

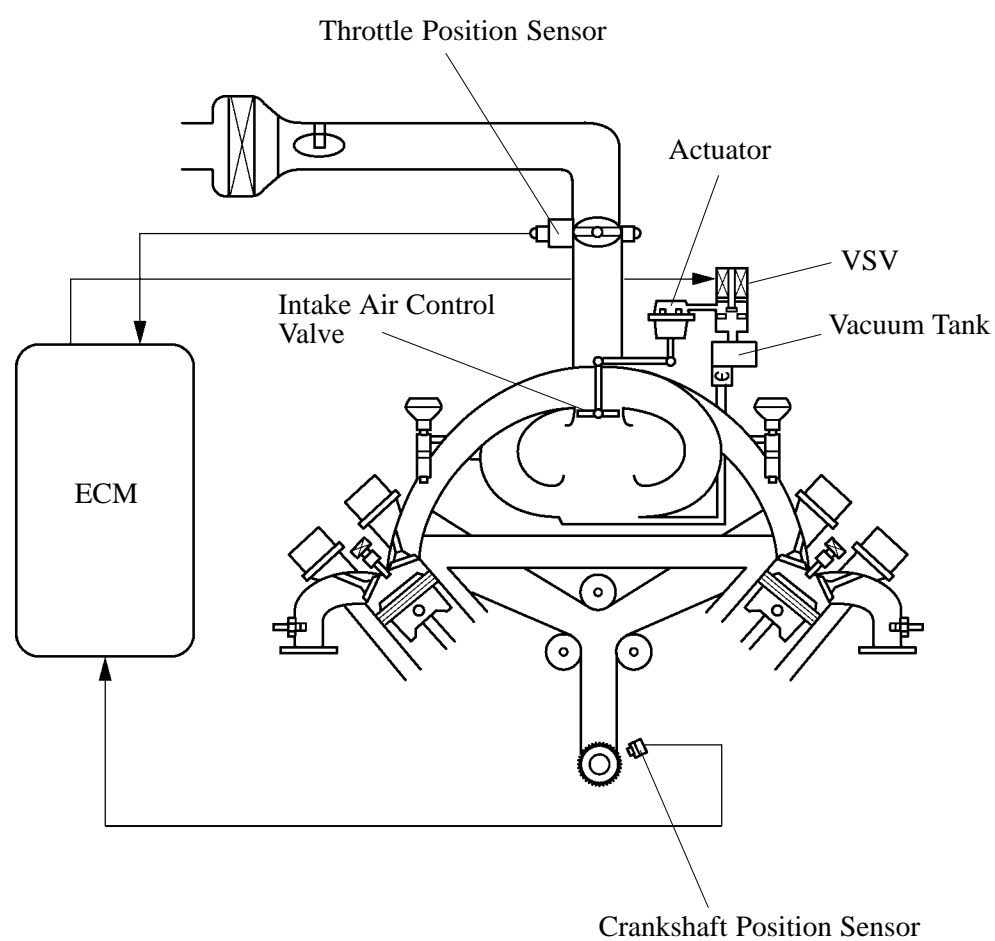
ACIS (Acoustic Control Induction System)

1) General

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The ACIS (Acoustic Control Induction System) is realized by using a bulkhead to divide the intake manifold into 2 stages, with an intake air control valve in the bulkhead being opened and closed to vary the effective length of the intake manifold in accordance with the engine speed and throttle valve opening angle. This increases the power output in all ranges from low to high speed.

► System Diagram ◀

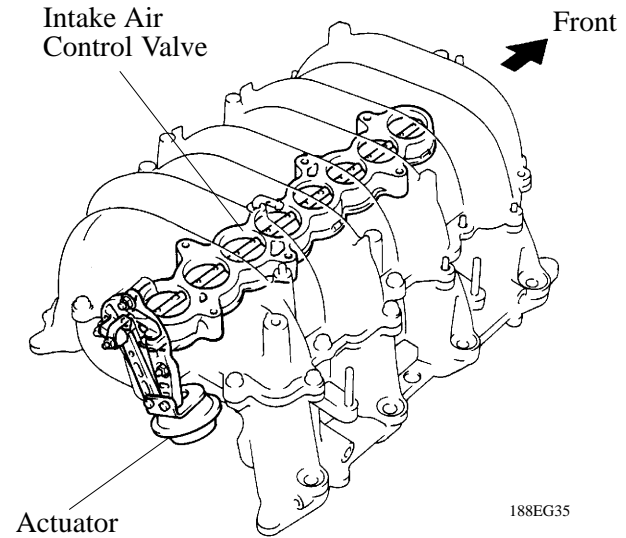


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2) Construction

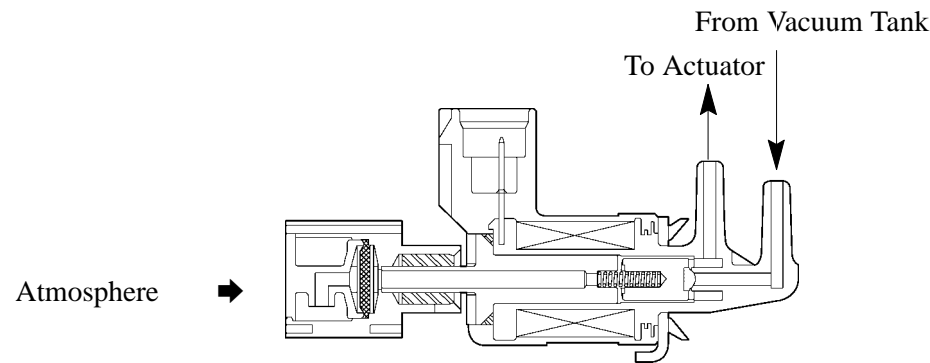
a. Intake Air Control Valve

The intake air control valve, which is provided in the middle of the intake manifold in the intake air chamber, opens and closes to change the effective length of the intake manifold in two stages.



b. VSV (Vacuum Switching Valve)

Controls the vacuum that is applied to the actuator by way of the signal (ACIS) that is output by the engine ECU.



c. Vacuum Tank

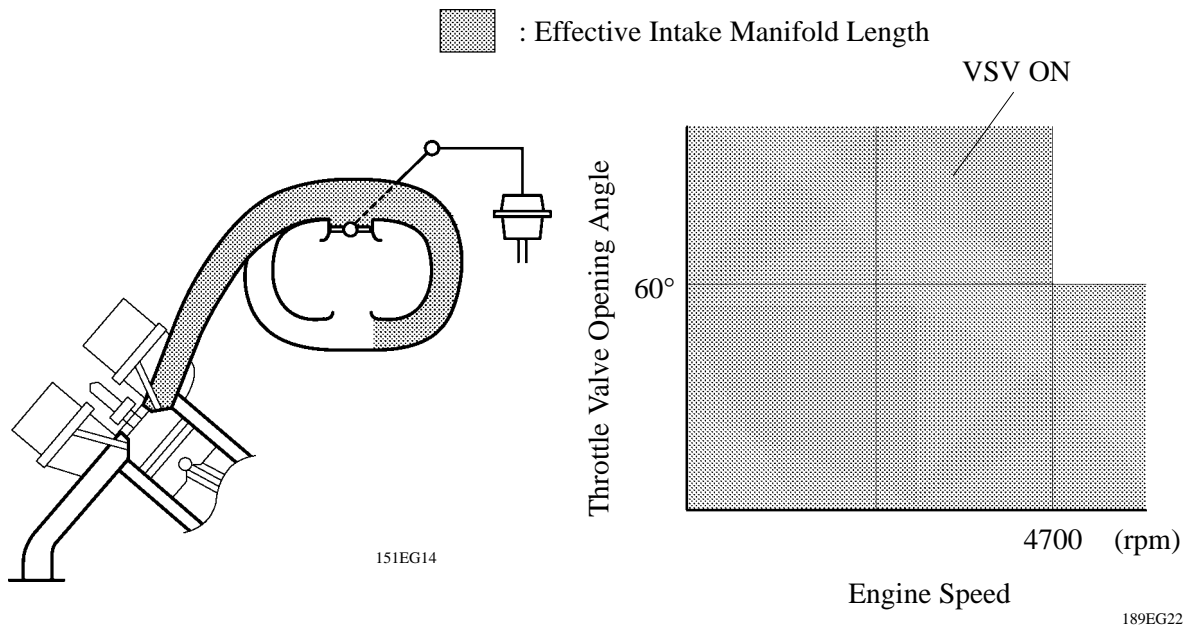
Equipped with an internal check valve, the vacuum tank stores the vacuum that is applied to the actuator in order to maintain the intake air control valve fully closed even during low-vacuum conditions.

3) Operation

a. When the Intake Control Valve Closes (VSV ON)

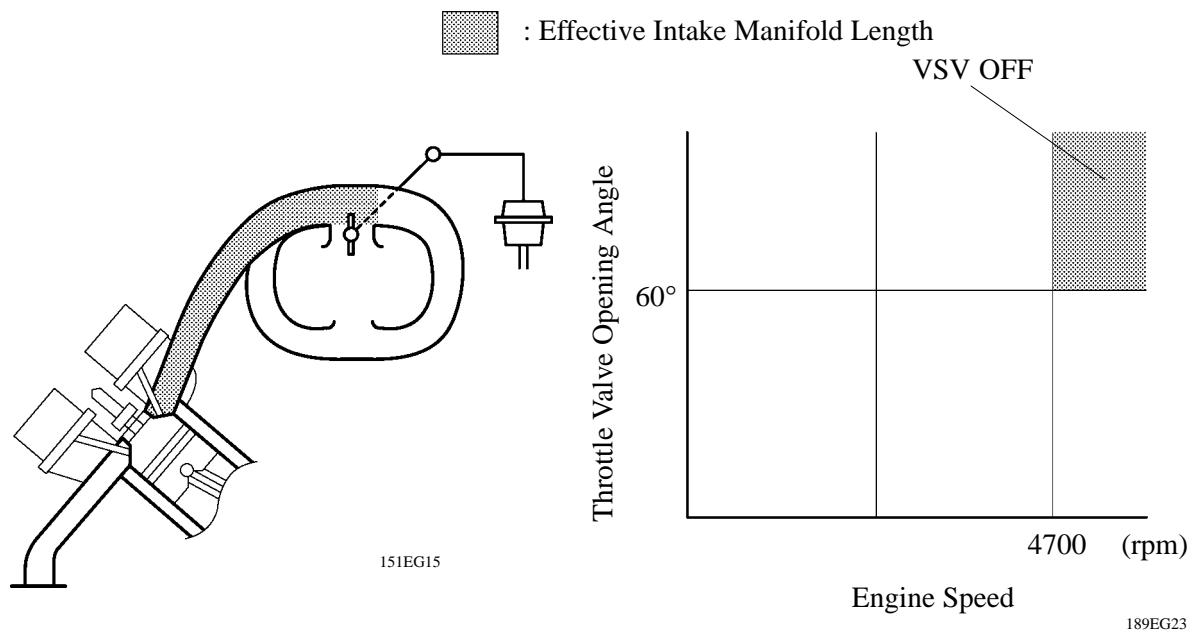
The ECM activates the VSV to match the longer pulsation cycle so that the negative pressure acts on the diaphragm chamber of the actuator. This closes the control valve. As a result, the effective length of the intake manifold is lengthened and the intake efficiency in the low-to-medium speed range is improved due to the dynamic effect of the intake air, thereby increasing the power output.

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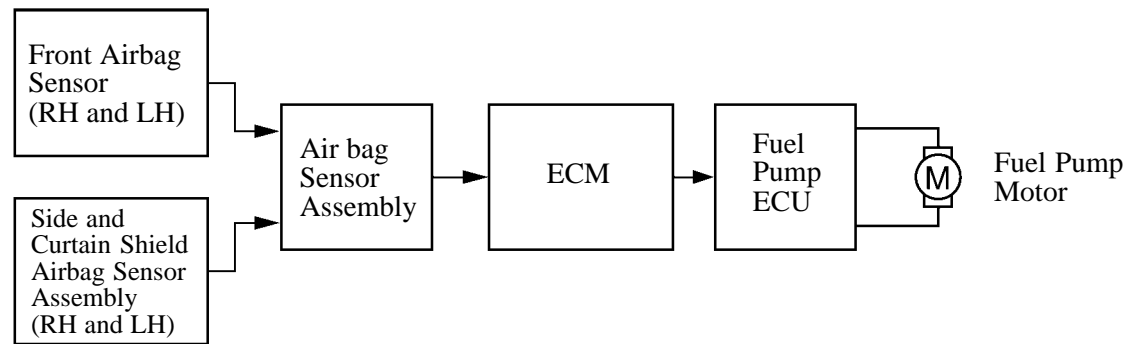
b. When the Intake Control Valve Open (VSV OFF)

The ECM deactivates the VSV to match the shorter pulsation cycle so that atmospheric air is led into the diaphragm chamber of the actuator and opens the control valve. When the control valve is open, the effective length of the intake air chamber is shortened and peak intake efficiency is shifted to the high engine speed range, thus providing greater output at high engine speeds.



Fuel Pump Control

A fuel cut control is adopted to stop the fuel pump when the airbag is deployed at the front or side collision. In this system, when the ECM detects the airbag deployment signal from the airbag sensor assembly, it actuates the fuel pump ECU to stop the operation of the fuel pump motor. After the fuel cut control has been activated, turning the ignition switch from OFF to ON cancels the fuel cut control, thus engine can be restarted.



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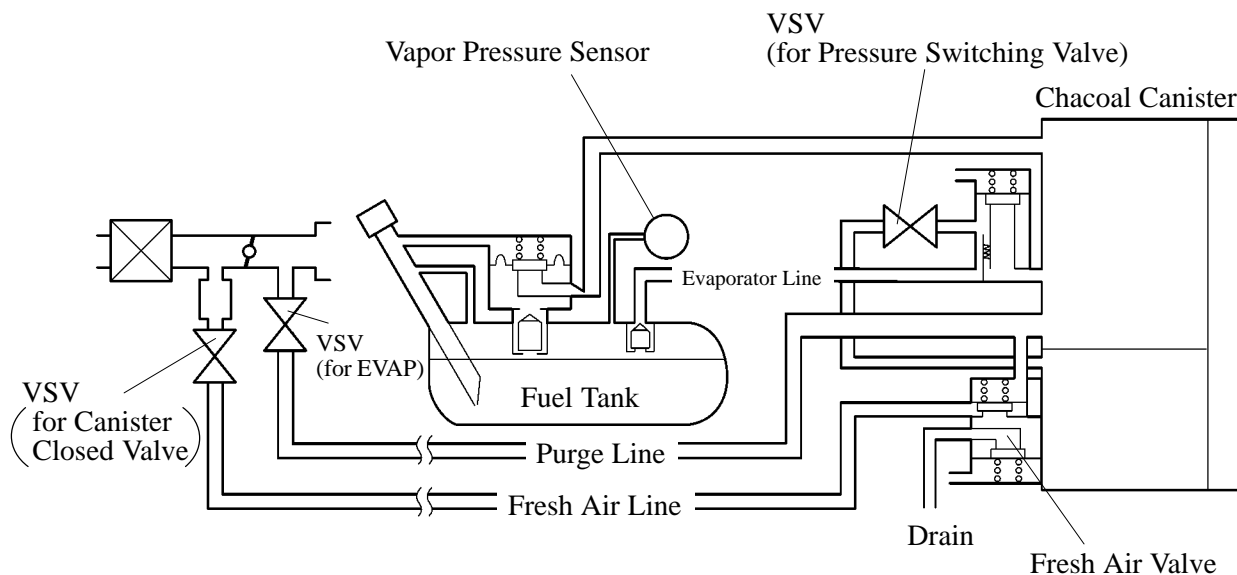
Evaporative Emission Control System

1) General

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A vacuum system has been adopted to detect leaks in the evaporative emission control system. This vacuum system detects leaks by forcefully introducing the purge vacuum into the entire system and monitoring the changes in the pressure. It consists of the following main components:

- A VSV (for canister closed valve) that closes the fresh air line from the air cleaner to the charcoal canister has been adopted.
- A VSV (for pressure switching valve) that opens the evaporator line between the fuel tank and the charcoal canister has been adopted.
- Function to close the purge line from the air intake chamber to the charcoal canister for this system is added to the original functions of VSV (for EVAP).
- A vapor pressure sensor that measures the pressure in the fuel tank while checking for evaporative emission leaks and sends signals to the ECM has been adopted.



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2) Operation

Initially, when the VSV (for canister closed valve) is closed, and the VSV (for pressure switching valve) and the VSV (for EVAP) are opened, a vacuum is applied to the purge line from the air intake to the charcoal canister and to the evaporator line from the charcoal canister to the fuel tank. Next, the VSV (for EVAP) is closed in order to maintain a vacuum from the VSV (for EVAP) to the inside of the fuel tank. Then, any subsequent changes in the pressure are monitored by the vapor pressure sensor in order to check for evaporative emission leaks.

If a leak is detected, the malfunction indicator lamp (MIL) illuminates to inform the driver. Also, the diagnostic trouble code (DTC) can be accessed through the use of a LEXUS hand-held tester. For details on the DTCs, refer to the 2001 GS430/300 Repair Manual (Pub. No. RM791U).