

ENGINE MISFIRE DIAGNOSTIC PROCEDURES - SERVICE TIP

TECHNICAL SERVICE BULLETIN

Reference Number(s): 01-002/06

MAZDA: Multi-Model

ARTICLE BEGINNING

APPLICABLE MODEL(S)/VINS

2005-2006 MPV 2003-2006 Mazda6 (2.3L) 2005-2006 Mazda6 (3.0L) 2004-2006 Mazda3 2006 Mazda5 2004-2006 RX-8 2006 MX-5 2006 MAZDASPEED6

DESCRIPTION

Some vehicles may experience rough idle, hesitation, and/or misfire. The concern may occur with the Malfunction Indicator Light (MIL) illuminated and a Diagnostic Trouble Code (DTC) P0300 stored in PCM memory. In other cases, there may be no MIL illumination or DTC stored.

Customers having this concern should have their vehicle repaired using the following repair procedure.

REPAIR PROCEDURE

NOTE:

- **The following repair procedure WILL NOT work on vehicles equipped with a Visteon PCM (i.e.: 2002-2004 MPV and 2003-2004 Mazda6 3.0L)**
- **Before attempting repairs, be sure the concern can be duplicated at the time of diagnosis.**

1. Verify customer concern.
2. Record Freeze Frame Data (FFD).
3. Install WDS to vehicle and I.D. the vehicle.
4. Select the TOOLBOX icon at the top of the screen.
5. Select "POWERTRAIN".
6. Select "OBD TEST MODES".
7. Select "MODE6 ON-BOARD TEST RESULTS", then press the Tick mark.
 - Mode06 shows OBD system monitor completion and monitor results. Nearly all OBD monitors work after every drive cycle. However, the results of monitoring stored in memory is only the last / current driving cycle. For misfire monitors, the last ten (10) drive cycles are stored.
 - Be sure the PCM has learned the vehicles crank profile before proceeding. A vehicle equipped with misfire monitor needs to learn the crank shaft profile. If Keep Alive Memory is erased, both Mode06 and crank shaft profile data are erased also. In this case, the vehicle must be driven again.
8. Move the scroll bar on the right side of the screen about 3/4 toward the bottom until you see

"MISFIRE CYLINDER DATA" for each cylinder.

Description	CBDMIC	Test ID	Min	Max	Value
Oxygen sensor monitor bank 1	1				
Rich to lean sensor monitor bank 1	1	1	0V	0V	0V
Lean to rich sensor monitor bank 1	1	2	0V	0V	0V
Low sensor voltage for switch time calculation	1	3	0V	0V	0V
High sensor voltage for switch time calculation	1	4	0V	0V	0V
Rich to lean sensor switch time	1	5	0s	0s	0s
Lean to rich sensor switch time	1	6	0s	0s	0s
Sensor period	1	A	0s	0s	0s
Monitor	2				
Low sensor voltage for switch time calculation (constant)	2	3	0V	0V	0V
High sensor voltage for switch time calculation (constant)	2	4	0V	0V	0V
Rich to lean sensor switch time (calculated)	2	5	0s	0s	0s
Catalyst monitor bank 1	21				
Rear to front switch ratio monitor bank 1	31				
EGR Flow Test monitor (large)	3A				
EVAP monitor large leak check monitor (0.040 inch)	3B				

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Fig. 1: On-Board Diagnostic Screen - "Misfire Cylinder Data"

Courtesy of MAZDA MOTORS CORP.

- In the "VALUE" column, if a misfire occurred, there will be a number greater than zero (0) shown for that cylinder. The cylinder with a number greater than zero (0) would then be the misfiring cylinder.

NOTE:

- **EWMA Exponential Weighted Moving Average.** This is an indicator of 1 of misfire counts from the last ten (10) driving cycles.

Description	OBD ID	Test ID	Min	Max	Value
Purge flow monitor	3D	80	0mA	0mA	0mA
Misfire Cylinder 1 Data	A2				
EWMA misfire counts for last 10 driving cycles	A2	B	0counts	65535counts	0counts
Misfire counts for last/current driving cycles	A2	C	0counts	65535counts	0counts
Misfire Cylinder 2 Data	A3				
EWMA misfire counts for last 10 driving cycles	A3	B	0counts	65535counts	0counts
Misfire counts for last/current driving cycles	A3	C	0counts	65535counts	0counts
Misfire Cylinder 3 Data	A4				
EWMA misfire counts for last 10 driving cycles	A4	B	0counts	65535counts	0counts
Misfire counts for last/current driving cycles	A4	C	0counts	65535counts	0counts
Misfire Cylinder 4 Data	A5				
EWMA misfire counts for last 10 driving cycles	A5	B	0counts	65535counts	0counts
Misfire counts for last/current driving cycles	A5	C	0counts	65535counts	0counts
Thermostat Monitor	E1				
Heat radiation ratio	E1	80	0	0	0
Engine coolant temperature	E1	81	-40°C	-40°C	-40°C

Complete

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Fig. 2: On-Board Diagnostic Screen - Column
Courtesy of MAZDA MOTORS CORP.

10. If there are all zeroes (0) in the value column for each cylinder, then a misfire did NOT occur in the last 10 drive cycles.
11. Verify repair.