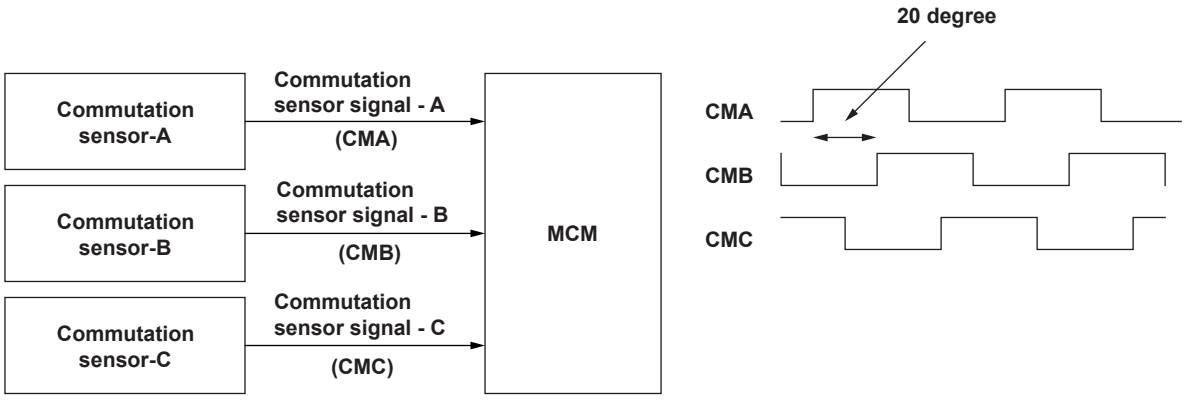
Advanced Diagnostics

DTC P1565 (42): Motor Commutation Signal Problem



P1565-0071

General Description

The motor control module (MCM) detects rotor polar position based on the Low/High combinations of three commutation sensors signals (CMA, CMB, CMC) to supply power to the motor. The commutation sensor outputs six pulsing signals for each motor revolution, and each signal (CMA, CMB, CMC) phase differs by 20 degrees. The Low/High combination of the signals and its transition state follows a specific pattern, and they are considered to be abnormal when they do not agree. If the MCM detects abnormalities a specific number of times within a set time period, it determinesth commutation sensor signal is faulty and stores a DTC. The abnormalities are defined as these:

1. The transition state of CM[A:B:C] is other than: [L:L:H]→[H:L:H]→[H:L:L]→[H:H:L]→[L:H:L]→[L:H:H]→[L:L:H]→ • • •
   or other than: [L:L:H]→[L:H:H]→[L:H:L]→[H:H:L]→[H:L:L]→[H:L:H]→[L:L:H]→ • • • (H represents High, L represents Low)
2. CMA, CMB and CMC are all "High" or all "Low".
3. A high frequency signal input to commutation sensors A, B or C (20 pulses or more within 10 ms.)

Monitor Execution, Sequence, Duration, DTC Type

Execution	Continuous
Sequence	None
Duration	0.5 second or more
DTC Type	One drive cycle, MIL ON, IMA system indicator ON

Enable Conditions

1: The transition state of [CMA: CMB: CMC] is abnormal.

Condition	Minimum	Maximum
MCM power-supply voltage	10.5 V	—
Motor speed	1,000 rpm	—
No active DTCs	MCM	

2: CMA, CMB and CMC are all High or all Low.

Condition	Minimum	Maximum
MCM power-supply voltage	10.5 V	—
Motor speed	—	1,000 rpm
No active DTCs	MCM	

3: A high frequency signal input.

Condition	Minimum	Maximum
MCM power-supply voltage	10.5 V	—
No active DTCs	MCM	

Malfunction Threshold

1. An abnormality has been detected 20 times within 0.5 second when the transition state of [CMA: CMB: CMC] is abnormal.
2. An abnormality has been detected 25 times within 0.5 second when CMA, CMB and CMC are all “High” or all “Low”.
3. An abnormality has been detected 20 times within 0.5 second during high frequency signal input.

Driving Pattern

1. If the transition state of [CMA: CMB: CMC] is abnormal, the abnormality will be detected at a motor speed between 0 - 1,000 rpm.
2. If CMA, CMB and CMC are all High or Low, the abnormality will be detected at a motor speed of 1,000 rpm or more.
3. If a high frequency signal is input, the abnormality will be detected continuously regardless of motor speed.

Diagnosis Details

Conditions for illuminating the MIL

When a malfunction is detected, the MIL comes on and the DTC and the freeze frame data are stored in the ECM memory.

Conditions for clearing the MIL

The MIL will be cleared if the malfunction does not recur during three consecutive trips in which the diagnostic runs.
The MIL, the DTC, and the freeze frame data can be cleared by using the scan tool Clear command or by disconnecting the battery.