GROUP 13B

MULTIPORT FUEL SYSTEM (MFI) <3.8L ENGINE>

CONTENTS

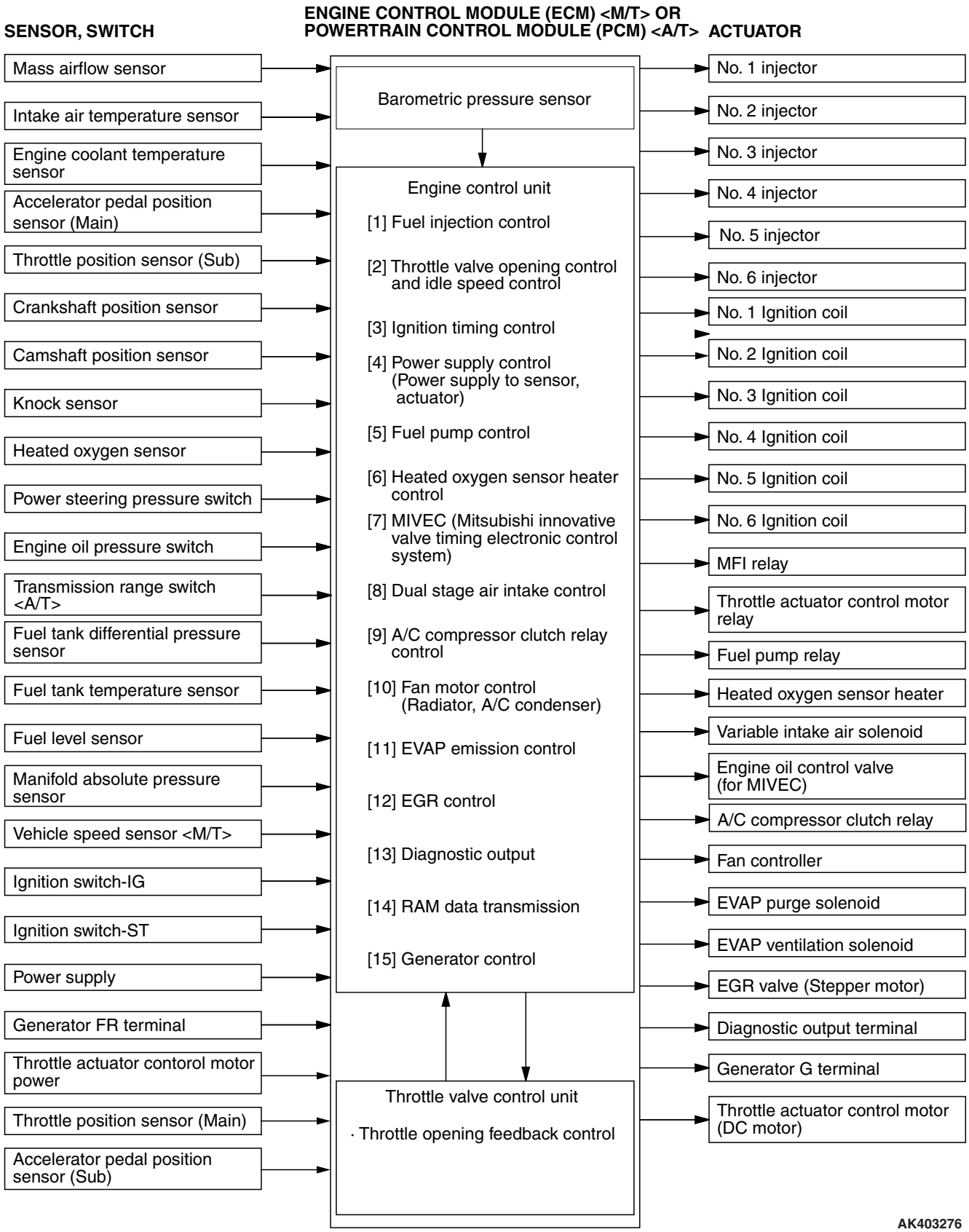
GENERAL DESCRIPTION

M2132000100763

The basic design is the same as that for the 3.8L engine installed in the GALANT except that the following modifications have been incorporated:

IMPROVEMENT/ADDITION	REMARK
Adoption of the valve timing and lift switching system.	Improves power output performance and fuel economy. Reduces emission gas (CO).
Adoption of the dual stage air intake system.	Improves power output performance.
Adoption of PWM (pulse width modulation) method of fan motor control.	Improves fuel economy. Reduces fan noise.

SYSTEM BLOCK DIAGRAM



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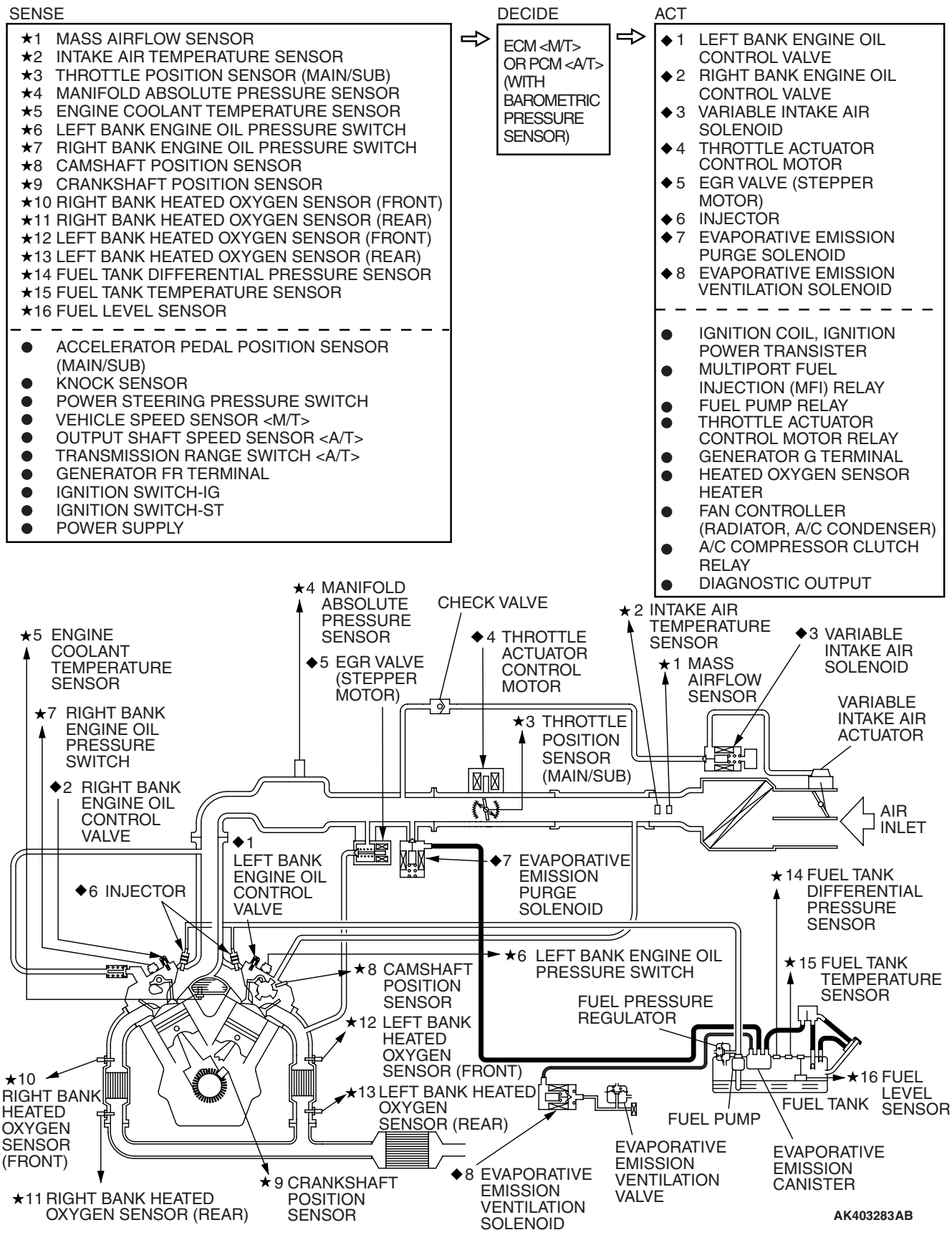
CONTROL SYSTEM DIAGRAM



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SENSOR

M2132001000349

ENGINE OIL PRESSURE SWITCH

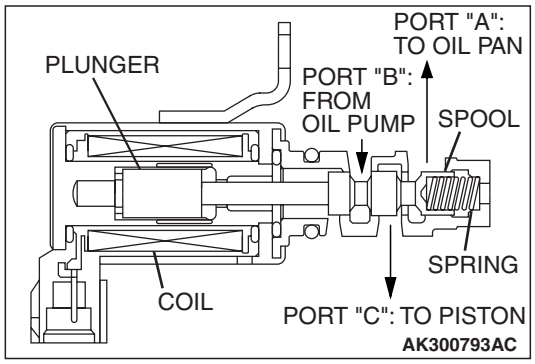
The engine oil pressure switch is installed per cylinder head for each bank. The engine oil pressure switch is set to ON/OFF in response to the oil pressure of the oil line for switching the cam and inputs the signal to the ECM <M/T> or PCM <A/T>. The ECM <M/T> or PCM <A/T> detects abnormalities in the MIVEC, based on the signal from this engine oil pressure switch and the engine operating conditions.

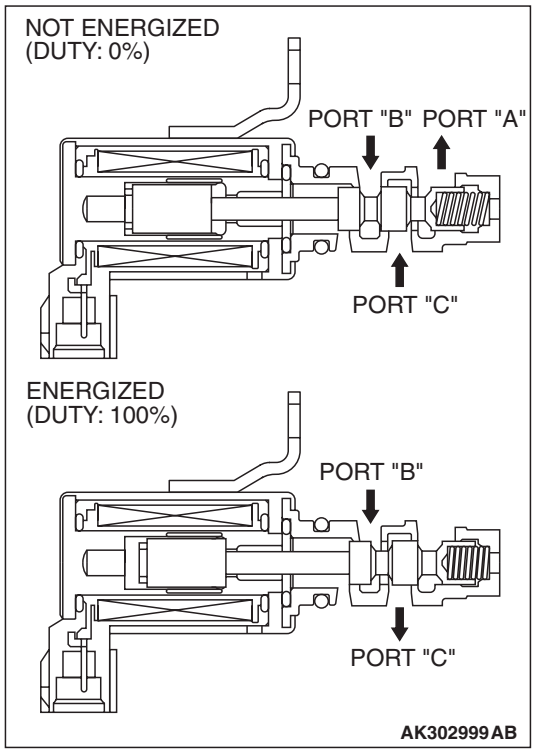
ACTUATOR

M2132002000182

ENGINE OIL CONTROL VALVE

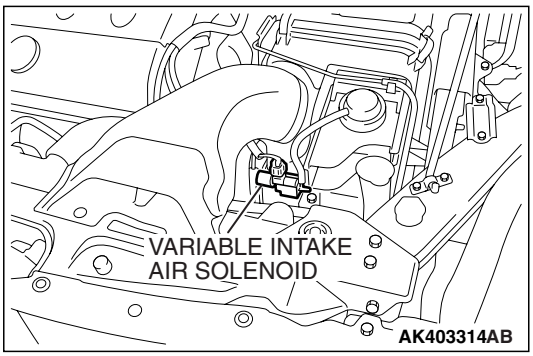
The engine oil control valve is a type of solenoid valve that is controlled with duty cycles. Mounted on the cylinder head, this valve is used for hydraulically controlling the switching of cams.





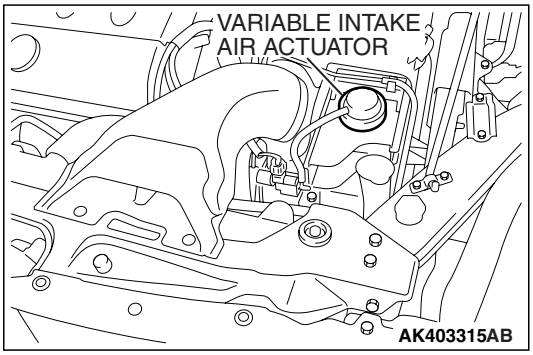
When the coil of the engine oil control valve is not energized (duty cycle: 0%), port B closes, and ports A and C open, allowing the oil that was acting on the cam switching control piston to be discharged from port C via port A. When the coil is energized (duty cycle: 100%), the spool valve moves, closing port A and opening ports B and C. The oil that has been pumped by the oil pump passes via ports B and C, and acts on the cam switching control piston (rocker arm).

VARIABLE INTAKE AIR SOLENOID



The variable intake air solenoid switches the pressure (the intake manifold negative pressure or the atmospheric pressure), which is introduced into the variable intake actuator, through the signal from the ECM <M/T> or PCM <A/T>.
The solenoid coil acts as an electromagnet and attracts the plunger. When the plunger is attracted, the passage between the intake manifold and the variable intake air actuator is opened. Thus, the intake manifold negative pressure is introduced into the actuator.
When there is no current, the reaction force in the spring closes the passage between the intake manifold and the variable intake air actuator. The atmospheric pressure is introduced into the actuator.

VARIABLE INTAKE AIR ACTUATOR



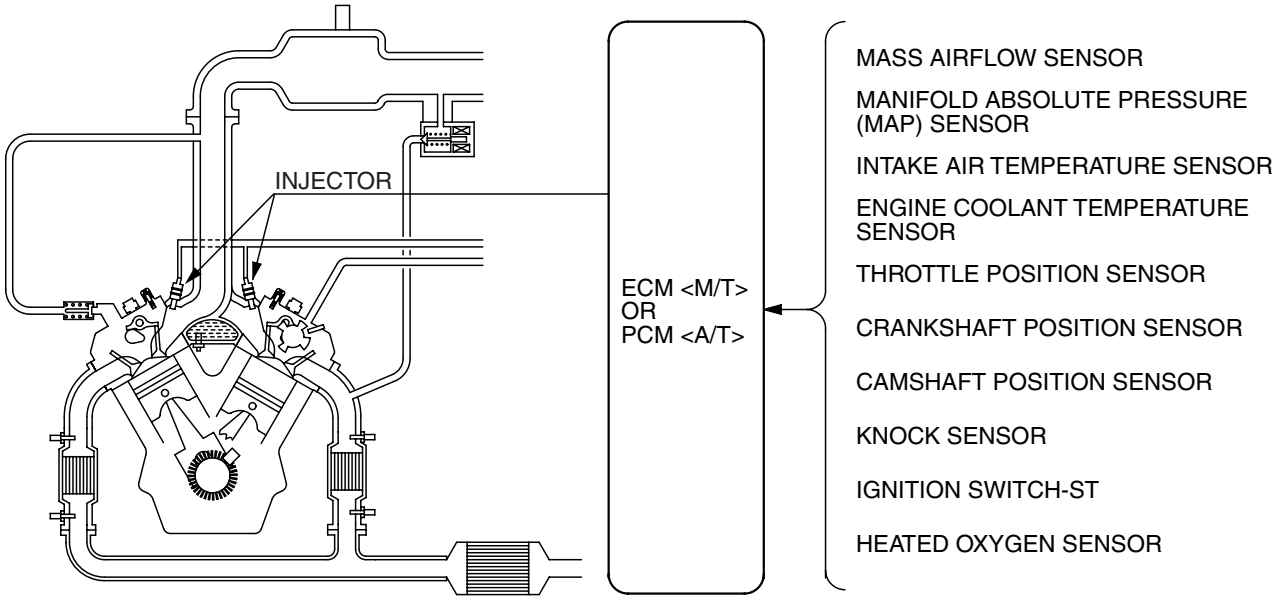
The variable intake air actuator opens and closes the variable intake air valve. The actuator is consisted of the main body, the rod, the diaphragm chamber, spring, and valve.
While atmospheric pressure is introduced into the diaphragm chamber, the reaction force in the spring pushes the rod. The valve is closed.
When the intake manifold negative pressure is introduced into the diaphragm chamber, the force on the diaphragm chamber overcomes the reaction force in the spring. The rod is pulled and the valve is opened.

FUEL INJECTION CONTROL

M2132003000646

The fuel injection control is basically the same as that for the 3.8L engine installed in the GALANT.

System Configuration Diagram



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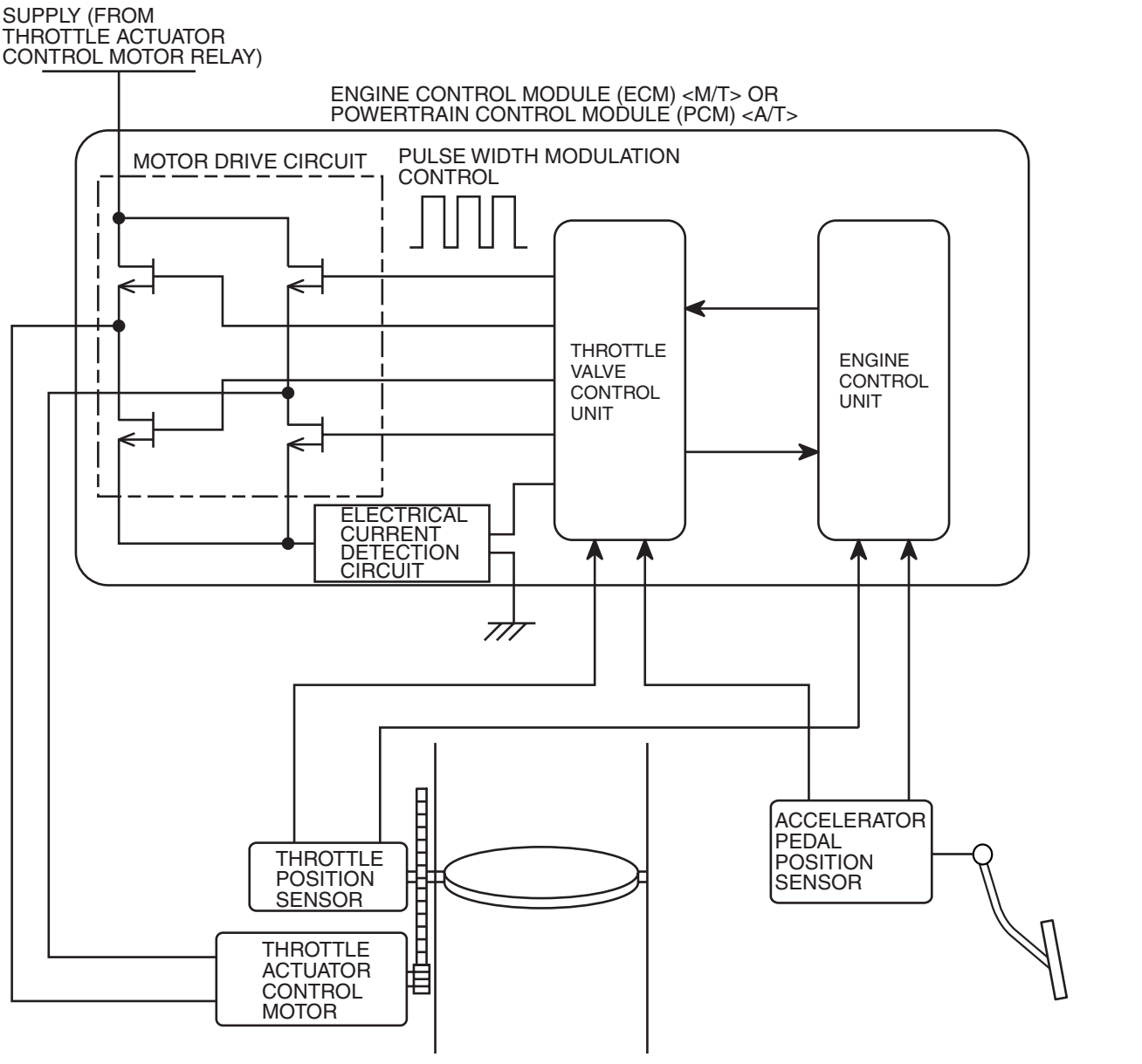
THROTTLE VALVE OPENING ANGLE CONTROL

M2132015000267

The throttle valve opening angle control is basically the same as that for the 3.8L engine installed in the GALANT.

System Configuration Diagram

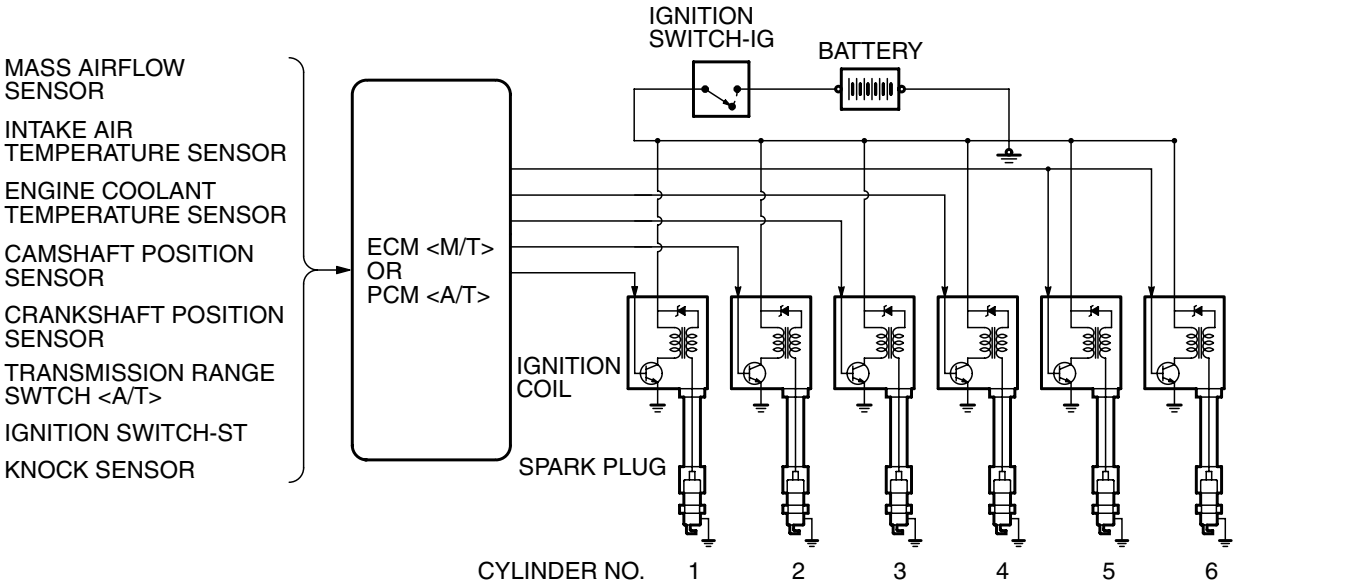


IGNITION TIMING CONTROL

M2132005000608

The ignition timing control system is basically the same as that for the 3.8L engine installed in the GALANT.

System Configuration Diagram



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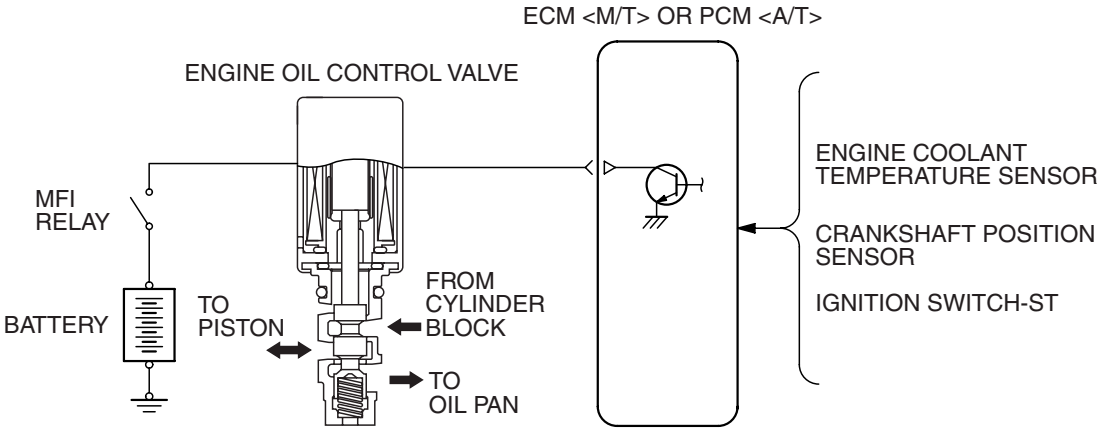
MIVEC (Mitsubishi Innovative Valve Timing Electronic Control System)

M2132023500063

At low engine speeds, a low-speed cam that is suited to low-speed operations actuates the intake valve. At high engine speeds, a high-speed cam that is suited to high-speed operations actuates the intake valve. By switching the low-speed cam and the high-speed cam according to the operation conditions, both the low-speed torque and high-speed output have been improved.



AK300245AL

The low-speed cam has a shorter valve overlap and valve opening duration, characteristics that are suited to low-speed operations in which the intake inertia is small. The high-speed cam has a longer valve overlap and valve opening duration, characteristics that are suited to high-speed operations in which the intake inertia is large.

At low engine speeds (approximately below 4,000 r/min), the ECM <M/T> or PCM <A/T> turns the oil control valve OFF (duty cycle: 0%). As a result, the cam switching control piston discharges oil, and the low-speed cam actuates the intake valve. The low-speed cam, which consists of two cams with different valve lifts, and the two cams actuate one independent intake valve each. Consequently, the difference in the valve lifts strengthens the flow of the air/fuel mixture in the cylinder, thus stabilizing combustion. As a result, low fuel consumption, low exhaust gas emissions, and high torque have been realized.

At high engine speeds (approximately above 4,000 r/min), the ECM <M/T> or PCM <A/T> turns the oil control valve ON (duty cycle: 100% for 2 seconds during switching; 60% after 2 seconds have elapsed). As a result, the hydraulic pressure acts on the cam switching control piston, and the high-speed cam actuates the two intake valve altogether. By increasing the valve opening duration and the lift in this manner, the intake air volume has been increased and the output has been improved.

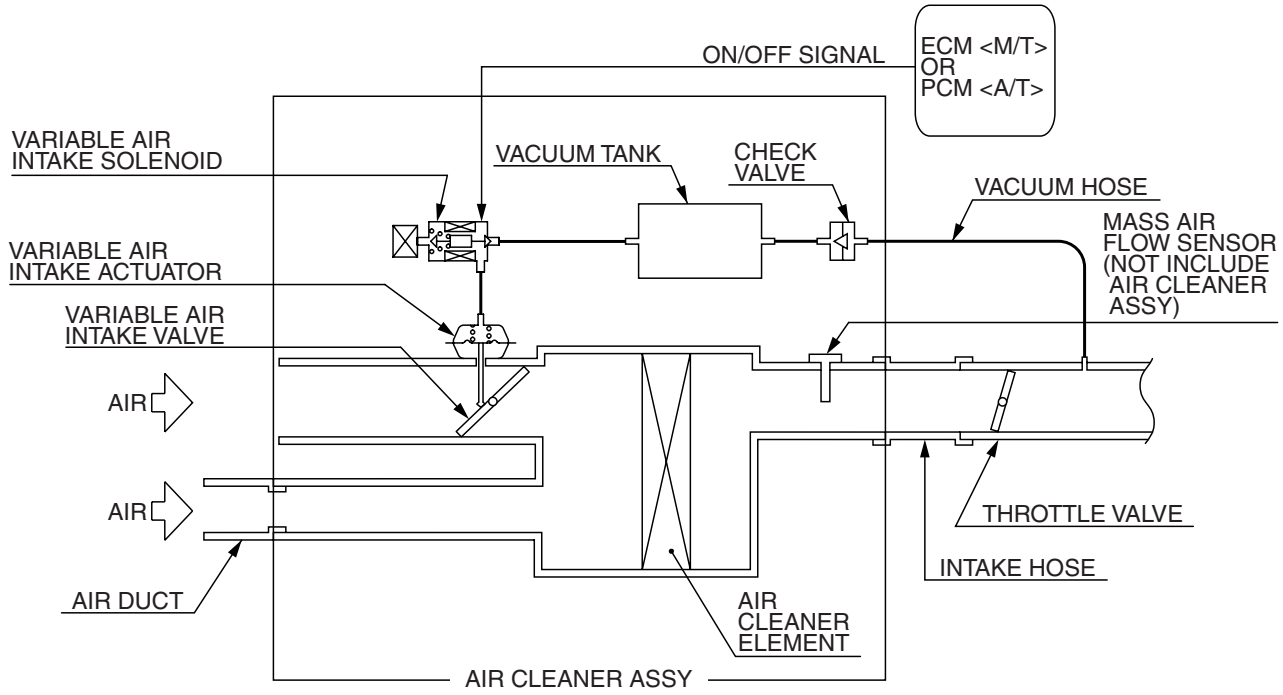
In addition, the engine oil pressure switch that is installed in the cam switching oil line detects system malfunctions. Under the conditions listed below, the low-speed cam constantly actuates the intake valve.

- Engine coolant temperature is 10°C (50°F) or less.
- Within 10 seconds after engine start.

DUAL STAGE AIR INTAKE CONTROL

M2132026500017

The dual stage air intake system has two duct passage. By opening/closing the intake air valve in the one of the passages, the sporty intake air sound and the engine performance are both improved.
The dual stage air intake system is consisted of the variable intake air valve, the variable intake air actuator, the variable intake air solenoid, the check valve, and the vacuum tank
When the engine is running in the low to middle speed (approximately below 4,000 r/min), the variable intake air solenoid is OFF. The atmospheric pressure is introduced into the actuator and the valve is closed. Under this condition, the size of the air inlet opening is the opening area of the air duct. This improves the reduction in the intake air sound.
When the engine is running in the high speed (approximately above 4,000 r/min), the solenoid is ON. The intake manifold negative pressure is introduced into the actuator and the valve is opened. Under this condition, the size of the air inlet opening brings the total opening size of the air duct and the valve. Therefore, the inlet air resistance is reduced. This improves the engine output at high engine speeds.



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FAN MOTOR CONTROL

M2132008000102

The fan motor (pulse width modulation) control is basically the same as that for the 3.8L engine installed in the ENDEAVOR.

OTHER CONTROL FUNCTIONS

M2132010000529

The following items are basically the same as those for the 3.8L engine installed in the GALANT.

- Power Supply and Fuel Pump Control
- Generator Control
- Heated Oxygen Sensor Heater Control
- A/C Compressor Clutch Relay Control
- EVAP Emission Control
- EGR Control

ON-BOARD DIAGNOSTICS

M2132009000677

The engine control module (ECM) <M/T> or the powertrain control module (PCM) <A/T> has been provided with the following functions for easier system inspection.

Diagnostic Trouble Codes and Malfunction Indicator Lamp (SERVICE ENGINE SOON or Check Engine Lamp) Function

The diagnostic trouble code and malfunction indicator lamp (SERVICE ENGINE SOON or Check Engine Lamp) items are shown in the following table.

*NOTE: *1: Diagnostic Trouble Code*

*NOTE: *2: Malfunction Indicator Lamp*

DTC*1	DIAGNOSTIC ITEM	MIL*2 ITEM
–	Engine control module (ECM) <M/T> or powertrain control module (PCM) <A/T> malfunction	×
P0031	Heated oxygen sensor heater control circuit low (bank 1 sensor 1)	×
P0032	Heated oxygen sensor heater control circuit high (bank 1 sensor 1)	×
P0037	Heated oxygen sensor heater control circuit low (bank 1 sensor 2)	×
P0038	Heated oxygen sensor heater control circuit high (bank 1 sensor 2)	×
P0051	Heated oxygen sensor heater control circuit low (bank 2 sensor 1)	×
P0052	Heated oxygen sensor heater control circuit high (bank 2 sensor 1)	×
P0057	Heated oxygen sensor heater control circuit low (bank 2 sensor 2)	×
P0058	Heated oxygen sensor heater control circuit high (bank 2 sensor 2)	×
P0069	Abnormal correlation between manifold absolute pressure sensor and barometric pressure sensor	×
P0101	Mass airflow circuit range/performance problem	×
P0102	Mass airflow circuit low input	×
P0103	Mass airflow circuit high input	×
P0106	Manifold absolute pressure circuit range/performance problem	×
P0107	Manifold absolute pressure circuit low input	×
P0108	Manifold absolute pressure circuit high input	×
P0111	Intake air temperature circuit range/performance problem	×
P0112	Intake air temperature circuit low input	×
P0113	Intake air temperature circuit high input	×
P0116	Engine coolant temperature circuit range/performance problem	×

DTC*1	DIAGNOSTIC ITEM	MIL*2 ITEM
P0117	Engine coolant temperature circuit low input	×
P0118	Engine coolant temperature circuit high input	×
P0122	Throttle position sensor (main) circuit low input	×
P0123	Throttle position sensor (main) circuit high input	×
P0125	Insufficient coolant temperature for closed loop fuel control	×
P0128	Coolant thermostat (Coolant temperature below thermostat regulating temperature)	×
P0131	Heated oxygen sensor circuit low voltage (bank 1 sensor 1)	×
P0132	Heated oxygen sensor circuit high voltage (bank 1 sensor 1)	×
P0133	Heated oxygen sensor circuit slow response (bank 1 sensor 1)	×
P0134	Heated oxygen sensor circuit no activity detected (bank 1)	×
P0137	Heated oxygen sensor circuit low voltage (bank 1 sensor 2)	×
P0138	Heated oxygen sensor circuit high voltage (bank 1 sensor 2)	×
P0139	Heated oxygen sensor circuit slow response (bank 1 sensor 2)	×
P0140	Heated oxygen sensor circuit no activity detected (bank 1 sensor 2)	×
P0151	Heated oxygen sensor circuit low voltage (bank 2 sensor 1)	×
P0152	Heated oxygen sensor circuit high voltage (bank 2 sensor 1)	×
P0153	Heated oxygen sensor circuit slow response (bank 2 sensor 1)	×
P0154	Heated oxygen sensor circuit no activity detected (bank 2)	×
P0157	Heated oxygen sensor circuit low voltage (bank 2 sensor 2)	×
P0158	Heated oxygen sensor circuit high voltage (bank 2 sensor 2)	×
P0159	Heated oxygen sensor circuit slow response (bank 2 sensor 2)	×
P0160	Heated oxygen sensor circuit no activity detected (bank 2 sensor 2)	×
P0171	System too lean (bank 1)	×
P0172	System too rich (bank 1)	×
P0174	System too lean (bank 2)	×
P0175	System too rich (bank 2)	×
P0181	Fuel tank temperature sensor circuit range/performance	×
P0182	Fuel tank temperature sensor circuit low input	×
P0183	Fuel tank temperature sensor circuit high input	×
P0201	Injector circuit-cylinder 1	×
P0202	Injector circuit-cylinder 2	×
P0203	Injector circuit-cylinder 3	×
P0204	Injector circuit-cylinder 4	×
P0205	Injector circuit-cylinder 5	×
P0206	Injector circuit-cylinder 6	×
P0222	Throttle position sensor (sub) circuit low input	×

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DTC*1	DIAGNOSTIC ITEM	MIL*2 ITEM
P0223	Throttle position sensor (sub) circuit high input	×
P0300	Random/multiple cylinder misfire detected	×
P0301	Cylinder 1 misfire detected	×
P0302	Cylinder 2 misfire detected	×
P0303	Cylinder 3 misfire detected	×
P0304	Cylinder 4 misfire detected	×
P0305	Cylinder 5 misfire detected	×
P0306	Cylinder 6 misfire detected	×
P0325	Knock sensor circuit	–
P0335	Crankshaft position sensor circuit	×
P0340	Camshaft position sensor circuit	×
P0401	Exhaust gas recirculation flow insufficient detected	×
P0403	Exhaust gas recirculation control circuit	×
P0421	Warm up catalyst efficiency below threshold (bank 1)	×
P0431	Warm up catalyst efficiency below threshold (bank 2)	×
P0441	Evaporative emission control system incorrect purge flow	×
P0442	Evaporative emission control system leak detected (small leak)	×
P0443	Evaporative emission control system purge control valve circuit	×
P0446	Evaporative emission control system vent control circuit	×
P0450	Evaporative emission control system pressure sensor malfunction	×
P0451	Evaporative emission control system pressure sensor range/performance	×
P0452	Evaporative emission control system pressure sensor low input	×
P0453	Evaporative emission control system pressure sensor high input	×
P0455	Evaporative emission control system leak detected (gross leak)	×
P0456	Evaporative emission control system leak detected (very small leak)	×
P0461	Fuel level sensor (main) circuit range/performance	×
P0462	Fuel level sensor circuit low input	×
P0463	Fuel level sensor circuit high input	×
P0500	Vehicle speed sensor malfunction <M/T>	×
P0506	Idle control system RPM lower than expected	×
P0507	Idle control system RPM higher than expected	×
P0513	Immobilizer malfunction	–
P0551	Power steering pressure switch circuit range/performance	×
P0554	Power steering pressure switch circuit intermittent	×
P0603	EEPROM malfunction	×
P0606	Powertrain control module main processor malfunction	×
P0622	Generator FR terminal circuit malfunction	–

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DTC*1	DIAGNOSTIC ITEM	MIL*2 ITEM
P0630	VIN malfunction	×
P0638	Throttle actuator control motor circuit range/performance	×
P0642	Throttle position sensor power supply	×
P0657	Throttle actuator control motor relay circuit malfunction	×
P0660	Variable intake air solenoid circuit	–
P0705	Transmission range switch circuit malfunction (PRNDL input) <A/T>	×
P0712	Transmission fluid temperature sensor circuit low input <A/T>	×
P0713	Transmission fluid temperature sensor circuit high input <A/T>	×
P0715	Input/turbine speed sensor circuit <A/T>	×
P0720	Output speed sensor circuit <A/T>	×
P0731	Gear 1 incorrect ratio <A/T>	×
P0732	Gear 2 incorrect ratio <A/T>	×
P0733	Gear 3 incorrect ratio <A/T>	×
P0734	Gear 4 incorrect ratio <A/T>	×
P0735	Gear 5 incorrect ratio <A/T>	×
P0736	Gear R incorrect ratio <A/T>	×
P0741	Torque converter clutch circuit performance or stuck off <A/T>	×
P0742	Torque converter clutch circuit stuck on <A/T>	×
P0743	Torque converter clutch circuit electrical <A/T>	×
P0753	Shift solenoid "A" electrical <A/T>	×
P0758	Shift solenoid "B" electrical <A/T>	×
P0763	Shift solenoid "C" electrical <A/T>	×
P0768	Shift solenoid "D" electrical <A/T>	×
P0773	Shift solenoid "E" electrical <A/T>	×
P1020	Mitsubishi innovative valve timing electronic control system (MIVEC) performance problem (bank 2)	×
P1021	Engine oil control valve circuit (bank 2)	×
P1022	Mitsubishi innovative valve timing electronic control system (MIVEC) performance problem (bank 1)	×
P1023	Engine oil control valve circuit (bank 1)	×
P1506	Idle control system RPM lower than expected at low engine coolant temperature	×
P1507	Idle control system RPM higher than expected at low engine coolant temperature	×
P1564	Auto-cruise control switch system	–
P1571	Stoplight switch system	–
P1574	ECM <M/T> or PCM <A/T> and its related components	–
P1575	Cancel latch system	–

TSB Revision

DTC*1	DIAGNOSTIC ITEM	MIL*2 ITEM
P1602	Communication malfunction (between ECM <M/T> or PCM <A/T> main processor and system LSI)	×
P1603	Battery backup line malfunction	×
P1751	A/T control relay malfunction <A/T>	×
P2066	Fuel level sensor (sub) circuit range/performance	×
P2100	Throttle actuator control motor circuit (open)	×
P2101	Throttle actuator control motor magneto malfunction	×
P2122	Accelerator pedal position sensor (main) circuit low input	×
P2123	Accelerator pedal position sensor (main) circuit high input	×
P2127	Accelerator pedal position sensor (sub) circuit low input	×
P2128	Accelerator pedal position sensor (sub) circuit high input	×
P2135	Throttle position sensor (main and sub) range/performance problem	×
P2138	Accelerator pedal position sensor (main and sub) range/performance problem	×
P2195	Heated oxygen sensor inactive (bank 1 sensor 1)	×
P2197	Heated oxygen sensor inactive (bank 2 sensor 1)	×
P2228	Barometric pressure circuit low input	×
P2229	Barometric pressure circuit high input	×
P2252	Heated oxygen sensor offset circuit low voltage	×
P2253	Heated oxygen sensor offset circuit high voltage	×
U1073	Bus off	–
U1102	ABS-ECU time-out	–
U1108	Combination meter time-out	×
U1109	ETACS-ECU time-out	–
U1110	A/C-ECU time-out	–
U1117	Immobilizer-ECU time-out	–

Data List Function

The data list items are shown in the following table.

NOTE: Data list items consist of MUT-III items and GST items. GST items can be accessed through the use of a general scan tool.

NOTE: When MUT-III is used, MUT-III items appear alphabetically

NOTE: The items marked "" are not applied to 3.8L engines.*

MUT-III Item

MUT-III SCAN TOOL DISPLAY	ITEM NO.	INSPECTION ITEM	UNIT
A/C compressor relay	93	A/C compressor clutch relay	ON/OFF
A/C SW1	76	A/C switch	ON/OFF
Absolute load value	72	Absolute load value	%
Airflow sensor	10	Mass airflow sensor	mV
APP sensor (main)	11	Accelerator pedal position sensor (main)	mV
APP sensor (sub)	12	Accelerator pedal position sensor (sub)	mV
Brake light switch	74	Brake light switch	ON/OFF
Calculated load value	73	Calculated load value	%
Closed throttle position switch	84	Closed throttle position switch	ON/OFF
Cranking signal	79	Cranking signal (ignition switch-ST)	ON/OFF
Crankshaft position sensor	2	Crankshaft position sensor	r/min
ECT sensor	6	Engine coolant temperature sensor	°C (°F)
EGR step motor	31	EGR valve (stepper motor)	Step
Engine control relay	95	Engine control relay	ON/OFF
ETV relay	96	Throttle actuator control motor relay	ON/OFF
EVAP. emission purge SOL. duty	49	Evaporative emission purge solenoid duty	%
Fan duty	47	Fan motor duty	%
Fuel level gage	51	Fuel level gage	%
Fuel pump relay	97	Fuel pump relay	ON/OFF
Fuel system status (bank 1)	105	Fuel control system status (bank 1)	Closed loop/ Open circuit drive condition
Fuel system status (bank 2)	106	Fuel control system status (bank 2)	Closed loop/ Open circuit drive condition
Fuel tank differential PRS. SNSR	52	Fuel tank differential pressure sensor	mV
Fuel tank temperature sensor	53	Fuel tank temperature sensor	°C (°F)
Ignition switch	85	Ignition switch (IG1)	ON/OFF
Injectors	17	Injectors	ms
Intake air temperature sensor	5	Intake air temperature sensor	°C (°F)
ISC learned value (A/C OFF)	19	Idle speed control learned value (at A/C OFF)	Step
ISC learned value (A/C ON)	20	Idle speed control learned value (at A/C ON)	Step
Knock retard	32	Knock retard	CA
Learned knock retard	33	Knock control learned value	%
Long term fuel trim (bank1)	26	Long-term fuel trim (bank 1)	%
Long term fuel trim (bank2)	27	Long-term fuel trim (bank 2)	%

TSB Revision

MUT-III SCAN TOOL DISPLAY	ITEM NO.	INSPECTION ITEM	UNIT
MAP sensor	8	Manifold absolute pressure sensor	kPa (in.Hg)
Normally closed brake switch	89	Normally closed brake switch	ON/OFF
Oil control valve (bank 1)	98	Engine oil control valve (bank 1)	ON/OFF
Oil control valve (bank 2)	99	Engine oil control valve (bank 2)	ON/OFF
Power steering switch	83	Power steering pressure switch	ON/OFF
Power supply voltage	1	Power supply voltage	V
Radiator fan control relay (high)	100	Radiator fan relay, condenser fan relay *	ON/OFF
Radiator fan control relay (low)	101	Fan control relay *	ON/OFF
Short term fuel trim (bank 1)	28	Short-term fuel trim (bank 1)	%
Short term fuel trim (bank 2)	29	Short-term fuel trim (bank 2)	%
Spark advance	16	Ignition timing advance	CA
Starter relay	102	Starter relay <M/T>	ON/OFF
Target ETV value	59	Throttle actuator control motor target value	V
Target idle speed	3	Target idle speed	r/min
Throttle actuator	58	Throttle actuator control motor	%
TP sensor (main)	13	Throttle position sensor (main)	mV
TP sensor (main) learned value	14	Throttle position sensor (main) mid opening learning value	mV
TP sensor (sub)	15	Throttle position sensor (sub)	mV
Variable intake solenoid	103	Variable intake air solenoid	ON/OFF
Vehicle speed	4	Vehicle speed	km/h (mph)

GST Item

PARAMETER IDENTIFICATION (PID)	DESCRIPTION	COMMON EXAMPLE OF GENERAL SCAN TOOL DISPLAY
01	Number of emission-related DTCs and MIL status	DTC and MIL status:
	Number of DTCs stored in this ECU	DTC_CNT: xxxd
	Malfunction Indicator Lamp (MIL) status	MIL: OFF or ON
	Supported tests which are continuous	Support status of continuous monitors:
	Misfire monitoring	MIS_SUP: YES
	Fuel system monitoring	FUEL_SUP: YES
	Comprehensive component monitoring	CCM_SUP: YES
	Status of continuous monitoring tests since DTC cleared	Completion status of continuous monitors since DTC cleared:
	Misfire monitoring	MIS_RDY: YES or NO
	Fuel system monitoring	FUEL_RDY: YES or NO
	Comprehensive component monitoring	CCM_RDY: YES or NO
	Supported tests run at least once per trip	Supported status of non-continuous monitors:
	Catalyst monitoring	CAT_SUP: YES
	Heated catalyst monitoring	HCAT_SUP: NO
	Evaporative system monitoring	EVAP_SUP: YES
	Secondary air system monitoring	AIR_SUP: NO
	A/C system refrigerant monitoring	ACRF_SUP: NO
	Oxygen sensor monitoring	O2S_SUP: YES
	Oxygen sensor heater monitoring	HTR_SUP: YES
	EGR system monitoring	EGR_SUP: YES
	Status of tests run at least once per trip	Completion status of non-continuous monitors since DTC cleared:
	Catalyst monitoring	CAT_RDY: YES or NO
	Heated catalyst monitoring	HCAT_RDY: YES
	Evaporative system monitoring	EVAP_RDY: YES or NO
	Secondary air system monitoring	AIR_RDY: YES
	A/C system refrigerant monitoring	ACRF_RDY: YES
	Oxygen sensor monitoring	O2S_RDY: YES or NO
	Oxygen sensor heater monitoring	HTR_RDY: YES or NO
	EGR system monitoring	EGR_RDY: YES or NO

TSB Revision

PARAMETER IDENTIFICATION (PID)	DESCRIPTION	COMMON EXAMPLE OF GENERAL SCAN TOOL DISPLAY
03	Fuel system 1 status	FUELSYS1: OL/CL/OL-Drive/ OL-Fault/CL-Fault
	Fuel system 2 status	FUELSYS2: OL/CL/OL-Drive/ OL-Fault/CL-Fault
04	Calculated LOAD Value	LOAD_PCT: xxx.x%
05	Engine Coolant Temperature	ECT: xxx°C (xxx°F)
06	Short Term Fuel Trim−Bank 1	SHRTFT1: xxx.x %
07	Long Term Fuel Trim−Bank 1	LONGFT1: xxx.x %
08	Short Term Fuel Trim−Bank 2	SHRTFT2: xxx.x %
09	Long Term Fuel Trim−Bank 2	LONGFT2: xxx.x %
0B	Intake Manifold Absolute Pressure	MAP: xxx kPa (xx.x inHg)
0C	Engine RPM	RPM: xxxxx min^{-1}
0D	Vehicle Speed Sensor	VSS: xxx km/h (xxx mph)
0E	Ignition Timing Advance for #1 Cylinder	SPARKADV: xx°
0F	Intake Air Temperature	IAT: xxx°C (xxx°F)
10	Air Flow Rate from Mass Air Flow Sensor	MAF: xxx.xx g/s (xxxx.x lb/ min)
11	Absolute Throttle Position	TP: xxx.x%
13	Location of Oxygen Sensor	O2SLOC: O2S22
14	Bank 1−Sensor 1	O2S11: x.xxx V
		SHRTFT11: xxx.x%
15	Bank 1−Sensor 2	O2S12: x.xxx V
		SHRTFT12: xxx.x%
18	Bank 2−Sensor 1	O2S21: x.xxx V
		SHRTFT21: xxx.x%
19	Bank 2−Sensor 2	O2S22: x.xxx V
		SHRTFT22: xxx.x%
1C	OBD requirements to which vehicle is designed	OBDSUP: OBD II
1F	Time Since Engine Start	RUNTM: xxxxx sec.
21	Distance Travelled While MIL is Active	MIL DIST: xxxxx km (xxxxx miles)
2C	Commanded EGR	EGR_PCT: xxx.x%
2E	Commanded Evaporative Purge	EVAP_PCT: xxx.x%
2F	Fuel Level Input	FLI: xxx.x%
30	Number of warm-ups since diagnostic trouble codes cleared	WARM_UPS: xxx
31	Distance since diagnostic trouble codes cleared	CLR_DIST: xxxxx km (xxxxx miles)
32	Evap System Vapor Pressure	EVAP_VP: xxxx.xx Pa (xx.xxx in H2O)
33	Barometric Pressure	BARO: xxx kPa (xx.x inHg)

TSB Revision

PARAMETER IDENTIFICATION (PID)	DESCRIPTION	COMMON EXAMPLE OF GENERAL SCAN TOOL DISPLAY
41	Monitor status this driving cycle	
	Enable status of continuous monitors this monitoring cycle: NO means disable for rest of this monitoring cycle or not supported in PID $01, YES means enable for this monitoring cycle.	Enable status of continuous monitors this monitoring cycle:
	Misfire monitoring	MIS_ENA: NO or YES
	Fuel system monitoring	FUEL_ENA: NO or YES
	Comprehensive component monitoring	CCM_ENA: YES
	Completion status of continuous monitors this monitoring cycle:	Completion status of continuous monitors this monitoring cycle:
	Misfire monitoring	MIS_COMPL: YES or NO
	Fuel system monitoring	FUEL_COMP: YES or NO
	Comprehensive component monitoring	CCM_CMPL: YES or NO
	Enable status of non-continuous monitors this monitoring cycle:	Enable status of non-continuous monitors this monitoring cycle:
	Catalyst monitoring	CAT_ENA: YES or NO
	Heated catalyst monitoring	HCAT_ENA: NO
	Evaporative system status	EVAP_ENA: YES or NO
	Secondary air system monitoring	AIR_ENA: NO
	A/C system refrigerant monitoring	ACRF_ENA: NO
	Oxygen sensor monitoring	O2S_ENA: YES or NO
	Oxygen sensor heater monitoring	HTR_ENA: YES or NO
	EGR system monitoring	EGR_ENA: YES or NO
	Completion status of non-continuous monitors this monitoring cycle:	Completion status of non-continuous monitors this monitoring cycle:
	Catalyst monitoring	CAT_CMPL: YES or NO
	Evaporative system status	EVAP_CMPL: YES or NO
	Oxygen sensor monitoring	O2S_CMPL: YES or NO
	Oxygen sensor heater monitoring	HTR_CMPL: YES or NO
	EGR system monitoring	EGR_CMPL: YES or NO
42	Control module voltage	VPWR: xx.xxx V
43	Absolute Load Value	LOAD_ABS: xxx.x%
44	Commanded Equivalence Ratio	EQ_RAT: x.xxx
45	Relative Throttle Position	TP_R: xxx.x%

PARAMETER IDENTIFICATION (PID)	DESCRIPTION	COMMON EXAMPLE OF GENERAL SCAN TOOL DISPLAY
46	Ambient air temperature	AAT: xxx°C (xxx°F)
47	Absolute Throttle Position B	TP_B: xxx.x%
49	Accelerator Pedal Position D	APP_D: xxx.x%
4A	Accelerator Pedal Position E	APP_E: xxx.x%
4C	Commanded Throttle Actuator Control	TAC_PCT: xxx.x%

Actuator Test Function

The actuator test items are shown in the following table.

NOTE: The items marked "" are not applied to 3.8L engines.*

MUT-III SCAN TOOL DISPLAY	ITEM NO.	INSPECTION ITEM	ACTIVATING CONTENT
A/C relay	16	A/C compressor clutch relay	The relay turns from OFF to ON
EGR valve	19	EGR valve	EGR valve turns from close to open
EVAP. emission purge SOL. valve	10	Evaporative emission purge solenoid	The solenoid valve turns from OFF to ON
EVAP. emission ventilation SOL.	15	Evaporative emission ventilation solenoid	The solenoid valve turns from OFF to ON
FUEL PUMP	9	Fuel pump	Fuel pump operates
Ignition timing 5 BTDC	11	Basic ignition timing	Set to ignition timing adjustment mode
No. 1 injector	1	Injectors	Cut fuel to No. 1 injector
No. 2 injector	2		Cut fuel to No. 2 injector
No. 3 injector	3		Cut fuel to No. 3 injector
No. 4 injector	4		Cut fuel to No. 4 injector
No. 5 injector	5		Cut fuel to No. 5 injector
No. 6 injector	6		Cut fuel to No. 6 injector
PWM Radiator fan	14	Radiator fan, A/C condenser fan	Drives the fan motor at high speed
Radiator fan (high)	12	Radiator fan, A/C condenser fan*	Drives the fan motor at high speed
Radiator fan (low)	13		Drives the fan motor at low speed
Variable intake solenoid	21	Variable intake air solenoid	The solenoid valve turns from OFF to ON