

2012 - Mazda6 - Engine

DTC P0300:00 [MZI 3.7 V6]

DTC P0300:00	Random misfire detected
DETECTION CONDITION	• The random misfire DTC indicates multiple cylinders are misfiring or the PCM cannot identify which cylinder is misfiring.
POSSIBLE CAUSE	• 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 ▪ Related wiring harness malfunction • CMP sensor malfunction • CKP sensor malfunction • Ignition coil malfunction • Ignition system malfunction • MAF sensor contamination • Excess air suction in intake air system (between MAF/IAT sensor and dynamic chamber) • Vacuum hoses damages or improper connection • Fuel pump malfunction • Fuel pressure regulator malfunction • Fuel line clogged • Fuel filter clogged

	• Fuel runout • Poor quality fuel • Fuel leakage in fuel line • Insufficient compression • Variable valve timing control system improper operation • Purge solenoid valve malfunction • PCV valve malfunction • Related connector and terminal malfunction • Related wiring harness malfunction • PCM malfunction
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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 off). • Verify related pending code or stored DTCs. • Are other DTCs present?	Yes	Go to the appropriate DTC troubleshooting. (See DTC TABLE [MZI 3.7 V6] .)
		No	Go to the next step.

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. (See PCM INSPECTION [MZI 3.7 V6].) Then go to Step 17. 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. (See PCM INSPECTION [MZI 3.7 V6].) Then go to Step 17. No Go to the next step.
6	INSPECT CMP SENSOR • Inspect the CMP sensor. (See CAMSHAFT POSITION (CMP) SENSOR INSPECTION [MZI 3.7 V6].) • Is there any	Yes Inspect the installation condition for damage to the timing belt and gears, and repair malfunctioning parts. • If it is normal, replace CMP sensor. (See CAMSHAFT POSITION (CMP) SENSOR REMOVAL/ INSTALLATION [MZI 3.7 V6].) Then go to Step 17.

	malfunction?	No	Go to the next step.
7	VERIFY CKP SENSOR INSTALLATION CONDITION - Inspect for CKP sensor looseness. - Is the CKP sensor loose?	Yes	Retighten the CKP sensor, then go to Step 17. (See CRANKSHAFT POSITION (CKP) SENSOR REMOVAL/ INSTALLATION [MZI 3.7 V6] .)
		No	Go to the next step.
8	INSPECT IGNITION SYSTEM OPERATION - Perform the spark test. (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	Repair or replace the malfunctioning part according to the spark test results, then go to Step 17.
9	INSPECT MAF PID - Start the engine. - Access the MAF PID using the M-MDS. - Verify that the MAF PID changes quickly according to the engine speed when the engine is raced. - Is the MAF PID response normal?	Yes	Go to Step 11.
		No	Go to the next step.
10	INSPECT FOR EXCESSIVE AIR SUCTION IN INTAKE AIR SYSTEM - Inspect for air leakage at the following: - Between the MAF/IAT sensor and the throttle body - Between	Yes	Repair or replace the suspected part, then go to Step 17.
		No	Replace the MAF/IAT sensor, then go to Step 17. (See MASS AIR FLOW (MAF)/ INTAKE AIR TEMPERATURE (IAT) SENSOR REMOVAL/ INSTALLATION [MZI 3.7 V6] .)

	the throttle body and the dynamic chamber Is there any malfunction?		
11	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 13.
12	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.
13	INSPECT VARIABLE VALVE TIMING CONTROL SYSTEM OPERATION Inspect the variable valve timing control	Yes	Go to the next step.
		No	Repair or replace the malfunctioning part according to the variable valve timing control system inspection results, then go to Step 17.

	system operation. (See ENGINE CONTROL SYSTEM OPERATION INSPECTION [MZI 3.7 V6].) Does the variable timing control system work properly?		
14	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 properly?	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.
15	INSPECT SEALING OF ENGINE COOLANT PASSAGE WARNING: - 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,	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 parts, then go to Step 17.
		No	Go to the next step.

	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 the filling opening? NOTE: • Large bubbles are normal since they are remaining air coming from the engine coolant passage.		
16	INSPECT ENGINE COMPRESSION • Inspect the engine compression. (See COMPRESSION INSPECTION [MZI 3.7 V6].) • Is it normal?	Yes	Inspect the PCV valve. • If the PCV valve operation is not normal, replace the PCV valve. Then go to the next step. • If the PCV valve operation is normal, 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	Perform an engine overhaul for repairs, then go to the next step.
17	VERIFY TROUBLESHOOTING OF DTC P0300:00 HAS BEEN COMPLETED • Verify that all disconnected connectors are reconnected. • 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].)	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.

	Is the PENDING CODE for this DTC present?		
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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		No	Go to the next step.
3	VERIFY RELATED PENDING CODE OR STORED DTCs • Switch the ignition to off, then to the ON (Engine off). • Verify related pending code or stored DTCs. • Are other DTCs present?	Yes	Go to the appropriate DTC troubleshooting. (See DTC TABLE [MZI 3.7 V6] .)
		No	Go to the next step.

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. (See PCM INSPECTION [MZI 3.7 V6].) Then go to Step 17. 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. (See PCM INSPECTION [MZI 3.7 V6].) Then go to Step 17. No Go to the next step.
6	INSPECT CMP SENSOR • Inspect the CMP sensor. (See CAMSHAFT POSITION (CMP) SENSOR INSPECTION [MZI 3.7 V6].) • Is there any	Yes Inspect the installation condition for damage to the timing belt and gears, and repair malfunctioning parts. • If it is normal, replace CMP sensor. (See CAMSHAFT POSITION (CMP) SENSOR REMOVAL/ INSTALLATION [MZI 3.7 V6].) Then go to Step 17.

	malfunction?	No	Go to the next step.
7	VERIFY CKP SENSOR INSTALLATION CONDITION - Inspect for CKP sensor looseness. - Is the CKP sensor loose?	Yes	Retighten the CKP sensor, then go to Step 17. (See CRANKSHAFT POSITION (CKP) SENSOR REMOVAL/ INSTALLATION [MZI 3.7 V6] .)
		No	Go to the next step.
8	INSPECT IGNITION SYSTEM OPERATION - Perform the spark test. (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	Repair or replace the malfunctioning part according to the spark test results, then go to Step 17.
9	INSPECT MAF PID - Start the engine. - Access the MAF PID using the M-MDS. - Verify that the MAF PID changes quickly according to the engine speed when the engine is raced. - Is the MAF PID response normal?	Yes	Go to Step 11.
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		No	Replace the MAF/IAT sensor, then go to Step 17. (See MASS AIR FLOW (MAF)/ INTAKE AIR TEMPERATURE (IAT) SENSOR REMOVAL/ INSTALLATION [MZI 3.7 V6] .)

	the throttle body and the dynamic chamber Is there any malfunction?		
11	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.
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		No	Repair or replace the malfunctioning part according to the variable valve timing control system inspection results, then go to Step 17.

	system operation. (See ENGINE CONTROL SYSTEM OPERATION INSPECTION [MZI 3.7 V6].) Does the variable timing control system work properly?		
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	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 the filling opening? NOTE: - Large bubbles are normal since they are remaining air coming from the engine coolant passage.		
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		No	Perform an engine overhaul for repairs, then go to the next step.
17	VERIFY TROUBLESHOOTING OF DTC P0300:00 HAS BEEN COMPLETED - Verify that all disconnected connectors are reconnected. - 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].)	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.

	Is the PENDING CODE for this DTC present?		
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.