GROUP 17

ENGINE AND EMISSION CONTROL

CONTENTS

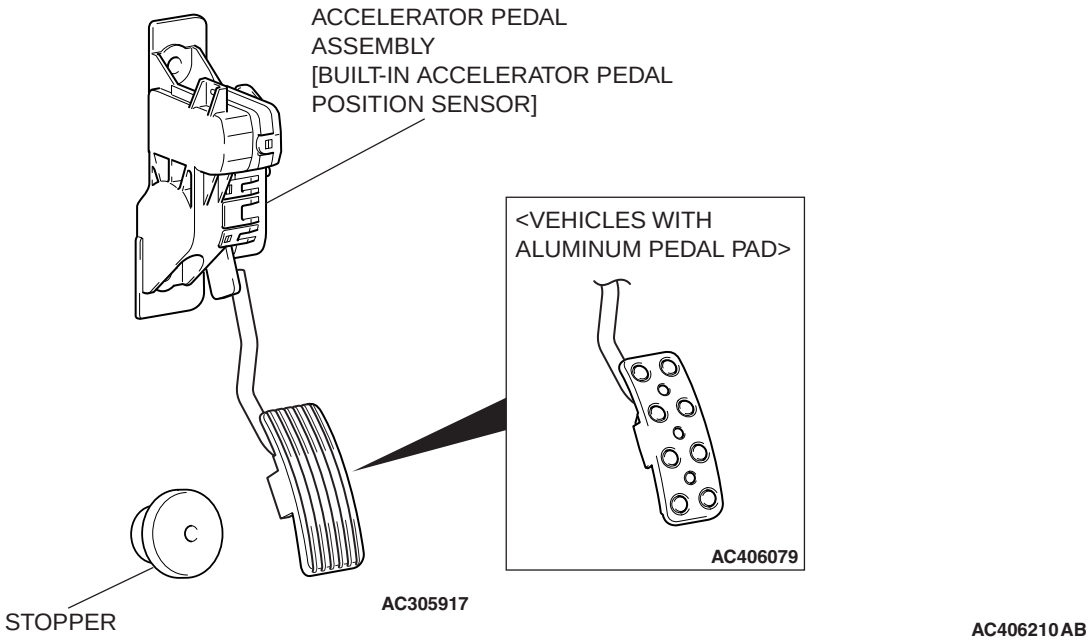
ACCELERATOR SYSTEM

GENERAL DESCRIPTION

M2170001000358

An electronic throttle valve control system detects the amount of pressure applied to the accelerator pedal by using an accelerator pedal-position sensor in the accelerator pedal assembly for electronic control of the throttle valve angle.

CONSTRUCTION DIAGRAM



AUTO-CRUISE CONTROL SYSTEM

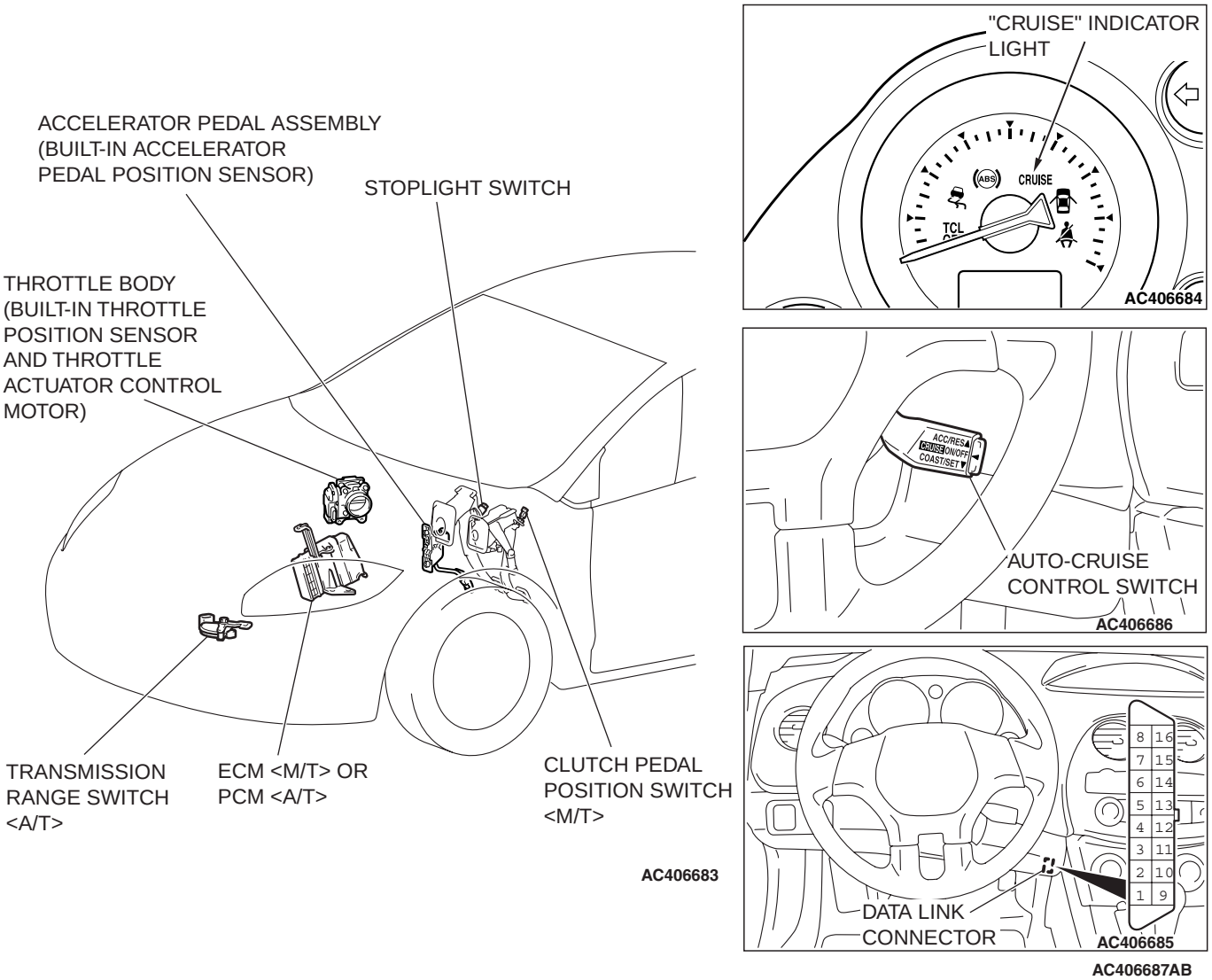
GENERAL DESCRIPTION

M2170001000369

By using the auto-cruise control system, the driver can drive at preferred speeds in a range of approximately 40 to 200 km/h (25 to 124 mph) without depressing the accelerator pedal.

For this auto-cruise control system, in conjunction with the electronic throttle valve control system, the engine control module (ECM) <M/T> or powertrain control module (PCM) <A/T> electronically controls the throttle valve.

CONSTRUCTION DIAGRAM



COMPONENTS AND FUNCTIONS

COMPONENT		FUNCTION
Accelerator pedal position sensor		Informs the ECM <M/T> or PCM <A/T> of the accelerator pedal depression.
Auto-cruise control switch	"CRUISE" (MAIN) switch	Power switch for auto-cruise control system.
	"ACC/RES" switch	Vehicle speed is set with the "ACC/RES" switch and "COAST/SET" switch.
	"COAST/SET" switch	
	"CANCEL" switch	Cancels the cruise speed setting.
Cancel system	Stoplight switch	Sends a signal to cancel auto-cruise control system.
	Clutch pedal position switch <M/T>	
	Transmission range switch <A/T>	
"CRUISE" indicator light		The light is included in the combination meter and illuminates when the "CRUISE" (MAIN) switch is in the "ON" position.
Data link connector		If the MUT-III scan tool is connected, the diagnostic trouble code and service data output from the ECM <M/T> or PCM <A/T> can be read.
ECM <M/T> or PCM <A/T>		• Judges how the auto-cruise control system is operating by using input signals from the auto-cruise control system and the cancel system, and sends the throttle valve opening angle signal to the throttle actuator control motor. • The diagnostic trouble code and service data output are sent to the data link connector. • When the "CRUISE" (MAIN) switch "ON" signal is entered, a signal is sent to illuminate the "CRUISE" indicator light.
Throttle actuator control motor		The throttle valve opens and closes in response to the throttle angle control signal from the ECM <M/T> or PCM <A/T>.
Throttle position sensor		Informs the ECM <M/T> or PCM <A/T> of the throttle valve opening angle.
Vehicle speed sensor <M/T>		Output pulse signals which are directly proportional to the vehicle speed (the speed of the transaxle output gear) to the ECM.

CONSTRUCTION AND OPERATION

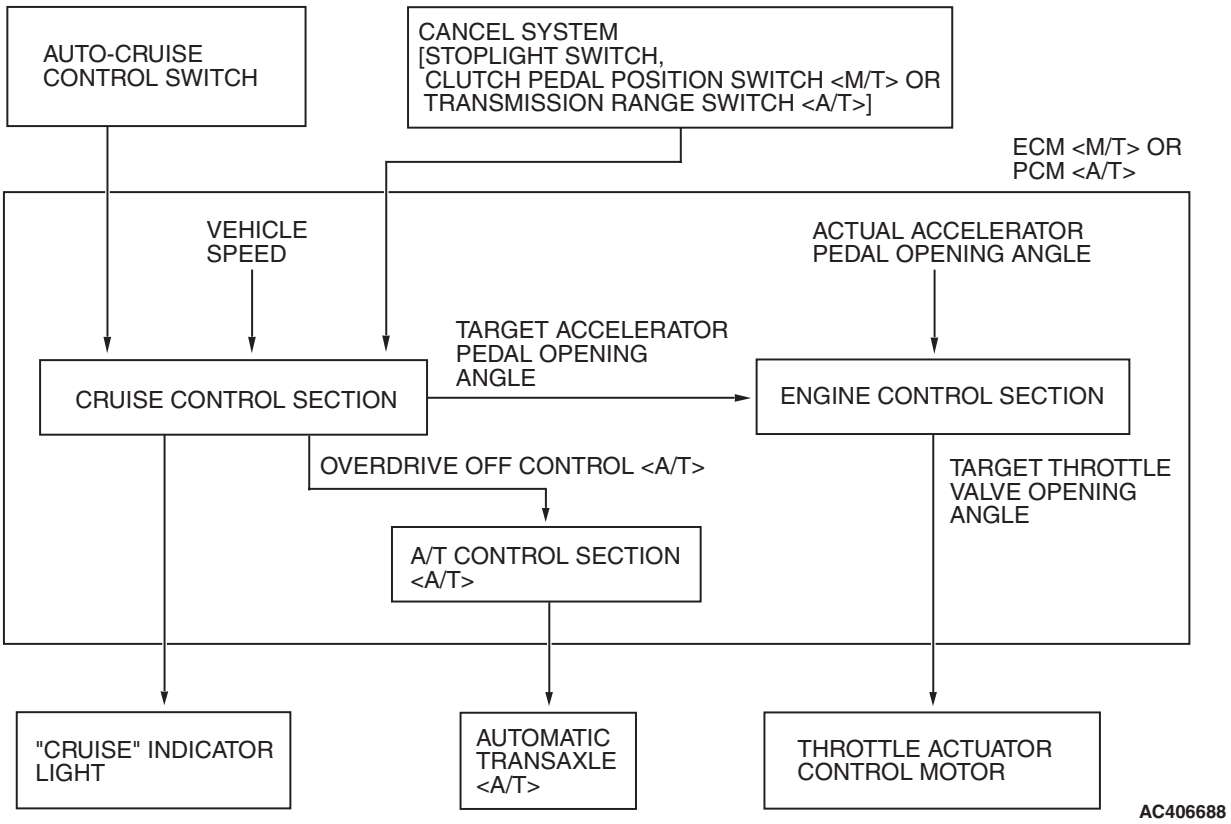
M2170002000083

SYSTEM OUTLINE

The ECM <M/T> or PCM <A/T> calculates the auto-cruise control system operation status when the control section of the auto-cruise control system inside the ECM <M/T> or PCM <A/T> receives the input signals of the auto-cruise control switch, vehicle speed, and cancel system [stoplight switch and clutch pedal position switch <M/T> or transmission range switch <A/T>]. To the engine control section it sends the target accelerator angle value for auto-cruise control system, to the A/T control section it issues a command to cancel OD <A/T>, and to the gauge it issues an ON/OFF command for the "CRUISE" indicator light.

In the engine control section, the target throttle angle value is calculated from the target acceleration value for auto-cruise control system and the actual accelerator angle value, and the vehicle speed is controlled by applying the throttle actuator control motor.

BLOCK DIAGRAM



SYSTEM FUNCTIONS

"COAST/SET" SWITCH FUNCTION

SET

The vehicle speed at the moment the "COAST/SET" switch was switched from OFF to ON while driving within the limited vehicle speed range is memorized as the "set vehicle speed" and thereafter the throttle actuator control motor is controlled so that during auto-cruise control system driving at that speed is possible.
However, if the vehicle speed is set at 200 km/h (124 mph) or higher, the speed of 200 km/h (124 mph) is saved as the vehicle speed, but if the vehicle speed is set above 205 km/h (127 mph), it is not possible to set the specified speed.

COAST

While the "COAST/SET" switch is held ON during auto-cruise control system driving, the vehicle keeps decelerating. If the "COAST/SET" switch is turned OFF before the vehicle speed decreases to 40 km/h (25 mph), the vehicle runs at the fixed speed at the moment the switch is turned OFF. If the "COAST/SET" switch is turned OFF after the vehicle speed decreases to less than 40 km/h (25 mph), the auto-cruise control system is cancelled.
However if the "COAST/SET" switch has been ON for 0.5 second or less, a tap-down operation is performed [decelerating from the current speed by 1.6 km/h (1 mph)]; at over 0.5 second, continuous deceleration is performed.

"ACC/RES" SWITCH FUNCTION

RESUME

When fixed speed driving is cancelled by the conditions given in "CANCEL FUNCTION," switching the "ACC/RES" switch from OFF to ON while driving at a speed higher than the set speed causes the vehicle to be driven at a fixed speed which is the speed memorized just before canceling.

ACCELERATING
While the "ACC/RES" switch is ON during auto-cruise control system driving, the vehicle keepS accelerating. The vehicle speed at the moment the switch is turned OFF is then memorized and the vehicle remains this fixed speed. When the "ACC/RES" switch is ON, the vehicle may accelerate to speeds above the 200 km/h (124 mph) but after the "ACC/RES" switch is turned OFF, the vehicle will remain at this 200 km/h (124 mph).
However, if the "ACC/RES" switch has been ON for 0.5 second or less, a tap-up operation is performed [accelerating from the current speed by 1.6 km/h (1 mph)]. If on for 0.5 second, acceleration is performed continuously.

OVERDRIVE-CANCEL FUNCTION <A/T>
The actual vehicle speed decreases to (or below) the memorized speed, during fixed speed driving, the overdrive is cancelled temporarily, the memorized speed is restored when driving conditions allow.
Overdrive is cancelled in the following case:
- The vehicle speed is less than 130 km/h (81 mph), and during, the auto-cruise control system cannot keep the vehicle speed at the fixed vehicle speed.

CANCEL FUNCTION
When any of the following conditions occur, the auto-cruise control system is cancelled.
- "CRUISE" (MAIN) switch "OFF"
- "CANCEL" switch ON
- Brake is applied. (stoplight switch ON and brake switch OFF
- Clutch is applied (clutch pedal position switch ON) <M/T>
- Transmission range switch in "N" position <A/T>
- Vehicle speed at the low-speed limit [about 40 km/h (25 mph)] or lower
- Vehicle speed is lower than memorized speed by 15 km/h (9 mph) or more
- Vehicle speed once increasing to memorized speed less than 10 km/h (6 mph) and then decreasing more than 15 km/h (9 mph) during resuming.
- Vehicle speed changing sharply
- Stoplight switch circuit (malfunction or short circuit)
- Brake switch circuit (malfunction or open circuit)
- Defective auto-cruise control switch input voltage
- Malfunction of the ECM <M/T> or PCM <A/T>

FAIL-SAFE FUNCTION
When any of the following conditions are met and do not activate auto-cruise control system, and if the requirements are met during auto-cruise control system, auto-cruise control system is cancelled instantly. At this time, after the regular state is restored, auto-cruise control system is possible again.
- "COAST/SET" switch or "ACC/RES" switch held ON for 60 seconds or more
- Fault in cancel state holding circuit
- Vehicle speed is 40 km/h (25 mph) or more, and vehicle speed signal fails to be input for 0.1 second or longer
- During fixed-speed driving, if the vehicle exceeds the set speed by 10 km/h (6 mph), the fixed-speed control is cancelled momentarily, then resumed after the vehicle speed exceeds the set speed by 7 km/h (4 mph) or less.

When any of the following conditions are met, until the ignition is switched OFF once, do not activate auto-cruise control system. If the requirements are met during auto-cruise control driving, auto-cruise control system is cancelled instantly.
- Defective ECM <M/T> or PCM <A/T>
- Defective throttle position sensor
- Defective accelerator pedal position sensor

SELF-DIAGNOSIS AND SERVICE DATA OUTPUT FUNCTIONS

SELF-DIAGNOSIS
When there is a cancellation of the auto-cruise control system operation not intentionally made by the driver, it is possible to determine the cause simply by reading the diagnostic trouble code.

DIAGNOSTIC TROUBLE CODE CHART

DIAGNOSTIC TROUBLE CODE	MAJOR CONTENT OF DIAGNOSIS
15	Defective auto-cruise control switch
22	Defective stoplight switch
23	Defective ECM <M/T> or PCM <A/T>

DIAGNOSTIC TROUBLE CODE INDICATION METHOD

The diagnostic trouble codes can be checked using the "CRUISE" indicator light and auto-cruise control switch. (Refer to Service Manual).

DIAGNOSTIC TROUBLE CODE CLEARING PROCEDURE

The diagnostic trouble codes can be cleared using the auto-cruise control switch. (Refer to Service Manual).

SERVICE DATA OUTPUT

The service data output is shown in the following.

MUT-III SCAN TOOL DISPLAY	ITEM NO.	SERVICE DATA ITEM	UNIT
APS (main)	11	Accelerator pedal position sensor	mV
Brake light switch	74	Stoplight switch	ON/OFF
Cancel code	57	Cancel code	Displays a cancel code number.
Cancel switch	75	"CANCEL" switch	ON/OFF
Clutch switch	78	Clutch pedal position switch <M/T>	ON/OFF
Cruise switch	81	Auto-cruise control system operation	ON/OFF
Main switch	86	"CRUISE" (MAIN) switch	ON/OFF
Neutral switch	88	Transmission range switch <A/T>	ON/OFF
Normally closed brake switch	89	Brake switch	ON/OFF
Resume switch	91	"ACC/RES" switch	ON/OFF
Set switch	92	"COAST/SET" switch	ON/OFF
TPS (main)	13	Throttle position sensor	mV
Vehicle speed sensor	4	Vehicle speed signal	km/h

NOTE: If two or more actions are taken at the same time, codes are set in ascending order of code number.

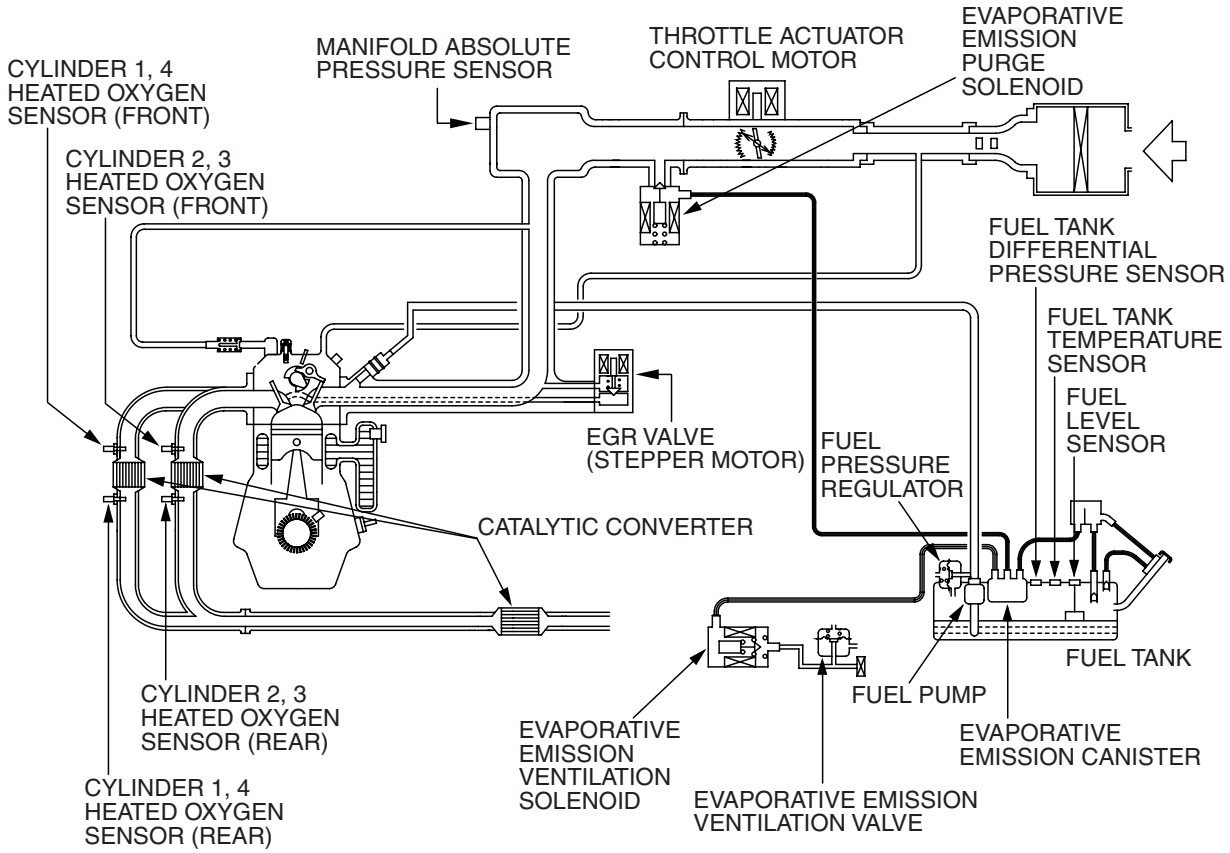
EMISSION CONTROL

GENERAL DESCRIPTION

M2171000100612

The emission control system is basically the same as that for the 2.4L engine installed in the GALANT.

EMISSION CONTROL SYSTEM DIAGRAM <2.4L ENGINE>



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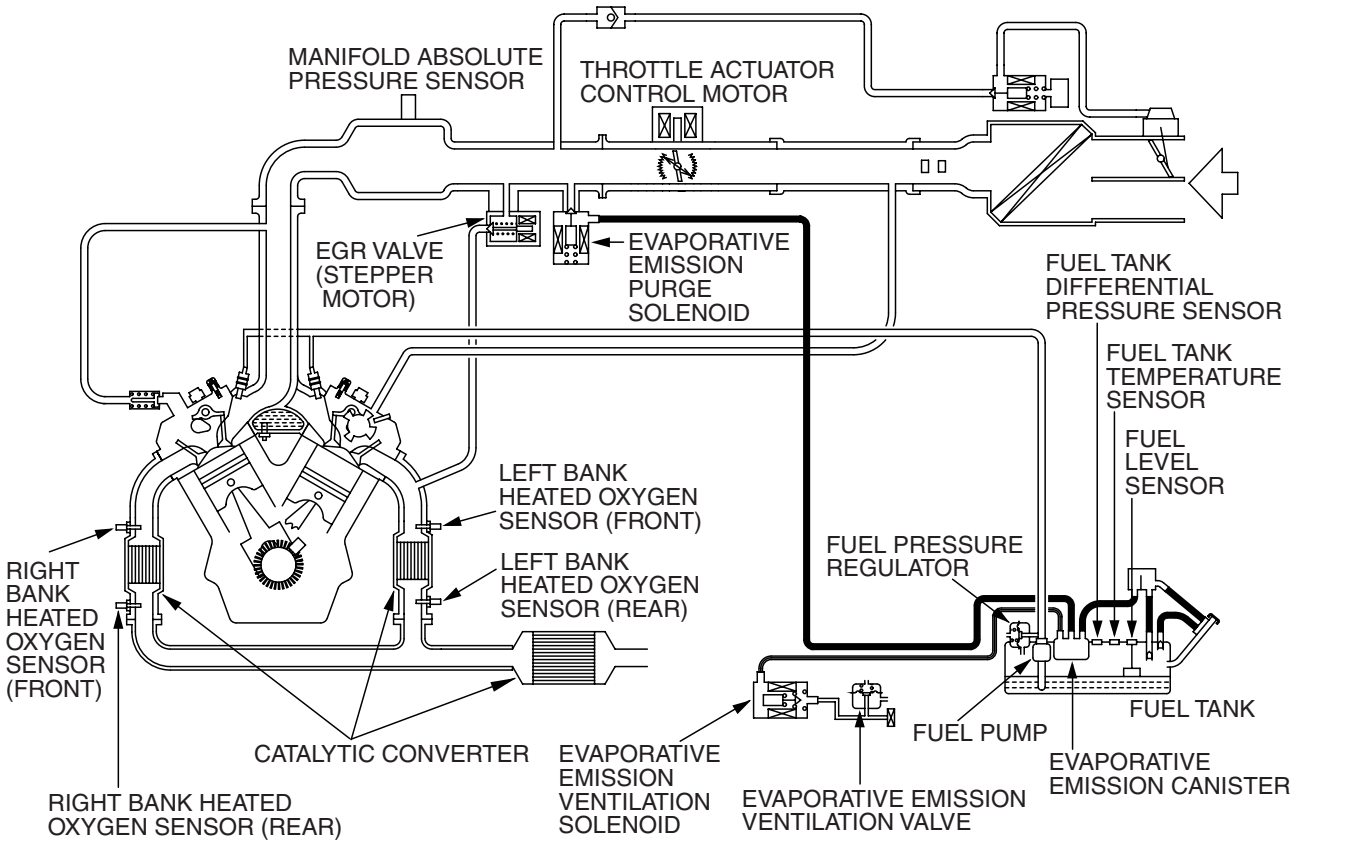
GENERAL DESCRIPTION

M2171000100623

The emission control system is basically the same as that for the GALANT.

EMISSION CONTROL SYSTEM DIAGRAM <3.8L ENGINE>



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