2012 - Mazda6 - Engine

DTC P0101:00 [MZR 2.5]

DTC P0101:00	MAF sensor circuit range/performance problem
DETECTION CONDITION	• When the conditions are as follows, the PCM compares the intake airflow amount with the estimated intake airflow amount (calculated from the barometric pressure, MAP sensor and throttle opening angle). **MONITORING CONDITIONS** ▪ Engine speed: **below 4,500 rpm** ▪ Barometric pressure divided by intake manifold absolute pressure: **above 1.2** ▪ Throttle position−throttle position **before 15 ms**: **below 10 %** ▪ Battery voltage: **above 8 V** • If over a period continuing **for 5 s**, the cumulative value of the intake airflow amount divided by the estimated intake airflow amount is 1.35 or more, and intake airflow amount multiplied by the estimated intake airflow amount is **6 g/s {0.8 lb/min} or more**, the PCM determines that the detected mass air flow amount is above is too high. • If over a period continuing **for 5 s**, the cumulative value of the intake airflow amount divided by the estimated intake airflow amount is 0.65 or less, and intake airflow amount multiplied by the estimated intake airflow amount is **6 g/s {0.8 lb/min} or less**, the PCM determines that the detected mass air flow amount is above is too low. **Diagnostic support note** • This is a continuous monitor (CCM). • The MIL illuminates if PCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM. • PENDING CODE is available if PCM detects the above malfunction condition during first drive cycle. • FREEZE FRAME DATA (Mode 2)/Snapshot data is available. • The DTC is stored in the PCM memory.

POSSIBLE CAUSE	• MAF sensor connector or terminal malfunction • PCM connector or terminal malfunction • MAF sensor malfunction • PCM malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA (MODE 2)/ SNAPSHOT DATA HAS BEEN RECORDED** • Has the FREEZE FRAME DATA (Mode 2)/snapshot data been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA (Mode 2)/snapshot 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 repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**VERIFY RELATED PENDING AND STORED DTC** • Switch the ignition to off, then to ON (engine off). • Verify pending and stored DTCs using the M-MDS. (See **ON-BOARD DIAGNOSTIC TEST [MZR 2.5]**.) • Is the DTC P2108:00 also present?	Yes	Go to the applicable DTC inspection. (See **DTC P2108:00 [MZR 2.5]**.)
		No	Go to the next step.
4	**VERIFY CURRENT INPUT SIGNAL STATUS IS CONCERN INTERMITTENT OR CONSTANT** • Start the engine. • Access the following PIDs using the M-MDS. (See **ON-BOARD DIAGNOSTIC TEST [MZR 2.5]**.) ▪ ECT ▪ MAF ▪ TP REL	Yes	Go to the next step.
		No	Intermittent concern exists. • Go to the "INTERMITTENT CONCERN TROUBLESHOOTING" procedure. (See **INTERMITTENT CONCERN TROUBLESHOOTING [MZR 2.5]**.)

	▪ RPM • Warm-up the engine until ECT PID is **above −200 °C {−392 °F}**. • Idle the engine for **5 s or more**. **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. • Drive the vehicle under the following two PID conditions: **Condition 1** ▪ TP REL: **50—87.5 %** ▪ RPM: **above 500 rpm** ▪ 4th gear (MTX), D range (ATX) **Condition 2** ▪ TP REL: **above 80 %** ▪ RPM: **below 2,000 rpm** ▪ Gear in • Perform the Pending Trouble Code Access Procedure. (See **ON-BOARD DIAGNOSTIC TEST [MZR 2.5]**.) • Is the PENDING CODE for this DTC present?		
5	**INSPECT MAF/IAT SENSOR CONNECTOR CONDITION** • Switch the ignition to off.	Yes	Repair or replace the terminal and/or connector, then go to Step 8.

	• Disconnect the MAF/IAT sensor connector. • Inspect for poor connection (such as damaged/pulled-out pins, corrosion). • Is there any malfunction?	No	Go to the next step.
6	**INSPECT PCM CONNECTOR CONDITION** • Disconnect the PCM connector. • Inspect for poor connection (such as damaged/pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal and/or connector, then go to Step 8.
		No	Go to the next step.
7	**INSPECT MAF SENSOR** • Inspect the MAF sensor. (See **MASS AIR FLOW (MAF) SENSOR INSPECTION [MZR 2.5]**.) • Is there any malfunction?	Yes	Replace the MAF/IAT sensor, then go to the next step. (See **INTAKE-AIR SYSTEM REMOVAL/ INSTALLATION [MZR 2.5]**.)
		No	Go to the next step.
8	**VERIFY DTC TROUBLESHOOTING COMPLETED** • Make sure to connect all disconnected connectors. • Clear the DTC from the PCM memory using the M-MDS. (See **AFTER REPAIR PROCEDURE [MZR 2.5]**.) • Start the engine. • Warm-up the engine until ECT PID is **above −200 °C {−392 °F}**. • Idle the engine for **5 s or more**. **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	Yes	Repeat the inspection from Step 1. • If the malfunction recurs, replace the PCM. (See **PCM REMOVAL/ INSTALLATION [MZR 2.5]**.) Go to the next step.
		No	Go to the next step.

	AND RECORD capturing function and inspect later. • Drive the vehicle under the following two PID conditions: **Condition 1** ▪ TP REL: **50—87.5 %** ▪ RPM: **above 500 rpm** ▪ 4th gear (MTX), D range (ATX) **Condition 2** ▪ TP REL: **above 80 %** ▪ RPM: **below 2,000 rpm** ▪ Gear in • Perform the Pending Trouble Code Access Procedure. (See **ON-BOARD DIAGNOSTIC TEST [MZR 2.5]**.) • Is the PENDING CODE for this DTC present?		
9	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "AFTER REPAIR PROCEDURE". (See **AFTER REPAIR PROCEDURE [MZR 2.5]**.) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See **DTC TABLE [MZR 2.5]**.)
		No	DTC troubleshooting completed.

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DTC P0101:00	MAF sensor circuit range/performance problem
DETECTION CONDITION	• When the conditions are as follows, the PCM compares the intake airflow amount with the estimated intake airflow amount (calculated from the barometric pressure, MAP sensor and throttle opening angle). **MONITORING CONDITIONS** ▪ Engine speed: **below 4,500 rpm** ▪ Barometric pressure divided by intake manifold absolute pressure: **above 1.2** ▪ Throttle position−throttle position **before 15 ms**: **below 10 %** ▪ Battery voltage: **above 8 V** • If over a period continuing **for 5 s**, the cumulative value of the intake airflow amount divided by the estimated intake airflow amount is 1.35 or more, and intake airflow amount multiplied by the estimated intake airflow amount is **6 g/s {0.8 lb/min} or more**, the PCM determines that the detected mass air flow amount is above is too high. • If over a period continuing **for 5 s**, the cumulative value of the intake airflow amount divided by the estimated intake airflow amount is 0.65 or less, and intake airflow amount multiplied by the estimated intake airflow amount is **6 g/s {0.8 lb/min} or less**, the PCM determines that the detected mass air flow amount is above is too low. **Diagnostic support note** • This is a continuous monitor (CCM). • The MIL illuminates if PCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM. • PENDING CODE is available if PCM detects the above malfunction condition during first drive cycle. • FREEZE FRAME DATA (Mode 2)/Snapshot data is available. • The DTC is stored in the PCM memory.

POSSIBLE CAUSE	• MAF sensor connector or terminal malfunction • PCM connector or terminal malfunction • MAF sensor malfunction • PCM malfunction

Diagnostic procedure

STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA (MODE 2)/ SNAPSHOT DATA HAS BEEN RECORDED** • Has the FREEZE FRAME DATA (Mode 2)/snapshot data been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA (Mode 2)/snapshot 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 repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**VERIFY RELATED PENDING AND STORED DTC** • Switch the ignition to off, then to ON (engine off). • Verify pending and stored DTCs using the M-MDS. (See **ON-BOARD DIAGNOSTIC TEST [MZR 2.5]**.) • Is the DTC P2108:00 also present?	Yes	Go to the applicable DTC inspection. (See **DTC P2108:00 [MZR 2.5]**.)
		No	Go to the next step.
4	**VERIFY CURRENT INPUT SIGNAL STATUS IS CONCERN INTERMITTENT OR CONSTANT** • Start the engine. • Access the following PIDs using the M-MDS. (See **ON-BOARD DIAGNOSTIC TEST [MZR 2.5]**.) ▪ ECT ▪ MAF ▪ TP REL	Yes	Go to the next step.
		No	Intermittent concern exists. • Go to the "INTERMITTENT CONCERN TROUBLESHOOTING" procedure. (See **INTERMITTENT CONCERN TROUBLESHOOTING [MZR 2.5]**.)

	▪ RPM • Warm-up the engine until ECT PID is **above −200 °C {−392 °F}**. • Idle the engine for **5 s or more**. **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. • Drive the vehicle under the following two PID conditions: **Condition 1** ▪ TP REL: **50—87.5 %** ▪ RPM: **above 500 rpm** ▪ 4th gear (MTX), D range (ATX) **Condition 2** ▪ TP REL: **above 80 %** ▪ RPM: **below 2,000 rpm** ▪ Gear in • Perform the Pending Trouble Code Access Procedure. (See **ON-BOARD DIAGNOSTIC TEST [MZR 2.5]**.) • Is the PENDING CODE for this DTC present?		
5	**INSPECT MAF/IAT SENSOR CONNECTOR CONDITION** • Switch the ignition to off.	Yes	Repair or replace the terminal and/or connector, then go to Step 8.

	• Disconnect the MAF/IAT sensor connector. • Inspect for poor connection (such as damaged/pulled-out pins, corrosion). • Is there any malfunction?	No	Go to the next step.
6	**INSPECT PCM CONNECTOR CONDITION** • Disconnect the PCM connector. • Inspect for poor connection (such as damaged/pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal and/or connector, then go to Step 8.
		No	Go to the next step.
7	**INSPECT MAF SENSOR** • Inspect the MAF sensor. (See **MASS AIR FLOW (MAF) SENSOR INSPECTION [MZR 2.5]**.) • Is there any malfunction?	Yes	Replace the MAF/IAT sensor, then go to the next step. (See **INTAKE-AIR SYSTEM REMOVAL/ INSTALLATION [MZR 2.5]**.)
		No	Go to the next step.
8	**VERIFY DTC TROUBLESHOOTING COMPLETED** • Make sure to connect all disconnected connectors. • Clear the DTC from the PCM memory using the M-MDS. (See **AFTER REPAIR PROCEDURE [MZR 2.5]**.) • Start the engine. • Warm-up the engine until ECT PID is **above −200 °C {−392 °F}**. • Idle the engine for **5 s or more**. **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	Yes	Repeat the inspection from Step 1. • If the malfunction recurs, replace the PCM. (See **PCM REMOVAL/ INSTALLATION [MZR 2.5]**.) Go to the next step.
		No	Go to the next step.

	AND RECORD capturing function and inspect later. • Drive the vehicle under the following two PID conditions: **Condition 1** ▪ TP REL: **50—87.5 %** ▪ RPM: **above 500 rpm** ▪ 4th gear (MTX), D range (ATX) **Condition 2** ▪ TP REL: **above 80 %** ▪ RPM: **below 2,000 rpm** ▪ Gear in • Perform the Pending Trouble Code Access Procedure. (See **ON-BOARD DIAGNOSTIC TEST [MZR 2.5]**.) • Is the PENDING CODE for this DTC present?		
9	**VERIFY AFTER REPAIR PROCEDURE** • Perform the "AFTER REPAIR PROCEDURE". (See **AFTER REPAIR PROCEDURE [MZR 2.5]**.) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See **DTC TABLE [MZR 2.5]**.)
		No	DTC troubleshooting completed.

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