

DTC DETECTION LOGIC AND CONDITIONS [ZJ, Z6]

B3E010200102T09

P0011 CMP-timing over-advanced

- The actual valve timing is over-advanced from the target valve timing when the OCV is controlled within the maximum valve timing retard condition.

P0012 CMP-timing over-retarded

- The actual valve timing is over-retarded from the target valve timing when the OCV system control is within feed-back range.

P0031 Front HO2S heater control circuit low

- The PCM monitors front HO2S heater control voltage at PCM terminal 2AM. If PCM turns front HO2S heater off but front HO2S heater circuit has low voltage, PCM determines that front HO2S heater circuit has malfunction.

P0032 Front HO2S heater control circuit high

- The PCM monitors the front HO2S heater control voltage at PCM terminal 2AM. If the PCM turns the front HO2S heater on but the front HO2S heater circuit has high voltage, the PCM determines that the front HO2S heater circuit has a malfunction.

P0037 Rear HO2S heater control circuit low

- The PCM monitors the rear HO2S heater control voltage at PCM terminal 2AT. If the PCM turns the rear HO2S heater off but the rear HO2S heater circuit has low voltage, the PCM determines that the rear HO2S heater circuit has a malfunction.

P0038 Rear HO2S heater control circuit high

- The PCM monitors the rear HO2S heater control voltage at PCM terminal 2AT. If the PCM turns the rear HO2S heater on but the rear HO2S heater circuit has high voltage, the PCM determines that the rear HO2S heater circuit has a malfunction.

P0102 MAF sensor circuit low input

- The PCM monitors the input voltage from the MAF sensor when the engine is running. If the input voltage at PCM terminal 2AU is **less than 0.21 V**, the PCM determines that the MAF circuit has a malfunction.

P0103 MAF sensor circuit high input

- The PCM monitors the input voltage from the MAF sensor when the engine is running. If input the voltage at PCM terminal 2AU is **more than 4.9 V**, the PCM determines that the MAF circuit has a malfunction.

P0111 IAT sensor circuit range/performance problem

- The PCM compares the IAT with the ECT when the engine is running. If the IAT is higher than the ECT by **40 °C {104 °F}**, the PCM determines that there is an IAT sensor circuit range/performance problem.

P0112 IAT sensor circuit low input

- The PCM monitors the IAT sensor signal at PCM terminal 2AQ. If the PCM detects that the IAT sensor voltage is **less than 0.16 V**, the PCM determines that the IAT sensor circuit has a malfunction.

P0113 IAT sensor circuit high input

- The PCM monitors the input voltage from the IAT sensor. If the input voltage at PCM terminal 2AQ is **more than 4.8 V**, the PCM determines that the IAT sensor circuit has a malfunction.

P0117 ECT sensor circuit low input

- The PCM monitors the ECT sensor signal at PCM terminal 2J. If the PCM detects that the ECT sensor voltage is **less than 0.20 V**, the PCM determines that the ECT sensor circuit has a malfunction.

P0118 ECT sensor circuit high input

- The PCM monitors the ECT sensor signal at PCM terminal 2J. If the PCM detects that the ECT sensor voltage is **more than 4.9 V**, the PCM determines that the ECT sensor circuit has a malfunction.

P0121 TP sensor circuit range/performance problem

- If the PCM detects that the throttle valve opening angle is **less than 12.5 %** for **5 s** after the following conditions are met, the PCM determines that there is a TP sensor circuit range/performance problem:

MONITORING CONDITION

- Engine coolant temperature is **more than 70 °C {158 °F}**.
- MAF sensor signal is **more than 59.5 g/s {7.9 lb/min}**.

- If the PCM detects that the throttle valve opening angle is **more than 50%** for **5 s** after the following conditions are met, the PCM determines that there is a TP sensor circuit range/performance problem.

MONITORING CONDITION

- MAF sensor signal is **less than 3.3 g/s {0.4 lb/min}**.

P0122 TP sensor circuit low input

- If the PCM detects that the TP sensor voltage at PCM terminal 2AA is **less than 0.10 V** while the engine is running, the PCM determines that the TP sensor circuit has a malfunction.

P0123 TP sensor circuit high input

- If the PCM detects that the TP sensor voltage at PCM terminal 2AA is **more than 4.9 V** after the ignition switch is turned to the ON position, the PCM determines that the TP sensor circuit has a malfunction.

P0125 Insufficient coolant temperature for closed loop fuel control

- The PCM monitors the ECT after cold engine start. If the ECT does not reach the specification in a certain period, the PCM determines that the engine coolant temperature for closed loop fuel control is insufficient.

P0132 Front HO2S circuit high voltage

- The PCM monitors the input voltage from the front HO2S when the engine is running. If the input voltage is **more than 1.2 V**, the PCM determines that the front HO2S circuit voltage is high.

P0133 Front HO2S circuit slow response

- The PCM monitors the inversion cycle period, lean-to-rich response time and rich-to-lean response time of the sensor. The PCM calculates the average of the inversion cycle period-specified inversion cycles, average response time from lean-to-rich, and from rich-to-lean when the following conditions are met. If any exceeds the threshold, the PCM determines that circuit has a malfunction.

MONITORING CONDITION

- HO2S heater, HO2S, and TWC repair verification drive mode
- Following conditions are met:
 - Calculation load is **18.0-59.4 %** (at **2,000 rpm**).
 - Engine speed is **1,410- 4,000 rpm**.
 - Vehicle speed is **more than 3.76 km/h {2.33 mph}**.
 - Engine coolant temperature is **more than -10 °C {14 °F}**.
 - Front HO2S signal inversion cycle is **more than 10 cycles**.

P0134 Front HO2S circuit no activity detected

- The PCM monitors the input voltage from the front HO2S when the following conditions are met. If the input voltage from sensor never **exceeds 0.55 V** for **120 s or more**, the PCM determines that sensor circuit is not activated.

MONITORING CONDITION

- Front HO2S, front HO2S heater and TWC repair verification drive mode
- Following conditions are met:
 - Engine speed is **1,500 rpm or more**.
 - Engine coolant temperature is **70 °C {158 °F} or more**.
 - Within feed-back range

P0138 Rear HO2S circuit high voltage

- The PCM monitors the input voltage from the rear HO2S when the engine is running. If the input voltage is **more than 1.2 V**, the PCM determines that the rear HO2S circuit voltage is high.

P0140 Rear HO2S circuit no activity detected

- The PCM monitors the input voltage from the rear HO2S when the following conditions are met. If the input voltage from the sensor never **exceeds 0.55 V** for **30.4 s**, the PCM determines that the sensor circuit is not activated.

MONITORING CONDITION

- HO2S, HO2S heater and TWC repair verification drive mode
- Following conditions are met:
 - Engine speed is **1,500 rpm or more**.
 - Engine coolant temperature is **70 °C {158 °F} or more**.
 - Within feed-back range

P0300 Random misfire detected

- The PCM monitors the CKP sensor input signal interval time. the PCM calculates the change of interval time for each cylinder. If change of interval time exceeds the preprogrammed criteria, the PCM detects misfire in the corresponding cylinder. While the engine is running, the PCM counts the number of misfires that occurred at **200 crankshaft revolutions** and **1,000 crankshaft revolutions** and calculates the misfire ratio for each crankshaft revolution. If the ratio exceeds the preprogrammed criteria, the PCM determines that a misfire, which can damage the catalytic converter or affect emission performance, has occurred.

P0301, P0302, P0303, P0304 Each cylinder misfire detected

- The PCM monitors the CKP sensor input signal interval time. The PCM calculates the change of interval time for each cylinder. If the change of interval time exceeds the preprogrammed criteria, the PCM detects a misfire in the corresponding cylinder. While the engine is running, the PCM counts the number of misfires that occurred at **200 crankshaft revolutions** and **1,000 crankshaft revolutions** and calculates the misfire ratio for each crankshaft revolution. If the ratio exceeds the preprogrammed criteria, the PCM determines that a misfire, which can damage the catalytic converter or affect emission performance, has occurred.

P0327 KS circuit low input

- The PCM monitors the input signal from the KS when the engine is running. If the input voltage at PCM terminal 2BA is **less than 1.25 V**, the PCM determines that the KS circuit has a malfunction.

P0328 KS circuit high input

- The PCM monitors the input signal from the KS when the engine is running. If the input voltage at PCM terminal 2BA is **more than 3.75 V**, the PCM determines that the KS circuit has a malfunction.

P0335 CKP sensor circuit problem

- If the PCM does not receive the input voltage from the CKP sensor for **4.2 s or more** while the MAF is **1.43 g/s {0.189 lb/min} or more**, the PCM determines that there is a CKP sensor circuit problem.

P0340 CMP sensor circuit problem

- The PCM monitors the input voltage from the CMP sensor when the engine is running. If the PCM does not receive the input voltage from the CMP sensor for **12** consecutive engine rotations, the PCM determines that there is a CKP sensor circuit problem.

P0403 EGR control circuit problem

- The PCM monitors the input voltage from the EGR valve. If the voltages at PCM terminals 2Z, 2V, 2R and/or 2N remain low or high, the PCM determines that there is a EGR control circuit problem.

P0420 Catalyst system efficiency below threshold

- The PCM compares the number of the front HO2S and rear HO2S inversions for a predetermined time. The PCM monitors the number of inversions the rear side performs while the front side inverts for a specified number of times when the following monitoring conditions are met. The PCM detects the inversion ratio. If inversion ratio is below the threshold, the PCM determines that the catalyst system has deteriorated.

MONITORING CONDITION

- HO2S, HO2S heater and TWC repair verification drive mode
- Engine speed is **1,500- 3,000 rpm**.
- Calculated TWC temperature in PCM is **more than 600 °C {1112 °F} (MTX)**, **more than 620 °C {1148 °F} (ATX)**.
- Calculated load is **17- 48 %**.^{*1}

^{*1}: Maximum calculated load value varies depending on engine speed.

P0443 Purge solenoid valve circuit problem

- The PCM monitors the purge solenoid valve control signal. If the voltage at PCM terminal 2AV remains low or high, the PCM determines that there is a purge solenoid valve circuit problem.

P0480 Cooling fan control circuit problem

- The PCM monitors input voltage from the fan control module. If the voltage at PCM terminal 1AP remains low or high, the PCM determines that there is a cooling fan control circuit problem.

P0500 VSS circuit problem

- The PCM monitors the vehicle speed from the ABS HU/CM or DSC HU/CM. If the PCM does not receive the input vehicle speed signal, the PCM determines that there is a VSS circuit problem.

P0505 IAC system problem

- The PCM cannot control idle speed toward target idle speed while KOER self test.

P0506 IAC system RPM lower than expected

- The PCM compares the actual idle speed with the target idle speed when the engine is running. If the actual idle speed is lower than the targeted by **100 rpm** for **14 s**, the PCM determines that the IAC system RPM is lower than expected.

P0507 IAC system RPM higher than expected

- The PCM compares the actual idle speed with the target idle speed when the engine is running. If the actual idle speed is higher than the targeted by **200 rpm** for **14 s**, the PCM determines that the IAC system RPM is higher than expected.

P0511 IAC circuit problem

- If the PCM detects that the IAC signal voltage is above or below the threshold* when the IAC control duty target is **within 19-50%**, the PCM determines that the IAC circuit problem.

*: Detected threshold value depends on the battery voltage and the IAC control signal duty value.

P0550 PSP switch circuit problem

- The PCM monitors the input signal from the PSP switch. If the input signal does not change for **1 min**, the PCM determines that the PSP switch circuit problem.
- The PCM monitors the input voltage from the PSP switch when the following conditions are met. If the input voltage is low for **1 min**, the PCM determines that the PSP switch circuit problem.

MONITORING CONDITION

- Vehicle speed is **more than 60 km/h {37.3 mph}**.
- ECT is **more than 60 °C {140 °F}**.

P0602 PCM programming error

- No configuration data in the PCM.

P0610 PCM vehicle options error

- PCM data configuration error.

P0660 Variable intake-air control circuit/open

- The PCM monitors the variable intake-air control signal at PCM terminals 2AS and 2AO. If the PCM turns the variable intake-air shutter valve actuator to open or close but the voltages at PCM terminals 2AS and 2AO do not coincide with the PCM signal voltages, the PCM determines that the variable intake-air control circuit has a malfunction.
- The PCM could not perform the self-test for the variable intake-air control circuit.

P0668 PCM temperature sensor circuit low input

- The PCM monitors the PCM temperature sensor (integrated in the PCM) signal. If the PCM detects that the PCM temperature sensor voltage is **0.10 V or less**, the PCM determines that the PCM temperature sensor has a malfunction.

P0669 PCM temperature sensor circuit high input

- The PCM monitors the PCM temperature sensor (integrated the PCM) signal. If the PCM detects that the PCM temperature sensor voltage is **4.98 V or more**, the PCM determines that the PCM temperature sensor has a malfunction.

P0703 Brake switch input circuit problem

- The PCM monitors the input signal from the brake switch. If the input signal does not change while following decelerating **8 times**, the PCM determines that there is a brake switch input circuit problem.

MONITORING CONDITION

- Vehicle speed is from **above 30 km/h {19 mph} to 30 km/h {19 mph} or less**
- Deceleration rate **exceeds 3.8 km/h {2.4 mph} per 0.1 s**

P0704 CPP switch input circuit problem

- The PCM monitors the input signal from the CPP switch. If the input signal does not change while following decelerating **8 times**, the PCM determines that there is a CPP switch input circuit problem.

MONITORING CONDITION

- Vehicle speed: from **above 30 km/h {19 mph} to 30 km/h {19 mph} or less**

P0850 Neutral switch input circuit problem

- The PCM monitors changes in input voltage from neutral switch. If the PCM does not detect PCM terminal 1AB voltage changes while running vehicle with vehicle speed **30 km/h {19 mph} or more** and clutch pedal turns press and depress **10 times** repeatedly, the PCM determines that there is a neutral switch circuit problem.

P1260 Immobilizer system problem

- The instrument cluster detects an immobilizer system problem.

P2006 Variable tumble control stuck close

- The PCM monitors the mass air amount. If the actual air flow amount is below the estimated air flow amount when the following monitoring conditions are met. The PCM determines that the variable tumble control is stuck closed.

MONITORING CONDITION

- Engine coolant temperature is **70 °C {158 °F} or more**.
- Throttle valve opening angle is **more than 75 %**.
- Engine speed is **4,500 rpm or more**. (ZJ)
- Engine speed is **3,500 rpm or more**. (Z6)

P2008 Variable tumble control circuit/open

- The PCM monitors the variable tumble control signal at PCM terminals 2AF and 2AJ. If the PCM turns the variable tumble shutter valve actuator to open or close but voltages at PCM terminals 2AF and 2AJ do not coincide with the PCM signal voltages the PCM determines that the variable tumble control circuit has a malfunction.

- Variable tumble control IC error.

P2088 Variable valve timing control circuit low

- If the PCM detects that the OCV drive current is less than the specification* when the OCV control duty target is **approx. 100 %**, the PCM determines that the variable valve timing control circuit low.

*: Detected specification value depends on the battery voltage.

P2089 Variable valve timing control circuit high

- If the PCM detects that the OCV drive current is as specified or more when the OCV control duty target is **3 % or less**, the PCM determines that the variable valve timing control circuit high.

P2096 Target A/F feedback system too lean

- The PCM monitors the target A/F fuel trim when under the target A/F feedback control. If the fuel trim is more than the specification, the PCM determines that the target A/F feedback system is too lean.

P2097 Target A/F feedback system too rich

- The PCM monitors the target A/F fuel trim when under the target A/F feedback control. If the fuel trim is less than the specification, the PCM determines that the target A/F feedback system is too rich.

P2177 System too lean off idle

- The PCM monitors short term fuel trim (SHRTFT) and long term fuel trim (LONGFT) during closed loop fuel control during off-idle. If the LONGFT or the sum total of these fuel trims exceed preprogrammed criteria, PCM determines that fuel system is too lean during off-idle.

P2178 System too rich off idle

- The PCM monitors short term fuel trim (SHRTFT) and long term fuel trim (LONGFT) during closed loop fuel control at off-idle. If the LONGFT or the sum total of these fuel trims exceed preprogrammed criteria, PCM determines that fuel system is too rich at off-idle.

P2187 System too lean at idle

- The PCM monitors short term fuel trim (SHRTFT) and long term fuel trim (LONGFT) during closed loop fuel control during idle. If the LONGFT or the sum total of these fuel trims and correction exceed preprogrammed criteria, PCM determines that fuel system is too lean during idle.

P2188 System too rich at idle

- The PCM monitors the short term fuel trim (SHRTFT) and long term fuel trim (LONGFT) during the closed loop fuel control at idle. If the LONGFT or the sum total of these fuel terms exceed the preprogrammed criteria, PCM determines that fuel system is too rich at idle.

P2195 Front HO2S signal stuck lean

- The PCM monitors the front HO2S output voltage when the following conditions are met. If the output voltage is **less than 0.45 V** for **46 s**, the PCM determines that the front HO2S signal remains lean.

MONITORING CONDITION

- Fuel injection control system status: feedback zone
- ECT is **more than 70 °C {158 °F}**.
- Engine speed is **more than 1,500 rpm**.

P2196 Front HO2S signal stuck rich

- The PCM monitors the front HO2S output voltage when the following conditions are met. If output voltage is **more than 0.45 V** for **46 s**, the PCM determines that the front HO2S signal remains rich.

MONITORING CONDITION

- Fuel injection control system status: feedback zone

- ECT: **more than 70 °C {158 °F}**
- Engine speed: **more than 1,500 rpm**

P2228 BARO sensor circuit low input

- The PCM monitors input voltage from the BARO sensor. If the input voltage at PCM terminal 2S is **less than 1.7 V**, the PCM determines that the BARO sensor circuit has a malfunction.

P2229 BARO sensor circuit high input

- The PCM monitors input voltage from the BARO sensor. If the input voltage at PCM terminal 2S is **2.9 V or more**, PCM determines that the BARO sensor circuit has a malfunction.

P2502 Charging system voltage problem

- The PCM determines that the generator output voltage is **more than 17 V** or the battery voltage is **less than 11 V** while the engine running.

P2503 Charging system voltage low

- The PCM needs **more than 20 A** from the generator, and determines that the generator output voltage is **less than 8.5 V** while the engine running.

P2504 Charging system voltage high

- The PCM determines that the generator output voltage is **more than 18.5 V** or battery voltage is **more than 16.0 V** while the engine running.

P2507 PCM power input signal low

- The PCM monitors the voltage of the backup battery positive at PCM terminal 1AX. If the PCM detects that the battery positive terminal voltage is **2.5 V or less** for **2 s**, the PCM determines that the backup voltage circuit has a malfunction.