

EMISSION CONTROL SYSTEM

SECTION EC

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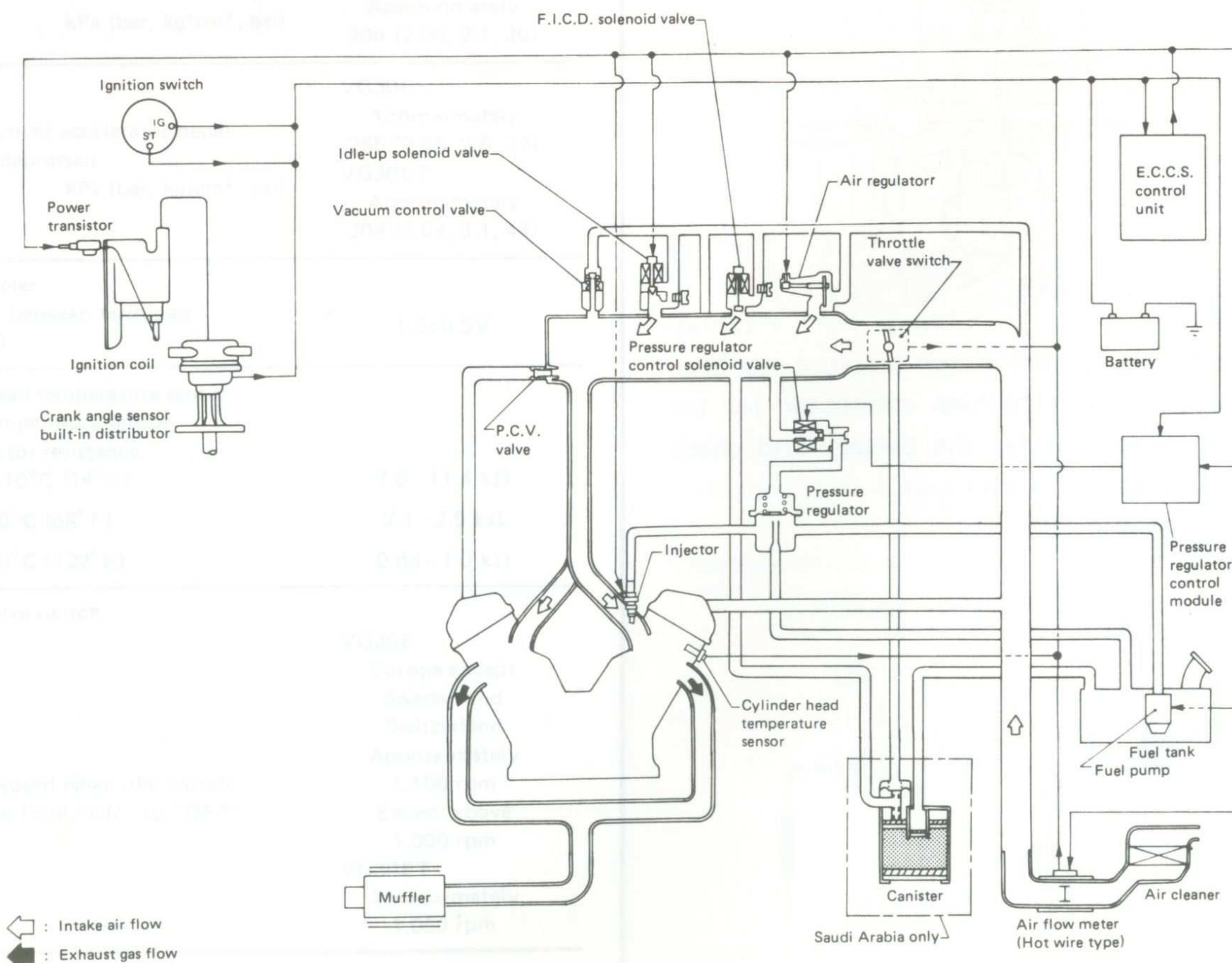
GENERAL DESCRIPTION

		VG30E				VG30ET		Major unit
		Europe & general areas	Saudi Arabia	Sweden & Switzerland	Australia	Europe & general areas	Saudi Arabia	
Crankcase emission control system		X	X	X	X	X	X	P.C.V. valve
Exhaust emission control system	Boost controlled deceleration device (B.C.D.D.)	—	—	X	X	—	—	- B.C.D.D. - B.C.D.D. control solenoid - Speed detecting switch and amplifier (M/T) - Inhibitor switch (A/T)
	Intake manifold vacuum control	X	X	X	X	X	X	Vacuum control valve
	Exhaust gas recirculation (E.G.R.) control	—	—	X	X	—	—	- E.G.R. control valve - E.G.R. control solenoid valve - E.C.C.S. control unit
	Exhaust air induction (E.A.I.)	—	—	X	X	—	—	- E.A.I. valves - E.A.I. tubes
Evaporative emission control system		—	X	—	X	—	X	- Carbon canister - Fuel check valve

X: Available

—: Not available

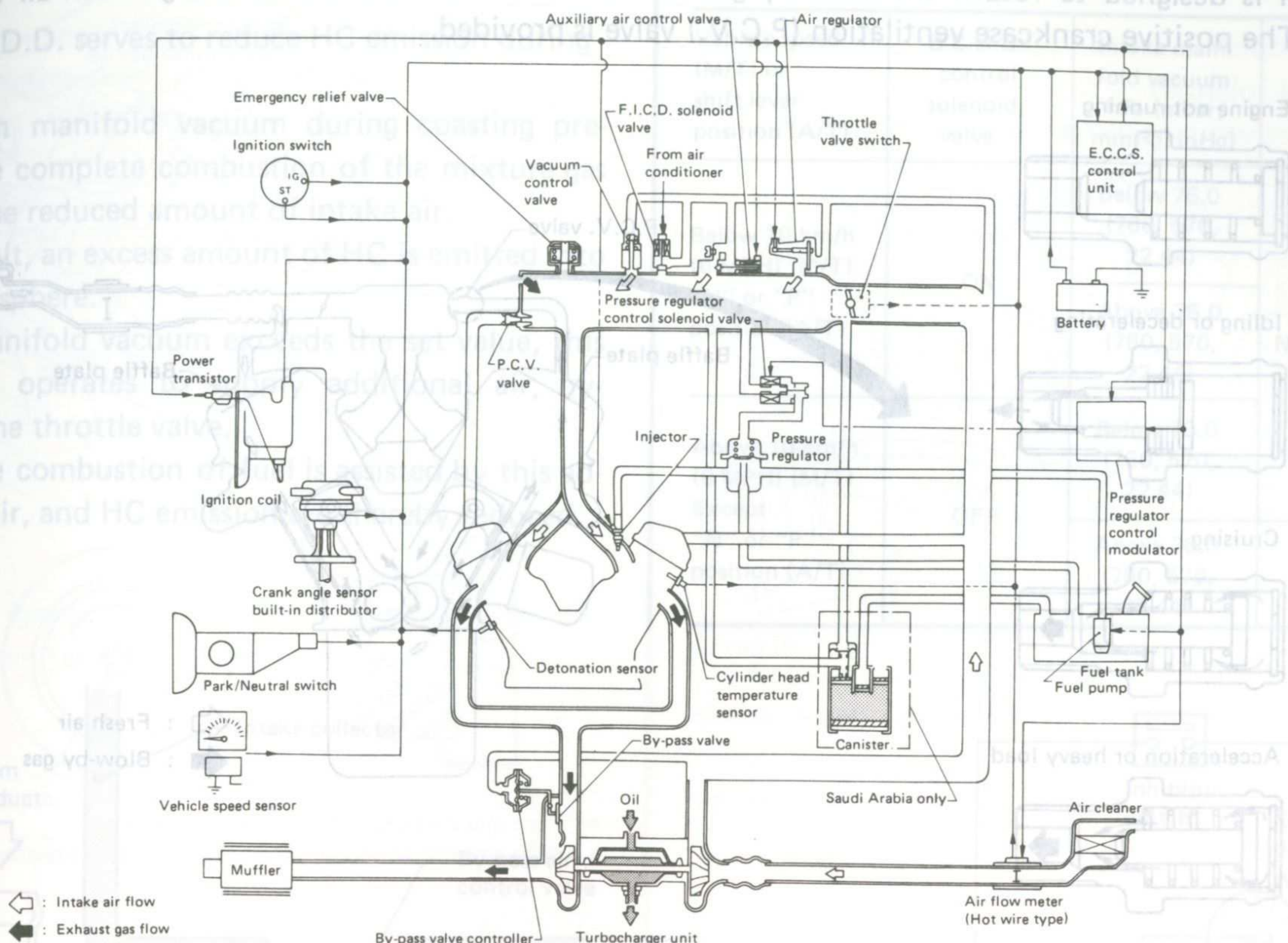
VG30E engine for Europe, Saudi Arabia and general areas



SEC434A

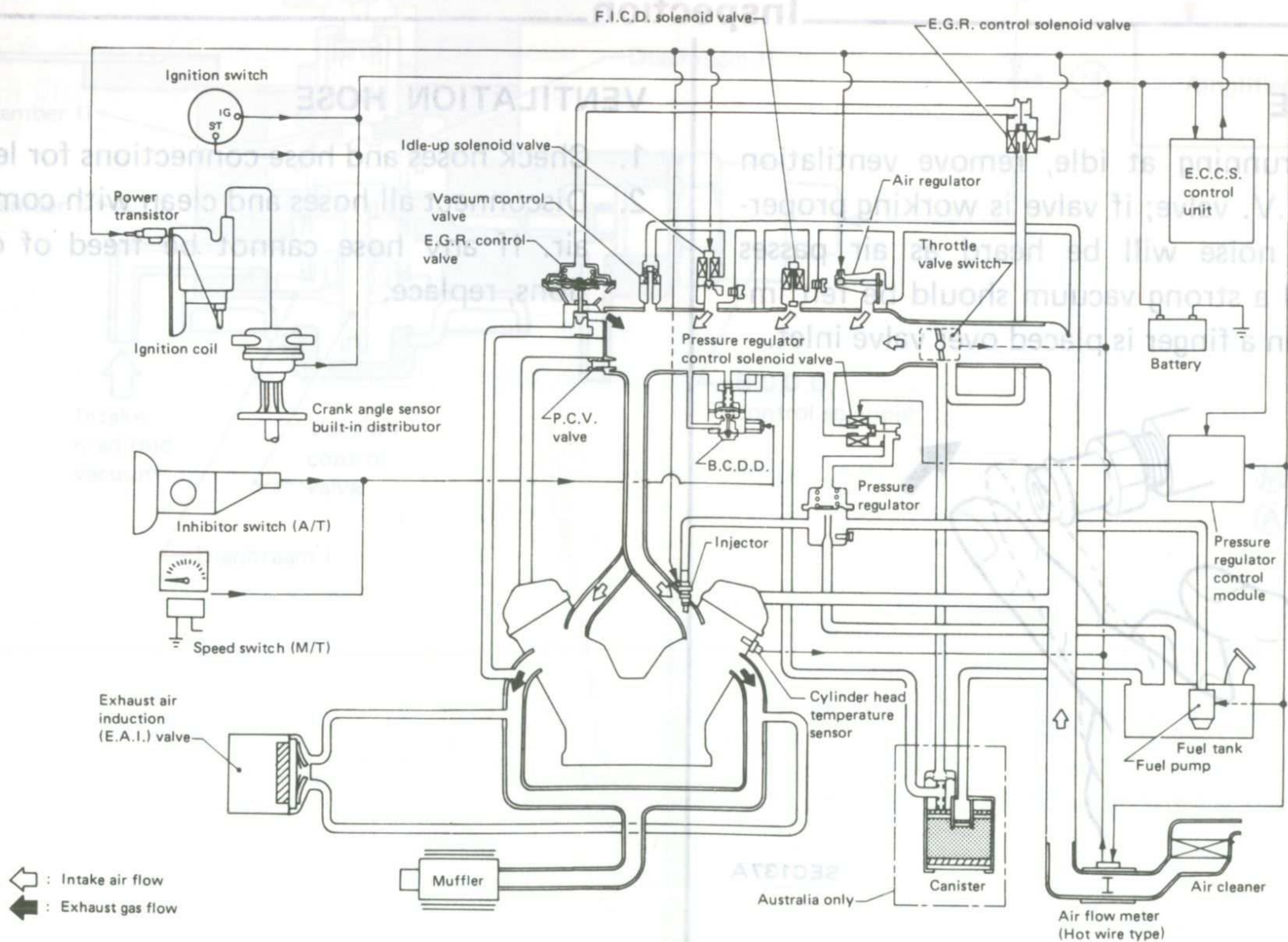
GENERAL DESCRIPTION

VG30ET engine for Europe, Saudi Arabia and general areas



SEC435A

VG30E engine for Sweden, Switzerland and Australia

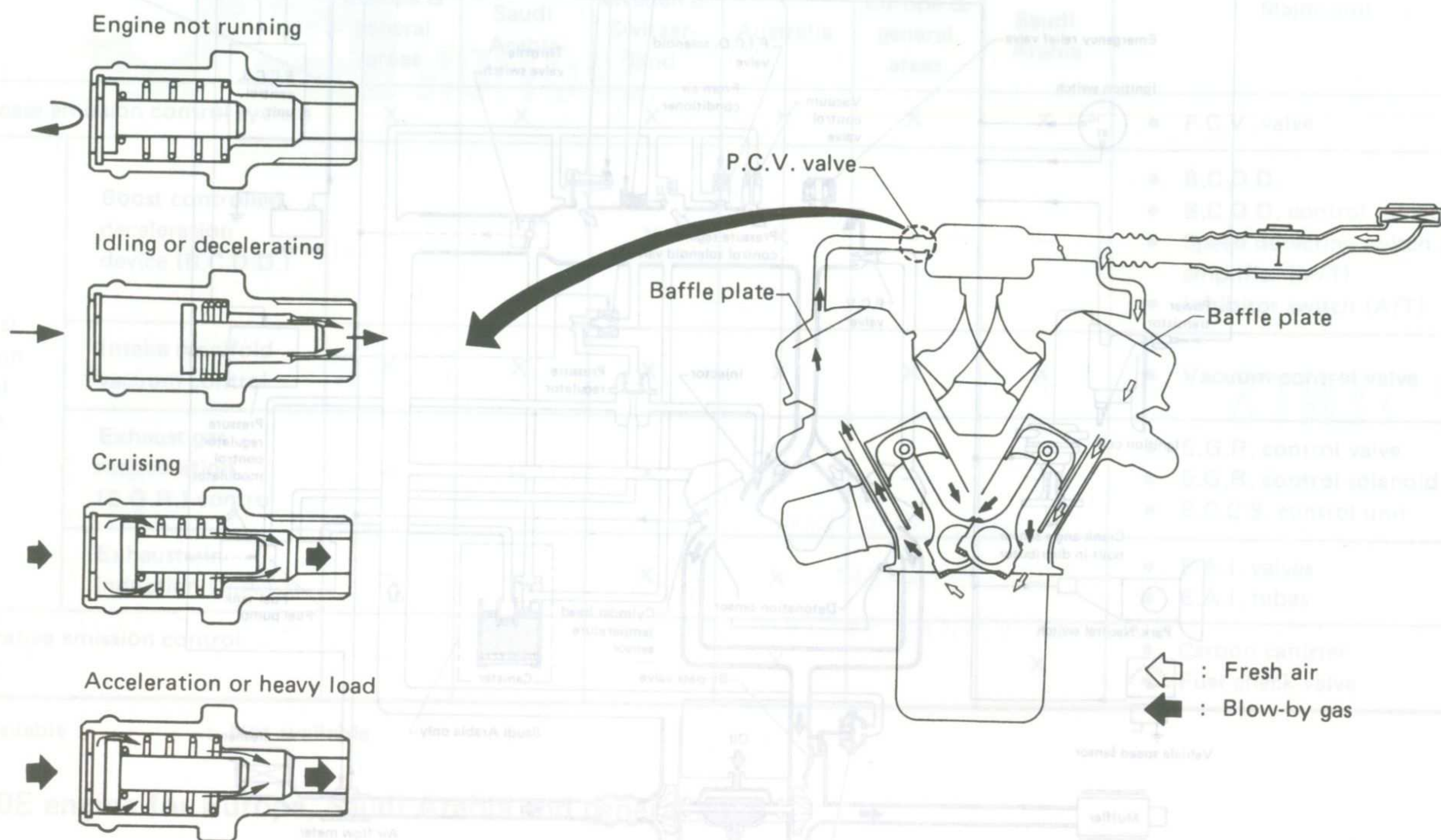


SEC436A

CRANKCASE EMISSION CONTROL SYSTEM

Description

This system is designed to return the blow-by gas to the intake manifold and to charge fresh air into the crankcase. The positive crankcase ventilation (P.C.V.) valve is provided.

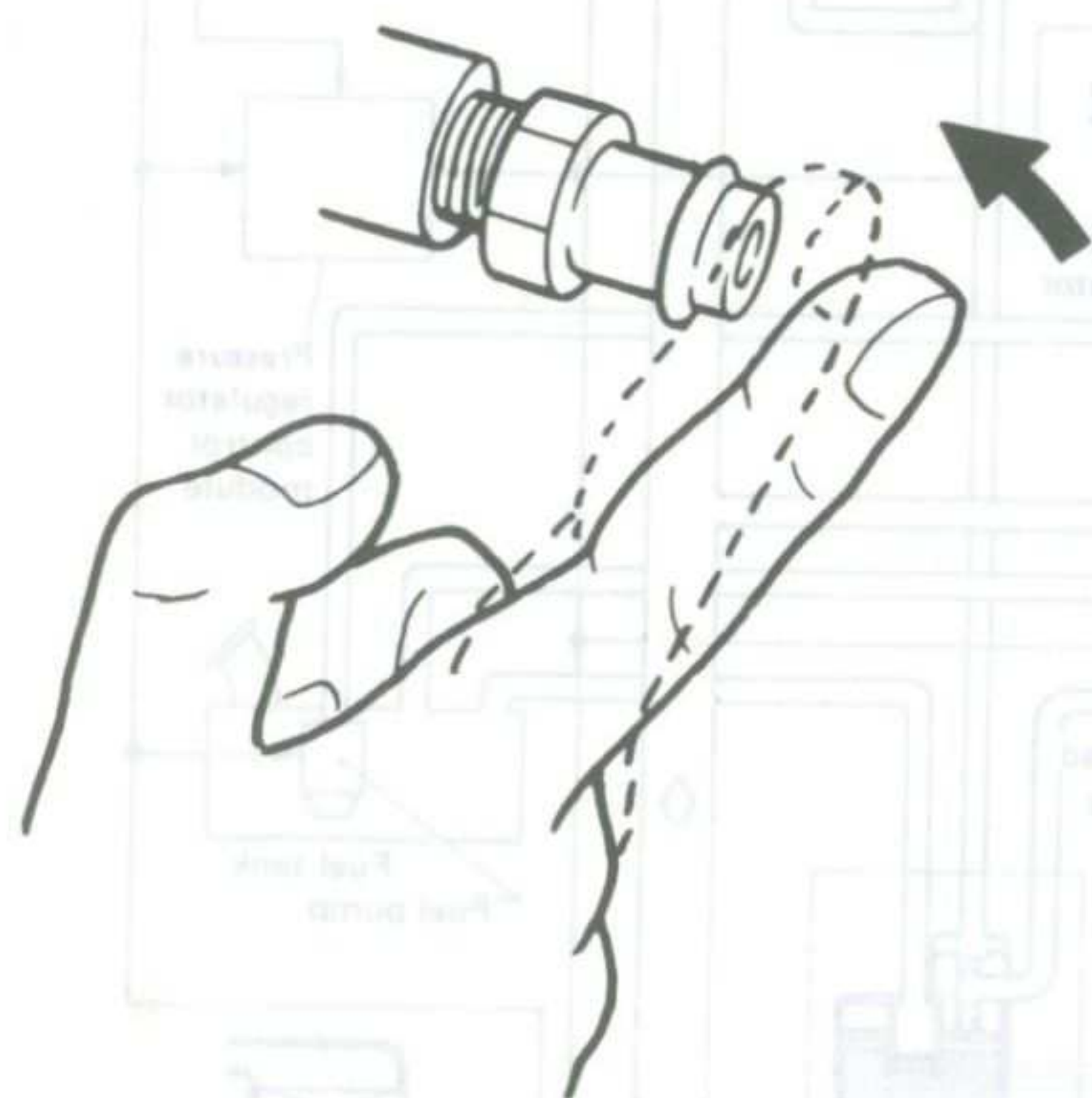


SEC437A

Inspection

P.C.V. VALVE

With engine running at idle, remove ventilation hose from P.C.V. valve; if valve is working properly, a hissing noise will be heard as air passes through it and a strong vacuum should be felt immediately when a finger is placed over valve inlet.



SEC137A

VENTILATION HOSE

1. Check hoses and hose connections for leaks.
2. Disconnect all hoses and clean with compressed air. If any hose cannot be freed of obstructions, replace.

EXHAUST EMISSION CONTROL SYSTEM

Boost Controlled Deceleration Device (B.C.D.D.)

DESCRIPTION

The B.C.D.D. serves to reduce HC emission during coasting.

The high manifold vacuum during coasting prevents the complete combustion of the mixture gas due to the reduced amount of intake air.

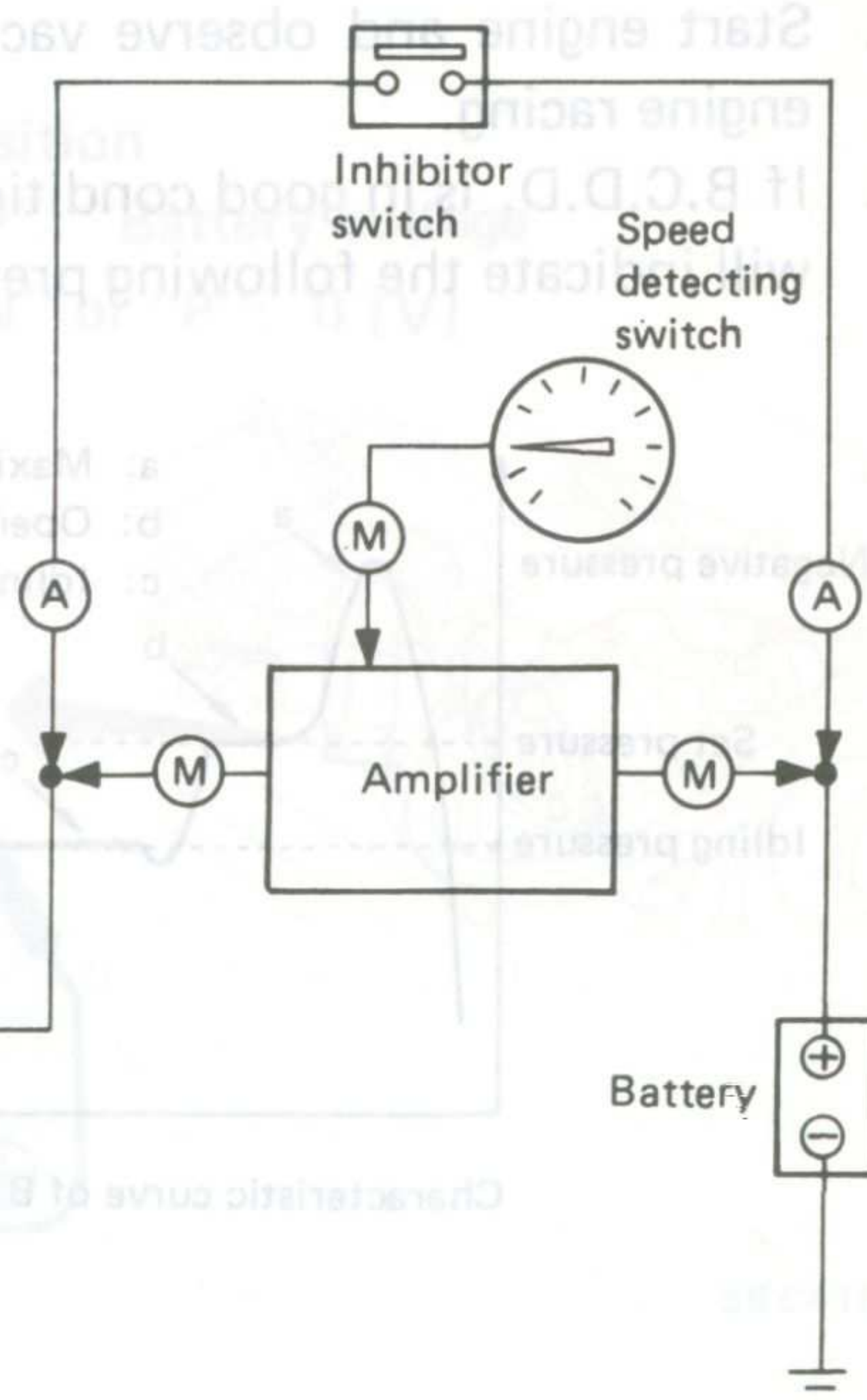
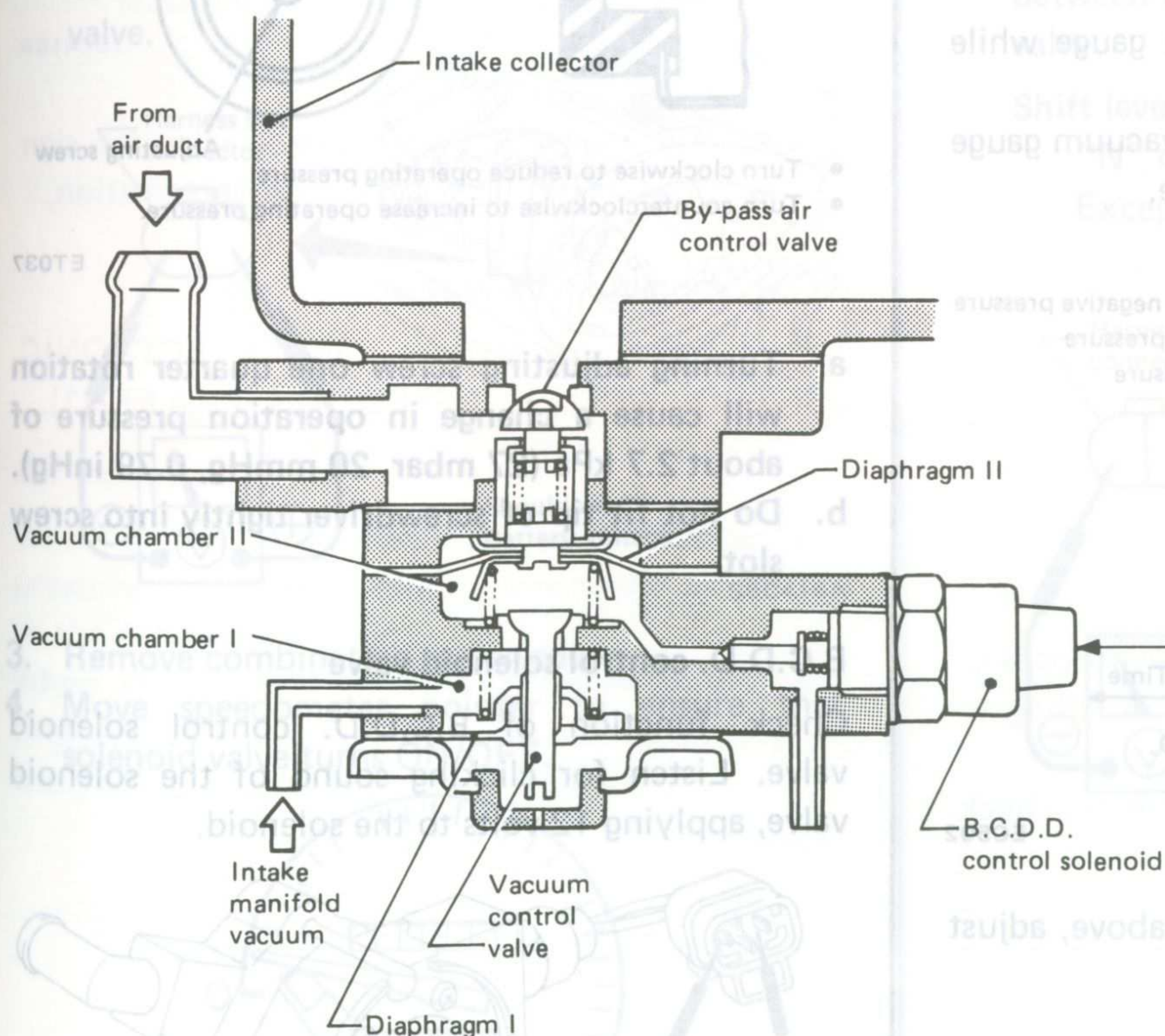
As a result, an excess amount of HC is emitted into the atmosphere.

When manifold vacuum exceeds the set value, this B.C.D.D. operates to supply additional air, by-passing the throttle valve.

Complete combustion of fuel is assisted by this additional air, and HC emission are thereby reduced.

OPERATION

Vehicle speed (M/T) or shift lever position (A/T)	B.C.D.D. control solenoid valve	Intake manifold vacuum kPa (mbar, mmHg, inHg)	B.C.D.D. operation
Below 10 km/h (6 MPH) (M/T) "N" or "P" position (A/T)	ON	Below 76.0 (760, 570, 22.44)	Not actuated
		Above 76.0 (760, 570, 22.44)	
Above 10 km/h (6 MPH) (M/T) Except "N" or "P" position (A/T)	OFF	Below 76.0 (760, 570, 22.44)	Actuated
		Above 76.0 (760, 570, 22.44)	



(M) : MT/ models
(A) : A/T models

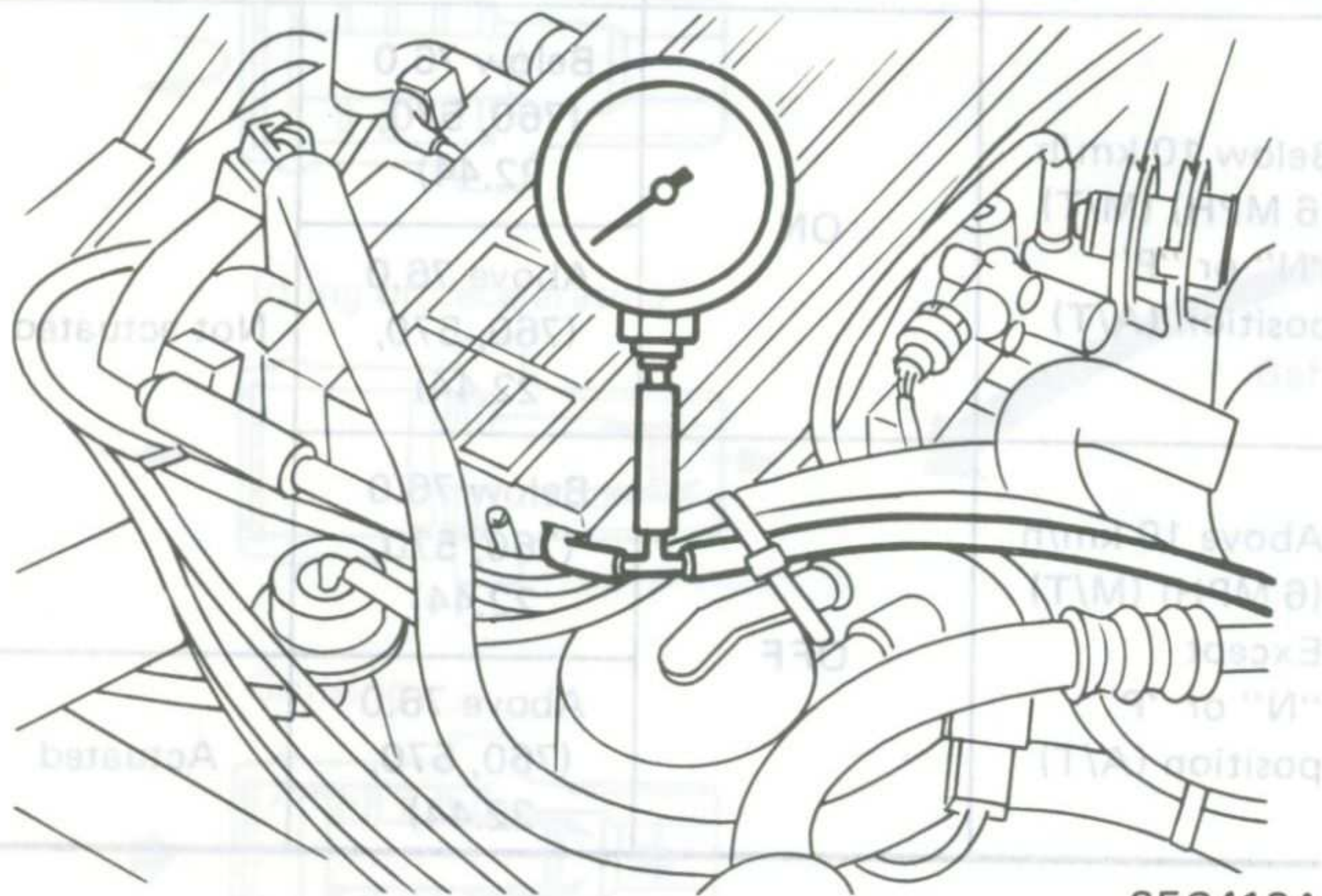
SEC438A

EXHAUST EMISSION CONTROL SYSTEM

Boost Controlled Deceleration Device (B.C.D.D.) (Cont'd)

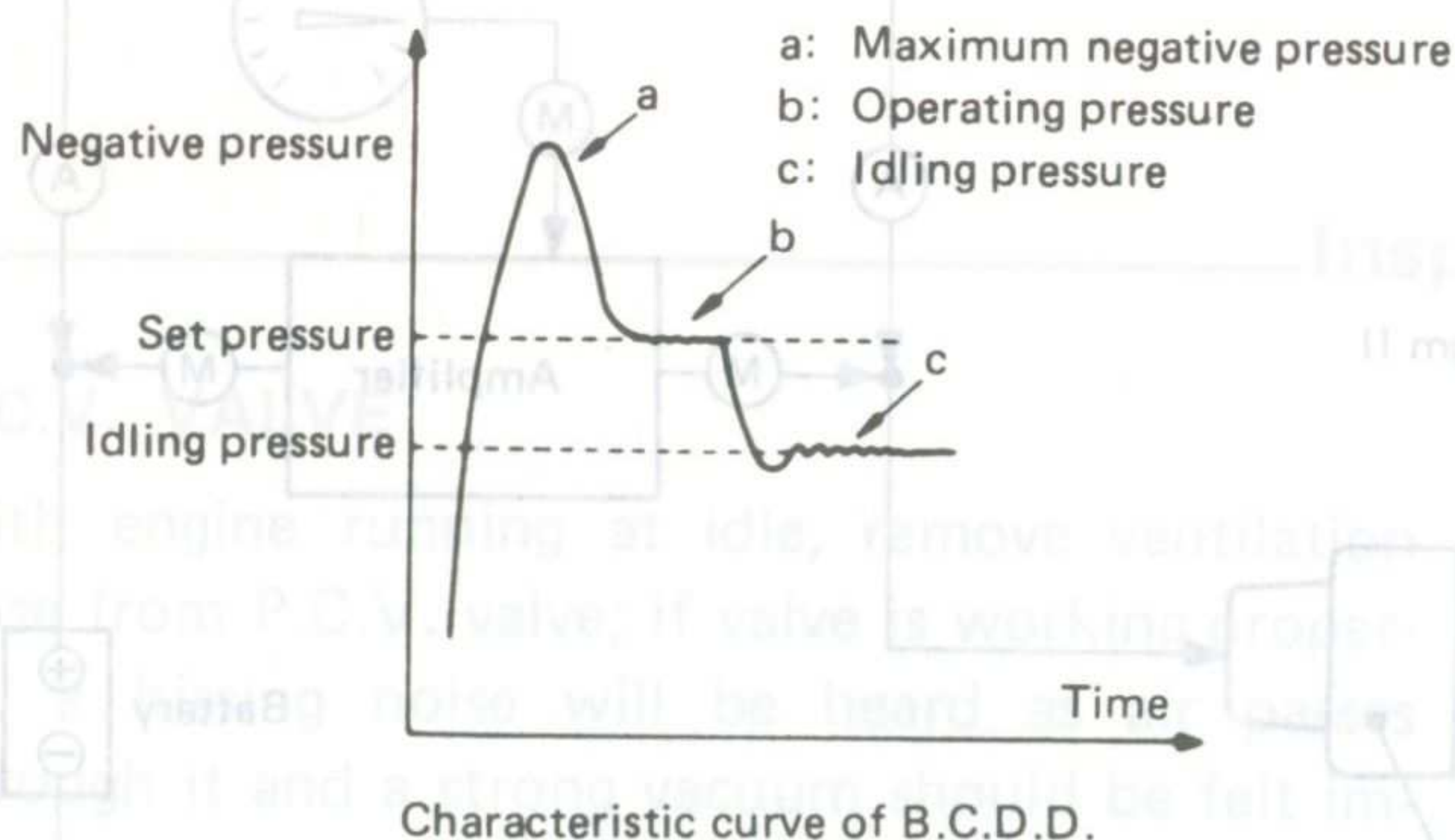
INSPECTION

1. Disconnect harness connector of B.C.D.D. control solenoid.
2. Connect vacuum gauge to intake manifold.



SEC412A

3. Start engine and observe vacuum gauge while engine racing.
4. If B.C.D.D. is in good condition, vacuum gauge will indicate the following pressure.

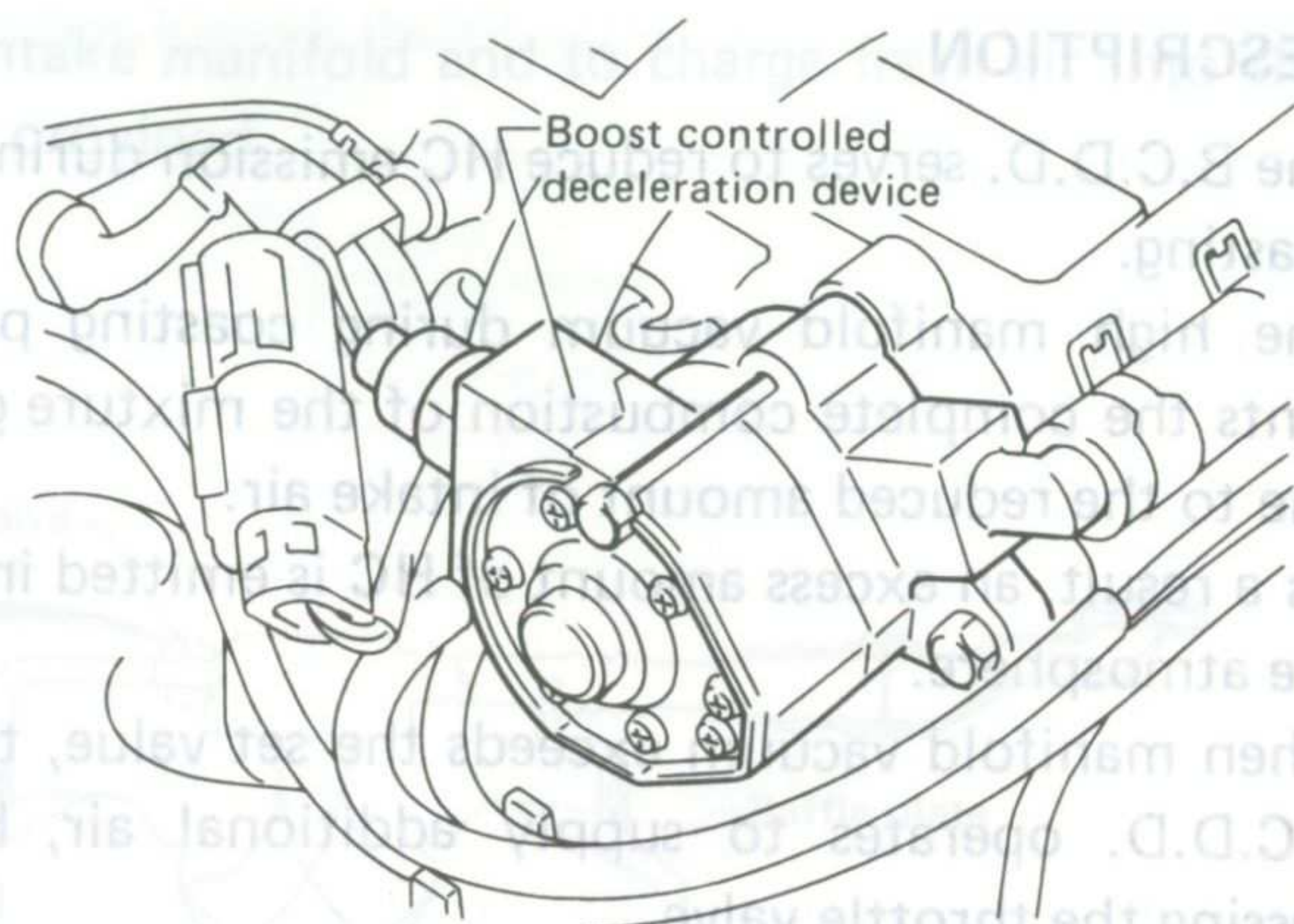


EC502

5. If it does not react as described above, adjust operating pressure.
 - 1) Remove rubber cap on B.C.D.D.
 - 2) Racing engine, turn adjusting screw until the specified set pressure is obtained.

B.C.D.D. set pressure:

$-76.0 \pm 2.7 \text{ kPa}$
 $(-760 \pm 27 \text{ mbar}, -570 \pm 20 \text{ mmHg},$
 $-22.44 \pm 0.79 \text{ inHg})$



SEC413A



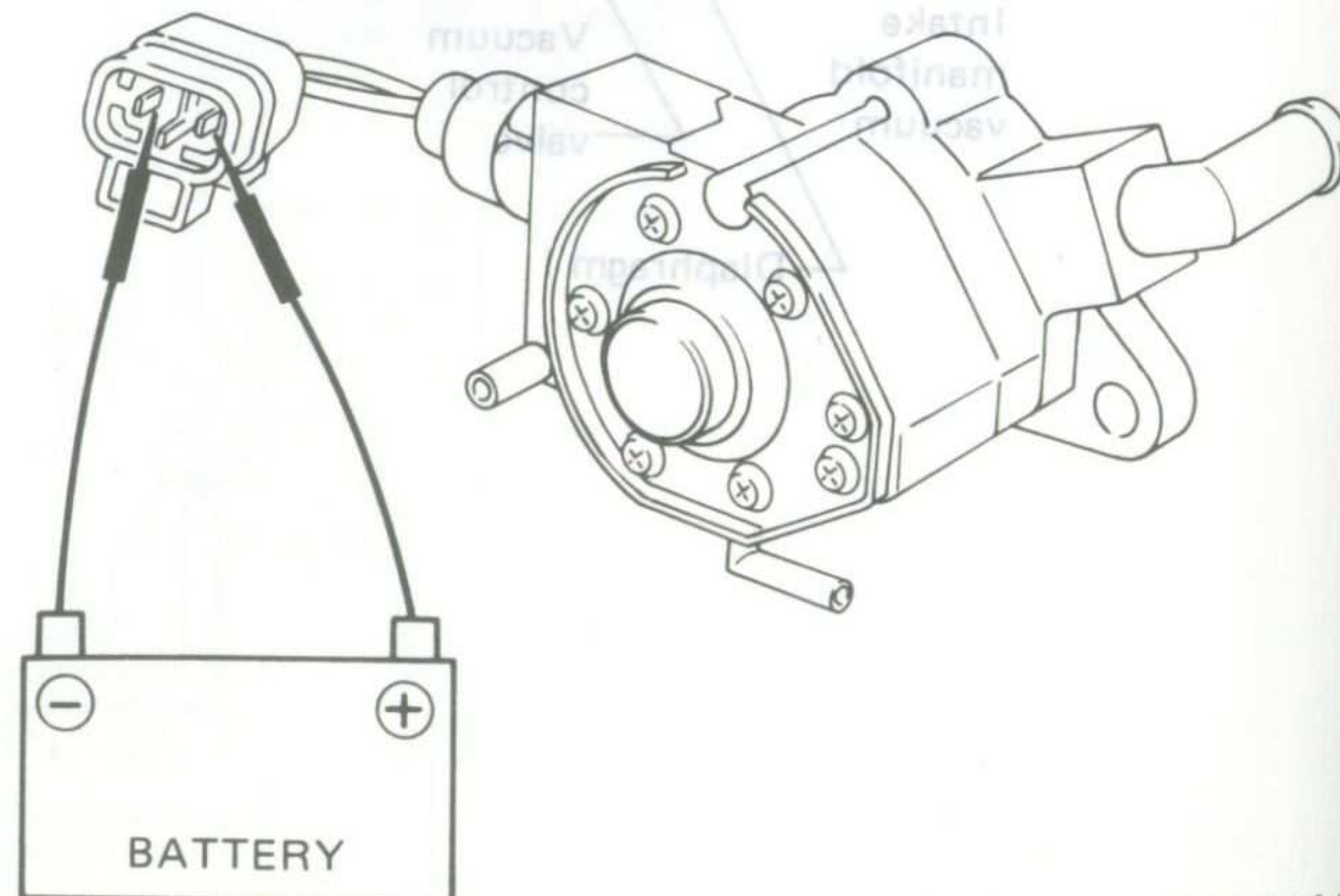
- Turn clockwise to reduce operating pressure.
- Turn counterclockwise to increase operating pressure.

ET037

- a. Turning adjusting screw one quarter rotation will cause a change in operation pressure of about 2.7 kPa (27 mbar, 20 mmHg, 0.79 inHg).
- b. Do not fit tip of screwdriver tightly into screw slot.

B.C.D.D. control solenoid valve

Check function of B.C.D.D. control solenoid valve. Listen for clicking sound of the solenoid valve, applying 12 volts to the solenoid.



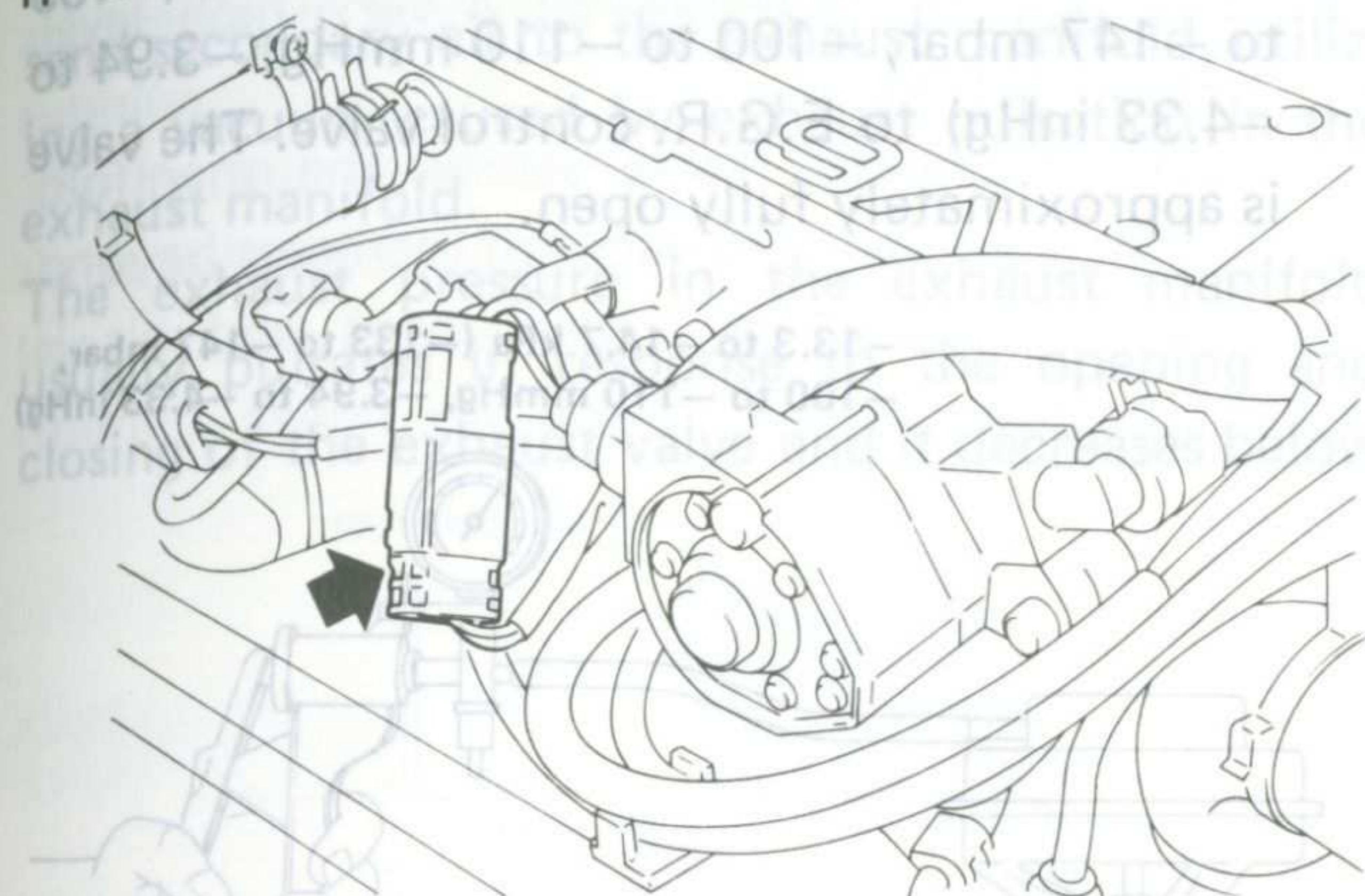
SEC414A

EXHAUST EMISSION CONTROL SYSTEM

Boost Controlled Deceleration Device (B.C.D.D.) (Cont'd)

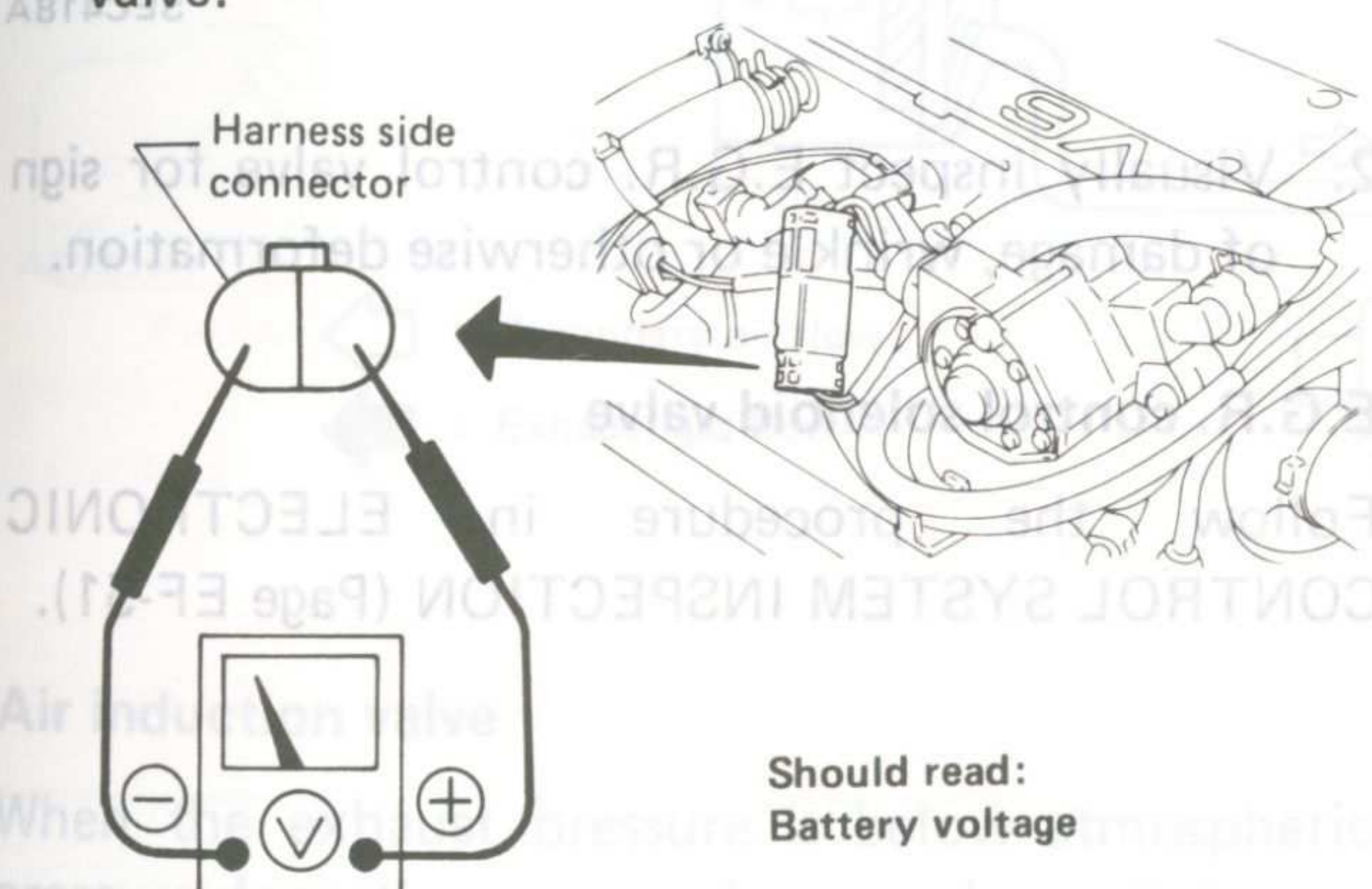
Control circuit for M/T models

1. Disconnect B.C.D.D. harness connector.



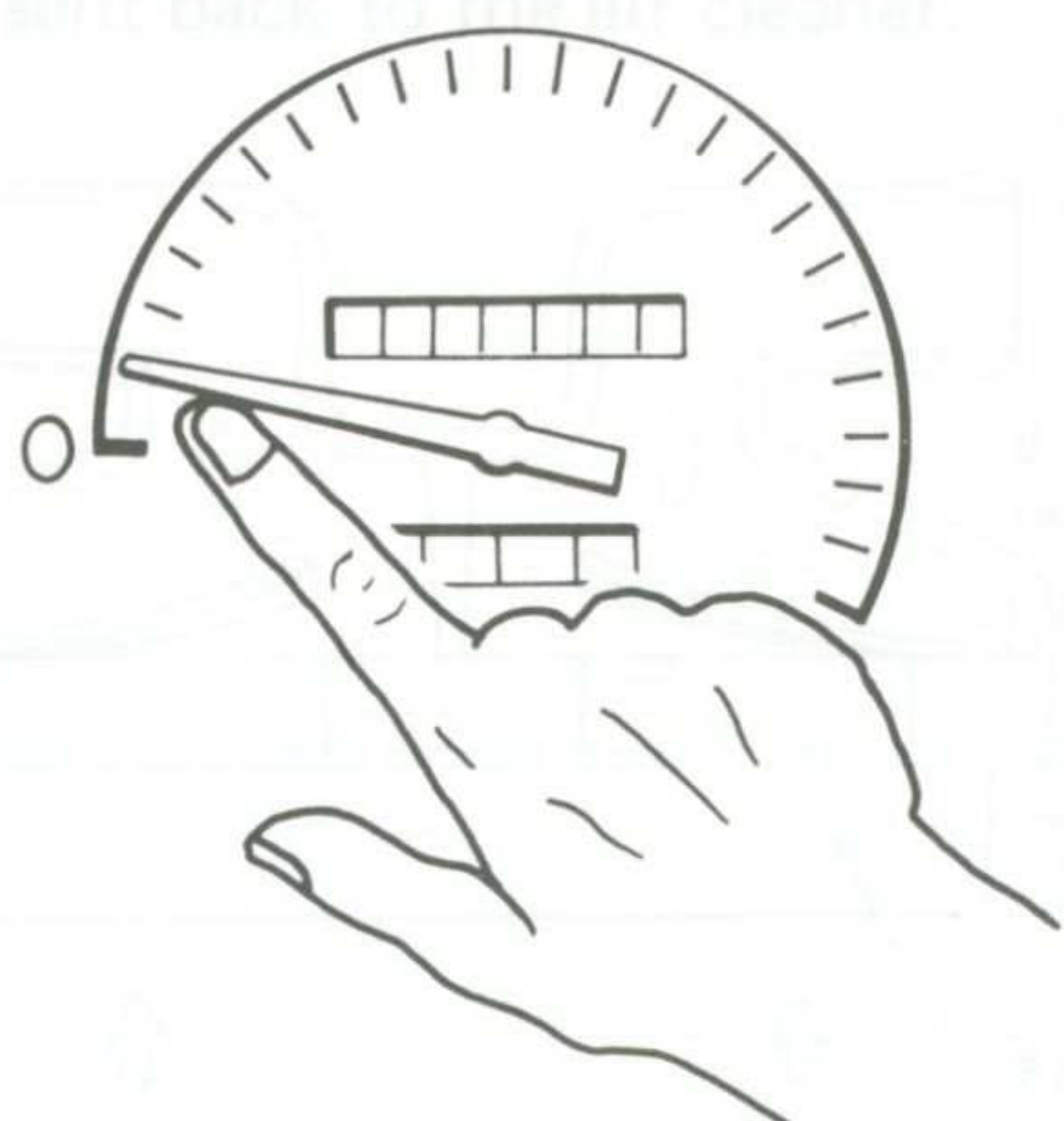
SEC415A

2. Turn ignition switch "ON" and check voltage between terminals of B.C.D.D. control solenoid valve.



SEC416A

3. Remove combination meter cover.
4. Move speedometer pointer to ensure that solenoid valve turns ON/OFF.

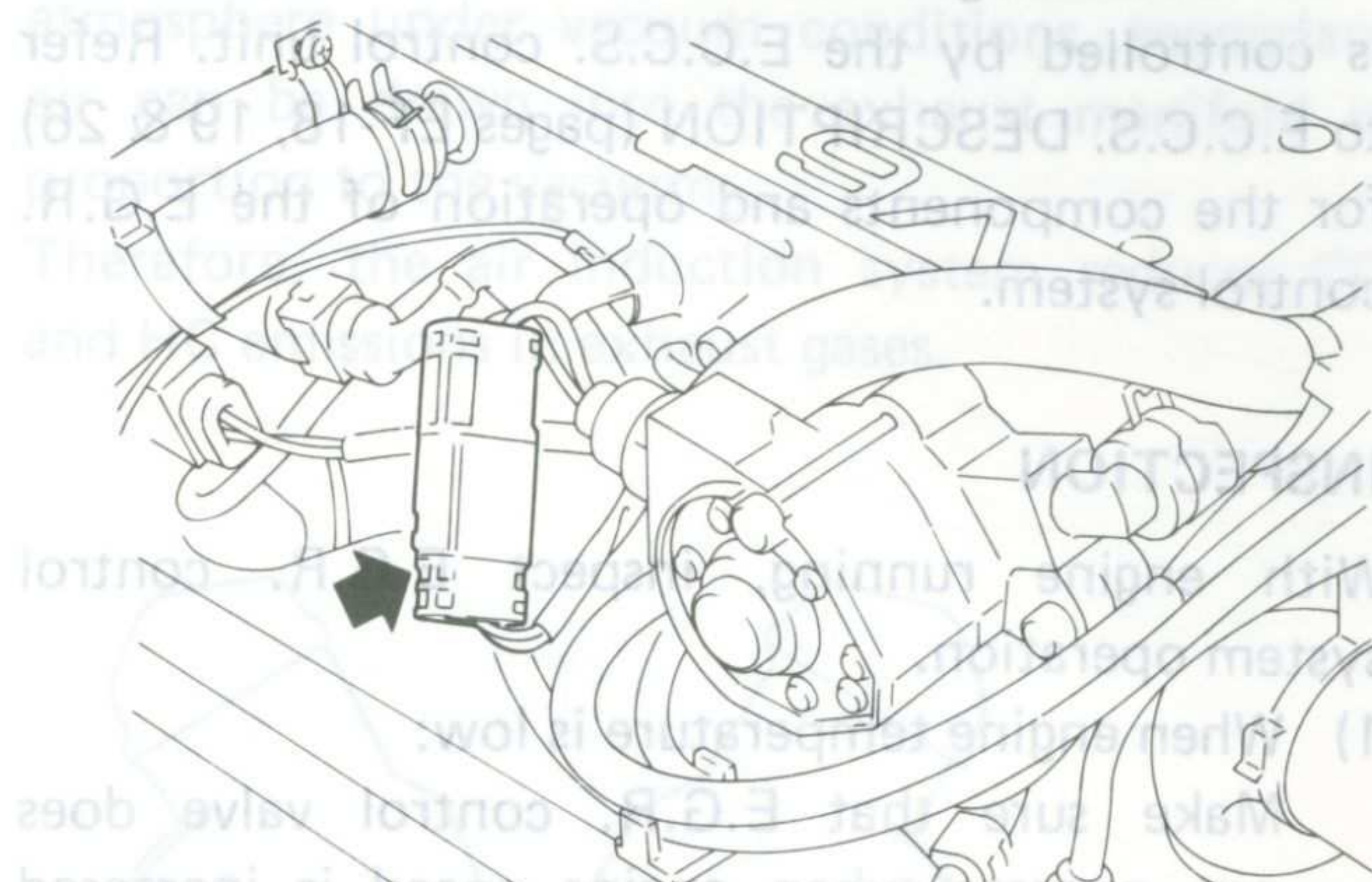


SEC370A

Below 10 km/h (6 MPH): ON
Above 10 km/h (6 MPH): OFF

Control circuit for A/T models

1. Disconnect B.C.D.D. harness connector.



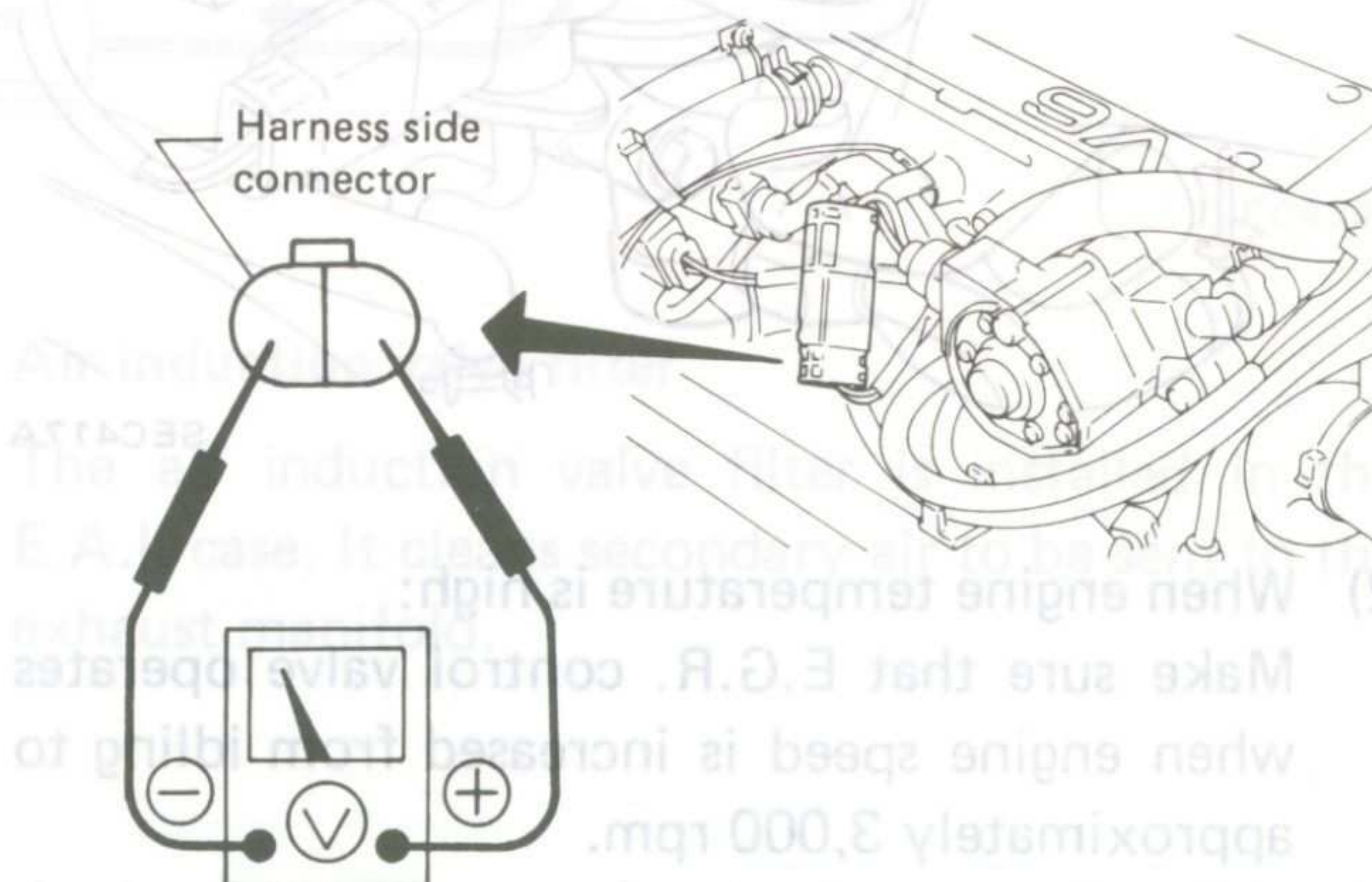
SEC415A

2. Turn ignition switch "ON" and check voltage between terminals of B.C.D.D. control solenoid valve.

Shift lever position

"N" or "P": Battery voltage

Except "N" or "P": 0 [V]



SEC416A

EXHAUST EMISSION CONTROL SYSTEM

Exhaust Gas Recirculation (E.G.R.) Control System

DESCRIPTION

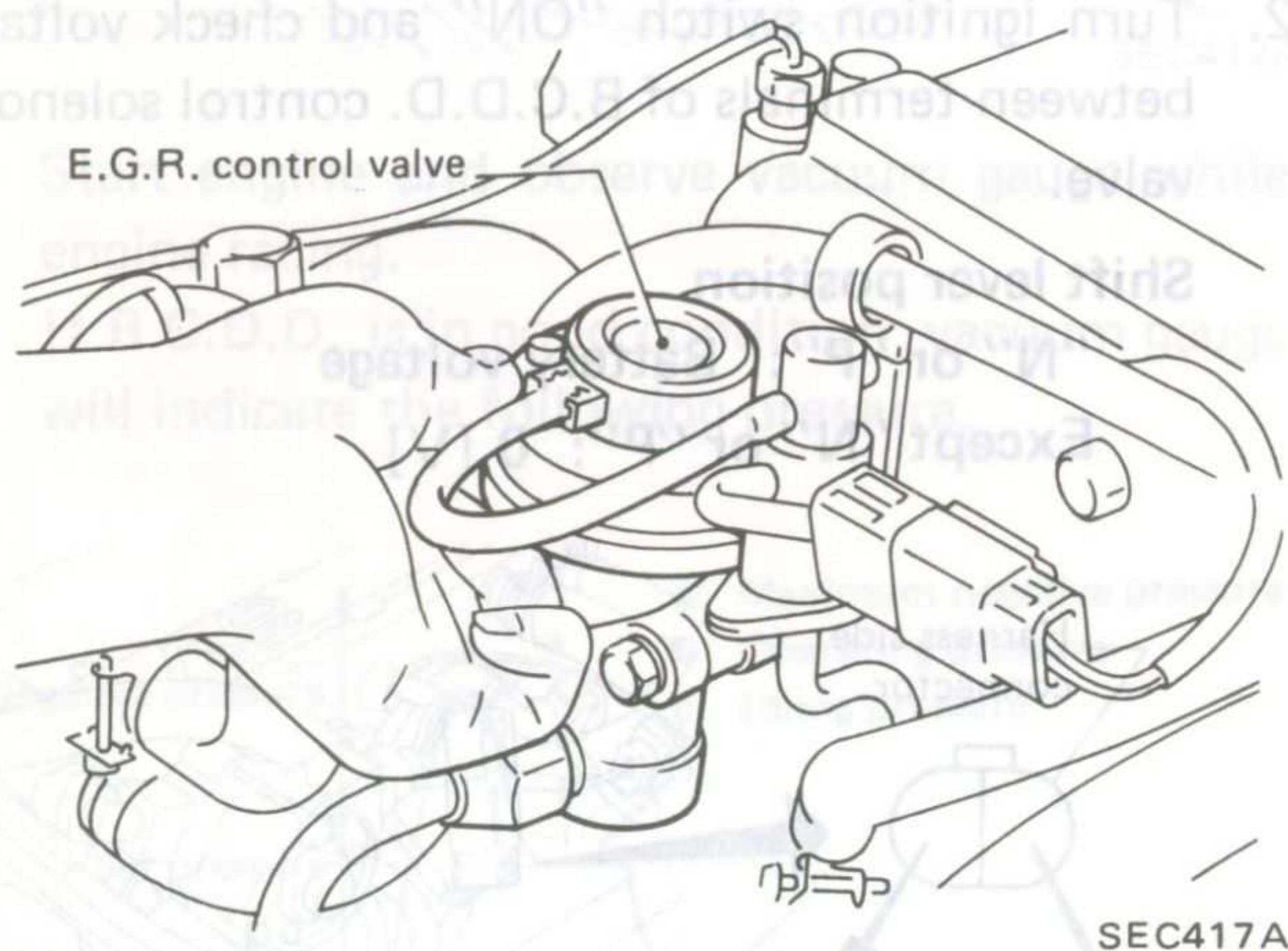
The exhaust gas recirculation (E.G.R.) system is controlled by the E.C.C.S. control unit. Refer to E.C.C.S. DESCRIPTION (pages EF-18, 19 & 26) for the components and operation of the E.G.R. control system.

INSPECTION

With engine running, inspect E.G.R. control system operation.

- 1) When engine temperature is low:

Make sure that E.G.R. control valve does not operate when engine speed is increased from idling to approximately 3,000 rpm.



- 2) When engine temperature is high:

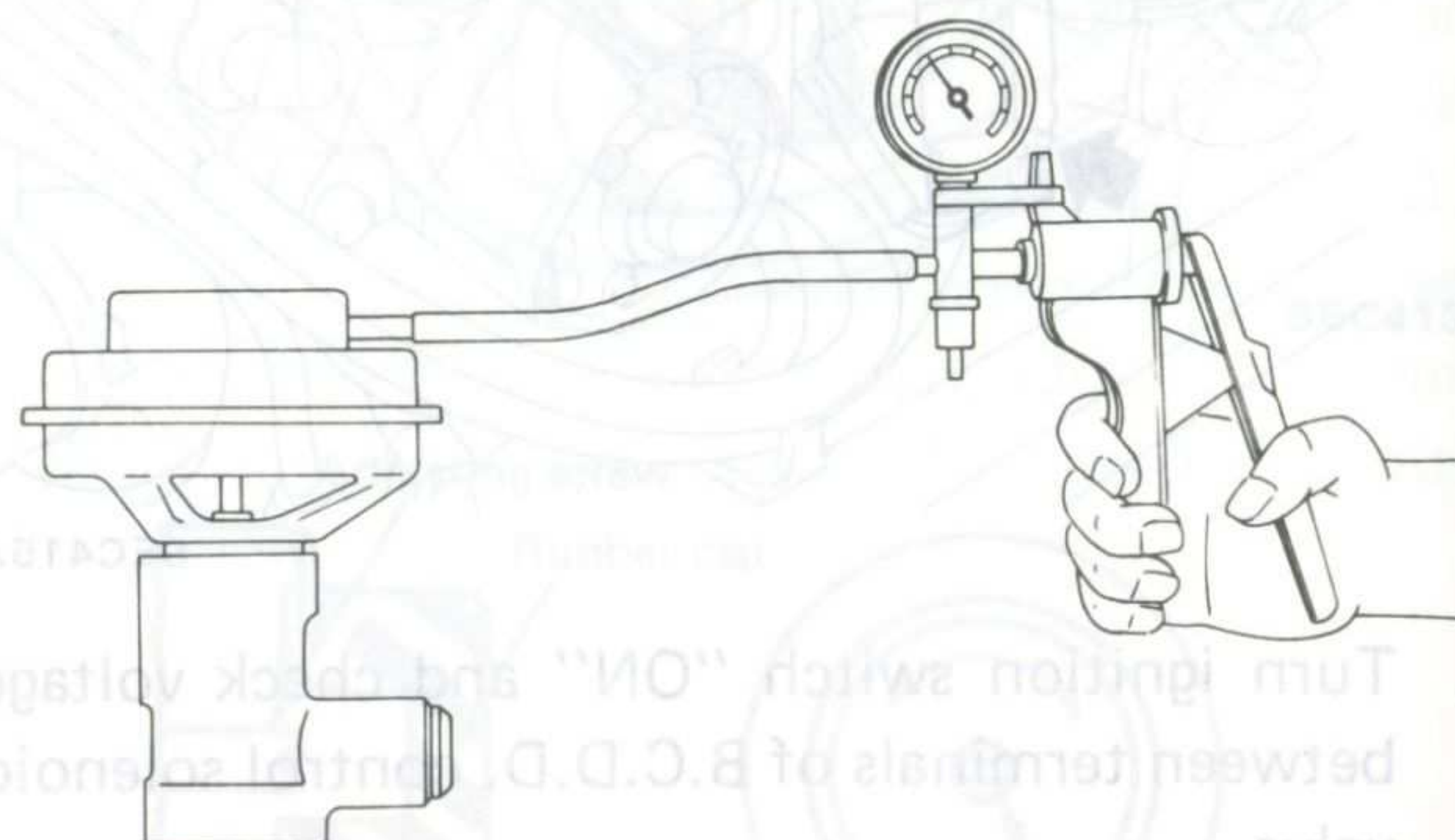
Make sure that E.G.R. control valve operates when engine speed is increased from idling to approximately 3,000 rpm.

- 3) If E.G.R. control valve does not operate, check E.G.R. control valve and E.G.R. control solenoid valve.

E.G.R. control valve

1. Apply a vacuum of -13.3 to -14.7 kPa (-133 to -147 mbar, -100 to -110 mmHg, -3.94 to -4.33 inHg) to E.G.R. control valve. The valve is approximately fully open.

-13.3 to -14.7 kPa (-133 to -147 mbar,
 -100 to -110 mmHg, -3.94 to -4.33 inHg)



2. Visually inspect E.G.R. control valve for sign of damage, wrinkle or otherwise deformation.

E.G.R. control solenoid valve

Follow the procedure in ELECTRONIC CONTROL SYSTEM INSPECTION (Page EF-51).

EXHAUST EMISSION CONTROL SYSTEM

Exhaust Air Induction (E.A.I.) System

DESCRIPTION

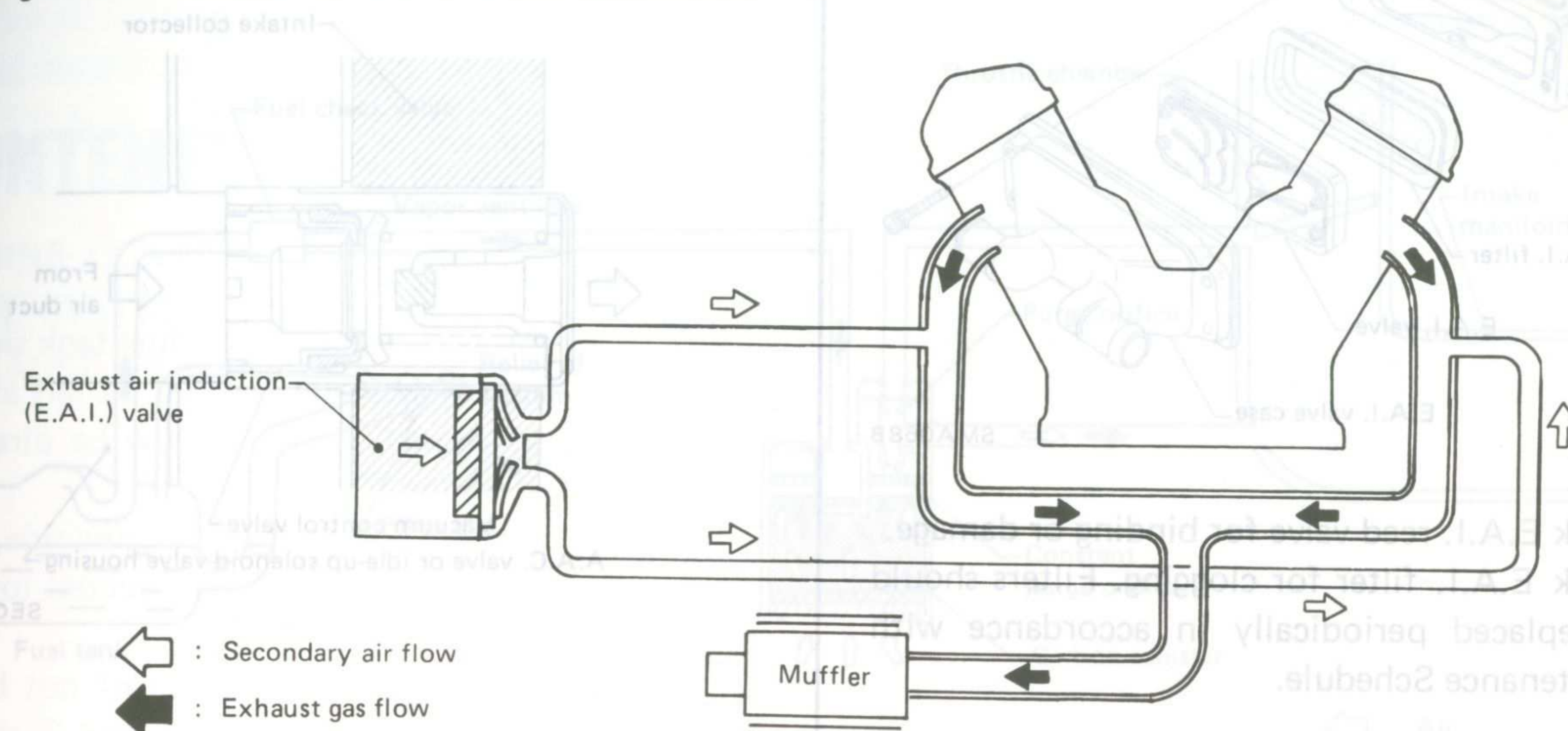
The exhaust air induction system is designed to send secondary air to the exhaust manifold, utilizing a vacuum caused by exhaust pulsation in the exhaust manifold.

The exhaust pressure in the exhaust manifold usually pulsates in response to the opening and closing of the exhaust valve and it decreases below

atmospheric pressure periodically.

If a secondary air intake pipe is opened to the atmosphere under vacuum conditions, secondary air can be drawn into the exhaust manifold in proportion to the vacuum.

Therefore, the air induction system reduces CO and HC emissions in exhaust gases.

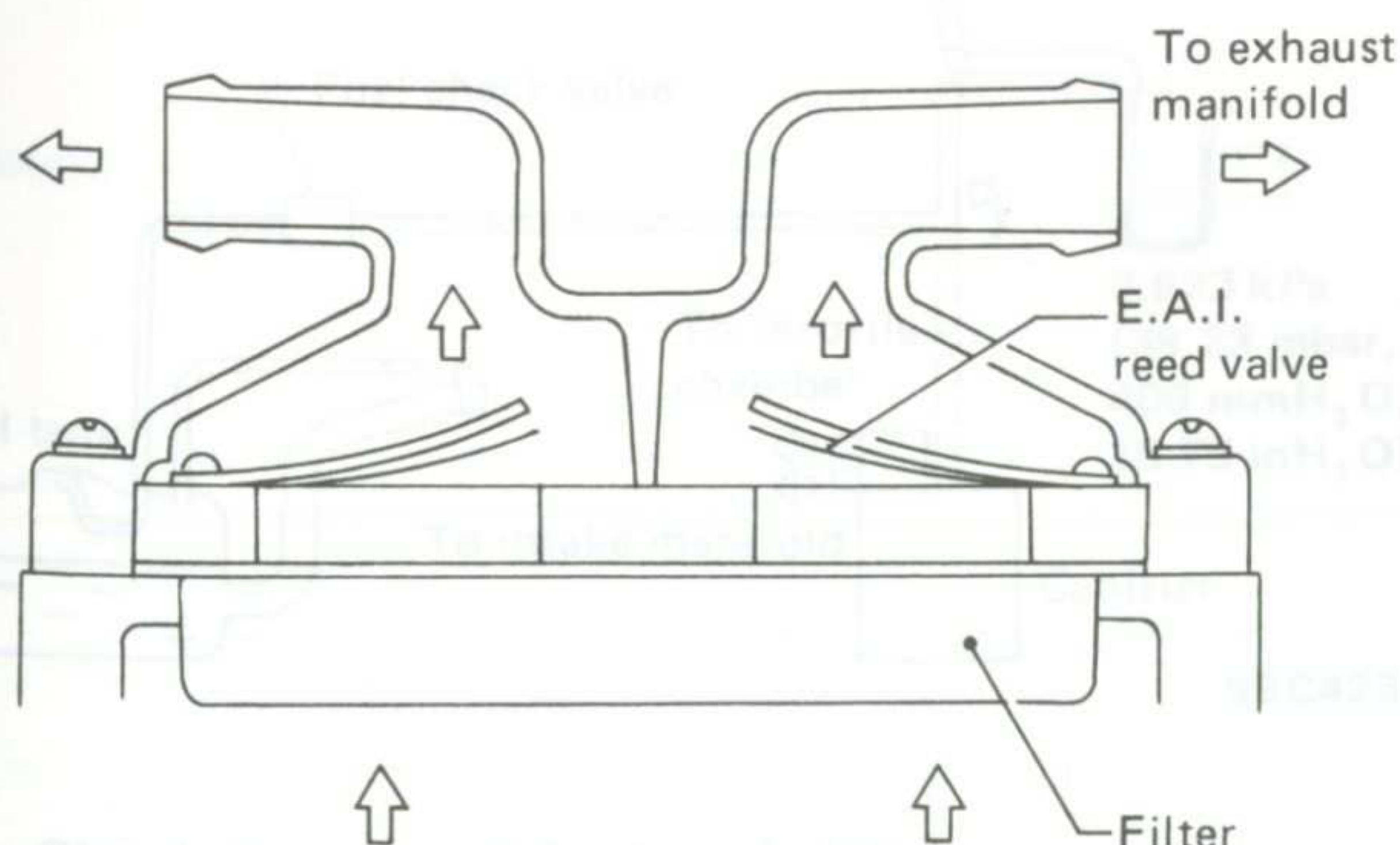


SEC439A

Air induction valve

When the exhaust pressure is below atmospheric pressure (negative pressure), secondary air is sent to the exhaust manifold.

When the exhaust pressure is above atmospheric pressure, the reed valves prevent secondary air from being sent back to the air cleaner.



SEC440A

Air induction valve filter

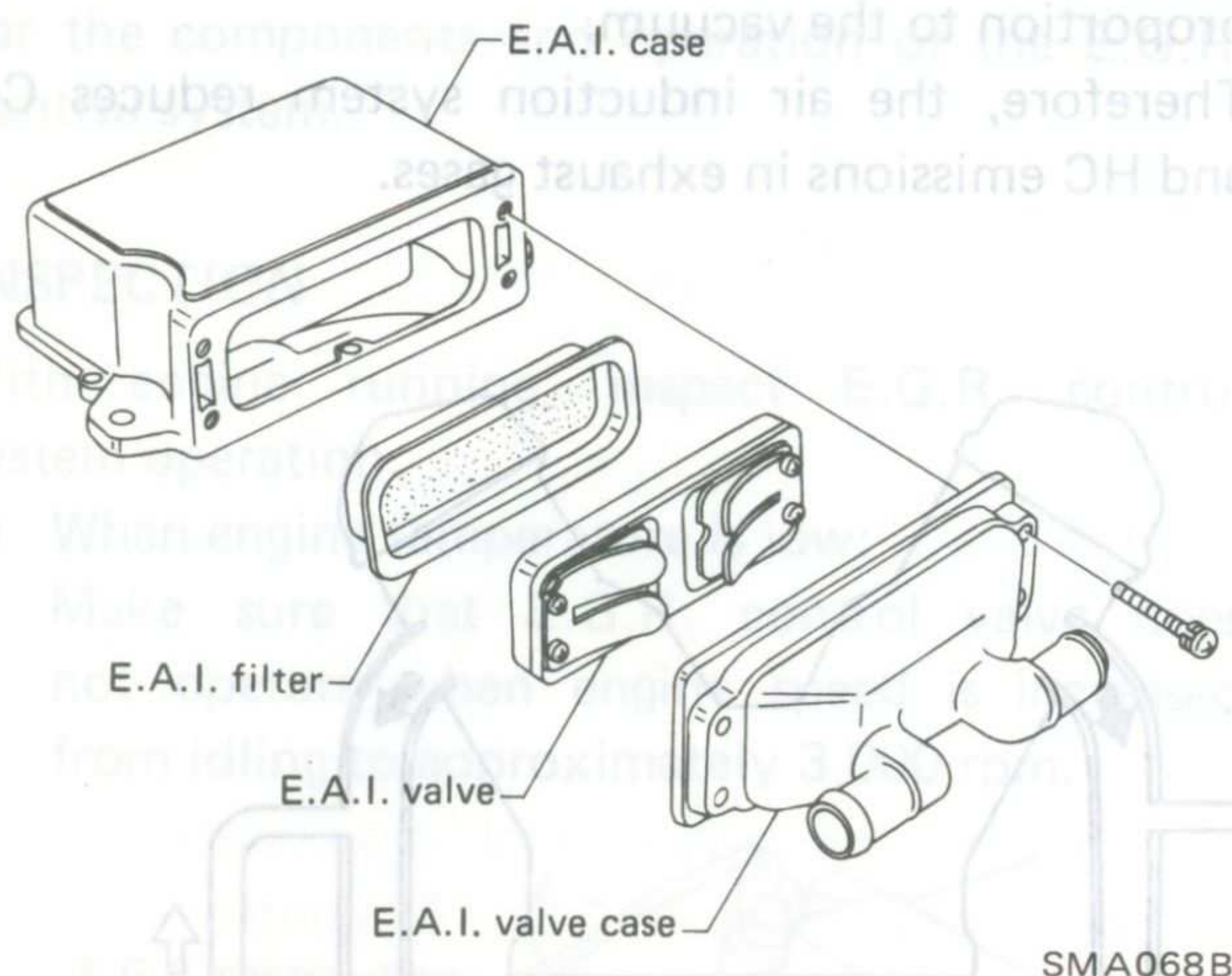
The air induction valve filter is installed in the E.A.I. case. It cleans secondary air to be sent to the exhaust manifold.

EXHAUST EMISSION CONTROL SYSTEM

Exhaust Air Induction (E.A.I.) System (Cont'd)

INSPECTION

1. Remove air induction valve and filter from E.A.I. case.

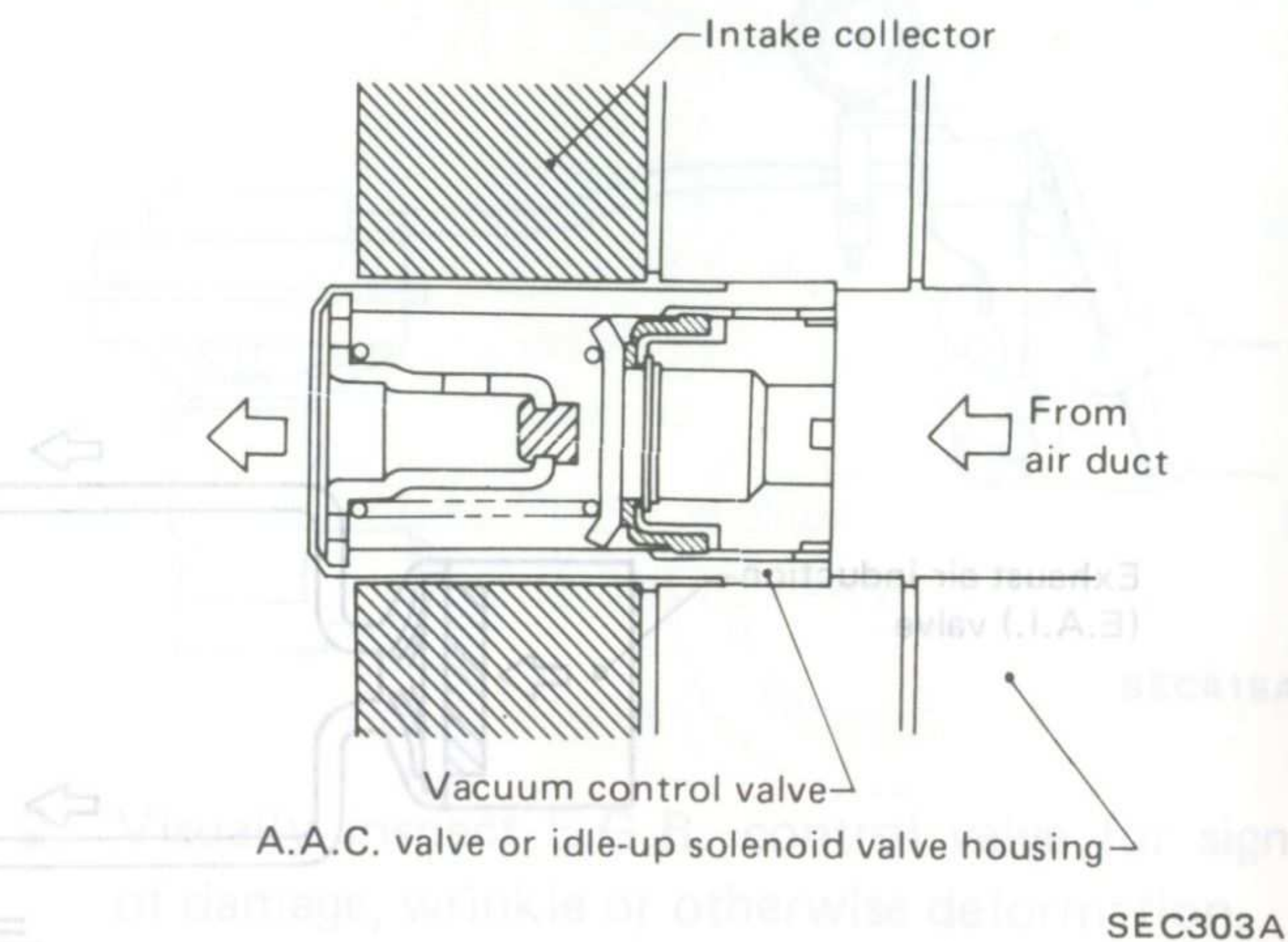


2. Check E.A.I. reed valve for binding or damage.
3. Check E.A.I. filter for clogging. Filters should be replaced periodically in accordance with Maintenance Schedule.

Intake Manifold Vacuum Control

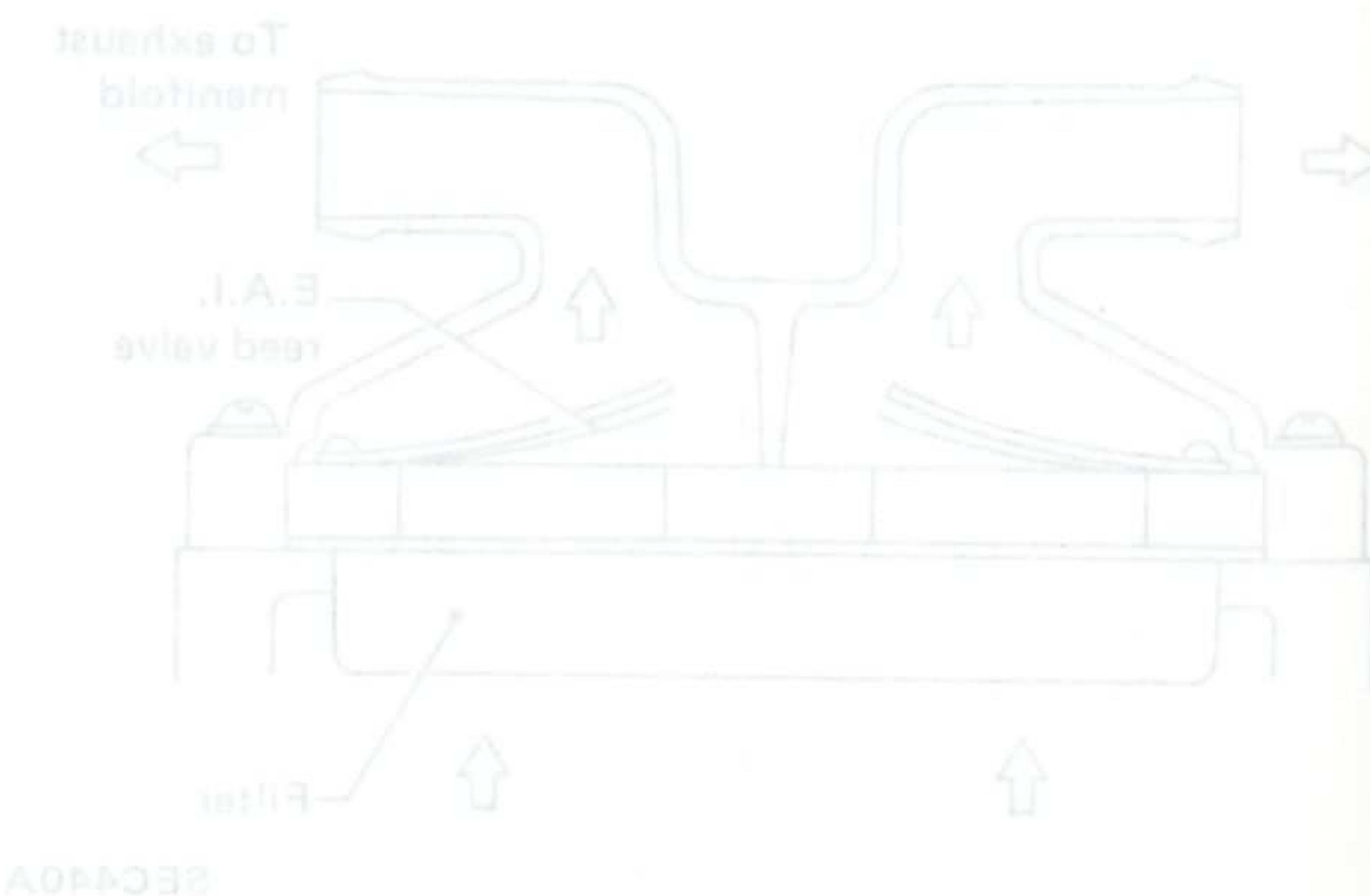
The vacuum control valve is provided to reduce the engine lubricating oil consumption when the intake manifold vacuum increases to a very high level during deceleration.

The vacuum control valve senses the manifold vacuum. As the manifold vacuum increases beyond the specified value, the valve opens and air is sucked into the intake manifold.



Follow the procedure in ELECTRONIC CONTROL SYSTEM INSPECTION (Page EF-51).

When the exhaust pressure is below atmospheric pressure (negative pressure), secondary air is sent to the exhaust manifold. When the exhaust pressure is above atmospheric pressure, the reed valves prevent secondary air from being sent back to the air cleaner.



EVAPORATIVE EMISSION CONTROL SYSTEM

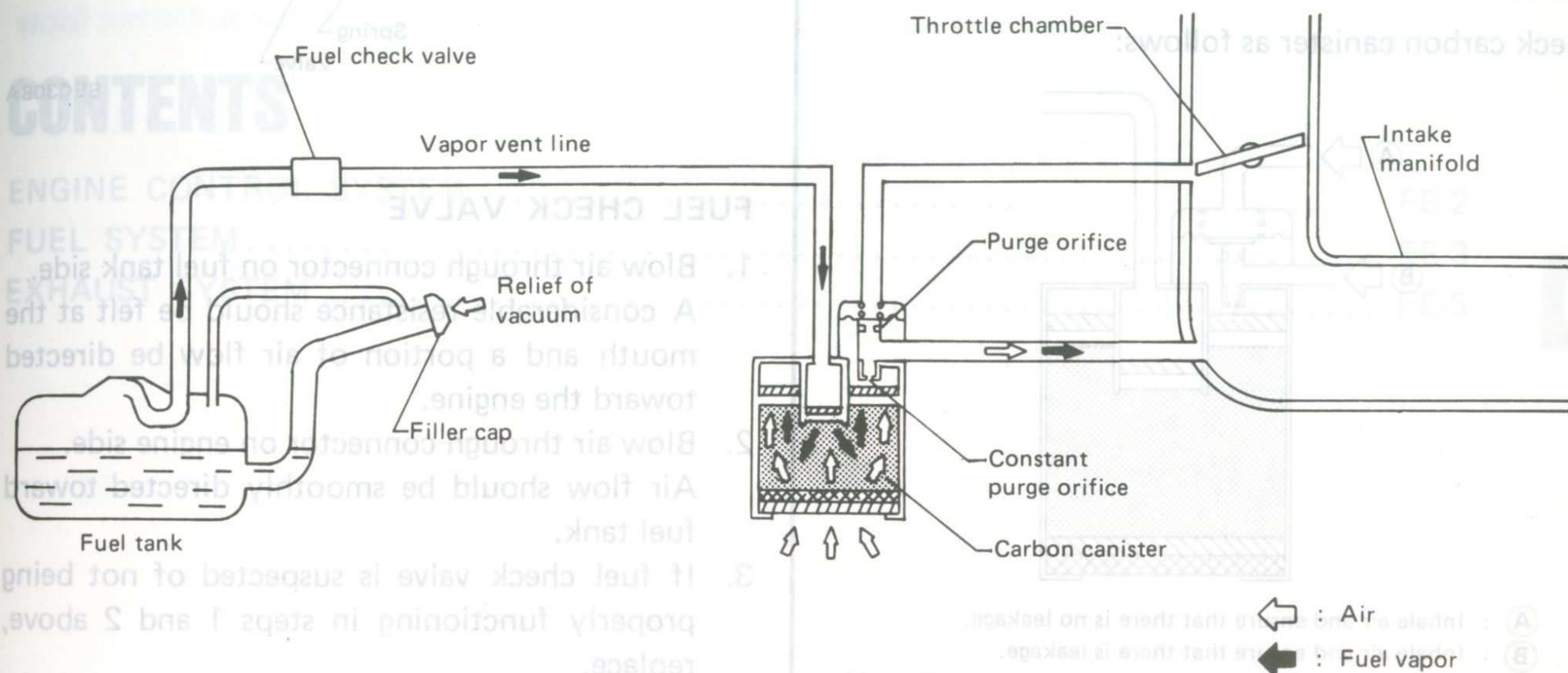
Operation

The fuel vapor from the sealed fuel tank is led into the canister which contains activated carbon and the vapor is stored there when the engine is not running.

The canister retains the fuel vapor until the canister is purged by the air drawn through the purge line to the intake manifold when the engine is running. When the engine runs at idle, the purge

control valve is closed.

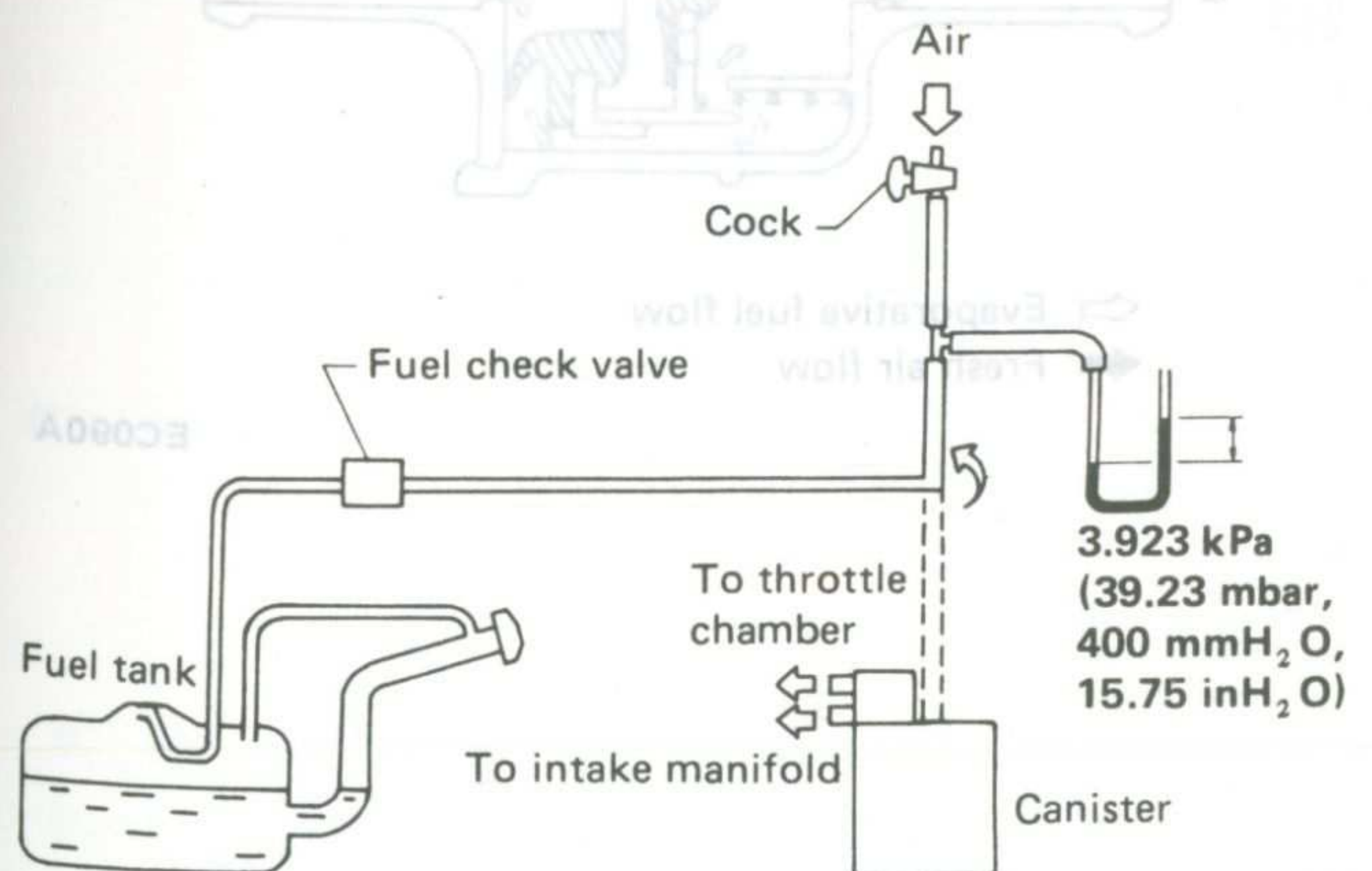
Only a small amount of purge air flows into the intake manifold through the constant purge orifice. As the engine speed increases, and the throttle vacuum rises higher, the purge control valve opens and the vapor is sucked into the intake manifold through both the fixed orifice and the constant purge orifice.



SEC422A

Inspection

VAPOR VENT LINE



SEC423A

1. Check hoses and fuel tank filler cap.
2. Disconnect the vapor vent line connecting carbon canister to fuel tank.

3. Connect a 3-way connector, a manometer and a cock (or an equivalent 3-way charge cock) to the end of the vent line.
4. Supply fresh air into the vapor vent line through the cock little by little until pressure becomes 3.923 kPa (39.23 mbar, 400 mmH₂O, 15.75 inH₂O).
5. Shut the cock completely and leave it unattended.
6. After 2.5 minutes, measure the height of the liquid in the manometer.
7. Variation in height should remain at 0.245 kPa (2.45 mbar, 25 mmH₂O, 0.98 inH₂O).
8. When filler cap does not close completely, the height should drop to zero in a short time.

EVAPORATIVE EMISSION CONTROL SYSTEM

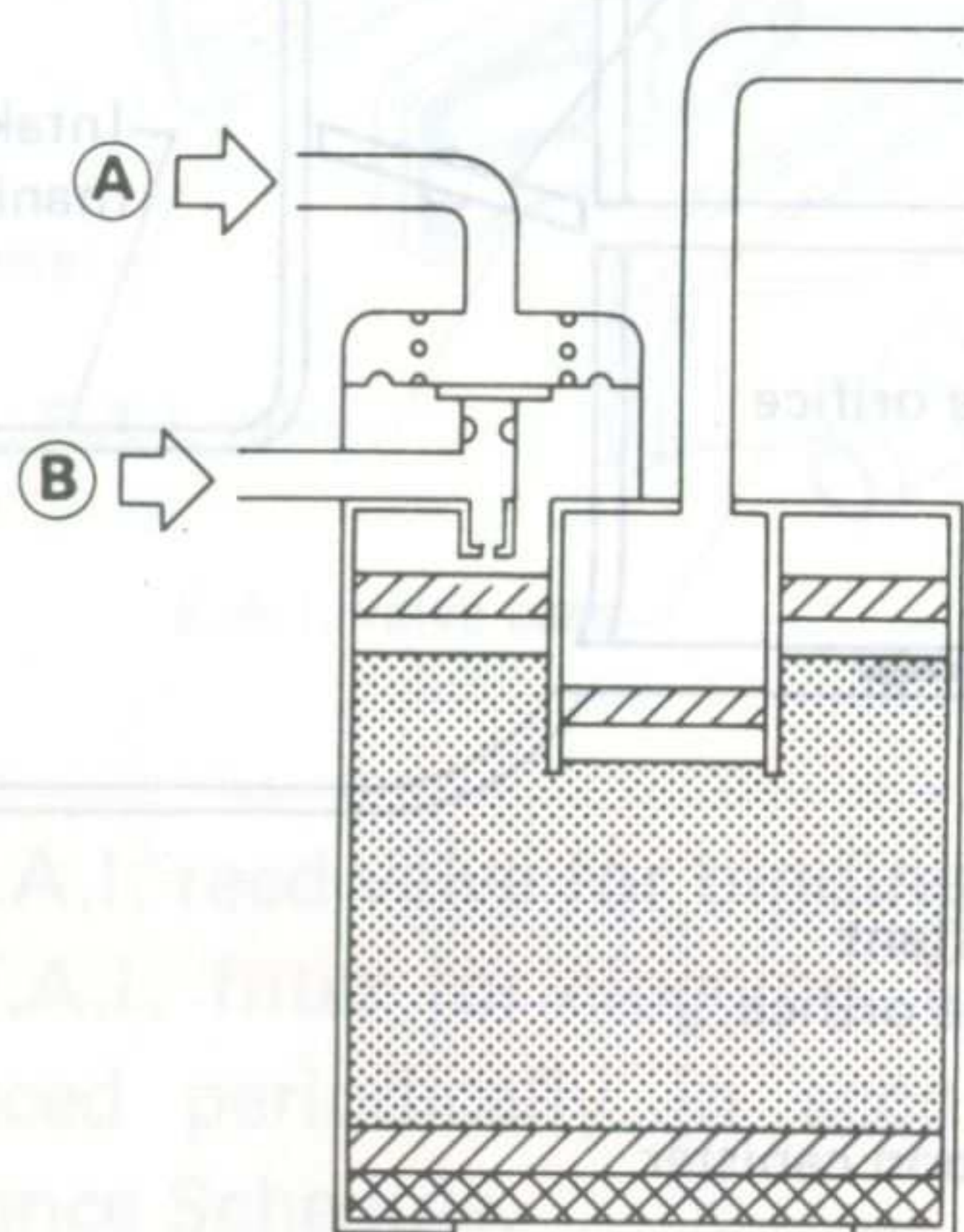
Inspection (Cont'd)

9. If the height does not drop to zero in a short time when filler cap is removed, the cause is a stuffy hose.

In case the vent line is stuffy the breathing in fuel tank is not thoroughly made thus causing insufficient deliver of fuel to engine or vapor lock. It must, therefore, be repaired or replaced.

CARBON CANISTER

Check carbon canister as follows:



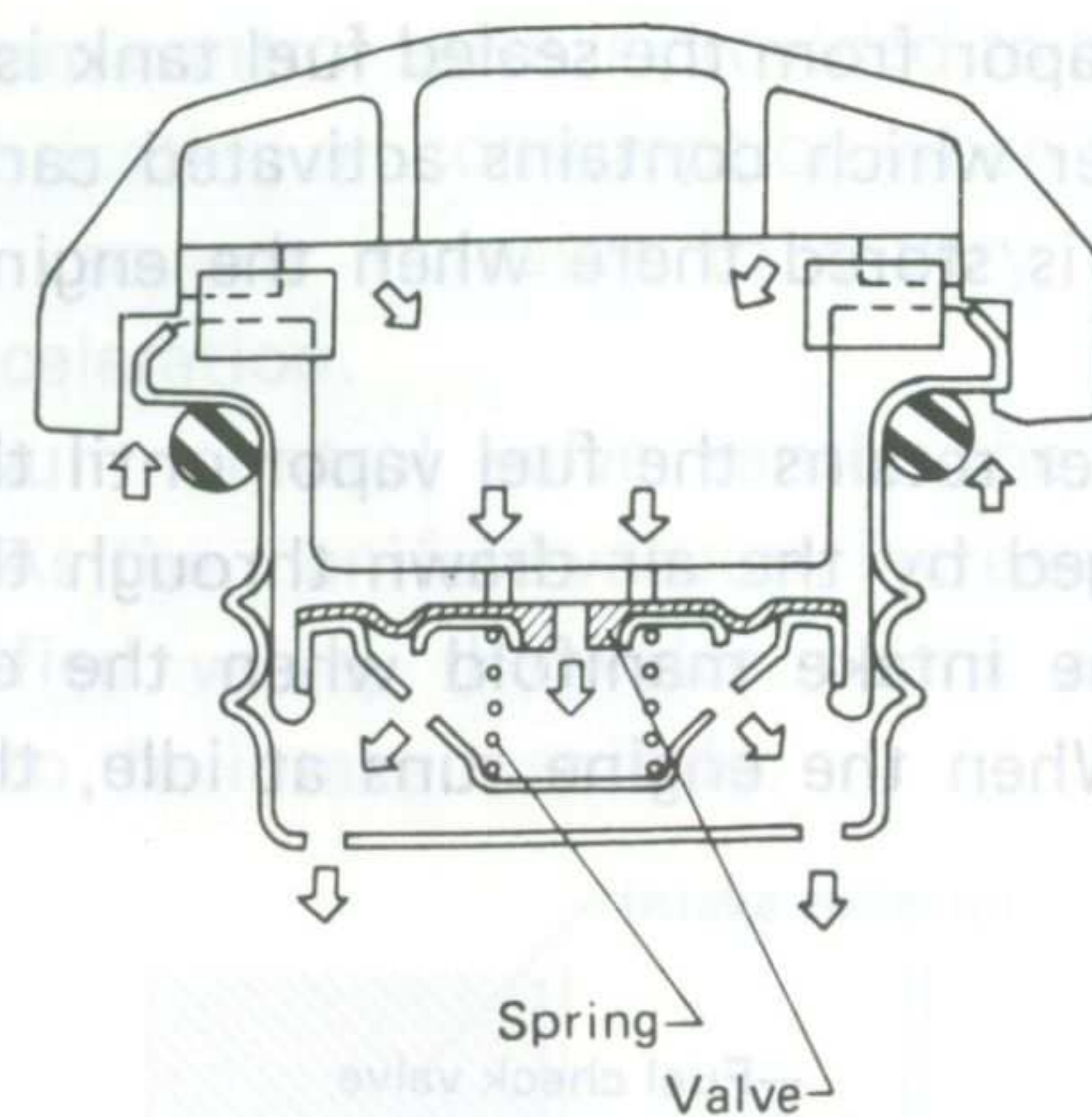
- (A) : Inhale air and ensure that there is no leakage.
- (B) : Inhale air and ensure that there is leakage.

SEC424A

If malfunctioning, replace faulty part.

FUEL TANK VACUUM RELIEF VALVE

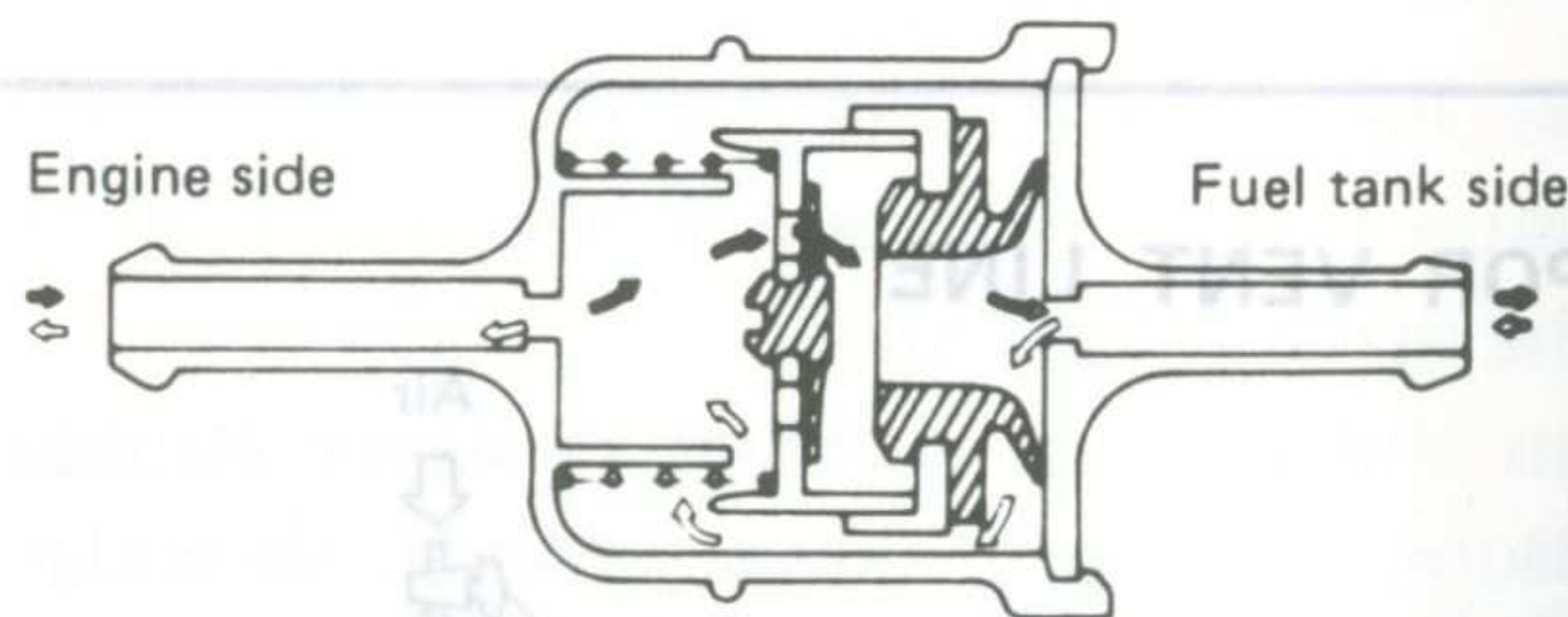
1. Wipe clean valve housing and have it in your mouth.
2. Inhale air. A slight resistance accompanied by valve indicates that valve is in good mechanical condition. Note also that, by further inhaling air, the resistance should be disappeared with valve clicks.
3. If valve is clogged, or if no resistance is felt, replace cap as an assembled unit.



SEC308A

FUEL CHECK VALVE

1. Blow air through connector on fuel tank side. A considerable resistance should be felt at the mouth and a portion of air flow be directed toward the engine.
2. Blow air through connector on engine side. Air flow should be smoothly directed toward fuel tank.
3. If fuel check valve is suspected of not being properly functioning in steps 1 and 2 above, replace.



- ↔ Evaporative fuel flow
- Fresh air flow

EC090A