

Powertrain DTC Summaries – OBD II

Quick Reference Diagnostic Guide

Jaguar X-TYPE 2.5L and 3.0L 2002 Model Year

Revised January, 2002:

P0706, P0731, P0732, P0733, P0734, P0735, P0740, P1780 "POSSIBLE CAUSES" Revised

P0860 Added

P1606 Revised CK ENG

Evaporative System Monitor Drive Cycle Revised

Revised April, 2002: P0831, P0832, P1517, P1601

Revised August, 2002: P0507, P1260

Revised February, 2003: Page 7, P0915, P1532, P1459

Refer to page 2 for important information regarding the use of "Powertrain DTC Summaries".

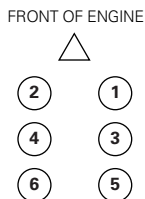
KEY TO COLUMN HEADINGS

DTC	Diagnostic Trouble Code.
SYS	The powertrain system with which the DTC is associated – EMS, TRANS, ABS/TC (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 – 7. 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”. N NO – indicates that the CHECK ENGINE MIL is not activated.
OTHER	Driver Warnings: N None R RED MIL / Message or Powertrain Warning Indicator A AMBER MIL / Message or Powertrain Warning Indicator 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 (SYS – EMS) / TCM (SYS – TRANS) 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.

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

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. Refer to page 7.

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 six 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 six diagnostic monitors are as follows:

- Heated Oxygen Sensors Monitor
- Adaptive Fuel Monitor
- Misfire Monitor
- Catalyst Efficiency Monitor
- Evaporative System 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 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 4th 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 engine and bring to normal operating temperature > 82 °C (180 °F).
- 4 Drive vehicle to the recorded freeze frame conditions (from step 1).
- 5 Repeat several times.

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 vehicle steadily between 1700 – 2500 rpm for 5 minutes.

EVAPORATIVE SYSTEM MONITOR DRIVE CYCLE

- 1 Ensure that fuel filler cap is fully closed (minimum three clicks).
- 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.

COMPREHENSIVE COMPONENT MONITOR ENGINE MANAGEMENT DRIVE CYCLE

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

COMPREHENSIVE COMPONENT MONITOR TRANSMISSION DRIVE CYCLE

The Comprehensive Component Monitor transmission drive cycle will “check” all transmission system components.

- 1 Engine and transmission at normal operating temperature. Ignition OFF; ensure that SPORT mode is NOT selected.
- 2 With gear selector in P and the ignition ON. Check gearshift interlock by attempting to move selector without pressing the brake pedal. Verify P state illumination.
- 3 Press and hold the brake pedal. Move the gear selector to R. Verify R state illumination.
- 4 Set the parking brake. Press and hold the brake pedal. Attempt to start the engine. The engine should not start.
- 5 Move the gear selector to N. Verify N state illumination. Start the engine.
- 6 With the hand brake set and the brake pedal pressed, move the gear selector to the remaining positions in the J Gate (D, 4, 3, 2) for five (5) seconds each. Verify the state illumination in each position.
- 7 Move the gear selector back to 4. Verify 4 state illumination.
- 8 Move the gear selector to D. Verify D state illumination.
- 9 Move the gear selector to N. Verify N state illumination.
- 10 Select R, release the brakes and drive the vehicle in Reverse for a short distance.
- 11 Stop the vehicle.
- 12 Select 2 and drive the vehicle up to 65 km/h (40 mph). Hold 65 km/h (40 mph) for a minimum of five (5) seconds.
- 13 Select 3 and hold 65 km/h (40 mph) for a minimum of five (5) seconds.
- 14 Select 4 and hold 65 km/h (40 mph) for a minimum of five (5) seconds.
- 15 Select D and accelerate to a minimum speed of 80 km/h (50 mph). Hold 80 – 129 km/h (50 – 80 mph) for a minimum of 1.7 kilometers (1 mile).
- 16 Stop the vehicle; do not switch OFF the engine.
- 17 Use WDS Datalogger “TOTAL NUMBER OF DTC SET” to ensure that transmission DTC monitoring is complete.

POWERTRAIN CONTROL ACRONYMS:

A/C	Air conditioning	IAT Sensor	Intake Air Temperature Sensor
APP Sensor	Accelerator Pedal Position Sensor	IMT Valve 1	Intake Manifold Tuning Valve: Bottom
B+	Battery Voltage	IMT Valve 2	Intake Manifold Tuning Valve: Top
Bank 1	RH Engine cylinder bank (cylinders 1, 3, 5) (A Bank)	IP Sensor	Injection Pressure Sensor
Bank 2	LH Engine cylinder bank (cylinders 2, 4, 6) (B Bank)	KS 1	Knock Sensor – Bank 1
BARO Sensor	Barometric Pressure Sensor	KS 2	Knock Sensor – Bank 2
CAN	Controller Area Network	MAF Sensor	Mass Air Flow Sensor
CKP Sensor	Crankshaft Position Sensor	MAP Sensor	Manifold Absolute Pressure Sensor
CMP Sensor 1	Camshaft Position Sensor – Bank 1	TCC	Torque converter clutch
CMP Sensor 2	Camshaft Position Sensor – Bank 2	TCM	Transmission Control Module
DLC	Data Link Connector	TFT Sensor	Transmission Fluid Temperature Sensor
ECM	Engine Control Module	TP Sensor	Throttle Position Sensor
ECT Sensor	Engine Coolant Temperature Sensor	WVT Valve 1	Variable Valve Timing Valve – Bank 1
EFT Sensor	Engine Fuel Temperature Sensor	WVT Valve 2	Variable Valve Timing Valve – Bank 2
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		

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 450 mA	EN16 -109	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 450 mA	EN16 -110	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 4 (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	EN16 -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 (EN16-029, EN16-030) 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 4 (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	EN16 -001 -002 -029 -030	HO2 Sensor 1/1 heater control circuit: short circuit to ground HO2 Sensor 1/1 heater ground circuit(s) fault (EN16-029, EN16-030) 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 4 (Oxygen sensor heaters)	2	N	None	EN16 -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 4 (Oxygen sensor heaters)	2	N	None	EN16 -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 4 (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	EN16 -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 (EN16-081, EN16-082) HO2 Sensor 2/1 heater failure
P0052	EMS OBD II	HO2 Sensor heater control circuit high current – bank 2, upstream (2/1)	Heated oxygen sensors monitor drive cycle – page 4 (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	EN16 -055 -056 -081 -082	HO2 Sensor 2/1 heater control circuit: short circuit to ground HO2 Sensor 2/1 heater ground circuit(s) fault (EN16-081, EN16-082) HO2 Sensor 2/1 heater failure

DTC	SYS	FAULT DESCRIPTION	MONITORING CONDITIONS	CK ENG	OTHER	DEFAULT ACTION	CM PIN	POSSIBLE CAUSES
P0057	EMS OBD II	HO2 Sensor heater control circuit low resistance – bank 2, downstream (2/2)	Heated oxygen sensors monitor drive cycle – page 4 (Oxygen sensor heaters)	2	N	None	EN16-93	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 4 (Oxygen sensor heaters)	2	N	None	EN16-93	HO2 Sensor 2/2 heater control circuit: open circuit; high resistance HO2 Sensor 2/2 heater 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 1700 – 2300 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	EN16-044	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
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	EN16-044	Blocked air cleaner 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	EN16 -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 1700 – 2300 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	EN16 -127	MAP Sensor to ECM circuit(s) fault MAP Sensor failure
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 of 25 °C (77 °F) used	EN16-071	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 of 25 °C (77 °F) used	EN16-071	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 of 25 °C (77 °F) used	EN16-071	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 (50 °F) Drive the vehicle steadily in 4th or 5th gear above 1700 rpm for 5 minutes Idle engine until 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	EN16-070	Low coolant level Contaminated coolant Engine thermostat failure ECT Sensor to ECM sensing 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	EN16-070	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	EN16 -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 v 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	EN16 -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 v 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	EN16 -075	TP Sensor to ECM sensing circuit (TP1): open circuit, 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 v 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	EN16 -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 (50 °F) Drive the vehicle steadily in 4th or 5th gear above 1700 rpm for 5 minutes Idle engine until 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	EN16 -070	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 > 82 °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 4 (Upstream oxygen sensors)	2	N	None	EN16 -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 4 (Upstream oxygen sensors)	2	N	None	EN16 -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 4 (Upstream oxygen sensors)	2	N	ECM Default: – Bank 1 closed loop fuel metering inhibited – Canister purge inhibited	EN16 -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 4 (Downstream oxygen sensors)	2	N	None	EN16 -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 4 (Downstream oxygen sensors)	2	N	None	EN16 -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 4 (Downstream oxygen sensors)	2	N	None	EN16 -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 4 (Upstream oxygen sensors)	2	N	None	EN16 -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 4 (Upstream oxygen sensors)	2	N	None	EN16 -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 4 (Upstream oxygen sensors)	2	N	ECM Default: – Bank 1 closed loop fuel metering inhibited – Canister purge inhibited	EN16 -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 4 (Downstream oxygen sensors)	2	N	None	EN16 -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 4 (Downstream oxygen sensors)	2	N	None	EN16 -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 4 (Downstream oxygen sensors)	2	N	None	EN16 -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	A	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 throttle Fuel filter / system restriction Fuel injector restriction Fuel pressure sensor failure (low fuel pressure) Low fuel pump output HO2 Sensor(s) (1/1, 1/2) harness wiring condition fault 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	A	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) Fuel pressure sensor failure (high fuel pressure) 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	A	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 throttle Fuel filter / system restriction Fuel injector restriction Fuel pressure sensor failure (low fuel pressure) Low fuel pump output HO2 Sensor(s) (2/1, 2/2) harness wiring condition fault 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
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	A	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) Fuel pressure sensor failure (high fuel pressure) 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
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	EN16 -050	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	EN16 -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	EN16 -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
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	EN16 -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

DTC	SYS	FAULT DESCRIPTION	MONITORING CONDITIONS	CK ENG	OTHER	DEFAULT ACTION	CM PIN	POSSIBLE CAUSES
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	EN16 -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	EN16 -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	EN16 -078	EOT Sensor to ECM sensing circuit; high resistance when hot, intermittent high resistance EOT Sensor failure
P0197	EMS OBD II	EOT Sensor low voltage (high temperature)	Ignition ON 10 seconds	2	N	ECM Default: – ECT substituted	EN16 -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	EN16 -078	EOT Sensor disconnected EOT Sensor to ECM sensing circuit: high resistance, open circuit, short circuit to B+ voltage EOT Sensor failure

DTC	SYS	FAULT DESCRIPTION	MONITORING CONDITIONS	CK ENG	OTHER	DEFAULT ACTION	CM PIN	POSSIBLE CAUSES
P0201	EMS OBD II	Fuel injector 1 circuit malfunction	Start engine Battery voltage > 12 v 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	EN16 -115	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 v 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	EN16 -120	Injector disconnected Injector harness wiring: open circuit, short circuit Injector failure
P0203	EMS OBD II	Fuel injector 3 circuit malfunction	Start engine Battery voltage > 12 v 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	EN16 -114	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
P0204	EMS OBD II	Fuel injector 4 circuit malfunction	Start engine Battery voltage > 12 v 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	EN16 -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 v 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	EN16 -113	Injector disconnected Injector harness wiring: open circuit, short circuit Injector failure
P0206	EMS OBD II	Fuel injector 6 circuit malfunction	Start engine. Battery voltage > 12 v 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	EN16 -118	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 v 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	EN16 -076	TP Sensor to ECM sensing circuit (TP2): open circuit, high resistance TP Sensor failure
P0223	EMS OBD II	TP Sensor sense circuit 2 (TP2) high voltage	Battery voltage > 10 v 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	EN16 -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 5	Misfire monitor drive cycle – page 5	1 or 2*	N	None	—	Cylinder compression low Worn camshaft / broken valve spring(s) Fuel delivery pressure (low / high) Fuel injector(s) restricted / leaking Fuel injector(s) continuously open Fuel contamination Fuel injector circuit fault(s) (Injector DTCs also flagged) Spark plug failure / fouled / incorrect gap ECM to ignition coil primary circuit fault (Cylinder misfire detected DTC also flagged) Ignition coil failure

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 5	Misfire monitor drive cycle – page 5	1 or 2*	N	None	—	Refer to P0300 Possible Causes
P0302	EMS OBD II	Misfire detected – cylinder 2 *Refer to Misfire Note, page 5	Misfire monitor drive cycle – page 5	1 or 2*	N	None	—	Refer to P0300 Possible Causes
P0303	EMS OBD II	Misfire detected – cylinder 3 *Refer to Misfire Note, page 5	Misfire monitor drive cycle – page 5	1 or 2*	N	None	—	Refer to P0300 Possible Causes
P0304	EMS OBD II	Misfire detected – cylinder 4 *Refer to Misfire Note, page 5	Misfire monitor drive cycle – page 5	1 or 2*	N	None	—	Refer to P0300 Possible Causes
P0305	EMS OBD II	Misfire detected – cylinder 5 *Refer to Misfire Note, page 5	Misfire monitor drive cycle – page 5	1 or 2*	N	None	—	Refer to P0300 Possible Causes
P0306	EMS OBD II	Misfire detected – cylinder 6 *Refer to Misfire Note, page 5	Misfire monitor drive cycle – page 5	1 or 2*	N	None	—	Refer to P0300 Possible Causes
P0332	EMS OBD II	KS sense circuit out of range – low voltage	Start engine Battery voltage > 12 v Idle for 2 minutes	2	A	ECM Default: – Maximum ignition retard – Maximum engine speed reduced	EN16 -098	Poor sensor contact with the cylinder block KS to ECM sense circuit short circuit to ground KS failure
P0333	EMS OBD II	KS sense circuit out of range – high voltage	Start engine Battery voltage > 12 v Idle for 2 minutes	2	A	ECM Default: – Maximum ignition retard – Maximum engine speed reduced	EN16 -098	Poor sensor contact with the cylinder block KS to ECM sense circuit: high resistance, open circuit, short circuit to high voltage KS failure

DTC	SYS	FAULT DESCRIPTION	MONITORING CONDITIONS	CK ENG	OTHER	DEFAULT ACTION	CM PIN	POSSIBLE CAUSES
P0335	EMS OBD II	CKP Sensor circuit malfunction	Start engine; momentarily race the engine; stop engine Repeat two additional times Start engine; idle 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 Note: If CKP Sensor fault exists and engine will not start, battery voltage must drop below 10.5 V during cranking for DTC to be flagged. (Crank period – 30 seconds.) If CKP Sensor fault exists, engine will start on the second crank as the ECM will default to CMP signals for synchronization.	2	A	ECM Default: – Maximum engine speed reduced	EN16 -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

DTC	SYS	FAULT DESCRIPTION	MONITORING CONDITIONS	CK ENG	OTHER	DEFAULT ACTION	CM PIN	POSSIBLE CAUSES
P0336	EMS OBD II	CKP Sensor circuit range / performance	Start engine; momentarily race the engine; stop engine Repeat two additional times Start engine; idle 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	A	ECM Default: – Maximum engine speed reduced	EN16 -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
P0340	EMS OBD II	CMP Sensor 1 circuit malfunction – bank 1	Start engine; momentarily race the engine; stop engine Repeat two additional times Start engine idle 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	None	EN16 -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

DTC	SYS	FAULT DESCRIPTION	MONITORING CONDITIONS	CK ENG	OTHER	DEFAULT ACTION	CM PIN	POSSIBLE CAUSES
P0341	EMS OBD II	CMP Sensor 1 circuit range / performance – bank 1	Start engine; momentarily race the engine; stop engine Repeat two additional times Start engine; idle 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	None	EN16 -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
P0351	EMS OBD II	Ignition module primary circuit malfunction – cylinder 1	Start engine Battery voltage > 12 v 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 – Fuel injection cut off (cylinder 1)	EN16 -087	ECM to ignition module primary circuit: open circuit, short circuit to ground, high resistance Ignition module ground circuit: open circuit, high resistance Ignition module / coil failure

DTC	SYS	FAULT DESCRIPTION	MONITORING CONDITIONS	CK ENG	OTHER	DEFAULT ACTION	CM PIN	POSSIBLE CAUSES
P0352	EMS OBD II	Ignition module primary circuit malfunction – cylinder 2	Start engine Battery voltage > 12 v 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 – Fuel injection cut off (cylinder 2)	EN16 -061	ECM to ignition module primary circuit: open circuit, short circuit to ground, high resistance Ignition module ground circuit: open circuit, high resistance Ignition module / coil failure
P0353	EMS OBD II	Ignition module primary circuit malfunction – cylinder 3	Start engine Battery voltage > 12 v 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 – Fuel injection cut off (cylinder 3)	EN16 -088	ECM to ignition module primary circuit: open circuit, short circuit to ground, high resistance Ignition module ground circuit: open circuit, high resistance Ignition module / coil failure

DTC	SYS	FAULT DESCRIPTION	MONITORING CONDITIONS	CK ENG	OTHER	DEFAULT ACTION	CM PIN	POSSIBLE CAUSES
P0354	EMS OBD II	Ignition module primary circuit malfunction – cylinder 4	Start engine Battery voltage > 12 v 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 – Fuel injection cut off (cylinder 4)	EN16-062	ECM to ignition module primary circuit: open circuit, short circuit to ground, high resistance Ignition module ground circuit: open circuit, high resistance Ignition module / coil failure
P0355	EMS OBD II	Ignition module primary circuit malfunction – cylinder 5	Start engine Battery voltage > 12 v 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 – Fuel injection cut off (cylinder 5)	EN16-089	ECM to ignition module primary circuit: open circuit, short circuit to ground, high resistance Ignition module ground circuit: open circuit, high resistance Ignition module / coil failure

DTC	SYS	FAULT DESCRIPTION	MONITORING CONDITIONS	CK ENG	OTHER	DEFAULT ACTION	CM PIN	POSSIBLE CAUSES
P0356	EMS OBD II	Ignition module primary circuit malfunction – cylinder 6	Start engine Battery voltage > 12 v 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 – Fuel injection cut off (cylinder 6)	EN16 -063	ECM to ignition module primary circuit: open circuit, short circuit to ground, high resistance Ignition module ground circuit: open circuit, high resistance Ignition module / coil failure
P0420	EMS OBD II	Catalytic converter system efficiency below threshold – bank 1	Catalyst efficiency monitor drive cycle – page 5	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 5	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 6	2	N	ECM Default: – Canister purge inhibited – Adaptive fuel metering inhibited	—	Fuel cap seal defective EVAP system leak (canister damage, pipework damage) EVAP Canister purge valve to ECM drive circuit: open circuit, short circuit, high resistance EVAP Canister purge valve power supply circuit: open circuit, short circuit EVAP Canister purge valve to engine purge pipe: restricted, leaking, disconnected EVAP Canister purge valve operating vacuum hose leak / restriction EVAP Canister purge valve failure Fuel tank leak
P0443	EMS OBD II	EVAP canister purge valve circuit malfunction	Evaporative system monitor drive cycle – page 6	2	N	ECM Default: – Canister purge inhibited – Adaptive fuel metering inhibited	EN16-066	EVAP Canister purge valve to ECM drive circuit: open circuit, short circuit, high resistance EVAP Canister purge valve power supply circuit: open circuit, short circuit EVAP Canister purge valve operating vacuum hose leak / restriction EVAP Canister purge valve failure
P0444	EMS OBD II	EVAP canister purge valve circuit open circuit	Evaporative system monitor drive cycle – page 6.	2	N	ECM Default: – Canister purge inhibited – Adaptive fuel metering inhibited	EN16-066	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 6.	2	N	ECM Default: – Canister purge inhibited – Adaptive fuel metering inhibited	EN16-066	EVAP Canister purge valve to ECM drive circuit: short circuit to ground EVAP Canister purge valve failure

DTC	SYS	FAULT DESCRIPTION	MONITORING CONDITIONS	CK ENG	OTHER	DEFAULT ACTION	CM PIN	POSSIBLE CAUSES
P0446	EMS OBD II	EVAP canister close valve circuit malfunction	Evaporative system monitor drive cycle – page 6	2	N	ECM Default: – Canister purge inhibited – Adaptive fuel metering inhibited	EN16 -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
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	EN16 -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	EN16 -067	EVAP canister close valve to ECM drive circuit: short to ground EVAP canister close valve failure
P0450	EMS OBD II	FTP Sensor circuit malfunction	Evaporative system monitor drive cycle – page 6	2	N	None	EN16 -104	FTP Sensor disconnected FTP Sensor to ECM sense circuit: open circuit, short circuit to ground, short circuit to B+ voltage FTP Sensor to splice sensor supply circuit: open circuit, high resistance FTP Sensor to splice ground circuit: open circuit, high resistance FTP Sensor failure
P0452	EMS OBD II	FTP Sensor circuit low voltage (low pressure)	Ignition ON 10 seconds	2	N	None	EN16 -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

DTC	SYS	FAULT DESCRIPTION	MONITORING CONDITIONS	CK ENG	OTHER	DEFAULT ACTION	CM PIN	POSSIBLE CAUSES
P0453	EMS OBD II	FTP Sensor circuit high voltage (high pressure)	Ignition ON 10 seconds	2	N	None	EN16 -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
P0455	EMS OBD II	EVAP system leak detected – large	Evaporative system monitor drive cycle – page 6	2	N	ECM Default: – Canister purge inhibited – Adaptive fuel metering inhibited	—	Fuel cap off Fuel cap seal defective EVAP system leak (canister damage, pipework damage) EVAP Canister purge valve to ECM drive circuit: open circuit, short circuit, high resistance EVAP Canister purge valve power supply circuit: open circuit, short circuit EVAP Canister purge valve to engine purge pipe: restricted, leaking, disconnected EVAP Canister purge valve operating vacuum hose leak / restriction EVAP Canister purge valve failure Fuel tank leak

DTC	SYS	FAULT DESCRIPTION	MONITORING CONDITIONS	CK ENG	OTHER	DEFAULT ACTION	CM PIN	POSSIBLE CAUSES
P0456	EMS OBD II	EVAP system leak detected – very small (0.020 in.)	Evaporative system monitor drive cycle – page 6	2	N	ECM Default: – Canister purge inhibited – Adaptive fuel metering inhibited	—	Fuel cap seal defective EVAP system leak (canister damage, pipework damage) EVAP Canister purge valve to ECM drive circuit: open circuit, short circuit, high resistance EVAP Canister purge valve power supply circuit: open circuit, short circuit EVAP Canister purge valve to engine purge pipe: restricted, leaking EVAP Canister purge valve operating vacuum hose leak / restriction EVAP Canister purge 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 pack circuit(s): intermittent short circuit, open circuit, high resistance Fuel level sensor failure Instrument pack fault (incorrect fuel level data)
P0480	EMS JAG	Radiator cooling fan module drive circuit malfunction	Start and run engine > 2000 rpm for 2 minutes (Ensures voltage stays above 14 V for the required time)	N	N	ECM Default: – With ignition ON, fan operates at maximum speed	EN16-051	ECM to radiator cooling fan module drive circuit: short circuit, open circuit, high resistance 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
P0560	EMS OBD II	Battery power supply voltage malfunction Note: This DTC can be flagged due to fuel injection pressure sensor fault. If P0193 is also flagged, correct first.	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	EN16-022	ECM battery power supply open circuit, high resistance

DTC	SYS	FAULT DESCRIPTION	MONITORING CONDITIONS	CK ENG	OTHER	DEFAULT ACTION	CM PIN	POSSIBLE CAUSES
P0565	EMS JAG	Cruise control ON / OFF switch fault	Ignition ON 45 seconds	N	A	ECM Default: – Speed control inhibited – Maximum engine speed reduced	EN16 -047	Cruise 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 ON / OFF switch failure (stuck ON)
P0566	EMS JAG	Cruise control CANCEL switch ON fault	Ignition ON 45 seconds	N	A	ECM Default: – Speed control inhibited – Maximum engine speed reduced	EN16 -047	Cruise 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	Cruise control RESUME switch ON fault	Ignition ON 45 seconds	N	A	ECM Default: – Speed control inhibited – Maximum engine speed reduced	EN16 -047	Cruise 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)
P0568	EMS JAG	Cruise control input signal low / high resistance	Ignition ON 45 seconds	N	A	ECM Default: – Speed control inhibited – Maximum engine speed reduced	EN16 -047	Cruise 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

DTC	SYS	FAULT DESCRIPTION	MONITORING CONDITIONS	CK ENG	OTHER	DEFAULT ACTION	CM PIN	POSSIBLE CAUSES
P0569	EMS JAG	Cruise control SET / - switch ON fault	Ignition ON 45 seconds	N	A	ECM Default: – Speed control inhibited – Maximum engine speed reduced	EN16 -047	Cruise 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	Cruise control SET / + switch ON fault	Ignition ON 45 seconds	N	A	ECM Default: – Speed control inhibited – Maximum engine speed reduced	EN16 -047	Cruise 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
P0616	EMS OBD II	Starter relay drive circuit low voltage / starter relay request off (ignition switch position III OFF)	Ignition ON Battery voltage > 12 v Automatic – P for 5 seconds; manual – clutch fully pressed for 5 seconds Start engine	2	N	None	EN16 -041 -006	Starter relay drive circuit: open circuit, high resistance Starter relay failure

DTC	SYS	FAULT DESCRIPTION	MONITORING CONDITIONS	CK ENG	OTHER	DEFAULT ACTION	CM PIN	POSSIBLE CAUSES
P0617	EMS OBD II	Starter relay drive circuit high voltage / starter relay request on (ignition switch position III ON)	Ignition ON Battery voltage > 12 v Automatic – P for 5 seconds; manual – clutch fully pressed for 5 seconds Start engine	2	N	None	EN16 -041 -006	Starter relay drive circuit: short circuit to high voltage Starter relay failure
P0646	EMS OBD II	A/C Compressor clutch relay drive circuit low voltage / A/C (compressor clutch request off [CAN])	Start engine Climate control system OFF Idle for 10 seconds	2	N	None	EN16 -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 / A/C (compressor clutch request on [CAN])	Start engine Climate control system ON – full cooling Idle for 2 minutes	2	N	None	EN16 -034	A/C Compressor clutch relay drive circuit: short circuit to high voltage A/C Compressor clutch relay failure
P0706	TRANS OBD II	Transmission range sensor circuit – no signal; incorrect signal(s)	Comprehensive component monitor transmission drive cycle – page 7	2	A	TCM Default: – 4, 3, 2 Cannot be selected – No J Gate illumination – Reverse disengaged above 10 km/h (6 mph) (Poor shift quality)	JB131 -007 -008 -025 -026 -027 -030 -009	J Gate – incorrect setting Selector cable adjustment / installation incorrect Range sensor incorrect installation / adjustment Range sensor to TCM circuit(s): open circuit, short circuit to ground TCM Ground circuit: open circuit, high resistance Range sensor failure

DTC	SYS	FAULT DESCRIPTION	MONITORING CONDITIONS	CK ENG	OTHER	DEFAULT ACTION	CM PIN	POSSIBLE CAUSES
P0710	TRANS OBD II	TFT Sensor circuit malfunction	Comprehensive component monitor transmission drive cycle – page 7	2	A	None (Poor shift quality)	JB131 -039 -020	Transmission to TCM temperature sensor circuit: open circuit, short circuit, high resistance Transmission internal temperature sensor circuit (internal harness): open circuit, short circuit; high resistance Sensor ground circuit fault TFT Sensor failure
P0715	TRANS OBD II	Turbine speed sensor circuit malfunction	Start and run engine – 10 seconds	2	A	None (Poor shift quality)	JB131 -024 -020	Transmission to TCM turbine speed sensor circuit: open circuit, short circuit, high resistance Transmission internal turbine speed sensor circuit: open circuit, short circuit, high resistance Transmission to TCM turbine speed sensor circuit: shielding defective Sensor ground circuit fault Turbine speed sensor failure
P0720	TRANS OBD II	Output speed sensor circuit malfunction (Automatic Transmission)	Comprehensive component monitor transmission drive cycle – page 7	2	A	TCM Default: – ABS Wheel speed (CAN) substituted (Poor shift quality) – If ABS Wheel speed message incorrect – fixed 4th gear	JB131 -005 -020	Transmission to TCM output speed sensor circuit: open circuit, short circuit, high resistance Transmission internal output speed sensor circuit: open circuit, short circuit, high resistance Transmission to TCM output speed sensor circuit: shielding defective Sensor ground circuit fault Output speed sensor failure
P0731	TRANS OBD II	1st Gear ratio error Note: If a shift solenoid failure DTC is also flagged, correct shift solenoid DTC first.	Comprehensive component monitor transmission drive cycle – page 7	2	A	TCM Default: – Fixed 4th gear	—	J Gate – incorrect setting Transmission oil level low Transmission mechanical failure

DTC	SYS	FAULT DESCRIPTION	MONITORING CONDITIONS	CK ENG	OTHER	DEFAULT ACTION	CM PIN	POSSIBLE CAUSES
P0732	TRANS OBD II	2nd Gear ratio error Note: If a shift solenoid failure DTC is also flagged, correct shift solenoid DTC first.	Comprehensive component monitor transmission drive cycle – page 7	2	A	TCM Default: – Fixed 4th gear	—	J Gate – incorrect setting Transmission oil level low Transmission mechanical failure
P0733	TRANS OBD II	3rd Gear ratio error Note: If a shift solenoid failure DTC is also flagged, correct shift solenoid DTC first.	Comprehensive component monitor transmission drive cycle – page 7	2	A	TCM Default: – Fixed 4th gear	—	J Gate – incorrect setting Transmission oil level low Transmission mechanical failure
P0734	TRANS OBD II	4th Gear ratio error Note: If a shift solenoid failure DTC is also flagged, correct shift solenoid DTC first.	Comprehensive component monitor transmission drive cycle – page 7	2	A	TCM Default: – Fixed 4th gear	—	J Gate – incorrect setting Transmission oil level low Transmission mechanical failure
P0735	TRANS OBD II	5th Gear ratio error Note: If a shift solenoid failure DTC is also flagged, correct shift solenoid DTC first.	Comprehensive component monitor transmission drive cycle – page 7	2	A	TCM Default: – Fixed 4th gear	—	J Gate – incorrect setting Transmission oil level low Transmission mechanical failure
P0736	TRANS JAG	Reverse gear ratio error	Comprehensive component monitor transmission drive cycle – page 7	N	A	TCM Default: – Fixed 4th gear in D (R range not effected)	—	J Gate – incorrect setting Transmission oil level low Transmission mechanical failure
P0740	TRANS OBD II	TCC malfunction	Comprehensive component monitor transmission drive cycle – page 7	2	A	TCM Default: – No TCC control	—	J Gate – incorrect setting Transmission oil level low Transmission mechanical failure

DTC	SYS	FAULT DESCRIPTION	MONITORING CONDITIONS	CK ENG	OTHER	DEFAULT ACTION	CM PIN	POSSIBLE CAUSES
P0743	TRANS OBD II	TCC Solenoid circuit malfunction	Comprehensive component monitor transmission drive cycle – page 7	2	A	TCM Default: – If short circuit to B+ V – TCC permanently engaged – If other cause – TCC inoperative	JB131 -016 -009	Transmission to TCM TCC solenoid circuit: open circuit, short circuit to B+ V, short circuit to ground Transmission internal TCC solenoid circuit: open circuit, short circuit TCM Ground circuit: open circuit, high resistance TCC Solenoid failure
P0748	TRANS OBD II	Line pressure control solenoid circuit malfunction	Start and run engine – 10 seconds	2	A	TCM Default: – Fixed 4th gear	JB131 -018 -009	Transmission to TCM line pressure solenoid circuit: open circuit, short circuit Transmission internal line pressure solenoid circuit: open circuit, short circuit TCM Ground circuit: open circuit, high resistance Line pressure solenoid failure
P0753	TRANS OBD II	Shift solenoid A circuit malfunction	Comprehensive component monitor transmission drive cycle – page 7	2	A	TCM Default: – If short circuit to B+ V – fixed 2nd gear at low vehicle speed; fixed 5th gear at high vehicle speed – If other cause – fixed 3rd gear at low vehicle speed; fixed 4th gear at high vehicle speed	JB131 -015 -009	Transmission to TCM shift solenoid A circuit: open circuit, short circuit to B+ V, short circuit to ground Transmission internal shift solenoid A circuit: open circuit, short circuit TCM Ground circuit: open circuit, high resistance Shift solenoid A pressure solenoid failure
P0758	TRANS OBD II	Shift solenoid B circuit malfunction	Comprehensive component monitor transmission drive cycle – page 7	2	A	TCM Default: – If short circuit to B+ V: fixed 3rd gear – If other cause: fixed 4rd gear	JB131 -014 -009	Transmission to TCM shift solenoid B circuit: open circuit, short circuit to B+ V, short circuit to ground Transmission internal shift solenoid B circuit: open circuit, short circuit TCM Ground circuit: open circuit, high resistance Shift solenoid B pressure solenoid failure

DTC	SYS	FAULT DESCRIPTION	MONITORING CONDITIONS	CK ENG	OTHER	DEFAULT ACTION	CM PIN	POSSIBLE CAUSES
P0763	TRANS OBD II	Shift solenoid C circuit malfunction	Comprehensive component monitor transmission drive cycle – page 7	2	A	TCM Default: – Fixed 4th gear	JB131 -052 -009	Transmission to TCM shift solenoid C circuit: open circuit, short circuit to B+ V, short circuit to ground Transmission internal shift solenoid C circuit: open circuit, short circuit TCM Ground circuit: open circuit, high resistance Shift solenoid C pressure solenoid failure
P0778	TRANS OBD II	2/4 Brake pressure control solenoid circuit malfunction	Start and run engine – 10 seconds	2	A	TCM Default: – Fixed 4th gear	JB131 -003 -009	Transmission to TCM 2/4 Brake pressure solenoid circuit: open circuit, short circuit Transmission internal 2/4 Brake pressure solenoid circuit: open circuit, short circuit TCM Ground circuit: open circuit, high resistance 2/4 Brake pressure solenoid failure
P0791	TRANS OBD II	Intermediate speed sensor circuit malfunction (Automatic transmission)	Comprehensive component monitor transmission drive cycle – page 7	2	A	None (Poor shift quality)	JB131 -021 -020	Transmission to TCM intermediate speed sensor circuit: open circuit, short circuit, high resistance Transmission internal intermediate speed sensor circuit: open circuit, short circuit, high resistance Transmission to TCM intermediate speed sensor circuit: shielding defective Sensor ground circuit fault Intermediate speed sensor failure
P0791	TRANS (ECM*) JAG	Output speed sensor circuit malfunction (Manual transmission)	Drive vehicle above 16 km/h (10 mph) for 15 seconds	N	N	None	EN16 -026	Output speed sensor power supply circuit: open circuit, short circuit Transmission to ECM output speed sensor circuits: open circuit, short circuit, high resistance Output speed sensor failure

DTC	SYS	FAULT DESCRIPTION	MONITORING CONDITIONS	CK ENG	OTHER	DEFAULT ACTION	CM PIN	POSSIBLE CAUSES
P0831	TRANS (ECM*) OBD II	Clutch cancel switch low voltage (switch normally closed) * Manual transmission input to ECM	Drive vehicle 60 – 100 km/h (37 – 62 mph); 1800 – 2500 rpm; engine load > 0.40 g/rpm	2	N	None	EN16 -033	Clutch cancel switch supply circuit: open circuit Clutch cancel switch to ECM circuit: open circuit, high resistance Clutch cancel switch failure
P0832	TRANS (ECM*) OBD II	Clutch cancel switch high voltage (switch normally closed) * Manual transmission input to ECM	Drive vehicle; shift from 1st to 2nd; stop vehicle Repeat 5 times	2	N	None	EN16 -033	Clutch cancel switch to ECM circuit: short circuit to high voltage Clutch cancel switch failure
P0834	TRANS (ECM*) JAG	Clutch pedal safety switch low voltage (switch normally open) * Manual transmission input to ECM	Drive vehicle; shift from 1st to 2nd; stop vehicle Repeat 5 times	N	N	None	EN16 -031	Clutch pedal safety switch supply circuit: open circuit Clutch pedal safety switch to ECM circuit: open circuit, high resistance Clutch pedal safety switch failure
P0835	TRANS (ECM*) JAG	Clutch pedal safety switch high voltage (switch normally open) * Manual transmission input to ECM	Drive vehicle 60 – 100 km/h (37 – 62 mph); 1800 – 2500 rpm; engine load > 0.40 g/rpm	N	N	None	EN16 -031	Clutch pedal safety switch to ECM circuit: short circuit to high voltage Clutch pedal safety switch failure
P0860	TRANS (ECM*) JAG	J Gate CAN network malfunction * J Gate / CAN monitored by ECM	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	EN16 -123 -124	CAN open circuit fault CAN short circuit fault J Gate failure

DTC	SYS	FAULT DESCRIPTION	MONITORING CONDITIONS	CK ENG	OTHER	DEFAULT ACTION	CM PIN	POSSIBLE CAUSES
P0915	TRANS OBD II	J Gate signal failure	Comprehensive component monitor transmission drive cycle – page 7	2	A	None	JB131 -008 -009 -045 -009	2nd Gear signal to TCM circuit: short circuit, open circuit, high resistance 3rd Gear signal to TCM circuit: short circuit, open circuit, high resistance 4th Gear signal to TCM circuit: short circuit, open circuit, high resistance J-Gate ground circuit: open circuit, high resistance TCM Ground circuit: open circuit, high resistance
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: – Default air mass used – Adaptive fuel metering inhibited – Catalyst warm up ignition retard inhibited – Canister purge inhibited – Maximum engine speed reduced	EN16 -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
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	EN16 -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

DTC	SYS	FAULT DESCRIPTION	MONITORING CONDITIONS	CK ENG	OTHER	DEFAULT ACTION	CM PIN	POSSIBLE CAUSES
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	EN16 -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 v 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 adoptions (wear, variance) inhibited	EN16 -103	APP Sensor to ECM sense circuit (APP1): open circuit, 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 v 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 adoptions (wear, variance) inhibited	EN16 -103 -102	APP Sensor sensor to ECM sense circuit(s) (APP1 or APP2): short circuit to B+ voltage APP Sensor sensor ground circuit(s): open circuit APP Sensor failure
P1146	EMS OBD II	Generator “CHARGE” circuit low voltage / request high	Battery voltage > 12 v Switch OFF all electrical consumers Start engine; idle for 16 minutes with all electrical consumers switched OFF	2	C	None	EN16 -053	Generator to ECM “CHARGE” circuit: open circuit, high resistance Generator regulator failure

DTC	SYS	FAULT DESCRIPTION	MONITORING CONDITIONS	CK ENG	OTHER	DEFAULT ACTION	CM PIN	POSSIBLE CAUSES
P1215	EMS OBD II	APP Sensor sense circuit low voltage – APP2	Battery voltage > 10 v 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	EN16 -102	APP Sensor to ECM sense circuit (APP2): open circuit, 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 v 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	EN16 -102 -103	APP Sensor sensor to ECM sense circuit(s) (APP2 or APP1): short circuit to B+ 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 v 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	—	Throttle adaptations not performed after battery disconnect TP Sensor disconnected TP Sensor to ECM sense circuits: open circuit, high resistance Throttle motor relay failure Throttle motor relay to ECM circuit fault Throttle motor relay power supply open circuit ECM ground circuit fault (relay coil drive) Throttle motor to ECM drive circuits: open circuit, short circuit, high resistance 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 v 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	—	Throttle motor disconnected Throttle motor to ECM drive circuits: short circuit or open circuit Throttle motor failure
P1234	EMS OBD II	No fuel pump commands received by ECM	Start engine Battery voltage > 12 v Idle for 2 minutes	2	N	ECM Default: – Fuel pump feedback control inhibited	EN16 -025 -027	ECM to fuel pump control module control and / or feedback circuits: open circuit, short circuit, high resistance Fuel pump control module failure
P1236	EMS OBD II	Fuel pump not activated when requested by ECM	Start engine Battery voltage > 12 v Idle for 2 minutes	2	N	ECM Default: – Fuel pump feedback control inhibited	EN16 -025 -027	ECM to fuel pump control module control and / or feedback circuits: open circuit, short circuit, high resistance Fuel pump control module failure
P1240	EMS OBD II	Sensor power supply circuit malfunction (APP Sensor, TP Sensor, IP Sensor, MAP Sensor, FTP Sensor)	Ignition ON 10 seconds	2	N	None	EN16 -012 -013	ECM to sensors sensor supply voltage circuit(s): short circuit to ground, short circuit to high voltage, open circuit, high resistance APP Sensor, TP Sensor, IP Sensor, MAP Sensor, FTP Sensor failure(s)
P1241	EMS OBD II	Sensor power supply circuit low voltage (APP Sensor, TP Sensor, IP Sensor, MAP Sensor, FTP Sensor)	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	EN16 -012 -013	ECM to sensors sensor supply voltage circuit(s): short circuit to ground APP Sensor, TP Sensor, IP Sensor, MAP Sensor, FTP Sensor failure(s)

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 (APP Sensor, TP Sensor, IP Sensor, MAP Sensor, FTP Sensor)	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	EN16 -012 -013	ECM to sensors supply voltage circuit(s): open circuit, high resistance, short circuit to high voltage APP Sensor, TP Sensor, IP Sensor, MAP Sensor, FTP Sensor failure(s)
P1243	EMS OBD II	Sensor ground circuits open circuit (APP Sensor, TP Sensor, IP Sensor, MAP Sensor, FTP Sensor)	Ignition ON 10 seconds	2	N	None	EN16 -019 -020	ECM to sensors sensor ground circuit(s): open circuit, high resistance APP Sensor, TP Sensor, IP Sensor, MAP Sensor, FTP Sensor failure(s)
P1244	EMS OBD II	Generator "CHARGE" circuit high voltage / request low	Battery voltage > 12 v Switch OFF all electrical consumers Start engine; idle for 16 minutes with all electrical consumers switched OFF	2	C	ECM Default: – Cooling fan speed increased	EN16 -053	Generator to ECM "CHARGE" circuit: short circuit to high voltage Generator regulator failure Generator failure
P1245	EMS OBD II	Engine crank signal low voltage	Start engine Starter should stop when the key is released from position III (CRANK)	2	N	None	EN16 -006	Starter relay coil to ECM / ignition switch circuit: open circuit
P1246	EMS OBD II	Engine crank signal high voltage	Drive vehicle > 32 km/h (20 mph) between 2000 – 2500 rpm for 10 seconds; stop vehicle Repeat 10 times	2	N	None	EN16 -006	Starter relay coil to ECM / ignition switch circuit: short circuit to high voltage Ignition switch failure

DTC	SYS	FAULT DESCRIPTION	MONITORING CONDITIONS	CK ENG	OTHER	DEFAULT ACTION	CM PIN	POSSIBLE CAUSES
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: – Limp home unavailable – Vehicle speed limited – Speed control inhibited – Possible engine shut down	—	Throttle return spring failure (throttle body failure)
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	EN16-052	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: – Limp home unavailable – Vehicle speed limited – Speed control inhibited – Possible engine shut down	—	Throttle limp home spring failure (throttle body failure)
P1260	EMS JAG	Security input malfunction	Start engine	N	N	None	—	Invalid ignition key code Passive anti-theft system (PATS) signal to instrument pack missing or corrupted Security message (PATS) CAN failure NOTE: To clear this DTC, the failure must first be rectified, followed by an ignition ON cycle to allow a successful PATS identification exchange between the ECM and the IC. The fault code can then be cleared.

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 – P0306	Misfire monitor drive cycle – page 5	2	A	ECM Default: – Maximum engine speed reduced	—	Cylinder compression low Worn camshaft / broken valve spring(s) Fuel delivery pressure (low / high) Fuel injector(s) restricted / leaking Fuel injector(s) continuously open Fuel contamination Fuel injector circuit fault(s) (Injector DTCs also flagged) Spark plug failure / fouled / incorrect gap ECM to ignition coil primary circuit fault (Cylinder misfire detected DTC also flagged) Ignition coil failure
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 – P0306	Misfire monitor drive cycle – page 5	2	A	ECM Default: – Maximum engine speed reduced	—	Cylinder compression low Worn camshaft / broken valve spring(s) Fuel delivery pressure (low / high) Fuel injector(s) restricted / leaking Fuel injector(s) continuously open Fuel contamination Fuel injector circuit fault(s) (Injector DTCs also flagged) Spark plug failure / fouled / incorrect gap ECM to ignition coil primary circuit fault (Cylinder misfire detected DTC also flagged) Ignition coil failure

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 – P0306	Misfire monitor drive cycle – page 5	2	N	None	—	Cylinder compression low Worn camshaft / broken valve spring(s) Fuel delivery pressure (low / high) Fuel injector(s) restricted / leaking Fuel injector(s) continuously open Fuel contamination Fuel injector circuit fault(s) (Injector DTCs also flagged) Spark plug failure / fouled / incorrect gap ECM to ignition coil primary circuit fault (Cylinder misfire detected DTC also flagged) Ignition coil failure
P1338	EMS OBD II	Fuel pump feedback circuit low / high voltage	Start engine Battery voltage > 12 v Idle for 2 minutes	2	N	ECM Default: – Fuel pump feedback control inhibited	EN16 -025 -027	ECM to fuel pump control module control and / or feedback circuits: open circuit, short circuit, high resistance Fuel pump control module failure
P1340	EMS OBD II	CMP Sensor 2 circuit malfunction – bank 2	Start engine; momentarily race the engine; stop engine Repeat two additional times Start engine; idle 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	None	EN16 -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 two additional times Start engine; idle 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	None	EN16 -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 v 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	EN16 -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

DTC	SYS	FAULT DESCRIPTION	MONITORING CONDITIONS	CK ENG	OTHER	DEFAULT ACTION	CM PIN	POSSIBLE CAUSES
P1367	EMS OBD II	Ignition amplifier bank 1 (1, 3, 5) fault	Start engine Battery voltage > 12 v Idle for 2 minutes	2	A	ECM Default: - Closed loop fuel metering inhibited - Adaptive fuel metering inhibited - Catalyst warm up ignition retard inhibited - Canister purge inhibited - Maximum engine speed reduced - Fuel injection cut off (cylinders 1, 3, 5)	EN16 -131	Ignition monitoring circuit between splice and ECM: open circuit, short circuit to ground, short circuit to B+ voltage Ignition module / coil bank 1 ground circuit fault
P1368	EMS OBD II	Ignition amplifier bank 2 (2, 4, 6) fault	Start engine Battery voltage > 12 v Idle for 2 minutes	2	A	ECM Default: - Closed loop fuel metering inhibited - Adaptive fuel metering inhibited - Catalyst warm up ignition retard inhibited - Canister purge inhibited - Maximum engine speed reduced - Fuel injection cut off (cylinders 2, 4, 6)	EN16 -132	Ignition monitoring circuit between splice and ECM: open circuit, short circuit to ground, short circuit to B+ voltage Ignition module / coil bank 2 ground circuit fault

DTC	SYS	FAULT DESCRIPTION	MONITORING CONDITIONS	CK ENG	OTHER	DEFAULT ACTION	CM PIN	POSSIBLE CAUSES
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 valve of 450 mA	EN16 -109	VVT solenoid valve 1 to ECM PWM drive circuit fault VVT solenoid valve 1 ground circuit fault VVT solenoid 1 failure VVT 1 oil flow fault VVT / camshaft mechanical failure – bank 1
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	EN16 -110	VVT solenoid valve 2 to ECM PWM drive circuit fault VVT solenoid valve 2 ground circuit fault VVT solenoid 2 failure VVT 2 oil flow fault VVT / camshaft mechanical failure – bank 2
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	EN16 -031	Gear selector cable setting incorrect Transmission range sensor to ECM circuit: open circuit, high resistance Transmission range sensor failure D – 4 Switch to TCM circuit: open circuit, high resistance D – 4 Switch failure

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, 4, 3, 2 CAUTION: If the P/N switch is faulty, the engine may start while in gear	2	A	ECM Default: – Speed control inhibited – Maximum throttle opening for N range inhibited – Maximum engine speed reduced	EN16 -031	Gear selector cable setting incorrect Transmission range sensor to ECM circuit: open circuit or high resistance Transmission range sensor failure
P1532	EMS OBD II	IMT valve 2 (top) circuit malfunction	Battery voltage > 12 v Start engine and bring to normal operating temperature > 82 °C (180 °F) Run engine at 5000 rpm in N for 20 seconds	2	N	ECM Default: – IMT 2 Inhibited	EN16 -039	IMT Valve 2 (top) disconnected IMT Valve 2 (top) to ECM drive circuit fault IMT Valve 2 (top) power supply circuit fault IMT Valve 2 (top) failure
P1549	EMS OBD II	IMT valve 1 (bottom) circuit malfunction	Battery voltage > 12 v Start engine and bring to normal operating temperature > 82 °C (180 °F) Run engine at 5000 rpm in N for 20 seconds	2	N	ECM Default: – IMT 1 Inhibited	EN16 -038	IMT Valve 1 (bottom) disconnected IMT Valve 1 (bottom) to ECM drive circuit fault IMT Valve 1 (bottom) power supply circuit fault IMT Valve 1 (bottom) failure
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 > 30 seconds; release brake pedal Repeat 5 times Momentarily press brake pedal and release; press again and hold > 30 seconds; release brake pedal Repeat 5 times	N	A	ECM Default: – Speed control inhibited – Maximum engine speed reduced	EN16 -008 -009	Brake ON / OFF switch to ECM circuit: open circuit, short circuit to ground, high resistance Brake ON / OFF power supply 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

DTC	SYS	FAULT DESCRIPTION	MONITORING CONDITIONS	CK ENG	OTHER	DEFAULT ACTION	CM PIN	POSSIBLE CAUSES
P1573	TRANS JAG	CAN throttle angle error	Ignition ON – 5 seconds	N	A	None (Poor shift quality)	JB131 -012 -013	TP Sensor fault (TP Sensor DTC flagged – P0121, P0122, P0123, P0222, P0223) ECM CAN message error
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	EN16 -010	If none of the five conditions occur, check: Inertia switch to ECM circuit: short circuit to B+ voltage Inertia switch failure
P1601	TRANS OBD II	Incorrect ECM or TCM fitted to vehicle	Ignition ON – 5 seconds	1	A	TCM Default: – Fixed 4th gear	JB131 -012 -013 -033 -034	Configure ECM and TCM using WDS
P1603	TRANS OBD II	TCM EEPROM failure	Ignition ON – 5 seconds	1	A	None	JB131 -009	Battery disconnected while the ignition is switched ON B+ power supply circuit: open circuit TCM failure
P1606	EMS OBD II	EMS control relay malfunction Note: This DTC could be flagged along with P0032 and P0052, which if flagged, should be corrected first.	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	1 2*	N	None * Early production vehicles	EN16 -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)

DTC	SYS	FAULT DESCRIPTION	MONITORING CONDITIONS	CK ENG	OTHER	DEFAULT ACTION	CM PIN	POSSIBLE CAUSES
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
P1629	EMS OBD II	Generator "FIELD" circuit failure	Battery voltage > 12 v Switch OFF all electrical consumers Ignition ON 15 seconds Start engine; momentarily idle with all electrical consumers switched OFF Switch ignition OFF Switch ignition ON	2	C	None	EN16-065	ECM to generator "FIELD" return circuit: open circuit, high resistance Generator regulator failure Generator 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	EN16-052	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 v 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	— EN16-079	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: – Throttle opening limited to 30% – Vehicle speed limited – Speed control limited	—	ECM Failure

DTC	SYS	FAULT DESCRIPTION	MONITORING CONDITIONS	CK ENG	OTHER	DEFAULT ACTION	CM PIN	POSSIBLE CAUSES
P1637	EMS OBD II	CAN ECM to ABS/TCCM (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	EN16 -123 -124	CAN open circuit fault – ABS/TCCM (DSCCM) to ECM CAN short circuit fault ABS/TCCM (DSCCM) failure ECM failure
P1638	EMS OBD II	CAN ECM / INST network malfunction	Ignition ON 10 seconds	2	N	None	EN16 -123 -124	CAN open circuit fault – INST to ECM CAN short circuit fault INST failure ECM failure
P1642	EMS OBD II	CAN circuit 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	EN16 -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	EN16 -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 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 ECM Failure
P1648	EMS OBD II	ECM KS self test failure	Start engine Battery voltage > 12 v. 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	EN16 -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: – Throttle opening limited to 30% – Vehicle speed limited – Speed control inhibited	EN16 -052	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: – Throttle opening limited to 30% – Vehicle speed limited – Speed control inhibited	EN16 -052	Throttle motor relay failure Throttle motor relay coil to ECM drive circuit: short circuit to B+ voltage
P1699	EMS OBD II	CAN ECM / A/CCM network malfunction	Ignition ON 10 seconds	2	N	None	EN16 -123 -124	CAN open circuit fault – A/CCM to ECM CAN short circuit fault A/CCM failure ECM failure
P1710	TRANS OBD II	Control valve solenoids ground circuit malfunction	Ignition ON – 5 seconds	2	A	TCM Default: – Fixed 4th gear	JB131 -017 -009	TCM to transmission sensor ground circuit: open circuit TCM ground circuit: open circuit, high resistance
P1745	TRANS OBD II	Low clutch timing solenoid circuit malfunction	Comprehensive component monitor transmission drive cycle – page 7	2	A	TCM Default: – Fixed 4th gear	JB131 -053 -009	Transmission to TCM low clutch timing solenoid circuit: open circuit, short circuit Transmission internal low clutch timing solenoid circuit: open circuit, short circuit TCM ground circuit: open circuit, high resistance Low clutch timing solenoid failure

DTC	SYS	FAULT DESCRIPTION	MONITORING CONDITIONS	CK ENG	OTHER	DEFAULT ACTION	CM PIN	POSSIBLE CAUSES
P1746	TRANS OBD II	Reduction timing solenoid circuit malfunction	Comprehensive component monitor transmission drive cycle – page 7	2	A	TCM Default: – If short circuit to B+ V: no engine braking in D, 4, 3, 2 – If other cause: poor shift quality	JB131 -010 -009	Transmission to TCM reduction timing solenoid circuit: open circuit, short circuit to B+ V, short circuit to ground Transmission internal reduction timing solenoid circuit: open circuit, short circuit TCM ground circuit: open circuit, high resistance Reduction timing solenoid failure
P1747	TRANS OBD II	2/4 Brake timing solenoid circuit malfunction	Comprehensive component monitor transmission drive cycle – page 7	2	A	TCM Default: – Fixed 4th gear	JB131 -004 -009	Transmission to TCM 2/4 brake timing solenoid circuit: open circuit, short circuit Transmission internal 2/4 brake timing solenoid circuit: open circuit, short circuit TCM ground circuit: open circuit, high resistance 2/4 Brake timing solenoid failure
P1777	TRANS OBD II	CAN torque reduction error	Comprehensive component monitor transmission drive cycle – page 7	2	A	None (D poor shift quality)	JB131 -012 -013	ECM CAN message error
P1780	TRANS OBD II	D – 4 Switch circuit malfunction	Comprehensive component monitor transmission drive cycle – page 7	2	A	None (D – 4 Switch signal ignored)	JB131 -045 -009	J Gate – incorrect setting Selector cable adjustment / installation incorrect Range sensor incorrect installation / adjustment D – 4 Switch to TCM circuit: short circuit, open circuit, high resistance J-Gate ground circuit: open circuit, high resistance TCM Ground circuit: open circuit, high resistance

DTC	SYS	FAULT DESCRIPTION	MONITORING CONDITIONS	CK ENG	OTHER	DEFAULT ACTION	CM PIN	POSSIBLE CAUSES
P1793	TRANS OBD II	TCM Ignition switched power supply circuit malfunction	Ignition ON – 5 seconds	2	A	TCM Default – Fixed 4th gear	JB131 -036 -054 -009	TCM Power supply circuit: open circuit (fuse) TCM Relay failure TCM Relay ground circuit: open circuit, high resistance TCM Relay supply circuits: open circuit (fuse) TCM Ground circuit: open circuit, high resistance
P1796	TRANS OBD II	CAN network malfunction	Ignition ON – 5 seconds	2	A	TCM Default – Fixed 4th gear	JB131 -012 -013	CAN open circuit fault CAN short circuit fault TCM failure
P1797	TRANS OBD II	CAN TCM / ECM network malfunction	Ignition ON – 5 seconds	2	A	TCM Default – Fixed 4th gear	JB131 -012 -013	CAN open circuit fault – TCM to ECM CAN short circuit fault ECM failure TCM failure
P1799	TRANS OBD II	CAN TCM / ABS/TC (DSCCM) network malfunction	Ignition ON – 5 seconds	2	A	None	JB131 -012 -013	CAN open circuit fault – TCM to ABS/TC (DSCCM) CAN short circuit fault ABS/TC (DSCCM) failure TCM failure