

2012 - Mazda6 - Engine

NO.4 HARD TO START/ LONG CRANK/ ERRATIC START/ ERRATIC CRANK [MZI 3.7 V6]

|                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|----------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 4              | HARD TO START/LONG CRANK/ERRATIC START/ERRATIC CRANK                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| DESCRIPTION    | <ul style="list-style-type: none"><li>• The starter cranks engine at normal speed but engine requires excessive cranking time before starting.</li><li>• The battery is in normal condition.</li></ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| POSSIBLE CAUSE | <ul style="list-style-type: none"><li>• Vacuum leakage</li><li>• Poor fuel quality</li><li>• Air leakage or restriction in intake-air system</li><li>• Low or dead battery</li><li>• Charging system malfunction</li><li>• PCM DTC is stored.</li><li>• Engine overheating</li><li>• Purge solenoid valve malfunction</li><li>• MAF sensor contamination</li><li>• Incorrect MAF sensor ground voltage</li><li>• Improper operation of drive-by-wire control system</li><li>• Restriction in exhaust system</li><li>• Open circuit in PCM ground circuit</li><li>• Ignition coil related circuit malfunction</li><li>• Erratic signal to ignition coil</li><li>• Spark plug malfunction</li><li>• Erratic signal from CKP sensor</li><li>• Erratic signal from CMP sensor</li><li>• Inadequate fuel pressure<ul style="list-style-type: none"><li>▪ Open or short circuit in fuel pump and related wiring harness</li><li>▪ Fuel pump mechanical malfunction</li><li>▪ Fuel line clogged</li><li>▪ Pressure regulator malfunction (built-in fuel pump unit)</li></ul></li><li>• Fuel leakage from fuel system</li><li>• PCV valve malfunction</li><li>• Starting system malfunction</li><li>• Electrical connector loose or terminal poor contact</li></ul> <p><b>WARNING:</b></p> <ul style="list-style-type: none"><li>• The following troubleshooting flow chart contains the fuel system diagnosis and repair procedures. Read the following warnings before servicing the fuel system:</li></ul> |

- 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>INSPECT RELATED PART CONDITION</b> <ul style="list-style-type: none"> <li>• Inspect for the following: <ul style="list-style-type: none"> <li>▪ Vacuum leakage</li> <li>▪ Proper fuel quality (such as proper octane, contamination, winter/summer blend)</li> <li>▪ Loose bands on intake-air system</li> <li>▪ Cracks on intake-air system parts</li> <li>▪ Intake-air system restriction (such as air cleaner element, fresh air duct)</li> <li>▪ Low or dead battery</li> <li>▪ Charging system malfunction</li> </ul> </li> <li>• Are all items normal?</li> </ul> | Yes     | Go to the next step.                                                                                                                                       |
|      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | No      | Repair or replace the malfunctioning part according to the inspection results.<br>Repeat Step 1.                                                           |
| 2    | <b>VERIFY PCM DTC</b> <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> (See <a href="#">ON-BOARD DIAGNOSTIC TEST [MZI 3.7 V6]</a> .) <ul style="list-style-type: none"> <li>• Are there any DTCs displayed?</li> </ul>                                                                                                                                                                                                                                                            | Yes     | DTC is displayed: <ul style="list-style-type: none"> <li>• Go to the appropriate DTC inspection.</li> </ul> (See <a href="#">DTC TABLE [MZI 3.7 V6]</a> .) |
|      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | No      | No DTC is displayed: <ul style="list-style-type: none"> <li>• Go to the next step.</li> </ul>                                                              |
| 3    | <b>VERIFY IF MALFUNCTION CAUSE IS OVERHEATING</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Yes     | Go to the symptom troubleshooting "NO.17 COOLING SYSTEM CONCERNS-OVERHEATING".                                                                             |

|    |                                                                                                                                                                                                                                                                                             |     |                                                                                                                                                                                                                          |
|----|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|    | <ul style="list-style-type: none"> <li>Is the engine overheating?</li> </ul>                                                                                                                                                                                                                |     | (See <b>NO.17 COOLING SYSTEM CONCERNS-OVERHEATING [MZI 3.7 V6] .</b> )                                                                                                                                                   |
|    |                                                                                                                                                                                                                                                                                             | No  | Go to the next step.                                                                                                                                                                                                     |
| 4  | <b>DETERMINE IF MALFUNCTION CAUSE IS EVAP CONTROL SYSTEM OR OTHER</b> <ul style="list-style-type: none"> <li>Disconnect a vacuum hose from purge solenoid valve and plug opening end of vacuum hose.</li> <li>Start the engine.</li> <li>Is the starting condition improved?</li> </ul>     | Yes | Inspect if the purge solenoid valve is stuck open.<br><br>Repair or replace the malfunctioning part according to the inspection results.                                                                                 |
|    |                                                                                                                                                                                                                                                                                             | No  | Go to the next step.                                                                                                                                                                                                     |
| 5  | <b>INSPECT MAF SENSOR</b> <ul style="list-style-type: none"> <li>Inspect the MAF sensor for following:               <ul style="list-style-type: none"> <li>Contamination</li> <li>MAF sensor terminal B voltage (ground circuit)</li> </ul> </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.                                                                                                                                                                                                     |
| 6  | <b>DETERMINE IF MALFUNCTION CAUSE IS DRIVE-BY-WIRE CONTROL SYSTEM OR OTHER</b> <ul style="list-style-type: none"> <li>Attempt to start the engine at part throttle.</li> <li>Does the engine run smoothly at part throttle?</li> </ul>                                                      | Yes | Inspect the drive-by-wire control system operation.<br><br>(See <b>ENGINE CONTROL SYSTEM OPERATION INSPECTION [MZI 3.7 V6] .</b> )<br><br>Repair or replace the malfunctioning part according to the inspection results. |
|    |                                                                                                                                                                                                                                                                                             | No  | Go to the next step.                                                                                                                                                                                                     |
| 7  | <b>INSPECT PCM FOR POOR GROUND</b> <ul style="list-style-type: none"> <li>Verify the PCM ground point condition.</li> <li>Is there any ground point looseness or lifting in the PCM?</li> </ul>                                                                                             | Yes | Repair the ground point and lifting.                                                                                                                                                                                     |
|    |                                                                                                                                                                                                                                                                                             | No  | Go to the next step.                                                                                                                                                                                                     |
| 8  | <b>INSPECT DEFORMED IN EXHAUST SYSTEM</b> <ul style="list-style-type: none"> <li>Visually inspect the exhaust system part.</li> <li>Is there any deformed exhaust system part?</li> </ul>                                                                                                   | Yes | Repair or replace the malfunctioning part according to the inspection results.                                                                                                                                           |
|    |                                                                                                                                                                                                                                                                                             | No  | Go to the next step.                                                                                                                                                                                                     |
| 9  | <b>INSPECT IGNITION SYSTEM RELATED WIRING HARNESS</b> <ul style="list-style-type: none"> <li>Inspect the ignition coil related wiring harness condition (intermittent open or short circuit) for all cylinders.</li> <li>Are wiring harness conditions normal?</li> </ul>                   | Yes | Go to the next step.                                                                                                                                                                                                     |
|    |                                                                                                                                                                                                                                                                                             | No  | Repair or replace suspect wiring harness and connector.                                                                                                                                                                  |
| 10 | <b>INSPECT IGNITION SYSTEM OPERATION</b> <ul style="list-style-type: none"> <li>Perform the spark test.</li> </ul> (See <b>ENGINE CONTROL SYSTEM OPERATION INSPECTION [MZI 3.7 V6] .</b> )                                                                                                  | Yes | Go to the next step.                                                                                                                                                                                                     |
|    |                                                                                                                                                                                                                                                                                             | No  | Repair or replace the malfunctioning part according to the inspection results.                                                                                                                                           |

|    |                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |  |
|----|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|
|    | <ul style="list-style-type: none"> <li>Is strong blue spark visible at each cylinder?</li> </ul>                                                                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |  |
| 11 | <b>VERIFY SPARK PLUG CONDITION</b> <ul style="list-style-type: none"> <li>Verify the spark plug conditions when the spark plug removed in Step 10.</li> <li>Is spark plug wet, covered with carbon or grayish white?</li> </ul>                                                                                   | Yes         Spark plug is wet or covered with carbon: <ul style="list-style-type: none"> <li>Inspect for fuel leakage from fuel injector.</li> </ul> Spark plug is grayish white: <ul style="list-style-type: none"> <li>Inspect the fuel injector for clogging.</li> </ul> Repair or replace the malfunctioning part according to the inspection results.                                                                                                                                                                                                                                                                                                                           |  |
|    |                                                                                                                                                                                                                                                                                                                   | No         Install the spark plugs on original cylinders.<br>Go to the next step.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |  |
| 12 | <b>INSPECT CKP SENSOR</b> <ul style="list-style-type: none"> <li>Inspect the CKP sensor.<br/>(See <b>CRANKSHAFT POSITION (CKP) 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.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |  |
| 13 | <b>INSPECT CMP SENSOR</b> <ul style="list-style-type: none"> <li>Inspect the CMP sensors.<br/>(See <b>CRANKSHAFT POSITION (CKP) 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.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |  |
| 14 | <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>Measure the fuel line pressure.<br/>(See <b>FUEL LINE PRESSURE INSPECTION [MZI 3.7 V6].</b>)</li> <li>Is the fuel line pressure correct?</li> </ul> | Yes         Go to the next step.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |  |
|    |                                                                                                                                                                                                                                                                                                                   | No         Zero or low: <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)<br/>(See <b>FUEL PUMP UNIT REMOVAL/ INSTALLATION [MZI 3.7 V6].</b>)</li> </ul> </li> </ul> </li> </ul> High: <ul style="list-style-type: none"> <li>Replace the fuel pump unit. (Pressure regulator malfunction)<br/>(See <b>FUEL PUMP UNIT REMOVAL/ INSTALLATION [MZI 3.7 V6].</b>)</li> </ul> |  |
| 15 | <b>INSPECT FUEL LINE HOLD PRESSURE FOR FUEL LEAKAGE</b> <ul style="list-style-type: none"> <li>Is the fuel line pressure held after ignition is switched to off?<br/>(See <b>FUEL LINE PRESSURE</b></li> </ul>                                                                                                    | Yes         Go to the next step.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |  |
|    |                                                                                                                                                                                                                                                                                                                   | No         Inspect the fuel injector.<br>(See <b>FUEL INJECTOR INSPECTION [MZI 3.7 V6].</b> )                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |  |

|    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |     |                                                                                                                                                                                                                                                                                                                                              |
|----|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|    | INSPECTION [MZI 3.7 V6] .)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |     | <ul style="list-style-type: none"> <li>If the fuel injector is normal, replace the fuel pump unit.<br/>(See <b>FUEL PUMP UNIT REMOVAL/ INSTALLATION [MZI 3.7 V6] .)</b></li> </ul>                                                                                                                                                           |
| 16 | <b>INSPECT PCV VALVE</b><br><br><b>NOTE:</b> <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.<br/><br/>(See <b>POSITIVE CRANKCASE VENTILATION (PCV) VALVE INSPECTION [MZI 3.7 V6] .)</b></li> <li>Is there any malfunction?</li> </ul>                                                                                                                                                                                          | Yes | Replace the PCV valve.<br><br>(See <b>POSITIVE CRANKCASE VENTILATION (PCV) VALVE REMOVAL/ INSTALLATION [MZI 3.7 V6] .)</b>                                                                                                                                                                                                                   |
|    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | No  | Go to the next step.                                                                                                                                                                                                                                                                                                                         |
| 17 | <b>INSPECT STARTING SYSTEM</b> <ul style="list-style-type: none"> <li>Inspect the starting system.<br/><br/>(See <b>STARTER INSPECTION [MZI 3.7 V6] .)</b></li> <li>Is the starting system normal?</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                      | Yes | Inspect for loose connectors or poor terminal contact. <ul style="list-style-type: none"> <li>If connectors are normal, inspect the PCV valve.<br/><br/>(See <b>POSITIVE CRANKCASE VENTILATION (PCV) VALVE INSPECTION [MZI 3.7 V6] .)</b></li> <li>Repair or replace the malfunctioning part according to the inspection results.</li> </ul> |
|    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | No  | Repair or replace the malfunctioning part according to the inspection results.                                                                                                                                                                                                                                                               |
| 18 | Verify test results. <ul style="list-style-type: none"> <li>If normal, return to diagnostic index to service any additional symptoms.<br/><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> |     |                                                                                                                                                                                                                                                                                                                                              |

2012 - Mazda6 - Engine

NO.4 HARD TO START/ LONG CRANK/ ERRATIC START/ ERRATIC CRANK [MZI 3.7 V6]

|                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|----------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 4              | HARD TO START/LONG CRANK/ERRATIC START/ERRATIC CRANK                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| DESCRIPTION    | <ul style="list-style-type: none"><li>• The starter cranks engine at normal speed but engine requires excessive cranking time before starting.</li><li>• The battery is in normal condition.</li></ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| POSSIBLE CAUSE | <ul style="list-style-type: none"><li>• Vacuum leakage</li><li>• Poor fuel quality</li><li>• Air leakage or restriction in intake-air system</li><li>• Low or dead battery</li><li>• Charging system malfunction</li><li>• PCM DTC is stored.</li><li>• Engine overheating</li><li>• Purge solenoid valve malfunction</li><li>• MAF sensor contamination</li><li>• Incorrect MAF sensor ground voltage</li><li>• Improper operation of drive-by-wire control system</li><li>• Restriction in exhaust system</li><li>• Open circuit in PCM ground circuit</li><li>• Ignition coil related circuit malfunction</li><li>• Erratic signal to ignition coil</li><li>• Spark plug malfunction</li><li>• Erratic signal from CKP sensor</li><li>• Erratic signal from CMP sensor</li><li>• Inadequate fuel pressure<ul style="list-style-type: none"><li>▪ Open or short circuit in fuel pump and related wiring harness</li><li>▪ Fuel pump mechanical malfunction</li><li>▪ Fuel line clogged</li><li>▪ Pressure regulator malfunction (built-in fuel pump unit)</li></ul></li><li>• Fuel leakage from fuel system</li><li>• PCV valve malfunction</li><li>• Starting system malfunction</li><li>• Electrical connector loose or terminal poor contact</li></ul> <p><b>WARNING:</b></p> <ul style="list-style-type: none"><li>• The following troubleshooting flow chart contains the fuel system diagnosis and repair procedures. Read the following warnings before servicing the fuel system:</li></ul> |

- 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>INSPECT RELATED PART CONDITION</b> <ul style="list-style-type: none"> <li>• Inspect for the following: <ul style="list-style-type: none"> <li>▪ Vacuum leakage</li> <li>▪ Proper fuel quality (such as proper octane, contamination, winter/summer blend)</li> <li>▪ Loose bands on intake-air system</li> <li>▪ Cracks on intake-air system parts</li> <li>▪ Intake-air system restriction (such as air cleaner element, fresh air duct)</li> <li>▪ Low or dead battery</li> <li>▪ Charging system malfunction</li> </ul> </li> <li>• Are all items normal?</li> </ul> | Yes     | Go to the next step.                                                                                                                                       |
|      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | No      | Repair or replace the malfunctioning part according to the inspection results.<br>Repeat Step 1.                                                           |
| 2    | <b>VERIFY PCM DTC</b> <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> (See <a href="#">ON-BOARD DIAGNOSTIC TEST [MZI 3.7 V6]</a> .) <ul style="list-style-type: none"> <li>• Are there any DTCs displayed?</li> </ul>                                                                                                                                                                                                                                                            | Yes     | DTC is displayed: <ul style="list-style-type: none"> <li>• Go to the appropriate DTC inspection.</li> </ul> (See <a href="#">DTC TABLE [MZI 3.7 V6]</a> .) |
|      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | No      | No DTC is displayed: <ul style="list-style-type: none"> <li>• Go to the next step.</li> </ul>                                                              |
| 3    | <b>VERIFY IF MALFUNCTION CAUSE IS OVERHEATING</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Yes     | Go to the symptom troubleshooting "NO.17 COOLING SYSTEM CONCERNS-OVERHEATING".                                                                             |

|    |                                                                                                                                                                                                                                                                                             |     |                                                                                                                                                                                                                          |
|----|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|    | <ul style="list-style-type: none"> <li>Is the engine overheating?</li> </ul>                                                                                                                                                                                                                |     | (See <b>NO.17 COOLING SYSTEM CONCERNS-OVERHEATING [MZI 3.7 V6] .</b> )                                                                                                                                                   |
|    |                                                                                                                                                                                                                                                                                             | No  | Go to the next step.                                                                                                                                                                                                     |
| 4  | <b>DETERMINE IF MALFUNCTION CAUSE IS EVAP CONTROL SYSTEM OR OTHER</b> <ul style="list-style-type: none"> <li>Disconnect a vacuum hose from purge solenoid valve and plug opening end of vacuum hose.</li> <li>Start the engine.</li> <li>Is the starting condition improved?</li> </ul>     | Yes | Inspect if the purge solenoid valve is stuck open.<br><br>Repair or replace the malfunctioning part according to the inspection results.                                                                                 |
|    |                                                                                                                                                                                                                                                                                             | No  | Go to the next step.                                                                                                                                                                                                     |
| 5  | <b>INSPECT MAF SENSOR</b> <ul style="list-style-type: none"> <li>Inspect the MAF sensor for following:               <ul style="list-style-type: none"> <li>Contamination</li> <li>MAF sensor terminal B voltage (ground circuit)</li> </ul> </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.                                                                                                                                                                                                     |
| 6  | <b>DETERMINE IF MALFUNCTION CAUSE IS DRIVE-BY-WIRE CONTROL SYSTEM OR OTHER</b> <ul style="list-style-type: none"> <li>Attempt to start the engine at part throttle.</li> <li>Does the engine run smoothly at part throttle?</li> </ul>                                                      | Yes | Inspect the drive-by-wire control system operation.<br><br>(See <b>ENGINE CONTROL SYSTEM OPERATION INSPECTION [MZI 3.7 V6] .</b> )<br><br>Repair or replace the malfunctioning part according to the inspection results. |
|    |                                                                                                                                                                                                                                                                                             | No  | Go to the next step.                                                                                                                                                                                                     |
| 7  | <b>INSPECT PCM FOR POOR GROUND</b> <ul style="list-style-type: none"> <li>Verify the PCM ground point condition.</li> <li>Is there any ground point looseness or lifting in the PCM?</li> </ul>                                                                                             | Yes | Repair the ground point and lifting.                                                                                                                                                                                     |
|    |                                                                                                                                                                                                                                                                                             | No  | Go to the next step.                                                                                                                                                                                                     |
| 8  | <b>INSPECT DEFORMED IN EXHAUST SYSTEM</b> <ul style="list-style-type: none"> <li>Visually inspect the exhaust system part.</li> <li>Is there any deformed exhaust system part?</li> </ul>                                                                                                   | Yes | Repair or replace the malfunctioning part according to the inspection results.                                                                                                                                           |
|    |                                                                                                                                                                                                                                                                                             | No  | Go to the next step.                                                                                                                                                                                                     |
| 9  | <b>INSPECT IGNITION SYSTEM RELATED WIRING HARNESS</b> <ul style="list-style-type: none"> <li>Inspect the ignition coil related wiring harness condition (intermittent open or short circuit) for all cylinders.</li> <li>Are wiring harness conditions normal?</li> </ul>                   | Yes | Go to the next step.                                                                                                                                                                                                     |
|    |                                                                                                                                                                                                                                                                                             | No  | Repair or replace suspect wiring harness and connector.                                                                                                                                                                  |
| 10 | <b>INSPECT IGNITION SYSTEM OPERATION</b> <ul style="list-style-type: none"> <li>Perform the spark test.</li> </ul> (See <b>ENGINE CONTROL SYSTEM OPERATION INSPECTION [MZI 3.7 V6] .</b> )                                                                                                  | Yes | Go to the next step.                                                                                                                                                                                                     |
|    |                                                                                                                                                                                                                                                                                             | No  | Repair or replace the malfunctioning part according to the inspection results.                                                                                                                                           |



|    |                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |  |
|----|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|
|    | <ul style="list-style-type: none"> <li>Is strong blue spark visible at each cylinder?</li> </ul>                                                                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |  |
| 11 | <b>VERIFY SPARK PLUG CONDITION</b> <ul style="list-style-type: none"> <li>Verify the spark plug conditions when the spark plug removed in Step 10.</li> <li>Is spark plug wet, covered with carbon or grayish white?</li> </ul>                                                                                   | Yes         Spark plug is wet or covered with carbon: <ul style="list-style-type: none"> <li>Inspect for fuel leakage from fuel injector.</li> </ul> Spark plug is grayish white: <ul style="list-style-type: none"> <li>Inspect the fuel injector for clogging.</li> </ul> Repair or replace the malfunctioning part according to the inspection results.                                                                                                                                                                                                                                                                                                                           |  |
|    |                                                                                                                                                                                                                                                                                                                   | No         Install the spark plugs on original cylinders.<br>Go to the next step.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |  |
| 12 | <b>INSPECT CKP SENSOR</b> <ul style="list-style-type: none"> <li>Inspect the CKP sensor.<br/>(See <b>CRANKSHAFT POSITION (CKP) 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.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |  |
| 13 | <b>INSPECT CMP SENSOR</b> <ul style="list-style-type: none"> <li>Inspect the CMP sensors.<br/>(See <b>CRANKSHAFT POSITION (CKP) 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.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |  |
| 14 | <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>Measure the fuel line pressure.<br/>(See <b>FUEL LINE PRESSURE INSPECTION [MZI 3.7 V6].</b>)</li> <li>Is the fuel line pressure correct?</li> </ul> | Yes         Go to the next step.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |  |
|    |                                                                                                                                                                                                                                                                                                                   | No         Zero or low: <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)<br/>(See <b>FUEL PUMP UNIT REMOVAL/ INSTALLATION [MZI 3.7 V6].</b>)</li> </ul> </li> </ul> </li> </ul> High: <ul style="list-style-type: none"> <li>Replace the fuel pump unit. (Pressure regulator malfunction)<br/>(See <b>FUEL PUMP UNIT REMOVAL/ INSTALLATION [MZI 3.7 V6].</b>)</li> </ul> |  |
| 15 | <b>INSPECT FUEL LINE HOLD PRESSURE FOR FUEL LEAKAGE</b> <ul style="list-style-type: none"> <li>Is the fuel line pressure held after ignition is switched to off?<br/>(See <b>FUEL LINE PRESSURE</b></li> </ul>                                                                                                    | Yes         Go to the next step.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |  |
|    |                                                                                                                                                                                                                                                                                                                   | No         Inspect the fuel injector.<br>(See <b>FUEL INJECTOR INSPECTION [MZI 3.7 V6].</b> )                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |  |

