



# DTC Summaries

## AJ16 Engine Management – 1996/97 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”.

Use the PDU “Scantool Application” disc to communicate with the EMS ECM.

The Systems Readiness Test occurs automatically when PDU establishes communication with the ECM. PDU will report if any portion of the Systems Readiness Test has not been completed in the following format:

The following tests have been identified as incomplete:

- Module \$51 (identifies EMS ECM)
  - Catalyst
  - Evaporative purge system
  - Secondary air system
  - O<sub>2</sub> sensor
  - EGR system

## PDU DATALOGGER ACRONYMS

|         |  |          |   |
|---------|--|----------|---|
| ACLOAD  | Air conditioning request                 | HO2S1HM  | Oxygen sensor heaters upstream                    |
| ADAPT   | Adaptive rate                            | HO2S2HM  | Oxygen sensor heaters downstream                  |
| AMFR    | Adaptive air mass flow rate              | IAT      | Intake air temperature                            |
| BATT    | Battery voltage                          | ISCPOS   | Idle air control valve (IAC)                      |
| CRANK   | Engine cranking signal                   | MAFS     | Mass airflow sensor                               |
| DTCS    | Number of DTCs flagged                   | MIL      | CHECK ENGINE MIL                                  |
| ECT     | Engine coolant temperature               | REFIDLE  | Idle reference speed                              |
| EGRT    | Exhaust gas temperature sensor           | RPM      | Engine speed                                      |
| EVP     | Exhaust gas recirculation valve position | TCMRET   | Torque reduction request                          |
| FMFR    | Adaptive fuel mass flow rate             | TMS-MAFS | Mass airflow                                      |
| FUEL    | Fuel level                               | TPS      | Throttle position sensor                          |
| GEAR    | Drive / Neutral                          | TPS-INT  | Closed throttle adaptive position Intel processor |
| HO2S1B1 | Heated oxygen sensor cyl 1 3 upstream    | TPS-TMS  | Closed throttle adaptive position TMS processor   |
| HO2S1B2 | Heated oxygen sensor cyl 4 6 upstream    | VSS      | Vehicle speed                                     |
| HO2S2B1 | Heated oxygen sensor cyl 1 3 downstream  |          |   |
| HO2S2B2 | Heated oxygen sensor cyl 4 6 downstream  |          |   |

| <b>DTC</b> | <b>FAULT DESCRIPTION</b>        | <b>OBD II MONITORING CONDITIONS (see page 1)</b>           | <b>TRIPS*</b> | <b>POSSIBLE CAUSES</b>   |
|------------|---------------------------------|--|---------------|--|
| P0101      | MAFS range / performance        | Drive > 1500 rpm > 4 seconds                               | 2             | TPS signal voltage high, but undetected<br>Blocked air filter<br>Blocked exhaust system<br>Air intake leak<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  | Engine run > 4 seconds                                     | 2             | Blocked air filter<br>Blocked exhaust system<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                       |
| P0103      | MAFS sense circuit high voltage | Engine idle < 1000 rpm > 4 seconds                         | 2             | MAFS to ECM signal ground wire open circuit<br>MAFS to ECM sensing circuit short circuit to B+ voltage<br>MAFS failure   |
| P0111      | IATS range / performance        | Engine at normal operating temperature, drive; idle; drive | 2             | IATS disconnected<br>Engine compartment hot air leak into intake tract<br>IATS to ECM wiring open circuit or high resistance<br>IATS to ECM sensing circuit short circuit to B+ voltage<br>IATS failure  |

\* Number of consecutive trips required to activate CHECK ENGINE MIL.

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|------------|---|--|---------------|---|
| P0112      | IATS sense circuit high voltage (low air temperature)     | Ignition ON > 20 seconds                                       | 2             | IATS disconnected<br>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 > 20 seconds                                       | 2             | IATS to ECM wiring short circuit to ground<br>IATS failure  |
| P0116      | ECTS range / performance                                  | Engine at normal operating temperature; drive at highway speed | 2             | Low coolant level<br>Engine thermostat stuck open<br>ECTS to ECM sensing circuit high resistance when hot<br>ECTS to ECM sensing circuit intermittent high resistance<br>ECTS failure |
| P0117      | ECTS sense circuit high voltage (low coolant temperature) | Engine run > 4 seconds   | 2             | ECTS disconnected<br>ECTS to ECM sensing circuit high resistance, open circuit or short circuit to B+ voltage<br>ECTS failure   |
| P0118      | ECTS sense circuit low voltage (high coolant temperature) | Engine run > 4 seconds   | 2             | Engine overheat condition<br>ECTS to ECM wiring short circuit to ground<br>ECTS failure   |
| P0121      | TPS performance   | Drive at highway speed   | 2             | Intake air or exhaust restricted<br>Extreme high altitude operation<br>Intermittent / incorrect , but undetected; TPS, engine speed, IATS, MAFS or IACV signals                       |

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|------------|--|--|---------------|--|
| P0123      | TPS sense circuit high voltage   | Drive steadily < 35% load > 25 seconds   | 2             | TPS to ECM signal ground circuit open circuit<br>TPS to ECM wiring (supply, sense) short circuit to each other<br>TPS position sense circuit short circuit to B+ voltage<br>MAFS signal voltage low, but undetected<br>TPS failure |
| P0125      | ECTS response  | Engine coolant temperature < 68° F (20° C)<br>Run engine to coolant temperature > 68° F (20° C) > 1 minute, 25 seconds | 2             | ECTS disconnected<br>Low coolant level<br>Engine thermostat stuck open<br>ECTS to ECM sensing circuit high resistance, open circuit or short circuit to B+ voltage<br>ECTS failure   |
| P0131      | HO2S sense circuit low voltage – cylinders 1, 2, 3 (A bank), upstream (1)    | Engine at normal operating temperature; idle > 25 seconds  | 2             | HO2S sense wire short circuit to ground<br>HO2S failure<br>HO2S heater malfunction (tip temperature too hot)   |
| P0132      | HO2S sense circuit high voltage – cylinders 1, 2, 3 (A bank), upstream (1)   | Engine at normal operating temperature; idle > 25 seconds  | 2             | HO2S disconnected<br>HO2S signal ground wire open circuit<br>HO2S sense wire open circuit or short circuit to B+ voltage<br>HO2S failure<br>HO2S heater malfunction (tip temperature too cold)                                     |
| P0133      | HO2S sense circuit slow response – cylinders 1, 2, 3 (A bank), upstream (1)  | Engine at normal operating temperature; drive steadily at > 20 mph (32 km/h) for > 25 seconds                          | 2             | HO2S contaminated<br>HO2S wiring harness high resistance fault<br>HO2S failure   |
| P0137      | HO2S sense circuit low voltage – cylinders 1, 2, 3 (A bank), downstream (2)  | Engine at normal operating temperature; idle > 25 seconds  | 2             | Refer to P0131 possible causes   |
| P0138      | HO2S sense circuit high voltage – cylinders 1, 2, 3 (A bank), downstream (2) | Engine at normal operating temperature; idle > 25 seconds  | 2             | Refer to P0132 possible causes   |

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|------------|---|---|---------------|---|
| P0139      | HO2S sense circuit slow response – cylinders 1, 2, 3 (A bank), downstream (2) | Engine at normal operating temperature; drive steadily at > 20 mph (32 km/h) for > 25 seconds | 2             | Refer to P0133 possible causes  |
| P0151      | HO2S sense circuit low voltage – cylinders 4, 5, 6 (B bank), upstream (1)     | Engine at normal operating temperature; idle > 25 seconds                                     | 2             | Refer to P0131 possible causes  |
| P0152      | HO2S sense circuit high voltage – cylinders 4, 5, 6 (B bank), upstream (1)    | Engine at normal operating temperature; idle > 25 seconds                                     | 2             | Refer to P0132 possible causes  |
| P0153      | HO2S sense circuit slow response – cylinders 4, 5, 6 (B bank), upstream (1)   | Engine at normal operating temperature; drive steadily at > 20 mph (32 km/h) for > 25 seconds | 2             | Refer to P0133 possible causes  |
| P0157      | HO2S sense circuit low voltage – cylinders 4, 5, 6 (B bank), downstream (2)   | Engine at normal operating temperature; idle > 25 seconds                                     | 2             | Refer to P0131 possible causes  |
| P0158      | HO2S sense circuit high voltage: cylinders 4, 5, 6 (B bank), downstream (2)   | Engine at normal operating temperature; idle > 25 seconds                                     | 2             | Refer to P0132 possible causes  |
| P0159      | HO2S sense circuit slow response – cylinders 4, 5, 6 (B bank), downstream (2) | Engine at normal operating temperature; steadily at > 20 mph (32 km/h) for > 25 seconds       | 2             | Refer to P0133 possible causes  |
| P0171      | Cylinders 1, 2, 3 (A bank) combustion too lean                                | Engine at normal operating temperature; drive steadily at > 20 mph (32 km/h) for > 25 seconds | 2             | Fuel injector blockage<br>Fuel injector wiring open circuit<br>Engine misfire<br>Intake manifold air leak<br>Exhaust air leak (before catalyst) |
| P0172      | Cylinders 1, 2, 3 (A bank) combustion too rich                                | Engine at normal operating temperature; drive steadily at > 20 mph (32 km/h) for > 25 seconds | 2             | Exhaust air leak (before catalyst)<br>Fuel injector blockage<br>Engine misfire  |
| P0174      | Cylinders 4, 5, 6 (B bank) combustion too lean                                | Engine at normal operating temperature; drive steadily at > 20 mph (32 km/h) for > 25 seconds | 2             | Refer to P0171 possible causes  |
| P0175      | Cylinders 4, 5, 6 (B bank) combustion too rich                                | Engine at normal operating temperature; drive steadily at > 20 mph (32 km/h) for > 25 seconds | 2             | Refer to P0172 possible causes  |

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|------------|--|--|---------------|--|
| P0201      | Fuel injector circuit malfunction – cylinder 1 | Engine running > 2 seconds                       | 2             | Injector disconnected<br>Injector harness wiring open or short circuit<br>Injector failure   |
| P0202      | Fuel injector circuit malfunction – cylinder 2 | Engine running > 2 seconds                       | 2             | Refer to P0201 possible causes   |
| P0203      | Fuel injector circuit malfunction – cylinder 3 | Engine running > 2 seconds                       | 2             | Refer to P0201 possible causes   |
| P0204      | Fuel injector circuit malfunction – cylinder 4 | Engine running > 2 seconds                       | 2             | Refer to P0201 possible causes   |
| P0205      | Fuel injector circuit malfunction – cylinder 5 | Engine running > 2 seconds                       | 2             | Refer to P0201 possible causes   |
| P0206      | Fuel injector circuit malfunction – cylinder 6 | Engine running > 2 seconds                       | 2             | Refer to P0201 possible causes   |
| P0300      | Random misfire detected                        | Run engine steady > 2 minutes                    | 2             | Fuel contaminated<br>Fuel injector(s) blocked or leaking<br>Ignition secondary circuit breakdown<br>(coils, spark plugs)<br>Fuel pressure low<br>Cylinder compression low<br>Broken valve spring(s)<br>CKPS circuit fault (CKPS DTCs also flagged)<br>Fuel injector(s) circuit fault(s)<br>(Injector DTCs also flagged)<br>Ignition coil primary circuit fault(s)<br>(Ignition coil DTCs also flagged) |
| P0301      | Misfire detected – cylinder 1                  | Run engine steady > 2 minutes                    | 2             | Refer to P0300 possible causes   |
| P0302      | Misfire detected – cylinder 2                  | Run engine steady > 2 minutes                    | 2             | Refer to P0300 possible causes   |
| P0303      | Misfire detected – cylinder 3                  | Run engine steady > 2 minutes                    | 2             | Refer to P0300 possible causes   |
| P0304      | Misfire detected – cylinder 4                  | Run engine steady > 2 minutes                    | 2             | Refer to P0300 possible causes   |
| P0305      | Misfire detected – cylinder 5                  | Run engine steady > 2 minutes                    | 2             | Refer to P0300 possible causes   |
| P0306      | Misfire detected – cylinder 6                  | Run engine steady > 2 minutes                    | 2             | Refer to P0300 possible causes   |

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|------------|---|--|---------------|--|
| P0326      | Knock sensing circuit 1 (cylinders 1, 2, 3) at maximum correction       | Drive steadily @ 2000 rpm, 50% load > 15 seconds | 2             | Low coolant level<br>Poor quality fuel<br>Knock sensor harness wiring shield condition (RFI interference)<br>Combustion chamber deposits (pre ignition)<br>Mechanical or background noise<br>ECM failure |
| P0327      | Knock sensing circuit 1 (cylinders 1, 2, 3) out of range (low voltage)  | Drive steadily @ 2000 rpm, 50% load > 15 seconds | 2             | One or both knock sensors loose in block<br>ECM to knock sensors wiring high resistance, open circuit or short circuit to ground<br>Knock sensor(s) failure  |
| P0328      | Knock sensing circuit 1 (cylinders 1, 2, 3) out of range (high voltage) | Drive steadily @ 2000 rpm, 50% load > 15 seconds | 2             | Knock sensor harness wiring shield condition (RFI interference)<br>Knock sensor(s) failure   |
| P0331      | Knock sensing circuit 2 (cylinders 4, 5, 6) at maximum correction       | Drive steadily @ 2000 rpm, 50% load > 15 seconds | 2             | Low coolant level<br>Poor quality fuel<br>Knock sensor harness wiring shield condition (RFI interference)<br>Combustion chamber deposits (pre ignition)<br>Mechanical or background noise<br>ECM failure |
| P0332      | Knock sensing circuit 2 (cylinders 4, 5, 6) out of range (low voltage)  | Drive steadily @ 2000 rpm, 50% load > 15 seconds | 2             | Refer to P0327 possible causes   |
| P0333      | Knock sensing circuit 2 (cylinders 4, 5, 6) out of range (high voltage) | Drive steadily @ 2000 rpm, 50% load > 15 seconds | 2             | Refer to P0328 possible causes   |
| P0335      | CKPS circuit malfunction  | Engine idle > 10 seconds                         | 2             | CKPS mounting bracket loose<br>CKPS / reductor ring alignment<br>CKPS to ECM sensing circuit; open circuit, short circuit to ground or B+ voltage<br>CKPS failure  |

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|------------|--|--|---------------|--|
| P0336      | CKPS range / performance                         | Engine idle > 10 seconds   | 2             | Foreign material on CKPS face<br>Reluctor ring damaged<br>CKPS harness wiring shield condition (RFI interference)<br>CKPS failure  |
| P0340      | CMPS circuit malfunction                         | Engine idle > 10 seconds   | 2             | CMPS alignment<br>CMPS tooth damage<br>CMPS harness wiring shield condition (RFI interference)<br>CMPS failure   |
| P0400      | EGR temperature sensor circuit malfunction       | Engine at normal operating temperature;<br>drive at 35% load > 1 minutes | 2             | ECM to EGR temperature sensor sense wire open circuit<br>EGR temperature sensor "coked up"<br>EGR valve, pipework blocked (insufficient EGR flow)<br>EGR pipework leak (insufficient EGR flow)<br>EGR temperature sensor failure |
| P0411      | AIR system insufficient air flow to exhaust      | Engine at normal operating temperature;<br>start; idle 30 seconds        | 2             | AIR system pipework blocked or leaking<br>AIR pump stuck ON or OFF<br>AIR pump control circuit fault<br>AIR pump supply circuit fault<br>AIR pump failure  |
| P0413      | AIR pump relay drive (coil) circuit open circuit | Ignition ON > 1 second   | 2             | Air injection relay removed<br>Air injection relay (coil circuit) open circuit<br>ECM to air injection relay (coil) wiring open circuit or short circuit to B+ voltage   |

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|------------|---|---|---------------|--|
| P0414      | AIR pump relay drive (coil) circuit short circuit                   | Ignition ON > 1 second  | 2             | Air injection relay (coil circuit) short circuit<br>ECM to air injection relay (coil) wiring short circuit to ground   |
| P0420      | Catalyst efficiency below threshold – cylinders 1, 2, 3 (A bank)    | Engine at normal operating temperature; drive steadily > 20 mph (32 km/h) > 1 minute, 10 seconds  | ***           | Exhaust leak<br>Upstream HO2S slow response<br>Upstream HO2S sense wire open or short circuit<br>Intake air leak<br>MAFS fault   |
| P0430      | Catalyst efficiency below threshold – cylinders 4, 5, 6 (B bank)    | Engine at normal operating temperature; drive steadily > 20 mph (32 km/h) > 1 minute, 10 seconds  | ***           | Refer to P0420 possible causes   |
| P0441      | EVAP system incorrect purge flow                                    | Engine at normal operating temperature; varied driving for 15 minutes; hot idle > 1 minute  | 2             | EVAP valve sticking<br>EVAP valve blocked<br>EVAP purge hose blocked or disconnected<br>EVAP canister atmosphere vent blocked<br>EVAP valve failure<br>AIR pump stuck ON |
| P0442      | EVAP system pressure leak (enhanced evaporative emissions vehicles) | Engine at normal operating temperature; fuel level between 1/4 and 3/4 full; varied driving for > 22 minutes; drive > 30 mph (48 km/h) > 10 seconds | 2 **          | Fuel tank, fuel filler cap or pipework pressure leak<br>EVAP hoses / lines pressure leak<br>EVAP valve pressure leak to engine<br>Fuel tank pressure sensor signal high  |
| P0443      | EVAP valve circuit malfunction                                      | Ignition ON > 1 second  | 2             | EVAP valve disconnected<br>ECM to EVAP valve “drive” circuit; open circuit, short circuit to ground or B+ voltage<br>EVAP valve failure                                  |

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\*\* Through 1996 MY: DTC does not activate the CHECK ENGINE MIL.

\*\*\* Three successive fail judgements. Diagnostic tests are performed continuously. Use the PDU “Scantool” Systems Readiness Test to determine if tests are complete.

| <b>DTC</b> | <b>FAULT DESCRIPTION</b>   | <b>OBD II MONITORING CONDITIONS (see page 1)</b>   | <b>TRIPS*</b> | <b>POSSIBLE CAUSES</b>   |
|------------|--|--|---------------|--|
| P0446      | Canister close valve circuit malfunction   | Engine at normal operating temperature;<br>varied driving for > 22 minutes;<br>drive > 30 mph (48 km/h) > 10 seconds | 2             | ECM to canister close valve open circuit,<br>short circuit to ground or B+ voltage<br>Canister close valve electrical failure  |
| P0452      | Fuel tank pressure sensor signal low<br>(enhanced evaporative emissions vehicles)  | Engine run   | 2             | ECM to fuel tank pressure sensor circuit;<br>open circuit or short circuit to ground<br>Fuel tank pressure sensor failure  |
| P0453      | Fuel tank pressure sensor signal high<br>(enhanced evaporative emissions vehicles) | Engine run   | 2             | ECM to fuel tank pressure sensor circuit; open<br>circuit, short circuit to 5V supply or B+ voltage<br>Fuel tank pressure sensor failure   |
| P0460      | Fuel level sense circuit malfunction   | Engine idle < 2 minutes  | 2             | Instrument pack to ECM fuel level signal circuit;<br>open circuit, short circuit to ground<br>or B+ voltage<br>Instrument pack fault (incorrect fuel level signal)<br>Fuel level sensor failure  |
| P0461      | Fuel level sense signal performance  | Drive > 10 mph (16 km/h) > 50 minutes  | 2             | Instrument pack to ECM fuel level signal circuit;<br>open circuit, short circuit to ground<br>or B+ voltage<br>Instrument pack fault (incorrect fuel level signal)<br>Fuel level sensor failure  |
| P0500      | Vehicle speed sensor malfunction<br>(signal from instrument pack)                  | Drive > 1900 rpm; high load > 40 seconds;<br>40 gear changes   | 2             | ECM to instrument pack wiring: open circuit,<br>short circuit or high resistance<br>Vehicle speed signal from instrument<br>pack incorrect<br>TCM fault – requests torque reduction while<br>vehicle stopped<br>ABS / TC CM vehicle speed signal incorrect<br>ABS wheel speed sensor fault |

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|------------|---|--|---------------|---|
| P0506      | Idle air control system: rpm lower than expected  | Engine at normal operating temperature;<br>idle > 10 seconds                                     | 2             | IACV disconnected<br>IACV passages blocked<br>IACV stepper motor jammed or<br>mounted incorrectly<br>MAFS signal fault (steady high voltage)<br>Engine incorrect operation –<br>open throttle / engine still idle   |
| P0507      | Idle air control system: rpm higher than expected   | Engine at normal operating temperature;<br>idle > 10 seconds                                     | 2             | IACV disconnected<br>IACV passages blocked<br>IACV stepper motor jammed or<br>mounted incorrectly<br>MAFS signal fault (steady low voltage)   |
| P0508      | IACV circuit: open circuit  | Run engine; switch ignition OFF  | 2             | IACV circuit open circuit<br>IACV malfunction   |
| P0509      | IACV circuit: short circuit   | Run engine; switch ignition OFF  | 2             | IACV circuit short circuit to ground or B+ voltage<br>IACV malfunction  |
| P0605      | ECM data corrupted  | Ignition ON  | 1             | ECM failure   |
| P1137      | HO2S sense circuit lack of "swing" –<br>cylinders 1, 2, 3 (A bank), downstream (2)<br>Sense circuit indicates lean combustion<br>(No HO2S response) | Engine at normal operating temperature; drive<br>steadily at > 20 mph (32 km/h) for > 30 seconds | 2             | Downstream HO2S harness connectors<br>(cylinders 1, 2, 3 / cylinders 4, 5, 6) reversed<br>(Perform HO2S orientation)<br>HO2S loose in exhaust pipe screw threads<br>HO2S sense wire open circuit<br>Exhaust leak before catalyst<br>HO2S heater malfunction<br>(tip temperature too cold)<br>HO2S failure |
| P1138      | HO2S sense circuit lack of "swing" –<br>cylinders 1, 2, 3 (A bank), downstream (2)<br>Sense circuit indicates rich combustion<br>(No HO2S response) | Engine at normal operating temperature; drive<br>steadily at > 20 mph (32 km/h) for > 30 seconds | 2             | Downstream HO2S harness connectors<br>(cylinders 1, 2, 3 / cylinders 4, 5, 6) reversed<br>(Perform HO2S orientation)<br>HO2S sense wire short circuit to ground<br>HO2S heater malfunction<br>(tip temperature too hot)<br>HO2S failure   |

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|------------|---|---|---------------|---|
| P1157      | HO2S sense circuit lack of "swing" – cylinders 4, 5, 6 (B bank), downstream (2)<br>Sense circuit indicates lean combustion (No HO2S response) | Engine at normal operating temperature; drive steadily at > 20 mph (32 km/h) for > 30 seconds | 2             | Refer to P1137 possible causes  |
| P1158      | HO2S sense circuit lack of "swing" – cylinders 4, 5, 6 (B bank), downstream (2)<br>Sense circuit indicates rich combustion (No HO2S response) | Engine at normal operating temperature; drive steadily at > 20 mph (32 km/h) for > 30 seconds | 2             | Refer to P1138 possible causes  |
| P1171      | All cylinders combustion too lean   | Engine at normal operating temperature; drive steadily at > 20 mph (32 km/h) for > 25 seconds | 2             | Fuel filter, system blockage<br>Fuel system leak<br>Fuel pressure regulator failure (low fuel pressure)<br>Low fuel pump output<br>Fuel injectors blocked<br>MAFS signal fault (low voltage)<br>SC engine – Incorrect MAFS installed  |
| P1172      | All cylinders combustion too rich   | Engine at normal operating temperature; drive steadily at > 20 mph (32 km/h) for > 25 seconds | 2             | Fuel return pipe blocked<br>Fuel pressure regulator failure (high fuel pressure)<br>Fuel injectors leaking<br>MAFS signal fault (high voltage)<br>NA engine – Incorrect MAFS installed  |
| P1176      | Adaptive fuel metering trim too lean (fuel flow rate)   | Engine at normal operating temperature; drive steadily at > 20 (32 km/h) mph for > 25 seconds | 2             | Fuel injector supply wiring short circuit to ground<br>Fuel filter, system blockage<br>Fuel system leak<br>Fuel pressure regulator failure (low fuel pressure)<br>Low fuel pump output<br>Fuel injectors blocked<br>MAFS signal fault (low voltage)<br>SC engine – Incorrect MAFS installed |

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|------------|---|--|---------------|---|
| P1177      | Adaptive fuel metering trim too rich (fuel flow rate)     | Engine at normal operating temperature; drive steadily at > 20 mph (32 km/h) for > 25 seconds                                    | 2             | Fuel return pipe blocked<br>Fuel pressure regulator failure (high fuel pressure)<br>Fuel injectors leaking<br>MAFS signal fault (high voltage)<br>NA engine – Incorrect MAFS installed<br>SC engine – Intake air leak       |
| P1178      | Adaptive fuel metering trim too lean (air flow rate)      | Engine at normal operating temperature; idle > 3 minutes; drive steadily at > 20 mph (32 km/h) for > 3 minutes; idle > 3 minutes | 2             | Air intake leak<br>Low fuel pressure at idle<br>Blocked injector<br>MAFS signal fault (low voltage)   |
| P1179      | Adaptive fuel metering trim too rich (air flow rate)      | Engine at normal operating temperature; idle > 3 minutes; drive steadily at > 20 mph (32 km/h) for > 3 minutes; idle > 3 minutes | 2             | High fuel pressure at idle<br>MAFS signal fault (high voltage)<br>NA engine – Incorrect MAFS installed  |
| P1185      | HO2S heater circuit open circuit – both upstream sensors  | Engine idle < 1000 rpm > 3 minutes, 20 seconds   | 2             | HO2S heater circuits high resistance<br>HO2S heater harness wiring high resistance, open circuit or short circuit to ground   |
| P1186      | HO2S heater circuit short circuit – both upstream sensors | Engine idle < 1000 rpm > 3 minutes, 20 seconds   | 2             | HO2S heater circuits short circuit to sensor<br>HO2S heater harness wiring short circuit to B+ voltage  |
| P1187      | HO2S heater circuit open circuit – both upstream sensors  | Engine idle < 1000 rpm > 3 minutes, 20 seconds   | 2             | HO2S heater circuits high resistance<br>HO2S heater harness wiring high resistance<br>HO2S heater harness wiring open circuit<br>MAFS signal fault<br>Ignition fault (ignition retard causing high exhaust gas temperature) |

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|------------|---|--|---------------|--|
| P1188      | HO2S heater circuit high resistance – both upstream sensors   | Engine idle > 25 seconds                         | 2             | ECM to HO2S heater wiring open circuit (or intermittent open circuit)<br>ECM to HO2S heater wiring short circuit to ground<br>HO2S heater circuits high resistance or open circuit<br>HO2S heaters failure |
| P1189      | HO2S heater circuit low resistance – both upstream sensors    | Engine idle > 25 seconds                         | 2             | HO2S loose<br>HO2S heater circuit; short circuit to ground or B+ voltage<br>HO2S heater circuits; high resistance or open circuit<br>HO2S heaters failure  |
| P1190      | HO2S heater circuit low resistance – both upstream sensors    | Engine idle > 25 seconds                         | 2             | High battery voltage (>17v) producing excess heater current<br>ECM to HO2S heater wiring; short circuit to B+ voltage<br>HO2S heater circuits; short circuit to ground<br>Both HO2S heaters failure        |
| P1191      | HO2S heater circuit open circuit – both downstream sensors    | Engine idle < 1000 rpm > 3 minutes, 20 seconds   | 2             | Refer to P1185 possible causes   |
| P1192      | HO2S heater circuit short circuit – both downstream sensors   | Engine idle < 1000 rpm > 3 minutes, 20 seconds   | 2             | Refer to P1186 possible causes   |
| P1193      | HO2S heater circuit open circuit – both downstream sensors    | Engine idle < 1000 rpm > 3 minutes, 20 seconds   | 2             | Refer to P1187 possible causes   |
| P1194      | HO2S heater circuit high resistance – both downstream sensors | Engine idle > 25 seconds                         | 2             | Refer to P1188 possible causes   |
| P1195      | HO2S heater circuit low resistance – both downstream sensors  | Engine idle > 25 seconds                         | 2             | Refer to P1189 possible causes   |

\* Number of consecutive trips required to activate CHECK ENGINE MIL.

| DTC   | FAULT DESCRIPTION  | OBD II MONITORING CONDITIONS (see page 1) | TRIPS* | POSSIBLE CAUSES  |
|-------|--|---|--------|--|
| P1196 | HO2S heater circuit low resistance – both downstream sensors           | Engine idle > 25 seconds                  | 2      | Refer to P1190 possible causes   |
| P1201 | Fuel injector circuit open or short circuit – cylinder 1               | Run engine; ignition OFF > 2 seconds      | 2      | Refer to P0201 possible causes   |
| P1202 | Fuel injector circuit open or short circuit – cylinder 2               | Run engine; ignition OFF > 2 seconds      | 2      | Refer to P0201 possible causes   |
| P1203 | Fuel injector circuit open or short circuit – cylinder 3               | Run engine; ignition OFF > 2 seconds      | 2      | Refer to P0201 possible causes   |
| P1204 | Fuel injector circuit open or short circuit – cylinder 4               | Run engine; ignition OFF > 2 seconds      | 2      | Refer to P0201 possible causes   |
| P1205 | Fuel injector circuit open or short circuit – cylinder 5               | Run engine; ignition OFF > 2 seconds      | 2      | Refer to P0201 possible causes   |
| P1206 | Fuel injector circuit open or short circuit – cylinder 6               | Run engine; ignition OFF > 2 seconds      | 2      | Refer to P0201 possible causes   |
| P1313 | Catalyst damage misfire detected – cylinders 1, 2, 3 (A bank)          | Run engine steady > 2 minutes             | 1 **   | Refer to P0300 possible causes   |
| P1314 | Catalyst damage misfire detected – cylinders 4, 5, 6 (B bank)          | Run engine steady > 2 minutes             | 1 **   | Refer to P0300 possible causes   |
| P1315 | Persistent misfire (one cylinder identified and injector switched off) | Run engine steady > 2 minutes             | 1      | Refer to P0300 possible causes   |
| P1316 | Misfire excess emission  | Run engine steady > 2 minutes             | 2 **   | Refer to P0300 possible causes   |
| P1361 | Ignition coil primary circuit malfunction – cylinder 1                 | Engine running > 1 second                 | 2      | ECM to ignition coil primary circuit high resistance, open circuit or short circuit to ground<br>CKPS malfunction (refer to P0335, P0336)<br>Ignition coil failure |

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\*\* Through 1996 MY: DTC does not activate CHECK ENGINE MIL. If DTCs P1313, P1314 or P1316 are flagged, one or more of the cylinder identification DTCs will also be flagged (random misfire P0300 or individual cylinder P0301 – P0306). If DTC P1315 is flagged, one or more of the individual cylinder identification DTCs (P0301 – P0306) will also be flagged.



| <b>DTC</b> | <b>FAULT DESCRIPTION</b>  | <b>OBD II MONITORING CONDITIONS (see page 1)</b> | <b>TRIPS*</b> | <b>POSSIBLE CAUSES</b>  |
|------------|---|--|---------------|---|
| P1362      | Ignition coil primary circuit malfunction – cylinder 2                | Engine running > 1 second                        | 2             | Refer to P1361 possible causes  |
| P1363      | Ignition coil primary circuit malfunction – cylinder 3                | Engine running > 1 second                        | 2             | Refer to P1361 possible causes  |
| P1364      | Ignition coil primary circuit malfunction – cylinder 4                | Engine running > 1 second                        | 2             | Refer to P1361 possible causes  |
| P1365      | Ignition coil primary circuit malfunction – cylinder 5                | Engine running > 1 second                        | 2             | Refer to P1361 possible causes  |
| P1366      | Ignition coil primary circuit malfunction – cylinder 6                | Engine running > 1 second                        | 2             | Refer to P1361 possible causes  |
| P1371      | Ignition coil primary circuit:<br>incorrect spark timing – cylinder 1 | Engine running > 1 second                        | 2             | ECM to ignition coil primary circuit short circuit<br>Ignition coil failure                         |
| P1372      | Ignition coil primary circuit:<br>incorrect spark timing – cylinder 2 | Engine running > 1 second                        | 2             | Refer to P1371 possible causes  |
| P1373      | Ignition coil primary circuit:<br>incorrect spark timing – cylinder 3 | Engine running > 1 second                        | 2             | Refer to P1371 possible causes  |
| P1374      | Ignition coil primary circuit:<br>incorrect spark timing – cylinder 4 | Engine running > 1 second                        | 2             | Refer to P1371 possible causes  |
| P1375      | Ignition coil primary circuit:<br>incorrect spark timing – cylinder 5 | Engine running > 1 second                        | 2             | Refer to P1371 possible causes  |
| P1376      | Ignition coil primary circuit:<br>incorrect spark timing – cylinder 6 | Engine running > 1 second                        | 2             | Refer to P1371 possible causes  |
| P1400      | EGR valve position malfunction  | Ignition ON > 1 second                           | 2             | EGR valve sticky, dirty or seized<br>ECM to EGR valve position signal wire short<br>or open circuit |

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| <b>DTC</b> | <b>FAULT DESCRIPTION</b>  | <b>OBD II MONITORING CONDITIONS (see page 1)</b>  | <b>TRIPS*</b> | <b>POSSIBLE CAUSES</b>   |
|------------|---|---|---------------|--|
| P1401      | EGR position circuit out of range (low or high voltage)   | Ignition ON > 1 second  | 2             | ECM to EGR valve position signal wire open circuit, short circuit to ground or B+ voltage<br>EGR valve position sensor supply wire short or open circuit<br>EGR valve position sensor ground wire short circuit to supply wire or open circuit<br>EGR valve position sensor failure (EGR valve assembly) |
| P1408      | EGR temperature sensor circuit out of range (high voltage)  | Ignition ON > 1 second  | 2             | ECM to EGR temperature sensor sense wire short circuit to ground<br>ECM to EGR temperature sensor sense wire short circuit to supply wire<br>EGR temperature sensor failure  |
| P1409      | EGR valve drive circuit malfunction   | Ignition ON > 1 second  | 2             | ECM to EGR valve drive wire open circuit<br>ECM to EGR valve drive wire short circuit to ground<br>EGR valve failure   |
| P1440      | EVAP valve incorrect flow (enhanced evaporative emissions vehicles)                               | Engine at normal operating temperature; fuel level between 1/4 and 3/4 full; varied driving for > 22 minutes; drive > 30 mph (48 km/h) > 10 seconds | 2             | EVAP valve stuck open<br>Fuel tank pressure sensor low output (but in range)<br>Fuel tank filled with engine running   |
| P1447      | Canister close valve low flow (enhanced evaporative emissions vehicles)                           | Engine at normal operating temperature; varied driving for 15 minutes; hot idle > 1 minute  | 2 **          | Canister close valve blocked or stuck closed   |
| P1448      | Enhanced evaporative emissions system performance fault 2 (vacuum test OK but no feedback change) | Engine at normal operating temperature; fuel level between 1/4 and 3/4 full; varied driving for > 22 minutes; drive > 30 mph (48 km/h) > 10 seconds | 2 **          | Fuel tank, fuel filler cap or pipework pressure leak<br>EVAP hoses / lines pressure leak<br>EVAP valve leaking pressure to engine<br>Canister close valve stuck open   |

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| DTC   | FAULT DESCRIPTION   | OBD II MONITORING CONDITIONS (see page 1)   | TRIPS* | POSSIBLE CAUSES  |
|-------|---|---|--------|--|
| P1496 | Enhanced evaporative emissions system performance fault 1 (vacuum test failed and no feedback change) | Engine at normal operating temperature; fuel level between 1/4 and 3/4 full; varied driving for > 22 minutes; drive > 30 mph (48 km/h) > 10 seconds | 2 **   | Fuel tank filled with engine running<br>Fuel tank, fuel filler cap or pipework pressure leak<br>EVAP hoses / lines pressure leak<br>EVAP valve stuck closed<br>Canister close valve stuck open<br>Fuel tank pressure sensor signal circuit resistance<br>Fuel tank pressure sensor malfunction |
| P1508 | IACV circuit open circuit   | Ignition ON > 15 seconds; ignition OFF  | 2      | IACV disconnected<br>IACV harness wiring open circuit<br>IACV stepper motor failure (open circuit)   |
| P1509 | IACV circuit short circuit  | Ignition ON > 15 seconds; ignition OFF  | 2      | IACV harness wiring short circuit<br>IACV stepper motor failure (short circuit)  |
| P1514 | High load NEUTRAL / DRIVE malfunction   | Drive at > 90% load   | 2      | MAFS signal voltage high, but undetected<br>NEUTRAL / PARK wiring (decoder to ECM) short circuit to ground<br>BPM fault (NEUTRAL / PARK parallel circuit)  |
| P1516 | Gear change NEUTRAL / DRIVE malfunction   | Drive > 30 gear changes   | 2      | NEUTRAL / PARK wiring (decoder to ECM) short circuit to ground<br>BPM low resistance fault (NEUTRAL / PARK parallel circuit)<br>TCM to ECM torque reduction request fault<br>Vehicle speed signal fault, but undetected  |
| P1517 | Engine cranking NEUTRAL / DRIVE malfunction   | Start engine  | 2      | BPM cranking inhibit fault<br>BPM high resistance fault (NEUTRAL / PARK parallel circuit)<br>NEUTRAL / PARK wiring (decoder to ECM) open circuit or short circuit to B+ voltage  |

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| <b>DTC</b> | <b>FAULT DESCRIPTION</b>                       | <b>OBD II MONITORING CONDITIONS (see page 1)</b> | <b>TRIPS*</b> | <b>POSSIBLE CAUSES</b>   |
|------------|--|--|---------------|--|
| P1607      | CHECK ENGINE MIL circuit malfunction           | Ignition ON                                      | 2             | ECM to instrument pack / BPM wiring open circuit, short circuit or high resistance<br>BPM fault (CHECK ENGINE)<br>Instrument pack fault (CHECK ENGINE)                           |
| P1775      | TCM CHECK ENGINE MIL request                   | Ignition ON                                      | 1             | Possible transmission fault –<br>check for flagged TCM DTCs  |
| P1776      | Torque reduction request signal duration fault | Drive vehicle to initiate automatic gear changes | 1             | Driver placing rapid repeated shift demands<br>on the transmission requiring torque reduction –<br>torque reduction may not be possible<br>Possible TCM fault (request too long) |
| P1777      | Torque reduction circuit malfunction           | Engine running; normal operating temperature     | 2             | Torque reduction signal wire open circuit,<br>short circuit to ground or B+ voltage<br>Possible TCM fault (invalid signal)   |
| P1794      | ECM B+ supply voltage low (below 10.5 V)       | Run engine > 1600 rpm                            | 2             | Generator drive belt loose<br>ECM B+ supply circuit; high resistance, open<br>circuit or short circuit to ground<br>Battery malfunction<br>Charging system malfunction           |

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