

2012 - Mazda6 - Engine

DTC P0301:00, P0302:00, P0303:00, P0304:00, P0305:00, P0306:00, P0316:00 [MZI 3.7 V6]

DTC P0301:00 DTC P0302:00 DTC P0303:00 DTC P0304:00 DTC P0305:00 DTC P0306:00 DTC P0316:00	P0301:00: Cylinder No.1 misfire detected P0302:00: Cylinder No.2 misfire detected P0303:00: Cylinder No.3 misfire detected P0304:00: Cylinder No.4 misfire detected P0305:00: Cylinder No.5 misfire detected P0306:00: Cylinder No.6 misfire detected P0316:00: Misfire detected on startup (first 1000 revolutions)
DETECTION CONDITION	• DTC P0301:00, P0302:00, P0303:00, P0304:00, P0305:00, P0306:00: The misfire detection monitor is designed to monitor engine misfire and identify the specific cylinder in which the misfire has occurred. Misfire is defined as lack of combustion in a cylinder due to absence of spark, poor fuel metering, poor compression, or any other cause • DTC P0316:00 is set in addition to misfire DTC which occurs in the first 1,000 revolution test interval following engine start.
	• Erratic signal to PCM ▪ APP sensor signal malfunction ▪ ECT sensor signal malfunction ▪ IAT sensor signal malfunction ▪ MAF sensor signal malfunction ▪ CKP sensor signal malfunction ▪ TP sensor signal malfunction ▪ VSS signal malfunction ▪ Related connector and terminal malfunction

POSSIBLE CAUSE	▪ Related wiring harness malfunction
	• Air suction in intake air system (between dynamic chamber and cylinder head) • Spark plug malfunction • Ignition system malfunction • Ignition coil malfunction • Fuel injector malfunction • Purge solenoid valve malfunction • Evaporative emission system malfunction • Fuel pressure inadequate • Poor fuel quality • Fuel nearly depleted • Inadequate engine compression due to engine internal malfunction • Related connector or terminal malfunction • Related wiring harness malfunction • PCM malfunction

Diagnostic procedure

STEP	INSPECTION	ACTION	
1	VERIFY FREEZE FRAME DATA HAS BEEN RECORDED • Has FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record FREEZE FRAME DATA on the repair order, then go to the next step.
2	VERIFY RELATED REPAIR INFORMATION AVAILABILITY • Verify related Service Bulletins and/or on-line repair information availability. • Is any related Service Bulletins available?	Yes	Perform repair or diagnosis according to the available Service Bulletins. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	VERIFY RELATED PENDING CODE OR STORED DTCs • Switch the ignition to off, then to the ON (Engine	Yes	Go to the appropriate DTC troubleshooting. (See DTC TABLE [MZI 3.7 V6] .)
		No	Go to the next step.

	off). • Verify related pending code or stored DTCs. • Are other DTCs present?		
4	VERIFY CURRENT INPUT SIGNAL STATUS (KEY TO ON / IDLE) • Access APP1, APP2, ECT, IAT, MAF, RPM TP REL and VSS PIDs using the M-MDS. (See PCM INSPECTION [MZI 3.7 V6].) • Is there any signal that is far out of specification when the ignition is switched ON, and the engine is run at idle?	Yes	Inspect the suspected circuit or part or both according to inspection results. Then go to Step 17. (See PCM INSPECTION [MZI 3.7 V6] .)
		No	Go to the next step.
5	VERIFY CURRENT INPUT SIGNAL STATUS UNDER TROUBLE CONDITION CAUTION: • While performing this step, always operate the vehicle in a safe and lawful manner. • When the M-MDS is used to observe monitor system status while driving, be sure to have another technician with you, or record the data in the M-MDS using the PID/DATA MONITOR AND RECORD capturing function and inspect later. • Inspect the same PIDs as in Step 4 when simulating the FREEZE FRAME DATA condition. • Is there any signal which causes drastic changes?	Yes	Inspect the suspected circuit or part or both according to inspection results. Then go to Step 17. (See PCM INSPECTION [MZI 3.7 V6] .)
		No	Go to the next step.
6	INSPECT FOR EXCESSIVE AIR SUCTION IN INTAKE AIR SYSTEM • Inspect for air leakage at	Yes	Repair or replace the suspected part, then go to Step 17.
		No	Go to the next step.

	the following: Between the dynamic chamber and the cylinder head • Is there any malfunction?		
7	INSPECT SPARK PLUG CONDITION - Switch the ignition to off. - Remove the spark plug from the suspected cylinder. - Check the spark plug condition: - Cracks - Excess wear - Gap - Wet - Is any problem found on the spark plug?	Yes	- If the spark plug is wet, fuel flooding is suspected. Go to Step 9. - If the spark plug has a crack, excess wear or improper gap, replace the malfunctioning spark plug. Then go to Step 17. (See SPARK PLUG REMOVAL/ INSTALLATION [MZI 3.7 V6] .)
		No	Go to the next step.
8	INSPECT IGNITION SYSTEM OPERATION FOR SUSPECTED CYLINDER - Perform the spark test for the suspected cylinder. (See ENGINE CONTROL SYSTEM OPERATION INSPECTION [MZI 3.7 V6] .) - Are the results of the spark test normal?	Yes	Go to the next step.
		No	Replace or replace the malfunctioning part according to the spark test results, then go to Step 17.
9	INSPECT FUEL INJECTOR WIRING HARNESS - Remove the intake air system parts. - Disconnect the fuel injector connector on the	Yes	Go to the next step.
		No	Inspect the fuel injector wiring harnesses. Repair or replace if necessary, then go to Step 17.

	suspected cylinder. • Connect the noid light to the fuel injector connector terminals. • Verify the light dimness during cranking. • Does the noid light illuminate?		
10	INSPECT FUEL INJECTOR OPERATION • Remove fuel injector from the suspected cylinder. (See FUEL INJECTOR REMOVAL/ INSTALLATION [MZI 3.7 V6].) • Swap the fuel injector with one from another cylinder. • Start the engine and run it at idle. • Is there the misfire DTC for the cylinder which has a suspected fuel injector?	Yes	Replace fuel injector, then go to Step 17. (See FUEL INJECTOR REMOVAL/ INSTALLATION [MZI 3.7 V6] .)
		No	Go to the next step.
11	INSPECT FOR AIR SUCTION AT INTAKE AIR SYSTEM • Inspect for air leakage at the following: ▪ Around the connection of the dynamic chamber and the intake manifold ▪ Around the connection of the intake manifold and the cylinder head • Is air leakage found?	Yes	Repair or replace the suspected part, then go to Step 17.
		No	Go to the next step.

12	INSPECT OPERATION OF PURGE SOLENOID VALVE - Inspect the purge control system operation. (See ENGINE CONTROL SYSTEM OPERATION INSPECTION [MZI 3.7 V6].) - Does the purge control system work correctly?	Yes Go to the next step. No Repair or replace the malfunctioning part according to the purge control system inspection results, then go to Step 17.
13	INSPECT FUEL LINE PRESSURE - Switch the ignition to off. - Inspect the fuel line pressure. (See FUEL LINE PRESSURE INSPECTION [MZI 3.7 V6].) - Is there any malfunction?	Yes If the fuel line pressure is too low, go to the next step. If the fuel line pressure is excessively high, check as follows: - Fuel pump maximum pressure - Fuel return line for clogging - If all of the above are normal, replace the pressure regulator. (See FUEL PUMP UNIT DISASSEMBLY/ ASSEMBLY [MZI 3.7 V6].) Then go to Step 17. No Go to Step 15.
14	INSPECT FUEL LINE FROM FUEL PUMP TO FUEL DELIVERY PIPE - Visually inspect the fuel line for any leakage. - Is any fuel leakage found?	Yes Replace suspected fuel line, then go to Step 17. No Inspect the low-pressure side fuel filter for the following: - Foreign material or staining inside the fuel filter Perform the following actions as a result: - If foreign material or staining is found inside the fuel filter (low-pressure side), clean the fuel tank and filter. - If normal, replace the fuel pump unit. (See FUEL PUMP UNIT REMOVAL/ INSTALLATION [MZI 3.7 V6].) Then go to Step 17.
15	INSPECT SEALING OF ENGINE COOLANT PASSAGE WARNING:	Yes Air penetrates due to poor sealing of the head gasket or other areas between the combustion chamber and the engine coolant passage. Repair or replace malfunctioning

	• Never remove the cooling system cap or loosen the radiator drain plug while the engine is running, or when the engine and radiator are hot. Scalding engine coolant and steam may shoot out and cause serious injury. It may also damage the engine and cooling system. • Turn off the engine and wait until it is cool. Even then, be very careful when removing the cap. Wrap a thick cloth around it and slowly turn it counterclockwise to the first stop. Step back while the pressure escapes. • When you are sure all the pressure is gone, press down on the cap using the cloth, turn it, and remove it. • Remove the radiator cap. • Implement the procedure to bleed air from the engine coolant, then run the engine at idle. • Are there any small bubbles which make the engine coolant white at filling opening? NOTE: • Large bubbles are normal since they are remaining air coming from the engine coolant passage.	parts, then go to Step 17.
		No Go to the next step.
16	INSPECT ENGINE COMPRESSION • Inspect the engine compression. (See COMPRESSION INSPECTION [MZI 3.7 V6].) • Is the engine compression normal?	Yes Go to the next step. (The system is operating correctly at this time. The concern may have been caused by a loose or corroded connector.) No Overhaul the engine, then go to the next step.

17	VERIFY TROUBLESHOOTING OF MISFIRE DTC HAS BEEN COMPLETED • Verify that all disconnected connectors are reconnected. • Switch the ignition to ON (Engine off). • Clear the DTC from the PCM memory using the M-MDS. • Perform the OBD-II DRIVE MODE up to Misfire, Fuel and HO2S Monitors (Step 11). (See OBD-II DRIVE MODE [MZI 3.7 V6].) • Retrieve DTCs using the M-MDS. • Is the PENDING CODE for this DTC present?	Yes	Repeat the inspection from Step 1. • If the malfunction recurs, replace the PCM. (See PCM REMOVAL/ INSTALLATION [MZI 3.7 V6].) Go to the next step.
		No	Go to the next step.
18	VERIFY AFTER REPAIR PROCEDURE • Perform the "AFTER REPAIR PROCEDURE". (See AFTER REPAIR PROCEDURE [MZI 3.7 V6].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See DTC TABLE [MZI 3.7 V6].)
		No	Troubleshooting completed.

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6	INSPECT FOR EXCESSIVE AIR SUCTION IN INTAKE AIR SYSTEM • Inspect for air leakage at	Yes	Repair or replace the suspected part, then go to Step 17.
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18	VERIFY AFTER REPAIR PROCEDURE • Perform the "AFTER REPAIR PROCEDURE". (See AFTER REPAIR PROCEDURE [MZI 3.7 V6].) • Are any DTCs present?		Yes Go to the applicable DTC inspection. (See DTC TABLE [MZI 3.7 V6].) No Troubleshooting completed.