



# DTC Summaries – OBD II

## AJ27 Engine Management 2001 Model Year ON

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Revised January, 2002:

P0031 Added  
P0032 Added  
P0037 Added  
P0038 Added  
P0051 Added  
P0052 Added  
P0057 Added  
P0058 Added  
P0065 Added  
P0066 Added

Refer to pages 2 and 3 for important information regarding the use of "AJ27 DTC Summaries".

## KEY TO COLUMN HEADINGS

DTC	Diagnostic Trouble Code.
TOOL	OBD II – Indicates that the DTC is an OBD II code and can be accessed via a generic scan tool or WDS / PDU. JAG – indicates that the DTC is not an OBD II code and is accessed only via WDS / PDU.
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. 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 A AMBER MIL / Message M Message
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 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.

## **OBD SYSTEM READINESS**

If DTC P1000 is flagged after DTCs have been cleared, all SIX (6) engine management OBD diagnostic monitor drive cycles HAVE NOT BEEN COMPLETED.

If DTC P1111 is flagged after DTCs have been cleared, all SIX (6) engine management OBD diagnostic monitor drive cycles HAVE BEEN COMPLETED.

## **OBD DIAGNOSTIC MONITORS**

The Engine Management System is continuously checked during vehicle operation by the Engine Control Module (ECM) Powertrain on-board diagnostic (OBD) facility. 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)

\* Note: 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 (A bank [1]), DTC P1314 (B 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 (A bank [1]), DTC P1314 (B bank [2]) will be flagged. When the fault is no longer present the CHECK ENGINE MIL will be activated.

## **REFERENCE**

**Refer to the applicable "Electrical Guide" for circuit information and acronym descriptions when using the information contained in this document.**

## PDU DATALOGGER ACRONYMS

AACV	Air assist control valve	FANFRLY	Cooling fan relay fast
ACCREQ	A/C compressor clutch request	FANS	Cooling fan slow
ACHPS	A/C refrigerant high pressure switch	FANSRLY	Cooling fan relay slow
ACLPS	A/C refrigerant low pressure switch	FBRAKE2	Brake switch
ADV	Ignition timing advance (Cyl 1, A bank)	FP1	Fuel pump 1
BARO	Barometric pressure sensor	FPRLY1	Fuel pump relay 1
BAT1+	Battery B+ supply to ECM	FP2	Fuel pump 2
CCV	Canister close valve	FPRLY2	Fuel pump relay 2
CLV	Calculated load value	FTP	Fuel tank pressure
CRANKREQ	Crank request (from BPM)	HO2SB1D	Heated oxygen sensor (downstream) A bank (1)
CRUISEA	Cruise control accel / decel switch	HO2SB2D	Heated oxygen sensor (downstream) B bank (2)
CRUISEB	Cruise resume / cancel switch	HO2SB1U	Heated oxygen sensor (upstream) A bank (1)
CRUISEC	Cruise cancel switch	HO2SB2U	Heated oxygen sensor (upstream) B bank (2)
CRUISED	Cruise control set / inch / decel switch	HTDSC	Heated windshield request
CRUISEO	Cruise control ON / OFF switch	IAT	Intake air temperature
CRUISER	Cruise control resume switch	IAT2	Intake air temperature 2
CRUISES	Cruise control set / inch / accel switch	KS1A	Knock sensor 1 A bank (1)
CRUISEC1	Cruise control cancel switch	KS1B	Knock sensor 1 B bank (2)
DTC1	Number of DTCs logged this trip	KS4A	Knock sensor 4 A bank (1)
DTCS	Number of permanent DTCs logged	KS4B	Knock sensor 4 B bank (2)
ECT	Engine coolant temperature	KSFA	Knock sensor fail A bank (1)
EGR	Exhaust gas recirculation	KSFB	Knock sensor fail B bank (2)
EOT	Engine oil temperature	LTFT1	Long term fuel trim A bank (1)
EVAP	Evaporative emission system monitor	LTFT2	Long term fuel trim B bank (2)
FANF	Cooling fan fast		

## PDU DATALOGGER ACRONYMS

MAF	Mass air flow
MAFGND1	MAFS ground
MAFS1	Mass air flow sensor
MAP	Manifold absolute pressure
MPROBE	Measurement probe (RED)
PKBRAKE	Park brake switch
PNPS	Park / neutral position switch (rotary switch)
PPS	Pedal position sensor
PPS1	Pedal position sensor track 1
PPS2	Pedal position sensor track 2
RPM	Engine speed
SPS	Sensor power supply monitor
STFT1	Short term fuel trim A bank (1)
STFT2	Short term fuel trim B bank (2)
STFTB1D	Short term fuel trim A bank (1) downstream
STFTB1U	Short term fuel trim A bank (1) upstream
STFTB2D	Short term fuel trim B bank (2) downstream
STFTB2U	Short term fuel trim B bank (2) upstream
TPS	Throttle position sensor
TPS1	Throttle position sensor track 1
TPS2	Throttle position sensor track 2
TTP	Target throttle position
VSS	Vehicle speed
VVTAM	Variable valve timing monitor A bank (1)
VVTBM	Variable valve timing monitor B bank (2)

DTC	TOOL	FAULT DESCRIPTION	MONITORING CONDITIONS	CK ENG	OTHER	DEFAULT ACTION	CM PIN	POSSIBLE CAUSES
P0031	OBD II	HO2 Sensor heater control circuit low current – bank 1, upstream (1/1)  (Replaces P0135)	Engine at normal operating temperature Idle for 3 minutes	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	EM85-01	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 failure
P0032	OBD II	HO2 Sensor heater control circuit high current – bank 1, upstream (1/1)  (Replaces P0135)	Engine at normal operating temperature Idle for 3 minutes	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	EM85-01	HO2 Sensor 1/1 heater control circuit: short circuit to ground HO2 Sensor 1/1 heater failure
P0037	OBD II	HO2 Sensor heater control circuit low resistance – bank 1, downstream (1/2)  (Replaces P0141)	Engine at normal operating temperature Idle for 3 minutes	2	N	None	EM84-07	HO2 Sensor 1/2 heater control circuit: short circuit to ground HO2 Sensor 1/2 heater failure
P0038	OBD II	HO2 Sensor heater control circuit high resistance – bank 1, downstream (1/2)  (Replaces P0141)	Engine at normal operating temperature Idle for 3 minutes	2	N	None	EN84-07	HO2 Sensor 1/2 heater control circuit: open circuit; high resistance HO2 Sensor 1/2 heater failure

DTC	TOOL	FAULT DESCRIPTION	MONITORING CONDITIONS	CK ENG	OTHER	DEFAULT ACTION	CM PIN	POSSIBLE CAUSES
P0051	OBD II	HO2 Sensor heater control circuit low current – bank 2, upstream (2/1)  (Replaces P0155)	Engine at normal operating temperature Idle for 3 minutes	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	EM85-02	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 failure
P0052	OBD II	HO2 Sensor heater control circuit high current – bank 2, upstream (2/1)  (Replaces P0155)	Engine at normal operating temperature Idle for 3 minutes	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	EM85-02	HO2 Sensor 2/1 heater control circuit: short circuit to ground HO2 Sensor 2/1 heater failure
P0057	OBD II	HO2 Sensor heater control circuit low resistance – bank 2, downstream (2/2)  (Replaces P0161)	Engine at normal operating temperature Idle for 3 minutes	2	N	None	EM84-15	HO2 Sensor 2/2 heater control circuit: short circuit to ground HO2 Sensor 2/2 heater failure
P0058	OBD II	HO2 Sensor heater control circuit high resistance – bank 2, downstream (2/2)  (Replaces P0161)	Engine at normal operating temperature Idle for 3 minutes	2	N	None	EM84-15	HO2 Sensor 2/2 heater control circuit: open circuit; high resistance HO2 Sensor 2/2 heater failure

DTC	TOOL	FAULT DESCRIPTION	MONITORING CONDITIONS	CK ENG	OTHER	DEFAULT ACTION	CM PIN	POSSIBLE CAUSES
P0065	OBD II	AACV (air assist close valve) range / performance  (Replaces P1143)	Engine at normal operating temperature; IAT > -8 °C (18 °F)  Drive and accelerate to 100 km/h (60 mph); release the accelerator and coast to 37 mph (60 km/h); engine rpm 1000 – 3000 during coast	2	N	None	—	AAI piping blocked Throttle body air channel blocked AACV stuck
P0066	OBD II	AACV (air assist close valve) circuit malfunction  (Replaces P1144)	ECT ambient; start engine and bring to normal operating temperature	2	N	When CK ENG MIL is activated (DTC flagged; second trip), ECM: – Inhibits AACV range / performance diagnostic monitoring	EM83-03	AACV B+ power supply circuit fault AACV ground circuit fault AACV to ECM PWM drive circuit; open circuit, short circuit or high resistance AACV failure
P0101	OBD II	MAFS range / performance	Engine at normal operating temperature  Drive at steady speed on level surface 70 – 95 km/h (43 – 59 mph); 1500 – 2500 rpm; > 10 seconds  Fuel level > 10%; surface elevation < 8,000 ft. (2,438 m)	2	2 [A, M]	When CK ENG MIL is activated (DTC flagged; second trip), ECM: – Substitutes throttle angle for engine load measurement – Limits engine speed to 3000 rpm – Inhibits canister purge	EM83-28	Blocked air cleaner Air intake leak Engine breather leak Throttle control malfunction MAFS to ECM sense circuit: high resistance or intermittent short circuit to ground MAFS supply circuit high resistance MAFS failure
P0102	OBD II	MAFS sense circuit low voltage	Ignition ON > 5 seconds	2	1 [A, M]	When AMBER MIL is activated (DTC logged; first trip), ECM: – Substitutes throttle angle for engine load measurement – Limits engine speed to 3000 rpm – Inhibits canister purge	EM83-28	Blocked air filter MAFS to ECM sense circuit: high resistance, open circuit or intermittent short circuit to ground MAFS supply circuit: open circuit or short circuit to ground MAFS failure



DTC	TOOL	FAULT DESCRIPTION	MONITORING CONDITIONS	CK ENG	OTHER	DEFAULT ACTION	CM PIN	POSSIBLE CAUSES
P0103	OBD II	MAFS sense circuit high voltage	Ignition ON > 5 seconds	2	1 [A, M]	When AMBER MIL is activated (DTC logged; first trip), ECM: <ul style="list-style-type: none"> <li>- Substitutes throttle angle for engine load measurement</li> <li>- Limits engine speed to 3000 rpm</li> <li>- Inhibits canister purge</li> </ul>	EM83 -26 -27 -28	MAFS to ECM sensor ground circuit: open circuit MAFS to ECM sense circuit: short circuit to B+ voltage MAFS failure
P0105	OBD II	MAP sensor circuit malfunction	Ignition ON > 5 seconds	2	N	When DTC logged (first trip), ECM: <ul style="list-style-type: none"> <li>- Substitutes fixed value of 1013 mBar (29.92 in hg)</li> </ul>	EM80 -28	MAP sensor to ECM circuit(s) fault MAP sensor failure
P0106	OBD II	BARO circuit range / performance	Engine running at idle > 5 seconds	2	N	When CK ENG MIL is activated (DTC flagged; second trip), ECM: <ul style="list-style-type: none"> <li>- Substitutes fixed value of 1013 mBar (29.92 in hg)</li> </ul>	—	BARO failure (internal ECM fault)
P0107	OBD II	BARO circuit low voltage	Ignition ON > 5 seconds	2	N	When CK ENG MIL is activated (DTC flagged; second trip), ECM: <ul style="list-style-type: none"> <li>- Substitutes fixed value of 1013 mBar (29.92 in hg)</li> </ul>	—	BARO failure (internal ECM fault)
P0108	OBD II	BARO circuit high voltage	Ignition ON > 5 seconds	2	N	When CK ENG MIL is activated (DTC flagged; second trip), ECM: <ul style="list-style-type: none"> <li>- Substitutes fixed value of 1013 mBar (29.92 in hg)</li> </ul>	—	BARO failure (internal ECM fault)

DTC	TOOL	FAULT DESCRIPTION	MONITORING CONDITIONS	CK ENG	OTHER	DEFAULT ACTION	CM PIN	POSSIBLE CAUSES
P0111	OBD II	IATS range / performance (Two part monitoring)	1 Ignition ON > 5 seconds 2 Drive above idle >1000 rpm; ECT < 40 °C (104 °F); > 20 seconds	2	N	When CK ENG MIL is activated (DTC flagged; second trip), ECM: – Substitutes fixed temperature of 50° C (122° F)	EM82 -17 EM83 -13	Blocked air cleaner Air intake leak Engine breather leak IATS to ECM wiring: open circuit or high resistance IATS to ECM sense circuit: short circuit to high voltage IATS failure
P0112	OBD II	IATS sense circuit high voltage (low air temperature)	Ignition ON > 5 seconds	2	N	When DTC is logged (first trip), ECM: – Substitutes fixed temperature of 50° C (122° F)	EM82 -17 EM83 -13	IATS to ECM wiring: open circuit or high resistance IATS to ECM sense circuit: short circuit to B+ voltage IATS failure
P0113	OBD II	IATS sense circuit low voltage (high air temperature)	Ignition ON > 5 seconds	2	N	When DTC is logged (first trip), ECM: – Substitutes fixed temperature of 50° C (122° F)	EM82 -17 EM83 -13	IATS to ECM wiring: short circuit to ground IATS failure
P0116	OBD II	ECTS range / performance (Two part monitoring)	1 Ignition ON > 5 seconds 2 ECT ambient: IAT > -8 °C (18 °F) start engine; bring to normal operating temperature Drive > 1500 rpm; > 3 minutes	2	2 [A, M]	When CK ENG MIL is activated (DTC flagged; second trip), ECM: – Substitutes transmission fluid temperature (via CAN) – Limits engine speed to 3000 rpm – Inhibits canister purge	EM82 -14	Low coolant level Contaminated coolant Engine thermostat failure ECTS to ECM sense circuit: high resistance when hot or intermittent high resistance ECTS failure

DTC	TOOL	FAULT DESCRIPTION	MONITORING CONDITIONS	CK ENG	OTHER	DEFAULT ACTION	CM PIN	POSSIBLE CAUSES
P0117	OBD II	ECTS sense circuit high voltage (low coolant temperature)	Ignition ON > 5 seconds	2	1 [A, M]	When AMBER MIL is activated (DTC logged; first trip), ECM: <ul style="list-style-type: none"> <li>- Substitutes transmission fluid temperature (via CAN)</li> <li>- Limits engine speed to 3000 rpm</li> <li>- Inhibits canister purge</li> </ul>	EM82 -14	ECTS disconnected ECTS to ECM sense circuit: high resistance, open circuit or short circuit to B+ voltage ECTS failure
P0118	OBD II	ECTS sense circuit low voltage (high coolant temperature)	Ignition ON > 5 seconds	2	1 [A, M]	Refer to P0117 Default Action	EM82 -14 EM83 -13	Engine overheat condition ECTS to ECM wiring: short circuit to ground ECTS failure
P0121	OBD II	TPS circuit range / performance (TPS1 compared to TPS2)	Ignition ON; battery > 9v Slowly move accelerator pedal through full range; > 40 seconds	2	1 [R, A, M]	When RED MIL is activated (DTC logged; first trip), ECM: <ul style="list-style-type: none"> <li>- Switches off throttle motor (via relay)</li> <li>- Initiates throttle "limp home" mode - engine speed controlled to between 1000-1250 rpm by fuel cutoff to cylinders</li> <li>- Inhibits idle speed control</li> <li>- Inhibits cruise control</li> <li>- Inhibits traction control/stability control</li> </ul>	EM81 -10 -19	TPS to ECM wiring: open circuit or high resistance TPS to ECM sensing circuits ("1" or "2"); short circuit to B+ voltage TPS failure
P0122	OBD II	TPS circuit "1" low voltage	Ignition ON > 5 seconds	2	1 [R, A, M]	Refer to P0121 Default Action	EM81 -10	TPS to ECM sensing circuit "1" (TPS pin 3): open circuit or high resistance TPS failure
P0123	OBD II	TPS circuit "1" high voltage	Ignition ON > 5 seconds	2	1 [R, A, M]	Refer to P0121 Default Action	EM81 -10	TPS to ECM sensing circuit "1" (TPS pin 3): short circuit to high voltage TPS failure

DTC	TOOL	FAULT DESCRIPTION	MONITORING CONDITIONS	CK ENG	OTHER	DEFAULT ACTION	CM PIN	POSSIBLE CAUSES
P0125	OBD II	ECTS response (for closed loop fuel control)	ECT ambient; IAT > -8 °C (18 °F) Start engine; bring to normal operating temperature; drive > 1500 rpm; > 3 minutes	2	1 [A, M]	When CK ENG MIL is activated (DTC flagged; second trip), ECM: – Substitutes transmission fluid temperature (via CAN) – Limits engine speed to 3000 rpm – Inhibits canister purge	EM82 -14	Low coolant level Contaminated coolant Engine coolant thermostat failure ECTS to ECM sense circuit: high resistance, open circuit or short circuit to high voltage
P0128	OBD II	Coolant thermostat range / performance malfunction	ECT -8 °C (18 °F) to 40 °C (104 °F); IAT > -8 °C (18 °F); engine running at idle	2	N	None	—	Contaminated coolant Engine coolant thermostat failure ECT failure (ECT DTC(s) also flagged)
P0131	OBD II	HO2S sense circuit low current – A bank (1), upstream (1) (Universal oxygen sensor: lean condition at ECM – high current at sensor)	Start and run engine > 5 seconds	2	N	None	EM82 -04 -10	HO2S disconnected HO2S to ECM variable current circuit fault (HO2S pin 3) ECM to HO2S constant current circuit fault (HO2S pin 4) HO2S failure
P0132	OBD II	HO2S sense circuit high current – A bank (1), upstream (1) (Universal oxygen sensor: rich condition at ECM – low current at sensor)	Start and run engine > 5 seconds	2	N	None	EM82 -04 -10	HO2S disconnected HO2S to ECM variable current circuit fault (HO2S pin 3) ECM to HO2S constant current circuit fault (HO2S pin 4) HO2S failure

DTC	TOOL	FAULT DESCRIPTION	MONITORING CONDITIONS	CK ENG	OTHER	DEFAULT ACTION	CM PIN	POSSIBLE CAUSES
P0133	OBD II	HO2S sense circuit slow response – A bank (1), upstream (1)	Engine at normal operating temperature: IAT > -8 °C (18 °F) Drive at 60 – 95 km/h (37 – 59 mph); engine speed 1500 – 2000 rpm >30 seconds Surface elevation < 8,000 ft. (2,438 m)	2	N	When CK ENG MIL is activated (DTC flagged; second trip), ECM: – Inhibits A bank (1) closed loop fuel metering – Inhibits A bank (1) adaptive fuel metering – Inhibits A bank (1) downstream HO2S control	EM82 -04 -10 EM85 -01	Engine misfire HO2S disconnected HO2S mechanical damage HO2S to ECM wiring fault HO2S short circuit to ground HO2S to ECM variable current circuit shielding: open circuit HO2S heater circuit fault Exhaust leak Low exhaust temperature Injector flow partially blocked Catalyst efficiency decrease HO2S failure
P0135	OBD II	HO2S heater circuit malfunction – A bank (1), upstream (1)	Ignition ON > 5 seconds	2	N	When CK ENG MIL is activated (DTC flagged; second trip), ECM: – Inhibits A bank (1) closed loop fuel metering – Inhibits A bank (1) adaptive fuel metering – Inhibits A bank (1) downstream HO2S control	EM85 -01	HO2S disconnected HO2S heater power supply: open circuit HO2S heater to ECM wiring: short circuit or open circuit HO2S heater failure
P0137	OBD II	HO2S sense circuit low voltage – A bank (1), downstream (2)	Start and run engine > 5 seconds	2	N	None	EM83 -21	HO2S disconnected HO2S to ECM wiring: open circuit HO2S short circuit to ground HO2S failure
P0138	OBD II	HO2S sense circuit high voltage – A bank (1), downstream (2)	Start and run engine; bring to normal operating temperature; IAT > -8 °C (18 °F); run engine > 1 minute	2	N	None	EM83 -12 -21	HO2S sense circuit: short circuit to high voltage HO2S ground (BRD – braided shield): open circuit HO2S failure

DTC	TOOL	FAULT DESCRIPTION	MONITORING CONDITIONS	CK ENG	OTHER	DEFAULT ACTION	CM PIN	POSSIBLE CAUSES
P0140	OBD II	HO2S sense circuit no activity – A bank (1), downstream (2)	Engine at normal operating temperature Drive > 64 km/h (40 mph); > 2 minute 30 seconds	2	N	None	EM83 -12 -21	HO2S disconnected HO2S mechanical damage HO2S to ECM wiring: open circuit HO2S sense circuit: short circuit to high voltage HO2S short circuit to ground HO2S ground (BRD – braided shield): open circuit Exhaust leak Low exhaust temperature HO2S failure
P0141	OBD II	HO2S Heater circuit malfunction – A bank (1), downstream (2)	Ignition ON > 5 seconds	2	N	None	EM84 -07	HO2S disconnected HO2S mechanical damage HO2S to ECM wiring fault HO2S heater failure
P0151	OBD II	HO2S sense circuit low current – B bank (2), upstream (1) (Universal oxygen sensor: lean condition at ECM – high current at sensor)	Start and run engine > 5 seconds	2	N	None	EM82 -05 -11	HO2S disconnected HO2S to ECM variable current circuit fault (HO2S pin 3) ECM to HO2S constant current circuit fault (HO2S pin 4) HO2S failure
P0152	OBD II	HO2S sense circuit high current – B bank (2), upstream (1) (Universal oxygen sensor: rich condition at ECM – low current at sensor)	Start and run engine > 5 seconds	2	N	None	EM82 -05 -11	HO2S disconnected HO2S to ECM variable current circuit fault (HO2S pin 3) ECM to HO2S constant current circuit fault (HO2S pin 4) HO2S failure

DTC	TOOL	FAULT DESCRIPTION	MONITORING CONDITIONS	CK ENG	OTHER	DEFAULT ACTION	CM PIN	POSSIBLE CAUSES
P0153	OBD II	HO2S sense circuit slow response – B bank (2), upstream (1)	Engine at normal operating temperature: IAT > -8 °C (18 °F) Drive at 60 – 95 km/h (37 – 59 mph); engine speed 1500 – 2000 rpm >30 seconds Surface elevation < 8,000 ft. (2,438 m)	2	N	When CK ENG MIL is activated (DTC flagged; second trip), ECM: – Inhibits B bank (2) closed loop fuel metering – Inhibits B bank (2) adaptive fuel metering – Inhibits B bank (2) downstream HO2S control	EM82 -05 -11 EM85 -02	Engine misfire HO2S disconnected HO2S mechanical damage HO2S to ECM wiring fault HO2S short circuit to ground HO2S to ECM variable current circuit shielding: open circuit HO2S heater circuit fault Exhaust leak Low exhaust temperature Injector flow partially blocked Catalyst efficiency decrease HO2S failure
P0155	OBD II	HO2S heater circuit malfunction – B bank (2), upstream (1)	Ignition ON > 5 seconds	2	N	When CK ENG MIL is activated (DTC flagged; second trip), ECM: – Inhibits B bank (2) closed loop fuel metering – Inhibits B bank (2) adaptive fuel metering – Inhibits B bank (2) downstream HO2S control	EM85 -02	HO2S disconnected HO2S heater power supply: open circuit HO2S heater to ECM wiring: short circuit or open circuit HO2S heater failure
P0157	OBD II	HO2S sense circuit low voltage – B bank (2), downstream (2)	Start and run engine > 5 seconds	2	N	None	EM83 -22	HO2S disconnected HO2S to ECM wiring: open circuit HO2S short circuit to ground HO2S failure
P0158	OBD II	HO2S sense circuit high voltage – B bank (2), downstream (2)	Start and run engine; bring to normal operating temperature; IAT > -8 °C (18 °F); run engine > 1 minute	2	N	None	EM83 -12 -22	HO2S sense circuit: short circuit to high voltage HO2S ground (BRD – braided shield): open circuit HO2S failure

DTC	TOOL	FAULT DESCRIPTION	MONITORING CONDITIONS	CK ENG	OTHER	DEFAULT ACTION	CM PIN	POSSIBLE CAUSES
P0160	OBD II	HO2S sense circuit no activity – B bank (2), downstream (2)	Engine at normal operating temperature; drive > 64 km/h (40 mph); > 2 minute 30 seconds	2	N	None	EM83 -12 -22	HO2S disconnected HO2S mechanical damage HO2S to ECM wiring: open circuit HO2S sense circuit: short circuit to high voltage HO2S short circuit to ground HO2S ground (BRD – braided shield): open circuit Exhaust leak Low exhaust temperature HO2S failure
P0161	OBD II	HO2S heater circuit malfunction –B bank (2), downstream (2)	Ignition ON > 5 seconds	2	N	None	EM84 -15	HO2S disconnected HO2S mechanical damage HO2S to ECM wiring fault HO2S heater failure
P0171	OBD II	A bank (1) combustion too lean	Engine at normal operating temperature; IAT > -8 °C (18 °F) Drive at steady speed > 64 km/h (40 mph); > 1 minute	2	2 [A, M]	When CK ENG MIL is activated (DTC flagged; second trip), ECM: – Inhibits downstream HO2S control If DTC P0174 is also flagged, ECM: – Limits engine speed to 3000 rpm – Inhibits canister purge*  * Inhibited when “lean” fault is first detected	—	Engine misfire Air intake leak between MAFS and throttle Fuel filter, system blockage Fuel injector blockage Fuel pressure regulator failure (low fuel pressure) Low fuel pump output HO2S harness wiring condition fault Exhaust leak (before catalyst) ECM receiving incorrect signal from one or more of the following components: ECTS, MAFS, IATS, TPS



DTC	TOOL	FAULT DESCRIPTION	MONITORING CONDITIONS	CK ENG	OTHER	DEFAULT ACTION	CM PIN	POSSIBLE CAUSES
P0172	OBD II	A bank (1) combustion too rich	Engine at normal operating temperature: IAT > -8 °C (18 °F) Drive at steady speed > 64 km/h (40 mph); > 1 minute	2	2 [A, M]	When CK ENG MIL is activated (DTC flagged; second trip), ECM: – Inhibits downstream HO2S control If DTC P0175 is also flagged, ECM: – Limits engine speed to 3000 rpm – Inhibits canister purge	—	Blocked air filter Fuel system return blockage Leaking fuel injector(s) Fuel pressure regulator failure (high fuel pressure) ECM receiving incorrect signal from one or more of the following components: ECTS, MAFS, IATS, TPS
P0174	OBD II	B bank (2) combustion too lean	Engine at normal operating temperature: IAT > -8 °C (18 °F) Drive at steady speed > 64 km/h (40 mph); > 1 minute	2	2 [A, M]	When CK ENG MIL is activated (DTC flagged; second trip), ECM: – Inhibits downstream HO2S control If DTC P0171 is also flagged, ECM: – Limits engine speed to 3000 rpm – Inhibits canister purge*  * Inhibited when "lean" fault is first detected	—	Engine misfire Air intake leak between MAFS and throttle Fuel filter, system blockage Fuel injector blockage Fuel pressure regulator failure (low fuel pressure) Low fuel pump output HO2S harness wiring condition fault Exhaust leak (before catalyst) ECM receiving incorrect signal from one or more of the following components: ECTS, MAFS, IATS, TPS
P0175	OBD II	B bank (2) combustion too rich	Engine at normal operating temperature: IAT > -8 °C (18 °F) Drive at steady speed > 64 km/h (40 mph); > 1 minute	2	2 [A, M]	When CK ENG MIL is activated (DTC flagged; second trip), ECM: – Inhibits downstream HO2S control If DTC P0172 is also flagged, ECM: – Limits engine speed to 3000 rpm – Inhibits canister purge	—	Blocked air filter Fuel system return blockage Leaking fuel injector(s) Fuel pressure regulator failure (high fuel pressure) ECM receiving incorrect signal from one or more of the following components: ECTS, MAFS, IATS, TPS

DTC	TOOL	FAULT DESCRIPTION	MONITORING CONDITIONS	CK ENG	OTHER	DEFAULT ACTION	CM PIN	POSSIBLE CAUSES
P0196	OBD II	EOTS range / performance	EOT and ECT ambient; IAT > -8 °C (18 °F) Start engine; bring to normal operating temperature	2	N	When CK ENG MIL is activated (DTC flagged; second trip), ECM: – Substitutes engine coolant temperature	EM80 -15	EOTS to ECM sense circuit: high resistance when hot, intermittent high resistance EOTS failure
P0197	OBD II	EOTS sense circuit low voltage (high oil temperature)	Ignition ON > 5 seconds	2	N	When CK ENG MIL is activated (DTC flagged; second trip), ECM: – Substitutes engine coolant temperature	EM80 -15	EOTS to ECM wiring; short circuit to ground EOTS failure
P0198	OBD II	EOTS sense circuit high voltage (low oil temperature)	Ignition ON > 5 seconds	2	N	When CK ENG MIL is activated (DTC flagged; second trip), ECM: – Substitutes engine coolant temperature	EM80 -15	EOTS disconnected EOTS to ECM sense circuit: high resistance, open circuit or short circuit to B+ voltage EOTS failure
P0201	OBD II	Fuel injector circuit malfunction cylinder A1 (1)	Start engine, bring to normal operating temperature; vary engine speed between idle – 2500 rpm > 10 times	2	1 [A, M]	When CK ENG MIL is activated (DTC flagged; second trip), ECM: – Limits engine speed to 3000 rpm – Inhibits canister purge If DTCs for all A bank (1) injectors are flagged: – Inhibits A bank (1) closed loop fuel metering – Inhibits A bank (1) adaptive fuel metering – Inhibits A bank (1) downstream HO2S control	EM84 -02	Injector disconnected Injector harness wiring: open or short circuit Injector failure
P0202	OBD II	Fuel injector circuit malfunction cylinder A2 (2)	Start engine, bring to normal operating temperature; vary engine speed between idle – 2500 rpm > 10 times	2	1 [A, M]	Refer to P0201 Default Action	EM84 -21	Injector disconnected Injector harness wiring: open or short circuit Injector failure

DTC	TOOL	FAULT DESCRIPTION	MONITORING CONDITIONS	CK ENG	OTHER	DEFAULT ACTION	CM PIN	POSSIBLE CAUSES
P0203	OBD II	Fuel injector circuit malfunction cylinder A3 (3)	Start engine, bring to normal operating temperature; vary engine speed between idle – 2500 rpm > 10 times	2	1 [A, M]	Refer to P0201 Default Action	EM84-14	Injector disconnected Injector harness wiring: open or short circuit Injector failure
P0204	OBD II	Fuel injector circuit malfunction cylinder A4 (4)	Start engine, bring to normal operating temperature; vary engine speed between idle – 2500 rpm > 10 times	2	1 [A, M]	Refer to P0201 Default Action	EM84-05	Injector disconnected Injector harness wiring: open or short circuit Injector failure
P0205	OBD II	Fuel injector circuit malfunction cylinder B1 (5)	Start engine, bring to normal operating temperature; vary engine speed between idle – 2500 rpm > 10 times	2	1 [A, M]	When CK ENG MIL is activated (DTC flagged; second trip), ECM: – Limits engine speed to 3000 rpm – Inhibits canister purge If DTCs for all B bank (2) injectors are flagged: – Inhibits B bank (2) closed loop fuel metering – Inhibits B bank (2) adaptive fuel metering – Inhibits B bank (2) downstream HO2S control	EM84-06	Injector disconnected Injector harness wiring: open or short circuit Injector failure
P0206	OBD II	Fuel injector circuit malfunction cylinder B2 (6)	Start engine, bring to normal operating temperature; vary engine speed between idle – 2500 rpm > 10 times	2	1 [A, M]	Refer to P0205 Default Action	EM84-04	Injector disconnected Injector harness wiring: open or short circuit Injector failure
P0207	OBD II	Fuel injector circuit malfunction cylinder B3 (7)	Start engine, bring to normal operating temperature; vary engine speed between idle – 2500 rpm > 10 times	2	1 [A, M]	Refer to P0205 Default Action	EM84-03	Injector disconnected Injector harness wiring: open or short circuit Injector failure

DTC	TOOL	FAULT DESCRIPTION	MONITORING CONDITIONS	CK ENG	OTHER	DEFAULT ACTION	CM PIN	POSSIBLE CAUSES
P0208	OBD II	Fuel injector circuit malfunction cylinder B4 (8)	Start engine, bring to normal operating temperature; vary engine speed between idle – 2500 rpm > 10 times	2	1 [A, M]	Refer to P0205 Default Action	EM84 -13	Injector disconnected Injector harness wiring: open or short circuit Injector failure
P0222	OBD II	TPS circuit "2" low voltage	Ignition ON > 5 seconds	2	1 [R, A, M]	When RED MIL is activated (DTC logged; first trip), ECM: <ul style="list-style-type: none"> <li>- Switches off throttle motor (via relay)</li> <li>- Initiates throttle "limp home" mode: engine speed controlled to between 1000-1250 rpm by fuel cutoff to cylinders</li> <li>- Inhibits idle speed control</li> <li>- Inhibits cruise control</li> <li>- Inhibits traction control/stability control</li> </ul>	EM81 -19	TPS to ECM sensing circuit "2" (TPS pin 2): open circuit or high resistance TPS failure
P0223	OBD II	TPS circuit "2" high voltage	Ignition ON > 5 seconds	2	1 [R, A, M]	Refer to P0222 Default Action	EM81 -19	TPS to ECM sensing circuit "2" (TPS pin 2): short circuit to B+ voltage TPS failure

DTC	TOOL	FAULT DESCRIPTION	MONITORING CONDITIONS	CK ENG	OTHER	DEFAULT ACTION	CM PIN	POSSIBLE CAUSES
P0300	OBD II	Random misfire detected *Refer to misfire note – page 4	Engine at normal operating temperature; IAT > -8 °C (18 °F) Drive at steady speed between idle – 2500 rpm; > 2 minutes 30 seconds Surface elevation < 8,000 ft. (2,438 m)	1 or 2*	1 [A, M]	When CK ENG MIL is activated (DTC flagged; second trip), ECM: – Limits engine speed to 3000 rpm – Inhibits closed loop fuel metering – Inhibits adaptive fuel metering – Inhibits canister purge	—	Cylinder compression low Worn camshaft / broken valve spring(s) Fuel delivery pressure (low / high) Fuel injector(s) blocked / 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 module primary circuit fault (Cylinder misfire detected DTC also flagged) Ignition module ground circuit: open circuit, high resistance Ignition module / coil failure
P0301	OBD II	Misfire detected – cylinder A1 (1) *Refer to misfire note – page 4	Engine at normal operating temperature; IAT > -8 °C (18 °F) Drive at steady speed between idle – 2500 rpm; > 2 minutes 30 seconds Surface elevation < 8,000 ft. (2,438 m)	1 or 2*	1 [A, M]	When CK ENG MIL is activated (DTC flagged; second trip), ECM: – Limits engine speed to 3000 rpm – Inhibits A bank (1) closed loop fuel metering – Inhibits A bank (1) adaptive fuel metering – Inhibits canister purge	EM84 -12	Refer to P0300 Possible Faults
P0302	OBD II	Misfire detected – cylinder A2 (2) *Refer to misfire note – page 4	Engine at normal operating temperature; IAT > -8 °C (18 °F) Drive at steady speed between idle – 2500 rpm; > 2 minutes 30 seconds Surface elevation < 8,000 ft. (2,438 m)	1 or 2*	1 [A, M]	Refer to P0301 Default Action	EM84 -11	Refer to P0300 Possible Faults

DTC	TOOL	FAULT DESCRIPTION	MONITORING CONDITIONS	CK ENG	OTHER	DEFAULT ACTION	CM PIN	POSSIBLE CAUSES
P0303	OBD II	Misfire detected – cylinder A3 (3) *Refer to misfire note – page 4	Engine at normal operating temperature; IAT > -8 °C (18 °F) Drive at steady speed between idle – 2500 rpm; > 2 minutes 30 seconds Surface elevation < 8,000 ft. (2,438 m)	1 or 2*	1 [A, M]	Refer to P0301 Default Action	EM84 -10	Refer to P0300 Possible Faults
P0304	OBD II	Misfire detected – cylinder A4 (4) *Refer to misfire note – page 4	Engine at normal operating temperature; IAT > -8 °C (18 °F) Drive at steady speed between idle – 2500 rpm; > 2 minutes 30 seconds Surface elevation < 8,000 ft. (2,438 m)	1 or 2*	1 [A, M]	Refer to P0301 Default Action	EM84 -09	Refer to P0300 Possible Faults
P0305	OBD II	Misfire detected – cylinder B1 (5) *Refer to misfire note – page 4	Engine at normal operating temperature; IAT > -8 °C (18 °F) Drive at steady speed between idle – 2500 rpm; > 2 minutes 30 seconds Surface elevation < 8,000 ft. (2,438 m)	1 or 2*	1 [A, M]	Refer to P0301 Default Action	EM84 -20	Refer to P0300 Possible Faults
P0306	OBD II	Misfire detected – cylinder B2 (6) *Refer to misfire note – page 4	Engine at normal operating temperature; IAT > -8 °C (18 °F) Drive at steady speed between idle – 2500 rpm; > 2 minutes 30 seconds Surface elevation < 8,000 ft. (2,438 m)	1 or 2*	1 [A, M]	Refer to P0301 Default Action	EM84 -19	Refer to P0300 Possible Faults

DTC	TOOL	FAULT DESCRIPTION	MONITORING CONDITIONS	CK ENG	OTHER	DEFAULT ACTION	CM PIN	POSSIBLE CAUSES
P0307	OBD II	Misfire detected – cylinder B3 (7) *Refer to misfire note – page 4	Engine at normal operating temperature; IAT > -8 °C (18 °F) Drive at steady speed between idle – 2500 rpm; > 2 minutes 30 seconds Surface elevation < 8,000 ft. (2,438 m)	1 or 2*	1 [A, M]	Refer to P0301 Default Action	EM84 -18	Refer to P0300 Possible Faults
P0308	OBD II	Misfire detected – cylinder B4 (8) *Refer to misfire note – page 4	Engine at normal operating temperature; IAT > -8 °C (18 °F) Drive at steady speed between idle – 2500 rpm; > 2 minutes 30 seconds Surface elevation < 8,000 ft. (2,438 m)	1 or 2*	1 [A, M]	Refer to P0301 Default Action	EM84 -17	Refer to P0300 Possible Faults
P0327	OBD II	KS sense circuit out of range (low voltage) A bank (1)	Start engine; run > 5 seconds	2	1 [A, M]	When DTC is logged (first trip), ECM: – Sets ignition retard to maximum – Limits engine speed to 3000 rpm	EM83 -14	Poor sensor contact with the cylinder block KS to ECM sense circuit: short circuit to ground KS failure
P0328	OBD II	KS sense circuit out of range (high voltage) A bank (1)	Start engine; run > 5 seconds	2	1 [A, M]	When DTC is logged (first trip), ECM: – Sets ignition retard to maximum – Limits engine speed to 3000 rpm	EM83 -14	Poor sensor contact with the cylinder block KS to ECM sense circuit: high resistance, open circuit or short circuit to high voltage KS failure

DTC	TOOL	FAULT DESCRIPTION	MONITORING CONDITIONS	CK ENG	OTHER	DEFAULT ACTION	CM PIN	POSSIBLE CAUSES
P0332	OBD II	KS sense circuit out of range (low voltage) B bank (2)	Start engine; run > 5 seconds	2	1 [A, M]	When DTC is logged (first trip), ECM: - Sets ignition retard to maximum - Limits engine speed to 3000 rpm	EM83 -23	Poor sensor contact with the cylinder block KS to ECM sense circuit: short circuit to ground KS failure
P0333	OBD II	KS sense circuit out of range (high voltage) B bank (2)	Start engine; run > 5 seconds	2	1 [A, M]	When DTC is logged (first trip), ECM: - Sets ignition retard to maximum - Limits engine speed to 3000 rpm	EM83 -23	Poor sensor contact with the cylinder block KS to ECM sense circuit: high resistance, open circuit or short circuit to high voltage KS failure
P0335	OBD II	CKPS circuit malfunction	Crank engine > 2 seconds – engine will not start; or start engine, run steady > 1000 rpm; or engine stall, ignition ON	2	1 [A, M]	When CK ENG MIL is activated (DTC flagged; first trip), ECM: - Limits engine speed to 3000 rpm	EM83 -07 -08	CKPS disconnected CKPS gap incorrect / foreign matter on sensor face CKPS sense circuit: open circuit, short circuit to ground, short circuit to high voltage CKPS failure
P0336	OBD II	CKPS range / performance	Start engine; idle > 5 seconds (If the CKPS signal is not present, the engine will not start. The engine will stop if the CKPS signal is lost while running.)	2	1 [A, M]	None	EM83 -07 -08	CKPS reluctor (on drive plate) foreign matter / damaged teeth CKPS sense circuit: intermittent open circuit, short circuit to ground, short circuit to high voltage CKPS failure



DTC	TOOL	FAULT DESCRIPTION	MONITORING CONDITIONS	CK ENG	OTHER	DEFAULT ACTION	CM PIN	POSSIBLE CAUSES
P0340	OBD II	CMPS circuit malfunction – A bank (1)	Crank engine > 5 seconds (battery v 6 – 10.5 during cranking); or start engine, idle > 600 rpm  (If the A bank (1) CMPS signal is not present, the engine may start – 50% chance. The engine will run normally if the A bank (1) CMPS signal is lost while running.)	2	N	None	EM83 -09 -19	CMPS disconnected CMPS gap incorrect / foreign matter on sensor face  CMPS sense circuit: open circuit, short circuit to ground, short circuit to high voltage CMPS failure
P0341	OBD II	CMPS range / performance – A bank (1) (CMPS pulse not detected at CKPS missing tooth)	Start engine; idle > 5 seconds  (If the A bank (1) CMPS signal is not present, the engine may start – 50% chance. The engine will run normally if the A bank (1) CMPS signal is lost while running.)	2	N	None	EM83 -09 -19	CMPS disconnected CMPS gap incorrect / foreign matter on sensor face  CMPS sense circuit: open circuit, short circuit to ground, short circuit to high voltage CMPS failure
P0351	OBD II	Ignition coil A1 (1) primary / secondary circuit malfunction	Run engine steady < 2500 rpm > 5 seconds	2	1 [A, M]	When fault is detected, ECM: – Limits engine speed to 3000 rpm – Inhibits individual cylinder fuel injection – Inhibits A bank (1) closed loop fuel metering – Inhibits A bank (1) downstream HO2S control	EM84 -12	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
P0352	OBD II	Ignition coil A2 (2) primary / secondary circuit malfunction	Run engine steady < 2500 rpm > 5 seconds	2	1 [A, M]	Refer to P0351 Default Action	EM84 -11	Refer to P0351 Possible Causes
P0353	OBD II	Ignition coil A3 (3) primary / secondary circuit malfunction	Run engine steady < 2500 rpm > 5 seconds	2	1 [A, M]	Refer to P0351 Default Action	EM84 -10	Refer to P0351 Possible Causes

DTC	TOOL	FAULT DESCRIPTION	MONITORING CONDITIONS	CK ENG	OTHER	DEFAULT ACTION	CM PIN	POSSIBLE CAUSES
P0354	OBD II	Ignition coil A4 (4) primary / secondary circuit malfunction	Run engine steady < 2500 rpm > 5 seconds	2	1 [A, M]	Refer to P0351 Default Action	EM84-09	Refer to P0351 Possible Causes
P0355	OBD II	Ignition coil B1 (5) primary / secondary circuit malfunction	Run engine steady < 2500 rpm > 5 seconds	2	1 [A, M]	When fault is detected, ECM: – Limits engine speed to 3000 rpm – Inhibits individual cylinder fuel injection – Inhibits B bank (2) closed loop fuel metering – Inhibits B bank (2) downstream HO2S control	EM84-20	Refer to P0351 Possible Causes
P0356	OBD II	Ignition coil B2 (6) primary / secondary circuit malfunction	Run engine steady < 2500 rpm > 5 seconds	2	1 [A, M]	Refer to P0355 Default Action	EM84-19	Refer to P0351 Possible Causes
P0357	OBD II	Ignition coil B3 (7) primary / secondary circuit malfunction	Run engine steady < 2500 rpm > 5 seconds	2	1 [A, M]	Refer to P0355 Default Action	EM84-18	Refer to P0351 Possible Causes
P0358	OBD II	Ignition coil B4 (8) primary / secondary circuit malfunction	Run engine steady < 2500 rpm > 5 seconds	2	1 [A, M]	Refer to P0355 Default Action	EM84-17	Refer to P0351 Possible Causes
P0400	OBD II	EGR flow malfunction	Engine at normal operating temperature Normal varied driving for 3 minutes; 60 – 120 km/h (37 – 75 mph); 1300 – 2500 rpm; then decelerate at fuel cut-off (foot off accelerator pedal) Surface elevation < 8,000 ft (2,438 m)	2	N	None	—	EGR pipe blocked EGR valve stuck open / closed, blocked EGR valve failure

DTC	TOOL	FAULT DESCRIPTION	MONITORING CONDITIONS	CK ENG	OTHER	DEFAULT ACTION	CM PIN	POSSIBLE CAUSES
P0405	OBD II	EGR valve drive circuits open circuit	Ignition ON > 5 seconds	2	N	None	EM85 -03 -04 -09 -10	EGR valve power supply circuit open circuit EGR valve to ECM drive circuit pair (EGR valve pins 1/4, 6/3): open circuit, high resistance ERG valve failure (stepper motor open circuit)
P0406	OBD II	EGR valve drive circuits short circuit	Ignition ON > 5 seconds	2	N	None	EM85 -03 -04 -09 -10	EGR valve to ECM drive circuit pair (EGR valve pins 1/4, 6/3): short circuit to ground or high voltage ERG valve failure (stepper motor short circuit)
P0420	OBD II	Catalyst efficiency below threshold A bank (1)	Engine at normal operating temperature; IAT > -8 °C (18 °F) Varied driving for 3 minutes; then, constant steady throttle 50 – 60 km/h (30 – 38 mph), 1100 – 1475 rpm > 25 seconds Surface elevation < 8,000 ft (2,438 m)	2	N	None	—	HO2S disconnected HO2S to ECM wiring fault HO2S heater to ECM wiring fault HO2S heater failure Upstream HO2S failure Downstream HO2S failure Catalyst failure
P0430	OBD II	Catalyst efficiency below threshold B bank (2)	Engine at normal operating temperature; IAT > -8 °C (18 °F) Varied driving for 3 minutes; then, constant steady throttle 50 – 60 km/h (30 – 38 mph), 1100 – 1475 rpm > 25 seconds Surface elevation < 8,000 ft (2,438 m)	2	N	None	—	HO2S disconnected HO2S to ECM wiring fault HO2S heater to ECM wiring fault HO2S heater failure Upstream HO2S failure Downstream HO2S failure Catalyst failure

DTC	TOOL	FAULT DESCRIPTION	MONITORING CONDITIONS	CK ENG	OTHER	DEFAULT ACTION	CM PIN	POSSIBLE CAUSES
P0442	OBD II	EVAP (system) leak detected – small (0.040 in)	Fuel tank level between 15% – 85% full After start-up, run engine 13 minutes. Engine at normal operating temperature; IAT > -8 °C (18 °F) Drive vehicle 20 – 100 km/h (12 – 60 mph) > 6 minutes Surface elevation < 8,000 ft. (2,438 m)	2	N	When CK ENG MIL is activated (DTC flagged; second trip), ECM: – Inhibits adaptive fuel metering – Inhibits canister purge	—	Fuel cap seal defective EVAP system leak (canister damage, pipework damage) EVAPP valve to ECM drive circuit: open circuit, short circuit, high resistance EVAPP valve power supply circuit: open circuit EVAPP valve to engine purge pipe damaged / blocked / leaking EVAPP valve operating vacuum hose leak / blockage EVAPP valve failure Fuel tank leak
P0443	OBD II	EVAP purge valve control malfunction	Occurs during “EVAP leak check”. Refer to P0442, P0455	2	N	When CK ENG MIL is activated (DTC flagged; second trip), ECM: – Inhibits EGR diagnostic monitoring	EM80-01	EVAPP valve to ECM drive circuit: open circuit, short circuit, high resistance EVAPP valve power supply circuit: open circuit EVAPP valve operating vacuum hose leak / blockage EVAPP valve failure
P0444	OBD II	EVAPP valve circuit open circuit	Engine at normal operating temperature; vehicle stationary; brakes applied; gear “D”; idle > 10 seconds	2	N	None	EM80-01	EVAPP to ECM drive circuit: open circuit or high resistance EVAPP failure
P0445	OBD II	EVAPP valve circuit short circuit	Engine at normal operating temperature; drive vehicle 20 – 100 km/h (12 – 60 mph) > 6 minutes	2	N	None	EM80-01	EVAPP to ECM drive circuit: short circuit to ground EVAPP failure
P0446	OBD II	CCV (canister close valve) malfunction	Occurs during “EVAP leak check”. Refer to P0442, P0455	2	N	None	EM80-02	CCV B+ power supply circuit fault CCV to ECM drive circuit: open circuit, high resistance or short circuit to B+ voltage CCV failure

DTC	TOOL	FAULT DESCRIPTION	MONITORING CONDITIONS	CK ENG	OTHER	DEFAULT ACTION	CM PIN	POSSIBLE CAUSES
P0447	OBD II	CCV (canister close valve) opened failure	Ignition ON > 5 seconds (ECM CCV drive inactive – valve open)	2	N	When CK ENG MIL is activated (DTC flagged; second trip), ECM: – Inhibits EVAP leak check monitoring – Inhibits adaptive fuel metering – Inhibits canister purge	EM80 -02	CCV B+ power supply circuit fault CCV to ECM drive circuit: open circuit, high resistance or short circuit to B+ voltage CCV failure
P0448	OBD II	CCV (canister close valve) closed failure	Occurs during “EVAP leak check”. Refer to P0442, P0455	2	N	When CK ENG MIL is activated (DTC flagged; second trip), ECM: – Inhibits EVAP leak check monitoring – Inhibits adaptive fuel metering – Inhibits canister purge	EM80 -02	CCV to ECM drive circuit: short circuit to ground CCV failure
P0450	OBD II	FTP (fuel tank pressure) sensor malfunction	Occurs during “EVAP leak check”. Refer to P0442, P0455	2	N	None	EM81 -16 EM83 -05 -13	FTP sensor disconnected FTP sensor to ECM sense circuit: open circuit, short circuit to ground, short circuit to B+ voltage FTP sensor to ECM power supply circuit: open circuit or short circuit to ground FTP sensor to ECM wiring (supply, sense, signal ground): short circuit to each other FTP sensor failure
P0452	OBD II	FTP (fuel tank pressure) sensor circuit low voltage	Ignition ON > 5 seconds	2	N	When CK ENG MIL is activated (DTC flagged; second trip), ECM: – Inhibits EVAP leak check monitoring	EM81 -16 EM83 -13	FTP sensor disconnected FTP sensor to ECM sense circuit: open circuit or short circuit to ground FTP sensor to ECM power supply circuit: open circuit or short circuit to ground FTP sensor failure

DTC	TOOL	FAULT DESCRIPTION	MONITORING CONDITIONS	CK ENG	OTHER	DEFAULT ACTION	CM PIN	POSSIBLE CAUSES
P0453	OBD II	FTP (fuel tank pressure) sensor circuit high voltage	Ignition ON > 5 seconds	2	N	When CK ENG MIL is activated (DTC flagged; second trip), ECM: – Inhibits EVAP leak check monitoring	EM81 -16  EM83 -05 -13	FTP sensor to ECM signal ground circuit: open circuit  FTP sensor to ECM wiring (supply, sense, signal ground): short circuit to each other  FTP sensor to ECM sense circuit: short circuit to B+ voltage  FTP sensor failure
P0455	OBD II	EVAP (system) leak detected – large	Fuel tank level between 15% – 85% full  After start-up, run engine 13 minutes. Engine at normal operating temperature; IAT > -8 °C (18 °F)  Drive vehicle 20 – 100 km/h (12 – 60 mph) > 6 minutes  Surface elevation < 8,000 ft (2,438 m)	2	N	When CK ENG MIL is activated (DTC flagged; second trip), ECM: – Inhibits adaptive fuel metering – Inhibits canister purge	—	Fuel cap off Fuel cap seal defective EVAP system leak (canister damage, pipework damage) EVAPP valve to ECM drive circuit: open circuit, short circuit, high resistance EVAPP valve power supply circuit: open circuit EVAPP valve to engine purge pipe damaged / blocked / leaking EVAPP valve operating vacuum hose leak / blockage EVAPP valve failure Fuel tank leak

DTC	TOOL	FAULT DESCRIPTION	MONITORING CONDITIONS	CK ENG	OTHER	DEFAULT ACTION	CM PIN	POSSIBLE CAUSES
P0456	OBD II	EVAP (system) leak detected – very small (0.020 in)	Fuel tank level between 15% – 85% full After start-up, run engine 13 minutes. Engine at normal operating temperature; IAT > -8 °C (18 °F) Drive vehicle 20 – 100 km/h (12 – 60 mph) > 6 minutes Surface elevation < 8,000 ft. (2,438 m)	2	N	When CK ENG MIL is activated (DTC flagged; second trip), ECM: – Inhibits adaptive fuel metering – Inhibits canister purge	—	Fuel cap seal defective EVAP system leak (canister damage, pipework damage) EVAPP valve to ECM drive circuit: open circuit, short circuit, high resistance EVAPP valve power supply circuit: open circuit EVAPP valve to engine purge pipe damaged / blocked / leaking EVAPP valve operating vacuum hose leak / blockage EVAPP valve failure Fuel tank leak
P0460	OBD II	Fuel level sense signal performance	Drive > 48 km (30 miles)	2	N	None	—	Fuel level sensor to instrument pack circuits: intermittent short or open circuit, high resistance Fuel level sensor failure Instrument pack fault (incorrect fuel level data)
P0480	JAG	Radiator fans slow (series) circuit malfunction	Engine at normal operating temperature; fans cycle ON / OFF	N	N	None	EM81-05	Radiator fan control relay module to ECM “series” drive circuit (relay pin 9) fault Relay coil ignition power supply: open circuit ECM ground circuit fault (relay coil drive) ECTS circuit malfunction (refer to P0116)
P0482	JAG	Radiator fans fast (parallel) circuit malfunction	Engine at normal operating temperature; fans cycle ON / OFF	N	N	None	EM81-04	Radiator fan control relay module to ECM “parallel” drive circuit (relay pin 7) fault Relay coil ignition power supply: open circuit ECM ground circuit fault (relay coil drive) ECTS circuit malfunction (refer to P0116)

DTC	TOOL	FAULT DESCRIPTION	MONITORING CONDITIONS	CK ENG	OTHER	DEFAULT ACTION	CM PIN	POSSIBLE CAUSES
P0506	OBD II	Idle rpm lower than expected	Engine and transmission at normal operating temperature: IAT > -8 °C (18 °F); gear "N"  Idle > 30 seconds (no electrical load, A/C compressor, radiator fans, brake pedal switching during period)  Surface elevation < 8,000 ft (2,438 m)	Y	N	None	—	Air intake blockage Accessory drive overload (defective / seized component) Throttle valve stuck closed Throttle assembly failure
P0507	OBD II	Idle rpm higher than expected	Engine and transmission at normal operating temperature: IAT > -8 °C (18 °F); gear "N"  Idle > 30 seconds (no electrical load, A/C compressor, radiator fans, brake pedal switching during period)  Surface elevation < 8,000 ft (2,438 m)	Y	N	None	—	Intake air leak between MAFS and throttle Intake air leak between throttle and engine Engine breather leak Throttle valve stuck open Throttle assembly failure
P0560	OBD II	Vehicle voltage malfunction	Ignition ON > 35 seconds	2	N	None	EM81 -17 EM82 -09 -13 EM83 -20	ECM battery power supply: open circuit, high resistance ECM ignition power supply: open circuit, high resistance



DTC	TOOL	FAULT DESCRIPTION	MONITORING CONDITIONS	CK ENG	OTHER	DEFAULT ACTION	CM PIN	POSSIBLE CAUSES
P0566	JAG	Cruise control CANCEL switch ON fault	Ignition ON > 75 seconds	N	1 [A, M]	When fault is detected, ECM: – Inhibits cruise control	EM81 -15	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	JAG	Cruise control RESUME switch ON fault	Ignition ON > 75 seconds	N	1 [A, M]	When fault is detected, ECM: – Inhibits cruise control	EM81 -15	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	JAG	Cruise control switch ground malfunction	Ignition ON > 5 seconds	N	1 [A, M]	When fault is detected, ECM: – Inhibits cruise control	EM81 -14 -15	Cruise control switches internal steering wheel circuit: open circuit Steering wheel cassette reel: open circuit or high resistance Cassette reel to ECM circuit (ACCEL / DECEL): open circuit or high resistance ACCEL / DECEL switch failure
P0569	JAG	Cruise control DECEL / SET (SET-) switch ON fault	Ignition ON > 10 minutes	N	1 [A, M]	When fault is detected, ECM: – Inhibits cruise control	EM81 -14	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 DECEL / set switch failure (stuck ON)

DTC	TOOL	FAULT DESCRIPTION	MONITORING CONDITIONS	CK ENG	OTHER	DEFAULT ACTION	CM PIN	POSSIBLE CAUSES
P0570	JAG	Cruise control ACCEL / SET (SET+) switch ON fault	Ignition ON > 10 minutes	N	1 [A, M]	When fault is detected, ECM: – Inhibits cruise control	EM81 -14	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 ACCEL / set failure (stuck ON)
P0603	OBD II	ECM data corrupted	Ignition ON > 5 seconds	1	N	When CK ENG MIL is activated (DTC flagged; first trip), ECM: – Inhibits all diagnostic monitoring except: • throttle control monitoring • upstream HO2S control monitoring • CPU 1 and 2 monitoring	—	ECM failure
P1000	JAG	System checks not complete since last memory clear	*System Readiness Test*	N	N	NONE	—	Refer to page3
P1104	OBD II	MAFS ground malfunction	Ignition ON > 5 seconds	2	1 [A, M]	When AMBER MIL is activated (DTC logged; first trip), ECM: – Limits engine speed to 3000 rpm – Substitutes throttle angle for engine load measurement – Inhibits canister purge	EM83 -26 -27	MAFS to ECM reference ground circuit: open circuit, short circuit to high voltage, high resistance MAFS to ECM sense circuit: open circuit MAFS failure
P1107	OBD II	MAP sensor sense circuit low voltage	Ignition ON > 5 seconds	2	N	When DTC logged (first trip), ECM: – Substitutes fixed value of 1013 mBar (29.92 in hg)	EM80 -28	MAP sensor to ECM sense circuit: open circuit or short circuit to ground MAP sensor to ECM reference voltage circuit: open circuit or short circuit to ground MAP sensor failure

DTC	TOOL	FAULT DESCRIPTION	MONITORING CONDITIONS	CK ENG	OTHER	DEFAULT ACTION	CM PIN	POSSIBLE CAUSES
P1108	OBD II	MAP sensor sense circuit high voltage	Ignition ON > 5 seconds	2	N	When DTC logged (first trip), ECM: – Substitutes fixed value of 1013 mBar (29.92 in hg)	EM80-28	MAP sensor to ECM reference ground circuit: open circuit MAP sensor to ECM wiring: short circuit to each other MAP sensor to ECM sense circuit: short circuit to high voltage MAP sensor failure
P1111	JAG	System checks complete since last memory clear	*System Readiness Test*	N	N	None	—	Refer to page 3
P1112	OBD II	IATS 2 sense circuit high voltage (low charge air temperature)	Ignition ON > 5 seconds	2	1 [A, M]	When AMBER MIL is activated (DTC logged, first trip), ECM: – Limits throttle opening to 30% – Substitutes fixed charge air temperature of 118 °C (244 °F)	EM81-23	IATS 2 to ECM sense circuit: open circuit, high resistance, short circuit to high voltage IATS 2 failure
P1113	OBD II	IATS 2 sense circuit low voltage (high charge air temperature)	Ignition ON > 5 seconds	2	1 [A, M]	When AMBER MIL is activated (DTC logged, first trip), ECM: – Limits throttle opening to 30% – Substitutes fixed charge air temperature of 118 °C (244 °F)	EM81-23	Supercharger intercooler failure IATS 2 to ECM sense circuit: short circuit to ground IATS 2 failure

DTC	TOOL	FAULT DESCRIPTION	MONITORING CONDITIONS	CK ENG	OTHER	DEFAULT ACTION	CM PIN	POSSIBLE CAUSES
P1121	OBD II	PPS circuit range / performance (PPS1 compared to PPS2)	Ignition ON; battery > 9v; Slowly move accelerator pedal through full range; > 40 seconds	2	1 [R, A, M]	When RED MIL is activated (DTC logged; first trip), ECM: - Switches off throttle motor (via relay) - Initiates throttle "limp home" mode: engine speed controlled to between 1000-1250 rpm by fuel cutoff to cylinders - Inhibits idle speed control - Inhibits cruise control - Inhibits traction control / stability control	EM81 -09 -18	Accelerator pedal to pedal position sensor cable adjustment incorrect Pedal position sensor to ECM sense circuits 1 and 2: open circuit, short circuit or high resistance Sensor power supply fault Sensor reference ground fault Pedal position sensor failure
P1122	OBD II	Pedal position sensor circuit "1" low voltage	Ignition ON > 5 seconds	2	1 [R, A, M]	Refer to P1121 Default Action	EM81 -09	Pedal position sensor to ECM sense circuit "1" (sensor pin 4) wire: open circuit or high resistance Sensor power supply fault Pedal position sensor failure
P1123	OBD II	Pedal position sensor circuit "1" high voltage	Ignition ON > 5 seconds	2	1 [R, A, M]	Refer to P1121 Default Action	EM81 -09	Pedal position sensor to ECM sense circuit "1" (sensor pin 4) wire: short circuit to B+ voltage Pedal position sensor failure
P1136	JAG	"Cool box" fan malfunction	Ignition ON; fan operating	N	N	None	EM85 -05	Cooling fan power supply (fuse) fault Cooling fan drive circuit fault Cooling fan motor failure

DTC	TOOL	FAULT DESCRIPTION	MONITORING CONDITIONS	CK ENG	OTHER	DEFAULT ACTION	CM PIN	POSSIBLE CAUSES
P1143	OBD II	AACV (air assist close valve) range / performance	Engine at normal operating temperature: IAT > -8 °C (18 °F) Drive and accelerate to 100 km/h (60 mph); release the accelerator and coast to 37 mph (60 km/h); engine rpm 1000 – 3000 during coast	2	N	None	—	AAI piping blocked Throttle body air channel blocked AACV stuck
P1144	OBD II	AACV (air assist close valve) circuit malfunction	ECT ambient: start engine and bring to normal operating temperature	2	N	When CK ENG MIL is activated (DTC flagged; second trip), ECM: – Inhibits AACV range / performance diagnostic monitoring	EM83-03	AACV B+ power supply circuit fault AACV ground circuit fault AACV to ECM PWM drive circuit: open circuit, short circuit or high resistance AACV failure
P1222	OBD II	Pedal position sensor circuit "2" low voltage	Ignition ON > 5 seconds	2	1 [R, A, M]	When RED MIL is activated (DTC logged; first trip), ECM: – Switches off throttle motor (via relay) – Initiates throttle "limp home" mode: engine speed controlled to between 1000-1250 rpm by fuel cutoff to cylinders – Inhibits idle speed control – Inhibits cruise control – Inhibits traction control / stability control	EM81-18	Pedal position sensor to ECM sense circuit "2" (sensor pin 2) wire: open circuit or high resistance Sensor power supply fault Pedal position sensor failure
P1223	OBD II	Pedal position sensor circuit "2" high voltage	Ignition ON > 5 seconds	2	1 [R, A, M]	Refer to P1222 Default Action	EM81-18	Pedal position sensor to ECM sense circuit "2" (sensor pin 2) wire: short circuit to B+ voltage Pedal position sensor failure

DTC	TOOL	FAULT DESCRIPTION	MONITORING CONDITIONS	CK ENG	OTHER	DEFAULT ACTION	CM PIN	POSSIBLE CAUSES
P1224	OBD II	Throttle control position error	Ignition ON > 3 minutes	2	1 [R, A, M]	Refer to P1222 Default Action	EM81 -10 -19 EM80 -08 -09 EM82 -06	Throttle adaptions not performed after battery disconnect TPS disconnected TPS to ECM sense circuits: open circuit, high resistance Throttle motor power relay failure Throttle motor power relay to ECM circuit fault Throttle motor power relay power supply: open circuit ECM ground circuit fault (relay coil drive) Throttle motor to ECM drive circuit: open circuit, short circuit, high resistance Throttle motor failure Throttle assembly failure
P1229	OBD II	Throttle motor control circuit malfunction	Ignition ON > 5 seconds	2	1 [R, A, M]	Refer to P1222 Default Action	EM82 -06	Throttle motor disconnected Throttle motor to ECM drive circuit: short circuit or open circuit Throttle motor failure
P1230	OBD II	Fuel pump relay malfunction  NOTE: This DTC covers the N/A system single fuel pump and the SC system fuel pump 1.	Ignition OFF; Ignition ON > 5 seconds	2	N/A: N SC: 2 [A, M]	N/A – None SC – When fault is detected, ECM: – Operates fuel pump 2	EM83 -04	Fuel pump relay failure Fuel pump relay to ECM circuit fault Fuel pump relay coil power supply open circuit ECM ground circuit fault (relay coil drive)

DTC	TOOL	FAULT DESCRIPTION	MONITORING CONDITIONS	CK ENG	OTHER	DEFAULT ACTION	CM PIN	POSSIBLE CAUSES
P1240	OBD II	Sensor supply voltage malfunction	Ignition ON > 5 seconds	2	1 [R, A, M]	When RED MIL is activated (DTC logged; first trip), ECM: <ul style="list-style-type: none"> <li>- Switches off throttle motor (via relay)</li> <li>- Initiates throttle "limp home" mode: engine speed controlled to between 1000-1250 rpm by fuel cutoff to cylinders</li> <li>- Inhibits idle speed control</li> <li>- Inhibits cruise control</li> <li>- Inhibits traction control / stability control</li> </ul>	EM82-01 EM83-05	ECM to sensors supply voltage circuit: short circuit to ground, short circuit to high voltage, open circuit, high resistance TPS, PPS, FTP sensor failure(s)
P1241	OBD II	Sensor supply voltage low	Ignition ON > 5 seconds	2	1 [R, A, M]	Refer to P1240 Default Action	EM82-01 EM83-05	ECM to sensors supply voltage circuit: short circuit to ground TPS, PPS, FTP sensor failure(s)
P1242	OBD II	Sensor supply voltage high	Ignition ON > 5 seconds	2	1 [R, A, M]	Refer to P1240 Default Action	EM82-01 EM83-05	ECM to sensors supply voltage circuit: open circuit, high resistance, short circuit to high voltage TPS, PPS, FTP sensor failure(s)
P1243	OBD II	Sensor ground malfunction	Ignition ON > 5 seconds	2	1 [R, A, M]	Refer to P1240 Default Action	EM82-07 EM83-13	ECM to sensors ground circuit: open circuit, high resistance TPS, PPS, ECTS, IATS, FTP sensor failure(s)
P1245	OBD II	Engine crank signal low voltage	Start engine; idle	2	1 [A, M]	When AMBER MIL is activated (DTC logged; first trip), ECM: <ul style="list-style-type: none"> <li>- Limits engine speed to 3000 rpm</li> </ul>	EM82-02	Starter relay coil to ECM / BPM circuit: open circuit

DTC	TOOL	FAULT DESCRIPTION	MONITORING CONDITIONS	CK ENG	OTHER	DEFAULT ACTION	CM PIN	POSSIBLE CAUSES
P1246	OBD II	Engine crank signal high voltage	Start engine; drive / accelerate > 20 km/h (13 mph) 1200 – 3000 rpm; decelerate to stop; repeat (5 times total)	2	1 [A, M]	When AMBER MIL is activated (DTC logged; first trip), ECM: – Limits engine speed to 3000 rpm	EM82 -02	Starter relay coil to ECM / BPM circuit: short circuit to B+ voltage BPM failure
P1250	JAG	Throttle valve return spring malfunction	Ignition ON; Ignition OFF > 3 seconds; Ignition ON	N	1 [R, M]	When fault is detected, ECM: – Limited throttle valve movement in response to normal accelerator pedal movement – Limits vehicle speed to 129 km/h (80 mph) – Inhibits cruise control	—	Throttle return spring failure (throttle failure)
P1251	OBD II	Throttle motor power relay malfunction	Ignition ON > 10 seconds	2	1 [R, A, M]	When RED MIL is activated (DTC logged; first trip), ECM: – Switches off throttle motor (via relay) – Initiates throttle “limp home” mode: engine speed controlled to between 1000-1250 rpm by fuel cutoff to cylinders – Inhibits idle speed control – Inhibits cruise control – Inhibits traction control/stability control	EM80 -08 -09 EM82 -06	Throttle motor power relay failure Throttle motor power relay to ECM circuit fault Throttle motor power relay coil power supply open circuit ECM ground circuit fault (relay coil drive)



DTC	TOOL	FAULT DESCRIPTION	MONITORING CONDITIONS	CK ENG	OTHER	DEFAULT ACTION	CM PIN	POSSIBLE CAUSES
P1254	JAG	Throttle "limp home" spring malfunction	Ignition ON; Ignition OFF > 3 seconds; Ignition ON	N	1 [R, M]	When fault is detected, ECM: <ul style="list-style-type: none"> <li>- Limited throttle valve movement in response to normal accelerator pedal movement</li> <li>- Limits vehicle speed to 129 km/h (80 mph)</li> <li>- Inhibits cruise control</li> </ul>	—	Throttle limp home spring failure (throttle failure)
P1260	JAG	Security input malfunction	Ignition ON > 10 seconds	N	N	None	EM82-15	KTM to ECM circuit: short circuit, high resistance or open circuit Loss of ignition switched power supply to the ECM PIN EM82-09 for greater than 16 milliseconds KTM failure Security system incorrectly configured (KTM / ECM)
P1313	OBD II	Misfire rate catalyst damage A bank (1)  NOTE: This DTC will flag only when accompanied by an individual cylinder misfire DTC: P0300 – P0308.	Engine at normal operating temperature; IAT > -8 °C (18 °F) Drive at steady speed between idle – 2500 rpm; > 2 minutes 30 seconds Surface elevation < 8,000 ft (2,438 m)	1	1 [A, M]	When CK ENG MIL is activated (DTC flagged; second trip), ECM: <ul style="list-style-type: none"> <li>- Limits engine speed to 3000 rpm</li> <li>- Inhibits A bank (1) closed loop fuel metering</li> <li>- Inhibits A bank (1) adaptive fuel metering</li> <li>- Inhibits canister purge</li> </ul>	—	Cylinder compression low Worn camshaft / broken valve spring(s) Fuel delivery pressure (low / high) Fuel injector(s) blocked / 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 module primary circuit fault(s) (Cylinder misfire detected DTC also flagged) Ignition module ground circuit: open circuit, high resistance Ignition module / coil failure

DTC	TOOL	FAULT DESCRIPTION	MONITORING CONDITIONS	CK ENG	OTHER	DEFAULT ACTION	CM PIN	POSSIBLE CAUSES
P1314	OBD II	Misfire rate catalyst damage B bank (2)  NOTE: This DTC will flag only when accompanied by an individual cylinder misfire DTC: P0300 – P0308.	Engine at normal operating temperature: IAT > -8 °C (18 °F) Drive at steady speed between idle – 2500 rpm; > 2 minutes 30 seconds Surface elevation < 8,000 ft (2,438 m)	1	1 [A, M]	When CK ENG MIL is activated (DTC flagged; second trip), ECM: – Limits engine speed to 3000 rpm – Inhibits B bank (2) closed loop fuel metering – Inhibits B bank (2) adaptive fuel metering – Inhibits canister purge	—	Refer to P1313 Possible Causes
P1316	OBD II	Misfire excess emission  NOTE: This DTC will flag only when accompanied by an individual cylinder misfire DTC: P0300 – P0308.	Engine at normal operating temperature: IAT > -8 °C (18 °F) Drive at steady speed between idle – 2500 rpm; > 2 minutes 30 seconds Surface elevation < 8,000 ft (2,438 m)	1	1 [A, M]	When CK ENG MIL is activated (DTC flagged; second trip), ECM: – Limits engine speed to 3000 rpm – Inhibits closed loop fuel metering – Inhibits adaptive fuel metering – Inhibits canister purge	—	Refer to P1313 Possible Causes
P1340	OBD II	CMPS circuit malfunction – B bank (2)	Crank engine > 5 seconds (battery v 6 – 10.5 during cranking); or start engine, idle > 600 rpm  (If the A bank (1) CMPS signal is not present, the engine may start – 50% chance. The engine will run normally if the A bank (1) CMPS signal is lost while running.)	2	N	None	EM83 -17 -18	CMPS disconnected CMPS gap incorrect / foreign matter on sensor face CMPS sense circuit: open circuit, short circuit to ground, short circuit to high voltage CMPS failure

DTC	TOOL	FAULT DESCRIPTION	MONITORING CONDITIONS	CK ENG	OTHER	DEFAULT ACTION	CM PIN	POSSIBLE CAUSES
P1341	OBD II	CMPS range / performance – B bank (2) (CMPS pulse not detected at CKPS missing tooth)	Start engine; idle > 5 seconds (If the B bank (2) CMPS signal is not present, the engine may start – 50% chance. The engine will run normally if the B bank (2) CMPS signal is lost while running.)	2	N	None	EM83 -17 -18	CMPS disconnected CMPS gap incorrect / foreign matter on sensor face CMPS sense circuit: open circuit, short circuit to ground, short circuit to high voltage CMPS failure
P1367	OBD II	Ignition monitor – Group One (1A, 2B, 3B, 4A)	Run engine steady < 2500 rpm > 5 seconds	2	1 [A, M]	When fault is detected, ECM: – Limits engine speed to 3000 rpm	EM83 -10	Ignition monitoring circuit between splice and ECM: open circuit, short circuit to ground or short circuit to B+ voltage Ignition module / coil group ground circuit fault Ignition coil relay failure
P1368	OBD II	Ignition monitor – Group Two (1B, 2A, 3A, 4B)	Run engine steady < 2500 rpm > 5 seconds	2	1 [A, M]	When fault is detected, ECM: – Limits engine speed to 3000 rpm	EM83 -11	Ignition monitoring circuit between splice and ECM: open circuit, short circuit to ground or short circuit to B+ voltage Ignition module / coil group ground circuit fault Ignition coil relay failure
P1384	OBD II	VVT solenoid malfunction – A bank (1)	Drive vehicle; accelerate rapidly to cruise, decelerate to stop, repeat several times	2	N	When CK ENG MIL is activated (DTC flagged; second trip), ECM: – Sets VVT drive PWM duty cycle to 0 (intake camshaft fully retarded)	EM81 -01 -02	VVT solenoid valve to ECM PWM drive circuit fault VVT solenoid valve to ECM ground circuit fault VVT solenoid failure VVT oil flow fault VVT / camshaft mechanical failure
P1392	OBD II	VVT Circuit malfunction – A bank (1)	Drive vehicle; accelerate rapidly to cruise, decelerate to stop, repeat several times	2	N	When CK ENG MIL is activated (DTC flagged; second trip), ECM: – Sets VVT drive PWM duty cycle to 0 (intake camshaft fully retarded)	EM81 -01 -02	VVT solenoid valve to ECM PWM drive circuit fault VVT solenoid valve to ECM ground circuit fault VVT solenoid failure

DTC	TOOL	FAULT DESCRIPTION	MONITORING CONDITIONS	CK ENG	OTHER	DEFAULT ACTION	CM PIN	POSSIBLE CAUSES
P1396	OBD II	VVT solenoid malfunction – B bank (2)	Drive vehicle; accelerate rapidly to cruise, decelerate to stop, repeat several times	2	N	When CK ENG MIL is activated (DTC flagged; second trip), ECM: – Sets VVT drive PWM duty cycle to 0 (intake camshaft fully retarded)	EM81 -06 -07	VVT solenoid valve to ECM PWM drive circuit fault VVT solenoid valve to ECM ground circuit fault VVT solenoid failure VVT oil flow fault VVT / camshaft mechanical failure
P1397	OBD II	VVT Circuit malfunction – B bank (2)	Drive vehicle; accelerate rapidly to cruise, decelerate to stop, repeat several times	2	N	When CK ENG MIL is activated (DTC flagged; second trip), ECM: – Sets VVT drive PWM duty cycle to 0 (intake camshaft fully retarded)	EM81 -06 -07	VVT solenoid valve to ECM PWM drive circuit fault VVT solenoid valve to ECM ground circuit fault VVT solenoid failure
P1474	OBD II	Intercooler coolant pump relay malfunction	Ignition OFF; Ignition ON > 5 seconds	2	1 [A, M]	When AMBER MIL is activated (DTC logged; first trip), ECM: – Limits throttle opening to 30%	EM80 -14	Intercooler coolant pump relay battery power supply open circuit Intercooler pump relay failure Intercooler pump ECM to relay drive circuit fault Intercooler pump relay coil ground circuit fault ECM power supply fault (relay drive)
P1516	OBD II	Gear change PARK / NEUTRAL driving malfunction	Engine at normal operating temperature Drive 80 – 100 km/h (50 – 62 mph) 1800 – 2200 rpm > 35 seconds	2	N	None	EM81 -12	Gear selector cable setting incorrect Transmission rotary switch to ECM circuit: open circuit or high resistance Rotary switch failure D – 4 switch to TCM circuit: open circuit or high resistance D – 4 switch fault
P1517	JAG	Engine cranking PARK / NEUTRAL malfunction  *If engine will not start, CHECK ENGINE MIL will remain on	Start engine	N*	N	When fault is detected, ECM: – Fuel injection inhibited	EM81 -12	Gear selector cable setting incorrect Transmission rotary switch to ECM circuit: open circuit or high resistance Rotary switch failure

DTC	TOOL	FAULT DESCRIPTION	MONITORING CONDITIONS	CK ENG	OTHER	DEFAULT ACTION	CM PIN	POSSIBLE CAUSES
P1571	JAG	Brake switch malfunction	Drive vehicle; engage cruise control > 10 seconds disengage cruise control; repeat (5 total cycles)	N	1 [A, M]	When fault is detected, ECM: – Inhibits cruise control	EM80 -20 EM82 -08	Brake switch to ECM circuit: open circuit, short circuit to ground, high resistance Brake switch ignition switched ground circuit: open circuit Brake switch failure Brake cancel switch to ECM circuit: open circuit, short circuit to ground, high resistance Brake cancel switch to cruise control switch to ECM circuit: open circuit, short circuit to ground, high resistance Brake cancel switch ignition switched power supply open circuit Brake cancel switch failure Cruise control switch failure
P1582	JAG	Throttle monitor data available or inertia switch malfunction	Ignition ON	N	N	None	EM82 -12	DTC indicates that the inertia switch has tripped (vehicle impact) If no vehicle impact: Inertia switch to ECM circuit: short circuit to ground Inertia switch failure
P1606	JAG	EMS control relay malfunction	Ignition ON; ignition OFF; ignition ON > 5 seconds	N	N	None	EM81 -03	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	TOOL	FAULT DESCRIPTION	MONITORING CONDITIONS	CK ENG	OTHER	DEFAULT ACTION	CM PIN	POSSIBLE CAUSES
P1609	OBD II	ECM microprocessor-to-microprocessor communication failure	Ignition ON > 5 seconds	2	1 [R, A, M]	When RED MIL is activated (DTC logged; first trip), ECM: <ul style="list-style-type: none"> <li>- Switches off throttle motor (via relay)</li> <li>- Initiates throttle "limp home" mode: engine speed controlled to between 1000-1250 rpm by fuel cutoff to cylinders</li> <li>- Inhibits idle speed control</li> <li>- Inhibits cruise control</li> <li>- Inhibits traction control / stability control</li> </ul>	—	ECM FCCP (programming) circuit (ECM pin EM80-19 or EM80-27): short circuit to ground ECM failure
P1611	OBD II	ECM CPU 2 failure	Ignition ON > 5 seconds	2	1 [R, A, M]	When RED MIL is activated (DTC logged; first trip), ECM: <ul style="list-style-type: none"> <li>- Switches off throttle motor (via relay)</li> <li>- Initiates throttle "limp home" mode: engine speed controlled to between 1000-1250 rpm by fuel cutoff to cylinders</li> <li>- Inhibits idle speed control</li> <li>- Inhibits cruise control</li> <li>- Inhibits traction control / stability control</li> </ul>	—	ECM failure

DTC	TOOL	FAULT DESCRIPTION	MONITORING CONDITIONS	CK ENG	OTHER	DEFAULT ACTION	CM PIN	POSSIBLE CAUSES
P1631	OBD II	Throttle motor power relay coil activation circuit failure	Ignition ON > 5 seconds	2	1 [R, A, M]	When RED MIL is activated (DTC logged; first trip), ECM: <ul style="list-style-type: none"> <li>- Switches off throttle motor (via relay)</li> <li>- Initiates throttle "limp home" mode: engine speed controlled to between 1000-1250 rpm by fuel cutoff to cylinders</li> <li>- Inhibits idle speed control</li> <li>- Inhibits cruise control</li> <li>- Inhibits traction control / stability control</li> </ul>	EM82-06	Throttle motor relay coil to ECM circuit: open circuit, short circuit to ground or short circuit to B+ voltage ECM failure
P1633	OBD II	ECM CPU 1 memory failure	Ignition ON > 5 seconds	2	1 [R, A, M]	When RED MIL is activated (DTC logged; first trip), ECM: <ul style="list-style-type: none"> <li>- Switches off throttle motor (via relay)</li> <li>- Initiates throttle "limp home" mode: engine speed controlled to between 1000-1250 rpm by fuel cutoff to cylinders</li> <li>- Inhibits idle speed control</li> <li>- Inhibits cruise control</li> <li>- Inhibits traction control / stability control</li> </ul>	—	ECM failure
P1634	JAG	Throttle "watchdog" circuit malfunction	Ignition ON; Ignition OFF > 3 seconds; Ignition ON; Ignition OFF > 3 seconds; Ignition ON	N	1 [R, A, M]	When fault is detected, ECM: <ul style="list-style-type: none"> <li>- Limited throttle valve movement in response to normal accelerator pedal movement</li> <li>- Limits vehicle speed to 129 km/h (80 mph)</li> <li>- Inhibits cruise control</li> </ul>	—	ECM failure

DTC	TOOL	FAULT DESCRIPTION	MONITORING CONDITIONS	CK ENG	OTHER	DEFAULT ACTION	CM PIN	POSSIBLE CAUSES
P1637	OBD II	CAN ABS/TCCM token message missing	Ignition ON > 5 seconds	2	1 [M]	When fault is detected, ECM: – Inhibits cruise control – (Idle speed control quality deteriorates)	EM83 -15 -16 -24 -25	CAN open circuit fault – ABS/TCCM to ECM CAN short circuit fault ABS/TCCM failure ECM failure
P1638	OBD II	CAN INST token message missing	Ignition ON > 5 seconds	1	N	None (Engine speed and coolant temperature data missing at instrument pack)	EM83 -15 -16 -24 -25	CAN open circuit fault – INST to ECM CAN short circuit fault INST failure ECM failure
P1642	OBD II	CAN circuit malfunction	Ignition ON > 5 seconds	1	1 [M]	When fault is detected, ECM: – Limits throttle to approximately 30% – Inhibits cruise control (All CAN data unavailable)	EM83 -15 -16 -24 -25	CAN short circuit fault Control module failure – check for additional flagged DTC(s) to locate control module source
P1643	OBD II	CAN TCM token message missing	Ignition ON > 5 seconds	2	1 [M]	When fault is detected, ECM: – Limits throttle to approximately 30% – Inhibits cruise control (Torque reduction request data missing; results in harsh transmission shifts)	EM83 -15 -16 -24 -25	CAN open circuit fault – TCM to ECM CAN short circuit fault TCM failure ECM failure
P1646	OBD II	Fuel pump 2 (SC) relay malfunction	Ignition ON > 5 seconds	2	1 [A, M]	When fault is detected, ECM: – Limits engine speed to 3000 rpm	EM82 -03	Fuel pump relay 2 failure Fuel pump relay 2 to ECM circuit fault Fuel pump relay 2 coil power supply open circuit ECM ground circuit fault (relay coil drive)



DTC	TOOL	FAULT DESCRIPTION	MONITORING CONDITIONS	CK ENG	OTHER	DEFAULT ACTION	CM PIN	POSSIBLE CAUSES
P1648	OBD II	ECM KS self test failure	Start engine; run > 5 seconds	2	1 [A, M]	When DTC is logged (first trip), ECM: - Sets ignition retard to maximum - Limits engine speed to 3000 rpm	—	ECM failure
P1649	JAG	ECM flash programming circuit malfunction	Ignition ON	N	N	None	EM80 -19 -27	ECM to DLC circuit: short circuit to ground or short circuit to B+ voltage
P1656	JAG	TPS amplifier circuit malfunction	Ignition ON > 5 seconds	N	1 [A]	None	—	ECM failure
P1657	JAG	Throttle motor power relay coil circuit ON failure	Ignition ON; Ignition OFF > 3 seconds; Ignition ON; Ignition OFF > 3 seconds; Ignition ON	N	1 [A, M]	When fault is detected, ECM: - Limited throttle valve movement in response to normal accelerator pedal movement - Limits vehicle speed to 129 km/h (80 mph) - Inhibits cruise control	—	ECM failure
P1658	JAG	Throttle motor power relay ON failure	Ignition ON; Ignition OFF > 3 seconds; Ignition ON; Ignition OFF > 3 seconds; Ignition ON	N	1 [A, M]	When fault is detected, ECM: - Limited throttle valve movement in response to normal accelerator pedal movement - Limits vehicle speed to 129 km/h (80 mph) - Inhibits cruise control	EM80 -08 -09 EM82 -06	Throttle motor power relay failure (contacts stuck on) Throttle motor power relay to ECM coil circuit: short circuit to ground Throttle motor power relay to ECM supply circuit: short circuit to B+ voltage

DTC	TOOL	FAULT DESCRIPTION	MONITORING CONDITIONS	CK ENG	OTHER	DEFAULT ACTION	CM PIN	POSSIBLE CAUSES
P1696	JAG	Adaptive speed control CAN malfunction	Ignition ON > 5 seconds	N	1 [A, M]	When fault is detected, ECM: – Inhibits cruise control	EM83 -15 -16 -24 -25	CAN open circuit fault – Adaptive Speed Control CM, Adaptive Speed Control Booster CM to ECM CAN short circuit fault Adaptive Speed Control CM or Adaptive Speed Control Booster CM failure
P1697	JAG	Adaptive speed control “Headway” switch(es) circuit(s) malfunction	Ignition ON > 1 minute	N	1 [A, M]	When fault is detected, ECM: – Inhibits cruise control	EM81 -14 -15	Adaptive speed control switch(es) failure
P3007	OBD II	ECM HO2S control malfunction – A bank (1), upstream	Ignition ON > 8 seconds	2	N	When CK ENG MIL is activated (DTC flagged; second trip), ECM: – Inhibits A bank (1) upstream HO2S operation	—	HO2S heater failure HO2S sense circuit: short circuit to ground or high voltage HO2S sense circuit: open circuit ECM failure
P3008	OBD II	ECM HO2S control malfunction – B bank (2), upstream	Ignition ON > 8 seconds	2	N	When CK ENG MIL is activated (DTC flagged; second trip), ECM: – Inhibits B bank (2) upstream HO2S operation	—	HO2S heater failure HO2S sense circuit: short circuit to ground or high voltage HO2S sense circuit: open circuit ECM failure