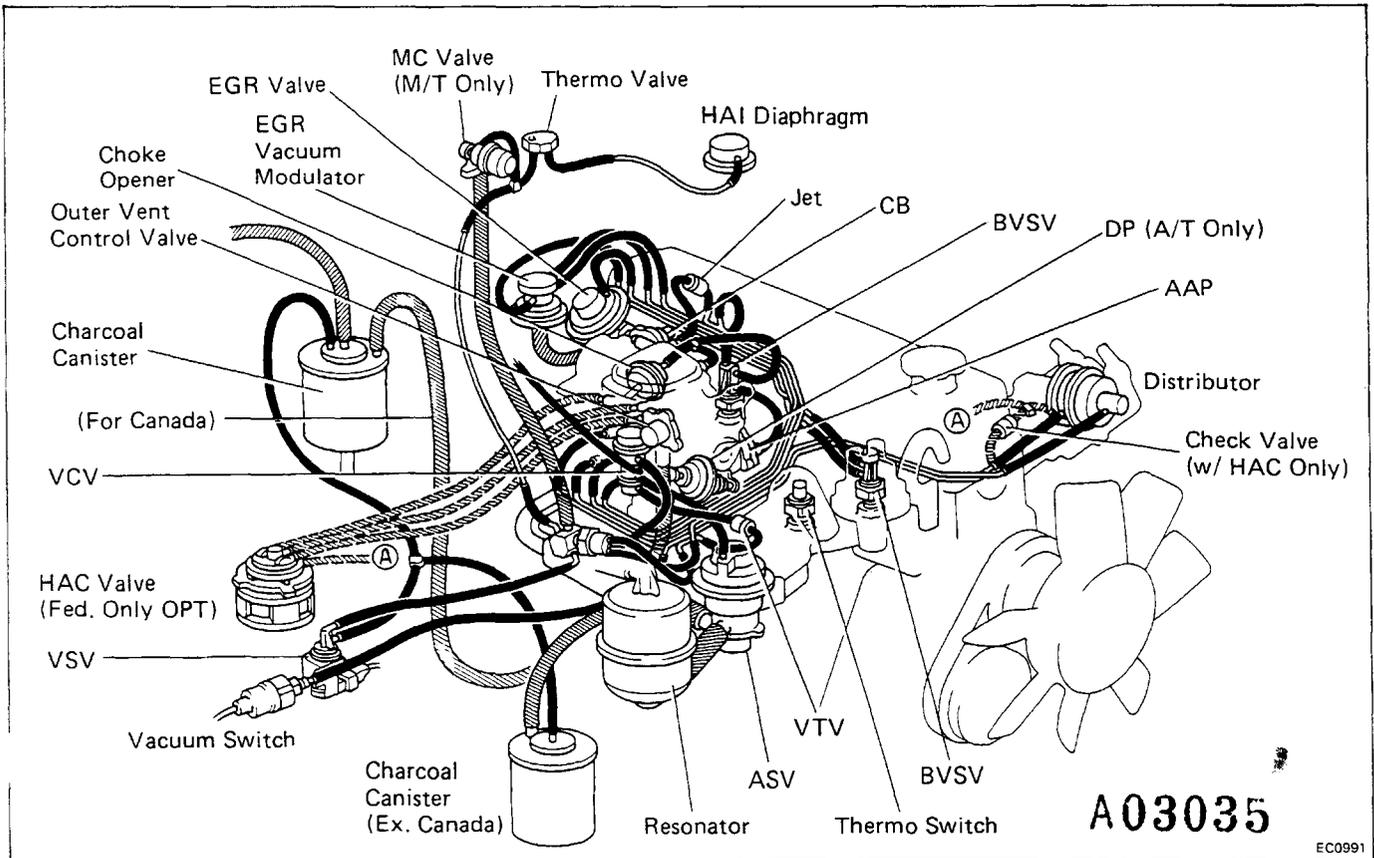
Remarks: \*<sup>1</sup> M/T vehicles only

\*<sup>2</sup> A/T vehicles only

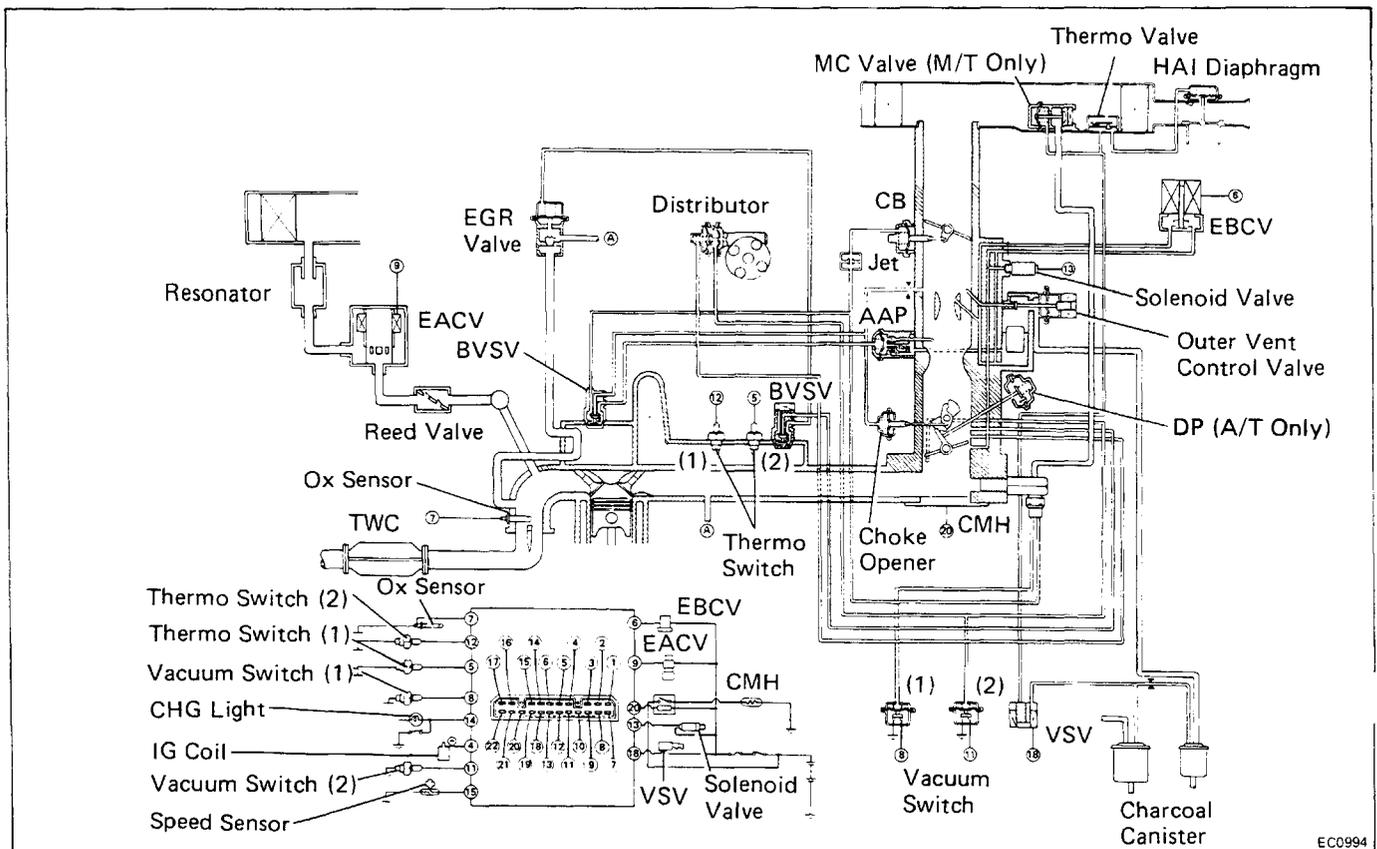
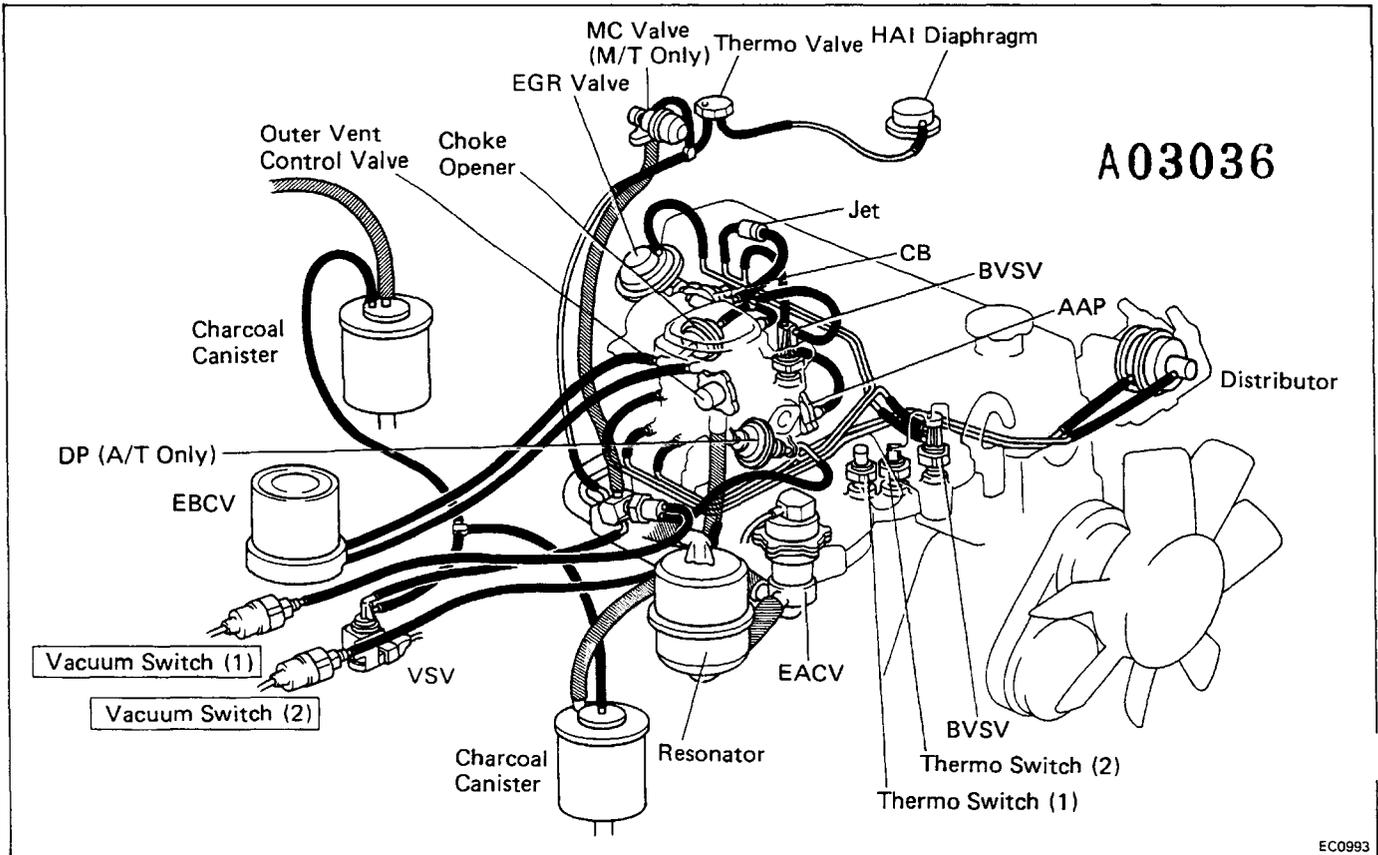
\*<sup>3</sup> Option in USA only, except in California.

# A03034

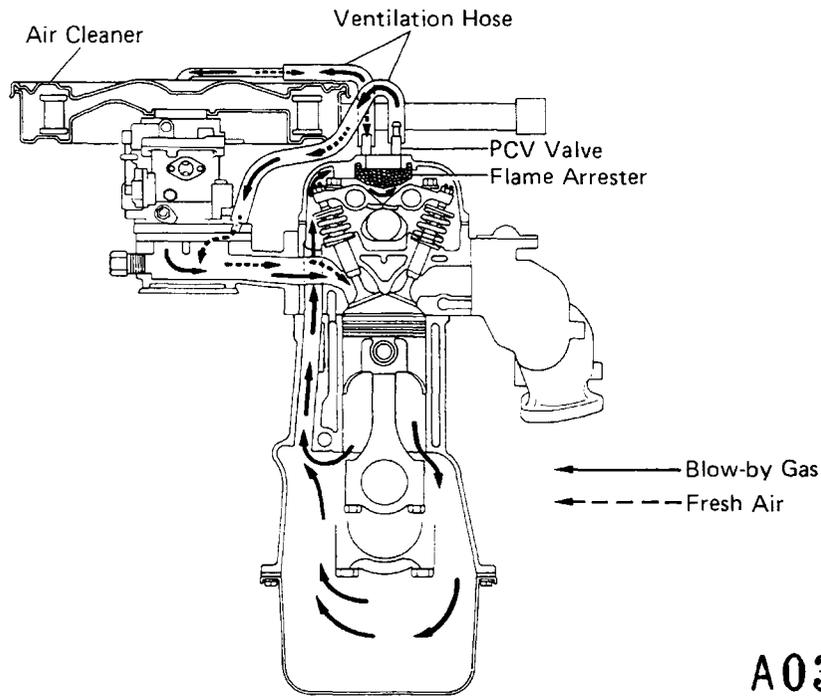
# COMPONENT LAYOUT AND SCHEMATIC DRAWING (Federal and Canada)



# COMPONENT LAYOUT AND SCHEMATIC DRAWING (California)



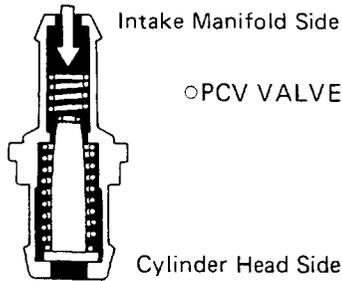
# POSITIVE CRANKCASE VENTILATION (PCV) SYSTEM



EC1048

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

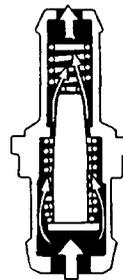
### Engine not Running or if Backfiring



○PCV VALVE IS CLOSED.

EC1001

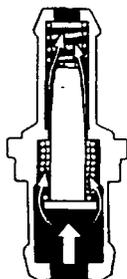
### Normal Operation



○PCV VALVE IS OPEN.  
○VACUUM PASSAGE IS LARGE.

EC1002

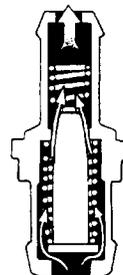
### Idling or Decelerating



○PCV VALVE IS OPEN.  
○VACUUM PASSAGE IS SMALL.

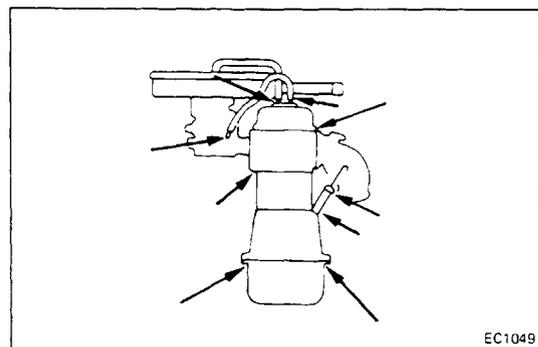
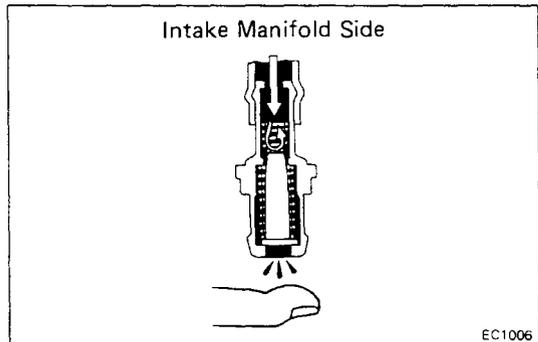
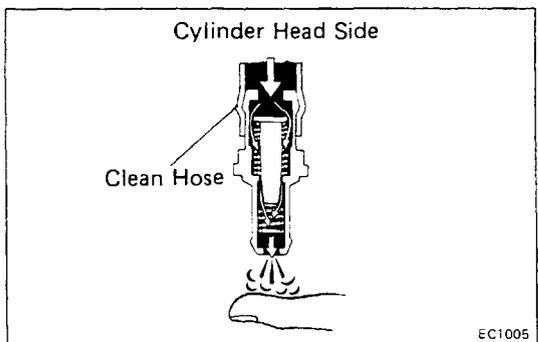
EC1003

### Acceleration of Heavy Load



○PCV VALVE IS FULLY OPEN.

EC1004



## INSPECTION OF PCV VALVE

1. REMOVE PCV VALVE
2. ATTACH CLEAN HOSE TO PCV VALVE
3. BLOW FROM CYLINDER HEAD SIDE  
Check that air passes through easily.  
**CAUTION: Do not suck air through the valve. Petroleum substances inside the valve are harmful.**
4. BLOW FROM INTAKE MANIFOLD SIDE  
Check that air passes through with difficulty.  
If the PCV valve fails either of the checks, replace it.
5. REINSTALL PCV VALVE

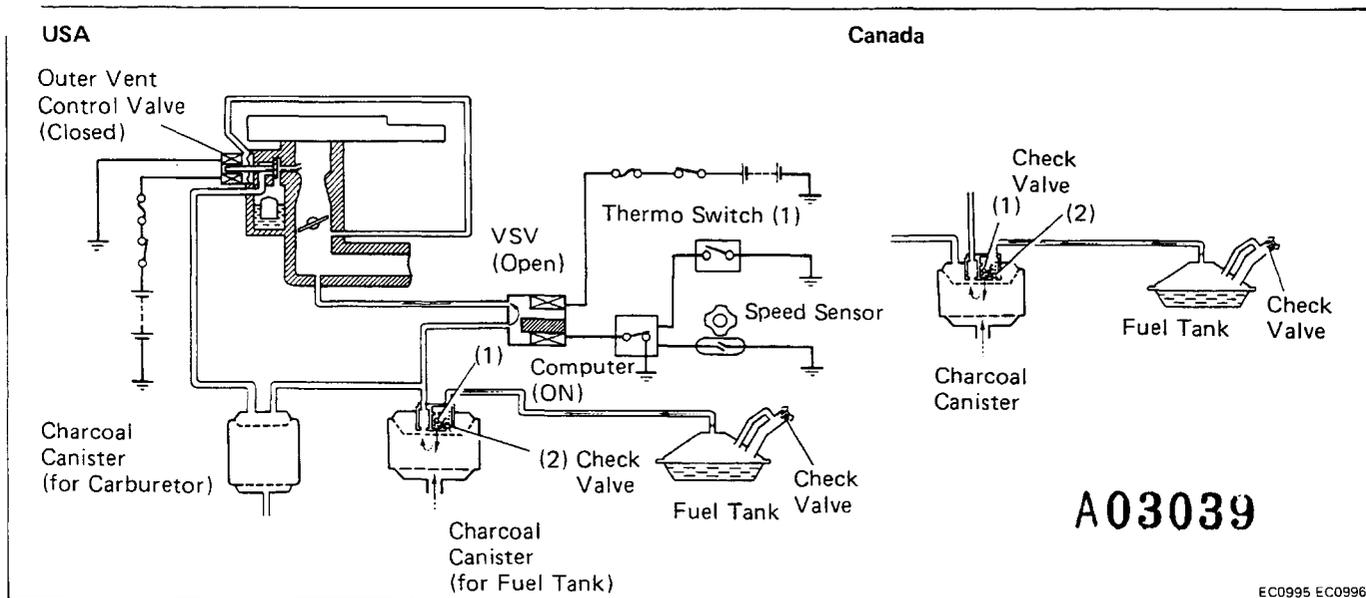
A03038

## INSPECTION OF PCV HOSES AND CONNECTIONS

### VISUALLY INSPECT HOSES, CONNECTIONS AND GASKET

Check for cracks, leaks or damage.

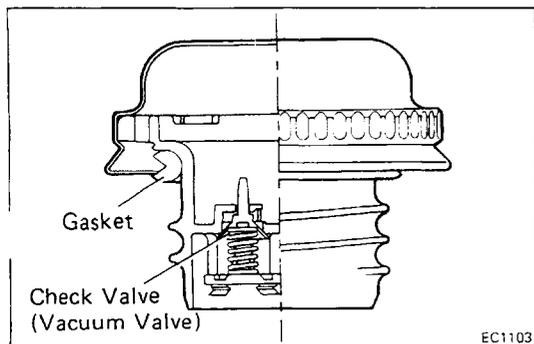
# FUEL EVAPORATIVE EMISSION CONTROL (EVAP) SYSTEM



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

IG S/W	Engine	*Outer Vent Control Valve	Coolant Temp.	Thermo S/W (1)	Vehicle Speed	Computer	VSV	Check Valve (1)	Check Valve (2)	Check Valve in Cap	Evaporated Fuel (HC)
OFF	Not running	OPEN	—	—	—	—	—	—	—	—	HC from tank and float chamber is absorbed into the canister.
ON	Running	CLOSED	Below 43°C (109°F)	ON	—	OFF	CLOSED	—	—	—	HC from tank is absorbed into the canister
			Above 55°C (131°F)	OFF	Below 7 mph (11 km/h)	OFF	CLOSED	—	—	—	HC from canister is led into the intake manifold.
					Above 16 mph (25 km/h)	ON	OPEN	—	—	—	HC from tank is led into the intake manifold.
	High pressure in tank	—	—	—	—	—	—	OPEN	CLOSED	CLOSED	HC from tank is absorbed into the canister.
	High vacuum in tank	—	—	—	—	—	—	CLOSED	OPEN	OPEN	(Air is led into the tank.)

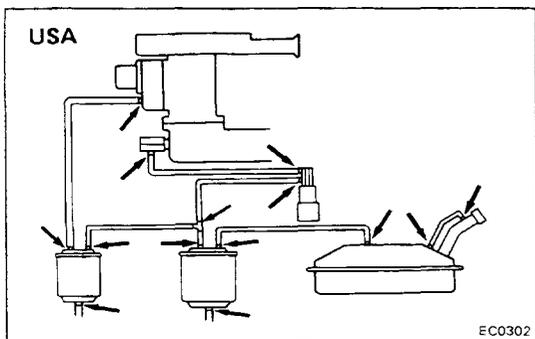
Remarks: \*The outer vent control valve is pulled by intake manifold vacuum and held by the solenoid. The solenoid itself cannot pull the valve.



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

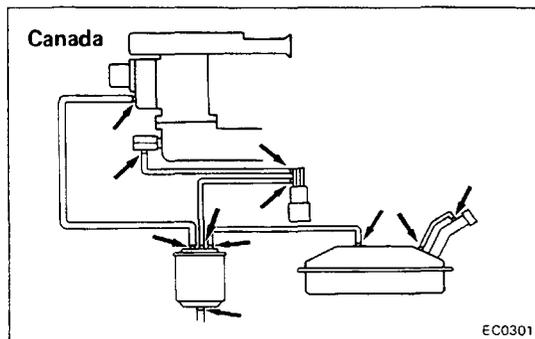
### 1. VISUALLY INSPECT FUEL FILLER CAP

Look for damaged or deformed gasket and cap. If a problem is found, repair or replace the cap.

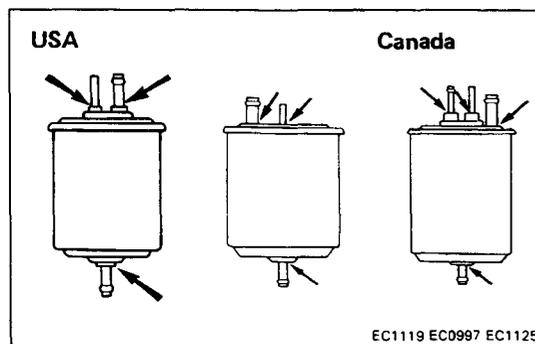


2. **VISUALLY INSPECT LINES AND CONNECTIONS**  
Look for loose connections, sharp bends or damage.
3. **VISUALLY INSPECT FUEL TANK**  
Look for deformation, cracks or fuel leakage.

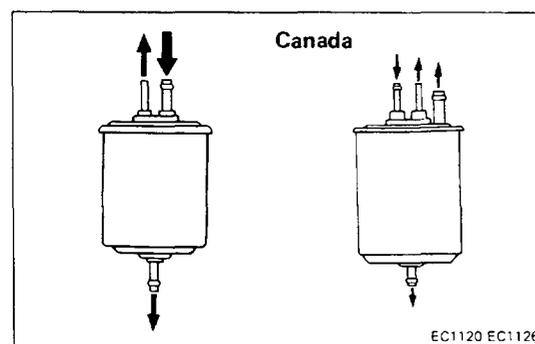
A03040



**INSPECTION OF CHARCOAL CANISTER(S)**

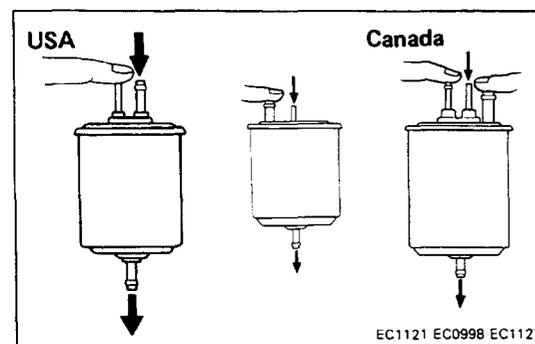


1. **REMOVE CHARCOAL CANISTER(S)**
2. **VISUALLY INSPECT CHARCOAL CANISTER(S)**  
Look for cracks or damage.

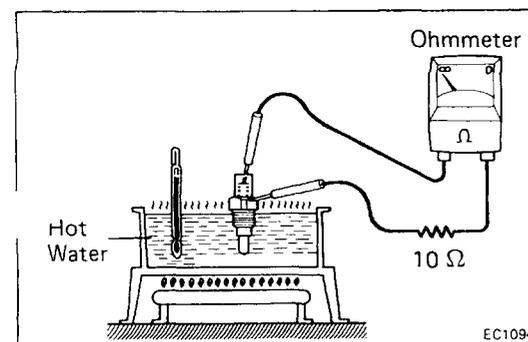
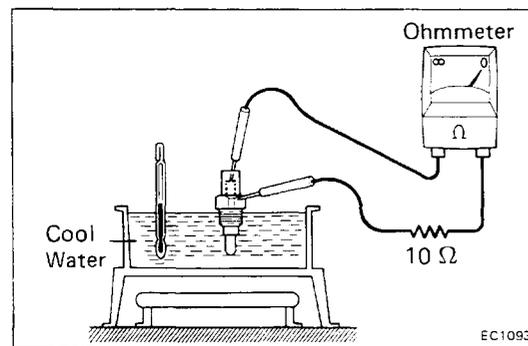
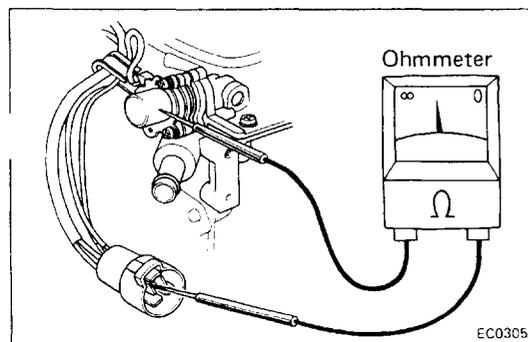
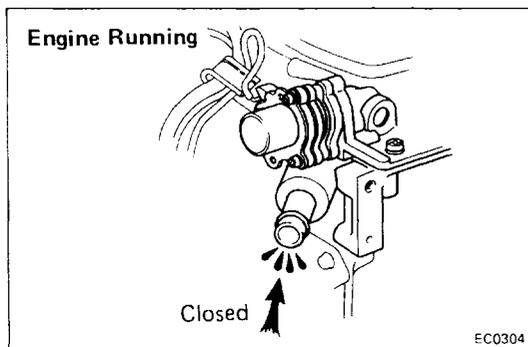
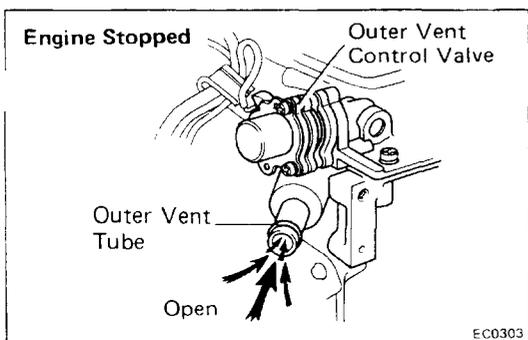


3. **CHECK FOR CLOGGED FILTER AND STUCK CHECK VALVE**
  - (a) Using low pressure compressed air, blow into the tank pipe and check that the air flows without resistance from the other pipes.
  - (b) Blow into the purge pipe and check that the air flows without resistance from the other pipes.

If a problem is found, replace the charcoal canister.



4. **CLEAN FILTER IN CANISTER(S)**  
Clean the filter by blowing 3 kg/cm<sup>2</sup> (43 psi, 294 kPa) of compressed air into the pipe, while holding the other upper canister pipes closed.
- NOTE:
  - Do not attempt to wash the canister.
  - No activated carbon should come out.
5. **REINSTALL CHARCOAL CANISTER(S)**



## INSPECTION OF OUTER VENT CONTROL VALVE

### 1. CHECK OUTER VENT CONTROL VALVE OPERATION

- (a) Disconnect the outer vent hose from the carburetor.
- (b) Blow air into the outer vent pipe and check that the outer vent control valve is open.

**A03041**

- (c) Start the engine.
- (d) With the engine idling, blow air into the outer vent pipe and check that the outer vent control valve is closed.

### 2. CHECK SOLENOID

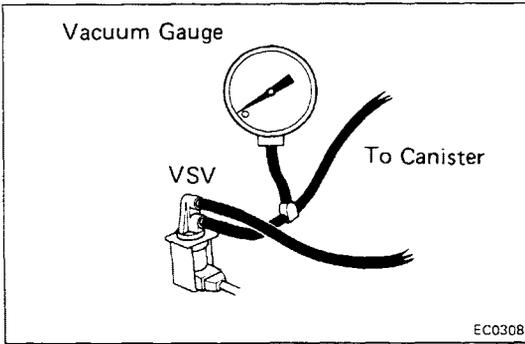
- (a) Unplug the wiring connector.
- (b) Using an ohmmeter, measure the resistance between the positive(+) terminal and the solenoid body.

**Specified resistance: 63 – 73  $\Omega$  at 20°C (68°F)**

## INSPECTION OF THERMO SWITCH (1)

### CHECK THERMO SWITCH BY USING OHMMETER

- (a) Drain the coolant from the radiator into a suitable container.
- (b) Remove the thermo switch from the intake manifold.
- (c) Cool the thermo switch to below 43°C (109°F).
- (d) Using an ohmmeter, check that there is continuity.
- (e) Heat the switch to above 55°C (131°F) with hot water.
- (f) Check that there is no continuity.
- (g) Apply liquid sealer to the threads of the switch and reinstall.
- (h) Fill the radiator with coolant.



### INSPECTION OF SPEED SENSOR TO VSV

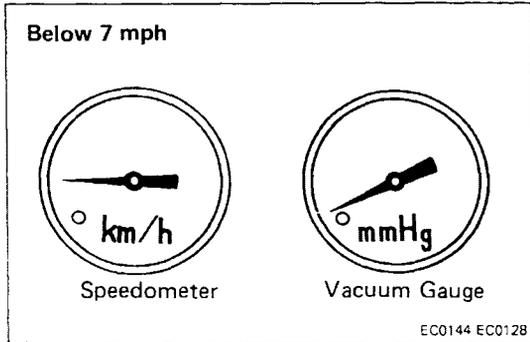
**1. CONNECT VACUUM GAUGE**

- (a) Using a 3-way connector, connect the vacuum gauge to the hose between the VSV and canister.
- (b) Set the gauge at the driver's seat.

**A03042**

**2. PERFORM ROAD TEST, OBSERVING SPEEDOMETER AND VACUUM GAUGE**

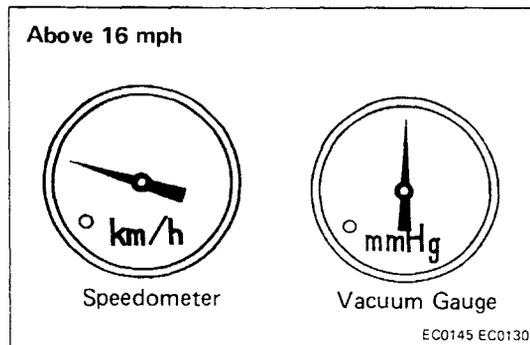
- (a) Warm up the engine.
- (b) Check that the vacuum gauge indicates zero at low speed driving (below 7 mph or 11 km/h).



- (c) Check that the vacuum gauge indicates intake manifold vacuum at middle and high speed driving (above 16 mph or 25 km/h).

If a problem is found, inspect speed sensor and VSV.

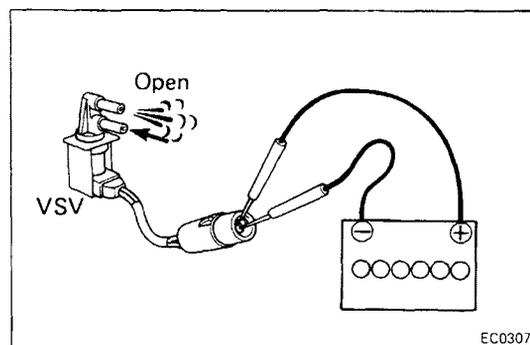
**3. REMOVE VACUUM GAUGE AND RECONNECT HOSE**



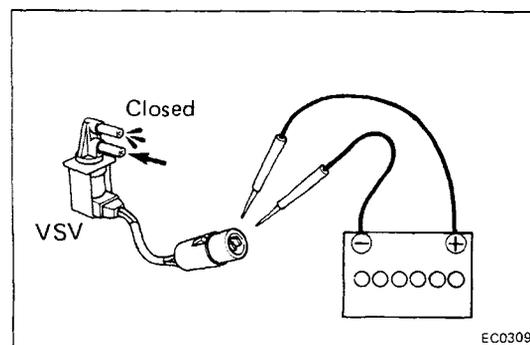
### INSPECTION OF VSV

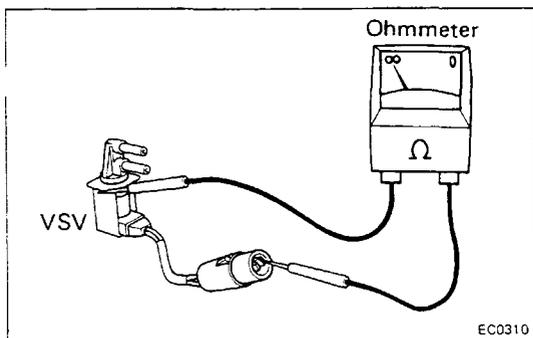
**1. CHECK VACUUM CIRCUIT CONTINUITY IN VSV BY BLOWING AIR INTO PIPE**

- (a) Connect the VSV terminals to the battery terminal as shown.
- (b) Blow into a pipe, and check that the VSV is open.



- (c) Disconnect the battery positive (+) terminal.
- (d) Blow into a pipe and check that the VSV is closed.

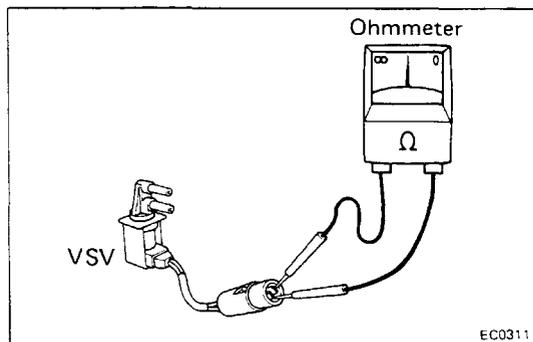




**2. CHECK FOR SHORT CIRCUIT**

Using an ohmmeter, check that there is no continuity between the positive (+) terminal and the VSV body. If a short circuit is found, repair or replace the VSV.

**A03043**

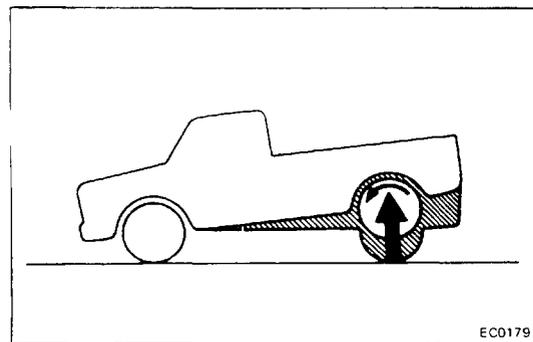


**3. CHECK FOR OPEN CIRCUIT**

Using an ohmmeter, measure the resistance between the positive (+) terminal and the other terminals as shown.

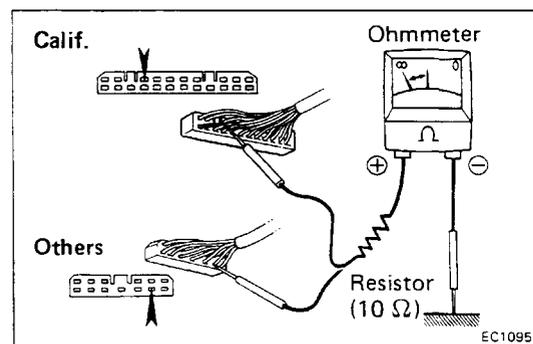
**Specified resistance: 38 – 44 Ω at 20°C (68°F)**

If the resistance is not within specification, replace the VSV.



**INSPECTION OF SPEED SENSOR**

1. JACK UP ONE REAR WHEEL TO CLEAR GROUND AND CHOCK FRONT WHEELS
2. RELEASE PARKING BRAKE
3. SET SHIFT LEVER INTO NEUTRAL
4. UNPLUG WIRING CONNECTOR FROM COMPUTER  
Computer location: Left Cowl Side



**5. CHECK ON-OFF CYCLES OF SPEED SENSOR**

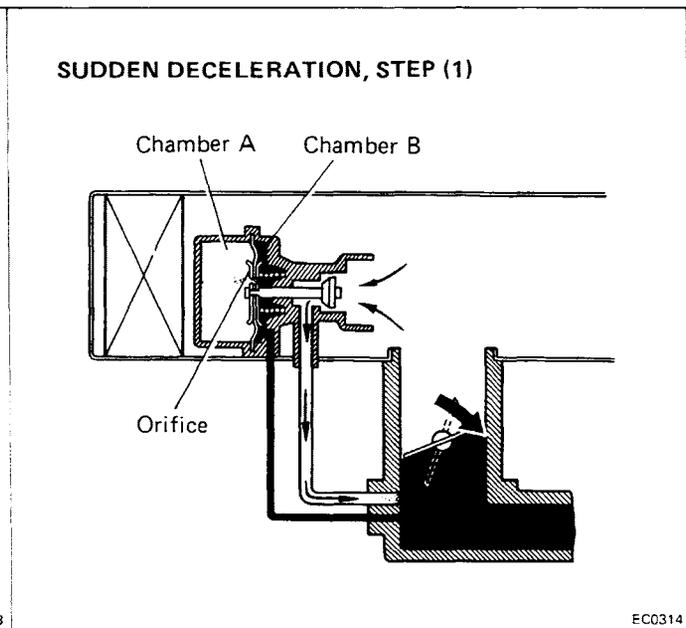
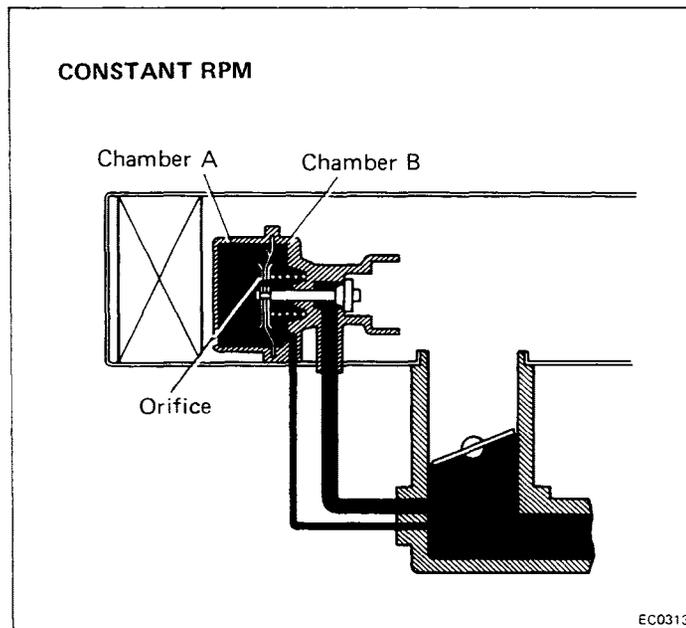
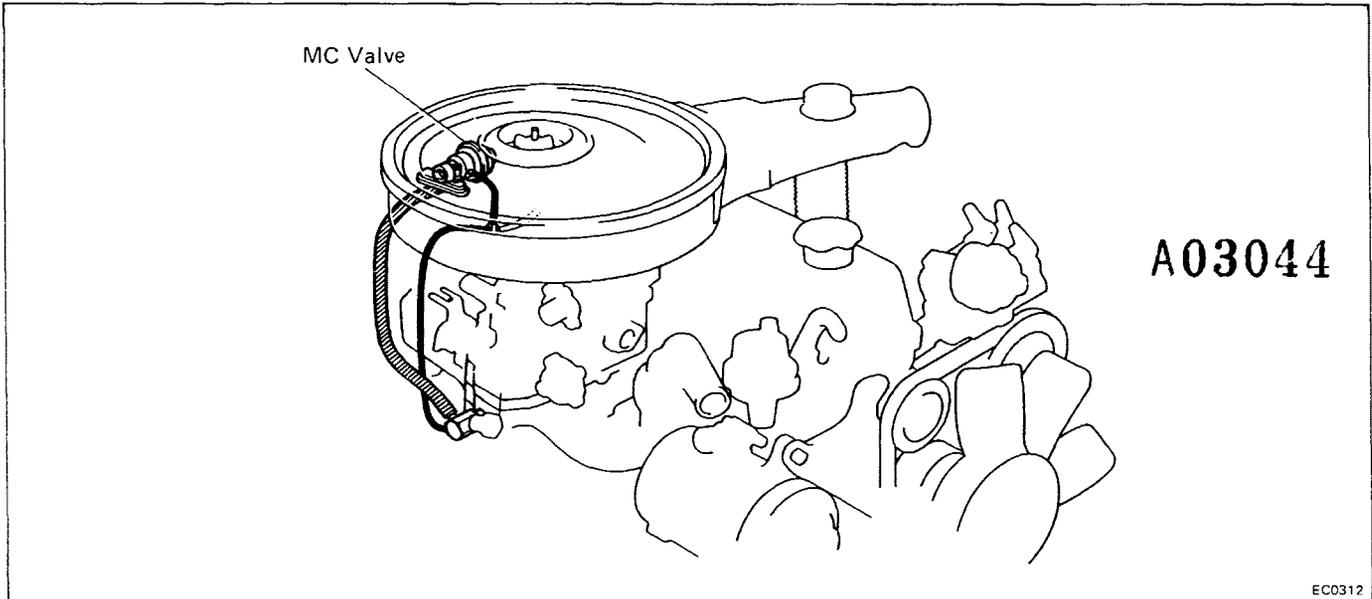
- (a) Place the positive (+) terminal of the ohmmeter on the wiring connector terminal and the negative (-) terminal on ground.
- (b) Turn the rear wheel slowly.
- (c) Check that the ohmmeter needle deflects consistently

**CAUTION:** The ohmmeter probe should be inserted from the rear side of the connector.

If the ohmmeter needle does not deflect, check that the speed sensor terminals at the back side of the speedometer air properly connected. If the connection is OK, replace the speedometer assembly.

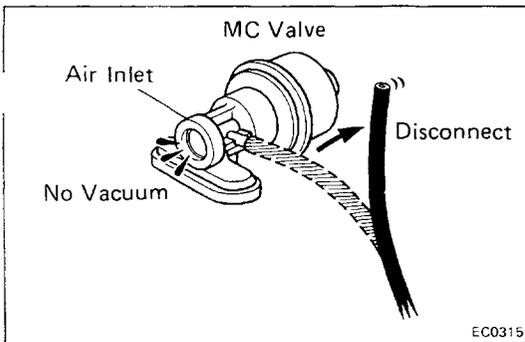
**6. RECONNECT WIRING CONNECTOR TO COMPUTER**

# MIXTURE CONTROL (MC) SYSTEM (M/T Vehicles Only)



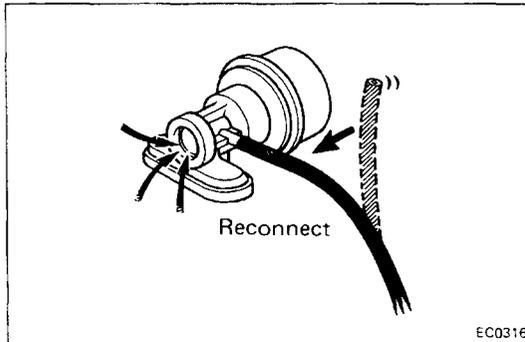
To reduce HC and CO emissions, this system allows air to enter the intake manifold on sudden deceleration.

Condition		Vacuum in Chambers A and B	MC Valve	Fresh Air
Constant RPM		Same vacuum	CLOSED	No air flow
Sudden deceleration	Step (1)	High vacuum acts on chamber B	OPEN	Air is routed through MC valve to intake manifold.
	Step (2)	After a few seconds, vacuum in both chambers equalizes through the orifice.	CLOSED	No air flow



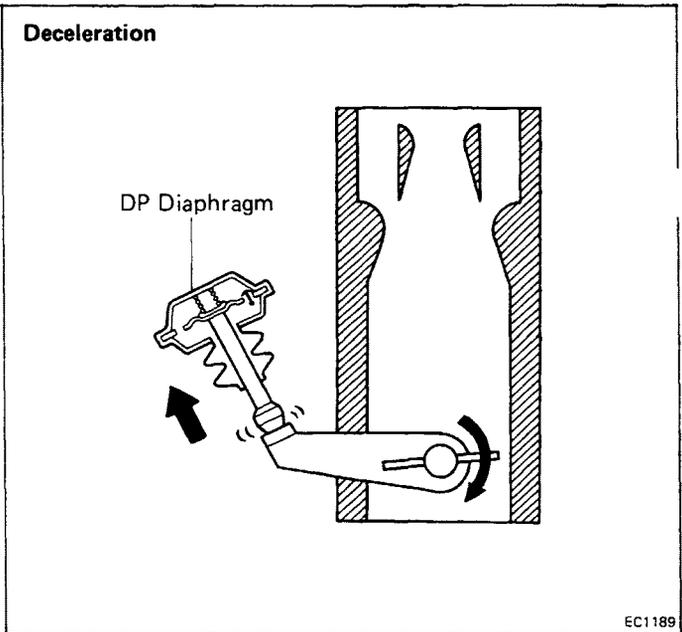
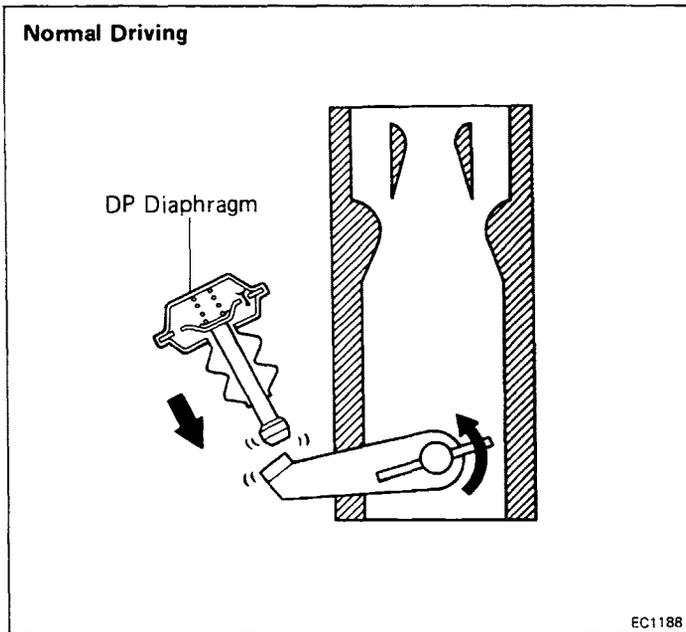
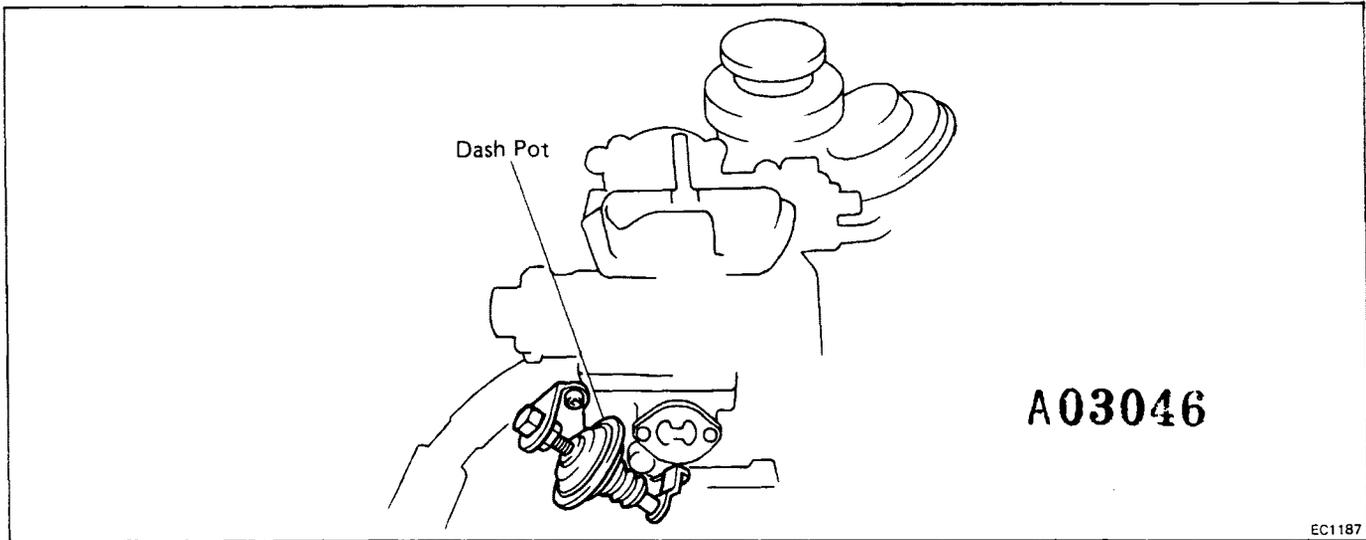
## INSPECTION OF MC SYSTEM

1. REMOVE AIR CLEANER COVER AND AIR FILTER
2. START ENGINE
3. CHECK MC VALVE
  - (a) Disconnect the vacuum hose from the MC valve.
  - (b) Place your fingers over the air inlet of the MC valve.
  - (c) Check that vacuum is not felt.
  - (d) Reconnect the vacuum hose and check that vacuum is felt momentarily.
4. REINSTALL AIR FILTER AND CLEANER COVER



**A03045**

## DASH POT (DP) SYSTEM (A/T Vehicles Only)



To reduce HC and CO emissions, when decelerating the dash pot opens the throttle valve slightly more than at idle. This causes the air-fuel mixture to burn completely.

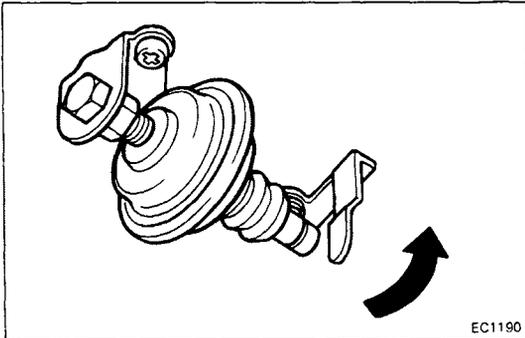
Condition	DP Diaphragm	Throttle Valve
Idling	Pushed in by return force of throttle valve	Idle speed position
Normal driving	Pushed out by diaphragm spring	High speed position
Deceleration	Pushed in by return force of throttle valve	Slightly opens and then slowly closes to idle position

**INSPECTION OF DP SYSTEM**

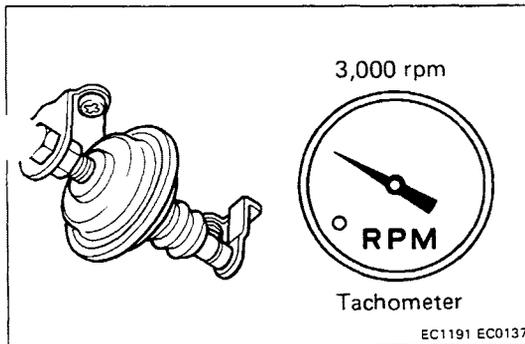
1. WARM UP ENGINE
2. CHECK IDLE SPEED AND ADJUST, IF NECESSARY

**A03047****3. CHECK DP SETTING SPEED**

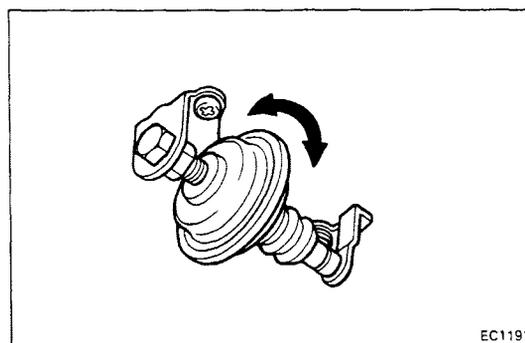
- (a) Open the throttle valve until the throttle lever separates from the DP end.



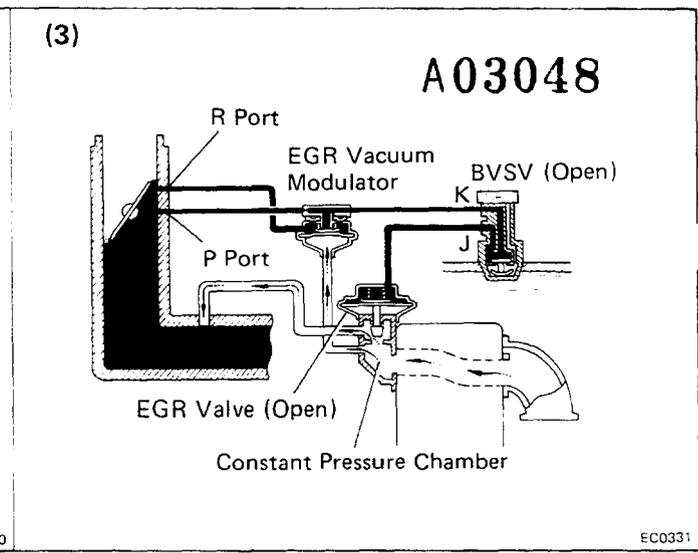
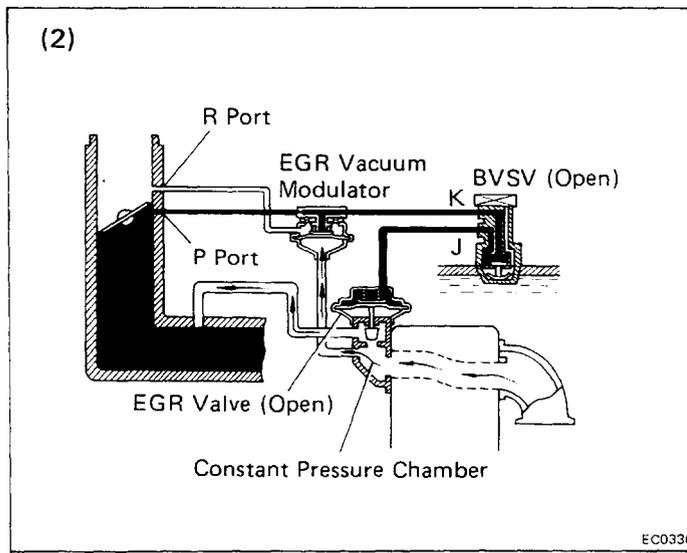
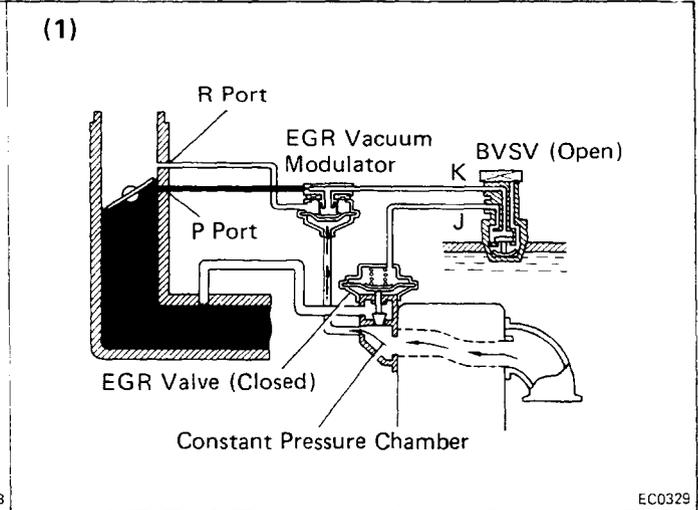
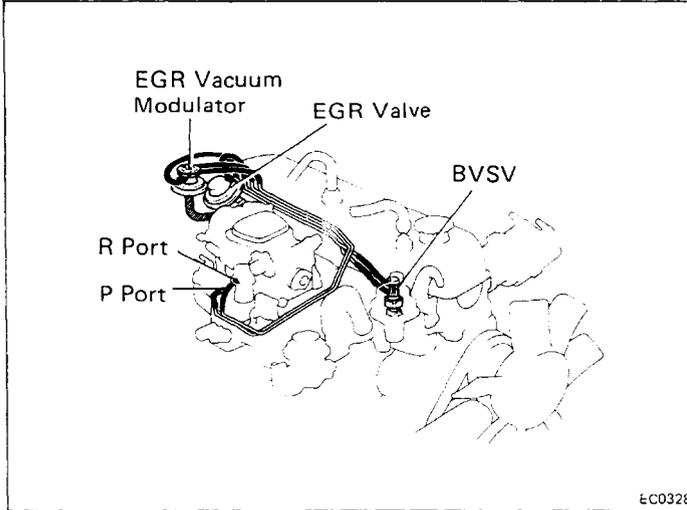
- (b) Release the throttle valve gradually, and check the DP setting speed when the throttle lever touches the DP end.

**DP setting speed: 3,000 rpm**

If the speed is not as specified, unlock the lock nut, and adjust the setting speed by turning the DP diaphragm.



## EXHAUST GAS RECIRCULATION (EGR) SYSTEM (Federal and Canada)

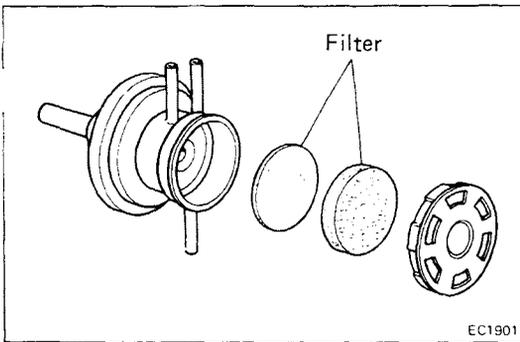


To reduce NOx emission, part of the exhaust gases are recirculated through the EGR valve to the intake manifold to lower the maximum combustion temperature.

Coolant Temp.	BVSV	Throttle Valve Opening Angle	Pressure in the EGR Valve Pressure Chamber	EGR Vacuum Modulator	EGR Valve	Exhaust Gas	
Below 30°C (86°F)	CLOSED (J-K)	—	—	—	CLOSED	Not recirculated	
Above 44°C (111°F)	OPEN (J-K)	Positioned below EGR port	—	—	CLOSED	Not recirculated	
		Positioned between P port & R port	(1) LOW	*Pressure constantly alternating between low and high	OPENS passage to atmosphere	CLOSED	Not recirculated
			(2) HIGH	**	CLOSES passage to atmosphere	OPEN	Recirculated
Positioned above EGR R port	(3) HIGH	**	CLOSES passage to atmosphere	OPEN	Recirculated (increase)		

Remarks: \*Pressure increase → Modulator closes → EGR valve opens → Pressure drops  
 ← EGR valve closes ← Modulator opens ←

\*\*When the throttle valve is positioned above the R 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.

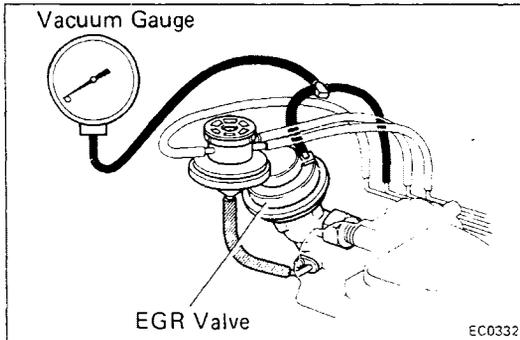


## INSPECTION OF EGR SYSTEM

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

- (a) Check the filter for contamination or damage.
- (b) Using compressed air, clean the filter.

**A03049**

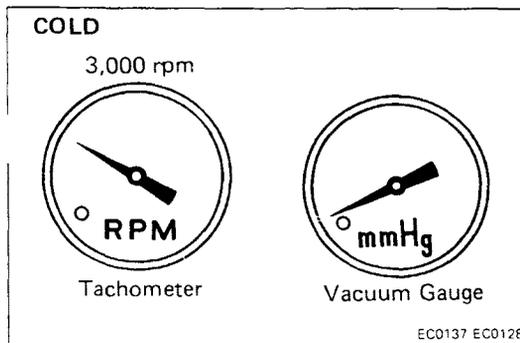


### 2. PREPARATION

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

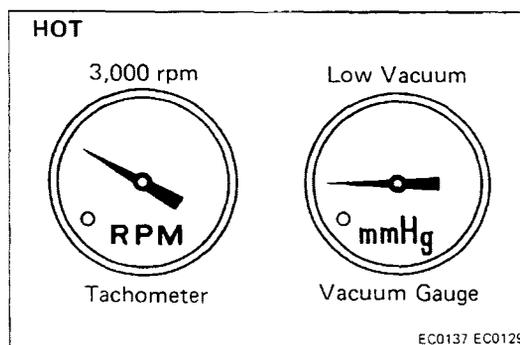
### 3. CHECK SEATING OF EGR VALVE

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



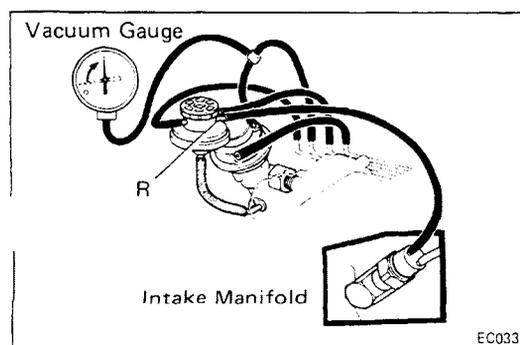
### 4. CHECK BVSV WITH COLD ENGINE

- (a) The coolant temperature should be below 30°C (86°F).
- (b) Check that the vacuum gauge indicates zero at 3,000 rpm.



### 5. CHECK BVSV, VSV AND EGR VACUUM MODULATOR WITH HOT ENGINE

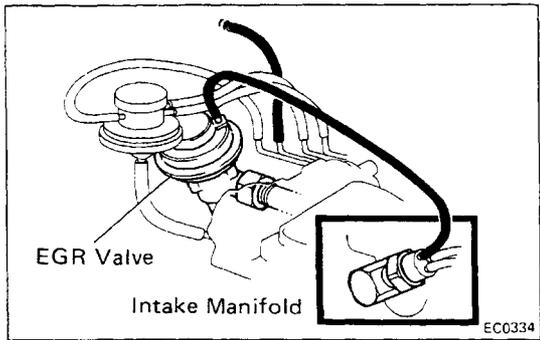
- (a) Warm up the engine.
- (b) Check that the vacuum gauge indicates low vacuum at 3,000 rpm.



- (c) Disconnect the vacuum hose from port R of the EGR vacuum modulator and connect port R directly to the intake manifold with another hose.
- (d) Check that the vacuum gauge indicates high vacuum at 3,000 rpm.

NOTE: As a large amount of EGR gas enters, the engine will misfire slightly at this time.

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



## 6. CHECK EGR VALVE

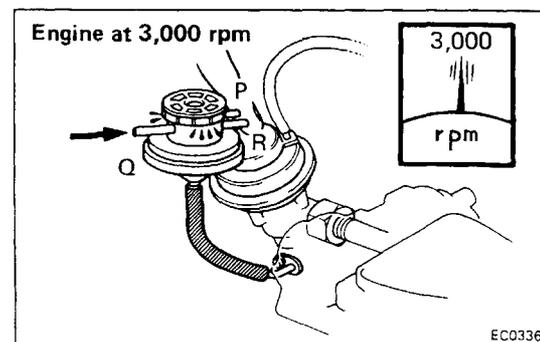
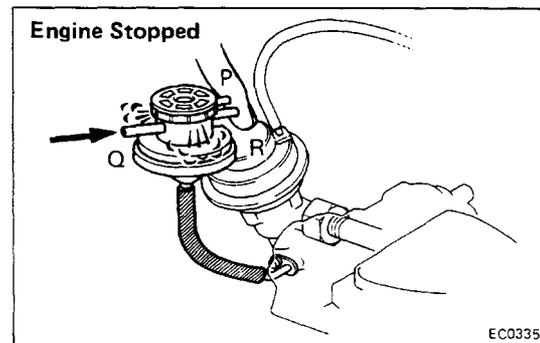
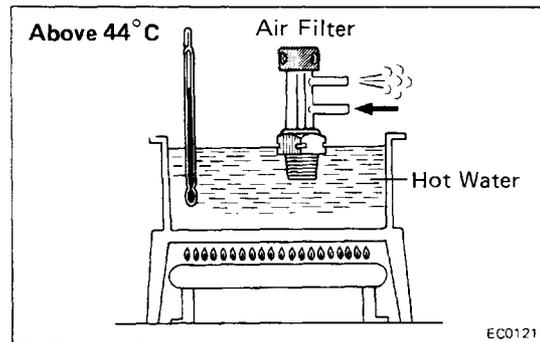
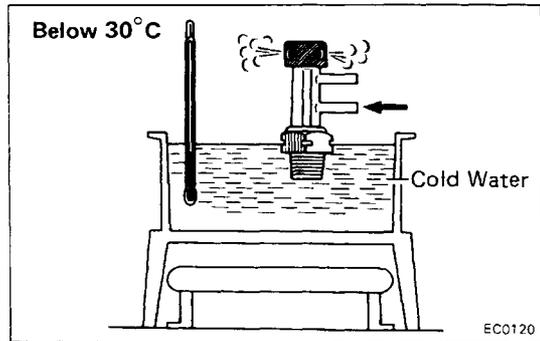
- (a) Apply vacuum directly to the EGR valve with the engine idling.
- (b) Check that the engine runs rough or dies.
- (c) Reconnect the vacuum hoses to the proper locations.

IF NO PROBLEM IS FOUND WITH THIS INSPECTION, THE SYSTEM IS OKAY; OTHERWISE INSPECT EACH PART

**A03050**

## 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.
  - (c) Cool the BVSV to below 30°C (86°F) with cool water.
  - (d) Blow air into a pipe and check that the BVSV is closed.
  - (e) Heat the BVSV to above 44°C (111°F) with hot water.
  - (f) Blow air into a pipe and check that the BVSV is open.
  - (g) Apply liquid sealer to the threads of the BVSV and reinstall.
  - (h) Fill the radiator with coolant.
- If a problem is found, replace the BVSV.

## INSPECTION OF EGR VACUUM MODULATOR

### CHECK EGR VACUUM MODULATOR OPERATION

- (a) Disconnect the vacuum hoses from port P, Q and R of the EGR vacuum modulator.
- (b) Plug port P and R with your finger.
- (c) Blow air into port Q. Check that the air passes through to the air filter side freely.
- (d) Start the engine and maintain the speed at 3,000 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.

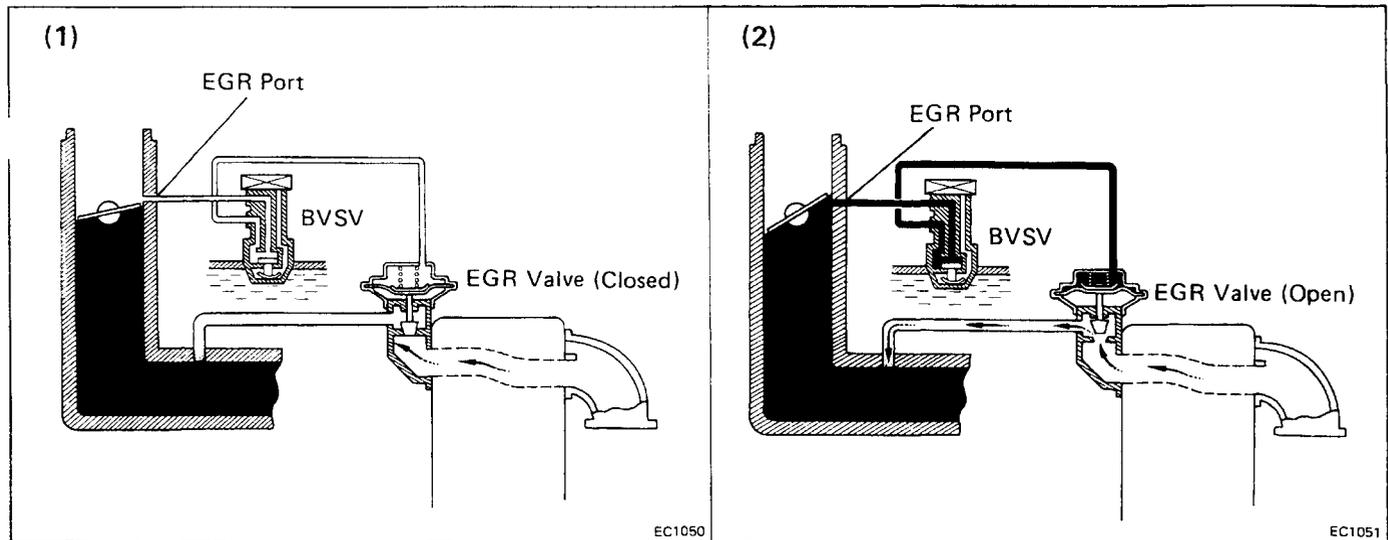
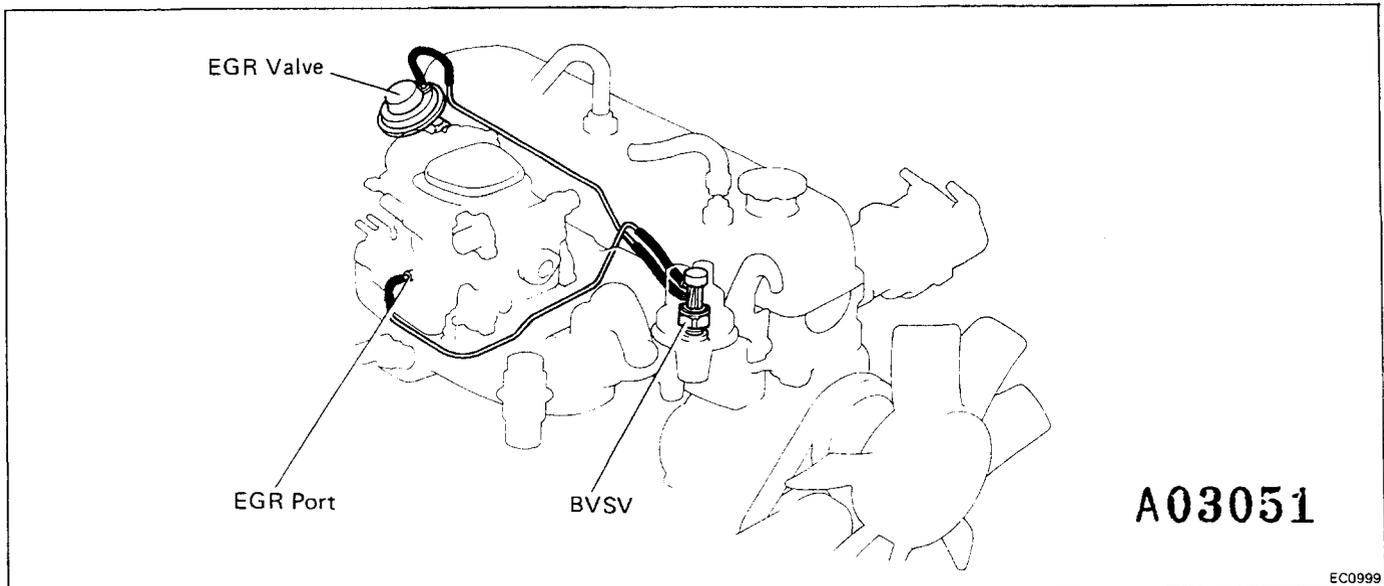
## INSPECTION OF EGR VALVE

### 1. REMOVE EGR VALVE

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

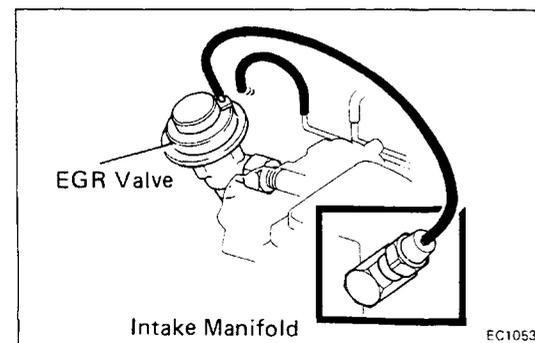
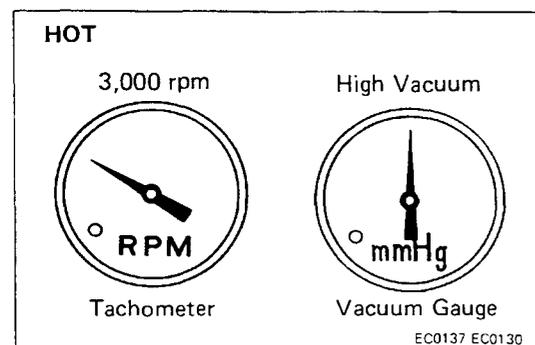
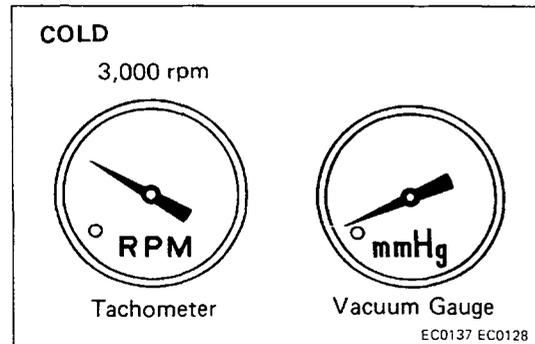
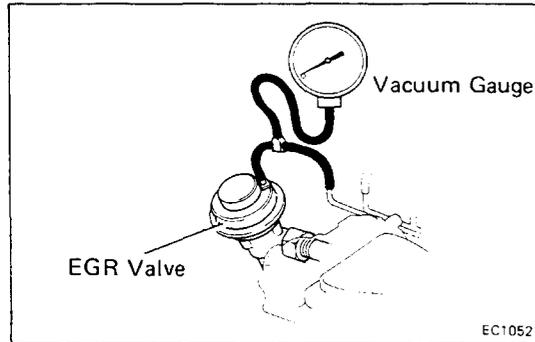
### 2. INSTALL EGR VALVE WITH A NEW GASKET

## EXHAUST GAS RECIRCULATION (EGR) SYSTEM (California)



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

Coolant Temp.	BVSV	Throttle Valve Opening Angle	EGR Valve	Exhaust Gas
Below 30°C (86°F)	CLOSED (J-K)	—	CLOSED	Not recirculated
Above 44°C (111°F)	OPEN (J-K)	Positioned below EGR port	CLOSED	Not recirculated
		Positioned above EGR port	OPEN	Recirculated



## INSPECTION OF EGR SYSTEM

### 1. PREPARATION

- (a) Disconnect the hose from the distributor main diaphragm, and plug the hose end.

**A03052**

- (b) Using a 3-way connector, connect a vacuum gauge to the hose between the EGR valve and EGR vacuum pipe.

### 2. CHECK SEATING OF EGR VALVE

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

### 3. CHECK BVSV WITH COLD ENGINE

- (a) The coolant temperature should be below 30°C (86°F).
- (b) Check that the vacuum gauge indicates zero at 3,000 rpm.

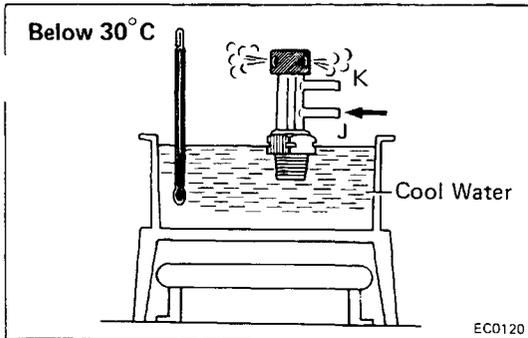
### 4. CHECK BVSV AND EGR VACUUM MODULATOR WITH HOT ENGINE

- (a) Warm up the engine.
- (b) Check that the vacuum gauge indicates high vacuum at 3,000 rpm.
- (c) Disconnect the vacuum gauge and reconnect the vacuum hose to the proper location.

### 5. 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.

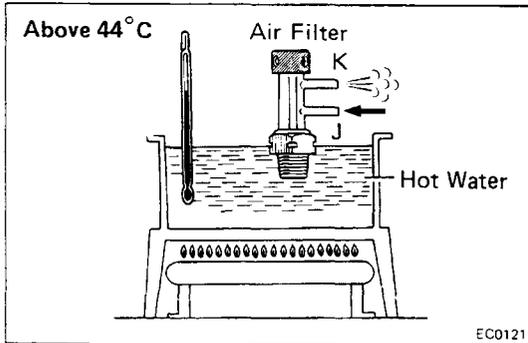
**IF NO PROBLEM IS FOUND WITH THIS INSPECTION, THE SYSTEM IS OKAY; OTHERWISE INSPECT EACH PART**



## INSPECTION OF BSVV

### CHECK BSVV BY BLOWING AIR INTO PIPE

- (a) Drain the coolant from the radiator into a suitable container.
  - (b) Remove the BSVV.
  - (c) Cool the BSVV to below 30°C (86°F).
  - (d) Check that air flows from pipe J to the air filter.
  - (e) Heat the BSVV to above 44°C (111°F).
  - (f) Check that air flows from pipe J to pipe K.
  - (g) Apply liquid sealer to the threads of the BSVV and reinstall.
  - (h) Fill the radiator with coolant.
- If a problem is found, replace the BSVV.



**A03053**

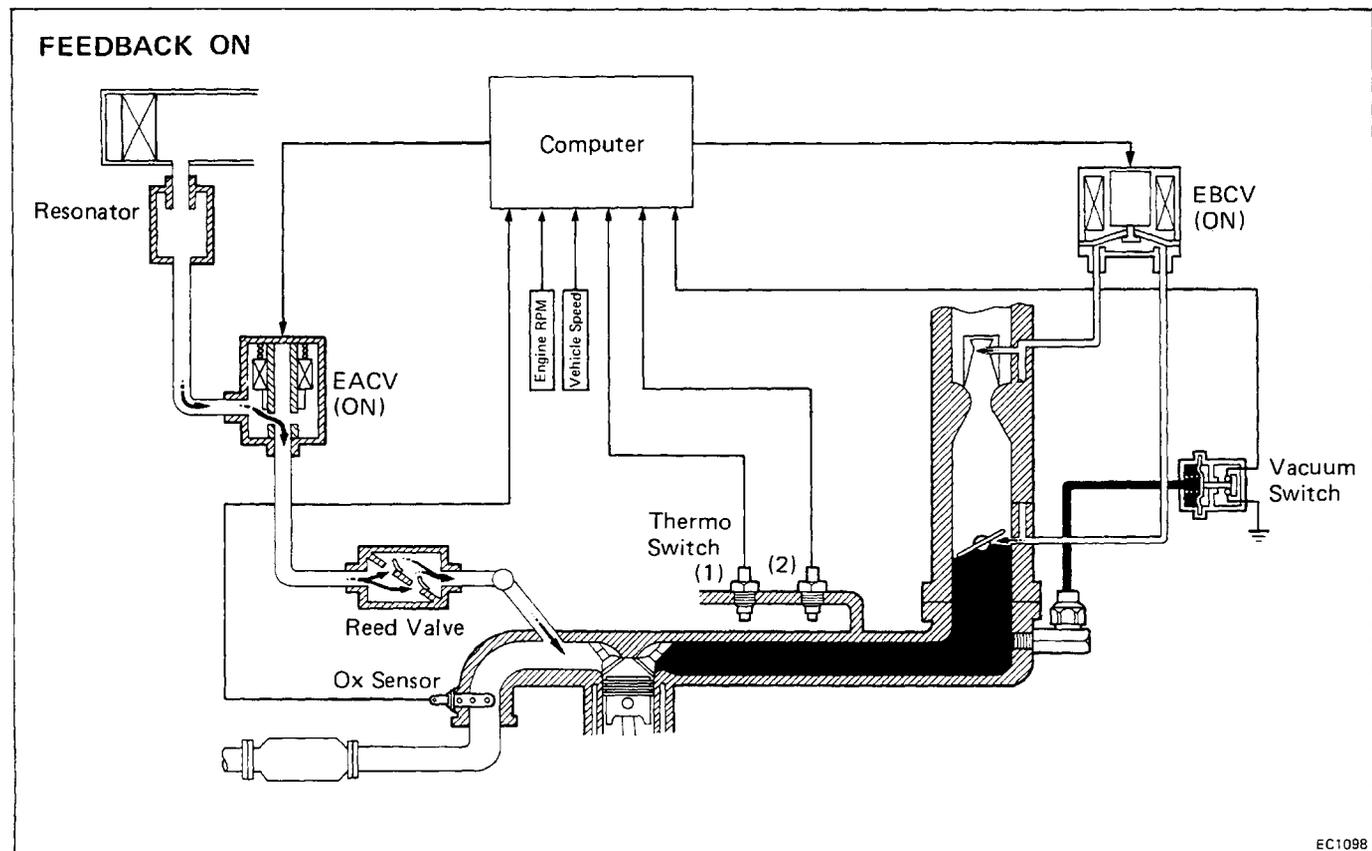
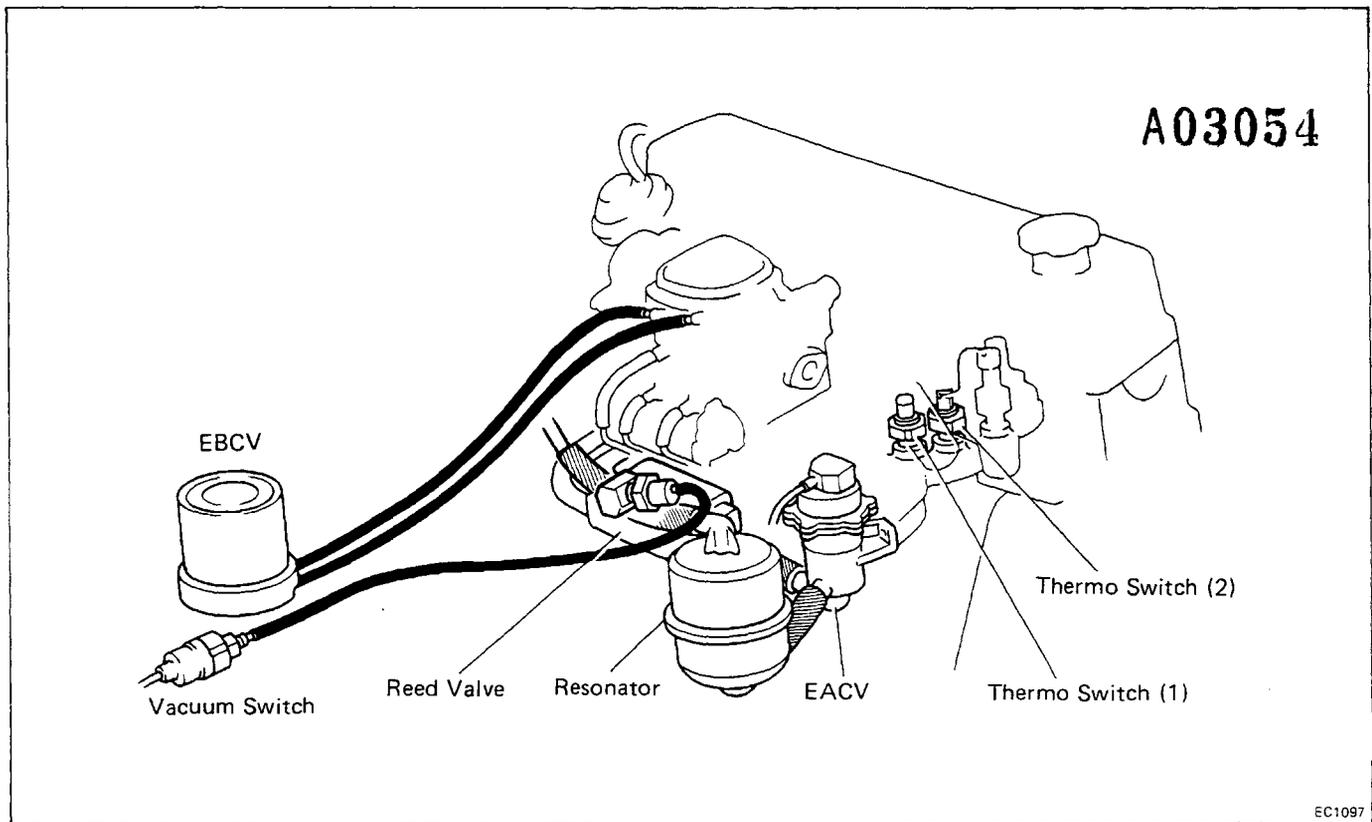
## INSPECTION OF EGR VALVE

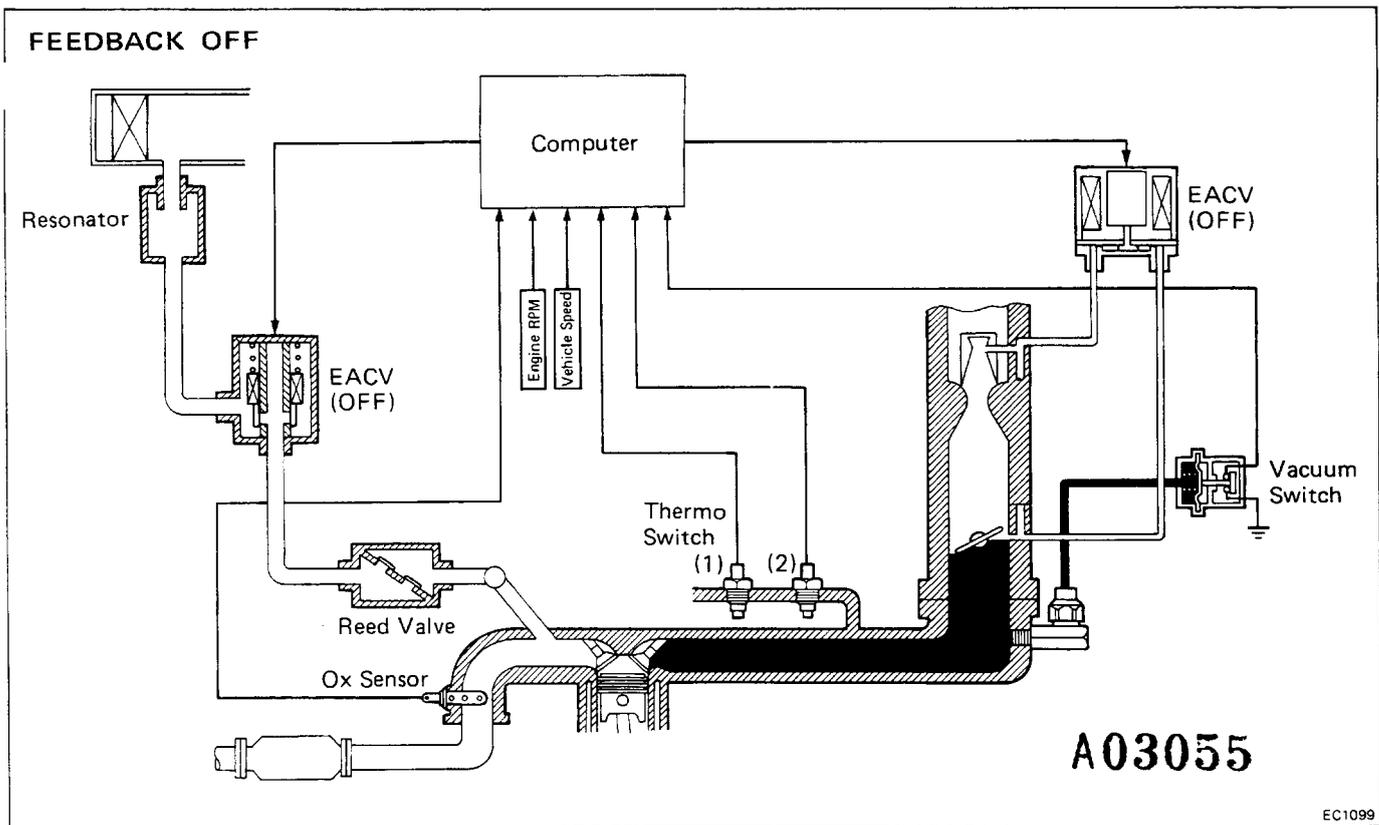
### 1. REMOVE EGR VALVE

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

### 2. INSTALL EGR VALVE WITH NEW GASKET

# AIR SUCTION AND FUEL SYSTEM FEEDBACK CONTROL SYSTEM (California,)





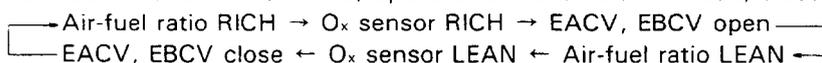
To maintain a stoichiometric air/fuel ratio in order to simultaneously reduce HC, CO and NO<sub>x</sub> emissions by the three-way catalyst, consist of the fuel system feedback control system and air suction feedback system.

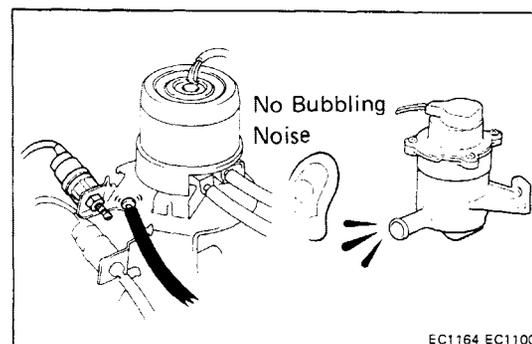
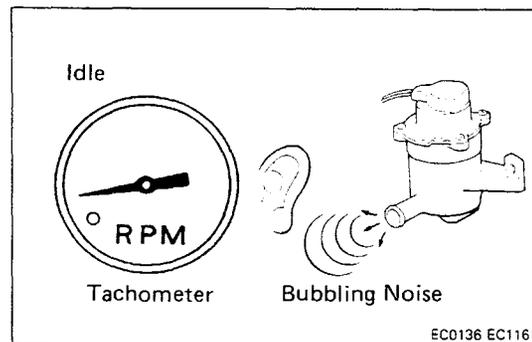
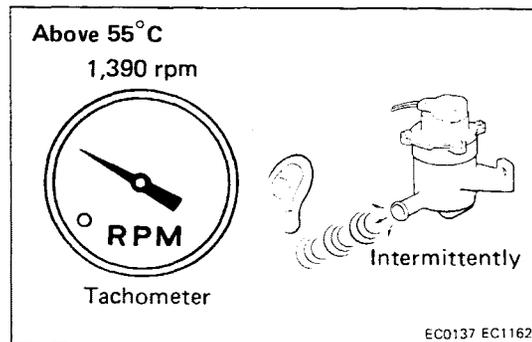
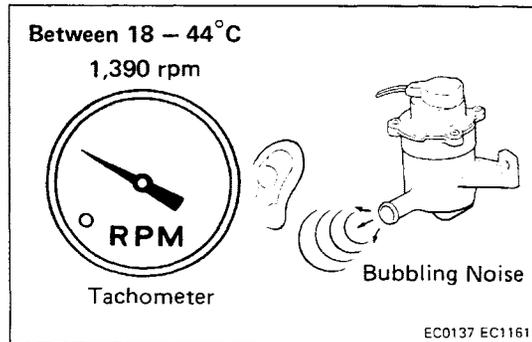
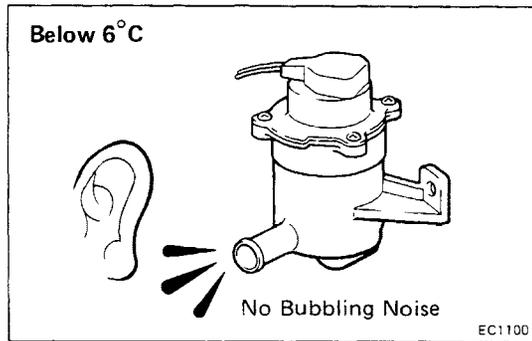
	*Vacuum Switch	Coolant Temp.	Thermo Switch		Engine RPM	Vehicle Speed	**Ox Sensor Signal	EACV		AS	
			(1)	(2)							
AS System Feedback Control System	OFF	—	—	—	—	—	—	CLOSED		OFF	
	ON	Below 6°C (43°F)	ON	ON	—	—	—	Always OPEN		Always ON	
		Between 18 — 44°C (64 — 111°F)			—	—	—	Always OPEN		Always ON	
		Above 55°C (131°F)	OFF	OFF	Below 1,000 rpm	Below 7 mph (11 km/h) Above 16 mph (26 km/h)	—	OPEN	ON	***Feed BACK	
				Above 1,390 rpm	—	LEAN	CLOSED	OFF			

Fuel System Feedback Control System	*Vacuum Switch	**Ox Sensor Signal	Fuel Control System	
	OFF	—	EBCV	OFF
	ON	RICH	OPEN	ON
LEAN		CLOSED	OFF	

Remarks: \* By means of vacuum switch, detects heavy load driving condition.  
 \*\* Signal of air-fuel ratio of inlet gas for TWC.  
 \*\*\* By means of Ox sensor, detects oxygen concentration in exhaust manifold after combustion.  
 If air-fuel ratio is rich for TWC, opens EACV and EBCV. If lean, closes EACV and EBCV.





## INSPECTION OF AS SYSTEM

1. VISUALLY CHECK HOSES AND TUBES FOR CRACKS, KINKS, DAMAGE OR LOOSE CONNECTION
2. DISCONNECT AS HOSE FROM EACV
3. CHECK COLD CONDITION
  - (a) The coolant temperature should be below 6°C (43°F).
  - (b) Check that a bubbling noise is not heard from the EACV.
  - (c) Warm up the engine to between 18 – 44°C (64 – 111°F).
  - (d) Maintain engine speed at above 1,390 rpm.
  - (e) Check that a bubbling noise is heard from the EACV.

# A03056

## 4. CHECK HOT CONDITION

- (a) Warm up the engine to above 55°C (131°F).
- (b) Maintain engine speed at above 1,390 rpm.
- (c) Check that a bubbling noise is heard intermitten from the EACV.

## 5. CHECK IDLE CONDITION

With the engine idling (below 1,000 rpm, below 7 mph), check that a bubbling noise is heard from the EACV.

## 6. CHECK HEAVY LOAD CONDITION

- (a) The coolant temperature should be above 18°C (64°F)
- (b) Disconnect the vacuum hose from the vacuum switch and plug the hose end.
- (c) Check that a bubbling noise is not heard from t EACV.

## 7. RECONNECT HOSES TO PROPER LOCATION

## INSPECTION OF FUEL FEEDBACK CONTROL SYSTEM

### CHECK FEEDBACK CONDITION

- (a) Maintain engine speed at 2,000 rpm.
- (b) Disconnect the connectors of EACV and EBCV.

**A03057**

- (c) Wait a few seconds.
- (d) Reconnect the EBCV connector and check that the engine drops about 300 rpm immediately.

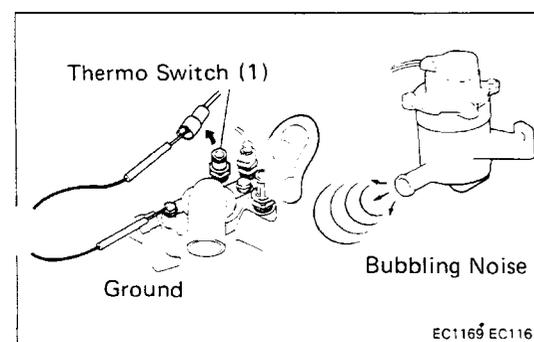
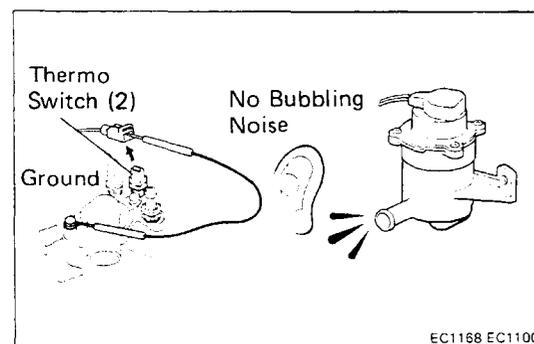
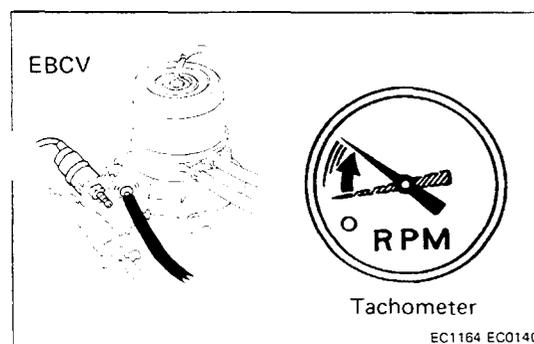
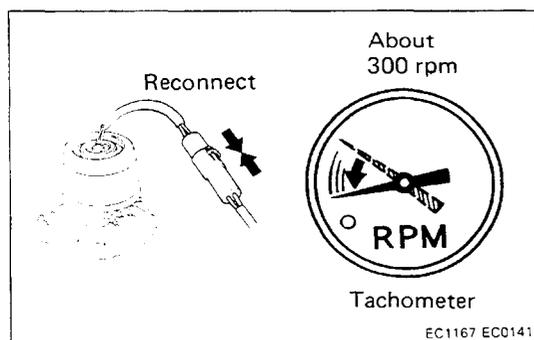
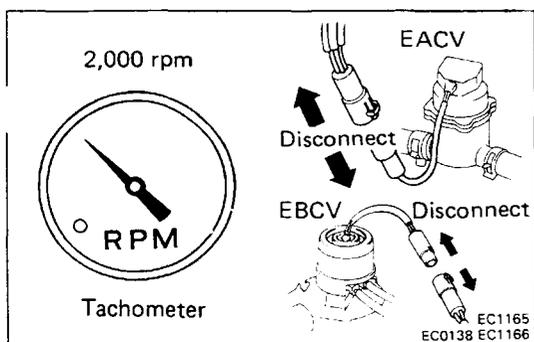
- (e) Disconnect the vacuum hose from vacuum switch and plug the hose end.
- (f) Check that the engine speed return to 2,000 rpm, after few seconds.
- (g) Reconnect the vacuum hose and connector to the proper locations.

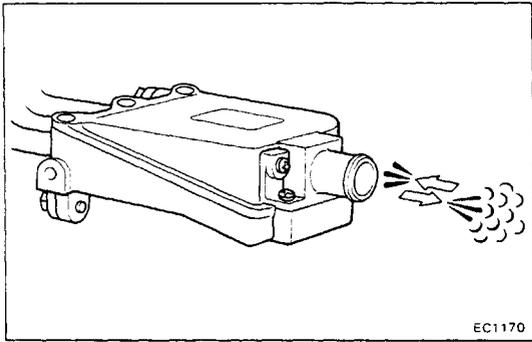
**IF NO PROBLEM IS FOUND WITH THIS INSPECTION, THE SYSTEM IS OKAY; OTHERWISE INSPECT EACH PART**

## INSPECTION OF EACV

### CHECK EACV

- (a) Disconnect the AS hose from the EACV.
  - (b) Disconnect the connector from the thermo switch (2), and ground it.
  - (c) Check that a bubbling noise is not heard from the EACV.
  - (d) Reconnect the connector to thermo switch (2).
  - (e) Disconnect the connector from the thermo switch (1), and ground it.
  - (f) Maintain engine speed at above 1,390 rpm.
  - (g) Check that a bubbling noise is heard from the EACV.
  - (h) Reconnect the connector to thermo switch (1).
- If a problem is found, replace the EACV.



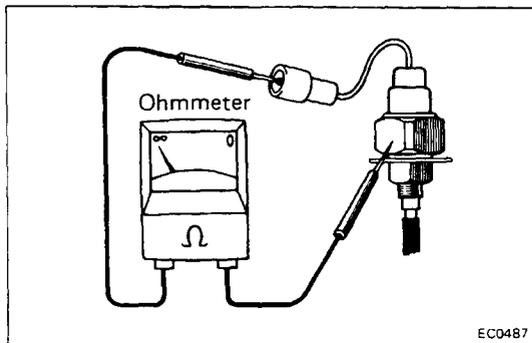


## INSPECTION OF REED VALVE

### CHECK REED VALVE BY BLOWING AND SUCKING ON PIPE

Check that there is air passage when blown hard, and no air passage when sucked.

**A03058**

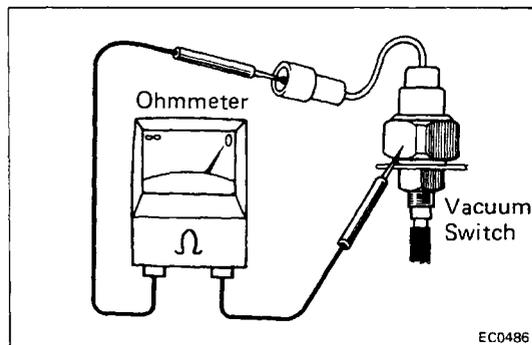


## INSPECTION OF VACUUM SWITCH

(a) Using an ohmmeter, check that there is no continuity between the switch terminal and switch body.

(b) Warm up the engine to normal operating temperature.

(c) Using an ohmmeter, check for continuity between the switch terminal and the body.



## INSPECTION OF THERMO SWITCH (1)

### CHECK THERMO SWITCH BY USING OHMMETER

(a) Drain the coolant from the radiator into a suitable container.

(b) Remove the thermo switch.

(c) Cool the thermo switch to below 43°C (109°F).

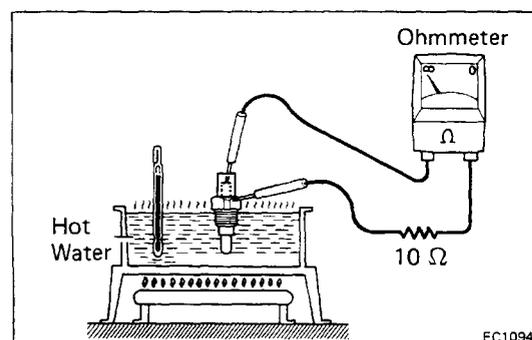
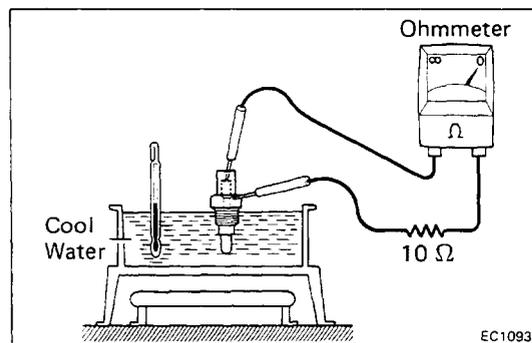
(d) Using an ohmmeter, check that there is continuity.

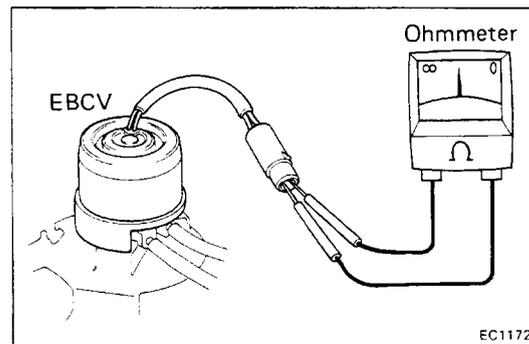
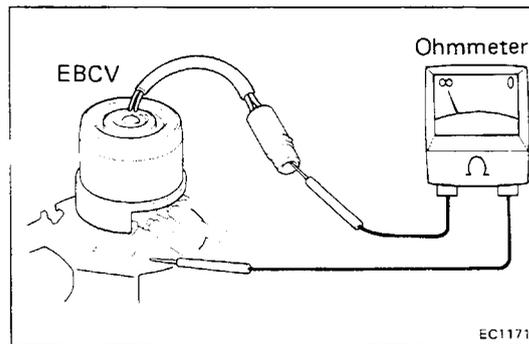
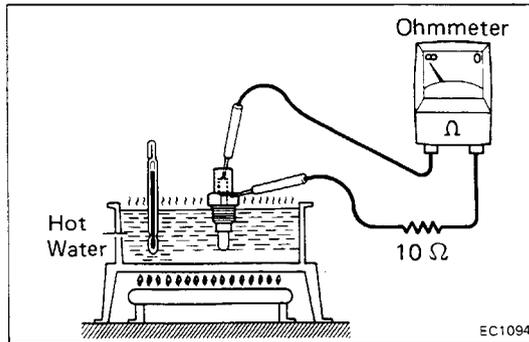
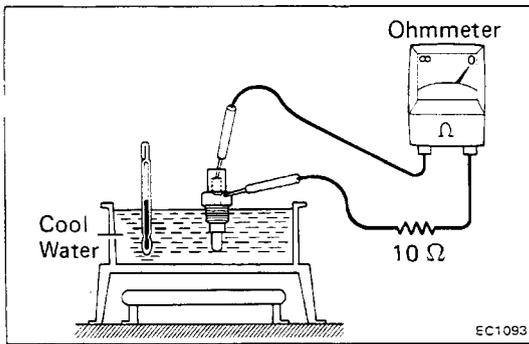
(e) Heat the switch to above 55°C (131°F) with hot water.

(f) Check that there is no continuity.

(g) Apply liquid sealer to the threads of the switch and reinstall.

(h) Fill the radiator with coolant.





## INSPECTION OF THERMO SWITCH (2)

### CHECK THERMO SWITCH BY USING OHMMETER

- (a) Drain the coolant from the radiator into a suitable container.
- (b) Remove the thermo switch from the intake manifold.
- (c) Cool the thermo switch to below 6°C (43°F).
- (d) Using an ohmmeter, check that there is continuity.
- (e) Heat the switch to above 18°C (64°F) with hot water.
- (f) Check that there is no continuity.
- (g) Apply liquid sealer to the threads of the switch and reinstall.
- (h) Fill the radiator with coolant.

**A03059**

## INSPECTION OF EBCV

### 1. CHECK FOR SHORT CIRCUIT

Using an ohmmeter, check that there is no continuity between the positive (+) terminal and the EBCV body.

If there is continuity, replace the EBCV.

### 2. CHECK FOR OPEN CIRCUIT

Using an ohmmeter, measure the resistance between the positive (+) terminal and the other terminal as shown.

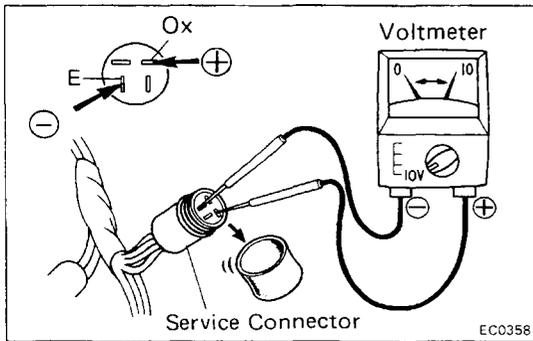
**Specified resistance: 11 – 13 Ω at 20°C (68°F)**

If the resistance is not within specification.

Replace the EBCV.

## INSPECTION OF SPEED SENSOR

(See Page EC-25)



## INSPECTION OF Ox SENSOR

### CHECK Ox SENSOR WITH VOLTMETER

- Warm up the engine to normal operating temperature.
- Connect the voltmeter to the service connector.

#### Service connector location: Left fender apron

Connect the positive (+) testing probe to the Ox terminal and negative (-) testing probe to terminal E.

- Race the engine at 2,500 rpm for about 90 seconds.
- Maintain engine speed at 2,500 rpm.
- Check that the needle of the voltmeter fluctuates 8 times or more in 10 seconds within 0 – 7 volts.

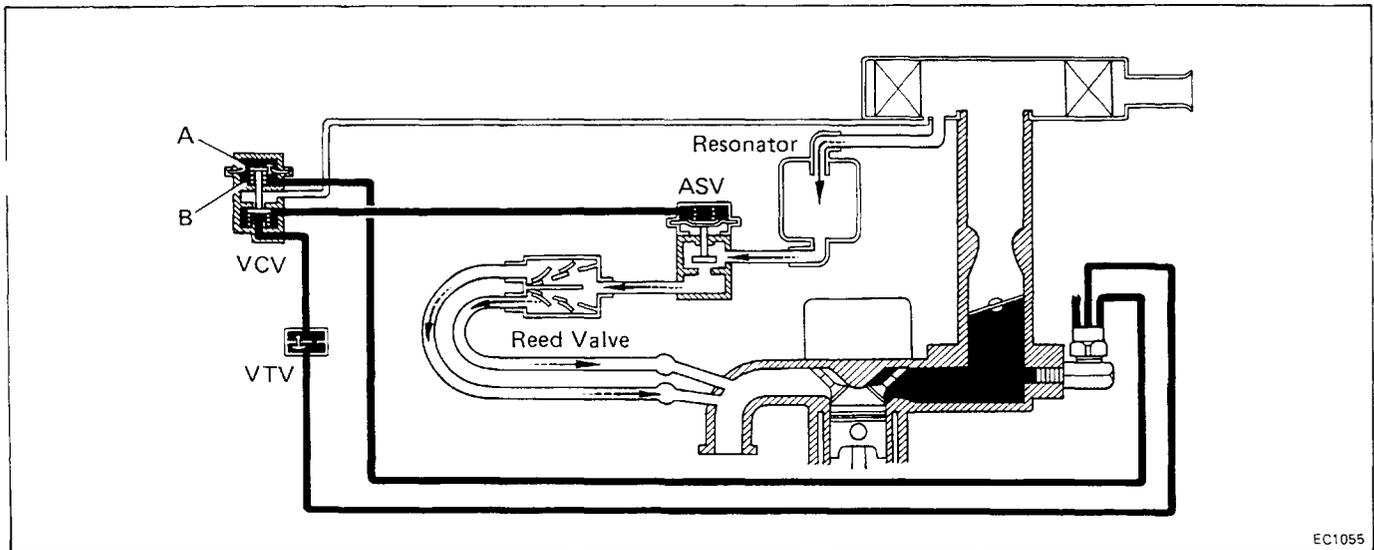
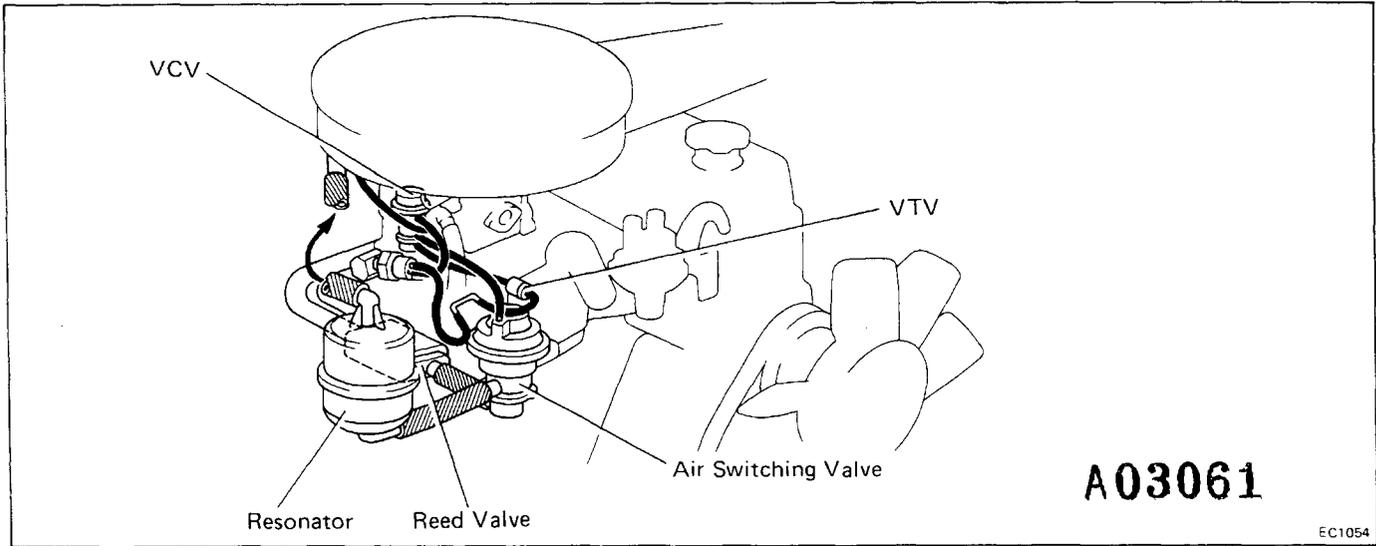
#### NOTE:

- If this test is positive, the Ox sensor is OK.
- If not, inspect the other parts, hose connections and wiring of air suction and fuel system feedback control system (EC-36).

If no problem is found, replace the Ox sensor.

**A03060**

## AIR SUCTION (AS) SYSTEM (Federal and Canada)

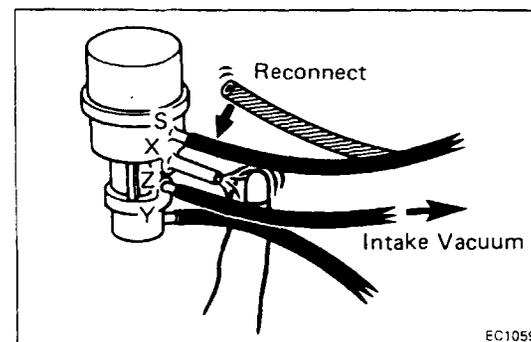
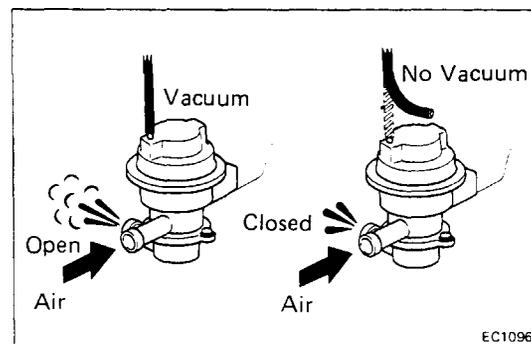
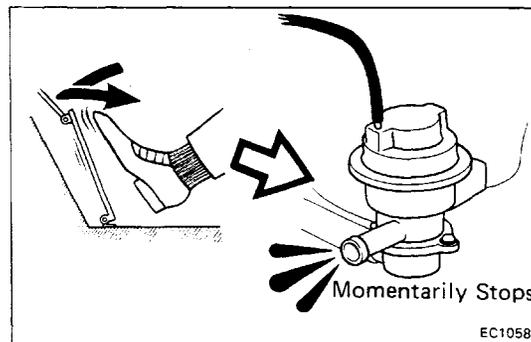
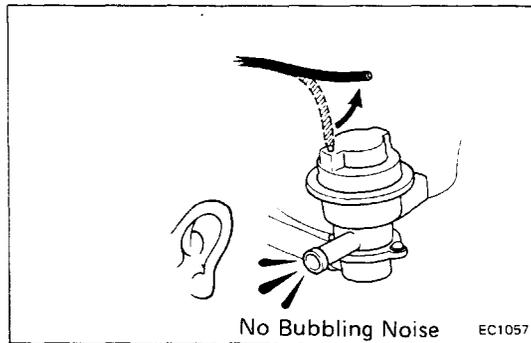
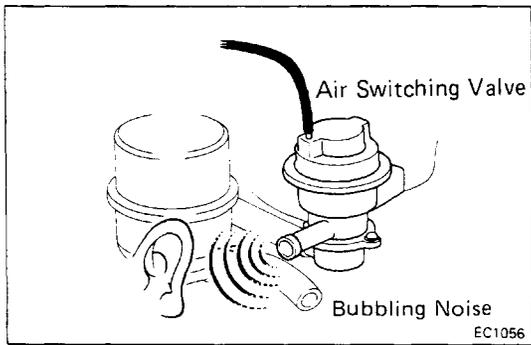


To reduce HC and CO emissions, this system draws in air into exhaust ports to accelerate oxidation, using vacuum generated by the exhaust pulsation in the exhaust manifold.

Condition	Intake Manifold Vacuum	Vacuum in VCV Chamber A and B	Air Switching Valve	AS
Normal driving	—	Same	OPEN	ON
Full load driving	Low vacuum	Same	*1 CLOSED	OFF
Sudden deceleration	High vacuum	*2 High vacuum acts on chamber B	CLOSED	Momentarily OFF

Remarks: \*1 The air switching valve shuts off gradually by the VTV.

\*2 After a few seconds, vacuum in both chambers of the VCV equalize through the orifice.



## INSPECTION OF AS SYSTEM

1. **VISUALLY CHECK HOSES AND TUBES FOR CRACK KINKS, DAMAGE OR LOOSE CONNECTIONS**
2. **DISCONNECT AIR SUCTION HOSE FROM AIR SWITCHING VALVE**
3. **CHECK AIR SWITCHING VALVE**
  - (a) Check that a bubbling noise is heard from the air switching valve at idle.
  - (b) Disconnect the vacuum hose from the air switching valve.
  - (c) Check that a bubbling noise is not heard from the air switching valve at idle.
  - (d) Reconnect vacuum hose.

**A03062**

## 4. CHECK VCV

Race the engine and quickly close the throttle valve. Check that the bubbling noise stops momentarily.

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

## INSPECTION OF AIR SWITCHING VALVE

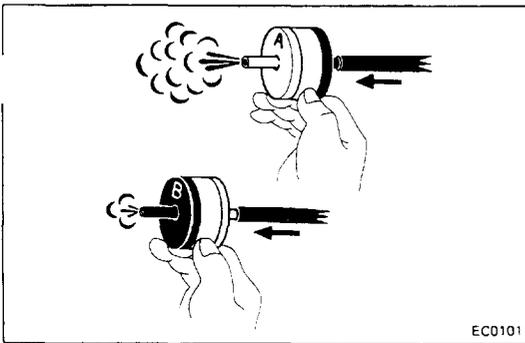
### CHECK AIR SWITCHING VALVE BY BLOWING AIR INTO PIPE

- (a) Apply vacuum to the air switching valve diaphragm.
- (b) Blow air into a pipe and check that the air switching valve is open.
- (c) Release the vacuum and check that the air switching valve is closed.

## INSPECTION OF VCV

### CHECK VCV OPERATION

- (a) Disconnect the vacuum hose from port Z of the VCV.
- (b) Connect port Z directly to the intake manifold with another hose, and disconnect the vacuum hoses from ports S and X of the VCV.
- (c) With the engine idling, place your finger over port X and check that vacuum is not felt.
- (d) Check that vacuum is felt momentarily as the vacuum hose is reconnected to port S.



## INSPECTION OF VTV

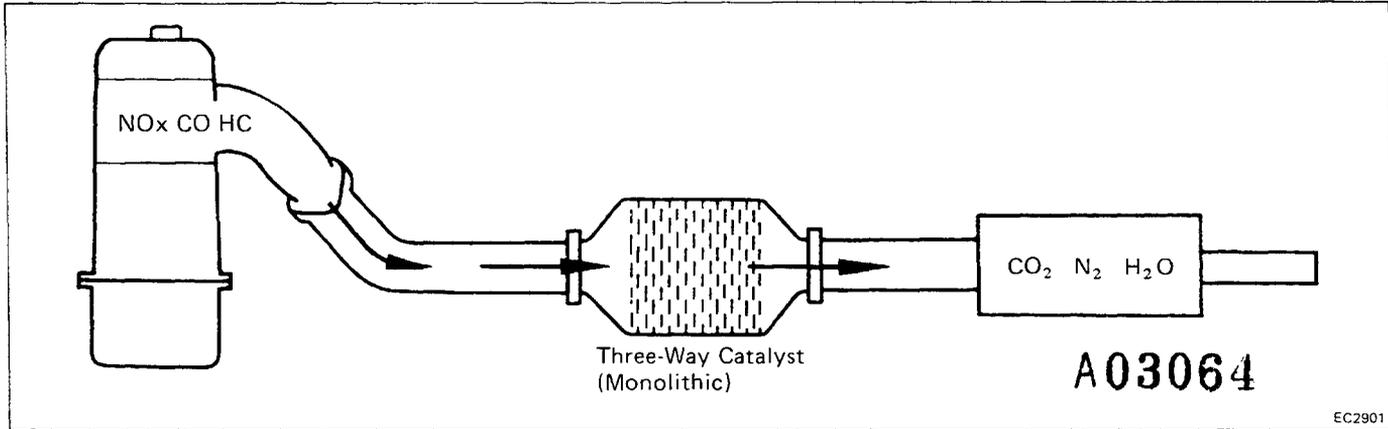
### CHECK VTV BY BLOWING AIR INTO EACH SIDE

- (a) Check that air flows without resistance from B to A.
- (b) Check that air flows with difficulty from A to B.

If a problem is found, replace the VTV.

**A03063**

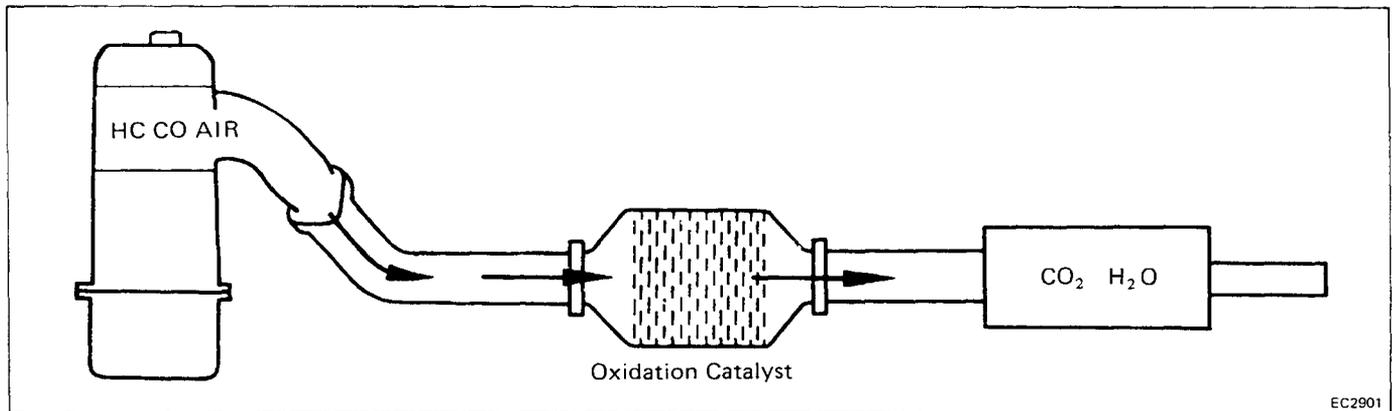
## THREE-WAY CATALYST (TWC) SYSTEM (California)



To reduce HC, CO and NOx 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		TWC		Exhaust Gas
HC, CO and NO <sub>x</sub>	→	Oxidation and reduction	→	CO <sub>2</sub> H <sub>2</sub> O N <sub>2</sub>

## OXIDATION CATALYST (OC) SYSTEM (Federal and Canada)



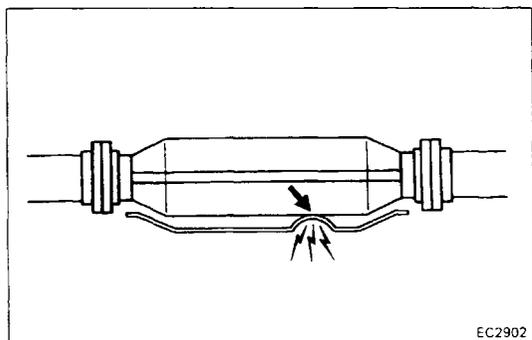
To reduce HC and CO emissions, HC and CO are oxidized and converted to water (H<sub>2</sub>O) and carbon dioxide (CO<sub>2</sub>) by the catalyst.

Exhaust		Converter		Exhaust Gas
Unburnt HC, CO and AIR	→	Oxidation	→	CO <sub>2</sub> H <sub>2</sub> O

## INSPECTION OF EXHAUST PIPE ASSEMBLY

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

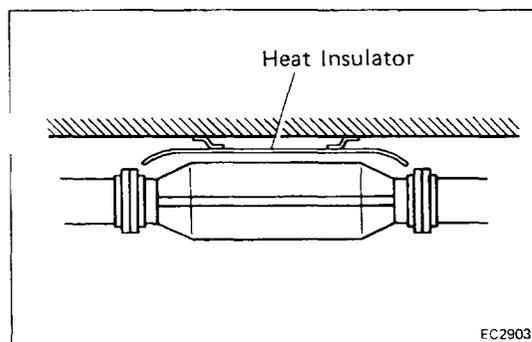
**A03065**



## INSPECTION OF CATALYTIC CONVERTER

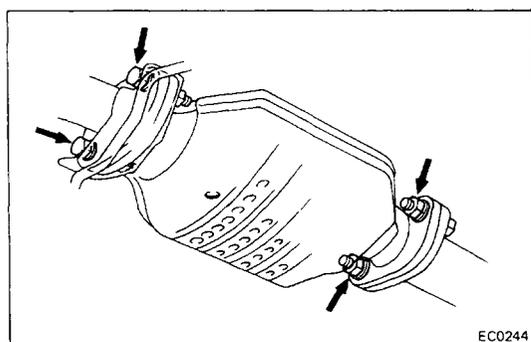
### CHECK FOR DENTS OR DAMAGE

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



## INSPECTION OF HEAT INSULATOR

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

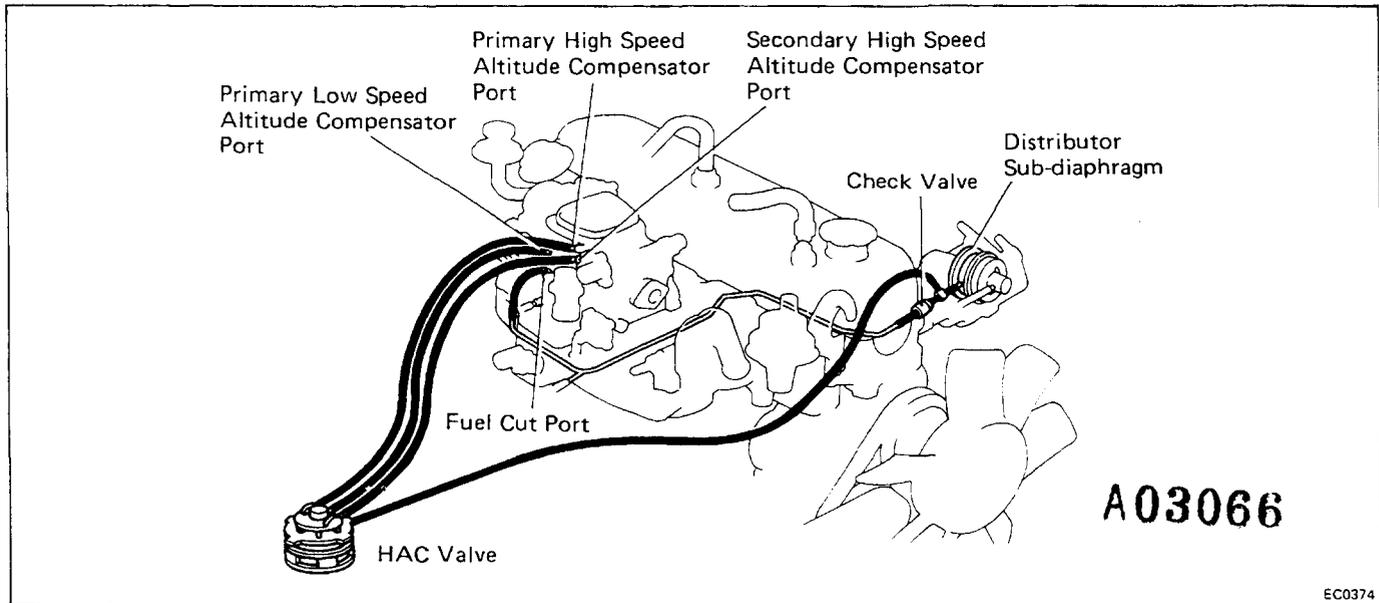


## REPLACEMENT OF CATALYTIC CONVERTER

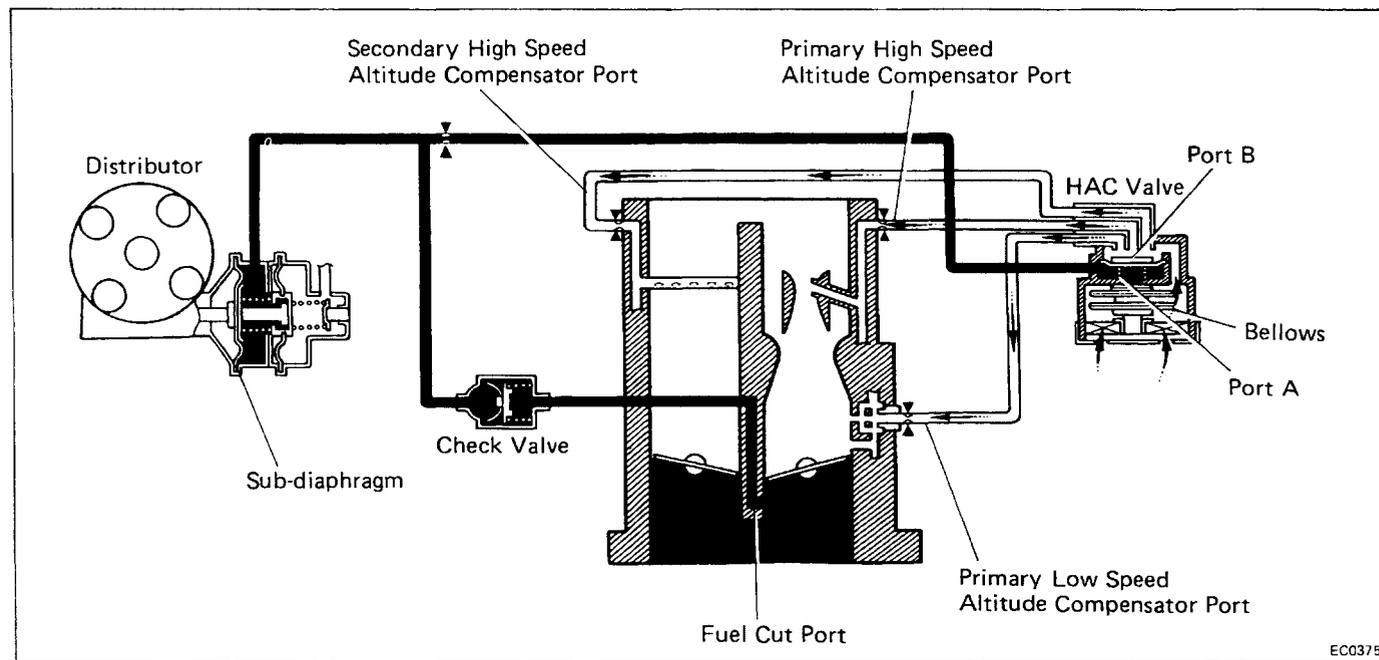
1. REMOVE CATALYTIC CONVERTER
  - (a) Jack up the vehicle.
  - (b) Check that the converter is cool.
  - (c) Remove the bolts at the front and rear of the converter.
  - (d) Remove the converter and gaskets.
2. INSTALL CATALYTIC CONVERTER
  - (a) Place new gaskets on the converter front and rear pipes, and connect the converter to the exhaust pipes.
  - (b) Tighten the bolts.

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

## HIGH ALTITUDE COMPENSATION (HAC) SYSTEM (Federal (Option))



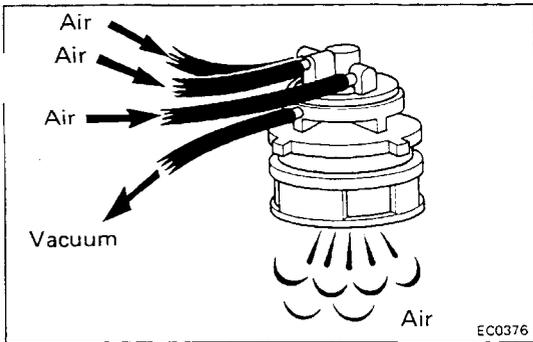
EC0374



EC0375

As altitude increases, the air-fuel mixture becomes richer. This system insures proper air-fuel mixture by supplying additional air to the primary low and high speed circuits and secondary high speed circuit of the carburetor, and advances the ignition timing to improve driveability at high altitude (above 1,198 m (3,930 ft)).

Altitude	Bellows in HAC Valve	Port A in HAC Valve	Distributor Sub-diaphragm	Port B in HAC Valve	Air from HAC Valve	Vacuum Ignition Timing
HIGH Above 1,198m (3,930 ft)	EXPANDED	CLOSED	PULLED (Always)	OPEN	Led into primary low and high speed circuits and secondary high speed circuit	ADVANCED (+ 12°) (Always)
LOW Below 783m (2,570 ft)	CONTRACTED	OPEN	NOT PULLED (PULLED only during idling)	CLOSED	STOPPED	INITIAL TIMING (ADVANCED (+ 12°) only during idling)



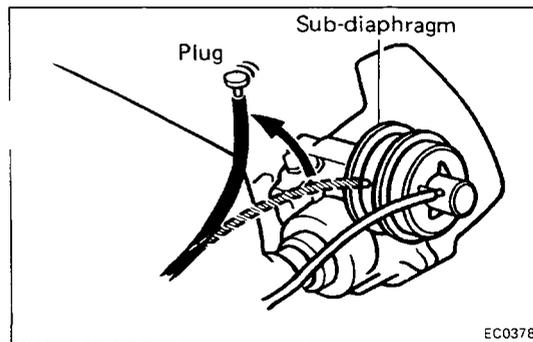
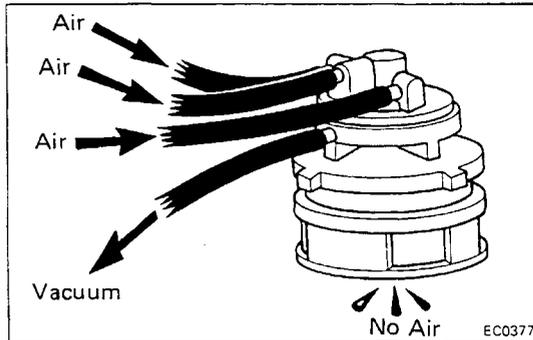
## INSPECTION OF HAC SYSTEM

### PRECHECK:

Before checking the HAC system, determine the position of the HAC valve. This can be done by blowing into any one of the three ports on top of the HAC valve with the engine idling. If the passage is open, the valve is in the HIGH ALTITUDE position.

**A03067**

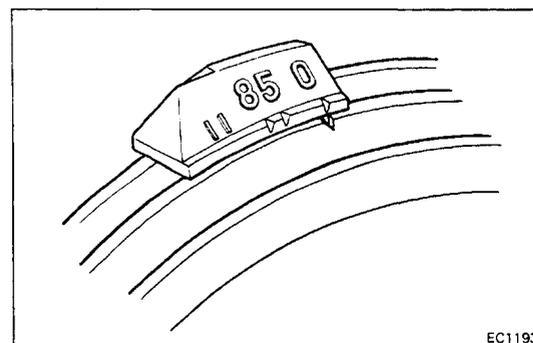
If it is closed, the valve is in the LOW ALTITUDE position.



### A. AT HIGH ALTITUDE

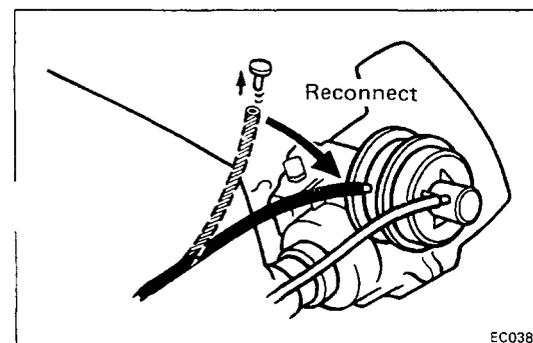
#### 1. CHECK IGNITION TIMING AT IDLE

- (a) Warm up the engine.
- (b) Disconnect the hose from the distributor sub-diaphragm, and plug the hose end.

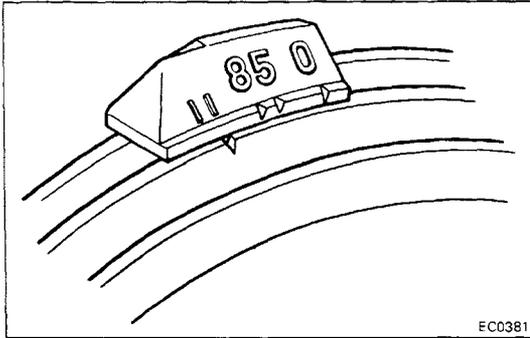


- (c) Check the ignition timing.

**Ignition timing: 0° BTDC @ Max. 950 rpm**

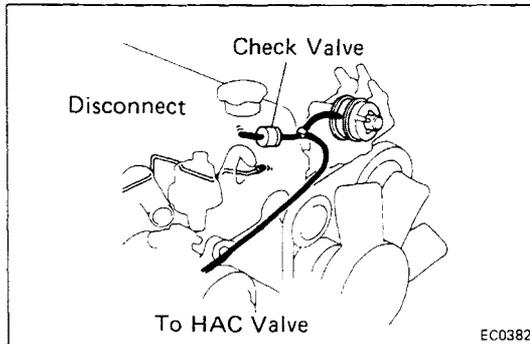


- (d) Reconnect the hose to the sub-diaphragm.



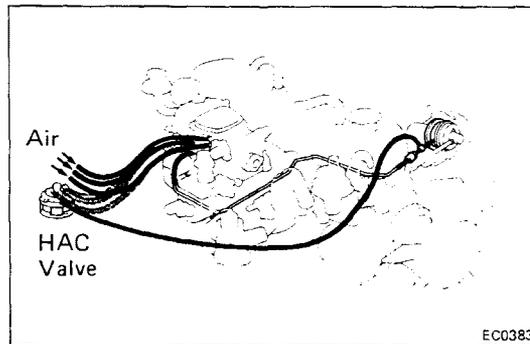
- (e) Check that the ignition timing advances.  
Ignition timing: **About 12° BTDC @ Max. 950 rpm**

**A03068**



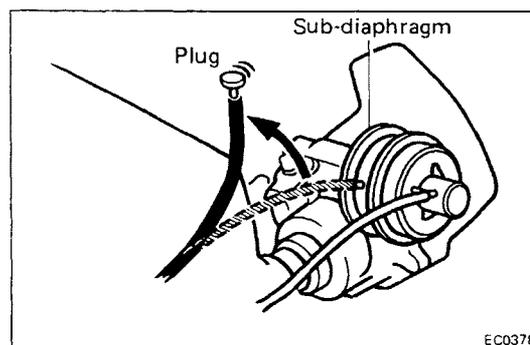
**2. CHECK THE CHECK VALVE**

- (a) Disconnect the vacuum hose between the check valve and vacuum pipe at the vacuum pipe side, and plug the pipe end.  
(b) Check that the ignition timing remains stationary for more than one minute.  
(c) Stop the engine and reconnect the hose to the vacuum pipe.



**3. CHECK CARBURETOR**

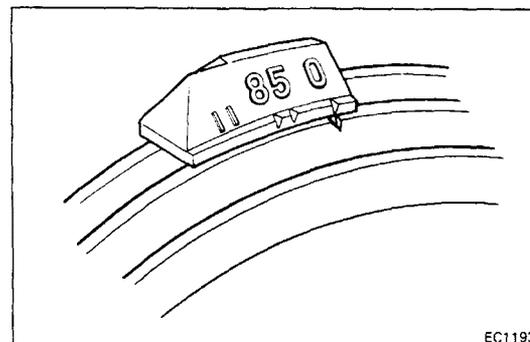
- (a) Disconnect three hoses from the pipes on top of the HAC valve.  
(b) Blow air into each hose and check that air flows in the carburetor.  
(c) Reconnect the hoses to the proper locations.



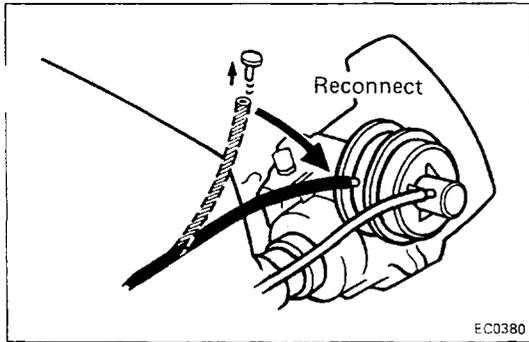
**B. AT LOW ALTITUDE**

**1. CHECK IGNITION TIMING AT IDLE**

- (a) Warm up the engine.  
(b) Disconnect the hose from the distributor sub-diaphragm, and plug the hose end.

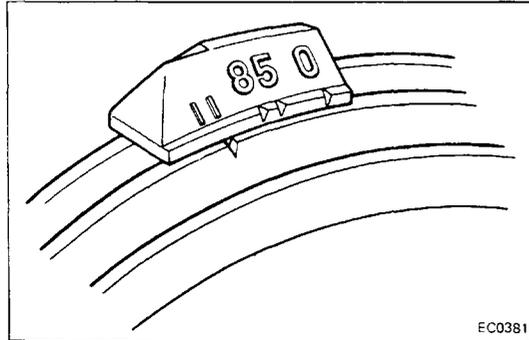


- (c) Check the ignition timing.  
Ignition timing: **0° BTDC @ Max. 950 rpm**



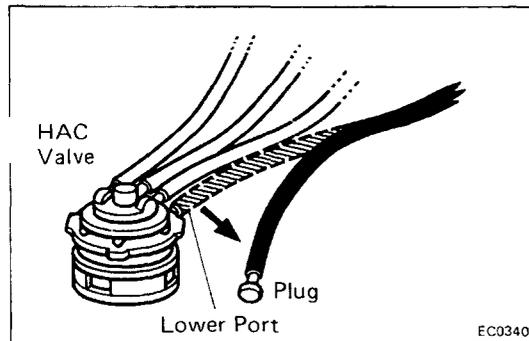
(d) Reconnect the hose to the sub-diaphragm.

**A03069**



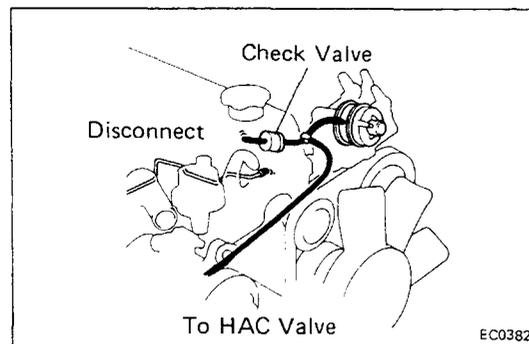
(e) Check that the ignition timing advances.

**Ignition timing: About 12° BTDC @ Max. 950 rpm**



## 2. CHECK THE CHECK VALVE

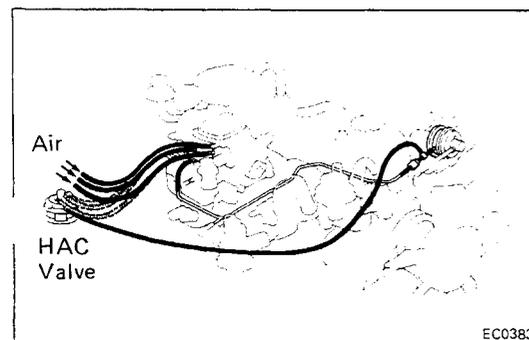
(a) Disconnect the vacuum hose from lowest port of the HAC valve, and plug the hose end.



(b) Disconnect the vacuum hose between the check valve and vacuum pipe at the pipe side, and plug the pipe end.

(c) Check that the ignition timing remains stationary for more than one minute.

(d) Stop the engine and reconnect the hoses to the vacuum pipe and HAC valve.



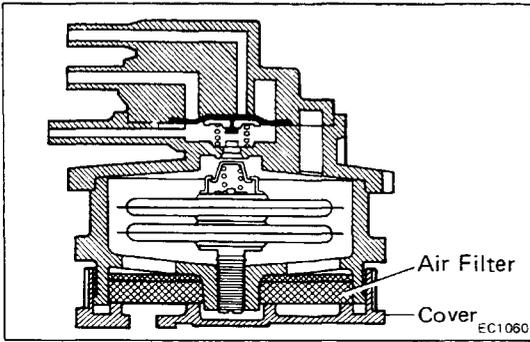
## 3. CHECK CARBURETOR

(a) Disconnect three hoses from the pipes on top of the HAC valve.

(b) Blow air into each hose and check that air flows into the carburetor.

(c) Reconnect the hoses to the proper locations.

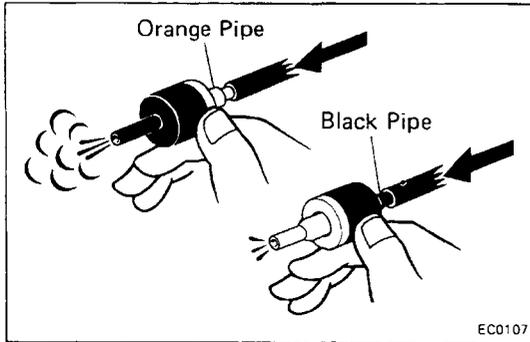
**IF NO PROBLEM IS FOUND WITH THIS INSPECTION, THE SYSTEM IS OKAY; OTHERWISE INSPECT EACH PART**



## INSPECTION OF HAC VALVE

VISUALLY CHECK AND CLEAN AIR FILTER IN HAC VALVE

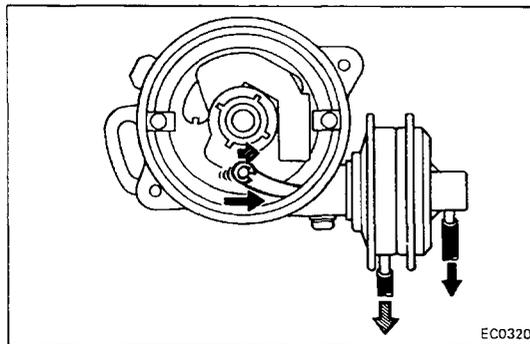
**A03070**



## INSPECTION OF CHECK VALVE

CHECK VALVE BY BLOWING AIR INTO EACH PIPE

- (a) Check that air flows from the orange pipe to the black pipe.
- (b) Check that air does not flow from the black pipe to the orange pipe.



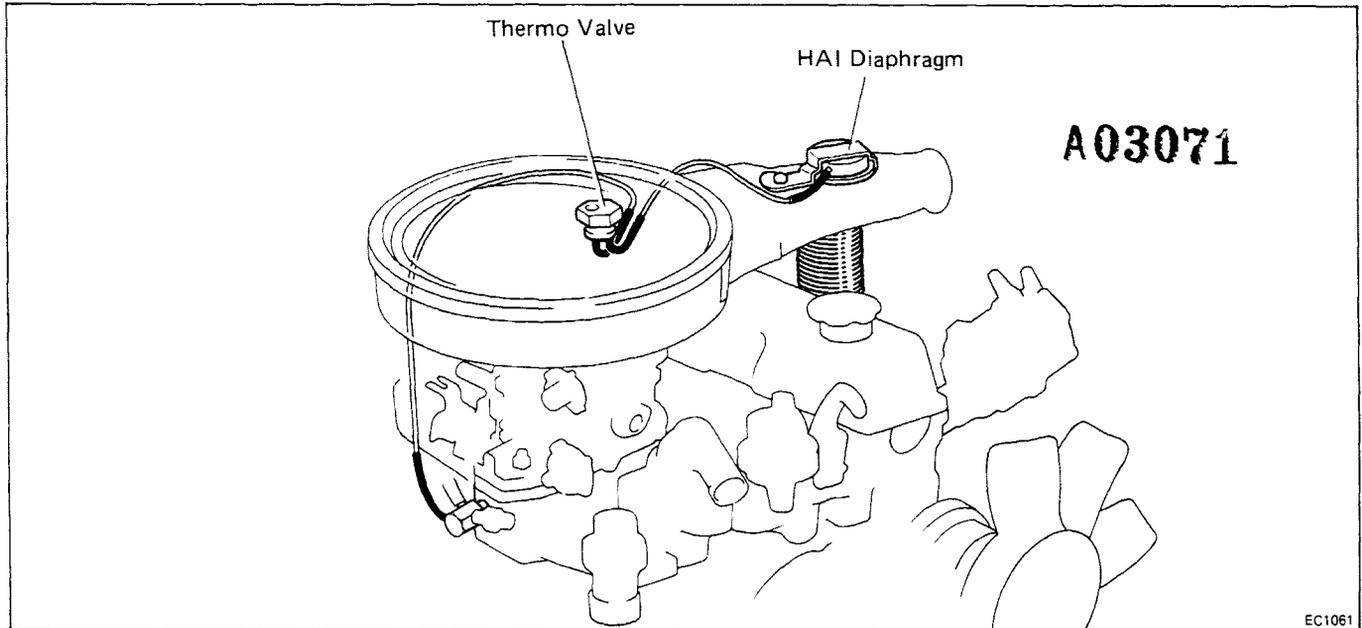
## INSPECTION OF DISTRIBUTOR VACUUM ADVANCER

CHECK OPERATION OF VACUUM ADVANCER

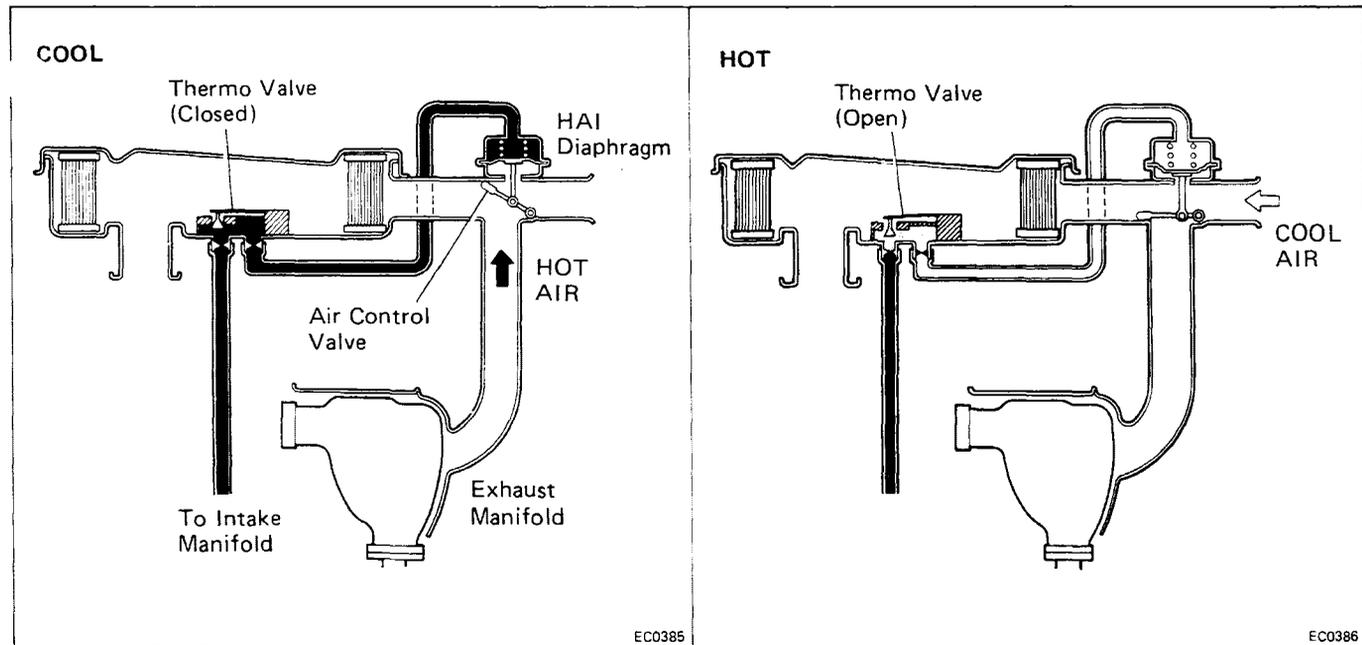
- (a) Remove the distributor cap and rotor.
- (b) Apply vacuum to the diaphragm, and check that the vacuum advancer moves in accordance with the vacuum.
- (c) Reinstall the rotor and distributor cap.

# AUXILIARY SYSTEMS

## 1. Automatic Hot Air Intake (HAI) System



EC1061

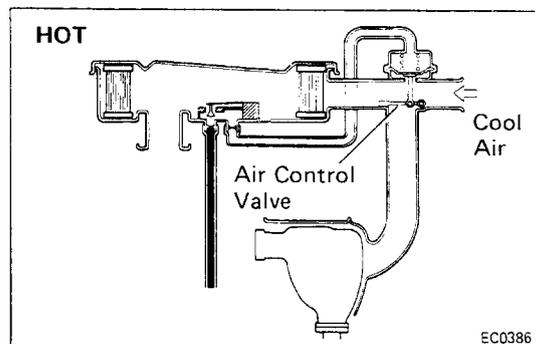
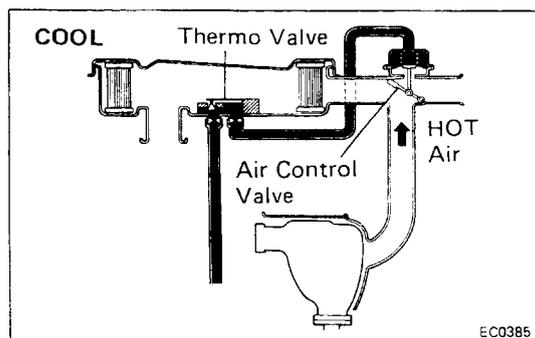


EC0385

EC0386

This system leads a hot air supply to the carburetor in cold weather to improve driveability and to prevent the carburetor from icing in extremely cold weather.

Temperature in Air Cleaner	Thermo Valve	Air Control Valve	Intake Air
Cool Below 30°C (86°F)	CLOSED	Hot air passage OPEN	HOT
Hot Above 45°C (113°F)	OPEN	Cool air passage OPEN	COOL



## INSPECTION OF HAI SYSTEM

### 1. CHECK AIR CONTROL VALVE OPERATION

- (a) Remove the air cleaner cover.
- (b) Cool the thermo valve by blowing compressed air on it.
- (c) Check that the air control valve closes the cool air passage at idle.

**A03072**

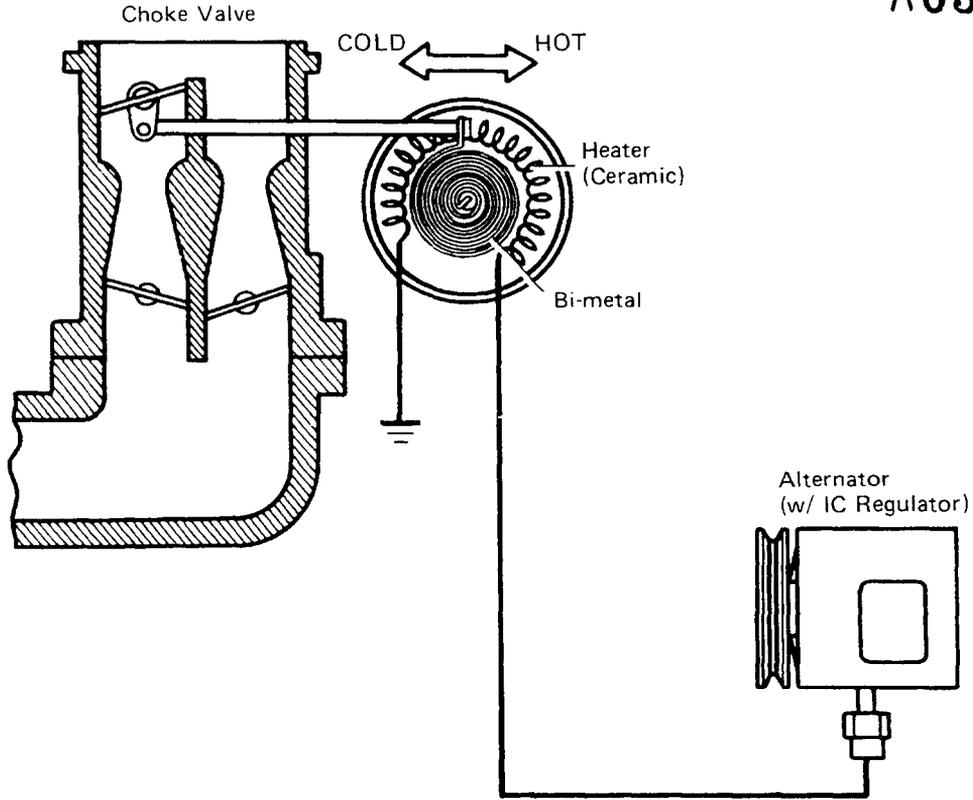
- (d) Reinstall the air cleaner cover and warm up the engine.
- (e) Check that the air control valve opens the cool air passage at idle.

### 2. CHECK HOSES AND CONNECTIONS

Visually check the hoses and connections for cracks, leaks or damage.

## 2. Automatic Choke System

A03073

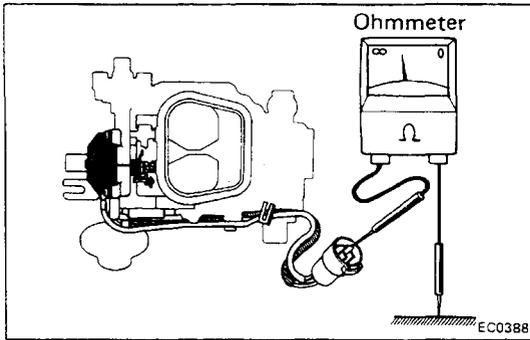


EC1194

This system temporarily supplies a rich mixture to the engine by closing the choke valve when the engine is cold.

IG S/W	Engine	Current from Terminal L to Heater	Bi-metal	Choke Valve
OFF	Not running	Not flowing	Expanded	CLOSED
ON	Not running	*Not flowing	Expanded	CLOSED
	Running	Flowing	Heated up and contracted	OPEN

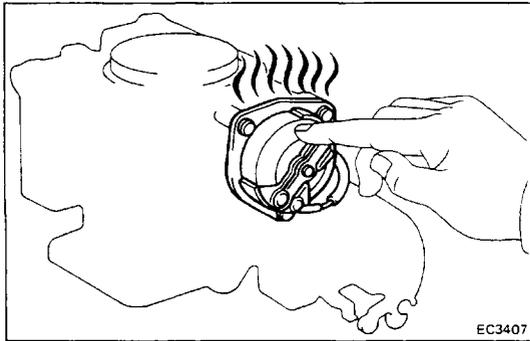
Remarks: \*On alternators with an IC regulator, slight voltage will occur when the ignition switch is turned ON, but not sufficient current to warm up the heater.



### INSPECTION OF HEATER (Ceramic)

1. UNPLUG WIRING CONNECTOR
2. MEASURE RESISTANCE WITH OHMMETER  
Resistance: 19 — 23  $\Omega$  at 20°C (68°F)

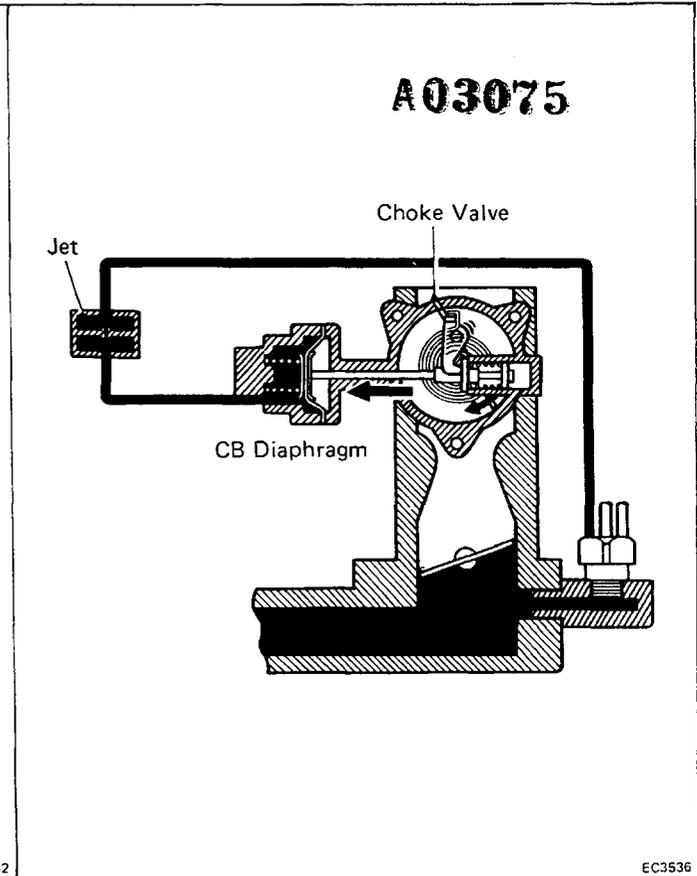
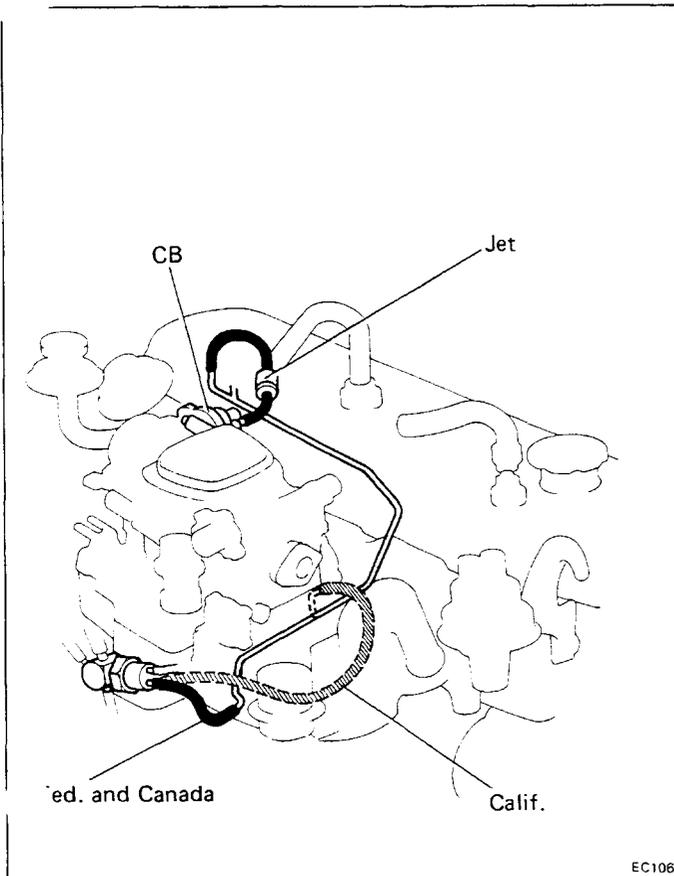
**A03074**



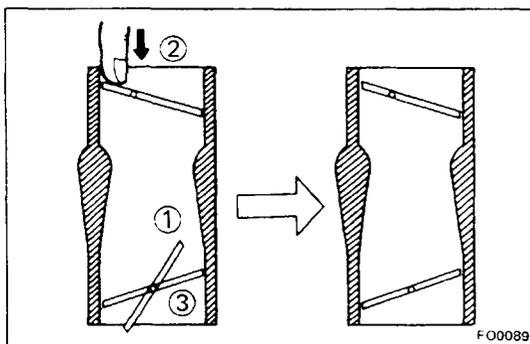
### INSPECTION OF AUTOMATIC CHOKE SYSTEM

1. START ENGINE
2. SHORTLY AFTER, CHECK THAT CHOKE VALVE BEGINS TO OPEN AND CHOKE HOUSING IS HEATED

### 3. Choke Breaker (CB) System



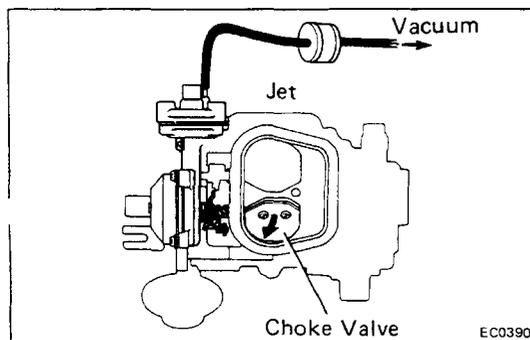
This system slightly opens the choke valve to prevent a too rich mixture after firing when the choke is closed.



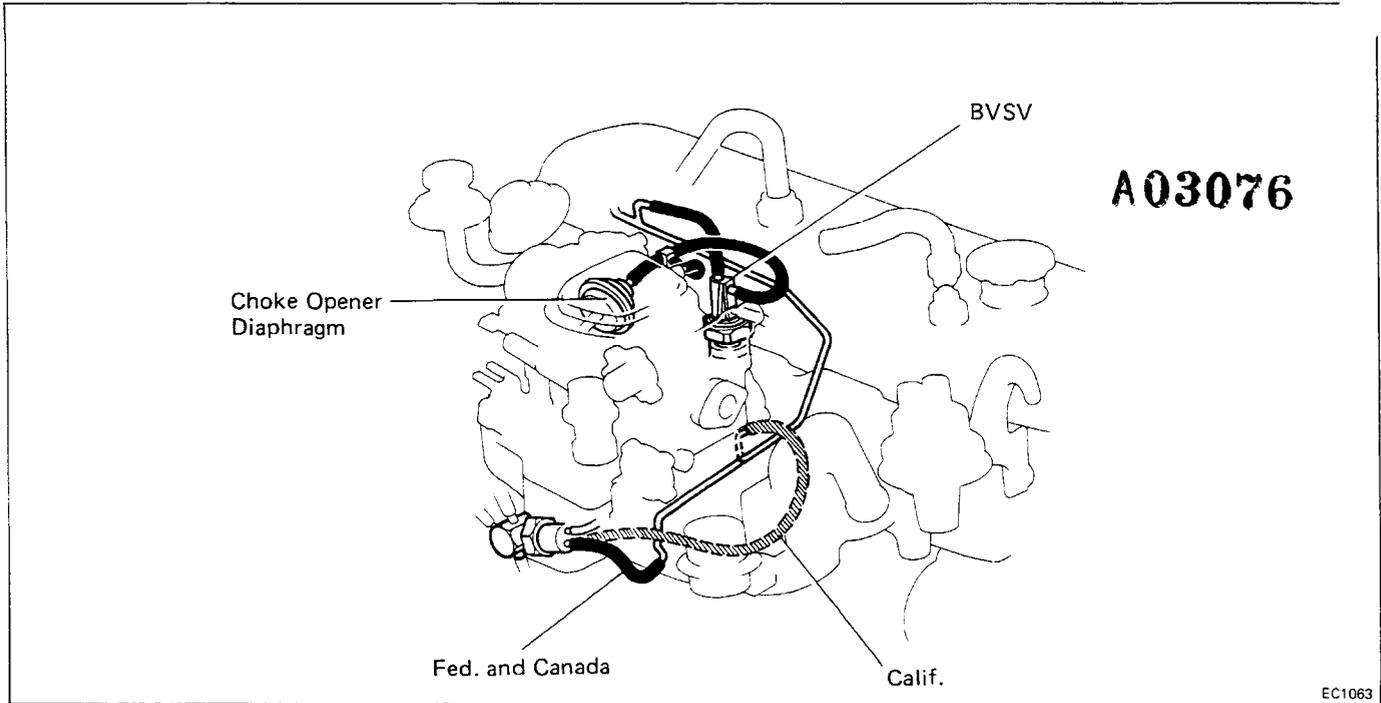
#### INSPECTION OF CB SYSTEM

##### CHECK CHOKE LINKAGE AND DIAPHRAGM WITH COLD ENGINE

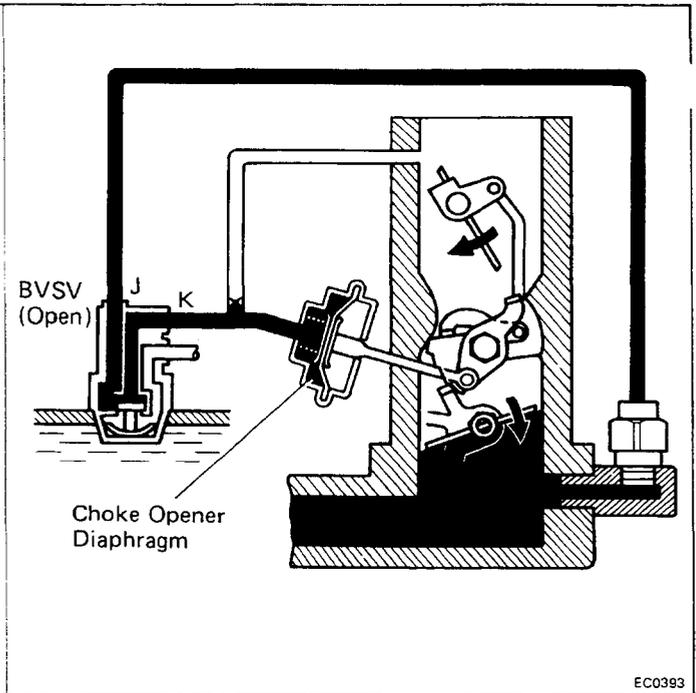
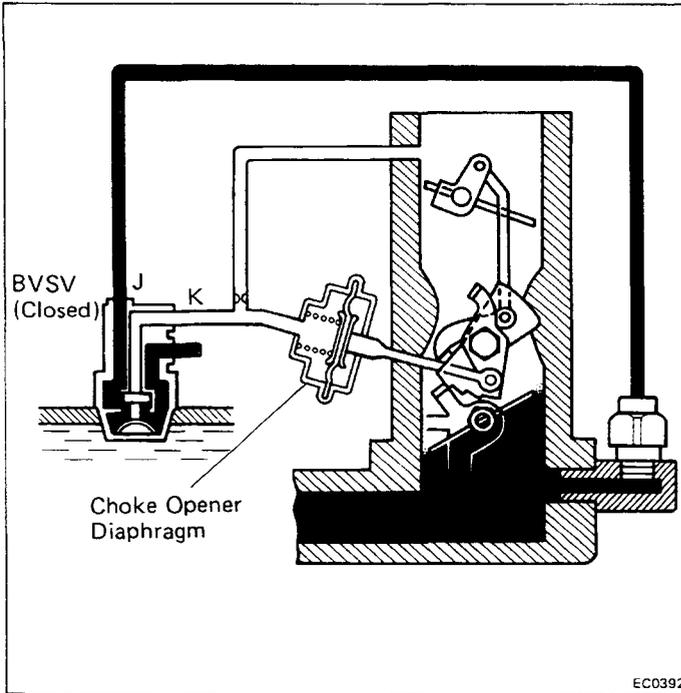
- (a) While holding the throttle valve slightly open, push the choke valve closed, and hold it closed as you release the throttle valve.
- (b) Disconnect the vacuum hose between the jet and vacuum pipe.
- (c) Apply vacuum to the jet and check that the choke valve slightly opens.



### 4. Choke Opener System

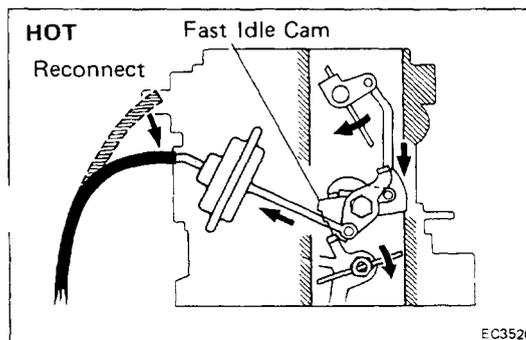
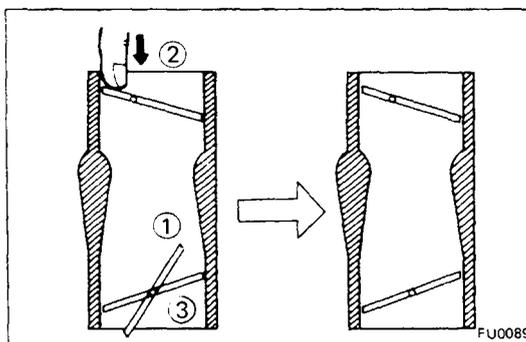
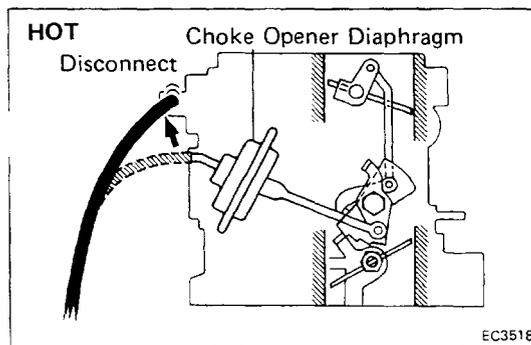
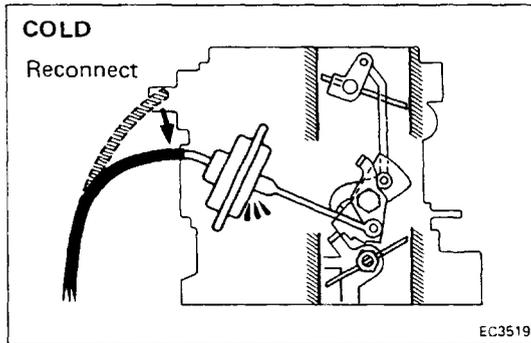
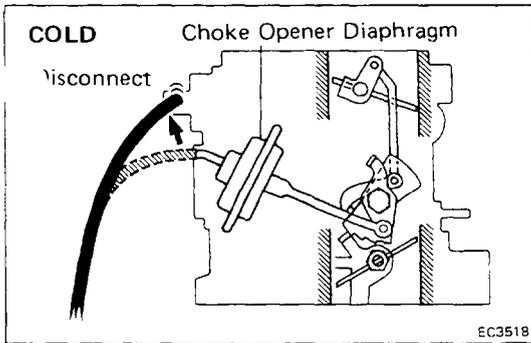


EC1063



After warm-up, this system forcibly holds the choke valve open to prevent an over-rich mixture and release the fast idle cam to the 4th step to lower the engine rpm.

Coolant Temp.	BVSV	Diaphragm	Choke Valve	Fast Idle Cam	Engine RPM
Below 55°C (131°F)	CLOSED (J-K)	Released by spring tension	Closed by automatic choke	Set at 1st or 2nd step	HIGH
Above 74°C (165°F)	OPEN (J-K)	Pulled by manifold vacuum	OPEN	Released to 4th step	LOW



## INSPECTION OF CHOKE OPENER SYSTEM

### 1. CHECK BVSV WITH COLD ENGINE

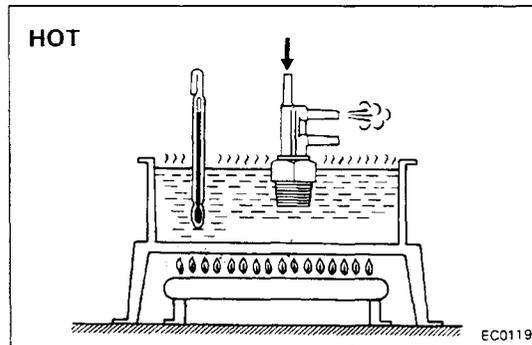
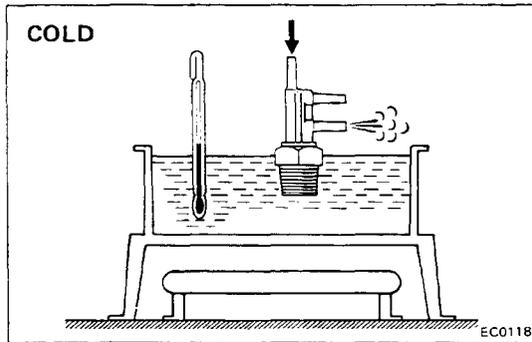
- The coolant temperature should be below 55°C (131°F).
- Disconnect the vacuum hose from the choke opener diaphragm.
- Step down on the accelerator pedal and release it. Then start the engine.
- Reconnect the vacuum hose and check that the choke linkage does not move.

**A03077**

### 2. CHECK BVSV, DIAPHRAGM AND LINKAGE WITH WARM ENGINE

- Warm up the engine to normal operating temperature.
- Disconnect the vacuum hose from the choke opener diaphragm.
- Set the fast idle cam. While holding the throttle slightly open, push the choke valve closed, and hold it closed as you release the throttle valve.
- Start the engine, but do not touch the accelerator pedal.
- Reconnect the vacuum hose, and check that the choke linkage moves, and that the fast idle cam is released to the 4th step.

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

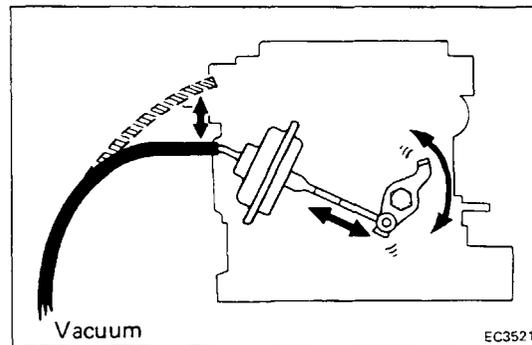


## INSPECTION OF BVSU

### CHECK BVSU BY BLOWING AIR INTO PIPE

- (a) Drain the coolant from the radiator into a suitable container.
  - (b) Remove the BVSU from the intake manifold.
  - (c) Cool the BVSU to below 55°C (131°F).
  - (d) Check that air flows from pipe J to pipe L.
  - (e) Heat the BVSU to above 74°C (165°F).
  - (f) Check that air flows from pipe J to pipe K.
- If a problem is found replace the BVSU.
- (g) Apply liquid sealer to the threads of the BVSU and reinstall.
  - (h) Fill the radiator with coolant.

**A03078**

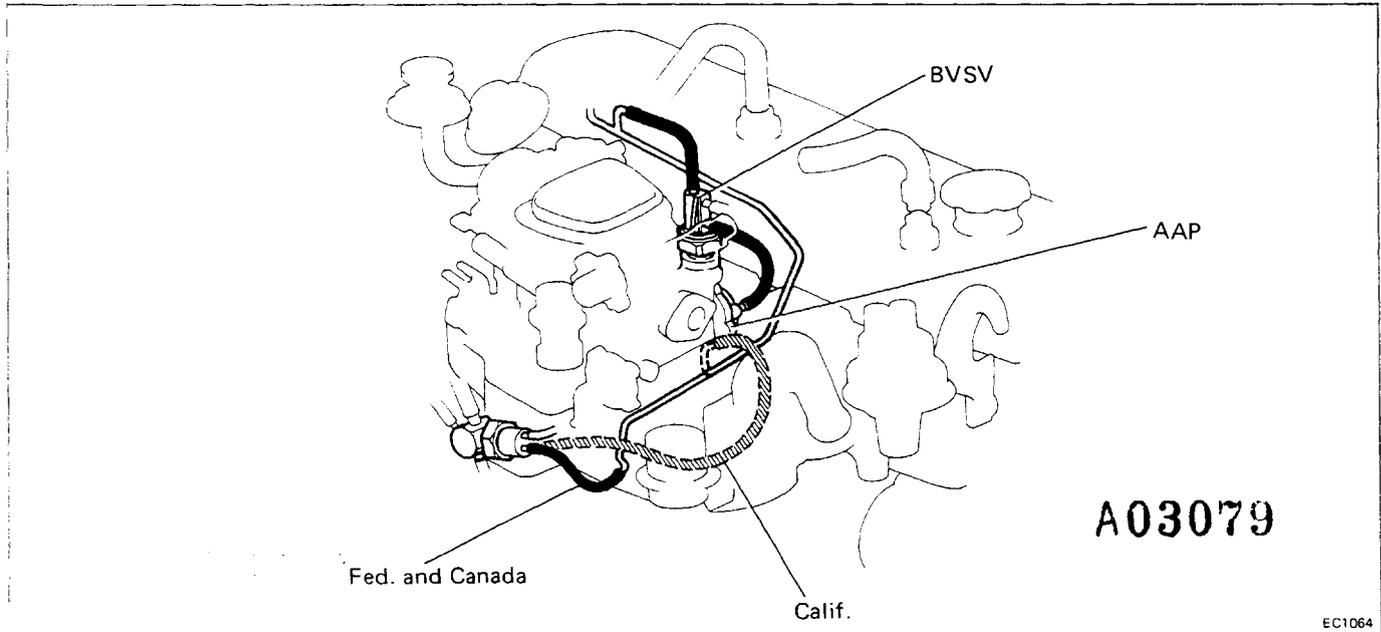


## INSPECTION OF DIAPHRAGM

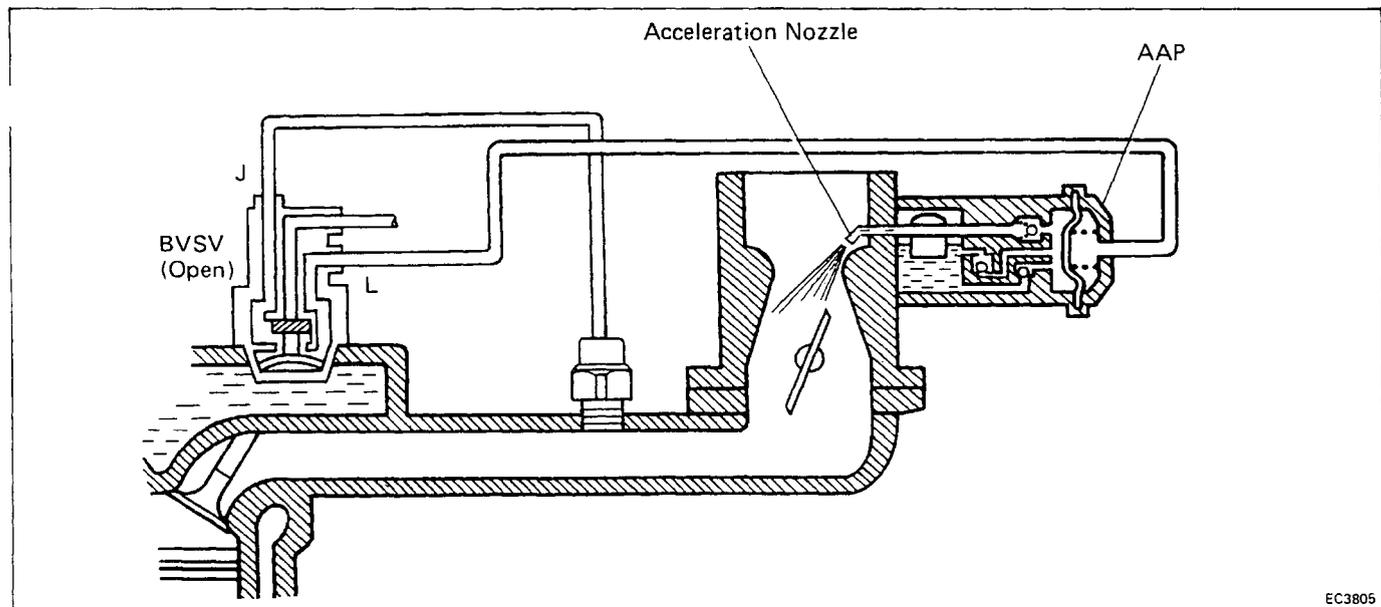
### CHECK THAT CHOKE LINKAGE MOVES IN ACCORDANCE WITH APPLIED VACUUM

If a problem is found, replace the diaphragm.

## 5. Auxiliary Acceleration Pump (AAP) System



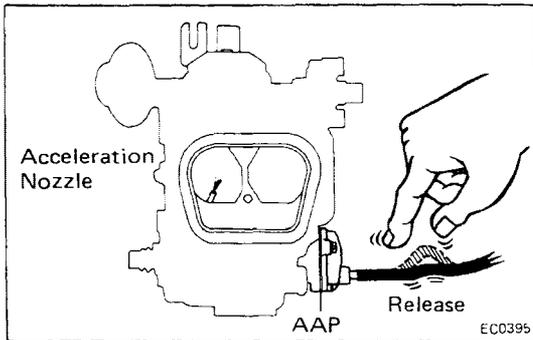
EC1064



EC3805

The carburetor air-fuel mixture is very lean. When accelerating with a cold engine, the main acceleration pump capacity is insufficient to provide good acceleration. The AAP system compensates for this by forcing more fuel into the acceleration nozzle to obtain better cold engine performance.

Coolant Temp.	BVSV	Engine	Intake Vacuum	Diaphragm in AAP	Fuel
Below 55°C (131°F)	OPEN (J-L)	Constant RPM	HIGH	Pulled by vacuum	Drawn into AAP Chamber
		Accelerataion	LOW	Returned by spring tension	Forced into acceleration Nozzle
Above 74°C (165°F)	CLOSED (J-L)	—	—	No operation	—



## INSPECTION OF AAP SYSTEM

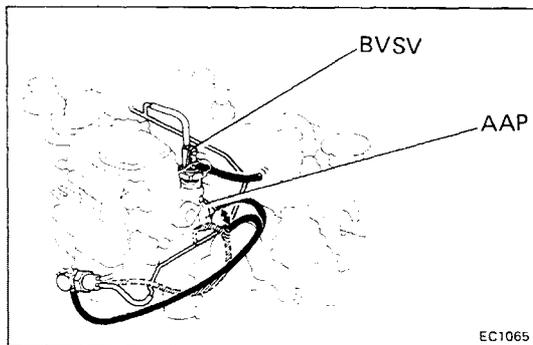
### 1. CHECK SYSTEM WITH COLD ENGINE

- (a) Check that the coolant temperature is below 55°C (131°F).
- (b) Remove the air cleaner. **A03080**
- (c) Start the engine.
- (d) Pinch the AAP hose, and stop the engine.
- (e) Release the hose.
- (f) Check that gasoline spurts out from the acceleration nozzle.

### 2. REPEAT (c), (d) AND (e) ABOVE AFTER WARM-UP

- (a) Check that gasoline does not spurt out from the acceleration nozzle.
- (b) Reinstall the air cleaner.

**IF NO PROBLEM IS FOUND WITH THIS INSPECTION, THE SYSTEM IS OKAY, OTHERWISE INSPECT EACH PART**



## INSPECTION OF AAP DIAPHRAGM

### CHECK DIAPHRAGM OPERATION AT IDLE

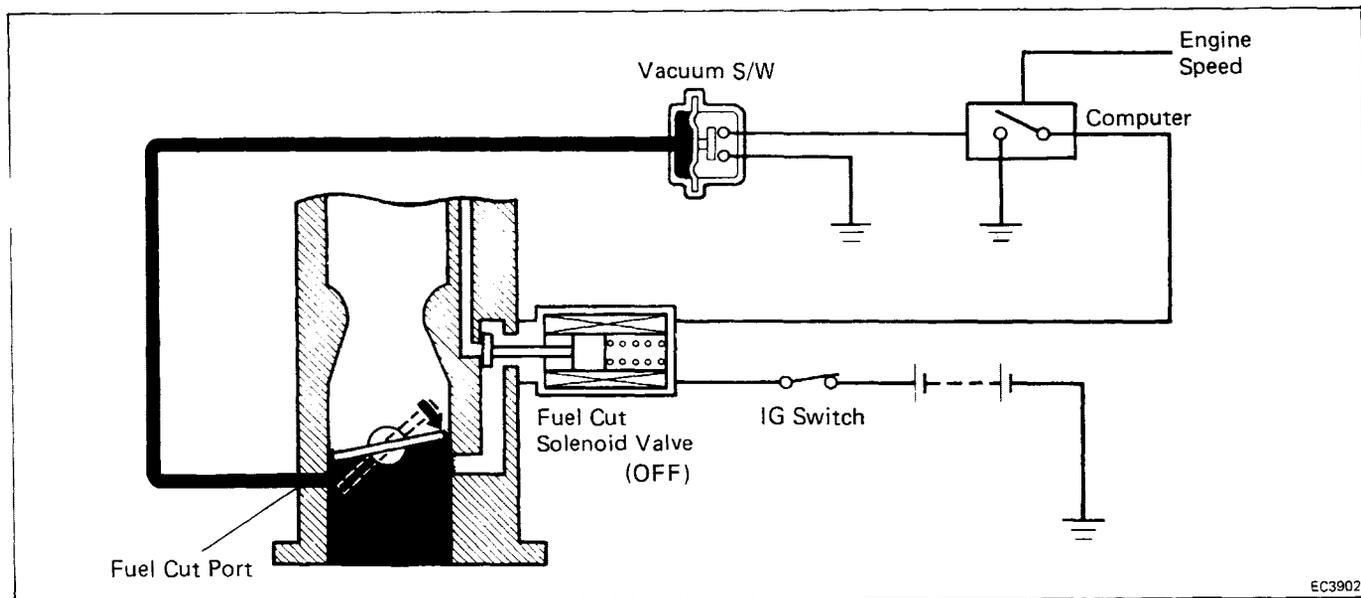
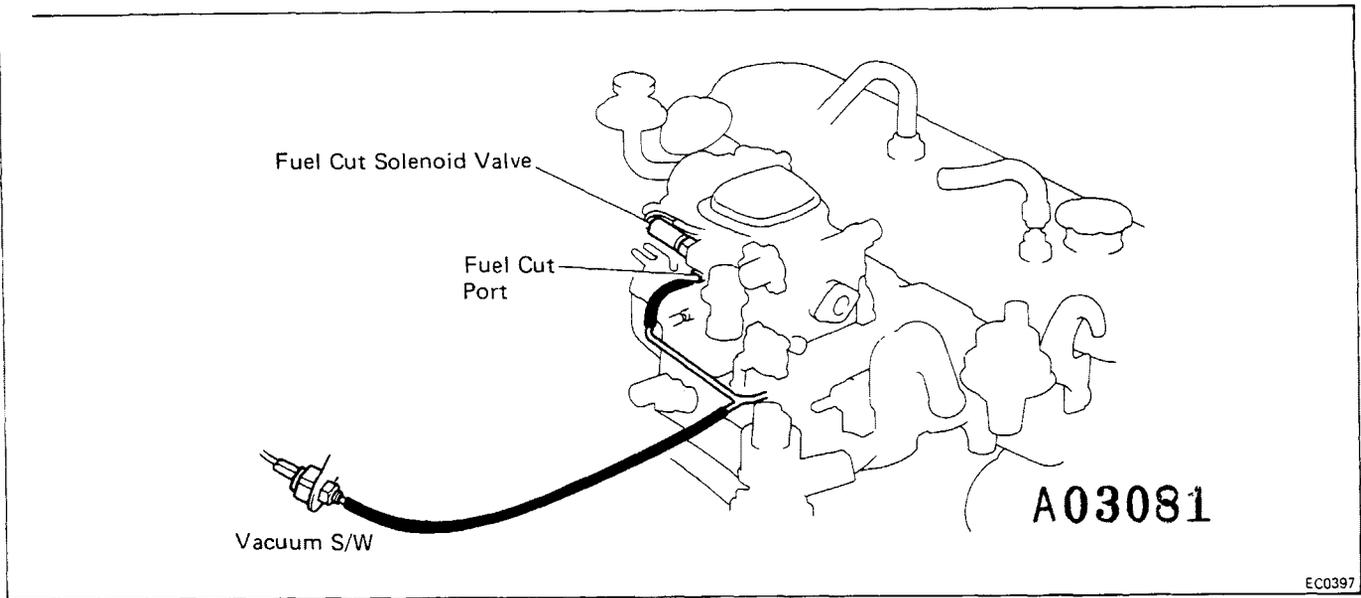
- (a) Start the engine.
- (b) Disconnect the vacuum hose from the AAP.
- (c) Apply and release vacuum to the diaphragm at idle.
- (d) Check that the engine rpm changes by releasing vacuum.
- (e) Reconnect the AAP hose.

If a problem is found, replace the diaphragm.

## INSPECTION OF BSV

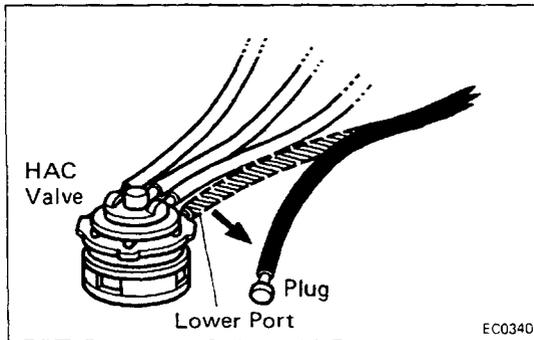
(See page EC-60)

## 6. Deceleration Fuel Cut System



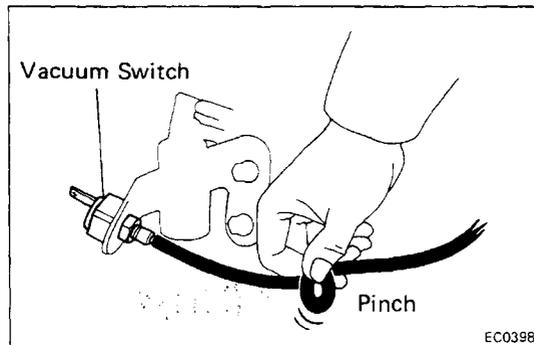
During deceleration this system cuts off part of the fuel in the slow circuit of the carburetor. This prevents overheating and afterburning in the exhaust system.

Engine RPM	Vacuum in the Vacuum S/W	Vacuum S/W	Computer	Fuel Cut Solenoid Valve	Slow Circuit in Carburetor
Below 1,810 rpm	Low vacuum below 360 mmHg (14.17 in.Hg, 48.0 kPa)	ON	ON	ON	OPEN
	High vacuum above 425 mmHg (16.73 in.Hg, 56.7 kPa)	OFF	ON	ON	OPEN
Above 2,200 rpm	Low vacuum below 360 mmHg (14.17 in.Hg, 48.0 kPa)	ON	ON	ON	OPEN
	High vacuum above 425 mmHg (16.73 in.Hg, 56.7 kPa)	OFF	OFF	OFF	CLOSED

**PREPARATION:**

(For vehicles with HAC system)

Disconnect the vacuum hose from the lower port of the H. valve, and plug the hose end.

**A03082****INSPECTION OF DECELERATION FUEL CUT SYSTEM****CHECK SYSTEM OPERATION**

- Connect a tachometer to the engine.
- Start the engine.
- Check that the engine runs normally.
- Pinch off the vacuum hose to the vacuum switch.

- Gradually increase engine speed to 3,000 rpm. Check that the engine misfires slightly between 1,800 and 3,000 rpm.

**CAUTION:** Perform this inspection quickly to avoid overheating the catalytic converter.

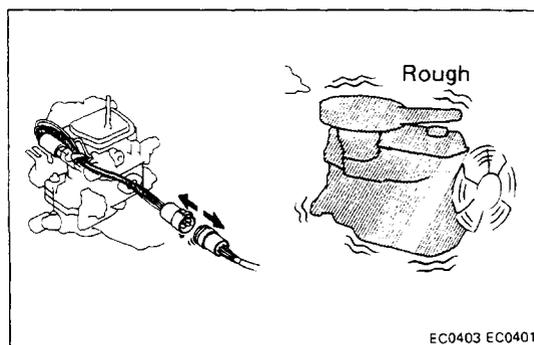
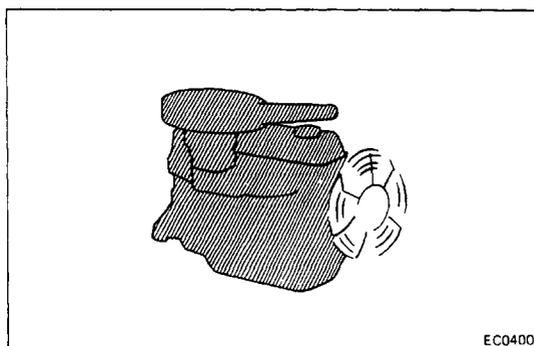
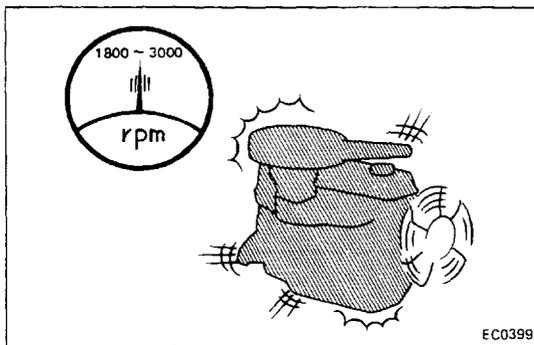
- Release the pinched hose. Again gradually increase the engine speed to 3,000 rpm and check that the engine operation returns to normal.

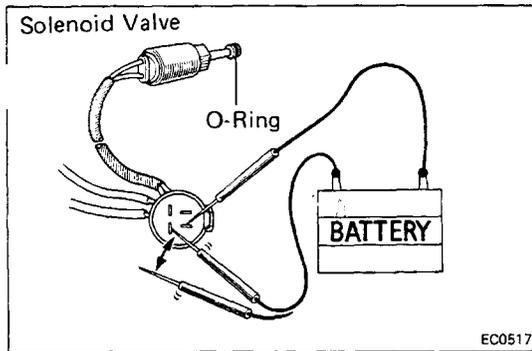
- With the engine idling, unplug the wiring connector to the solenoid valve. Check that the engine idles rough or dies.

**CAUTION:** Perform this inspection quickly to avoid overheating the catalyst.

- Stop the engine, and reconnect the wiring. Remove the tachometer.

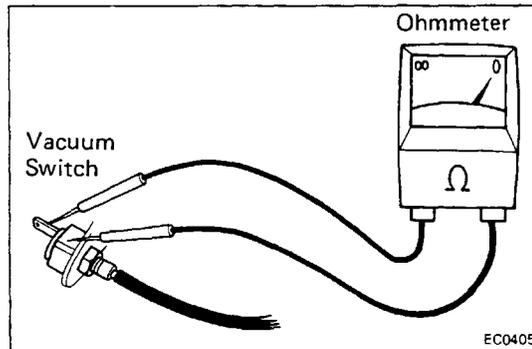
**IF NO PROBLEM IS FOUND WITH THIS INSPECTION, THE SYSTEM IS OKAY, OTHERWISE INSPECT EACH PART**





## INSPECTION OF FUEL CUT SOLENOID VALVE

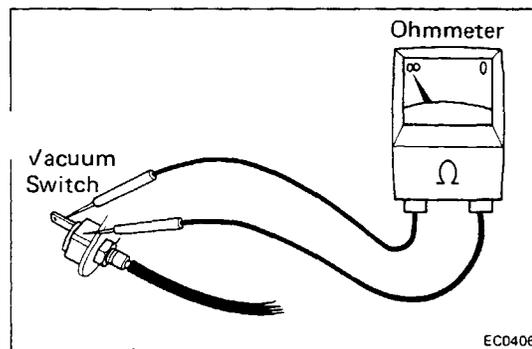
- (a) Remove the solenoid valve.
  - (b) Connect the two terminals and the battery terminals as shown.
  - (c) Check that you can feel a "click" from the solenoid valve when the battery is connected and disconnected.
  - (d) Check the O-ring for damage.
- If problem is found, replace the solenoid valve or O-ring.
- (e) Reinstall the valve and reconnect the wiring connector.



## INSPECTION OF VACUUM SWITCH

- (a) Using an ohmmeter, check for continuity between the switch terminal and switch body.

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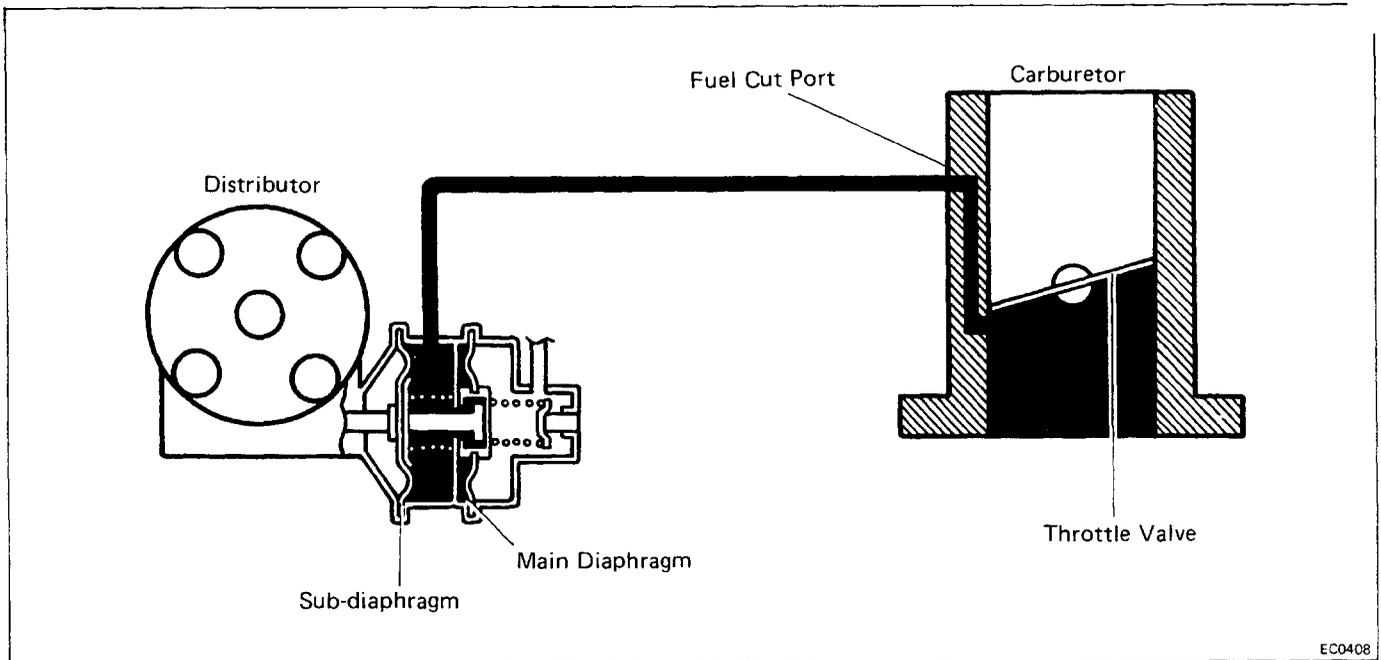
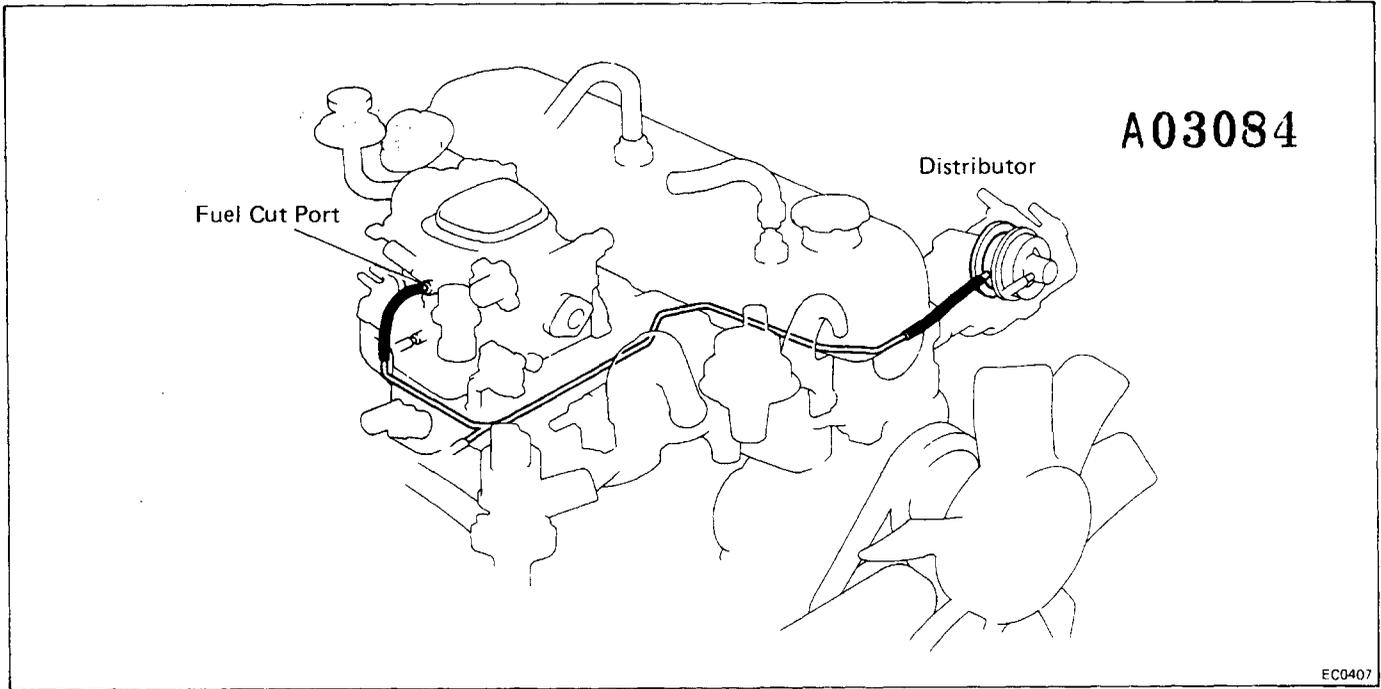


- (b) Start the engine.
- (c) Using an ohmmeter, check that there is no continuity between the switch terminal and the body.

If a problem is found, replace the vacuum switch.

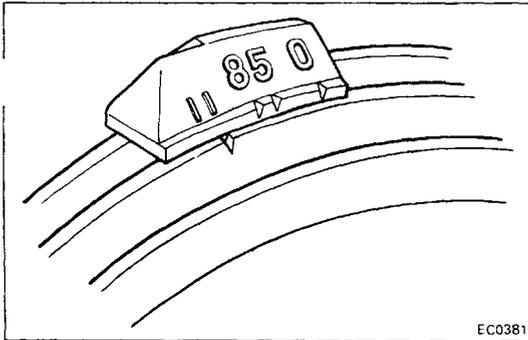
# 7. Idle Advance System

With HAC system: Refer to page EC-48 of HAC system



To improve fuel economy at idle, this system advances the ignition timing only while the engine is idling.

Condition	Distributor Sub-diaphragm	Sub-vacuum Advance
Idling	Pulled by fuel cut port vacuum	ADVANCED (+ 12°)
Cruising	Not pulled	NOT ADVANCED



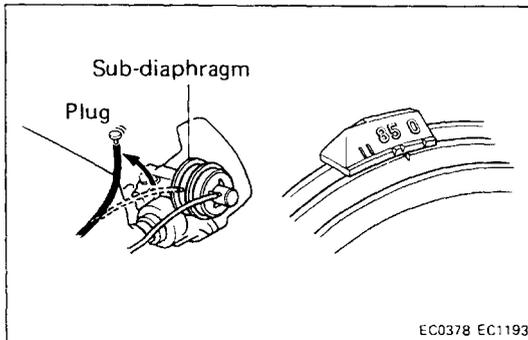
## INSPECTION OF IDLE ADVANCE SYSTEM

### CHECK IDLE ADVANCE SYSTEM OPERATION

- (a) Warm up the engine to normal operating temperature.
- (b) Check the ignition timing at idle.

**Ignition timing: About 12° BTDC @ Max. 950 rpm**

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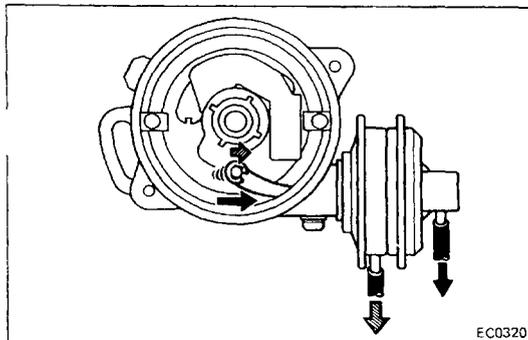


- (c) Disconnect the vacuum hose from the distributor sub-diaphragm and plug the hose end.
- (d) Check the ignition timing at idle.

**Ignition timing: 0° BTDC @ Max. 950 rpm**

- (e) Reconnect the vacuum hose and remove the timing light.

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



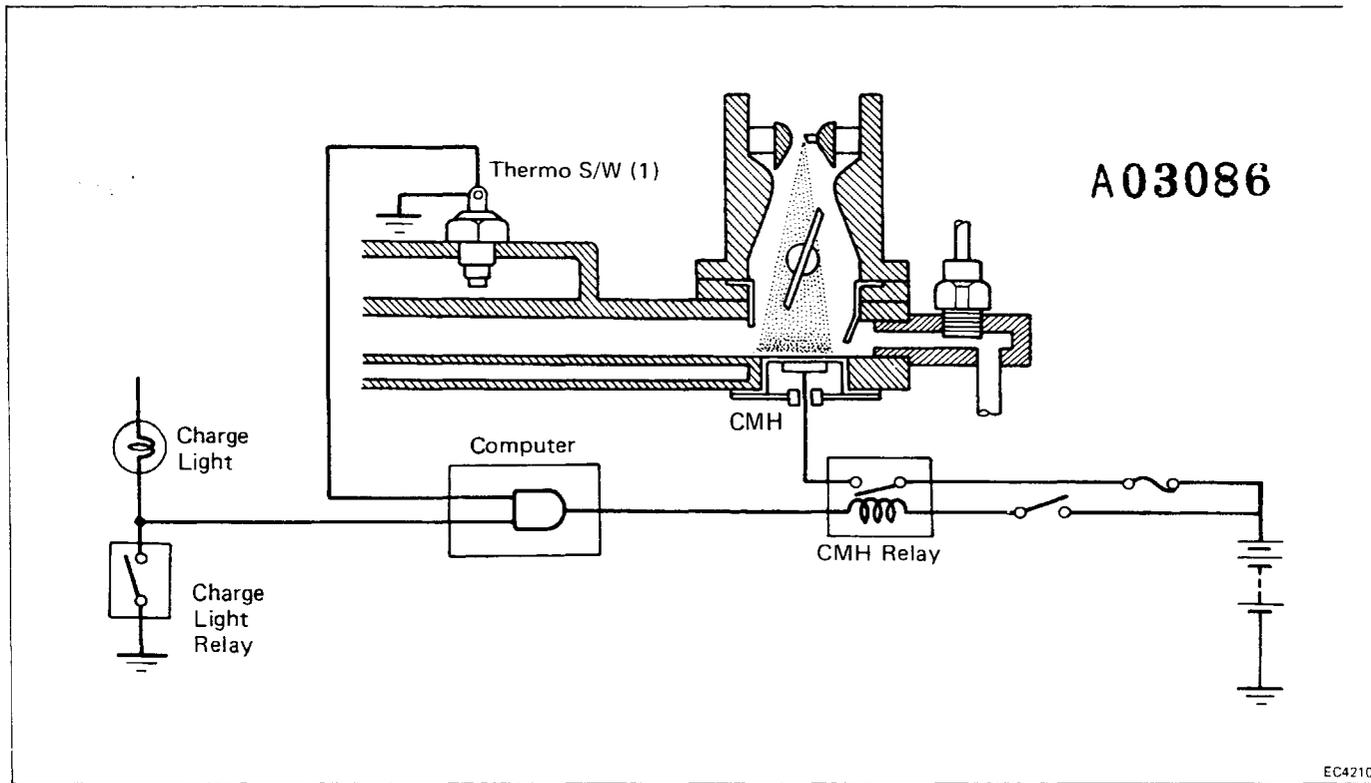
## INSPECTION OF DISTRIBUTOR VACUUM ADVANCER

### CHECK OPERATION OF VACUUM ADVANCER BY APPLYING VACUUM

- (a) Remove the distributor cap and rotor.
- (b) Check that the vacuum advancer moves in accordance with the vacuum.
- (c) Reinstall the rotor and distributor cap.

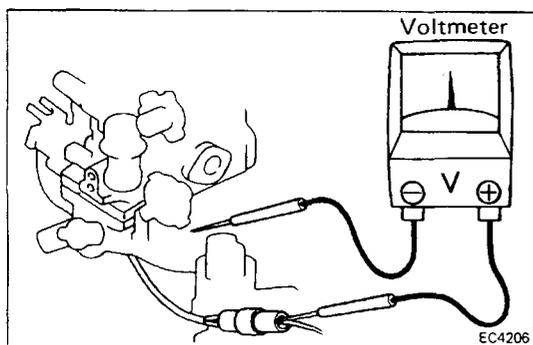
If a problem is found, repair or replace the distributor vacuum advancer.

## 8. Cold Mixture Heater (CMH) System



To reduce cold engine emission and improve drivability, the intake manifold riser is heated during cold engine operation to accelerate vaporization of the liquid fuel.

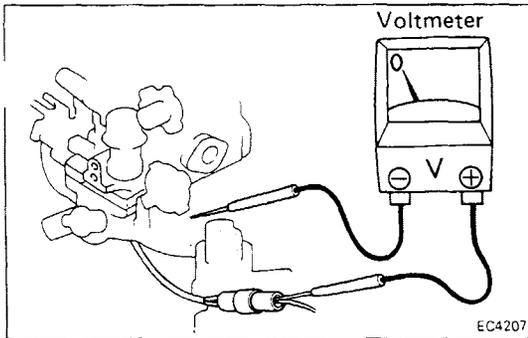
IG S/W	Engine	Coolant Temp.	Thermo S/W (1)	Computer	CMH Relay	CMH
OFF	Not running	—	—	—	OFF	OFF
ON	Not running	—	—	OFF	OFF	OFF
	Running	Below 43°C (109°F)	ON	ON	ON	ON (Heated)
		Above 55°C (131°F)	OFF	OFF	OFF	OFF



### INSPECTION OF CMH SYSTEM

1. START ENGINE
2. CHECK CMH WITH COLD ENGINE
  - (a) The coolant temperature should be below 43°C (109°F).
  - (b) Using a voltmeter check that there is voltage between the positive (+) terminal and intake manifold.

**CAUTION:** The voltmeter probe should be inserted from the rear side of the connector.



### 3. CHECK CMH WITH WARM ENGINE

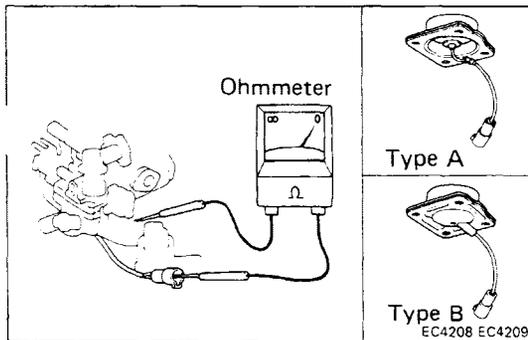
- (a) Warm up the engine to above 55°C (131°F).
- (b) Check that there is no voltage.

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

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## INSPECTION OF THERMO SWITCH (1)

(See page EC-23)



## INSPECTION OF CMH

### MEASURE RESISTANCE

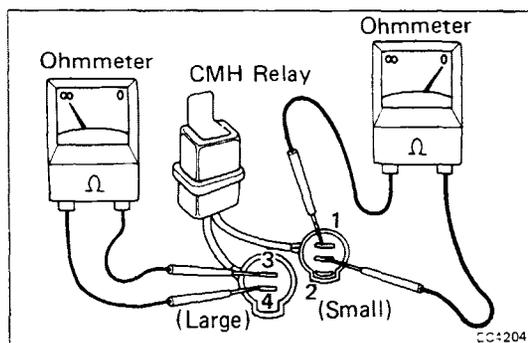
- (a) Unplug the wiring connector.
- (b) Using an ohmmeter, measure the resistance between the positive (+) terminal and intake manifold.

**Resistance at 20°C (68°F):**

**Type A (ND) 0.35 — 1.0 Ω**

**Type B (TDK) 0.5 — 2.0 Ω**

- (c) Plug in the wiring connector.

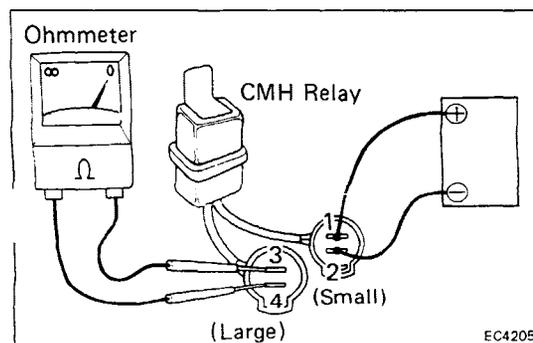


## INSPECTION OF CMH RELAY

### 1. INSPECT RELAY CONTINUITY

- Check that there is continuity between terminals 1 and 2.  
Check that there is no continuity between terminals 3 and 4.

**Relay location: Right fender apron**



### 2. INSPECT RELAY OPERATION

- Check the continuity between terminals 3 and 4 with battery voltage applied between terminals 1 and 2.