



# DTC Summaries

## AJ27 Engine Management – 1999 MY

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### **OBD II MONITORING CONDITIONS:**

When testing for DTC reoccurrence, it can be determined if the Service Drive Cycle was of sufficient length by performing a PDU “Systems Readiness Test”.

The Systems Readiness Test is accessed via the PDU menu structure. PDU will report if any portion of the Systems Readiness Test has not been completed in the following manner:

The following less frequently performed tests are identified as incomplete:

- Module \$11 (identifies EMS ECM)
- Catalyst
- Evaporative purge system
- O2 sensor
- O2 sensor heaters

Further confirmation of the System Readiness Test status is available by retrieving the logged DTCs.

- If DTC P1000 is logged in memory, the on-board diagnostic tests have not been completed.
- If DTC P1111 is logged in memory, all on-board diagnostic tests have been completed.

**Refer to page 2 for important information regarding the use of this Summary.**

## NOTES

|                              |  |   |
|------------------------------|--|---|
| MONITORING CONDITIONS        | "SERVICE DRIVE CYCLE" for the particular DTC. Operate the vehicle as described to check for a reoccurrence of the DTC. |   |
| OBD II                       | Y  | YES – indicates that the DTC is an OBD II DTC.  |
|                              | N  | NO – indicates that the DTC is a non OBD II DTC.  |
| CHECK ENGINE MIL<br>(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                        | N  | None  |
|                              | 1  | 1 "TRIP" to activate indicator(s).  |
|                              | 2  | 2 CONSECUTIVE "TRIPS" to activate indicator(s).   |
|                              | R  | RED MIL   |
|                              | A  | AMBER MIL   |
|                              | M  | MESSAGE   |
| DEFAULT ACTION               | ECM default action; Logged – DTC stored in memory buffer; Flagged – DTC stored in memory / CHECK ENGINE MIL activated. |   |
| POSSIBLE CAUSES              | HIGH VOLTAGE – High voltage can be either EMS 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.

## 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)  | FP      | Fuel pump                                |
| BARO     | Barometric pressure sensor               | FPRLY   | Fuel pump relay                          |
| BAT1+    | Battery B+ supply to ECM                 | FTP     | Fuel tank pressure                       |
| CCV      | Canister close valve                     | HO2SB1D | Heated oxygen sensor (downstream) A bank |
| CLV      | Calculated load value                    | HO2SB2D | Heated oxygen sensor (downstream) B bank |
| CRANKREQ | Crank request (from BPM)                 | HO2SB1U | Heated oxygen sensor (upstream) A bank   |
| CRUISEA  | Cruise control accel / decel switch      | HO2SB2U | Heated oxygen sensor (upstream) B bank   |
| CRUISEB  | Cruise resume / cancel switch            | HTDSC   | Heated windshield request                |
| CRUISEC  | Cruise cancel switch                     | IAT     | Intake air temperature                   |
| CRUISED  | Cruise control set / inch / decel switch | KS1A    | Knock sensor 1 A bank                    |
| CRUISEO  | Cruise control ON / OFF switch           | KS1B    | Knock sensor 1 B bank                    |
| CRUISER  | Cruise control resume switch             | KS4A    | Knock sensor 4 A bank                    |
| CRUISES  | Cruise control set / inch / accel switch | KS4B    | Knock sensor 4 B bank                    |
| CRUISEC1 | Cruise control cancel switch             | KSFA    | Knock sensor fail A bank                 |
| DTC1     | Number of DTCs logged this trip          | KSFB    | Knock sensor fail B bank                 |
| DTCS     | Number of permanent DTCs logged          | LTFT1   | Long term fuel trim A bank               |
| ECT      | Engine coolant temperature               | LTFT2   | Long term fuel trim B bank               |
| EOT      | Engine oil temperature                   | MAF     | Mass air flow                            |
| EVAP     | Evaporative emission system monitor      | MAFGND1 | MAFS ground                              |
| FANF     | Cooling fan fast                         | MAFS1   | Mass air flow sensor                     |

## PDU DATALOGGER ACRONYMS

|         |  |
|---------|--|
| 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                    |
| STFT2   | Short term fuel trim B bank                    |
| STFTB1D | Short term fuel trim A bank downstream         |
| STFTB1U | Short term fuel trim A bank upstream           |
| STFTB2D | Short term fuel trim B bank downstream         |
| STFTB2U | Short term fuel trim B bank 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 (A bank) monitor         |
| VVTBM   | Variable valve timing (B bank) monitor         |

| DTC   | FAULT DESCRIPTION                | MONITORING CONDITIONS   | OBD II | CK ENG | OTHER       | DEFAULT ACTION  | POSSIBLE CAUSES  |
|-------|----------------------------------|---|--------|--------|-------------|---|--|
| P0010 | VVT Circuit malfunction – A bank | Drive vehicle; accelerate rapidly to cruise, decelerate to stop, repeat several times   | Y      | 2      | N           | When CK ENG MIL is activated (DTC flagged; second trip), ECM:<br>Sets VVT drive PWM duty cycle to 0 (intake camshaft fully retarded)  | VVT solenoid valve to ECM PWM drive circuit fault<br>VVT solenoid valve to ECM ground circuit fault<br>VVT solenoid failure  |
| P0020 | VVT Circuit malfunction – B bank | Drive vehicle; accelerate rapidly to cruise, decelerate to stop, repeat several times   | Y      | 2      | N           | When CK ENG MIL is activated (DTC flagged; second trip), ECM:<br>– Sets VVT drive PWM duty cycle to 0 (intake camshaft fully retarded)  | VVT solenoid valve to ECM PWM drive circuit fault<br>VVT solenoid valve to ECM ground circuit fault<br>VVT solenoid failure  |
| P0101 | MAFS range / performance         | Engine at normal operating temperature; drive at steady speed on level surface 43 – 59 mph (70 – 95 km/h); 1500 – 2500 rpm; > 10 seconds<br>Fuel level > 10%;<br>surface elevation < 8,000 ft (2,438 m) | Y      | 2      | 2<br>[A, M] | When CK ENG MIL is activated (DTC flagged; second trip), ECM:<br>– Substitutes throttle angle for engine load measurement<br>– Limits engine speed to 3000 rpm<br>– Inhibits canister purge | Blocked air cleaner<br>Air intake leak<br>Engine breather leak<br>Throttle control malfunction<br>MAFS to ECM sensing circuit high resistance<br>MAFS to ECM sensing circuit intermittent short circuit to ground<br>MAFS supply circuit high resistance<br>MAFS failure |
| P0102 | MAFS sense circuit low voltage   | Ignition ON > 5 seconds   | Y      | 2      | 1<br>[A, M] | When AMBER MIL is activated (DTC logged; first trip), ECM:<br>– Substitutes throttle angle for engine load measurement<br>– Limits engine speed to 3000 rpm<br>– Inhibits canister purge    | Blocked air filter<br>MAFS to ECM sensing circuit high resistance or open circuit<br>MAFS to ECM sensing circuit intermittent short circuit to ground<br>MAFS supply circuit open circuit or short circuit to ground<br>MAFS failure                                     |

| DTC   | FAULT DESCRIPTION                                     | MONITORING CONDITIONS  | OBD II | CK ENG | OTHER       | DEFAULT ACTION   | POSSIBLE CAUSES   |
|-------|---|--|--------|--------|-------------|--|---|
| P0103 | MAFS sense circuit high voltage                       | Ignition ON > 5 seconds  | Y      | 2      | 1<br>[A, M] | When AMBER MIL is activated (DTC logged; first trip), ECM:<br>- Substitutes throttle angle for engine load measurement<br>- Limits engine speed to 3000 rpm<br>- Inhibits canister purge | MAFS to ECM reference ground circuit open circuit<br>MAFS to ECM sensing circuit short circuit to B+ voltage<br>MAFS failure  |
| P0107 | BARO circuit low voltage                              | Ignition ON > 5 seconds  | Y      | 2      | N           | When CK ENG MIL is activated (DTC flagged; second trip), ECM:<br>- Substitutes fixed value of 1013 mBar (29.92 in hg)  | BARO failure (internal ECM fault)   |
| P0108 | BARO circuit high voltage                             | Ignition ON > 5 seconds  | Y      | 2      | N           | When CK ENG MIL is activated (DTC flagged; second trip), ECM:<br>- Substitutes fixed value of 1013 mBar (29.92 in hg)  | BARO failure (internal ECM fault)   |
| P0111 | IATS range / performance (Two part monitoring)        | 1 Ignition ON > 5 seconds<br>2 Drive above idle >1000 rpm;<br>ECT < 104 °F (40 °C); > 20 seconds | Y      | 2      | N           | When CK ENG MIL is activated (DTC flagged; second trip), ECM:<br>- Substitutes fixed temperature of 50° C (122° F)   | Blocked air cleaner<br>Air intake leak<br>Engine breather leak<br>IATS to ECM wiring open circuit or high resistance<br>IATS to ECM sensing circuit short circuit to high voltage<br>IATS failure |
| P0112 | IATS sense circuit high voltage (low air temperature) | Ignition ON > 5 seconds  | Y      | 2      | N           | When DTC is logged (first trip), ECM:<br>- Substitutes fixed temperature of 50° C (122° F)   | IATS to ECM wiring open circuit or high resistance<br>IATS to ECM sensing circuit short circuit to B+ voltage<br>IATS failure   |
| P0113 | IATS sense circuit low voltage (high air temperature) | Ignition ON > 5 seconds  | Y      | 2      | N           | When DTC is logged (first trip), ECM:<br>- Substitutes fixed temperature of 50° C (122° F)   | IATS to ECM wiring short circuit to ground<br>IATS failure  |

| DTC   | FAULT DESCRIPTION  | MONITORING CONDITIONS  | OBD II | CK ENG | OTHER          | DEFAULT ACTION   | POSSIBLE CAUSES  |
|-------|--|--|--------|--------|----------------|--|--|
| P0116 | ECTS range / performance<br>(Two part monitoring)            | 1 Ignition ON > 5 seconds<br>2 ECT ambient; IAT > 18 °F (-8 °C);<br>start engine; bring to normal operating<br>temperature; drive > 1500 rpm;<br>> 3 minutes | Y      | 2      | 2<br>[A, M]    | When CK ENG MIL is activated<br>(DTC flagged; second trip), ECM:<br>- Substitutes transmission fluid<br>temperature (via CAN)<br>- Limits engine speed to<br>3000 rpm<br>- Inhibits canister purge   | Low coolant level<br>Contaminated coolant<br>Engine thermostat failure<br>ECTS to ECM sensing circuit high<br>resistance when hot<br>ECTS to ECM sensing circuit intermittent<br>high resistance<br>ECTS failure |
| P0117 | ECTS sense circuit high voltage<br>(low coolant temperature) | Ignition ON > 5 seconds  | Y      | 2      | 1<br>[A, M]    | When AMBER MIL is activated<br>(DTC logged; first trip), ECM:<br>- Substitutes transmission fluid<br>temperature (via CAN)<br>- Limits engine speed to<br>3000 rpm<br>- Inhibits canister purge  | ECTS disconnected<br>ECTS to ECM sensing circuit high<br>resistance, open circuit or short circuit<br>to B+ voltage<br>ECTS failure  |
| P0118 | ECTS sense circuit low voltage<br>(high coolant temperature) | Ignition ON > 5 seconds  | Y      | 2      | 1<br>[A, M]    | Refer to P0117 Default Action  | Engine overheat condition<br>ECTS to ECM wiring short circuit to<br>ground<br>ECTS failure   |
| P0121 | TPS circuit range / performance<br>(TPS1 compared to TPS2)   | Ignition ON; battery > 9v; slowly move<br>accelerator pedal through full range;<br>> 40 seconds  | Y      | 2      | 1<br>[R, A, M] | When RED MIL is activated<br>(DTC logged; first trip), ECM:<br>- Switches off throttle motor (via<br>relay)<br>- Initiates throttle "limp home"<br>mode – engine speed controlled<br>to between 1000-1250 rpm by<br>fuel cutoff to cylinders<br>- Inhibits idle speed control<br>- Inhibits cruise control<br>- Inhibits traction control / stability<br>control | TPS to ECM wiring open circuit or high<br>resistance<br>TPS to ECM sensing circuits (*1" or *2")<br>short circuit to B+ voltage<br>TPS failure   |

| DTC   | FAULT DESCRIPTION  | MONITORING CONDITIONS  | OBD II | CK ENG | OTHER          | DEFAULT ACTION  | POSSIBLE CAUSES  |
|-------|--|--|--------|--------|----------------|---|--|
| P0122 | TPS circuit "1" low voltage  | Ignition ON > 5 seconds  | Y      | 2      | 1<br>[R, A, M] | Refer to P0121 Default Action   | TPS to ECM sensing circuit "1"<br>(TPS pin 3) open circuit or high<br>resistance<br>TPS failure  |
| P0123 | TPS circuit "1" high voltage   | Ignition ON > 5 seconds  | Y      | 2      | 1<br>[R, A, M] | Refer to P0121 Default Action   | TPS to ECM sensing circuit "1"<br>(TPS pin 3) short circuit to high voltage<br>TPS failure   |
| P0125 | ECTS response (for closed loop fuel control)   | ECT ambient; IAT > 18 °F (-8 °C); start engine; bring to normal operating temperature; drive > 1500 rpm; > 3 minutes | Y      | 2      | 1<br>[A, M]    | When CK ENG MIL is activated (DTC flagged; second trip), ECM:<br>– Substitutes transmission fluid temperature (via CAN)<br>– Limits engine speed to 3000 rpm<br>– Inhibits canister purge | Low coolant level<br>Contaminated coolant<br>Engine coolant thermostat failure<br>ECTS to ECM sensing circuit high resistance, open circuit or short circuit to high voltage |
| P0131 | HO2S sense circuit low current – A bank, upstream (1)<br>(Universal oxygen sensor: lean condition at ECM – high current at sensor) | Start and run engine > 5 seconds   | Y      | 2      | N              | None  | HO2S disconnected<br>HO2S to ECM variable current circuit fault (HO2S pin 3)<br>ECM to HO2S constant current circuit fault (HO2S pin 4)<br>HO2S failure                      |
| P0132 | HO2S sense circuit high current – A bank, upstream (1)<br>(Universal oxygen sensor: rich condition at ECM – low current at sensor) | Start and run engine > 5 seconds   | Y      | 2      | N              | None  | HO2S disconnected<br>HO2S to ECM variable current circuit fault (HO2S pin 3)<br>ECM to HO2S constant current circuit fault (HO2S pin 4)<br>HO2S failure                      |



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

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

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

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

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

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

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

| DTC   | FAULT DESCRIPTION                                 | MONITORING CONDITIONS   | OBD II | CK ENG | OTHER          | DEFAULT ACTION  | POSSIBLE CAUSES  |
|-------|---|---|--------|--------|----------------|---|--|
| P0208 | Fuel injector circuit malfunction cylinder B4 (8) | Start engine, bring to normal operating temperature; vary engine speed between idle – 2500 rpm > 10 times | Y      | 2      | 1<br>[A, M]    | Refer to P0205 Default Action   | Injector disconnected<br>Injector harness wiring open or short circuit<br>Injector failure |
| P0222 | TPS circuit "2" low voltage                       | Ignition ON > 5 seconds   | Y      | 2      | 1<br>[R, A, M] | When RED MIL is activated (DTC logged; first trip), ECM:<br>– Switches off throttle motor (via relay)<br>– Initiates throttle "limp home" mode: engine speed controlled to between 1000-1250 rpm by fuel cutoff to cylinders<br>– Inhibits idle speed control<br>– Inhibits cruise control<br>– Inhibits traction control / stability control | TPS to ECM sensing circuit "2" (TPS pin 2) open circuit or high resistance<br>TPS failure  |
| P0223 | TPS circuit "2" high voltage                      | Ignition ON > 5 seconds   | Y      | 2      | 1<br>[R, A, M] | Refer to P0222 Default Action   | TPS to ECM sensing circuit "2" (TPS pin 2) short circuit to B+ voltage<br>TPS failure      |



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

\*\* If, on the first trip, the misfire is severe enough to cause excess exhaust emission, individual cylinder DTC plus DTC P1316 will be flagged; CHECK ENGINE MIL will flash.

If, on the first trip, the misfire is severe enough to cause catalyst damage, individual cylinder DTC plus DTC P1313 (A bank) P1314 (B bank) will be flagged; CHECK ENGINE MIL will flash.

| DTC   | FAULT DESCRIPTION                  | MONITORING CONDITIONS  | OBD II | CK ENG       | OTHER       | DEFAULT ACTION   | POSSIBLE CAUSES                |
|-------|------------------------------------|--|--------|--------------|-------------|--|--------------------------------|
| P0303 | Misfire detected – cylinder A3 (3) | Engine at normal operating temperature; IAT > 18 °F (-8 °C); drive at steady speed between idle – 2500 rpm; > 2 minutes 30 seconds<br>Surface elevation < 8,000 ft (2,438 m) | Y      | 1 or 2<br>** | 1<br>[A, M] | Refer to P0301 Default Action  | Refer to P0300 Possible Faults |
| P0304 | Misfire detected – cylinder A4 (4) | Engine at normal operating temperature; IAT > 18 °F (-8 °C); drive at steady speed between idle – 2500 rpm; > 2 minutes 30 seconds<br>Surface elevation < 8,000 ft (2,438 m) | Y      | 1 or 2<br>** | 1<br>[A, M] | Refer to P0301 Default Action  | Refer to P0300 Possible Faults |
| P0305 | Misfire detected – cylinder B1 (5) | Engine at normal operating temperature; IAT > 18 °F (-8 °C); drive at steady speed between idle – 2500 rpm; > 2 minutes 30 seconds<br>Surface elevation < 8,000 ft (2,438 m) | Y      | 1 or 2<br>** | 1<br>[A, M] | When CK ENG MIL is activated (DTC flagged; second trip), ECM:<br>– Limits engine speed to 3000 rpm<br>– Inhibits B bank closed loop fuel metering<br>– Inhibits B bank adaptive fuel metering<br>– Inhibits canister purge | Refer to P0300 Possible Faults |
| P0306 | Misfire detected – cylinder B2 (6) | Engine at normal operating temperature; IAT > 18 °F (-8 °C); drive at steady speed between idle – 2500 rpm; > 2 minutes 30 seconds<br>Surface elevation < 8,000 ft (2,438 m) | Y      | 1 or 2<br>** | 1<br>[A, M] | Refer to P0305 Default Action  | Refer to P0300 Possible Faults |
| P0307 | Misfire detected – cylinder B3 (7) | Engine at normal operating temperature; IAT > 18 °F (-8 °C); drive at steady speed between idle – 2500 rpm; > 2 minutes 30 seconds<br>Surface elevation < 8,000 ft (2,438 m) | Y      | 1 or 2<br>** | 1<br>[A, M] | Refer to P0305 Default Action  | Refer to P0300 Possible Faults |

\*\* If, on the first trip, the misfire is severe enough to cause excess exhaust emission, individual cylinder DTC plus DTC P1316 will be flagged; CHECK ENGINE MIL will flash.

If, on the first trip, the misfire is severe enough to cause catalyst damage, individual cylinder DTC plus DTC P1313 (A bank) P1314 (B bank) will be flagged; CHECK ENGINE MIL will flash.

| DTC   | FAULT DESCRIPTION                                      | MONITORING CONDITIONS   | OBD II | CK ENG       | OTHER       | DEFAULT ACTION   | POSSIBLE CAUSES  |
|-------|--|---|--------|--------------|-------------|--|--|
| P0308 | Misfire detected – cylinder B4 (8)                     | Engine at normal operating temperature;<br>IAT > 18 °F (-8 °C); drive at steady speed<br>between idle – 2500 rpm; > 2 minutes 30<br>seconds<br>Surface elevation < 8,000 ft (2,438 m) | Y      | 1 or 2<br>** | 1<br>[A, M] | Refer to P0305 Default Action  | Refer to P0300 Possible Faults   |
| P0327 | KS sense circuit out of range (low<br>voltage) A bank  | Start engine; run > 5 seconds   | Y      | 2            | 1<br>[A, M] | When DTC is logged (first trip), ECM:<br>– Sets ignition retard to maximum<br>– Limits engine speed to<br>3000 rpm | Poor sensor contact with the cylinder<br>block<br>KS to ECM sense circuit short circuit to<br>ground<br>KS failure   |
| P0328 | KS sense circuit out of range (high<br>voltage) A bank | Start engine; run > 5 seconds   | Y      | 2            | 1<br>[A, M] | When DTC is logged (first trip), ECM:<br>– Sets ignition retard to maximum<br>– Limits engine speed to<br>3000 rpm | Poor sensor contact with the cylinder<br>block<br>KS to ECM sense circuit high resistance<br>or open circuit<br>KS to ECM sense circuit short circuit to<br>high voltage<br>KS failure |
| P0332 | KS sense circuit out of range (low<br>voltage) B bank  | Start engine; run > 5 seconds   | Y      | 2            | 1<br>[A, M] | When DTC is logged (first trip), ECM:<br>– Sets ignition retard to maximum<br>– Limits engine speed to<br>3000 rpm | Poor sensor contact with the cylinder<br>block<br>KS to ECM sense circuit short circuit to<br>ground<br>KS failure   |
| P0333 | KS sense circuit out of range (high<br>voltage) B bank | Start engine; run > 5 seconds   | Y      | 2            | 1<br>[A, M] | When DTC is logged (first trip), ECM:<br>– Sets ignition retard to maximum<br>– Limits engine speed to<br>3000 rpm | Poor sensor contact with the cylinder<br>block<br>KS to ECM sense circuit high resistance<br>or open circuit<br>KS to ECM sense circuit short circuit to<br>high voltage<br>KS failure |

\*\* If, on the first trip, the misfire is severe enough to cause excess exhaust emission, individual cylinder DTC plus DTC P1316 will be flagged; CHECK ENGINE MIL will flash.

If, on the first trip, the misfire is severe enough to cause catalyst damage, individual cylinder DTC plus DTC P1313 (A bank) P1314 (B bank) will be flagged; CHECK ENGINE MIL will flash.

| DTC   | FAULT DESCRIPTION  | MONITORING CONDITIONS  | OBD II | CK ENG | OTHER       | DEFAULT ACTION  | POSSIBLE CAUSES   |
|-------|--|--|--------|--------|-------------|---|---|
| P0335 | CKPS circuit malfunction   | Crank engine > 2 seconds – engine will not start; or start engine, run steady > 1000 rpm; or engine stall, ignition ON   | Y      | 2      | 1<br>[A, M] | When CK ENG MIL is activated (DTC flagged; first trip), ECM:<br>– Limits engine speed to 3000 rpm | CKPS disconnected<br>CKPS gap incorrect / foreign matter on sensor face<br>CKPS sensing circuit open circuit, short circuit to ground, short circuit to high voltage<br>CKPS failure    |
| P0336 | CKPS range / performance   | Start engine; idle > 5 seconds<br>(If the CKPS signal is not present, the engine will not start. The engine will stop if the CKPS signal is lost while running.)   | Y      | 2      | 1<br>[A, M] | None  | CKPS reluctor (on drive plate) foreign matter / damaged teeth<br>CKPS sensing circuit intermittent open circuit, short circuit to ground, short circuit to high voltage<br>CKPS failure |
| P0340 | CMPS circuit malfunction – A bank  | Crank engine > 5 seconds (battery v 6 – 10.5 during cranking); or start engine, idle > 600 rpm<br>(If the A bank CMPS signal is not present, the engine may start – 50% chance. The engine will run normally if the A bank CMPS signal is lost while running.) | Y      | 2      | N           | None  | CMPS disconnected<br>CMPS gap incorrect / foreign matter on sensor face<br>CMPS sensing circuit open circuit, short circuit to ground, short circuit to high voltage<br>CMPS failure    |
| P0341 | CMPS range / performance – A bank<br>(CMPS pulse not detected at CKPS missing tooth) | Start engine; idle > 5 seconds<br>(If the A bank CMPS signal is not present, the engine may start – 50% chance. The engine will run normally if the A bank CMPS signal is lost while running.)   | Y      | 2      | N           | None  | CMPS disconnected<br>CMPS gap incorrect / foreign matter on sensor face<br>CMPS sensing circuit open circuit, short circuit to ground, short circuit to high voltage<br>CMPS failure    |

| DTC   | FAULT DESCRIPTION  | MONITORING CONDITIONS                    | OBD II | CK ENG | OTHER       | DEFAULT ACTION   | POSSIBLE CAUSES   |
|-------|--|--|--------|--------|-------------|--|---|
| P0351 | Ignition coil (A1) primary / secondary circuit malfunction | Run engine steady < 2500 rpm > 5 seconds | Y      | 2      | 1<br>[A, M] | When fault is detected, ECM:<br><ul style="list-style-type: none"> <li>- Limits engine speed to 3000 rpm</li> <li>- Inhibits individual cylinder fuel injection</li> <li>- Inhibits A bank closed loop fuel metering</li> <li>- Inhibits A bank downstream HO2S control</li> </ul> | ECM to ignition module primary circuit open circuit, short circuit to ground, high resistance<br>Ignition module ground circuit open circuit, high resistance<br>Ignition module / coil failure |
| P0352 | Ignition coil (A2) primary / secondary circuit malfunction | Run engine steady < 2500 rpm > 5 seconds | Y      | 2      | 1<br>[A, M] | Refer to P0351 Default Action  | Refer to P0351 Possible Causes  |
| P0353 | Ignition coil (A3) primary / secondary circuit malfunction | Run engine steady < 2500 rpm > 5 seconds | Y      | 2      | 1<br>[A, M] | Refer to P0351 Default Action  | Refer to P0351 Possible Causes  |
| P0354 | Ignition coil (A4) primary / secondary circuit malfunction | Run engine steady < 2500 rpm > 5 seconds | Y      | 2      | 1<br>[A, M] | Refer to P0351 Default Action  | Refer to P0351 Possible Causes  |
| P0355 | Ignition coil (B1) primary / secondary circuit malfunction | Run engine steady < 2500 rpm > 5 seconds | Y      | 2      | 1<br>[A, M] | When fault is detected, ECM:<br><ul style="list-style-type: none"> <li>- Limits engine speed to 3000 rpm</li> <li>- Inhibits individual cylinder fuel injection</li> <li>- Inhibits B bank closed loop fuel metering</li> <li>- Inhibits B bank downstream HO2S control</li> </ul> | Refer to P0351 Possible Causes  |
| P0356 | Ignition coil (B2) primary / secondary circuit malfunction | Run engine steady < 2500 rpm > 5 seconds | Y      | 2      | 1<br>[A, M] | Refer to P0355 Default Action  | Refer to P0351 Possible Causes  |
| P0357 | Ignition coil (B3) primary / secondary circuit malfunction | Run engine steady < 2500 rpm > 5 seconds | Y      | 2      | 1<br>[A, M] | Refer to P0355 Default Action  | Refer to P0351 Possible Causes  |
| P0358 | Ignition coil (B4) primary / secondary circuit malfunction | Run engine steady < 2500 rpm > 5 seconds | Y      | 2      | 1<br>[A, M] | Refer to P0355 Default Action  | Refer to P0351 Possible Causes  |

| DTC   | FAULT DESCRIPTION                          | MONITORING CONDITIONS  | OBD II | CK ENG | OTHER | DEFAULT ACTION  | POSSIBLE CAUSES  |
|-------|--|--|--------|--------|-------|---|--|
| P0420 | Catalyst efficiency below threshold A bank | Engine at normal operating temperature; IAT > 18 °F (-8 °C); varied driving for 3 minutes; then, constant steady throttle 30 – 38 mph (50 – 60 km/h), 1100 – 1475 rpm > 25 seconds<br>Surface elevation < 8,000 ft (2,438 m)                     | Y      | 2      | N     | None  | HO2S disconnected<br>HO2S to ECM wiring fault<br>HO2S heater to ECM wiring fault<br>HO2S heater failure<br>Upstream HO2S failure<br>Downstream HO2S failure<br>Catalyst failure  |
| P0430 | Catalyst efficiency below threshold B bank | Engine at normal operating temperature; IAT > 18 °F (-8 °C); varied driving for 3 minutes; then, constant steady throttle 30 – 38 mph (50 – 60 km/h), 1100 – 1475 rpm > 25 seconds<br>Surface elevation < 8,000 ft (2,438 m)                     | Y      | 2      | N     | None  | HO2S disconnected<br>HO2S to ECM wiring fault<br>HO2S heater to ECM wiring fault<br>HO2S heater failure<br>Upstream HO2S failure<br>Downstream HO2S failure<br>Catalyst failure  |
| P0442 | EVAP (system) leak detected – small        | Fuel tank level between 15 % – 85 % full; after start-up, run engine 13 minutes.<br>Engine at normal operating temperature; IAT > 18 °F (-8 °C); drive vehicle 12 – 60 mph (20 – 100 km/h) > 6 minutes<br>Surface elevation < 8,000 ft (2,438 m) | Y      | 2      | N     | When CK ENG MIL is activated (DTC flagged: second trip), ECM:<br>– Inhibits adaptive fuel metering<br>– Inhibits canister purge | Fuel cap seal defective<br>EVAP system leak (canister damage, pipework damage)<br>EVAPP valve to ECM drive circuit open circuit, short circuit, high resistance<br>EVAPP valve power supply circuit open circuit<br>EVAPP valve to engine purge pipe damaged / blocked / leaking<br>EVAPP valve operating vacuum hose leak / blockage<br>EVAPP valve failure<br>Fuel tank leak |

| DTC   | FAULT DESCRIPTION                         | MONITORING CONDITIONS   | OBD II | CK ENG | OTHER | DEFAULT ACTION   | POSSIBLE CAUSES  |
|-------|---|---|--------|--------|-------|--|--|
| P0443 | EVAP purge valve control malfunction      | Occurs during "EVAP leak check". Refer to P0442, P0455  | Y      | 2      | N     | When CK ENG MIL is activated (DTC flagged; second trip), ECM:<br>- Inhibits EGR diagnostic monitoring  | EVAPP valve to ECM drive circuit open circuit, short circuit, high resistance<br>EVAPP valve power supply circuit open circuit<br>EVAPP valve operating vacuum hose leak / blockage<br>EVAPP valve failure |
| P0444 | EVAPP valve circuit open circuit          | Engine at normal operating temperature; vehicle stationary; brakes applied; gear "D"; idle > 10 seconds | Y      | 2      | N     | None   | EVAPP to ECM drive circuit open circuit or high resistance<br>EVAPP failure  |
| P0445 | EVAPP valve circuit short circuit         | Engine at normal operating temperature; drive vehicle 12 – 60 mph (20 – 100 km/h) > 6 minutes           | Y      | 2      | N     | None   | EVAPP to ECM drive circuit short circuit to ground<br>EVAPP failure  |
| P0446 | CCV (canister close valve) malfunction    | Occurs during "EVAP leak check". Refer to P0442, P0455  | Y      | 2      | N     | None   | CCV B+ power supply circuit fault<br>CCV to ECM drive circuit open circuit, high resistance or short circuit to B+ voltage<br>CCV failure  |
| P0447 | CCV (canister close valve) opened failure | Ignition ON > 5 seconds (ECM CCV drive inactive – valve open)   | Y      | 2      | N     | When CK ENG MIL is activated (DTC flagged; second trip), ECM:<br>- Inhibits EVAP leak check monitoring<br>- Inhibits adaptive fuel metering<br>- Inhibits canister purge | CCV B+ power supply circuit fault<br>CCV to ECM drive circuit open circuit, high resistance or short circuit to B+ voltage<br>CCV failure  |
| P0448 | CCV (canister close valve) closed failure | Occurs during "EVAP leak check". Refer to P0442, P0455  | Y      | 2      | N     | When CK ENG MIL is activated (DTC flagged; second trip), ECM:<br>- Inhibits EVAP leak check monitoring<br>- Inhibits adaptive fuel metering<br>- Inhibits canister purge | CCV to ECM drive circuit short circuit to ground<br>CCV failure  |

| DTC   | FAULT DESCRIPTION                                    | MONITORING CONDITIONS                                  | OBD II | CK ENG | OTHER | DEFAULT ACTION   | POSSIBLE CAUSES  |
|-------|--|--|--------|--------|-------|--|--|
| P0450 | FTP (fuel tank pressure) sensor malfunction          | Occurs during "EVAP leak check". Refer to P0442, P0455 | Y      | 2      | N     | None   | FTP sensor disconnected<br>FTP sensor to ECM sense circuit open circuit, short circuit to ground, short circuit to B+ voltage<br>FTP sensor to ECM power supply circuit open circuit or short circuit to ground<br>FTP sensor to ECM wiring (supply, sense, signal ground) short circuit to each other<br>FTP sensor failure |
| P0452 | FTP (fuel tank pressure) sensor circuit low voltage  | Ignition ON > 5 seconds                                | Y      | 2      | N     | When CK ENG MIL is activated (DTC flagged; second trip), ECM:<br>- Inhibits EVAP leak check monitoring | FTP sensor disconnected<br>FTP sensor to ECM sense circuit open circuit or short circuit to ground<br>FTP sensor to ECM power supply circuit open circuit or short circuit to ground<br>FTP sensor failure   |
| P0453 | FTP (fuel tank pressure) sensor circuit high voltage | Ignition ON > 5 seconds                                | Y      | 2      | N     | When CK ENG MIL is activated (DTC flagged; second trip), ECM:<br>- Inhibits EVAP leak check monitoring | FTP sensor to ECM signal ground circuit open circuit<br>FTP sensor to ECM wiring (supply, sense, signal ground) short circuit to each other<br>FTP sensor to ECM sense circuit short circuit to B+ voltage<br>FTP sensor failure   |



| DTC   | FAULT DESCRIPTION                                 | MONITORING CONDITIONS   | OBD II | CK ENG | OTHER | DEFAULT ACTION  | POSSIBLE CAUSES  |
|-------|---|---|--------|--------|-------|---|--|
| P0455 | EVAP (system) leak detected – large               | Fuel tank level between 15 % – 85 % full; after start-up, run engine 13 minutes.<br>Engine at normal operating temperature; IAT > 18 °F (-8 °C); drive vehicle 12 – 60 mph (20 – 100 km/h) > 6 minutes.<br>Surface elevation < 8,000 ft (2,438 m) | Y      | 2      | N     | When CK ENG MIL is activated (DTC flagged; second trip), ECM:<br>– Inhibits adaptive fuel metering<br>– Inhibits canister purge | Fuel cap off<br>Fuel cap seal defective<br>EVAP system leak (canister damage, pipework damage)<br>EVAPP valve to ECM drive circuit open circuit, short circuit, high resistance<br>EVAPP valve power supply circuit open circuit<br>EVAPP valve to engine purge pipe damaged / blocked / leaking<br>EVAPP valve operating vacuum hose leak / blockage<br>EVAPP valve failure<br>Fuel tank leak |
| P0460 | Fuel level sense signal performance               | Drive > 30 miles (48 km)  | Y      | 2      | N     | None  | Fuel level sensor to instrument pack circuits intermittent short or open circuit, high resistance<br>Fuel level sensor failure<br>Instrument pack fault (incorrect fuel level data)  |
| P0480 | Radiator fans slow (series) circuit malfunction   | Engine at normal operating temperature; fans cycle ON / OFF   | N      | N      | N     | None  | Radiator fan control relay module to ECM “series” drive circuit (relay pin 9) fault<br>Relay coil ignition power supply open circuit<br>ECM ground circuit fault (relay coil drive)<br>ECTS circuit malfunction (refer to P0116)   |
| P0482 | Radiator fans fast (parallel) circuit malfunction | Engine at normal operating temperature; fans cycle ON / OFF   | N      | N      | N     | None  | Radiator fan control relay module to ECM “parallel” drive circuit (relay pin 7) fault<br>Relay coil ignition power supply open circuit<br>ECM ground circuit fault (relay coil drive)<br>ECTS circuit malfunction (refer to P0116)   |

| DTC   | FAULT DESCRIPTION                     | MONITORING CONDITIONS  | OBD II | CK ENG | OTHER       | DEFAULT ACTION  | POSSIBLE CAUSES   |
|-------|---------------------------------------|--|--------|--------|-------------|---|---|
| P0506 | Idle rpm lower than expected          | Engine and transmission at normal operating temperature; IAT > 18 °F (-8 °C); gear "N"; idle > 30 seconds (no electrical load, A/C compressor, radiator fans, brake pedal switching during period)<br>Surface elevation < 8,000 ft (2,438 m) | Y      | 2      | N           | None  | Air intake blockage<br>Accessory drive overload (defective / seized component)<br>Throttle valve stuck closed<br>Throttle assembly failure  |
| P0507 | Idle rpm higher than expected         | Engine and transmission at normal operating temperature; IAT > 18 °F (-8 °C); gear "N"; idle > 30 seconds (no electrical load, A/C compressor, radiator fans, brake pedal switching during period)<br>Surface elevation < 8,000 ft (2,438 m) | Y      | 2      | N           | None  | Intake air leak between MAFS and throttle<br>Intake air leak between throttle and engine<br>Engine breather leak<br>Throttle valve stuck open<br>Throttle assembly failure  |
| P0560 | Vehicle voltage malfunction           | Ignition ON > 35 seconds   | Y      | 2      | N           | None  | ECM battery power supply open circuit, high resistance<br>ECM ignition power supply open circuit, high resistance   |
| P0566 | Cruise control CANCEL switch ON fault | Ignition ON > 75 seconds   | N      | N      | 1<br>[A, M] | When fault is detected, ECM:<br>– Inhibits cruise control | Cruise control switches internal steering wheel short circuit to ground<br>Steering wheel cassette reel short circuit to ground<br>Cassette reel to ECM circuit short circuit to ground<br>CANCEL switch failure (stuck ON) |
| P0567 | Cruise control RESUME switch ON fault | Ignition ON > 75 seconds   | N      | N      | 1<br>[A, M] | When fault is detected, ECM:<br>– Inhibits cruise control | Cruise control switches internal steering wheel short circuit to ground<br>Steering wheel cassette reel short circuit to ground<br>Cassette reel to ECM circuit short circuit to ground<br>RESUME switch failure (stuck ON) |

| DTC   | FAULT DESCRIPTION                                  | MONITORING CONDITIONS    | OBD II | CK ENG | OTHER       | DEFAULT ACTION   | POSSIBLE CAUSES  |
|-------|--|--------------------------|--------|--------|-------------|--|--|
| P0568 | Cruise control switch ground malfunction           | Ignition ON > 5 seconds  | N      | N      | 1<br>[A, M] | When fault is detected, ECM:<br>– Inhibits cruise control  | Cruise control switches internal steering wheel open circuit<br>Steering wheel cassette reel open circuit or high resistance<br>Cassette reel to ECM circuit (ACCEL / DECEL) open circuit or high resistance<br>ACCEL / DECEL switch failure |
| P0569 | Cruise control DECEL / SET (SET-) switch ON fault  | Ignition ON > 10 minutes | N      | N      | 1<br>[A, M] | When fault is detected, ECM:<br>– Inhibits cruise control  | Cruise control switches internal steering wheel short circuit to ground<br>Steering wheel cassette reel short circuit to ground<br>Cassette reel to ECM circuit short circuit to ground<br>DECEL / set switch failure (stuck ON)             |
| P0570 | Cruise control ACCEL / SET (SET+) switch ON fault  | Ignition ON > 10 minutes | N      | N      | 1<br>[A, M] | When fault is detected, ECM:<br>– Inhibits cruise control  | Cruise control switches internal steering wheel short circuit to ground<br>Steering wheel cassette reel short circuit to ground<br>Cassette reel to ECM circuit short circuit to ground<br>ACCEL / set failure (stuck ON)                    |
| P0603 | ECM data corrupted                                 | Ignition ON > 5 seconds  | Y      | 1      | N           | When CK ENG MIL is activated (DTC flagged; first trip), ECM:<br>– Inhibits all diagnostic monitoring except: <ul style="list-style-type: none"> <li>• throttle control monitoring</li> <li>• upstream HO2S control monitoring</li> <li>• CPU 1 and 2 monitoring</li> </ul> | ECM failure  |
| P1000 | System checks not complete since last memory clear | "System Readiness Test"  | N      | N      | N           | None   | See page 1   |

| DTC   | FAULT DESCRIPTION                                       | MONITORING CONDITIONS   | OBD II | CK ENG | OTHER          | DEFAULT ACTION  | POSSIBLE CAUSES   |
|-------|---|---|--------|--------|----------------|---|---|
| P1104 | MAFS ground malfunction                                 | Ignition ON > 5 seconds   | Y      | 2      | 1<br>[A, M]    | When AMBER MIL is activated (DTC logged; first trip), ECM:<br><ul style="list-style-type: none"> <li>- Limits engine speed to 3000 rpm</li> <li>- Substitutes throttle angle for engine load measurement</li> <li>- Inhibits canister purge</li> </ul>  | MAFS to ECM reference ground circuit open circuit, short circuit to high voltage, high resistance<br>MAFS to ECM sensing circuit open circuit<br>MAFS failure                                     |
| P1111 | System checks complete since last memory clear          | "System Readiness Test"   | N      | N      | N              | None  | See page 1  |
| P1121 | PPS circuit range / performance (PPS1 compared to PPS2) | Ignition ON; battery > 9v; slowly move accelerator pedal through full range; > 40 seconds | Y      | 2      | 1<br>[R, A, M] | When RED MIL is activated (DTC logged; first trip), ECM:<br><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> | Pedal position sensor to ECM sense circuits 1 and 2 open circuit, short circuit or high resistance<br>Sensor power supply fault<br>Sensor reference ground fault<br>Pedal position sensor failure |
| P1122 | Pedal position sensor circuit "1" low voltage           | Ignition ON > 5 seconds   | Y      | 2      | 1<br>[R, A, M] | Refer to P1121 Default Action   | Pedal position sensor to ECM sense circuit "1" (sensor pin 4) wire open circuit or high resistance<br>Sensor power supply fault<br>Pedal position sensor failure                                  |
| P1123 | Pedal position sensor circuit "1" high voltage          | Ignition ON > 5 seconds   | Y      | 2      | 1<br>[R, A, M] | Refer to P1121 Default Action   | Pedal position sensor to ECM sense circuit "1" (sensor pin 4) wire short circuit to B+ voltage<br>Pedal position sensor failure   |
| P1136 | "Cool box" fan malfunction                              | Ignition ON; fan operating  | N      | N      | N              | None  | Cooling fan power supply (fuse) fault<br>Cooling fan drive circuit fault<br>Cooling fan motor failure   |

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

| DTC   | FAULT DESCRIPTION                          | MONITORING CONDITIONS                 | OBD II | CK ENG | OTHER          | DEFAULT ACTION                | POSSIBLE CAUSES  |
|-------|--|---------------------------------------|--------|--------|----------------|-------------------------------|--|
| P1224 | Throttle control position error            | Ignition ON > 3 minutes               | Y      | 2      | 1<br>[R, A, M] | Refer to P1222 Default Action | Throttle adaptations not performed after battery disconnect<br>TPS disconnected<br>TPS to ECM sense circuits open circuit, high resistance<br>Throttle motor power relay failure<br>Throttle motor power relay to ECM circuit fault<br>Throttle motor power relay power supply open circuit<br>ECM ground circuit fault (relay coil drive)<br>Throttle motor to ECM drive circuits open circuit, short circuit, high resistance<br>Throttle motor failure<br>Throttle assembly failure |
| P1229 | Throttle motor control circuit malfunction | Ignition ON > 5 seconds               | Y      | 2      | 1<br>[R, A, M] | Refer to P1222 Default Action | Throttle motor disconnected<br>Throttle motor to ECM drive circuits short circuit or open circuit<br>Throttle motor failure  |
| P1230 | Fuel pump relay malfunction                | Ignition OFF; Ignition ON > 5 seconds | Y      | 2      | N              | None                          | Fuel pump relay failure<br>Fuel pump relay to ECM circuit fault<br>Fuel pump relay coil power supply open circuit<br>ECM ground circuit fault (relay coil drive)   |

| DTC   | FAULT DESCRIPTION   | MONITORING CONDITIONS   | OBD II | CK ENG | OTHER          | DEFAULT ACTION  | POSSIBLE CAUSES   |
|-------|---|---|--------|--------|----------------|---|---|
| P1240 | Sensor reference voltage malfunction (throttle sensors, fuel tank pressure sensor) (ECM pins EM82-01, EM83-05)            | Ignition ON > 5 seconds   | Y      | 2      | 1<br>[R, A, M] | When RED MIL is activated (DTC logged: first trip), ECM:<br><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 to sensors reference voltage circuit short circuit to ground, short circuit to high voltage, open circuit, high resistance<br>TPS, PPS, FTP sensor failure(s) |
| P1241 | Sensor reference voltage low (throttle sensors, fuel tank pressure sensor) (ECM pins EM82-01, EM83-05)                    | Ignition ON > 5 seconds   | Y      | 2      | 1<br>[R, A, M] | Refer to P1240 Default Action   | ECM to sensors reference voltage circuit short circuit to ground<br>TPS, PPS, FTP sensor failure(s)   |
| P1242 | Sensor reference voltage high (throttle sensors, fuel tank pressure sensor) (ECM pins EM82-01, EM83-05)                   | Ignition ON > 5 seconds   | Y      | 2      | 1<br>[R, A, M] | Refer to P1240 Default Action   | ECM to sensors reference voltage circuit open circuit, high resistance, short circuit to high voltage<br>TPS, PPS, FTP sensor failure(s)                          |
| P1243 | Sensor reference ground malfunction (throttle sensors, fuel tank pressure sensor, ECTS, IATS) (ECM pins EM82-07, EM83-13) | Ignition ON > 5 seconds   | Y      | 2      | 1<br>[R, A, M] | Refer to P1240 Default Action   | ECM to sensors reference ground circuit open circuit, high resistance<br>TPS, PPS, ECTS, IATS, FTP sensor failure(s)  |
| P1245 | Engine crank signal low voltage   | Start engine: idle  | Y      | 2      | 1<br>[A, M]    | When AMBER MIL is activated (DTC logged: first trip), ECM:<br><ul style="list-style-type: none"> <li>- Limits engine speed to 3000 rpm</li> </ul>   | Starter relay coil to ECM / BPM circuit open circuit  |
| P1246 | Engine crank signal high voltage  | Start engine: drive / accelerate > 13 mph (20 km/h) 1200 – 3000 rpm; decelerate to stop; repeat (5 times total) | Y      | 2      | 1<br>[A, M]    | When AMBER MIL is activated (DTC logged: first trip), ECM:<br><ul style="list-style-type: none"> <li>- Limits engine speed to 3000 rpm</li> </ul>   | Starter relay coil to ECM / BPM circuit short circuit to B+ voltage<br>BPM failure  |

| DTC   | FAULT DESCRIPTION                        | MONITORING CONDITIONS                              | OBD II | CK ENG | OTHER          | DEFAULT ACTION  | POSSIBLE CAUSES  |
|-------|--|--|--------|--------|----------------|---|--|
| P1250 | Throttle valve return spring malfunction | Ignition ON; Ignition OFF > 3 seconds; Ignition ON | N      | N      | 1<br>[R, M]    | When fault is detected, ECM:<br><ul style="list-style-type: none"> <li>- Limited throttle valve movement in response to normal accelerator pedal movement</li> <li>- Limits vehicle speed to 80 mph (129 km/h)</li> <li>- Inhibits cruise control</li> </ul>  | Throttle return spring failure (throttle failure)  |
| P1251 | Throttle motor power relay malfunction   | Ignition ON > 10 seconds                           | Y      | 2      | 1<br>[R, A, M] | When RED MIL is activated (DTC logged; first trip), ECM:<br><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> | Throttle motor power relay failure<br>Throttle motor power relay to ECM circuit fault<br>Throttle motor power relay coil power supply open circuit<br>ECM ground circuit fault (relay coil drive)  |
| P1254 | Throttle "limp home" spring malfunction  | Ignition ON; Ignition OFF > 3 seconds; Ignition ON | N      | N      | 1<br>[R, M]    | When fault is detected, ECM:<br><ul style="list-style-type: none"> <li>- Limited throttle valve movement in response to normal accelerator pedal movement</li> <li>- Limits vehicle speed to 80 mph (129 km/h)</li> <li>- Inhibits cruise control</li> </ul>  | Throttle limp home spring failure (throttle failure)   |
| P1260 | Security input malfunction               | Ignition ON > 10 seconds                           | N      | N      | N              | None  | KTM to ECM circuit short circuit, high resistance or open circuit<br>Loss of ignition switched power supply to the ECM PIN EM82-09 for greater than 16 milliseconds<br>KTM failure<br>Security system incorrectly configured (KTM / ECM) |



| DTC   | FAULT DESCRIPTION  | MONITORING CONDITIONS   | OBD II | CK ENG | OTHER       | DEFAULT ACTION   | POSSIBLE CAUSES   |
|-------|--|---|--------|--------|-------------|--|---|
| P1313 | Misfire rate catalyst damage<br>A bank (1)<br><br>NOTE: This DTC will flag only when accompanied by an individual cylinder misfire DTC: P0300 – P0308. | Engine at normal operating temperature;<br>IAT > 18 °F (-8 °C); drive at steady speed<br>between idle – 2500 rpm; > 2 minutes 30<br>seconds<br>Surface elevation < 8,000 ft (2,438 m) | Y      | 1      | 1<br>[A, M] | When CK ENG MIL is activated<br>(DTC flagged; second trip), ECM:<br>– Limits engine speed to<br>3000 rpm<br>– Inhibits A bank closed loop fuel<br>metering<br>– Inhibits A bank adaptive fuel<br>metering<br>– Inhibits canister purge | Cylinder compression low<br>Worn camshaft / broken valve spring(s)<br>Fuel delivery pressure (low / high)<br>Fuel injector(s) blocked / leaking<br>Fuel injector(s) continuously open<br>Fuel contamination<br>Fuel injector circuit fault(s) (Injector DTCs<br>also flagged)<br>Spark plug failure / fouled / incorrect gap<br>ECM to ignition module primary circuit<br>fault(s) (Cylinder misfire detected DTC<br>also flagged)<br>Ignition module ground circuit open<br>circuit, high resistance<br>Ignition module / coil failure |
| P1314 | Misfire rate catalyst damage<br>B bank (2)<br><br>NOTE: This DTC will flag only when accompanied by an individual cylinder misfire DTC: P0300 – P0308. | Engine at normal operating temperature;<br>IAT > 18 °F (-8 °C); drive at steady speed<br>between idle – 2500 rpm; > 2 minutes 30<br>seconds<br>Surface elevation < 8,000 ft (2,438 m) | Y      | 1      | 1<br>[A, M] | When CK ENG MIL is activated<br>(DTC flagged; second trip), ECM:<br>– Limits engine speed to<br>3000 rpm<br>– Inhibits B bank closed loop fuel<br>metering<br>– Inhibits B bank adaptive fuel<br>metering<br>– Inhibits canister purge | Refer to P1313 Possible Causes  |
| P1316 | Misfire excess emission<br><br>NOTE: This DTC will flag only when accompanied by an individual cylinder misfire DTC: P0300 – P0308.                    | Engine at normal operating temperature;<br>IAT > 18 °F (-8 °C); drive at steady speed<br>between idle – 2500 rpm; > 2 minutes 30<br>seconds<br>Surface elevation < 8,000 ft (2,438 m) | Y      | 1      | 1<br>[A, M] | When CK ENG MIL is activated<br>(DTC flagged; second trip), ECM:<br>– Limits engine speed to<br>3000 rpm<br>– Inhibits closed loop fuel metering<br>– Inhibits adaptive fuel metering<br>– Inhibits canister purge                     | Refer to P1313 Possible Causes  |

| DTC   | FAULT DESCRIPTION  | MONITORING CONDITIONS  | OBD II | CK ENG | OTHER       | DEFAULT ACTION   | POSSIBLE CAUSES   |
|-------|--|--|--------|--------|-------------|--|---|
| P1340 | CMPS circuit malfunction – B bank  | Crank engine > 5 seconds (battery v 6 – 10.5 during cranking); or start engine, idle > 600 rpm<br><br>(If the A bank CMPS signal is not present, the engine may start – 50% chance. The engine will run normally if the A bank CMPS signal is lost while running.) | Y      | 2      | N           | None   | CMPS disconnected<br>CMPS gap incorrect / foreign matter on sensor face<br>CMPS sensing circuit open circuit, short circuit to ground, short circuit to high voltage<br>CMPS failure                        |
| P1341 | CMPS range / performance – B bank<br>(CMPS pulse not detected at CKPS missing tooth) | Start engine; idle > 5 seconds<br><br>(If the A bank CMPS signal is not present, the engine may start – 50% chance. The engine will run normally if the A bank CMPS signal is lost while running.)   | Y      | 2      | N           | None   | CMPS disconnected<br>CMPS gap incorrect / foreign matter on sensor face<br>CMPS sensing circuit open circuit, short circuit to ground, short circuit to high voltage<br>CMPS failure                        |
| P1367 | Ignition monitor – Group One (1A, 2B, 3B, 4A)  | Run engine steady < 2500 rpm > 5 seconds   | Y      | 2      | 1<br>[A, M] | When ECM detects fault:<br>– Limits engine speed to 3000 rpm   | Ignition monitoring circuit between splice and ECM open circuit, short circuit to ground or short circuit to B+ voltage<br>Ignition module / coil group ground circuit fault<br>Ignition coil relay failure |
| P1368 | Ignition monitor – Group Two (1B, 2A, 3A, 4B)  | Run engine steady < 2500 rpm > 5 seconds   | Y      | 2      | 1<br>[A, M] | When ECM detects fault:<br>– Limits engine speed to 3000 rpm   | Ignition monitoring circuit between splice and ECM open circuit, short circuit to ground or short circuit to B+ voltage<br>Ignition module / coil group ground circuit fault<br>Ignition coil relay failure |
| P1384 | VVT solenoid malfunction – A bank  | Drive vehicle; accelerate rapidly to cruise, decelerate to stop, repeat several times  | Y      | 2      | N           | When CK ENG MIL is activated (DTC flagged; second trip), ECM:<br>Sets VVT drive PWM duty cycle to 0 (intake camshaft fully retarded) | VVT solenoid valve to ECM PWM drive circuit fault<br>VVT solenoid valve to ECM ground circuit fault<br>VVT solenoid failure<br>VVT oil flow fault<br>VVT / camshaft mechanical failure                      |

| DTC   | FAULT DESCRIPTION                              | MONITORING CONDITIONS  | OBD II | CK ENG | OTHER       | DEFAULT ACTION  | POSSIBLE CAUSES  |
|-------|--|--|--------|--------|-------------|---|--|
| P1396 | VVT solenoid malfunction – B bank              | Drive vehicle; accelerate rapidly to cruise, decelerate to stop, repeat several times                  | Y      | 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) | VVT solenoid valve to ECM PWM drive circuit fault<br>VVT solenoid valve to ECM ground circuit fault<br>VVT solenoid failure<br>VVT oil flow fault<br>VVT / camshaft mechanical failure   |
| P1516 | Gear change PARK / NEUTRAL driving malfunction | Engine at normal operating temperature; drive 50 – 63 mph (80 – 100 km/h) 1800 – 2200 rpm > 35 seconds | Y      | 2      | N           | None  | Gear selector cable setting incorrect<br>Transmission rotary switch to ECM circuit open circuit or high resistance<br>Rotary switch failure<br>D – 4 switch to TCM circuit open circuit or high resistance<br>D – 4 switch fault   |
| P1517 | Engine cranking PARK / NEUTRAL malfunction     | Start engine   | N      | N*     | N           | When ECM detects fault:<br>– Fuel injection inhibited   | Gear selector cable setting incorrect<br>Transmission rotary switch to ECM circuit open circuit or high resistance<br>Rotary switch failure  |
| P1571 | Brake switch malfunction                       | Drive vehicle; engage cruise control > 10 seconds disengage cruise control; repeat (5 total cycles)    | N      | N      | 1<br>[A, M] | When ECM detects fault:<br>– Inhibits cruise control  | Brake switch to ECM circuit open circuit, short circuit to ground, high resistance<br>Brake switch ignition switched ground circuit open circuit<br>Brake switch failure<br>Brake cancel switch to ECM circuit open circuit, short circuit to ground, high resistance<br>Brake cancel switch to cruise control switch to ECM circuit open circuit, short circuit to ground, high resistance<br>Brake cancel switch ignition switched power supply open circuit<br>Brake cancel switch failure<br>Cruise control switch failure |

\* If engine will not start, CHECK ENGINE MIL will remain on.

| DTC   | FAULT DESCRIPTION   | MONITORING CONDITIONS                              | OBD II | CK ENG | OTHER          | DEFAULT ACTION  | POSSIBLE CAUSES   |
|-------|---|--|--------|--------|----------------|---|---|
| P1582 | Throttle monitor data available or Inertia switch malfunction | Ignition ON  | N      | N      | N              | None  | DTC indicates that the inertia switch has tripped (vehicle impact)<br>If no vehicle impact:<br>Inertia switch to ECM circuit, short circuit to ground<br>Inertia switch failure |
| P1606 | EMS control relay malfunction                                 | Ignition ON; ignition OFF; ignition ON > 5 seconds | N      | N      | N              | None  | ECM control relay failure<br>ECM control relay to ECM circuit fault<br>ECM control relay coil power supply open circuit<br>ECM ground circuit fault (relay coil drive)          |
| P1609 | ECM microprocessor-to-microprocessor communication failure    | Ignition ON > 5 seconds                            | Y      | 2      | 1<br>[R, A, M] | When RED MIL is activated (DTC logged; first trip), ECM:<br>- Switches off throttle motor (via relay)<br>- Initiates throttle "limp home" mode: engine speed controlled to between 1000-1250 rpm by fuel cutoff to cylinders<br>- Inhibits idle speed control<br>- Inhibits cruise control<br>- Inhibits traction control / stability control | ECM FCCP (programming) circuit (ECM pin EM80-19 or EM80-27) short circuit to ground<br>ECM failure  |

| DTC   | FAULT DESCRIPTION  | MONITORING CONDITIONS   | OBD II | CK ENG | OTHER          | DEFAULT ACTION  | POSSIBLE CAUSES  |
|-------|--|-------------------------|--------|--------|----------------|---|--|
| P1611 | ECM CPU 2 failure  | Ignition ON > 5 seconds | Y      | 2      | 1<br>[R, A, M] | When RED MIL is activated (DTC logged; first trip), ECM:<br><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  |
| P1631 | Throttle motor power relay coil activation circuit failure | Ignition ON > 5 seconds | Y      | 2      | 1<br>[R, A, M] | When RED MIL is activated (DTC logged; first trip), ECM:<br><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> | Throttle motor relay coil to ECM circuit open circuit, short circuit to ground or short circuit to B+ voltage<br>ECM failure |

| DTC   | FAULT DESCRIPTION                       | MONITORING CONDITIONS   | OBD II | CK ENG | OTHER          | DEFAULT ACTION  | POSSIBLE CAUSES  |
|-------|---|---|--------|--------|----------------|---|--|
| P1633 | ECM CPU 1 memory failure                | Ignition ON > 5 seconds   | Y      | 2      | 1<br>[R, A, M] | When RED MIL is activated (DTC logged; first trip), ECM:<br><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 | Throttle "watchdog" circuit malfunction | Ignition ON; Ignition OFF > 3 seconds;<br>Ignition ON; Ignition OFF > 3 seconds;<br>Ignition ON | N      | N      | 1<br>[R, A, M] | When fault is detected, ECM:<br><ul style="list-style-type: none"> <li>- Limited throttle valve movement in response to normal accelerator pedal movement</li> <li>- Limits vehicle speed to 80 mph (129 km/h)</li> <li>- Inhibits cruise control</li> </ul>  | ECM failure  |
| P1637 | CAN ABS/TCCM token message missing      | Ignition ON > 5 seconds   | Y      | 2      | 1<br>[M]       | When ECM detects fault:<br><ul style="list-style-type: none"> <li>- Inhibits cruise control</li> <li>- (Idle speed control quality deteriorates)</li> </ul>   | CAN open circuit fault - ABS/TCCM to ECM<br>CAN short circuit fault<br>ABS/TCCM failure<br>ECM failure |
| P1638 | CAN INST token message missing          | Ignition ON > 5 seconds   | Y      | 1      | N              | None<br>(Engine speed and coolant temperature data missing at instrument pack)  | CAN open circuit fault - INST to ECM<br>CAN short circuit fault<br>INST failure<br>ECM failure         |

| DTC   | FAULT DESCRIPTION                               | MONITORING CONDITIONS         | OBD II | CK ENG | OTHER       | DEFAULT ACTION   | POSSIBLE CAUSES   |
|-------|---|-------------------------------|--------|--------|-------------|--|---|
| P1642 | CAN circuit malfunction                         | Ignition ON > 5 seconds       | Y      | 1      | 1<br>[M]    | When ECM detects fault:<br>– Limits throttle to approximately 30%<br>– Inhibits cruise control (All CAN data unavailable)  | CAN short circuit fault<br>Control module failure – check for additional flagged DTC(s) to locate control module source                 |
| P1643 | CAN TCM token message missing                   | Ignition ON > 5 seconds       | Y      | 2      | 1<br>[M]    | When ECM detects fault:<br>– Limits throttle to approximately 30%<br>– Inhibits cruise control (Torque reduction request data missing; results in harsh transmission shifts) | CAN open circuit fault – TCM to ECM<br>CAN short circuit fault<br>TCM failure<br>ECM failure  |
| P1646 | ECM HO2S control malfunction – A bank, upstream | Ignition ON > 8 seconds       | Y      | 2      | N           | When CK ENG MIL is activated (DTC flagged; second trip), ECM:<br>– Inhibits A bank upstream HO2S operation   | HO2S heater failure<br>HO2S sensing circuit short circuit to ground or high voltage<br>HO2S sensing circuit open circuit<br>ECM failure |
| P1647 | ECM HO2S control malfunction – B bank, upstream | Ignition ON > 8 seconds       | Y      | 2      | N           | When CK ENG MIL is activated (DTC flagged; second trip), ECM:<br>– Inhibits B bank upstream HO2S operation   | HO2S heater failure<br>HO2S sensing circuit short circuit to ground or high voltage<br>HO2S sensing circuit open circuit<br>ECM failure |
| P1648 | ECM KS self test failure                        | Start engine; run > 5 seconds | Y      | 2      | 1<br>[A, M] | When DTC is logged (first trip), ECM:<br>– Sets ignition retard to maximum<br>– Limits engine speed to 3000 rpm  | ECM failure   |
| P1649 | ECM flash programming circuit malfunction       | Ignition ON                   | N      | N      | N           | None   | ECM to DLC circuit, short circuit to ground or short circuit to B+ voltage  |
| P1656 | TPS amplifier circuit malfunction               | Ignition ON > 5 seconds       | N      | N      | 1<br>[A]    | None   | ECM failure   |

| DTC   | FAULT DESCRIPTION                                  | MONITORING CONDITIONS   | OBD II | CK ENG | OTHER       | DEFAULT ACTION   | POSSIBLE CAUSES  |
|-------|--|---|--------|--------|-------------|--|--|
| P1657 | Throttle motor power relay coil circuit ON failure | Ignition ON; Ignition OFF > 3 seconds;<br>Ignition ON; Ignition OFF > 3 seconds;<br>Ignition ON | N      | N      | 1<br>[A, M] | When fault is detected, ECM:<br>- Limited throttle valve movement in response to normal accelerator pedal movement<br>- Limits vehicle speed to 80 mph (129 km/h)<br>- Inhibits cruise control | ECM failure  |
| P1658 | Throttle motor power relay ON failure              | Ignition ON; Ignition OFF > 3 seconds;<br>Ignition ON; Ignition OFF > 3 seconds;<br>Ignition ON | N      | N      | 1<br>[A, M] | When fault is detected, ECM:<br>- Limited throttle valve movement in response to normal accelerator pedal movement<br>- Limits vehicle speed to 80 mph (129 km/h)<br>- Inhibits cruise control | Throttle motor power relay failure (contacts stuck on)<br>Throttle motor power relay to ECM coil circuit, short circuit to ground<br>Throttle motor power relay to ECM supply circuit, short circuit to B+ voltage |