

## 2012 - Mazda6 - Engine

### NO.19 EXHAUST SMOKE [MZI 3.7 V6]

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| 19             | EXHAUST SMOKE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| DESCRIPTION    | <ul style="list-style-type: none"><li>• Blue, black, or white smoke from exhaust system.</li></ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| POSSIBLE CAUSE | <ul style="list-style-type: none"><li>• Blue smoke (Burning oil):<ul style="list-style-type: none"><li>▪ PCV valve malfunction</li><li>▪ Engine internal oil leakage</li></ul></li><li>• White smoke (Water in combustion):<ul style="list-style-type: none"><li>▪ Cooling system malfunction (coolant loss)</li><li>▪ Engine internal coolant leakage</li></ul></li><li>• Black smoke (Rich fuel mixture):<ul style="list-style-type: none"><li>▪ Air cleaner restriction</li><li>▪ Intake-air system is collapsed or restricted.</li><li>▪ PCM DTC is stored.</li><li>▪ Erratic signal to PCM<ul style="list-style-type: none"><li>• APP sensor or related circuit malfunction</li><li>• CHT sensor or related circuit malfunction</li><li>• IAT sensor or related circuit malfunction</li><li>• MAF sensor or related circuit malfunction</li><li>• MAP sensor or related circuit malfunction</li><li>• A/F sensor or related circuit malfunction</li><li>• HO2S or related circuit malfunction</li><li>• TP sensor or related circuit malfunction</li><li>• VSS or related circuit malfunction</li></ul></li><li>▪ Excessive fuel pressure<ul style="list-style-type: none"><li>• Fuel pump mechanical malfunction</li><li>• Fuel line restriction or clogging</li><li>• Pressure regulator malfunction (built-in fuel pump unit)</li></ul></li><li>▪ Ignition system malfunction<ul style="list-style-type: none"><li>• Ignition coil malfunction</li><li>• Ignition coil related circuit malfunction</li><li>• Spark plug malfunction</li></ul></li><li>▪ Erratic CMP sensor signal</li></ul></li></ul> |

- Improper engine compression
- Improper fuel injection timing and amount

**WARNING:**

- The following troubleshooting flow chart contains the fuel system diagnosis and repair procedures. Read the following warnings before servicing the fuel system:
  - Fuel vapor is hazardous. It can easily ignite, causing serious injury and damage. Always keep sparks and flames away from fuel.
  - Fuel line spills and leakage are dangerous. Fuel can ignite and cause serious injuries or death and damage. Fuel can also irritate skin and eyes. To prevent this, always complete "BEFORE SERVICE PRECAUTION" and "AFTER SERVICE PRECAUTION " described in this manual. (See **BEFORE SERVICE PRECAUTION [MZI 3.7 V6]** .) (See **AFTER SERVICE PRECAUTION [MZI 3.7 V6]** .)

**CAUTION:**

- Disconnecting/connecting quick release connector without cleaning it may cause damage to fuel pipe and quick release connector. Always clean quick release connector joint area before disconnecting/connecting, and make sure that it is free of foreign material.

**Diagnostic procedure**

| STEP | INSPECTION                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | RESULTS | ACTION                                                                                                                                                                                                                                                                                                                                                                                  |
|------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1    | <b>VERIFY EXHAUST GAS COLOR</b> <ul style="list-style-type: none"> <li>• What color is smoke coming from the exhaust system?</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                 | Blue    | Burning oil is indicated. <ul style="list-style-type: none"> <li>• Go to the next step.</li> </ul>                                                                                                                                                                                                                                                                                      |
|      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | White   | Water in combustion is indicated. <ul style="list-style-type: none"> <li>• Go to Step 3.</li> </ul>                                                                                                                                                                                                                                                                                     |
|      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Black   | Rich fuel mixture is indicated. <ul style="list-style-type: none"> <li>• Go to Step 4.</li> </ul>                                                                                                                                                                                                                                                                                       |
| 2    | <b>INSPECT IF MALFUNCTION CAUSE IS PCV VALVE OR OTHER</b> <p><b>NOTE:</b></p> <ul style="list-style-type: none"> <li>• The PCV valve cannot be reassembled once it is removed because the tabs will have been broken. Inspect the PCV valve without removing it from the vehicle.</li> <li>• Inspect the PCV valve with it installed.</li> </ul> <p>(See <b>POSITIVE CRANKCASE VENTILATION (PCV) VALVE INSPECTION [MZI 3.7 V6]</b> .)</p> <ul style="list-style-type: none"> <li>• Is there any malfunction?</li> </ul> | Yes     | Replace the PCV valve. <p>(See <b>POSITIVE CRANKCASE VENTILATION (PCV) VALVE REMOVAL/ INSTALLATION [MZI 3.7 V6]</b> .)</p>                                                                                                                                                                                                                                                              |
|      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | No      | Inspect for the following: <ul style="list-style-type: none"> <li>• Damaged valve guide, stems or valve seals</li> <li>• Blocked oil drain passage in cylinder head</li> <li>• Piston ring is not seated, seized or worn.</li> <li>• Damaged cylinder bore</li> </ul> <p>If other driveability symptoms are present, return to diagnostic index to service any additional symptoms.</p> |
| 3    | <b>INSPECT COOLING SYSTEM FOR LEAKAGE</b> <p><b>WARNING:</b></p> <ul style="list-style-type: none"> <li>• Never remove the cooling system cap or loosen the radiator drain plug while</li> </ul>                                                                                                                                                                                                                                                                                                                        | Yes     | Inspect for the following: <ul style="list-style-type: none"> <li>• Cylinder head gasket leakage</li> <li>• Intake manifold gasket leakage</li> <li>• Cracked or porous engine block</li> </ul>                                                                                                                                                                                         |

|   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                     |
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|   | <p>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.</p> <ul style="list-style-type: none"> <li>• 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.</li> <li>• When you are sure all the pressure is gone, press down on the cap using the cloth, turn it, and remove it.</li> <li>• Does the cooling system hold pressure?</li> </ul> | <p>If other driveability symptoms are present, return to diagnostic index to service any additional symptoms.</p>                                                                                   |
|   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | <p>No</p> <p>Inspect for cause.</p> <p>Repair or replace the malfunctioning part according to the inspection results.</p>                                                                           |
| 4 | <p><b>INSPECT INTAKE AIR SYSTEM</b></p> <ul style="list-style-type: none"> <li>• Inspect for the following: <ul style="list-style-type: none"> <li>▪ Air cleaner restriction</li> <li>▪ Collapsed or restricted intake-air system</li> <li>▪ Restricted fuel return line</li> </ul> </li> <li>• Are all items normal?</li> </ul>                                                                                                                                                                                                                                                                                                                          | <p>Yes</p> <p>Go to the next step.</p>                                                                                                                                                              |
|   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | <p>No</p> <p>Repair or replace the malfunctioning part according to the inspection results.</p> <p>Repeat Step 4.</p>                                                                               |
| 5 | <p><b>VERIFY PCM DTC</b></p> <ul style="list-style-type: none"> <li>• Switch the ignition to ON (Engine off).</li> <li>• Retrieve any DTCs using the M-MDS.</li> </ul> <p>(See <b>ON-BOARD DIAGNOSTIC TEST [MZI 3.7 V6]</b>.)</p> <ul style="list-style-type: none"> <li>• Are there any DTCs displayed?</li> </ul>                                                                                                                                                                                                                                                                                                                                       | <p>Yes</p> <p>DTC is displayed:</p> <ul style="list-style-type: none"> <li>• Go to the appropriate DTC inspection.</li> </ul> <p>(See <b>DTC TABLE [MZI 3.7 V6]</b>.)</p>                           |
|   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | <p>No</p> <p>No DTC is displayed:</p> <ul style="list-style-type: none"> <li>• Go to the next step.</li> </ul>                                                                                      |
| 6 | <p><b>VERIFY CURRENT INPUT SIGNAL STATUS</b></p> <p><b>CAUTION:</b></p> <ul style="list-style-type: none"> <li>• While performing this step, always operate the vehicle in a safe and lawful manner.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                           | <p>Yes</p> <p>Go to the next step.</p>                                                                                                                                                              |
|   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | <p>No</p> <p>APP1 or APP2 PID is not specified:</p> <ul style="list-style-type: none"> <li>• Inspect if output signal from APP sensor changes smoothly.</li> </ul> <p>ECT PID is not specified:</p> |

|   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
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|   | <ul style="list-style-type: none"> <li>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.</li> <li>Access the following PCM PIDs using the M-MDS:<br/>(See <b>ON-BOARD DIAGNOSTIC TEST [MZI 3.7 V6]</b>.) <ul style="list-style-type: none"> <li>APP1</li> <li>APP2</li> <li>ECT</li> <li>IAT</li> <li>MAF</li> <li>MAP</li> <li>O2S11</li> <li>O2S21</li> <li>O2S12</li> <li>O2S22</li> <li>TP1</li> <li>TP2</li> <li>VSS</li> </ul> </li> <li>Do the PIDs indicate the correct values under trouble condition?<br/>(See <b>PCM INSPECTION [MZI 3.7 V6]</b>.)</li> </ul> | <ul style="list-style-type: none"> <li>Inspect intermittent short circuit of CHT sensor and related wiring harnesses.</li> </ul> <p>IAT PID is not specified:</p> <ul style="list-style-type: none"> <li>Inspect for air suction in intake-air system. <ul style="list-style-type: none"> <li>If normal, inspect intermittent short circuit of IAT sensor and related wiring harnesses.</li> </ul> </li> </ul> <p>MAF PID is not specified:</p> <ul style="list-style-type: none"> <li>Inspect for intermittent open circuit of MAF sensor and related wiring harness.</li> </ul> <p>MAP PID is not specified:</p> <ul style="list-style-type: none"> <li>Inspect for intermittent open circuit of MAP sensor and related wiring harness.</li> </ul> <p>O2S11 or O2S21 PID is not specified:</p> <ul style="list-style-type: none"> <li>Inspect for intermittent open circuit of suspect A/F sensor and related wiring harness.</li> </ul> <p>O2S12 or O2S22 PID is not specified:</p> <ul style="list-style-type: none"> <li>Inspect for intermittent open circuit of suspect HO2S and related wiring harness.</li> </ul> <p>TP1 or TP2 PID is not specified:</p> <ul style="list-style-type: none"> <li>Inspect if output signal from TP sensor changes smoothly.</li> </ul> <p>VSS PID is not specified:</p> <ul style="list-style-type: none"> <li>Inspect for open circuit of VSS and related wiring harness intermittently.</li> </ul> <p>Repair or replace the malfunctioning part according to the inspection results.</p> |
| 7 | <b>INSPECT FUEL LINE PRESSURE</b> <ul style="list-style-type: none"> <li>Install the fuel pressure gauge between the fuel pipe and fuel distributor.</li> <li>Start the engine and idle it.</li> <li>Measure the fuel line pressure during idle.<br/>(See <b>FUEL LINE PRESSURE INSPECTION [MZI 3.7 V6]</b>.)</li> <li>Is the fuel line pressure correct during idle?</li> </ul>                                                                                                                                                                                                                                                                                                                                                                       | <p>Yes Go to the next step.</p> <p>No Zero or low:</p> <ul style="list-style-type: none"> <li>Inspect for the following: <ul style="list-style-type: none"> <li>Fuel pump relay</li> <li>Fuel pump circuit</li> <li>Fuel line for clogging <ul style="list-style-type: none"> <li>If there is no malfunction, replace the fuel pump unit. (Fuel pump or pressure regulator malfunction)</li> </ul> </li> </ul> </li> </ul> <p>(See <b>FUEL PUMP UNIT REMOVAL/ INSTALLATION [MZI 3.7 V6]</b>.)</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |

|    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |     |                                                                                                                                                                                       |
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|    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |     | High: <ul style="list-style-type: none"> <li>Replace the fuel pump unit. (Pressure regulator malfunction)</li> </ul> (See <b>FUEL PUMP UNIT REMOVAL/ INSTALLATION [MZI 3.7 V6]</b> .) |
| 8  | <b>INSPECT IGNITION SYSTEM OPERATION</b> <ul style="list-style-type: none"> <li>Perform the spark test.<br/>(See <b>ENGINE CONTROL SYSTEM OPERATION INSPECTION [MZI 3.7 V6]</b> .)</li> <li>Is strong blue spark visible at each cylinder?</li> </ul>                                                                                                                                                                                                                                                                                                                                                                       | Yes | Go to the next step.                                                                                                                                                                  |
|    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | No  | Repair or replace the malfunctioning part according to the inspection results.                                                                                                        |
| 9  | <b>INSPECT CMP SENSOR</b> <ul style="list-style-type: none"> <li>Inspect the CMP sensor.<br/>(See <b>CAMSHAFT POSITION (CMP) SENSOR INSPECTION [MZI 3.7 V6]</b> .)</li> <li>Is there any malfunction?</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                            | Yes | Repair or replace the malfunctioning part according to the inspection results.                                                                                                        |
|    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | No  | Go to the next step.                                                                                                                                                                  |
| 10 | <b>INSPECT ENGINE COMPRESSION</b> <ul style="list-style-type: none"> <li>Is the engine compression correct?</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Yes | Inspect the fuel injector.<br><br>(See <b>FUEL INJECTOR INSPECTION [MZI 3.7 V6]</b> .)<br><br>Repair or replace the malfunctioning part according to the inspection results.          |
|    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | No  | Inspect for cause.<br><br>Repair or replace the malfunctioning part according to the inspection results.                                                                              |
| 11 | Verify test results. <ul style="list-style-type: none"> <li>If normal, return to diagnostic index to service any additional symptoms.<br/>(See <b>SYMPTOM DIAGNOSTIC INDEX [MZI 3.7 V6]</b> .)</li> <li>If malfunction remains, inspect related Service Bulletins and/or On-line Repair Information and perform repair or diagnosis.             <ul style="list-style-type: none"> <li>If vehicle is repaired, troubleshooting completed.</li> <li>If vehicle is not repaired or additional diagnostic information is not available, reprogram the PCM if a later calibration is available. Retest.</li> </ul> </li> </ul> |     |                                                                                                                                                                                       |

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| 19             | EXHAUST SMOKE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
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| POSSIBLE CAUSE | <ul style="list-style-type: none"><li>• Blue smoke (Burning oil):<ul style="list-style-type: none"><li>▪ PCV valve malfunction</li><li>▪ Engine internal oil leakage</li></ul></li><li>• White smoke (Water in combustion):<ul style="list-style-type: none"><li>▪ Cooling system malfunction (coolant loss)</li><li>▪ Engine internal coolant leakage</li></ul></li><li>• Black smoke (Rich fuel mixture):<ul style="list-style-type: none"><li>▪ Air cleaner restriction</li><li>▪ Intake-air system is collapsed or restricted.</li><li>▪ PCM DTC is stored.</li><li>▪ Erratic signal to PCM<ul style="list-style-type: none"><li>• APP sensor or related circuit malfunction</li><li>• CHT sensor or related circuit malfunction</li><li>• IAT sensor or related circuit malfunction</li><li>• MAF sensor or related circuit malfunction</li><li>• MAP sensor or related circuit malfunction</li><li>• A/F sensor or related circuit malfunction</li><li>• HO2S or related circuit malfunction</li><li>• TP sensor or related circuit malfunction</li><li>• VSS or related circuit malfunction</li></ul></li><li>▪ Excessive fuel pressure<ul style="list-style-type: none"><li>• Fuel pump mechanical malfunction</li><li>• Fuel line restriction or clogging</li><li>• Pressure regulator malfunction (built-in fuel pump unit)</li></ul></li><li>▪ Ignition system malfunction<ul style="list-style-type: none"><li>• Ignition coil malfunction</li><li>• Ignition coil related circuit malfunction</li><li>• Spark plug malfunction</li></ul></li><li>▪ Erratic CMP sensor signal</li></ul></li></ul> |

- Improper engine compression
- Improper fuel injection timing and amount

**WARNING:**

- The following troubleshooting flow chart contains the fuel system diagnosis and repair procedures. Read the following warnings before servicing the fuel system:
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**CAUTION:**

- Disconnecting/connecting quick release connector without cleaning it may cause damage to fuel pipe and quick release connector. Always clean quick release connector joint area before disconnecting/connecting, and make sure that it is free of foreign material.

**Diagnostic procedure**

| STEP | INSPECTION                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | RESULTS | ACTION                                                                                                                                                                                                                                                                                                                                                                                  |
|------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1    | <b>VERIFY EXHAUST GAS COLOR</b> <ul style="list-style-type: none"> <li>• What color is smoke coming from the exhaust system?</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                 | Blue    | Burning oil is indicated. <ul style="list-style-type: none"> <li>• Go to the next step.</li> </ul>                                                                                                                                                                                                                                                                                      |
|      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | White   | Water in combustion is indicated. <ul style="list-style-type: none"> <li>• Go to Step 3.</li> </ul>                                                                                                                                                                                                                                                                                     |
|      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Black   | Rich fuel mixture is indicated. <ul style="list-style-type: none"> <li>• Go to Step 4.</li> </ul>                                                                                                                                                                                                                                                                                       |
| 2    | <b>INSPECT IF MALFUNCTION CAUSE IS PCV VALVE OR OTHER</b> <p><b>NOTE:</b></p> <ul style="list-style-type: none"> <li>• The PCV valve cannot be reassembled once it is removed because the tabs will have been broken. Inspect the PCV valve without removing it from the vehicle.</li> <li>• Inspect the PCV valve with it installed.</li> </ul> <p>(See <b>POSITIVE CRANKCASE VENTILATION (PCV) VALVE INSPECTION [MZI 3.7 V6]</b> .)</p> <ul style="list-style-type: none"> <li>• Is there any malfunction?</li> </ul> | Yes     | Replace the PCV valve. <p>(See <b>POSITIVE CRANKCASE VENTILATION (PCV) VALVE REMOVAL/ INSTALLATION [MZI 3.7 V6]</b> .)</p>                                                                                                                                                                                                                                                              |
|      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | No      | Inspect for the following: <ul style="list-style-type: none"> <li>• Damaged valve guide, stems or valve seals</li> <li>• Blocked oil drain passage in cylinder head</li> <li>• Piston ring is not seated, seized or worn.</li> <li>• Damaged cylinder bore</li> </ul> <p>If other driveability symptoms are present, return to diagnostic index to service any additional symptoms.</p> |
| 3    | <b>INSPECT COOLING SYSTEM FOR LEAKAGE</b> <p><b>WARNING:</b></p> <ul style="list-style-type: none"> <li>• Never remove the cooling system cap or loosen the radiator drain plug while</li> </ul>                                                                                                                                                                                                                                                                                                                        | Yes     | Inspect for the following: <ul style="list-style-type: none"> <li>• Cylinder head gasket leakage</li> <li>• Intake manifold gasket leakage</li> <li>• Cracked or porous engine block</li> </ul>                                                                                                                                                                                         |

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|   | <p>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.</p> <ul style="list-style-type: none"> <li>• 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.</li> <li>• When you are sure all the pressure is gone, press down on the cap using the cloth, turn it, and remove it.</li> <li>• Does the cooling system hold pressure?</li> </ul> | <p>If other driveability symptoms are present, return to diagnostic index to service any additional symptoms.</p>                                                                                   |
|   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | <p>No</p> <p>Inspect for cause.</p> <p>Repair or replace the malfunctioning part according to the inspection results.</p>                                                                           |
| 4 | <p><b>INSPECT INTAKE AIR SYSTEM</b></p> <ul style="list-style-type: none"> <li>• Inspect for the following: <ul style="list-style-type: none"> <li>▪ Air cleaner restriction</li> <li>▪ Collapsed or restricted intake-air system</li> <li>▪ Restricted fuel return line</li> </ul> </li> <li>• Are all items normal?</li> </ul>                                                                                                                                                                                                                                                                                                                          | <p>Yes</p> <p>Go to the next step.</p>                                                                                                                                                              |
|   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | <p>No</p> <p>Repair or replace the malfunctioning part according to the inspection results.</p> <p>Repeat Step 4.</p>                                                                               |
| 5 | <p><b>VERIFY PCM DTC</b></p> <ul style="list-style-type: none"> <li>• Switch the ignition to ON (Engine off).</li> <li>• Retrieve any DTCs using the M-MDS.</li> </ul> <p>(See <b>ON-BOARD DIAGNOSTIC TEST [MZI 3.7 V6]</b>.)</p> <ul style="list-style-type: none"> <li>• Are there any DTCs displayed?</li> </ul>                                                                                                                                                                                                                                                                                                                                       | <p>Yes</p> <p>DTC is displayed:</p> <ul style="list-style-type: none"> <li>• Go to the appropriate DTC inspection.</li> </ul> <p>(See <b>DTC TABLE [MZI 3.7 V6]</b>.)</p>                           |
|   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | <p>No</p> <p>No DTC is displayed:</p> <ul style="list-style-type: none"> <li>• Go to the next step.</li> </ul>                                                                                      |
| 6 | <p><b>VERIFY CURRENT INPUT SIGNAL STATUS</b></p> <p><b>CAUTION:</b></p> <ul style="list-style-type: none"> <li>• While performing this step, always operate the vehicle in a safe and lawful manner.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                           | <p>Yes</p> <p>Go to the next step.</p>                                                                                                                                                              |
|   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | <p>No</p> <p>APP1 or APP2 PID is not specified:</p> <ul style="list-style-type: none"> <li>• Inspect if output signal from APP sensor changes smoothly.</li> </ul> <p>ECT PID is not specified:</p> |

|   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
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|   | <ul style="list-style-type: none"> <li>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.</li> <li>Access the following PCM PIDs using the M-MDS:<br/>(See <b>ON-BOARD DIAGNOSTIC TEST [MZI 3.7 V6]</b>.) <ul style="list-style-type: none"> <li>APP1</li> <li>APP2</li> <li>ECT</li> <li>IAT</li> <li>MAF</li> <li>MAP</li> <li>O2S11</li> <li>O2S21</li> <li>O2S12</li> <li>O2S22</li> <li>TP1</li> <li>TP2</li> <li>VSS</li> </ul> </li> <li>Do the PIDs indicate the correct values under trouble condition?<br/>(See <b>PCM INSPECTION [MZI 3.7 V6]</b>.)</li> </ul> | <ul style="list-style-type: none"> <li>Inspect intermittent short circuit of CHT sensor and related wiring harnesses.</li> </ul> <p>IAT PID is not specified:</p> <ul style="list-style-type: none"> <li>Inspect for air suction in intake-air system. <ul style="list-style-type: none"> <li>If normal, inspect intermittent short circuit of IAT sensor and related wiring harnesses.</li> </ul> </li> </ul> <p>MAF PID is not specified:</p> <ul style="list-style-type: none"> <li>Inspect for intermittent open circuit of MAF sensor and related wiring harness.</li> </ul> <p>MAP PID is not specified:</p> <ul style="list-style-type: none"> <li>Inspect for intermittent open circuit of MAP sensor and related wiring harness.</li> </ul> <p>O2S11 or O2S21 PID is not specified:</p> <ul style="list-style-type: none"> <li>Inspect for intermittent open circuit of suspect A/F sensor and related wiring harness.</li> </ul> <p>O2S12 or O2S22 PID is not specified:</p> <ul style="list-style-type: none"> <li>Inspect for intermittent open circuit of suspect HO2S and related wiring harness.</li> </ul> <p>TP1 or TP2 PID is not specified:</p> <ul style="list-style-type: none"> <li>Inspect if output signal from TP sensor changes smoothly.</li> </ul> <p>VSS PID is not specified:</p> <ul style="list-style-type: none"> <li>Inspect for open circuit of VSS and related wiring harness intermittently.</li> </ul> <p>Repair or replace the malfunctioning part according to the inspection results.</p> |
| 7 | <b>INSPECT FUEL LINE PRESSURE</b> <ul style="list-style-type: none"> <li>Install the fuel pressure gauge between the fuel pipe and fuel distributor.</li> <li>Start the engine and idle it.</li> <li>Measure the fuel line pressure during idle.<br/>(See <b>FUEL LINE PRESSURE INSPECTION [MZI 3.7 V6]</b>.)</li> <li>Is the fuel line pressure correct during idle?</li> </ul>                                                                                                                                                                                                                                                                                                                                                                       | <p>Yes Go to the next step.</p> <p>No Zero or low:</p> <ul style="list-style-type: none"> <li>Inspect for the following: <ul style="list-style-type: none"> <li>Fuel pump relay</li> <li>Fuel pump circuit</li> <li>Fuel line for clogging <ul style="list-style-type: none"> <li>If there is no malfunction, replace the fuel pump unit. (Fuel pump or pressure regulator malfunction)</li> </ul> </li> </ul> </li> </ul> <p>(See <b>FUEL PUMP UNIT REMOVAL/ INSTALLATION [MZI 3.7 V6]</b>.)</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |

|    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |     |                                                                                                                                                                                                    |
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|    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |     | <p>High:</p> <ul style="list-style-type: none"> <li>Replace the fuel pump unit. (Pressure regulator malfunction)</li> </ul> <p>(See <b>FUEL PUMP UNIT REMOVAL/ INSTALLATION [MZI 3.7 V6]</b>.)</p> |
| 8  | <b>INSPECT IGNITION SYSTEM OPERATION</b> <ul style="list-style-type: none"> <li>Perform the spark test.</li> </ul> <p>(See <b>ENGINE CONTROL SYSTEM OPERATION INSPECTION [MZI 3.7 V6]</b>.)</p> <ul style="list-style-type: none"> <li>Is strong blue spark visible at each cylinder?</li> </ul>                                                                                                                                                                                                                                                                                                                                                                  | Yes | Go to the next step.                                                                                                                                                                               |
|    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | No  | Repair or replace the malfunctioning part according to the inspection results.                                                                                                                     |
| 9  | <b>INSPECT CMP SENSOR</b> <ul style="list-style-type: none"> <li>Inspect the CMP sensor.</li> </ul> <p>(See <b>CAMSHAFT POSITION (CMP) SENSOR INSPECTION [MZI 3.7 V6]</b>.)</p> <ul style="list-style-type: none"> <li>Is there any malfunction?</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                       | Yes | Repair or replace the malfunctioning part according to the inspection results.                                                                                                                     |
|    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | No  | Go to the next step.                                                                                                                                                                               |
| 10 | <b>INSPECT ENGINE COMPRESSION</b> <ul style="list-style-type: none"> <li>Is the engine compression correct?</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Yes | <p>Inspect the fuel injector.</p> <p>(See <b>FUEL INJECTOR INSPECTION [MZI 3.7 V6]</b>.)</p> <p>Repair or replace the malfunctioning part according to the inspection results.</p>                 |
|    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | No  | <p>Inspect for cause.</p> <p>Repair or replace the malfunctioning part according to the inspection results.</p>                                                                                    |
| 11 | <p>Verify test results.</p> <ul style="list-style-type: none"> <li>If normal, return to diagnostic index to service any additional symptoms.</li> </ul> <p>(See <b>SYMPTOM DIAGNOSTIC INDEX [MZI 3.7 V6]</b>.)</p> <ul style="list-style-type: none"> <li>If malfunction remains, inspect related Service Bulletins and/or On-line Repair Information and perform repair or diagnosis. <ul style="list-style-type: none"> <li>If vehicle is repaired, troubleshooting completed.</li> <li>If vehicle is not repaired or additional diagnostic information is not available, reprogram the PCM if a later calibration is available. Retest.</li> </ul> </li> </ul> |     |                                                                                                                                                                                                    |