

Powertrain DTC Summaries – OBD II

Quick Reference Diagnostic Guide

Jaguar XK-TYPE V8 N/A and V8 SC 2003 Model Year

Refer to pages 2 – 9 for important information regarding the use of “Powertrain DTC Summaries”.

REFERENCE: It is recommended that the applicable “Electrical Guide” be referenced when using the information contained in this document.

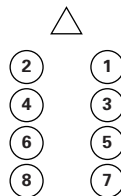
NOTE: Refer to Body DTC Summaries for codes P0335 (A/CCM), P0562 and P0563 (Driver and Passenger HRCM).

KEY TO COLUMN HEADINGS

DTC	Diagnostic Trouble Code.
SYS	The powertrain system with which the DTC is associated – EMS (ALL SYSTEMS), V8 EMS, V8 SC EMS, TRANS, DSC. DTC retrieval tools: OBD II – indicates that the DTC is an OBD II code and can be accessed via a generic scan tool or WDS. JAG – indicates that the DTC is not an OBD II code and is accessed only via WDS.
FAULT DESCRIPTION	Fault description.
MONITORING CONDITIONS	“DIAGNOSTIC MONITOR DRIVE CYCLE” for the particular DTC. Operate the vehicle as described to check for a reoccurrence of the DTC. Refer to pages 4 – 8. Use WDS Datalogger or Scan Tool to monitor specified engine parameter(s).
CHECK ENGINE MIL (CK ENG)	1 1 TRIP – indicates that the CHECK ENGINE MIL is activated by a fault occurring during ONE “TRIP”. 2 2 TRIPS – indicates that the CHECK ENGINE MIL is activated by a fault occurring during TWO CONSECUTIVE “TRIPS”. Refer to page 3 for definition of OBD “TRIP”. N NO – indicates that the CHECK ENGINE MIL is not activated.
OTHER	Driver Warnings: N = None R = RED MIL (warning lamp) plus Message Center message A = AMBER MIL (warning lamp) plus Message Center message C = Charge indicator
DEFAULT ACTION	Control Module default action: Logged – DTC stored in ECM memory buffer; Flagged – DTC stored in ECM memory / CHECK ENGINE MIL activated.
CM PIN	ECM (system – Engine Management System) / TCM (system – Transmission) connector pin number(s)
POSSIBLE CAUSES	Possible causes are listed in the order of diagnostic checking. HIGH VOLTAGE – High voltage can be either sensor supply voltage (5 volts) or B+ voltage.

CYLINDER NUMBERING

Engine cylinder numbering is as follows:



OBD SYSTEM READINESS – ENGINE MANAGEMENT

If DTC P1000 is flagged after DTCs have been cleared, all engine management OBD diagnostic monitor drive cycles HAVE NOT BEEN COMPLETED.

If DTC P1111 is flagged after DTCs have been cleared, all engine management OBD diagnostic monitor drive cycles HAVE BEEN COMPLETED.

OBD SYSTEM READINESS – TRANSMISSION

Use WDS Datalogger “TOTAL NUMBER OF DTC SET” to determine if transmission OBD monitoring has been completed.

OBD “TRIPS”

The OBD system defines 1 TRIP as an ignition cycle (ignition key OFF; wait 30 seconds; ignition key ON) plus a minimum engine coolant temperature increase of 22 °C (40 °F) after which, the engine coolant temperature has to reach a minimum of 71°C (160 °F).

OBD DIAGNOSTIC MONITORS

The Engine Management and Transmission Control systems are continuously checked during vehicle operation by the Engine Control Module (ECM) and Transmission Control Module (TCM) on-board diagnostic (OBD) facilities. Powertrain OBD incorporates seven diagnostic monitors. Each monitor has an associated group of DTCs. The diagnostic monitors will complete the diagnostic test(s) if a specified service "drive cycle" is carried out.

The seven diagnostic monitors are as follows:

- Heated Oxygen Sensors Monitor
- Adaptive Fuel Monitor
- Misfire Monitor
- Catalyst Efficiency Monitor
- Evaporative System Monitor
- Exhaust Gas Recirculation Monitor
- Comprehensive Component Monitor (Engine Management / Transmission)

DIAGNOSTIC MONITORS DRIVE CYCLES

Technicians can ensure that an OBD Monitor drive cycle is completed and that all or specific components have been checked by completing a specified drive cycle. Use the following service drive cycles to confirm that the components and subsystems covered by the Diagnostic Monitors are operating correctly.

HEATED OXYGEN SENSORS MONITOR DRIVE CYCLE

Upstream (Universal) oxygen sensors:

- 1 Engine OFF; cooling fans inoperative > 20 seconds.
- 2 Start engine and bring to normal operating temperature > 82 °C (180 °F).
- 3 Drive the vehicle between 3000 – 4000 rpm in 3rd gear at a steady speed. Lift foot completely off accelerator and coast to a stop within 30 seconds. Do not touch accelerator pedal for 4 seconds after coming to a stop.
- 4 Repeat step 3.
- 5 Idle engine for 11 minutes.

Downstream oxygen sensors:

- 1 Start engine and bring to normal operating temperature > 82 °C (180 °F).
- 2 Drive the vehicle steadily between 48 – 97 km/h (30 – 60 mph) for 10 minutes.
- 3 Drive the vehicle above 3000 rpm in 3rd gear at a steady speed. Lift foot completely off accelerator and coast for 30 seconds.

Oxygen sensor heaters:

- 1 Start engine and bring to normal operating temperature > 82 °C (180 °F).
- 2 Idle engine for 3 minutes.

ADAPTIVE FUEL MONITOR DRIVE CYCLE

- 1 Start engine and bring to normal operating temperature > 82 °C (180 °F).
- 2 Idle for a minimum of 10 minutes.

MISFIRE MONITOR DRIVE CYCLE

- 1 Record flagged DTC (s) and accompanying WDS DTC Monitor freeze frame(s) data.
- 2 Fuel level > 25%.
- 3 Start the engine at a coolant temperature lower than the recorded freeze frame value (from Step 1).
- 4 Drive the vehicle to the recorded freeze frame conditions for 4 minutes. If CHECK ENGINE MIL flashes, lower the engine speed until the flashing stops.

Note regarding misfire monitor DTCs:

If, on the first trip, the misfire is severe enough to cause excess exhaust emission, the individual cylinder DTC plus DTC P1316 will be logged. The CHECK ENGINE MIL will not be activated. If the fault reoccurs on the second trip, the individual cylinder DTC plus DTC P1316 will be flagged, and the CHECK ENGINE MIL will be activated.

If, on the first trip, the misfire is severe enough to cause catalyst damage (more severe than excess exhaust emission), the CHECK ENGINE MIL will flash while the fault is present and the individual cylinder DTC plus DTC P1313 (bank 1), DTC P1314 (bank 2) will be logged. When the fault is no longer present the MIL will be deactivated. If the fault reoccurs on the second trip, the CHECK ENGINE MIL will flash while the fault is present and the individual cylinder DTC plus DTC P1313 (bank 1), DTC P1314 (bank 2) will be flagged. When the fault is no longer present the CHECK ENGINE MIL will be activated.

CATALYST EFFICIENCY MONITOR DRIVE CYCLE

- 1 Start engine and bring to normal operating temperature > 82 °C (180 °F).
- 2 Drive the vehicle in a steady state condition between 1300 – 3000 rpm without stops or starts for a minimum of 5 minutes.

EVAPORATIVE SYSTEM MONITOR DRIVE CYCLE

- 1 Ensure that fuel filler cap is correctly fitted and fully closed (minimum three clicks, clockwise).
- 2 Fuel level > 30% and < 85%.
- 3 Using WDS, perform ECM DTC Clear (even if no DTCs are flagged).
- 4 Drive vehicle for a minimum of 2 minutes, and until engine is at normal operating temperature.
- 5 Using WDS, ensure that the EVAP Canister Purge Valve is operating by observing "PURGE VAPOR MANAGEMENT VALVE – DUTY CYCLE". If the valve is not active, ECM adaptations have not been learned. Conduct a "green ECM" Drive Cycle as described in Technical Service Bulletin.
- 6 Drive vehicle to the road where the EVAP System Drive Cycle will be conducted. Stop vehicle and switch OFF the ignition. Leave ignition OFF for 30 seconds, then restart the engine.
- 7 Accelerate briskly to 80 km/h (50 mph) ensuring that the engine speed reaches a minimum of 3500 rpm for a minimum of 5 seconds.
- 8 (0.040 inch EVAP Test) View WDS "PURGE VAPOR MANAGEMENT VALVE – DUTY CYCLE", "CANISTER CLOSE VALVE – VAPOR RECOVERY SYSTEM", and FUEL TANK PRESSURE – VAPOR RECOVERY SYSTEM". Avoiding high engine loads, drive the vehicle steadily between 65 km/h (40 mph) and 100 km/h (60 mph). Avoid driving conditions that will produce excessive fuel movement. WDS should give an indication that the test is active (it may take up to 30 minutes before the test will initialize). When the test has initialized (EVAP Canister Close Valve CLOSED), it will take approximately 90 seconds for the test to complete.
- 9 (0.020 inch EVAP Test) Continue driving vehicle as explained in Step 8 for an additional 10 minutes.
- 10 Gently coast the vehicle to a stop. Allow the engine to idle for 2 minutes and view WDS "PURGE VAPOR MANAGEMENT VALVE – DUTY CYCLE", "CANISTER CLOSE VALVE – VAPOR RECOVERY SYSTEM", and FUEL TANK PRESSURE – VAPOR RECOVERY SYSTEM". WDS should give an indication that the test is active. When the test has initialized (EVAP Canister Close Valve CLOSED), it will take approximately 90 seconds for the test to complete.
- 11 If the 0.020 inch EVAP Test is not activated, the purge system vapor concentration may be too great. To reduce the vapor concentration proceed as follows:
- 12 Drive the vehicle for an additional 30 minutes avoiding driving conditions that will produce excessive fuel movement. Repeat Step 10. If the 0.020 inch EVAP Test is still not activated, repeat the Drive Cycle from Step 6.
- 13 Using WDS, check for and clear flagged DTCs.

EXHAUST GAS RECIRCULATION MONITOR DRIVE CYCLE

- 1 Start engine and bring to normal operating temperature > 82 °C (180 °F).
- 2 Drive the vehicle in 3rd gear at 2500 rpm. Maintain a steady speed for 1 minute, then lift foot completely off accelerator and coast for a minimum of 10 seconds.

COMPREHENSIVE COMPONENT MONITOR ENGINE MANAGEMENT DRIVE CYCLE

To avoid unnecessary complexity, a single comprehensive engine management drive cycle has not been developed for XK-TYPE. Refer to the individual DTC for specific drive cycle / monitoring conditions.

COMPREHENSIVE COMPONENT MONITOR TRANSMISSION DRIVE CYCLE

To avoid unnecessary complexity, a single comprehensive transmission drive cycle has not been developed for XK-TYPE. Refer to the individual DTC for specific drive cycle / monitoring conditions.

POWERTRAIN CONTROL ACRONYMS:

A/C	Air conditioning
APP Sensor	Accelerator Pedal Position Sensor
ASC	Adaptive Speed Control
B+	Battery Voltage
Bank 1	RH Engine cylinder bank (cylinders 1, 3, 5, 7) (A Bank)
Bank 2	LH Engine cylinder bank (cylinders 2, 4, 6, 8) (B Bank)
BARO Sensor	Barometric Pressure Sensor
CAN	Controller Area Network
CKP Sensor	Crankshaft Position Sensor
CMP Sensor 1	Camshaft Position Sensor – Bank 1
CMP Sensor 2	Camshaft Position Sensor – Bank 2
DLC	Data Link Connector
DSC	Dynamic Stability Control
ECM	Engine Control Module
ECT Sensor	Engine Coolant Temperature Sensor
EFT Sensor	Engine Fuel Temperature Sensor
EGR	Exhaust Gas Recirculation
EOT Sensor	Engine Oil Temperature Sensor
EVAP Canister Close Valve	Evaporative Emission Canister Close Valve
EVAP Canister Purge Valve	Evaporative Emission Canister Purge Valve
FTP Sensor	Fuel Tank Pressure Sensor
HO2 Sensor 1 / 1	Heated Oxygen Sensor – Bank 1 / Upstream
HO2 Sensor 1 / 2	Heated Oxygen Sensor – Bank 1 / Downstream
HO2 Sensor 2 / 1	Heated Oxygen Sensor – Bank 2 / Upstream
HO2 Sensor 2 / 2	Heated Oxygen Sensor – Bank 2 / Downstream

IAT Sensor	Intake Air Temperature Sensor
IC	Instrument Cluster
IP Sensor	Injection Pressure Sensor
KS 1	Knock Sensor – Bank 1
KS 2	Knock Sensor – Bank 2
MAF Sensor	Mass Air Flow Sensor
MAP Sensor	Manifold Absolute Pressure Sensor
N/A	Normally Aspirated
SC	Supercharged
TCC	Torque converter clutch
TCM	Transmission Control Module
TFT Sensor	Transmission Fluid Temperature Sensor
TP Sensor	Throttle Position Sensor
V8	V8 Engine
VVT Valve 1	Variable Valve Timing Valve – Bank 1
VVT Valve 2	Variable Valve Timing Valve – Bank 2

DTC	SYS	FAULT DESCRIPTION	MONITORING CONDITIONS	CK ENG	OTHER	DEFAULT ACTION	CM PIN	POSSIBLE CAUSES
P0010	EMS OBD II	VVT circuit malfunction – bank 1	Idle engine 30 seconds Accelerate from stop through complete engine rpm range Coast to a stop Drive the vehicle steadily between 48 – 97 km/h (30 – 60 mph) for 5 minutes; coast to a stop Accelerate smoothly through complete accelerator pedal travel; coast to a stop Idle engine 30 seconds	2	N	ECM Default: – Bank 1 VVT hold current set at a constant value of 520 mA	EM80 -109	VVT solenoid valve disconnected VVT solenoid valve to ECM PWM drive circuit: open circuit, short circuit, high resistance VVT solenoid failure
P0020	EMS OBD II	VVT circuit malfunction – bank 2	Idle engine 30 seconds Accelerate from stop through complete engine rpm range; coast to a stop Drive the vehicle steadily between 48 – 97 km/h (30 – 60 mph) for 5 minutes; coast to a stop Accelerate smoothly through complete accelerator pedal travel; coast to a stop Idle engine 30 seconds	2	N	ECM Default: – Bank 2 VVT hold current set at a constant value of 520 mA	EM80 -110	VVT solenoid valve disconnected VVT solenoid valve to ECM PWM drive circuit: open circuit, short circuit, high resistance VVT solenoid failure
P0031	EMS OBD II	HO2 Sensor heater control circuit low current – bank 1, upstream (1/1)	Heated oxygen sensors monitor drive cycle – page 5 (Oxygen sensor heaters)	2	N	ECM Default: – Bank 1 closed loop fuel metering and adaptive fuel metering inhibited – Canister purge inhibited – Bank 1 upstream HO2S heater control circuit switched off	EM80 -001 -002 -029 -030	HO2 Sensor 1/1 heater power supply circuit: open circuit HO2 Sensor 1/1 heater control circuit: open circuit, high resistance HO2 Sensor 1/1 heater ground circuit(s) fault (EM80-029, EM80-030) HO2 Sensor 1/1 heater failure

DTC	SYS	FAULT DESCRIPTION	MONITORING CONDITIONS	CK ENG	OTHER	DEFAULT ACTION	CM PIN	POSSIBLE CAUSES
P0032	EMS OBD II	HO2 Sensor heater control circuit high current – bank 1, upstream (1/1)	Heated oxygen sensors monitor drive cycle – page 5 (Oxygen sensor heaters)	2	N	ECM Default: – Bank 1 closed loop fuel metering and adaptive fuel metering inhibited – Canister purge inhibited – Bank 1 upstream HO2S heater control circuit switched off	EM80 -001 -002 -029 -030	HO2 Sensor 1/1 heater control circuit: short circuit to ground HO2 Sensor 1/1 heater ground circuit(s) fault (EM80-029, EM80-030) HO2 Sensor 1/1 heater failure
P0037	EMS OBD II	HO2 Sensor heater control circuit low resistance – bank 1, downstream (1/2)	Heated oxygen sensors monitor drive cycle – page 5 (Oxygen sensor heaters)	2	N	None	EM80 -092	HO2 Sensor 1/2 heater control circuit: short circuit to ground HO2 Sensor 1/2 heater failure
P0038	EMS OBD II	HO2 Sensor heater control circuit high resistance – bank 1, downstream (1/2)	Heated oxygen sensors monitor drive cycle – page 5 (Oxygen sensor heaters)	2	N	None	EM80 -092	HO2 Sensor 1/2 heater control circuit: open circuit; high resistance HO2 Sensor 1/2 heater failure
P0051	EMS OBD II	HO2 Sensor heater control circuit low current – bank 2, upstream (2/1)	Heated oxygen sensors monitor drive cycle – page 5 (Oxygen sensor heaters)	2	N	ECM Default: – Bank 2 closed loop fuel metering and adaptive fuel metering inhibited – Canister purge inhibited – Bank 2 upstream HO2S heater control circuit switched off	EM80 -055 -056 -081 -082	HO2 Sensor 2/1 heater power supply circuit: open circuit HO2 Sensor 2/1 heater control circuit: open circuit, high resistance HO2 Sensor 2/1 heater ground circuit(s) fault (EM80-081, EM80-082) HO2 Sensor 2/1 heater failure

DTC	SYS	FAULT DESCRIPTION	MONITORING CONDITIONS	CK ENG	OTHER	DEFAULT ACTION	CM PIN	POSSIBLE CAUSES
P0052	EMS OBD II	HO2 Sensor heater control circuit high current – bank 2, upstream (2/1)	Heated oxygen sensors monitor drive cycle – page 5 (Oxygen sensor heaters)	2	N	ECM Default: – Bank 2 closed loop fuel metering and adaptive fuel metering inhibited – Canister purge inhibited – Bank 2 upstream HO2S heater control circuit switched off	EM80 -055 -056 -081 -082	HO2 Sensor 2/1 heater control circuit: short circuit to ground HO2 Sensor 2/1 heater ground circuit(s) fault (EM80-081, EM80-082) HO2 Sensor 2/1 heater failure
P0057	EMS OBD II	HO2 Sensor heater control circuit low resistance – bank 2, downstream (2/2)	Heated oxygen sensors monitor drive cycle – page 5 (Oxygen sensor heaters)	2	N	None	EM80 -093	HO2 Sensor 2/2 heater control circuit: short circuit to ground HO2 Sensor 2/2 heater failure
P0058	EMS OBD II	HO2 Sensor heater control circuit high resistance – bank 2, downstream (2/2)	Heated oxygen sensors monitor drive cycle – page 5 (Oxygen sensor heaters)	2	N	None	EM80 -093	HO2 Sensor 2/2 heater control circuit: open circuit; high resistance HO2 Sensor 2/2 heater failure
P0096	V8 SC EMS OBD II	IAT Sensor 2 circuit range / performance	Engine coolant temperature < 40 °C (104 °F) Ambient temperature < 40 °C (104 °F) Engine coolant temperature and ambient temperature within 10 °C (20 °F) of each other Start engine and drive above 1500 rpm at a steady speed for a minimum of 2 minutes	2	A	ECM Default: – Default value of 70 °C (158 °F) used	EM80 -072	IAT Sensor 2 disconnected IAT Sensor 2 to ECM sensing circuit: open circuit IAT Sensor 2 failure
P0097	V8 SC EMS OBD II	IAT Sensor 2 circuit high voltage (low air temperature)	Ignition ON 10 seconds	2	A	ECM Default: – Default value of 70 °C (158 °F) used	EM80 -072	IAT Sensor 2 disconnected IAT Sensor 2 to ECM wiring: open circuit or high resistance IAT Sensor 2 to ECM sensing circuit: short circuit to B+ voltage IAT Sensor 2 failure

DTC	SYS	FAULT DESCRIPTION	MONITORING CONDITIONS	CK ENG	OTHER	DEFAULT ACTION	CM PIN	POSSIBLE CAUSES
P0098	V8 SC EMS OBD II	IAT Sensor 2 circuit low voltage (high air temperature)	Ignition ON 10 seconds	2	A	ECM Default: – Default value of 70 °C (158 °F) used	EM80 -072	IAT Sensor 2 to ECM wiring: short circuit to ground IAT Sensor 2 failure
P0101	EMS OBD II	MAF Sensor circuit range / performance	Fuel level > 25% Start engine and bring to normal operating temperature > 82 °C (180 °F) Drive the vehicle steadily in 4th or 5th gear on a level road between 1200 – 1800 rpm; hold the engine speed constant for 40 seconds while maintaining a steady throttle	2	A	ECM Default: – Default air mass used – Adaptive fuel metering inhibited – Catalyst warm up ignition retard inhibited – Canister purge inhibited – Maximum engine speed reduced	EM80 -044	Blocked air cleaner Air intake leak Engine breather leak Throttle control malfunction MAF Sensor to ECM sensing circuit: high resistance, intermittent short circuit to ground MAF Sensor supply circuit: high resistance MAF Sensor failure Throttle adaption fault (check throttle position voltage at Ignition ON)
P0102	EMS OBD II	MAF Sensor circuit low voltage	Ignition ON 10 seconds	2	A	ECM Default: – Default air mass used – Adaptive fuel metering inhibited – Catalyst warm up ignition retard inhibited – Canister purge inhibited – Maximum engine speed reduced	EM80 -044	Blocked air cleaner Air intake leak between MAF Sensor and throttle MAF Sensor to ECM sensing circuit: high resistance, open circuit, intermittent short circuit to ground MAF Sensor supply circuit: open circuit, short circuit to ground MAF Sensor failure

DTC	SYS	FAULT DESCRIPTION	MONITORING CONDITIONS	CK ENG	OTHER	DEFAULT ACTION	CM PIN	POSSIBLE CAUSES
P0103	EMS OBD II	MAF Sensor circuit high voltage	Ignition ON 10 seconds	2	A	ECM Default: – Default air mass used – Adaptive fuel metering inhibited – Catalyst warm up ignition retard inhibited – Canister purge inhibited – Maximum engine speed reduced	EM80 -044 -045 -046	MAF Sensor to ECM sensing circuit: short circuit to B+ voltage MAF Sensor to ECM sensor ground circuit: open circuit MAF Sensor failure
P0105	EMS OBD II	MAP Sensor circuit malfunction	Fuel level > 25% Start engine and bring to normal operating temperature > 82 °C (180 °F) Drive the vehicle steadily in 4th or 5th gear on a level road between 1200 – 1800 rpm; hold the engine speed constant for 40 seconds while maintaining a steady throttle	2	N	ECM Default: – Default value of 1.013 BAR (29.92 in hg) used	EM80 -127	Intake manifold air leak (loose or missing component) MAP Sensor to ECM circuit(s) fault MAP Sensor failure Throttle adaption fault (check throttle position voltage at Ignition ON)
P0106	EMS OBD II	BARO Sensor circuit range / performance	Engine temperature cool (cooling fans not running) Remove ignition key for 20 seconds (cooling fans not running) Ignition key in, position II for 5 seconds (do not start) Repeat cycle twice more	2	N	ECM Default: – Default value of 1 BAR (29.53 in hg) used	—	BARO Sensor failure (internal ECM fault)
P0107	EMS OBD II	BARO Sensor circuit low voltage	Ignition ON 10 seconds	2	N	ECM Default: – Default value of 1 BAR (29.53 in hg) used	—	BARO Sensor failure (internal ECM fault)

DTC	SYS	FAULT DESCRIPTION	MONITORING CONDITIONS	CK ENG	OTHER	DEFAULT ACTION	CM PIN	POSSIBLE CAUSES
P0108	EMS OBD II	BARO Sensor circuit high voltage	Ignition ON 10 seconds	2	N	ECM Default: – Default value of 1 BAR (29.53 in hg) used	—	BARO Sensor failure (internal ECM fault)
P0111	EMS OBD II	IAT Sensor circuit range / performance	Engine OFF; coolant temperature < 35 °C (95 °F) Start engine and hold 3000 rpm in P or N for 30 seconds	2	N	ECM Default: – Default value substituted 50 °C (122 °F)	EM80-071	Blocked air cleaner Air intake leak Engine breather leak IAT Sensor to ECM wiring: open circuit or high resistance IAT Sensor to ECM sensing circuit: short circuit to high voltage IAT Sensor failure
P0112	EMS OBD II	IAT Sensor circuit high voltage (low air temperature)	Ignition ON 10 seconds	2	N	ECM Default: – Default value substituted 50 °C (122 °F)	EM80-071	IAT Sensor disconnected IAT Sensor to ECM wiring: open circuit or high resistance IAT Sensor to ECM sensing circuit: short circuit to B+ voltage IAT Sensor failure
P0113	EMS OBD II	IAT Sensor circuit low voltage (high air temperature)	Ignition ON 10 seconds	2	N	ECM Default: – Default value substituted 50 °C (122 °F)	EM80-071	IAT Sensor to ECM wiring: short circuit to ground IAT Sensor failure

DTC	SYS	FAULT DESCRIPTION	MONITORING CONDITIONS	CK ENG	OTHER	DEFAULT ACTION	CM PIN	POSSIBLE CAUSES
P0116	EMS OBD II	ECT Sensor circuit range / performance	Engine coolant temperature and ambient temperature within 10 °C (20 °F) of each other Start engine and drive the vehicle steadily in 4th or 5th gear above 1700 rpm until the engine coolant temperature reaches 80 °C (176 °F) CAUTION: Overheating is possible if the ECT sensor is faulty and cooling fans do not operate	2	A	ECM Default: – EOT value substituted (no greater than 95 °C (203 °F)) – Closed loop fuel metering inhibited – Adaptive fuel metering inhibited – Catalyst warm-up ignition retard inhibited – Canister purge inhibited – Maximum engine speed reduced	EM80 -070	ECT Sensor disconnected Low coolant level Contaminated coolant Engine thermostat failure ECT Sensor to ECM sensing circuit: open circuit, high resistance when hot, intermittent high resistance ECT Sensor failure
P0117	EMS OBD II	ECT Sensor circuit high voltage (low coolant temperature)	Ignition ON 10 seconds	2	A	ECM Default: – EOT value substituted (no greater than 95 °C (203 °F)) – Closed loop fuel metering inhibited – Adaptive fuel metering inhibited – Catalyst warm-up ignition retard inhibited – Canister purge inhibited – Maximum engine speed reduced	EM80 -070	ECT Sensor disconnected ECT Sensor to ECM sensing circuit: high resistance, open circuit, short circuit to B+ voltage ECT Sensor failure

DTC	SYS	FAULT DESCRIPTION	MONITORING CONDITIONS	CK ENG	OTHER	DEFAULT ACTION	CM PIN	POSSIBLE CAUSES
P0118	EMS OBD II	ECT Sensor circuit low voltage (high coolant temperature)	Ignition ON 10 seconds	2	A	ECM Default: - EOT value substituted (no greater than 95 °C (203 °F)) - Closed loop fuel metering inhibited - Adaptive fuel metering inhibited - Catalyst warm-up ignition retard inhibited - Canister purge inhibited - Maximum engine speed reduced	EM80 -070	Engine overheat condition ECT Sensor to ECM wiring: short circuit to ground ECT Sensor failure
P0121	EMS OBD II	TP Sensor range / performance (TP1 compared to TP2)	Battery voltage > 10 volts Ignition ON Slowly press accelerator pedal to the floor over a 5 second period Slowly return the pedal to rest Repeat 3 times	2	R	ECM Default: - Throttle motor and throttle motor relay disabled - Throttle valve opening set to default value - Idle speed controlled by fuel injection intervention - Idle speed adaption inhibited	EM80 -075 -076	TP Sensor to ECM wiring: open circuit, high resistance TP Sensor to ECM sensing circuits (TP1 or TP2): short circuit to B+ voltage TP Sensor failure
P0122	EMS OBD II	TP Sensor circuit 1 low voltage	Battery voltage > 10 volts Ignition ON Slowly press accelerator pedal to the floor over a 5 second period Slowly return the pedal to rest Repeat 3 times	2	R	ECM Default: - Throttle motor and throttle motor relay disabled - Throttle valve opening set to default value - Idle speed controlled by fuel injection intervention - Idle speed adaption inhibited	EM80 -075	TP Sensor to ECM sensing circuit (TP1): open circuit, short circuit to ground, high resistance TP Sensor failure

DTC	SYS	FAULT DESCRIPTION	MONITORING CONDITIONS	CK ENG	OTHER	DEFAULT ACTION	CM PIN	POSSIBLE CAUSES
P0123	EMS OBD II	TP Sensor circuit 1 high voltage	Battery voltage > 10 volts Ignition ON Slowly press accelerator pedal to the floor over a 5 second period Slowly return the pedal to rest Repeat 3 times	2	R	ECM Default: – Throttle motor and throttle motor relay disabled – Throttle valve opening set to default value – Idle speed controlled by fuel injection intervention – Idle speed adaption inhibited	EM80 -075	TP Sensor to ECM sensing circuit (TP1): short circuit to high voltage TP Sensor failure
P0125	EMS OBD II	ECT Sensor response (for closed loop fuel control) (Coolant thermostat monitor)	Engine coolant temperature and ambient temperature within 10 °C (20 °F) of each other Start engine and drive the vehicle steadily in 4th or 5th gear above 1700 rpm until the engine coolant temperature reaches 80 °C (176 °F) CAUTION: Overheating is possible if the ECT sensor is faulty and cooling fans do not operate	2	A	ECM Default: – EOT value substituted (no greater than 95 °C (203 °F)) – Closed loop fuel metering inhibited – Adaptive fuel metering inhibited – Catalyst warm-up ignition retard inhibited – Canister purge inhibited – Maximum engine speed reduced	EM80 -070	ECT Sensor disconnected Low coolant level Contaminated coolant Engine coolant thermostat failure ECT Sensor to ECM sensing circuit: high resistance, open circuit or short circuit to high voltage Engine cooling fan stuck on high speed Above normal air flow through engine compartment due to accident damage and/or missing panels
P0128	EMS OBD II	Coolant thermostat range / performance	Engine OFF; coolant temperature < 35 °C (95 °F) Start engine and drive until normal engine operating temperature > 85 °C (180 °F)	2	N	None	—	Contaminated coolant Engine coolant thermostat failure ECT Sensor failure (ECT Sensor DTC(s) also flagged)
P0131	EMS OBD II	HO2 Sensor sense circuit low current – bank 1, upstream (1/1) (Universal oxygen sensor: lean condition at ECM – high current at sensor)	Heated oxygen sensors monitor drive cycle – page 5 (Upstream oxygen sensors)	2	N	None	EM80 -083 -084	HO2 Sensor 1/1 disconnected HO2 Sensor 1/1 to ECM variable current circuit fault (HO2 Sensor pin 3) ECM to HO2 Sensor 1/1 constant current circuit fault (HO2 Sensor pin 4) HO2 Sensor 1/1 failure

DTC	SYS	FAULT DESCRIPTION	MONITORING CONDITIONS	CK ENG	OTHER	DEFAULT ACTION	CM PIN	POSSIBLE CAUSES
P0132	EMS OBD II	HO2 Sensor sense circuit high current – bank 1, upstream (1/1) (Universal oxygen sensor: rich condition at ECM – low current at sensor)	Heated oxygen sensors monitor drive cycle – page 5 (Upstream oxygen sensors)	2	N	None	EM80 -083 -084	HO2 Sensor 1/1 disconnected HO2 Sensor 1/1 to ECM variable current circuit fault (HO2 Sensor pin 3) ECM to HO2 Sensor 1/1 constant current circuit fault (HO2 Sensor pin 4) HO2 Sensor 1/1 failure
P0133	EMS OBD II	HO2 Sensor sense circuit slow response – bank 1, upstream (1/1)	Heated oxygen sensors monitor drive cycle – page 5 (Upstream oxygen sensors)	2	N	ECM Default: – Bank 1 closed loop fuel metering inhibited – Canister purge inhibited	EM80 -083 -084	Engine misfire HO2 Sensor 1/1 disconnected HO2 Sensor 1/1 mechanical damage HO2 Sensor 1/1 to ECM wiring fault HO2 Sensor 1/1 short circuit to ground HO2 Sensor 1/1 to ECM wiring shield open circuit HO2 Sensor 1/1 heater circuit fault Exhaust leak Low exhaust temperature Injector flow partially blocked Catalyst efficiency decrease HO2 Sensor 1/1 failure
P0137	EMS OBD II	HO2 Sensor sense circuit low voltage – bank 1, downstream (1/2)	Heated oxygen sensors monitor drive cycle – page 5 (Downstream oxygen sensors)	2	N	None	EM80 -128	HO2 Sensor 1/2 disconnected HO2 Sensor 1/2 to ECM wiring open circuit HO2 Sensor 1/2 short circuit to ground HO2 Sensor 1/2 failure
P0138	EMS OBD II	HO2 Sensor sense circuit high voltage – bank 1, downstream (1/2)	Heated oxygen sensors monitor drive cycle – page 5 (Downstream oxygen sensors)	2	N	None	EM80 -128	HO2 Sensor 1/2 sensing circuit: short circuit to high voltage HO2 Sensor 1/2 ground (BRD – braided shield) open circuit HO2 Sensor 1/2 failure

DTC	SYS	FAULT DESCRIPTION	MONITORING CONDITIONS	CK ENG	OTHER	DEFAULT ACTION	CM PIN	POSSIBLE CAUSES
P0140	EMS OBD II	HO2 Sensor sense circuit no activity – bank 1, downstream (1/2)	Heated oxygen sensors monitor drive cycle – page 5 (Downstream oxygen sensors)	2	N	None	EM80 -128	HO2 Sensor 1/2 disconnected HO2 Sensor 1/2 mechanical damage HO2 Sensor 1/2 to ECM wiring open circuit HO2 Sensor 1/2 sensing circuit: short circuit to high voltage HO2 Sensor 1/2 short circuit to ground HO2 Sensor 1/2 ground (BRD – braided shield) open circuit Exhaust leak Low exhaust temperature HO2 Sensor 1/2 failure
P0151	EMS OBD II	HO2 Sensor sense circuit low current – bank 2, upstream (2/1) (Universal oxygen sensor: lean condition at ECM – high current at sensor)	Heated oxygen sensors monitor drive cycle – page 5 (Upstream oxygen sensors)	2	N	None	EM80 -107 -108	HO2 Sensor 2/1 disconnected HO2 Sensor 2/1 to ECM variable current circuit fault (HO2 Sensor pin 3) ECM to HO2 Sensor 2/1 constant current circuit fault (HO2 Sensor pin 4) HO2 Sensor 2/1 failure
P0152	EMS OBD II	HO2 Sensor sense circuit high current – bank 2, upstream (2/1) (Universal oxygen sensor: rich condition at ECM – low current at sensor)	Heated oxygen sensors monitor drive cycle – page 5 (Upstream oxygen sensors)	2	N	None	EM80 -107 -108	HO2 Sensor 2/1 disconnected HO2 Sensor 2/1 to ECM variable current circuit fault (HO2 Sensor pin 3) ECM to HO2 Sensor 2/1 constant current circuit fault (HO2 Sensor pin 4) HO2 Sensor 2/1 failure

DTC	SYS	FAULT DESCRIPTION	MONITORING CONDITIONS	CK ENG	OTHER	DEFAULT ACTION	CM PIN	POSSIBLE CAUSES
P0153	EMS OBD II	HO2 Sensor sense circuit slow response – bank 2, upstream (2/1)	Heated oxygen sensors monitor drive cycle – page 5 (Upstream oxygen sensors)	2	N	ECM Default: – Bank 1 closed loop fuel metering inhibited – Canister purge inhibited	EM80 -107 -108	Engine misfire HO2 Sensor 2/1 disconnected HO2 Sensor 2/1 mechanical damage HO2 Sensor 2/1 to ECM wiring fault HO2 Sensor 2/1 short circuit to ground HO2 Sensor 2/1 to ECM wiring shield open circuit HO2 Sensor 2/1 heater circuit fault Exhaust leak Low exhaust temperature Injector flow partially blocked Catalyst efficiency decrease HO2 Sensor 2/1 failure
P0157	EMS OBD II	HO2 Sensor sense circuit low voltage – bank 2, downstream (2/2)	Heated oxygen sensors monitor drive cycle – page 5 (Downstream oxygen sensors)	2	N	None	EM80 -129	HO2 Sensor 2/2 disconnected HO2 Sensor 2/2 to ECM wiring open circuit HO2 Sensor 2/2 short circuit to ground HO2 Sensor 2/2 failure
P0158	EMS OBD II	HO2 Sensor sense circuit high voltage – bank 2, downstream (2/2)	Heated oxygen sensors monitor drive cycle – page 5 (Downstream oxygen sensors)	2	N	None	EM80 -129	HO2 Sensor 2/2 sensing circuit: short circuit to high voltage HO2 Sensor 2/2 ground (BRD – braided shield) open circuit HO2 Sensor 2/2 failure

DTC	SYS	FAULT DESCRIPTION	MONITORING CONDITIONS	CK ENG	OTHER	DEFAULT ACTION	CM PIN	POSSIBLE CAUSES
P0160	EMS OBD II	HO2 Sensor sense circuit no activity – bank 2, downstream (2/2)	Heated oxygen sensors monitor drive cycle – page 5 (Downstream oxygen sensors)	2	N	None	EM80 -129	HO2 Sensor 2/2 disconnected HO2 Sensor 2/2 mechanical damage HO2 Sensor 2/2 to ECM wiring open circuit HO2 Sensor 2/2 sensing circuit short circuit to high voltage HO2 Sensor 2/2 short circuit to ground HO2 Sensor 2/2 ground (BRD – braided shield) open circuit Exhaust leak Low exhaust temperature HO2 Sensor 2/2 failure
P0171	EMS OBD II	Bank 1 combustion too lean	Start engine and bring to normal operating temperature > 82 °C (180 °F) Idle for 10 minutes	2	N	ECM Default: – Bank 1 catalyst warm-up ignition retard inhibited – Bank 1 closed loop fuel metering inhibited – Canister purge inhibited – Maximum engine speed reduced	—	Engine misfire Air intake leak between MAF Sensor and cylinder head Fuel filter / system restriction Fuel injector restriction IP Sensor fault (low fuel pressure) Low fuel pump output HO2 Sensor(s) (1/1, 1/2) harness wiring condition fault EFT Sensor fault (low fuel temperature) MAF Sensor fault (low intake air flow) Exhaust leak (before catalyst) ECM receiving incorrect signal from one or more of the following components: ECT Sensor, MAF Sensor, IAT Sensor, IP Sensor, EFT Sensor, TP Sensor

DTC	SYS	FAULT DESCRIPTION	MONITORING CONDITIONS	CK ENG	OTHER	DEFAULT ACTION	CM PIN	POSSIBLE CAUSES
P0172	EMS OBD II	Bank 1 combustion too rich	Start engine and bring to normal operating temperature > 82 °C (180 °F) Idle for 10 minutes	2	N	ECM Default: – Bank 1 catalyst warm-up ignition retard inhibited – Bank 1 closed loop fuel metering inhibited – Canister purge inhibited – Maximum engine speed reduced	—	Restricted air filter Leaking fuel injector(s) IP Sensor fault (high fuel pressure) EFT Sensor fault (high fuel temperature) MAF Sensor fault (high intake air flow) HO2 Sensor(s) (1/1, 1/2) harness wiring condition fault ECM receiving incorrect signal from one or more of the following components: ECT Sensor, MAF Sensor, IAT Sensor, IP Sensor, EFT Sensor, TP Sensor
P0174	EMS OBD II	Bank 2 combustion too lean	Start engine and bring to normal operating temperature > 82 °C (180 °F) Idle for 10 minutes	2	N	ECM Default: – Bank 2 catalyst warm-up ignition retard inhibited – Bank 2 closed loop fuel metering inhibited – Canister purge inhibited – Maximum engine speed reduced	—	Engine misfire Air intake leak between MAF Sensor and cylinder head Fuel filter / system restriction Fuel injector restriction IP Sensor fault (low fuel pressure) Low fuel pump output HO2 Sensor(s) (2/1, 2/2) harness wiring condition fault EFT Sensor fault (low fuel temperature) MAF Sensor fault (low intake air flow) Exhaust leak (before catalyst) ECM receiving incorrect signal from one or more of the following components: ECT Sensor, MAF Sensor, IAT Sensor, IP Sensor, EFT Sensor, TP Sensor

DTC	SYS	FAULT DESCRIPTION	MONITORING CONDITIONS	CK ENG	OTHER	DEFAULT ACTION	CM PIN	POSSIBLE CAUSES
P0175	EMS OBD II	Bank 2 combustion too rich	Start engine and bring to normal operating temperature > 82 °C (180 °F) Idle for 10 minutes	2	N	ECM Default: – Bank 2 catalyst warm-up ignition retard inhibited – Bank 2 closed loop fuel metering inhibited – Canister purge inhibited – Maximum engine speed reduced	—	Restricted air filter Leaking fuel injector(s) IP Sensor fault (high fuel pressure) EFT Sensor fault (high fuel temperature) MAF Sensor fault (high intake air flow) HO2 Sensor(s) (2/1, 2/2) harness wiring condition fault ECM receiving incorrect signal from one or more of the following components: ECT Sensor, MAF Sensor, IAT Sensor, IP Sensor, EFT Sensor, TP Sensor
P0181	EMS OBD II	EFT Sensor range / performance	Engine OFF; coolant temperature < 35 °C (95 °F) Start engine and drive until normal engine operating temperature > 82 °C (180 °F) Drive for an additional 25 minutes	2	N	ECM Default: – Default value of 25 °C (77 °F) used	EM80 -050	EFT Sensor disconnected EFT Sensor to ECM sensing circuit: high resistance, open circuit, short circuit to ground short circuit to high voltage EFT Sensor to splice sensor ground circuit: high resistance, open circuit EFT Sensor failure
P0182	EMS OBD II	EFT Sensor circuit low voltage (high temperature)	Ignition ON 10 seconds	2	N	ECM Default: – Default value of 25 °C (77 °F) used	EM80 -050	EFT Sensor to ECM sensing circuit: short circuit to ground EFT Sensor to splice sensor ground circuit: short circuit EFT Sensor failure
P0183	EMS OBD II	EFT Sensor circuit high voltage (low temperature)	Ignition ON 10 seconds	2	N	ECM Default: – Default value of 25 °C (77 °F) used	EM80 -050	EFT Sensor disconnected EFT Sensor to ECM sensing circuit: high resistance, open circuit, short circuit to high voltage EFT Sensor to splice sensor ground circuit: high resistance, open circuit EFT Sensor failure

DTC	SYS	FAULT DESCRIPTION	MONITORING CONDITIONS	CK ENG	OTHER	DEFAULT ACTION	CM PIN	POSSIBLE CAUSES
P0191	EMS OBD II	IP Sensor circuit range / performance	Fuel level > 25% Idle engine 30 seconds Accelerate from stop through complete engine rpm range; coast to a stop Drive the vehicle steadily between 48 – 97 km/h (30 – 60 mph) for 5 minutes; coast to a stop Accelerate smoothly through complete accelerator pedal travel; coast to a stop Idle engine 30 seconds	2	N	ECM Default: – Default value of 3.80 BAR (55.11 psi) used – Fuel pump feedback control inhibited	EM80 -073	Fuel filter / system restriction Fuel system leak Incorrect fuel pump output IP Sensor to ECM sensing circuit: high resistance, open circuit, short circuit to ground, short circuit to high voltage IP Sensor to splice sensor supply circuit: high resistance, open circuit IP Sensor to splice sensor ground circuit: high resistance, open circuit, short circuit to ground, short circuit to high voltage IP Sensor failure
P0192	EMS OBD II	IP Sensor sensor circuit low voltage (low pressure)	Ignition ON 10 seconds	2	N	ECM Default: – Default value of 3.80 BAR (55.11 psi) used – Fuel pump feedback control inhibited	EM80 -073	IP Sensor disconnected IP Sensor to ECM sensing circuit: open circuit or short circuit to ground IP Sensor to splice sensor supply circuit: high resistance open circuit IP Sensor failure
P0193	EMS OBD II	IP Sensor sensor circuit high voltage (high pressure)	Ignition ON 10 seconds	2	N	ECM Default: – Default value of 3.80 BAR (55.11 psi) used – Fuel pump feedback control inhibited	EM80 -073	IP Sensor to ECM wiring (supply, sense): short circuit to each other IP Sensor to ECM sense circuit: short circuit to high voltage IP Sensor to splice sensor ground circuit: open circuit IP Sensor failure
P0196	EMS OBD II	EOT Sensor range / performance	Engine OFF; coolant temperature < 35 °C (95 °F) Start engine and drive until normal engine operating temperature > 82 °C (180 °F)	2	N	ECM Default: – ECT substituted	EM80 -078	EOT Sensor to ECM sensing circuit: high resistance when hot, intermittent high resistance EOT Sensor failure

DTC	SYS	FAULT DESCRIPTION	MONITORING CONDITIONS	CK ENG	OTHER	DEFAULT ACTION	CM PIN	POSSIBLE CAUSES
P0197	EMS OBD II	EOT Sensor low voltage (high temperature)	Ignition ON 10 seconds	2	N	ECM Default: – ECT substituted	EM80 -078	EOT Sensor to ECM sensing circuit: short circuit to ground EOT Sensor failure
P0198	EMS OBD II	EOT Sensor high voltage (low temperature)	Ignition ON 10 seconds	2	N	ECM Default: – ECT substituted	EM80 -078	EOT Sensor disconnected EOT Sensor to ECM sensing circuit: high resistance, open circuit, short circuit to B+ voltage EOT Sensor failure
P0201	EMS OBD II	Fuel injector 1 circuit malfunction	Start engine Battery voltage > 12 volts Idle for 2 minutes	2	A	ECM Default: – Bank 1 closed loop fuel metering inhibited – Bank 1 adaptive fuel metering inhibited – Bank 1 catalyst warm up ignition retard inhibited – Canister purge inhibited – Maximum engine speed reduced	EM80 -120	Injector disconnected Injector harness wiring: open circuit, short circuit Injector failure
P0202	EMS OBD II	Fuel injector 2 circuit malfunction	Start engine Battery voltage > 12 volts Idle for 2 minutes	2	A	ECM Default: – Bank 2 closed loop fuel metering inhibited – Bank 2 adaptive fuel metering inhibited – Bank 2 catalyst warm up ignition retard inhibited – Canister purge inhibited – Maximum engine speed reduced	EM80 -115	Injector disconnected Injector harness wiring: open circuit, short circuit Injector failure

DTC	SYS	FAULT DESCRIPTION	MONITORING CONDITIONS	CK ENG	OTHER	DEFAULT ACTION	CM PIN	POSSIBLE CAUSES
P0203	EMS OBD II	Fuel injector 3 circuit malfunction	Start engine Battery voltage > 12 volts Idle for 2 minutes	2	A	ECM Default: – Bank 1 closed loop fuel metering inhibited – Bank 1 adaptive fuel metering inhibited – Bank 1 catalyst warm up ignition retard inhibited – Canister purge inhibited – Maximum engine speed reduced	EM80 -114	Injector disconnected Injector harness wiring: open circuit, short circuit Injector failure
P0204	EMS OBD II	Fuel injector 4 circuit malfunction	Start engine Battery voltage > 12 volts Idle for 2 minutes	2	A	ECM Default: – Bank 2 closed loop fuel metering inhibited – Bank 2 adaptive fuel metering inhibited – Bank 2 catalyst warm up ignition retard inhibited – Canister purge inhibited – Maximum engine speed reduced	EM80 -119	Injector disconnected Injector harness wiring: open circuit, short circuit Injector failure
P0205	EMS OBD II	Fuel injector 5 circuit malfunction	Start engine Battery voltage > 12 volts Idle for 2 minutes	2	A	ECM Default: – Bank 1 closed loop fuel metering inhibited – Bank 1 adaptive fuel metering inhibited – Bank 1 catalyst warm up ignition retard inhibited – Canister purge inhibited – Maximum engine speed reduced	EM80 -113	Injector disconnected Injector harness wiring: open circuit, short circuit Injector failure

DTC	SYS	FAULT DESCRIPTION	MONITORING CONDITIONS	CK ENG	OTHER	DEFAULT ACTION	CM PIN	POSSIBLE CAUSES
P0206	EMS OBD II	Fuel injector 6 circuit malfunction	Start engine Battery voltage > 12 volts Idle for 2 minutes	2	A	ECM Default: – Bank 2 closed loop fuel metering inhibited – Bank 2 adaptive fuel metering inhibited – Bank 2 catalyst warm up ignition retard inhibited – Canister purge inhibited – Maximum engine speed reduced	EM80 -118	Injector disconnected Injector harness wiring: open circuit, short circuit Injector failure
P0207	EMS OBD II	Fuel injector 7 circuit malfunction	Start engine Battery voltage > 12 volts Idle for 2 minutes	2	A	ECM Default: – Bank 1 closed loop fuel metering inhibited – Bank 1 adaptive fuel metering inhibited – Bank 1 catalyst warm up ignition retard inhibited – Canister purge inhibited – Maximum engine speed reduced	EM80 -117	Injector disconnected Injector harness wiring: open circuit, short circuit Injector failure
P0208	EMS OBD II	Fuel injector 8 circuit malfunction	Start engine Battery voltage > 12 volts Idle for 2 minutes	2	A	ECM Default: – Bank 2 closed loop fuel metering inhibited – Bank 2 adaptive fuel metering inhibited – Bank 2 catalyst warm up ignition retard inhibited – Canister purge inhibited – Maximum engine speed reduced	EM80 -112	Injector disconnected Injector harness wiring: open circuit, short circuit Injector failure

DTC	SYS	FAULT DESCRIPTION	MONITORING CONDITIONS	CK ENG	OTHER	DEFAULT ACTION	CM PIN	POSSIBLE CAUSES
P0222	EMS OBD II	TP Sensor sense circuit 2 (TP2) low voltage	Battery voltage > 10 volts Ignition ON Slowly press accelerator pedal to the floor over a 5 second period Slowly return the pedal to rest Repeat 3 times	2	R	ECM Default: – Throttle motor and throttle motor relay disabled – Throttle valve opening set to default value – Idle speed controlled by fuel injection intervention – Idle speed adaption inhibited	EM80 -076	TP Sensor to ECM sensing circuit (TP2): open circuit, short circuit to ground, high resistance TP Sensor failure
P0223	EMS OBD II	TP Sensor sense circuit 2 (TP2) high voltage	Battery voltage > 10 volts Ignition ON Slowly press accelerator pedal to the floor over a 5 second period Slowly return the pedal to rest Repeat 3 times	2	R	ECM Default: – Throttle motor and throttle motor relay disabled – Throttle valve opening set to default value – Idle speed controlled by fuel injection intervention – Idle speed adaption inhibited	EM80 -076	TP Sensor to ECM sensing circuit (TP2): short circuit to high voltage TP Sensor failure
P0300	EMS OBD II	Random misfire detected *Refer to Misfire Note, page 6	Misfire monitor drive cycle – page 6	1 or 2*	N	None	—	ECM to ignition coil primary circuit fault (Cylinder misfire detected DTC also flagged) Fuel injector circuit fault(s) (Injector DTCs also flagged) Ignition coil failure Spark plug failure / fouled / incorrect gap Cylinder compression low Fuel delivery pressure (low / high) Fuel injector(s) restricted / leaking Fuel injector(s) continuously open Fuel contamination Worn camshaft / broken valve spring(s)

DTC	SYS	FAULT DESCRIPTION	MONITORING CONDITIONS	CK ENG	OTHER	DEFAULT ACTION	CM PIN	POSSIBLE CAUSES
P0301	EMS OBD II	Misfire detected – cylinder 1 *Refer to Misfire Note, page 6	Misfire monitor drive cycle – page 6	1 or 2*	N	None	—	Refer to P0300 Possible Causes
P0302	EMS OBD II	Misfire detected – cylinder 2 *Refer to Misfire Note, page 6	Misfire monitor drive cycle – page 6	1 or 2*	N	None	—	Refer to P0300 Possible Causes
P0303	EMS OBD II	Misfire detected – cylinder 3 *Refer to Misfire Note, page 6	Misfire monitor drive cycle – page 6	1 or 2*	N	None	—	Refer to P0300 Possible Causes
P0304	EMS OBD II	Misfire detected – cylinder 4 *Refer to Misfire Note, page 6	Misfire monitor drive cycle – page 6	1 or 2*	N	None	—	Refer to P0300 Possible Causes
P0305	EMS OBD II	Misfire detected – cylinder 5 *Refer to Misfire Note, page 6	Misfire monitor drive cycle – page 6	1 or 2*	N	None	—	Refer to P0300 Possible Causes
P0306	EMS OBD II	Misfire detected – cylinder 6 *Refer to Misfire Note, page 6	Misfire monitor drive cycle – page 6	1 or 2*	N	None	—	Refer to P0300 Possible Causes
P0307	EMS OBD II	Misfire detected – cylinder 7 *Refer to Misfire Note, page 6	Misfire monitor drive cycle – page 6	1 or 2*	N	None	—	Refer to P0300 Possible Causes
P0308	EMS OBD II	Misfire detected – cylinder 8 *Refer to Misfire Note, page 6	Misfire monitor drive cycle – page 6	1 or 2*	N	None	—	Refer to P0300 Possible Causes
P0327	EMS OBD II	Bank 1 KS sense circuit out of range – low voltage	Start engine Battery voltage > 12 volts Idle for 2 minutes	2	A	ECM Default: – Maximum ignition retard – Maximum engine speed reduced	EM80 -098	Poor sensor contact with the cylinder block KS to ECM sense circuit short circuit to ground KS failure

DTC	SYS	FAULT DESCRIPTION	MONITORING CONDITIONS	CK ENG	OTHER	DEFAULT ACTION	CM PIN	POSSIBLE CAUSES
P0328	EMS OBD II	Bank 1 KS sense circuit out of range – high voltage	Start engine Battery voltage > 12 volts Idle for 2 minutes	2	A	ECM Default: – Maximum ignition retard – Maximum engine speed reduced	EM80 -098	Poor sensor contact with the cylinder block KS to ECM sense circuit: high resistance, open circuit, short circuit to high voltage KS failure
P0332	EMS OBD II	Bank 2 KS sense circuit out of range – low voltage	Start engine Battery voltage > 12 volts Idle for 2 minutes	2	A	ECM Default: – Maximum ignition retard – Maximum engine speed reduced	EM80 -099	Poor sensor contact with the cylinder block KS to ECM sense circuit short circuit to ground KS failure
P0333	EMS OBD II	Bank 2 KS sense circuit out of range – high voltage	Start engine Battery voltage > 12 volts Idle for 2 minutes	2	A	ECM Default: – Maximum ignition retard – Maximum engine speed reduced	EM80 -099	Poor sensor contact with the cylinder block KS to ECM sense circuit: high resistance, open circuit, short circuit to high voltage KS failure
P0335	EMS OBD II	CKP Sensor circuit malfunction	Start engine; increase engine speed to 1500 rpm and hold for 30 seconds Repeat 2 additional times Note: If CKP Sensor fault exists, engine will start after approximately 5 seconds of cranking as the ECM will default to CMP Sensor 1 signal for synchronization.	2	A	ECM Default: – Maximum engine speed reduced – CMP Sensor 1 signal used for synchronization	EM80 -036 -037	CKP Sensor disconnected CKP Sensor gap incorrect / foreign matter on sensor face CKP Sensor sensing circuit: open circuit, short circuit to ground, short circuit to high voltage CKP Sensor failure
P0336	EMS OBD II	CKP Sensor circuit range / performance	Start engine; momentarily race the engine; stop engine Repeat 2 additional times Start engine; drive vehicle; select 2nd gear Accelerate smoothly through complete accelerator pedal travel; coast to a stop	2	A	ECM Default: – Maximum engine speed reduced	EM80 -036 -037	CKP Sensor reluctor: foreign matter / damaged teeth CKP Sensor sensing circuit: intermittent open circuit, short circuit to ground, short circuit to high voltage CKP Sensor failure

DTC	SYS	FAULT DESCRIPTION	MONITORING CONDITIONS	CK ENG	OTHER	DEFAULT ACTION	CM PIN	POSSIBLE CAUSES
P0340	EMS OBD II	CMP Sensor 1 circuit malfunction – bank 1	Start engine; momentarily race the engine; stop engine Repeat 2 additional times Idle engine 1 minute	2	N	None	EM80 -094 -095	CMP Sensor disconnected CMP Sensor gap incorrect / foreign matter on sensor face CMP Sensor sensing circuit: open circuit, short circuit to ground, short circuit to high voltage CMP Sensor 1 failure
P0341	EMS OBD II	CMP Sensor 1 circuit range / performance – bank 1	Start engine; momentarily race the engine; stop engine Repeat 2 additional times Idle engine 1 minute	2	N	None	EM80 -094 -095	CMP Sensor disconnected CMP Sensor gap incorrect / foreign matter on sensor face CMP Sensor sensing circuit: open circuit, short circuit to ground, short circuit to high voltage CMP Sensor 1 failure
P0345*	EMS OBD II	CMP Sensor 2 circuit malfunction – bank 2 * P0345 Early production vehicles; P1340 later production vehicles	Start engine; momentarily race the engine; stop engine Repeat 2 additional times Idle engine 1 minute	2	N	None	EM80 -068 -069	CMP Sensor disconnected CMP Sensor gap incorrect / foreign matter on sensor face CMP Sensor sensing circuit: open circuit, short circuit to ground, short circuit to high voltage CMP Sensor 2 failure
P0346*	EMS OBD II	CMP Sensor 2 circuit range / performance – bank 2 * P0346 Early production vehicles; P1341 later production vehicles	Start engine; momentarily race the engine; stop engine Repeat 2 additional times Idle engine 1 minute	2	N	None	EM80 -068 -069	CMP Sensor disconnected CMP Sensor gap incorrect / foreign matter on sensor face CMP Sensor sensing circuit: open circuit, short circuit to ground, short circuit to high voltage CMP Sensor 2 failure

DTC	SYS	FAULT DESCRIPTION	MONITORING CONDITIONS	CK ENG	OTHER	DEFAULT ACTION	CM PIN	POSSIBLE CAUSES
P0351	EMS OBD II	Ignition module primary circuit malfunction – cylinder 1	Start engine Battery voltage > 12 volts Idle for 2 minutes	2	A	ECM Default: – Bank 1 closed loop fuel metering inhibited – Bank 1 sub feedback control inhibited – Bank 1 adaptive fuel metering inhibited – Maximum engine speed reduced – Fuel injection cut off (cylinder 1)	EM80 -087	ECM to ignition module / coil drive circuit: open circuit, short circuit to ground, high resistance Ignition module / coil ground circuit: open circuit, high resistance Ignition module / coil B+ voltage supply circuit: open circuit (including relay, if fitted) Ignition module / coil failure
P0352	EMS OBD II	Ignition module primary circuit malfunction – cylinder 2	Start engine Battery voltage > 12 volts Idle for 2 minutes	2	A	ECM Default: – Bank 2 closed loop fuel metering inhibited – Bank 2 sub feedback control inhibited – Bank 2 adaptive fuel metering inhibited – Maximum engine speed reduced – Fuel injection cut off (cylinder 2)	EM80 -061	ECM to ignition module / coil drive circuit: open circuit, short circuit to ground, high resistance Ignition module / coil ground circuit: open circuit, high resistance Ignition module / coil B+ voltage supply circuit: open circuit (including relay, if fitted) Ignition module / coil failure

DTC	SYS	FAULT DESCRIPTION	MONITORING CONDITIONS	CK ENG	OTHER	DEFAULT ACTION	CM PIN	POSSIBLE CAUSES
P0353	EMS OBD II	Ignition module primary circuit malfunction – cylinder 3	Start engine Battery voltage > 12 volts Idle for 2 minutes	2	A	ECM Default: – Bank 1 closed loop fuel metering inhibited – Bank 1 sub feedback control inhibited – Bank 1 adaptive fuel metering inhibited – Maximum engine speed reduced – Fuel injection cut off (cylinder 3)	EM80 -088	ECM to ignition module / coil drive circuit: open circuit, short circuit to ground, high resistance Ignition module / coil ground circuit: open circuit, high resistance Ignition module / coil B+ voltage supply circuit: open circuit (including relay, if fitted) Ignition module / coil failure
P0354	EMS OBD II	Ignition module primary circuit malfunction – cylinder 4	Start engine Battery voltage > 12 volts Idle for 2 minutes	2	A	ECM Default: – Bank 2 closed loop fuel metering inhibited – Bank 2 sub feedback control inhibited – Bank 2 adaptive fuel metering inhibited – Maximum engine speed reduced – Fuel injection cut off (cylinder 4)	EM80 -062	ECM to ignition module / coil drive circuit: open circuit, short circuit to ground, high resistance Ignition module / coil ground circuit: open circuit, high resistance Ignition module / coil B+ voltage supply circuit: open circuit (including relay, if fitted) Ignition module / coil failure

DTC	SYS	FAULT DESCRIPTION	MONITORING CONDITIONS	CK ENG	OTHER	DEFAULT ACTION	CM PIN	POSSIBLE CAUSES
P0355	EMS OBD II	Ignition module primary circuit malfunction – cylinder 5	Start engine Battery voltage > 12 volts Idle for 2 minutes	2	A	ECM Default: – Bank 1 closed loop fuel metering inhibited – Bank 1 sub feedback control inhibited – Bank 1 adaptive fuel metering inhibited – Maximum engine speed reduced – Fuel injection cut off (cylinder 5)	EM80 -089	ECM to ignition module / coil drive circuit: open circuit, short circuit to ground, high resistance Ignition module / coil ground circuit: open circuit, high resistance Ignition module / coil B+ voltage supply circuit: open circuit (including relay, if fitted) Ignition module / coil failure
P0356	EMS OBD II	Ignition module primary circuit malfunction – cylinder 6	Start engine Battery voltage > 12 volts Idle for 2 minutes	2	A	ECM Default: – Bank 2 closed loop fuel metering inhibited – Bank 2 sub feedback control inhibited – Bank 2 adaptive fuel metering inhibited – Maximum engine speed reduced – Fuel injection cut off (cylinder 6)	EM80 -063	ECM to ignition module / coil drive circuit: open circuit, short circuit to ground, high resistance Ignition module / coil ground circuit: open circuit, high resistance Ignition module / coil B+ voltage supply circuit: open circuit (including relay, if fitted) Ignition module / coil failure

DTC	SYS	FAULT DESCRIPTION	MONITORING CONDITIONS	CK ENG	OTHER	DEFAULT ACTION	CM PIN	POSSIBLE CAUSES
P0357	EMS OBD II	Ignition module primary circuit malfunction – cylinder 7	Start engine Battery voltage > 12 volts Idle for 2 minutes	2	A	ECM Default: ECM Default: – Bank 1 closed loop fuel metering inhibited – Bank 1 sub feedback control inhibited – Bank 1 adaptive fuel metering inhibited – Maximum engine speed reduced – Fuel injection cut off (cylinder 7)	EM80 -090	ECM to ignition module / coil drive circuit: open circuit, short circuit to ground, high resistance Ignition module / coil ground circuit: open circuit, high resistance Ignition module / coil B+ voltage supply circuit: open circuit (including relay, if fitted) Ignition module / coil failure
P0358	EMS OBD II	Ignition module primary circuit malfunction – cylinder 8	Start engine Battery voltage > 12 volts Idle for 2 minutes	2	A	ECM Default: – Bank 2 closed loop fuel metering inhibited – Bank 2 sub feedback control inhibited – Bank 2 adaptive fuel metering inhibited – Maximum engine speed reduced – Fuel injection cut off (cylinder 8)	EM80 -064	ECM to ignition module / coil drive circuit: open circuit, short circuit to ground, high resistance Ignition module / coil ground circuit: open circuit, high resistance Ignition module / coil B+ voltage supply circuit: open circuit (including relay, if fitted) Ignition module / coil failure
P0400	EMS OBD II	EGR flow malfunction	EGR Monitor drive cycle – page 8	2	N	None	—	EGR valve incorrectly fitted or loose EGR pipe blocked EGR valve stuck open / closed, blocked EGR valve failure

DTC	SYS	FAULT DESCRIPTION	MONITORING CONDITIONS	CK ENG	OTHER	DEFAULT ACTION	CM PIN	POSSIBLE CAUSES
P0405	EMS OBD II	EGR valve drive circuits low voltage	Ignition ON 10 seconds	2	N	None	IP1 -057 -058 -059 -060	EGR valve power supply circuit open circuit EGR valve to ECM drive circuit pair (EGR valve pins 1/4, 6/3): open circuit, high resistance EGR valve failure (stepper motor open circuit)
P0406	EMS OBD II	EGR valve drive circuits high voltage	Ignition ON 10 seconds	2	N	None	IP1 -057 -058 -059 -600	EGR valve to ECM drive circuit pair (EGR valve pins 1/4, 6/3): short circuit to ground or high voltage EGR valve failure (stepper motor short circuit)
P0420	EMS OBD II	Catalytic converter system efficiency below threshold – bank 1	Catalyst efficiency monitor drive cycle – page 6	2	N	None	—	HO2 Sensor disconnected HO2 Sensor to ECM wiring fault HO2 Sensor heater to ECM wiring fault HO2 Sensor heater failure Upstream HO2 Sensor failure Downstream HO2 Sensor failure Catalyst failure
P0430	EMS OBD II	Catalytic converter system efficiency below threshold – bank 2	Catalyst efficiency monitor drive cycle – page 6	2	N	None	—	HO2 Sensor disconnected HO2 Sensor to ECM wiring fault HO2 Sensor heater to ECM wiring fault HO2 Sensor heater failure Upstream HO2 Sensor failure Downstream HO2 Sensor failure Catalyst failure

DTC	SYS	FAULT DESCRIPTION	MONITORING CONDITIONS	CK ENG	OTHER	DEFAULT ACTION	CM PIN	POSSIBLE CAUSES
P0442	EMS OBD II	EVAP system leak detected – small (0.040 in.)	Evaporative system monitor drive cycle – page 7	2	N	ECM Default: – Canister purge inhibited – Adaptive fuel metering inhibited	—	Fuel cap not fitted correctly Fuel cap seal defective EVAP system leak (canister damage, pipework damage) EVAP Canister leaking EVAP canister close valve failure Fuel tank leak
P0443	EMS OBD II	EVAP canister purge valve failure	Evaporative system monitor drive cycle – page 7	2	N	ECM Default: – Canister purge inhibited – Adaptive fuel metering inhibited	—	EVAP Canister purge valve failure (leaking)
P0444	EMS OBD II	EVAP canister purge valve circuit open circuit	Evaporative system monitor drive cycle – page 7 Purge system monitor drive cycle – page 7	2	N	ECM Default: – Canister purge inhibited – Adaptive fuel metering inhibited	EM80 -066	EVAP Canister purge valve disconnected EVAP Canister purge valve to ECM drive circuit: open circuit, high resistance EVAP Canister purge valve failure
P0445	EMS OBD II	EVAP canister purge valve circuit short circuit	Evaporative system monitor drive cycle – page 7 Purge system monitor drive cycle – page 7	2	N	ECM Default: – Canister purge inhibited – Adaptive fuel metering inhibited	EM80 -066	EVAP Canister purge valve to ECM drive circuit: short circuit to ground EVAP Canister purge valve failure
P0446	EMS OBD II	EVAP canister close valve malfunction	Evaporative system monitor drive cycle – page 7	2	N	ECM Default: – Canister purge inhibited – Adaptive fuel metering inhibited	—	Fuel tank / EVAP canister atmospheric port: restricted, blocked EVAP canister close valve failure (stuck closed)

DTC	SYS	FAULT DESCRIPTION	MONITORING CONDITIONS	CK ENG	OTHER	DEFAULT ACTION	CM PIN	POSSIBLE CAUSES
P0447	EMS OBD II	EVAP canister close valve circuit open circuit	Ignition ON 10 seconds	2	N	ECM Default: – Canister purge inhibited – Adaptive fuel metering inhibited	EM80 -067	EVAP canister close valve power supply circuit: open circuit, short circuit EVAP canister close valve to ECM drive circuit: open circuit, high resistance, short circuit to B+ voltage EVAP canister close valve failure
P0448	EMS OBD II	EVAP canister close valve circuit short circuit	Ignition ON 10 seconds	2	N	ECM Default: – Canister purge inhibited – Adaptive fuel metering inhibited	EM80 -067	EVAP canister close valve to ECM drive circuit: short to ground EVAP canister close valve failure
P0450	EMS OBD II	FTP Sensor failure	Evaporative system monitor drive cycle – page 7	2	N	None	—	FTP Sensor failure
P0452	EMS OBD II	FTP Sensor circuit low voltage (low pressure)	Ignition ON 10 seconds	2	N	None	EM80 -104	FTP Sensor disconnected FTP Sensor to ECM sense circuit: open circuit, short circuit to ground FTP Sensor to splice sensor supply circuit: open circuit, high resistance FTP Sensor failure
P0453	EMS OBD II	FTP Sensor circuit high voltage (high pressure)	Ignition ON 10 seconds	2	N	None	EM80 -104	FTP Sensor to splice sensor ground circuit: open circuit, high resistance FTP Sensor to ECM sense circuit: short circuit to high voltage FTP Sensor failure

DTC	SYS	FAULT DESCRIPTION	MONITORING CONDITIONS	CK ENG	OTHER	DEFAULT ACTION	CM PIN	POSSIBLE CAUSES
P0455	EMS OBD II	EVAP system leak detected – large	Evaporative system monitor drive cycle – page 7	2	N	ECM Default: – Canister purge inhibited – Adaptive fuel metering inhibited	—	Fuel cap off Fuel cap seal defective / missing EVAP system leak (canister damage, pipework damage) EVAP Canister purge valve to engine purge pipe: blocked, leaking, disconnected EVAP Canister purge valve failure (stuck closed) EVAP Canister close valve failure (stuck open) Fuel tank leak
P0456	EMS OBD II	EVAP system leak detected – very small (0.020 in.)	Evaporative system monitor drive cycle – page 7	2	N	ECM Default: – Canister purge inhibited – Adaptive fuel metering inhibited	—	Fuel cap not fitted correctly Fuel cap seal defective EVAP system leak (canister damage, pipework damage) EVAP Canister leaking EVAP Canister close valve failure Fuel tank leak
P0460	EMS OBD II	Fuel level sensor(s) circuit range / performance	Fuel tank empty Fill in stages: 1/4, 1/2, 3/4, full Check fuel gauge reading at each stage	2	N	None	—	Fuel level sensor to Instrument Cluster circuit(s): intermittent short circuit, open circuit, high resistance Fuel level sensor failure Instrument Cluster fault (incorrect fuel level data)
P0480	EMS JAG	Radiator cooling fan module drive circuit malfunction	Start engine Battery voltage > 12 volts Idle for 2 minutes	N	N	ECM Default: – With ignition ON, fan operates at maximum speed	EM80 -051	ECM to radiator cooling fan module drive circuit: short circuit, open circuit, high resistance Radiator cooling fan fault Radiator cooling fan module fault

DTC	SYS	FAULT DESCRIPTION	MONITORING CONDITIONS	CK ENG	OTHER	DEFAULT ACTION	CM PIN	POSSIBLE CAUSES
P0506	EMS OBD II	Idle RPM lower than expected	Start engine and drive until normal engine operating temperature > 82 °C (180 °F) Stop vehicle and idle 30 seconds Drive vehicle for 2 minutes Stop vehicle and idle 30 seconds Repeat drive / idle two additional times	2	N	None	—	Air intake restriction Accessory drive overload (defective / seized component) Throttle valve stuck closed Throttle body failure
P0507	EMS OBD II	Idle RPM higher than expected	Start engine and drive until normal engine operating temperature > 82 °C (180 °F) Stop vehicle and idle 30 seconds Drive vehicle for 2 minutes Stop vehicle and idle 30 seconds Repeat drive / idle two additional times	2	N	None	—	Intake air leak between MAF sensor and throttle Intake air leak between throttle and engine Engine crankcase breather leak Throttle valve stuck open Throttle body failure
P0532	EMS JAG	Air conditioning pressure sensor circuit low voltage (high pressure)	Start engine Use WDS to monitor air conditioning pressure sensor signal voltage Set climate control to a low temperature; operate for 2 minutes Switch off climate control; wait 2 minutes	N	N	ECM Default: – Air conditioning compressor clutch inhibited	EM80 -121	Air conditioning pressure sensor disconnected Air conditioning pressure sensor to ECM sense circuit: open circuit, short circuit to ground Air conditioning pressure sensor to splice sensor supply circuit: open circuit, high resistance Air conditioning pressure sensor failure

DTC	SYS	FAULT DESCRIPTION	MONITORING CONDITIONS	CK ENG	OTHER	DEFAULT ACTION	CM PIN	POSSIBLE CAUSES
P0533	EMS JAG	Air conditioning pressure sensor circuit high voltage (low pressure)	Start engine Use WDS to monitor air conditioning pressure sensor signal voltage Set climate control to a low temperature; operate for 2 minutes Switch off climate control; wait 2 minutes	N	N	ECM Default: – Air conditioning compressor clutch inhibited	EM80 -121	Air conditioning pressure sensor to splice sensor ground circuit: open circuit, high resistance Air conditioning pressure sensor to ECM sense circuit: short circuit to high voltage Air conditioning pressure sensor failure
P0560	EMS OBD II	Battery power supply voltage malfunction	Engine temperature cool (cooling fans not running) Remove ignition key for 20 seconds (cooling fans not running) Ignition key in, position II for 5 seconds (do not start) Repeat cycle two additional times	2	N	None	EM80 -022	ECM battery power supply open circuit, high resistance
P0566	EMS JAG	Speed control CANCEL switch ON fault	Ignition ON 45 seconds	N	A	ECM Default: – Speed control inhibited	EM80 -047	Speed control switches internal steering wheel circuit: short circuit to ground Steering wheel cassette reel: short circuit to ground Cassette reel to ECM circuit: short circuit to ground CANCEL switch failure (stuck ON)
P0567	EMS JAG	Speed control RESUME switch ON fault	Ignition ON 45 seconds	N	A	ECM Default: – Speed control inhibited	EM80 -047	Speed control switches internal steering wheel circuit: short circuit to ground Steering wheel cassette reel: short circuit to ground Cassette reel to ECM circuit: short circuit to ground RESUME switch failure (stuck ON)

DTC	SYS	FAULT DESCRIPTION	MONITORING CONDITIONS	CK ENG	OTHER	DEFAULT ACTION	CM PIN	POSSIBLE CAUSES
P0568	EMS JAG	Speed control input signal low / high resistance	Ignition ON 45 seconds	N	A	ECM Default: – Speed control inhibited	EM80 -047	Speed control switches internal steering wheel circuit: open circuit; high resistance Steering wheel cassette reel open circuit, high resistance Cassette reel to ECM circuit: open circuit, high resistance
P0569	EMS JAG	Speed control SET / - switch ON fault	Ignition ON for more than 5 minutes	N	A	ECM Default: – Speed control inhibited	EM80 -047	Speed control switches internal steering wheel circuit: short circuit to ground Steering wheel cassette reel: short circuit to ground Cassette reel to ECM circuit: short circuit to ground SET / - switch failure
P0570	EMS JAG	Speed control SET / + switch ON fault	Ignition ON for more than 5 minutes	N	A	ECM Default: – Speed control inhibited	EM80 -047	Speed control switches internal steering wheel circuit: short circuit to ground Steering wheel cassette reel: short circuit to ground Cassette reel to ECM circuit: short circuit to ground SET / + switch failure
P0603	EMS OBD II	ECM Keep alive memory error	Engine temperature cool (cooling fans not running) Remove ignition key for 20 seconds (cooling fans not running) Ignition key in, position II for 5 seconds (do not start) Repeat cycle two additional times	2	N	None	—	ECM Failure

DTC	SYS	FAULT DESCRIPTION	MONITORING CONDITIONS	CK ENG	OTHER	DEFAULT ACTION	CM PIN	POSSIBLE CAUSES
P0605	TRANS OBD II	TCM Self test error	Ignition ON 10 seconds	2	A	TCM Default: – Mechanical limp home mode	—	TCM failure
P0606	TRANS OBD II	TCM “Watch dog” circuit malfunction	Ignition ON 10 seconds	N	A	TCM Default: – Mechanical limp home mode	—	TCM failure
P0610	TRANS JAG	TCM Configuration error	Ignition ON 10 seconds	N	A	TCM Default: Mechanical limp home mode	—	Reconfigure TCM and/or ECM using WDS
P0617	EMS OBD II	Starter relay drive circuit high voltage / starter relay request on (ignition switch position III START)	Ignition ON Battery voltage > 12 volts P or N selected Crank engine for more than 2 seconds	2	N	None	EM80 -041	Starter relay drive circuit: short circuit to high voltage Starter relay failure
P0641	TRANS OBD II	Sensor supply voltage circuit malfunction	Ignition ON 10 seconds	2	A	TCM Default: – Mechanical limp home mode	—	TCM / Control valve failure
P0646	EMS OBD II	A/C Compressor clutch relay drive circuit low voltage (CAN A/C compressor clutch request OFF)	Start engine Climate control system OFF Idle for 10 seconds	2	N	None	EM80 -034	A/C Compressor clutch relay drive circuit: open circuit, high resistance A/C Compressor clutch relay failure
P0647	EMS OBD II	A/C Compressor clutch relay drive circuit high voltage (CAN A/C compressor clutch request ON)	Start engine Climate control system ON – full cooling Idle for 2 minutes	2	N	None	EM80 -034	A/C Compressor clutch relay drive circuit: short circuit to high voltage A/C Compressor clutch relay failure
P0651	TRANS OBD II	Pressure regulator and shift solenoid supply circuit malfunction	Ignition ON 10 seconds	2	A	TCM Default: – Mechanical limp home mode	—	TCM / Control valve failure

DTC	SYS	FAULT DESCRIPTION	MONITORING CONDITIONS	CK ENG	OTHER	DEFAULT ACTION	CM PIN	POSSIBLE CAUSES
P0666	TRANS JAG	Substrate temperature sensor circuit malfunction	Drive the vehicle steadily between 48 – 97 km/h (30 – 60 mph) for 5 minutes Coast to a stop	N	N	None	—	TCM / Control valve failure
P0701	TRANS OBD II	TCM control errors	Drive vehicle from stop to 113 km/h (70 mph) Coast to a stop	2	A	TCM Default: – Mechanical limp home mode	—	DSC Fault (Check for DSC DTCs) TCM / Control valve failure
P0702	TRANS OBD II	TCM Battery power supply low voltage (short time)	Ignition ON 10 seconds	2	A	TCM Default: – Mechanical limp home mode	GB2 -14	Battery power supply fuse failure Battery power supply: intermittent open circuit
P0705	TRANS OBD II	Gear position switch circuit malfunction	Switch ignition ON Move the gear selector slowly from P to the 2 position, then back to P	2	A	TCM Default: – Mechanical limp home mode	—	TCM / Control valve failure
P0706	TRANS JAG	Gear selector position plausibility fault	Switch ignition ON Move the gear selector slowly from P to the 2 position, then back to P	N	A	TCM Default: – Shift strategy fixed – Linear Switch Module “manual” function disabled – If selected, Sport Mode disabled	—	TCM / Linear Switch Module CAN fault Linear Switch Module failure TCM / Control valve failure
P0709	TRANS JAG	Gear selector Intermediate position fault	Switch ignition ON Move the gear selector slowly from P to the 2 position, then back to P	N	A	TCM Default: – Shift strategy fixed – Linear Switch Module “manual” function disabled – If selected, Sport Mode disabled	—	Linear Switch Module failure

DTC	SYS	FAULT DESCRIPTION	MONITORING CONDITIONS	CK ENG	OTHER	DEFAULT ACTION	CM PIN	POSSIBLE CAUSES
P0710	TRANS JAG	Transmission fluid temperature sensor circuit malfunction	Drive the vehicle steadily between 48 – 97 km/h (30 – 60 mph) for 5 minutes Coast to a stop	N	N	None	—	TCM / TCM Fluid temperature sensor failure
P0711	TRANS JAG	Engine oil temperature range fault	Drive the vehicle steadily between 48 – 97 km/h (30 – 60 mph) for 5 minutes Coast to a stop	N	N	None	—	EMS Fault (Check for ECM DTCs) ECM CAN Fault TCM / Control valve failure
P0715	TRANS OBD II	Turbine speed sensor circuit failure	Drive the vehicle steadily between 48 – 97 km/h (30 – 60 mph) for 5 minutes Coast to a stop	2	A	TCM Default: – Mechanical limp home mode	—	TCM / TCM Turbine speed sensor sensor failure
P0720	TRANS JAG	Output speed sensor circuit failure	Drive vehicle from stop to 113 km/h (70 mph) Coast to a stop	N	N	TCM Default: – Substitute DSC vehicle speed for transmission output speed	—	TCM / Control valve failure
P0721	TRANS OBD II	Output speed sensor signal gradient fault	Drive vehicle from stop to 113 km/h (70 mph) Coast to a stop	2	A	TCM Default: – Mechanical limp home mode – Substitute DSC vehicle speed for transmission output speed	—	Transmission mechanical failure TCM / Control valve failure
P0725	TRANS OBD II	Engine over-speed range fault	Using full acceleration, drive vehicle from stop to 113 km/h (70 mph) Coast to a stop	2	A	TCM Default: – Mechanical limp home mode	—	TCM / ECM CAN Fault

DTC	SYS	FAULT DESCRIPTION	MONITORING CONDITIONS	CK ENG	OTHER	DEFAULT ACTION	CM PIN	POSSIBLE CAUSES
P0729	TRANS OBD II	Sixth gear ratio fault	Drive vehicle from stop to 113 km/h (70 mph) Ensure that Sixth gear is engaged by moving the gear selector to the 5 position and observing that the transmission down shifts Coast to a stop	2	A	TCM Default: – Mechanical limp home mode	—	ECM Torque signal fault Transmission mechanical failure
P0730	TRANS JAG	Gear ratio fault	Drive vehicle from stop to 113 km/h (70 mph) Ensure that Sixth gear is engaged by moving the gear selector to the 5 position and observing that the transmission down shifts Coast to a stop	N	N	None	—	ECM Torque signal fault Transmission mechanical failure
P0731	TRANS OBD II	First gear ratio fault	Start vehicle and select gear position 2 Accelerate hard until the engine speed reaches 4500 rpm, after the transmission has shifted to second gear Stop the vehicle Repeat two additional times	2	A	TCM Default: – Mechanical limp home mode	—	ECM Torque signal fault Transmission mechanical failure
P0732	TRANS OBD II	Second gear ratio fault	Start vehicle and select gear position 2 Accelerate the vehicle until second gear is engaged Drive the vehicle for 5 minutes in second gear Vary the vehicle speed and acceleration rate	2	A	TCM Default: – Mechanical limp home mode	—	ECM Torque signal fault Transmission mechanical failure

DTC	SYS	FAULT DESCRIPTION	MONITORING CONDITIONS	CK ENG	OTHER	DEFAULT ACTION	CM PIN	POSSIBLE CAUSES
P0733	TRANS OBD II	Third gear ratio fault	Start vehicle and select gear position 3 Accelerate the vehicle until third gear is engaged Drive the vehicle for 5 minutes in third gear Vary the vehicle speed and acceleration rate	2	A	TCM Default: – Mechanical limp home mode	—	ECM Torque signal fault Transmission mechanical failure
P0734	TRANS OBD II	Fourth gear ratio fault	Start vehicle and select gear position 4 Accelerate the vehicle until fourth gear is engaged Drive the vehicle for 5 minutes in fourth gear Vary the vehicle speed and acceleration rate	2	A	TCM Default: – Mechanical limp home mode	—	ECM Torque signal fault Transmission mechanical failure
P0735	TRANS OBD II	Fifth gear ratio fault	Start vehicle and select gear position 5 Accelerate the vehicle until fifth gear is engaged Drive the vehicle for 5 minutes in fifth gear Vary the vehicle speed and acceleration rate	2	A	TCM Default: – Mechanical limp home mode	—	ECM Torque signal fault Transmission mechanical failure
P0736	TRANS OBD II	Reverse gear ratio fault	Start vehicle and select REVERSE gear Accelerate the vehicle at different rates for 1 minute	2	A	TCM Default: – Mechanical limp home mode	—	ECM Torque signal fault Transmission mechanical failure

DTC	SYS	FAULT DESCRIPTION	MONITORING CONDITIONS	CK ENG	OTHER	DEFAULT ACTION	CM PIN	POSSIBLE CAUSES
P0740	TRANS OBD II	Torque converter clutch pressure regulator solenoid circuit malfunction	Drive the vehicle at 113 km/h (70 mph), then reduce the throttle angle until the torque convertor locks Ensure that the torque convertor remains locked for at least 1 minute	2	A	TCM Default: – Mechanical limp home mode	—	TCM / Control valve failure
P0741	TRANS JAG	Torque converter clutch pressure regulator solenoid stuck open	Drive the vehicle at 113 km/h (70 mph), then reduce the throttle angle until the torque convertor locks Ensure that the torque convertor remains locked for at least 1 minute	N	N	TCM Default: – Deactivate torque converter clutch pressure regulator; lock up clutch disabled	—	TCM / Control valve failure Transmission mechanical failure
P0743	TRANS OBD II	Torque converter clutch pressure regulator solenoid circuit plausibility error	Drive the vehicle at 113 km/h (70 mph), then reduce the throttle angle until the torque convertor locks Ensure that the torque convertor remains locked for at least 1 minute	2	A	TCM Default: – Mechanical limp home mode	—	TCM / Control valve failure
P0750	TRANS OBD II	Pressure regulator solenoid 1 circuit malfunction	Drive the vehicle at 113 km/h (70 mph), then reduce the throttle angle until the torque convertor locks Ensure that the torque convertor remains locked for at least 1 minute	2	A	TCM Default: – Mechanical limp home mode	—	TCM / Control valve failure

DTC	SYS	FAULT DESCRIPTION	MONITORING CONDITIONS	CK ENG	OTHER	DEFAULT ACTION	CM PIN	POSSIBLE CAUSES
P0753	TRANS OBD II	Pressure regulator solenoid 1 circuit plausibility error	Drive the vehicle at 113 km/h (70 mph), then reduce the throttle angle until the torque convertor locks Ensure that the torque convertor remains locked for at least 1 minute	2	A	TCM Default: – Mechanical limp home mode	—	TCM / Control valve failure
P0755	TRANS OBD II	Pressure regulator solenoid 2 circuit malfunction	Drive the vehicle at 113 km/h (70 mph), then reduce the throttle angle until the torque convertor locks Ensure that the torque convertor remains locked for at least 1 minute	2	A	TCM Default: – Mechanical limp home mode	—	TCM / Control valve failure
P0758	TRANS OBD II	Pressure regulator solenoid 2 circuit plausibility error	Drive the vehicle at 113 km/h (70 mph), then reduce the throttle angle until the torque convertor locks Ensure that the torque convertor remains locked for at least 1 minute	2	A	TCM Default: – Mechanical limp home mode	—	TCM / Control valve failure
P0760	TRANS OBD II	Pressure regulator solenoid 3 circuit malfunction	Drive the vehicle at 113 km/h (70 mph), then reduce the throttle angle until the torque convertor locks Ensure that the torque convertor remains locked for at least 1 minute	2	A	TCM Default: – Mechanical limp home mode	—	TCM / Control valve failure

DTC	SYS	FAULT DESCRIPTION	MONITORING CONDITIONS	CK ENG	OTHER	DEFAULT ACTION	CM PIN	POSSIBLE CAUSES
P0763	TRANS OBD II	Pressure regulator solenoid 3 circuit plausibility error	Drive the vehicle at 113 km/h (70 mph), then reduce the throttle angle until the torque convertor locks Ensure that the torque convertor remains locked for at least 1 minute	2	A	TCM Default: – Mechanical limp home mode	—	TCM / Control valve failure
P0765	TRANS OBD II	Pressure regulator solenoid 4 circuit malfunction	Drive the vehicle at 113 km/h (70 mph), then reduce the throttle angle until the torque convertor locks Ensure that the torque convertor remains locked for at least 1 minute	2	A	TCM Default: – Mechanical limp home mode	—	TCM / Control valve failure
P0768	TRANS OBD II	Pressure regulator solenoid 4 circuit plausibility error	Drive the vehicle at 113 km/h (70 mph), then reduce the throttle angle until the torque convertor locks Ensure that the torque convertor remains locked for at least 1 minute	2	A	TCM Default: – Mechanical limp home mode	—	TCM / Control valve failure
P0770	TRANS OBD II	Pressure regulator solenoid 5 circuit malfunction	Drive the vehicle at 113 km/h (70 mph), then reduce the throttle angle until the torque convertor locks Ensure that the torque convertor remains locked for at least 1 minute	2	A	TCM Default: – Mechanical limp home mode	—	TCM / Control valve failure

DTC	SYS	FAULT DESCRIPTION	MONITORING CONDITIONS	CK ENG	OTHER	DEFAULT ACTION	CM PIN	POSSIBLE CAUSES
P0773	TRANS OBD II	Pressure regulator solenoid 5 circuit plausibility error	Drive the vehicle at 113 km/h (70 mph), then reduce the throttle angle until the torque convertor locks Ensure that the torque convertor remains locked for at least 1 minute	2	A	TCM Default: – Mechanical limp home mode	—	TCM / Control valve failure
P0780	TRANS JAG	Gear load fault	Drive the vehicle at 113 km/h (70 mph), then reduce the throttle angle until the torque convertor locks Ensure that the torque convertor remains locked for at least 1 minute	N	N	None	—	ECM Torque signal fault Transmission mechanical failure
P0781	TRANS OBD II	1-2 / 2-1 Gear load fault	Drive the vehicle at 113 km/h (70 mph), then reduce the throttle angle until the torque convertor locks Ensure that the torque convertor remains locked for at least 1 minute	2	A	TCM Default: – Electronic limp home mode	—	ECM Torque signal fault Transmission mechanical failure
P0782	TRANS OBD II	2-3 / 3-2 Gear load fault	Drive the vehicle at 113 km/h (70 mph), then reduce the throttle angle until the torque convertor locks Ensure that the torque convertor remains locked for at least 1 minute	2	A	TCM Default: – Electronic limp home mode	—	ECM Torque signal fault Transmission mechanical failure

DTC	SYS	FAULT DESCRIPTION	MONITORING CONDITIONS	CK ENG	OTHER	DEFAULT ACTION	CM PIN	POSSIBLE CAUSES
P0783	TRANS OBD II	3-4 / 4-3 Gear load fault	Drive the vehicle at 113 km/h (70 mph), then reduce the throttle angle until the torque convertor locks Ensure that the torque convertor remains locked for at least 1 minute	2	A	TCM Default: – Electronic limp home mode	—	ECM Torque signal fault Transmission mechanical failure
P0784	TRANS OBD II	4-5 / 5-4 Gear load fault	Drive the vehicle at 113 km/h (70 mph), then reduce the throttle angle until the torque convertor locks Ensure that the torque convertor remains locked for at least 1 minute	2	A	TCM Default: – Electronic limp home mode	—	ECM Torque signal fault Transmission mechanical failure
P0787	TRANS OBD I	Shift solenoid circuit malfunction	Ignition ON 10 seconds	2	A	TCM Default: – Mechanical limp home mode	—	TCM / Control valve failure
P0788	TRANS OBD II	Shift solenoid circuit plausibility error	Drive the vehicle at 113 km/h (70 mph), then reduce the throttle angle until the torque convertor locks Ensure that the torque convertor remains locked for at least 1 minute	2	A	TCM Default: – Mechanical limp home mode	—	TCM / Control valve failure
P0825	TRANS JAG	Gear positions R, D plausibility error	Ignition ON S lowly move gear selector from Park to Drive, then back to Park	N	A	None	—	Linear Switch Module incorrectly adjusted Linear Switch Module failure

DTC	SYS	FAULT DESCRIPTION	MONITORING CONDITIONS	CK ENG	OTHER	DEFAULT ACTION	CM PIN	POSSIBLE CAUSES
P0829	TRANS OBD II	5-6 Gear load fault	Drive the vehicle at 113 km/h (70 mph), then reduce the throttle angle until the torque convertor locks Ensure that the torque convertor remains locked for at least 1 minute	2	A	TCM Default: – Electronic limp home mode	—	ECM Torque signal fault Transmission mechanical failure
P0860	TRANS (ECM*) JAG	Linear Switch Module CAN network malfunction * Linear Switch Module / CAN monitored by ECM	Ignition ON 10 seconds	N	A	ECM Default: – Speed control inhibited – Maximum throttle opening for N range inhibited – Throttle opening limited to 30% – Maximum engine speed reduced	EM80 -123 -124	CAN open circuit fault CAN short circuit fault Linear Switch Module failure
P1000	EMS JAG	System (OBD) check not complete since last memory clear	System Readiness Test	N	N	None	—	Refer to page 3
P1104	EMS OBD II	MAF Sensor ground malfunction	Ignition ON 10 seconds	2	A	ECM Default: – Calculated default air mass used – Adaptive fuel metering inhibited – Sub feedback control inhibited – Catalyst warm up ignition retard inhibited – EGR inhibited – Canister purge inhibited – Maximum engine speed reduced	EM80 -045 -046	MAF Sensor to ECM sensor ground circuit open circuit, short circuit to high voltage, high resistance MAF Sensor to ECM sensing circuit: open circuit MAF Sensor failure

DTC	SYS	FAULT DESCRIPTION	MONITORING CONDITIONS	CK ENG	OTHER	DEFAULT ACTION	CM PIN	POSSIBLE CAUSES
P1107	EMS OBD II	MAP Sensor sense circuit low voltage	Ignition ON 10 seconds	2	N	ECM Default: – Default value of 1.013 BAR (29.92 in hg) used	EM80 -127	MAP Sensor to ECM sense circuit: open circuit, short circuit to ground MAP Sensor sensor supply circuit (to splice): open circuit MAP Sensor failure
P1108	EMS OBD II	MAP Sensor sense circuit high voltage	Ignition ON 10 seconds	2	N	ECM Default: – Default value of 1.013 BAR (29.92 in hg) used	EM80 -127	MAP Sensor sensor ground circuit (to splice): open circuit MAP Sensor to ECM sense circuit: short circuit to high voltage MAP Sensor failure
P1111	EMS JAG	System (OBD) checks complete since last memory clear	System Readiness Test	N	N	None	—	Refer to page 3
P1122	EMS OBD II	APP Sensor sense circuit low voltage – APP1	Battery voltage > 10 volts Ignition ON Slowly press accelerator pedal to the floor over a 5 second period. Slowly return the pedal to rest Repeat 3 times	2	R	ECM Default: – APP angle default value used – Speed control inhibited – APP adaptations (wear, variance) inhibited	EM80 -102	APP Sensor to ECM sense circuit (APP1): open circuit, short circuit to ground, high resistance APP Sensor sensor supply circuit: open circuit, high resistance APP Sensor failure
P1123	EMS OBD II	APP Sensor sense circuit high voltage – APP1 Note: This DTC could be flagged by both sensor element sensing circuit having faults.	Battery voltage > 10 volts Ignition ON Slowly press accelerator pedal to the floor over a 5 second period Slowly return the pedal to rest Repeat 3 times	2	R	ECM Default: – APP angle default value used – Speed control inhibited – APP adaptations (wear, variance) inhibited	EM80 -102 -103	APP Sensor sensor to ECM sense circuit(s) (APP1 or APP2): short circuit to high voltage APP Sensor sensor ground circuit(s): open circuit APP Sensor failure

DTC	SYS	FAULT DESCRIPTION	MONITORING CONDITIONS	CK ENG	OTHER	DEFAULT ACTION	CM PIN	POSSIBLE CAUSES
P1136	EMS JAG	ECM Cooling fan malfunction	Ignition ON Start engine	N	N	None	EM80 -038	ECM Cooling fan power supply circuit: open circuit, short circuit ECM Cooling fan drive circuit, open circuit, short circuit, high resistance ECM Cooling fan failure
P1215	EMS OBD II	APP Sensor sense circuit low voltage – APP2	Battery voltage > 10 volts Ignition ON Slowly press accelerator pedal to the floor over a 5 second period Slowly return the pedal to rest Repeat 3 times	2	R	ECM Default: – APP angle default value used – Speed control inhibited – APP adaptations (wear, variance) inhibited	EM80 -103	APP Sensor to ECM sense circuit (APP2): open circuit, short circuit to ground, high resistance APP Sensor sensor supply circuit (to splice): open circuit, high resistance APP Sensor failure
P1216	EMS OBD II	APP Sensor sense circuit high voltage – APP2 Note: This DTC could be flagged by both sensor element sensing circuit having faults.	Battery voltage > 10 volts Ignition ON Slowly press accelerator pedal to the floor over a 5 second period Slowly return the pedal to rest Repeat 3 times	2	R	ECM Default: – APP angle default value used – Speed control inhibited – APP adaptations (wear, variance) inhibited	EM80 -102 -103	APP Sensor sensor to ECM sense circuit(s) (APP2 or APP1): short circuit to high voltage APP Sensor sensor ground circuit(s) (to splice): open circuit APP Sensor failure
P1224	EMS OBD II	Throttle control position error	Battery voltage > 10 volts Ignition ON Slowly press accelerator pedal to the floor over a 5 second period Slowly return the pedal to rest Repeat 3 times	2	R	ECM Default: – Engine shut down – Speed control disabled	EM80 -080 -106 -052 -134	Throttle motor failure Throttle body failure

DTC	SYS	FAULT DESCRIPTION	MONITORING CONDITIONS	CK ENG	OTHER	DEFAULT ACTION	CM PIN	POSSIBLE CAUSES
P1229	EMS OBD II	Throttle motor control circuit malfunction	Battery voltage > 10 volts Ignition ON Slowly press accelerator pedal to the floor over a 5 second period Slowly return the pedal to rest Repeat 3 times	2	R	ECM Default: – Throttle motor and throttle motor relay disabled – Throttle valve opening set to default value – Idle speed controlled by fuel injection intervention – Idle speed adaption inhibited – Speed control disabled	EM80 -080 -106 -052 -134 -004 -005 -054	Throttle motor disconnected Throttle motor to ECM drive circuits: short circuit or open circuit ECM ground circuit fault(s) (EM80-004, 005, 054) Throttle motor failure Throttle body failure
P1234	EMS OBD II	No fuel pump commands received by ECM	Start engine Battery voltage > 12 volts Idle for 2 minutes	2	N	ECM Default: – Fuel pump feedback control inhibited	EM80 -027	ECM to Fuel Pump Module drive circuit: open circuit, short circuit, high resistance Fuel Pump Module failure
P1236	EMS OBD II	Fuel pump not activated when requested by ECM	Start engine Battery voltage > 12 volts Idle for 2 minutes	2	N	ECM Default: – Fuel pump feedback control inhibited	EM80 -027	ECM to Fuel Pump Module drive circuit: open circuit, short circuit, high resistance Fuel Pump Module failure
P1240	EMS OBD II	Sensor power supply circuit malfunction	Ignition ON 10 seconds	2	R	None	EM80 -012 -013	ECM to sensors sensor supply voltage circuit(s): short circuit to ground, short circuit to high voltage, open circuit, high resistance
P1241	EMS OBD II	Sensor power supply circuit low voltage	Ignition ON 10 seconds	2	R	ECM Default: – Throttle motor and throttle motor relay disabled – Throttle valve opening set to default value – Idle speed controlled by fuel injection intervention – Idle speed adaption inhibited	EM80 -012 -013	ECM to sensors sensor supply voltage circuit(s): short circuit to ground

DTC	SYS	FAULT DESCRIPTION	MONITORING CONDITIONS	CK ENG	OTHER	DEFAULT ACTION	CM PIN	POSSIBLE CAUSES
P1242	EMS OBD II	Sensor power supply circuit high voltage	Ignition ON 10 seconds	2	R	ECM Default: – Throttle motor and throttle motor relay disabled – Throttle valve opening set to default value – Idle speed controlled by fuel injection intervention – Idle speed adaption inhibited	EM80 -012 -013	ECM to sensors supply voltage circuit(s): open circuit, high resistance, short circuit to high voltage
P1243	EMS OBD II	Sensor ground circuits open circuit	Ignition ON 10 seconds	2	N	None	EM80 -019 -020	ECM to sensors sensor ground circuit(s): open circuit, high resistance
P1245	EMS OBD II	Engine crank signal low voltage	Remove starter relay Turn ignition switch to position III (START); hold for > 1 second	2	N	None	EM80 -006	Body Processor Module to ECM circuit: open circuit Ignition switch to Body Processor Module circuit failure
P1246	EMS OBD II	Engine crank signal high voltage	Drive vehicle > 15 km/h (9 mph) between 1500 – 4000 rpm for 10 seconds; stop vehicle Repeat 5 times	2	N	None	EM80 -006	Body Processor Module to ECM circuit: short circuit to high voltage Ignition switch to Body Processor Module circuit failure
P1250	EMS OBD II	Throttle valve return spring malfunction	Idle engine Switch OFF ignition for 10 seconds Start engine and repeat	2	R	ECM Default: – Vehicle speed limited – Throttle opening limited to 30% – Speed control inhibited	—	Throttle return spring failure (throttle body failure)

DTC	SYS	FAULT DESCRIPTION	MONITORING CONDITIONS	CK ENG	OTHER	DEFAULT ACTION	CM PIN	POSSIBLE CAUSES
P1251	EMS OBD II	Throttle motor relay OFF failure	Engine temperature cool (cooling fans not running) Remove ignition key for 20 seconds (cooling fans not running) Ignition key in, position II for 5 seconds (do not start) Repeat cycle two additional times	2	R	ECM Default: – Throttle motor and throttle motor relay disabled – Throttle valve opening set to default value – Idle speed controlled by fuel injection intervention – Idle speed adaption inhibited	EM80 -052	Throttle motor relay coil power supply circuit: open circuit (fuse) Throttle motor relay failure Throttle motor relay coil to ECM circuit: open circuit ECM ground circuit fault (relay coil drive)
P1254	EMS OBD II	Throttle “limp home” spring malfunction	Idle engine Switch OFF ignition for 10 seconds Start engine and repeat	2	R	ECM Default: – Vehicle speed limited – Throttle opening limited to 30% – Speed control inhibited	—	Throttle limp home spring failure (throttle body failure)
P1260	EMS JAG	Security input malfunction	Start engine	N	N	None	EM80 -006	Invalid ignition key code Key Transponder Module signal to Body Processor Module missing or corrupted Body Processor Module security signal to ECM missing or corrupted

DTC	SYS	FAULT DESCRIPTION	MONITORING CONDITIONS	CK ENG	OTHER	DEFAULT ACTION	CM PIN	POSSIBLE CAUSES
P1313	EMS OBD II	Misfire rate catalyst damage – bank 1 NOTE: This DTC will flag only when accompanied by an individual cylinder misfire DTC: P0300 – P0308	Misfire monitor drive cycle – page 6	2	A	ECM Default: – Maximum engine speed reduced	—	ECM to ignition coil primary circuit fault (Cylinder misfire detected DTC also flagged) Fuel injector circuit fault(s) (Injector DTCs also flagged) Ignition coil failure Spark plug failure / fouled / incorrect gap Cylinder compression low Fuel delivery pressure (low / high) Fuel injector(s) restricted / leaking Fuel injector(s) continuously open Fuel contamination Worn camshaft / broken valve spring(s)
P1314	EMS OBD II	Misfire rate catalyst damage – bank 2 NOTE: This DTC will flag only when accompanied by an individual cylinder misfire DTC: P0300 – P0308	Misfire monitor drive cycle – page 6	2	A	ECM Default: – Maximum engine speed reduced	—	ECM to ignition coil primary circuit fault (Cylinder misfire detected DTC also flagged) Fuel injector circuit fault(s) (Injector DTCs also flagged) Ignition coil failure Spark plug failure / fouled / incorrect gap Cylinder compression low Fuel delivery pressure (low / high) Fuel injector(s) restricted / leaking Fuel injector(s) continuously open Fuel contamination Worn camshaft / broken valve spring(s)

DTC	SYS	FAULT DESCRIPTION	MONITORING CONDITIONS	CK ENG	OTHER	DEFAULT ACTION	CM PIN	POSSIBLE CAUSES
P1316	EMS OBD II	Misfire excess emission NOTE: This DTC will flag only when accompanied by an individual cylinder misfire DTC: P0300 – P0308	Misfire monitor drive cycle – page 6	2	N	None	—	ECM to ignition coil primary circuit fault (Cylinder misfire detected DTC also flagged) Fuel injector circuit fault(s) (Injector DTCs also flagged) Ignition coil failure Spark plug failure / fouled / incorrect gap Cylinder compression low Fuel delivery pressure (low / high) Fuel injector(s) restricted / leaking Fuel injector(s) continuously open Fuel contamination Worn camshaft / broken valve spring(s)
P1338	EMS OBD II	Fuel pump drive circuit low / high voltage	Start engine Battery voltage > 12 volts Idle for 2 minutes	2	N	ECM Default: – Fuel pump feedback control inhibited	EM80 -027	Fuel Pump Module to fuel pump drive circuit: open circuit, short circuit, high resistance Fuel Pump Module failure Fuel pump failure
P1340	EMS OBD II	CMP Sensor 2 circuit malfunction – bank 2	Start engine; momentarily race the engine; stop engine Repeat 2 additional times Idle engine 1 minute	2	N	None	EM80 -068 -069	CMP Sensor disconnected CMP Sensor gap incorrect / foreign matter on sensor face CMP Sensor sensing circuit: open circuit, short circuit to ground, short circuit to high voltage CMP Sensor 2 failure

DTC	SYS	FAULT DESCRIPTION	MONITORING CONDITIONS	CK ENG	OTHER	DEFAULT ACTION	CM PIN	POSSIBLE CAUSES
P1341	EMS OBD II	CMP Sensor 2 circuit range / performance – bank 2	Start engine; momentarily race the engine; stop engine Repeat 2 additional times Idle engine 1 minute	2	N	None	EM80 -068 -069	CMP Sensor disconnected CMP Sensor gap incorrect / foreign matter on sensor face CMP Sensor sensing circuit: open circuit, short circuit to ground, short circuit to high voltage CMP Sensor 2 failure
P1344	EMS OBD II	APP Sensor sense circuits APP1 and APP2 range / performance	Battery voltage > 10 volts Ignition ON Slowly press accelerator pedal to the floor over a 5 second period Slowly return the pedal to rest Repeat 3 times	2	R	ECM Default: – APP angle default value used – Speed control inhibited – APP adaptations (wear, variance) inhibited	EM80 -102 -103	APP Sensor to ECM sense circuits: short circuit, open circuit, high resistance APP Sensor sensor supply circuits: short circuit, open circuit, high resistance APP Sensor sensor ground circuits: open circuit APP Sensor failure
P1367	EMS OBD II	Ignition modules, bank 1 fault	Start engine Battery voltage > 12 volts Idle for 2 minutes	2	A	ECM Default: – Closed loop fuel metering inhibited – Adaptive fuel metering inhibited – Catalyst warm up ignition retard inhibited – EGR Inhibited – Canister purge inhibited – Maximum engine speed reduced – Fuel injection cut off (bank 1 cylinders)	EM80 -131	Ignition monitoring circuit between splice and ECM: open circuit, short circuit to ground, short circuit to B+ voltage Ignition module / coils bank 1 ground circuit fault

DTC	SYS	FAULT DESCRIPTION	MONITORING CONDITIONS	CK ENG	OTHER	DEFAULT ACTION	CM PIN	POSSIBLE CAUSES
P1368	EMS OBD II	Ignition modules, bank 2 fault	Start engine Battery voltage > 12 volts Idle for 2 minutes	2	A	ECM Default: – Closed loop fuel metering inhibited – Adaptive fuel metering inhibited – Catalyst warm up ignition retard inhibited – EGR Inhibited – Canister purge inhibited – Maximum engine speed reduced – Fuel injection cut off (bank 2 cylinders)	EM80 -132	Ignition monitoring circuit between splice and ECM: open circuit, short circuit to ground, short circuit to B+ voltage Ignition module / coils bank 2 ground circuit fault
P1384	EMS OBD II	VVT solenoid malfunction – bank 1	Idle engine 30 seconds Accelerate from stop through complete engine rpm range; coast to a stop Drive the vehicle steadily between 48 – 97 km/h (30 – 60 mph) for 5 minutes; coast to a stop Accelerate smoothly through complete accelerator pedal travel; coast to a stop Idle engine 30 seconds	2	N	ECM Default: – Bank 1 VVT hold current set at a constant value of 450 mA	EM80 -109	VVT solenoid valve 1 to ECM PWM drive circuit fault VVT solenoid valve 1 ground circuit fault VVT solenoid 1 failure Oil contamination VVT 1 oil flow fault VVT / camshaft mechanical failure – bank 1

DTC	SYS	FAULT DESCRIPTION	MONITORING CONDITIONS	CK ENG	OTHER	DEFAULT ACTION	CM PIN	POSSIBLE CAUSES
P1396	EMS OBD II	VVT solenoid malfunction – bank 2	Idle engine 30 seconds Accelerate from stop through complete engine rpm range; coast to a stop Drive the vehicle steadily between 48 – 97 km/h (30 – 60 mph) for 5 minutes; coast to a stop Accelerate smoothly through complete accelerator pedal travel; coast to a stop Idle engine 30 seconds	2	N	ECM Default: – Bank 2 VVT hold current set at a constant valve of 450 mA	EM80 -110	VVT solenoid valve 2 to ECM PWM drive circuit fault VVT solenoid valve 2 ground circuit fault VVT solenoid 2 failure Oil contamination VVT 2 oil flow fault VVT / camshaft mechanical failure – bank 2
P1410	V8 SC EMS JAG	Air cleaner solenoid valve drive circuit malfunction	Start engine Idle for 2 minutes	N	N	None	EM80 -014	ECM to air cleaner solenoid circuit: open circuit, short circuit, high resistance Air cleaner solenoid failure
P1474	V8 SC EMS OBD II	Intercooler coolant pump malfunction	Start engine and bring to normal engine operating temperature > 80 °C (176 °F) Drive vehicle in Drive at 80 km/h (50 mph) – 105 km/h (65 mph) for > 10 minutes	2	N	ECM Default: – Default value of 70 °C (158 °F) used	—	Intercooler coolant pump failure
P1516	EMS OBD II	Gear change P / N driving malfunction	Drive vehicle > 24 km/h (15 mph) between 1500 – 4000 rpm for 30 seconds	2	A	ECM Default: – Speed control inhibited – Maximum engine speed reduced	EM80 -031	ECM P/N circuit: short circuit to ground, short circuit to high voltage; high resistance Gear selector cable setting incorrect Linear Switch Module incorrect setting Linear Switch Module / ECM CAN fault

DTC	SYS	FAULT DESCRIPTION	MONITORING CONDITIONS	CK ENG	OTHER	DEFAULT ACTION	CM PIN	POSSIBLE CAUSES
P1517	EMS OBD II	Gear change P / N starting malfunction	Start engine in P Start engine in N Check that engine does not start in R, D, 5, 4, 3, 2	2	A	ECM Default: – Speed control inhibited – Maximum throttle opening for N range inhibited – Maximum engine speed reduced	EM80 -031	ECM P/N circuit: short circuit to ground, short circuit to high voltage; high resistance Gear selector cable setting incorrect Linear Switch Module incorrect setting Linear Switch Module / ECM CAN fault
P1571	EMS JAG	Brake ON / OFF switch; brake cancel switch malfunction (Brake ON / OFF switch – normally open; brake cancel switch – normally closed)	Start engine; idle in P, N Press brake pedal for > 10 seconds; release brake pedal Repeat 5 times – or – Drive > 80 km/h (50 mph) > 1 minute (do not press the brake pedal); momentarily press the brake pedal Repeat 10 times –or– Using WDS, monitor both circuits Pedal at rest = “0” (both circuits); pedal pressed = “1” (both circuits)	N	A	ECM Default: – Speed control inhibited – Maximum engine speed reduced	EM80 -008 -009	Brake ON / OFF switch to stop lamp relay circuit: open circuit Stop lamp relay to ECM circuit: open circuit, short circuit to ground, high resistance Brake ON / OFF ignition switched ground circuit: open circuit Brake ON / OFF switch failure Brake cancel switch to ECM circuit: open circuit, short circuit to ground, high resistance Brake cancel switch power supply circuit: open circuit Brake cancel switch failure
P1582	EMS JAG	“Flight recorder” data is stored if any one of five conditions occur:	1 Inertia switch activated 2 Throttle Limp Home mode 3 Engine starts and stumbles 4 Engine fail to start 5 Engine stall	N	N	None	EM80 -010	If none of the five conditions occur, check: Inertia switch to ECM circuit: short circuit to B+ voltage Inertia switch failure
P1603	TRANS OBD II	TCM Internal communications error	Ignition ON 10 seconds	1	A	None	—	TCM / Control valve failure

DTC	SYS	FAULT DESCRIPTION	MONITORING CONDITIONS	CK ENG	OTHER	DEFAULT ACTION	CM PIN	POSSIBLE CAUSES
P1605	TRANS JAG	TCM RAM error	Ignition ON, then OFF Cycle ignition switch 6 times	N	N	TCM Default: – Mechanical limp home mode	GB2 -14	Battery power supply circuit: open circuit, short circuit to ground TCM / Control valve failure
P1606	EMS OBD II	EMS control relay malfunction	Engine temperature cool (cooling fans not running) Remove ignition key for 1 minute (cooling fans not running) Ignition key in, position II for 5 seconds (do not start)	1	N	None	EM80 -040	ECM control relay failure ECM control relay to ECM circuit fault ECM control relay coil power supply open circuit ECM ground circuit fault (relay coil drive)
P1609	EMS OBD II	ECM microprocessor to microprocessor communication failure	Ignition ON 10 seconds	2	R	ECM Default: – Throttle motor and throttle motor relay disabled – Throttle valve opening set to default value – Idle speed controlled by fuel injection intervention – Idle speed adaption inhibited	—	ECM Failure
P1611	EMS OBD II	ECM sub CPU failure	Drive vehicle If fitted, engage speed control Refer to Owner's Handbook and ensure that speed control engages normally	2	R	ECM Default: – Throttle motor and throttle motor relay disabled – Throttle valve opening set to default value – Idle speed controlled by fuel injection intervention – Idle speed adaption inhibited	—	ECM Failure

DTC	SYS	FAULT DESCRIPTION	MONITORING CONDITIONS	CK ENG	OTHER	DEFAULT ACTION	CM PIN	POSSIBLE CAUSES
P1631	EMS OBD II	Throttle motor relay coil drive circuit OFF failure	Engine temperature cool (cooling fans not running) Remove ignition key for 20 seconds (cooling fans not running) Ignition key in, position II for 5 seconds (do not start) Repeat cycle twice more	2	R	ECM Default: – Throttle motor and throttle motor relay disabled – Throttle valve opening set to default value – Idle speed controlled by fuel injection intervention – Idle speed adaption inhibited	EM80-052	Throttle motor relay coil power supply circuit: open circuit (fuse) Throttle motor relay failure Throttle motor relay coil to ECM drive circuit: open circuit, short circuit to ground
P1632	EMS OBD II	Generator charge system failure / generator "LOAD" feedback circuit failure	Battery voltage > 12 volts Switch OFF all electrical consumers Start engine; idle for 16 minutes with all electrical consumers switched OFF If no reoccurrence of DTC(s): hold engine > 1500 rpm for one minute in N	2	C	None	EM80-079	ECM to generator "LOAD" feedback circuit: short circuit, open circuit, high resistance Generator regulator failure Generator failure
P1633	EMS OBD II	ECM main CPU failure	Ignition ON 10 seconds	2	R	ECM Default: – Throttle motor and throttle motor relay disabled – Throttle valve opening set to default value – Idle speed controlled by fuel injection intervention – Idle speed adaption inhibited	—	ECM Failure
P1634	EMS OBD II	Throttle "watch dog" circuit malfunction	Idle engine Switch OFF ignition for 10 seconds Start engine and repeat	2	R	ECM Default: – Vehicle speed limited – Throttle opening limited to 30% – Speed control inhibited	—	ECM Failure

DTC	SYS	FAULT DESCRIPTION	MONITORING CONDITIONS	CK ENG	OTHER	DEFAULT ACTION	CM PIN	POSSIBLE CAUSES
P1637	EMS OBD II	CAN ECM to DSCCM network malfunction	Ignition ON 10 seconds	2	A	ECM Default: – Speed control inhibited – Maximum throttle opening for N range inhibited – Throttle opening limited to 30% – Maximum engine speed reduced	EM80 -123 -124	CAN open circuit fault – DSCCM to ECM CAN short circuit fault DSCCM failure ECM failure
P1638	EMS OBD II	CAN ECM / IC network malfunction	Ignition ON 10 seconds	1	N	None (Engine will not start – PATS failure)	EM80 -123 -124	CAN open circuit fault – IC to ECM CAN short circuit fault IC failure ECM failure
P1642	EMS OBD II	CAN circuit malfunction	Ignition ON 10 seconds	1	A	ECM Default: – Speed control inhibited – Maximum throttle opening for N range inhibited – Throttle opening limited to 30% – Maximum engine speed reduced (Engine will not start – PATS failure)	EM80 -123 -124	CAN short circuit fault Control module failure – check for additional flagged DTC(s) to locate control module source
P1643	EMS OBD II	CAN ECM / TCM network malfunction	Ignition ON 10 seconds	2	A	ECM Default: – Speed control inhibited – Maximum throttle opening for N range inhibited – Throttle opening limited to 30% – Maximum engine speed reduced	EM80 -123 -124	CAN open circuit fault – TCM to ECM CAN short circuit fault TCM failure ECM failure

DTC	SYS	FAULT DESCRIPTION	MONITORING CONDITIONS	CK ENG	OTHER	DEFAULT ACTION	CM PIN	POSSIBLE CAUSES
P1646	EMS OBD II	ECM HO2 Sensor control malfunction – bank 1 upstream (1/1)	Drive vehicle for 10 minutes	2	N	ECM Default: – HO2S 1/1 control circuit inhibited	—	HO2 Sensor 1/1 heater failure HO2 Sensor 1/1 sensing circuit: short circuit to ground, short circuit to high voltage, open circuit, high resistance ECM Failure
P1647	EMS OBD II	ECM HO2 Sensor control malfunction – bank 2 upstream (2/1)	Drive vehicle for 10 minutes	2	N	ECM Default: – HO2S 2/1 control circuit inhibited	—	HO2 Sensor 2/1 heater failure HO2 Sensor 2/1 sensing circuit: short circuit to ground, short circuit to high voltage, open circuit, high resistance ECM Failure
P1648	EMS OBD II	ECM internal Knock Sensor CPU self test failure	Start engine Battery voltage > 12 volts Idle for 2 minutes	2	A	ECM Default: – Maximum ignition retard – Maximum engine speed reduced	—	ECM Failure
P1656	EMS OBD II	TP Sensor amplifier circuit malfunction	Ignition ON 10 seconds	2	A	ECM Default: – Maximum engine speed reduced	EM80 -075	ECM Failure
P1657	EMS OBD II	Throttle motor relay coil drive circuit ON failure	Engine temperature cool (cooling fans not running) Remove ignition key for 20 seconds (cooling fans not running) Ignition key in, position II for 5 seconds (do not start) Repeat cycle two additional times	2	R	ECM Default: – Vehicle speed limited – Throttle opening limited to 30% – Speed control inhibited	EM80 -052 -134	Throttle motor relay failure Throttle motor relay coil to ECM drive circuit: short circuit to B+ voltage

DTC	SYS	FAULT DESCRIPTION	MONITORING CONDITIONS	CK ENG	OTHER	DEFAULT ACTION	CM PIN	POSSIBLE CAUSES
P1658	EMS OBD II	Throttle motor relay ON failure	Engine temperature cool (cooling fans not running) Remove ignition key for 20 seconds (cooling fans not running) Ignition key in, position II for 5 seconds (do not start) Repeat cycle two additional times	2	R	ECM Default: – Vehicle speed limited – Throttle opening limited to 30% – Speed control inhibited	EM80 -052	Throttle motor relay failure Throttle motor relay coil to ECM drive circuit: short circuit to B+ voltage
P1696	EMS JAG	CAN ECM / ASCCM network malfunction	Ignition ON 30 seconds	N	N	ECM Default: – Speed control inhibited	EM80 -123 -124	CAN open circuit fault – ASCCM to ECM CAN short circuit fault ASCCM failure ECM failure
P1697	EMS JAG	Adaptive speed control HEADWAY switch(es) circuit malfunction	Ignition ON 45 seconds	N	A	ECM Default: – Speed control inhibited	EM80 -047	Speed control switches internal steering wheel circuit: short circuit to ground Steering wheel cassette reel: short circuit to ground Cassette reel to ECM circuit: short circuit to ground HEADWAY + / - switch(es) failure (stuck ON)
P1749	TRANS JAG	PARK / NEUTRAL circuit malfunction	Ignition ON Move gear selector to N; leave in N for 5 seconds, then return to P	N	N	None	GB2 -10	TCM TO ECM P / N circuit: open circuit, short circuit to ground, short circuit to B+ voltage TCM / Control valve failure
P1774	TRANS JAG	CAN TCM / Linear Switch Module network malfunction	Ignition ON 10 seconds	N	A	TCM Default: – Manual gear selection disabled – Sport mode disabled	GB2 -2 -6	CAN open circuit fault – TCM to Linear Switch Module CAN short circuit fault Linear Switch Module failure

DTC	SYS	FAULT DESCRIPTION	MONITORING CONDITIONS	CK ENG	OTHER	DEFAULT ACTION	CM PIN	POSSIBLE CAUSES
P1783	TRANS OBD II	Transmission over-temperature shut-down	Drive vehicle for 1 hour while continually performing hard acceleration starts / stops	N	A	TCM Default: – Mechanical limp home mode	—	Transmission fluid level low Transmission fluid cooler circuit: obstructed, leaking Transmission fluid cooler fins blocked by debris Transmission mechanical failure
P1794	TRANS OBD II	TCM ignition switched power supply circuit malfunction	Ignition ON 10 seconds	2	A	TCM Default: – Mechanical limp home mode	GB2 -9	Ignition switched power supply fuse failure Ignition switched power supply circuit: short circuit to ground, open circuit
P1796	TRANS OBD II	CAN network fault	Ignition ON 10 seconds	2	A	TCM Default: – Mechanical limp home mode	GB2 -2 -6	CAN open circuit or short circuit fault TCM / Control valve failure
P1797	TRANS OBD II	CAN TCM / ECM network malfunction	Ignition ON 10 seconds	2	A	TCM Default: – Mechanical limp home mode	GB2 -2 -6	CAN open circuit fault – TCM to ECM CAN short circuit fault ECM failure TCM / Control valve failure
P1798	TRANS JAG	CAN TCM / IC network malfunction	Ignition ON 10 seconds	N	N	None	GB2 -2 -6	CAN open circuit fault – TCM to IC CAN short circuit fault IC failure TCM / Control valve failure
P1799	TRANS JAG	CAN TCM / DSCCM network malfunction	Ignition ON 10 seconds	N	N	TCM Default: – Substitute transmission output speed for DSC vehicle speed	GB2 -2 -6	CAN open circuit fault – TCM to DSCCM CAN short circuit fault DSCCM failure TCM / Control valve failure