

## 2012 - Mazda6 - Transmission/ Transaxle

### DTC P0731:00 [AY6A-EL]

|                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
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| DTC<br>P0731:00        | Gear 1 incorrect ratio                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| DETECTION<br>CONDITION | <ul style="list-style-type: none"><li>• Conditions: ATF temperature 20 °C {68 °F} or more, speed sensor normal, TCM communication normal, accelerator pedal position 10% or more, driving in D position, 1GR</li><li>• Circumstances: Not in 1GR ratio detected</li><li>• Time period: Determined after 5 times lasting 0.5 or more seconds</li></ul> <p><b>Diagnostic support note:</b></p> <ul style="list-style-type: none"><li>• The MIL illuminates if the TCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the TCM.</li><li>• The AT warning light illuminates.</li><li>• PENDING CODE is available.</li><li>• FREEZE FRAME DATA is available.</li><li>• The DTC is stored in the TCM memory.</li></ul> |
| FAIL-SAFE<br>FUNCTION  | <ul style="list-style-type: none"><li>• Emergency mode 2</li></ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| POSSIBLE<br>CAUSE      | <ul style="list-style-type: none"><li>• Deteriorated ATF</li><li>• ATF level low</li><li>• Line pressure malfunction</li><li>• Stall speed malfunction</li><li>• Solenoid valve malfunction<ul style="list-style-type: none"><li>▪ Line pressure control solenoid</li><li>▪ Shift solenoid D</li><li>▪ Shift solenoid E</li><li>▪ Shift solenoid F</li></ul></li></ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                   |

|                              |                                                                                                                                                                                                                                                                                 |
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|                              | <p>Clutch/brake malfunction</p> <ul style="list-style-type: none"> <li>▪ C2 clutch</li> <li>▪ C3 clutch</li> <li>▪ B1 brake</li> </ul> <ul style="list-style-type: none"> <li>• ATX malfunction</li> <li>• Control valve body malfunction</li> <li>• TCM malfunction</li> </ul> |
| <b>SYSTEM WIRING DIAGRAM</b> | —                                                                                                                                                                                                                                                                               |

### Diagnostic procedure

| STEP | INSPECTION                                                                                                                                                                                                                                           | ACTION |                                                                                                                                                                                     |
|------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1    | <b>VERIFY FREEZE FRAME DATA HAS BEEN RECORDED</b> <ul style="list-style-type: none"> <li>• Has the FREEZE FRAME DATA been recorded on the repair order?</li> </ul>                                                                                   | Yes    | Go to the next step.                                                                                                                                                                |
|      |                                                                                                                                                                                                                                                      | No     | Record the FREEZE FRAME DATA on the repair order, then go to the next step.                                                                                                         |
| 2    | <b>VERIFY RELATED REPAIR INFORMATION AVAILABILITY</b> <ul style="list-style-type: none"> <li>• Verify related Service Bulletins and/or on-line repair information availability.</li> <li>• Is any related repair information available?</li> </ul>   | Yes    | Perform repair or diagnosis according to the available repair information. <ul style="list-style-type: none"> <li>• If the vehicle is not repaired, go to the next step.</li> </ul> |
|      |                                                                                                                                                                                                                                                      | No     | Go to the next step.                                                                                                                                                                |
| 3    | <b>INSPECT FOR ATF LEAKAGE</b> <ul style="list-style-type: none"> <li>• Verify that there is no ATF leaking from the transaxle case, and the connecting surfaces of the transaxle and the engine.</li> <li>• Is any ATF leakage verified?</li> </ul> | Yes    | After repairing the spot where there is ATF leakage, adjust the ATF level, then go to Step 8.<br><br>(See <b>AUTOMATIC TRANSAXLE FLUID (ATF) LEVEL ADJUSTMENT [AY6A-EL]</b> .)      |
|      |                                                                                                                                                                                                                                                      | No     | Go to the next step.                                                                                                                                                                |
| 4    | <b>INSPECT ATF CONDITION</b> <ul style="list-style-type: none"> <li>• Inspect the ATF condition.<br/><br/>               (See <b>AUTOMATIC TRANSAXLE FLUID (ATF) INSPECTION [AY6A-EL]</b> .)</li> <li>• Is it normal?</li> </ul>                     | Yes    | Go to the next step.                                                                                                                                                                |
|      |                                                                                                                                                                                                                                                      | No     | Replace the ATF, then go to Step 8.<br><br>(See <b>AUTOMATIC TRANSAXLE FLUID (ATF) REPLACEMENT [AY6A-EL]</b> .)                                                                     |

|   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |     |                                                                                                      |
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| 5 | <b>INSPECT LINE PRESSURE</b> <ul style="list-style-type: none"> <li>Perform the "Line Pressures Test".<br/>(See <b>MECHANICAL SYSTEM TEST [AY6A-EL]</b>.)</li> <li>Is there any malfunction?</li> </ul>                                                                                                                                                                                                                                                                                                                                                                 | Yes | Repair or replace malfunctioning part according to test result, then go to Step 8.                   |
|   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | No  | Go to the next step.                                                                                 |
| 6 | <b>INSPECT STALL SPEED</b> <ul style="list-style-type: none"> <li>Perform the "Stall Test".<br/>(See <b>MECHANICAL SYSTEM TEST [AY6A-EL]</b>.)</li> <li>Is there any malfunction?</li> </ul>                                                                                                                                                                                                                                                                                                                                                                            | Yes | Repair or replace malfunctioning part according to test result, then go to Step 8.                   |
|   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | No  | Go to the next step.                                                                                 |
| 7 | <b>INSPECT SOLENOID VALVE</b> <ul style="list-style-type: none"> <li>Inspect the following solenoid valves: <ul style="list-style-type: none"> <li>Line pressure control solenoid<br/>(See <b>LINE PRESSURE CONTROL SOLENOID INSPECTION [AY6A-EL]</b>.)</li> <li>Shift solenoid D<br/>(See <b>SHIFT SOLENOID D INSPECTION [AY6A-EL]</b>.)</li> <li>Shift solenoid E<br/>(See <b>SHIFT SOLENOID E INSPECTION [AY6A-EL]</b>.)</li> <li>Shift solenoid F<br/>(See <b>SHIFT SOLENOID F INSPECTION [AY6A-EL]</b>.)</li> </ul> </li> <li>Is there any malfunction?</li> </ul> | Yes | Replace malfunctioning part according to test result, then go to the next step.                      |
|   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | No  | Go to the next step.                                                                                 |
| 8 | <b>VERIFY DTC TROUBLESHOOTING COMPLETED</b> <ul style="list-style-type: none"> <li>Make sure to reconnect all the disconnected connectors.</li> <li>Clear the DTC using the M-MDS.</li> <li>Perform the following procedure to ensure that the DTC has been resolved: <ul style="list-style-type: none"> <li>Start the engine.</li> <li>Warm up the engine to normal operating temperature.</li> </ul> </li> </ul>                                                                                                                                                      | Yes | Replace the TCM, then go to the next step.<br><br>(See <b>TCM REMOVAL/ INSTALLATION [AY6A-EL]</b> .) |
|   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | No  | Go to the next step.                                                                                 |

|   |                                                                                                                                                                                                                                    |     |                                                                                                           |
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|   | <ul style="list-style-type: none"> <li>◦ Drive the vehicle in D position, at 10 km/h {6 mph} or more for 2 s or more.</li> <li>• Is the PENDING CODE same as the DTC present?</li> </ul>                                           |     |                                                                                                           |
| 9 | <b>VERIFY NO DTCs ARE PRESENT</b> <ul style="list-style-type: none"> <li>• Perform the "Reading DTCs Procedure".<br/>(See <b>ON-BOARD DIAGNOSTIC SYSTEM DTC INSPECTION [AY6A-EL]</b>.)</li> <li>• Are any DTCs present?</li> </ul> | Yes | Go to the applicable DTC inspection.<br><br>(See <b>ON-BOARD DIAGNOSTIC SYSTEM DTC TABLE [AY6A-EL]</b> .) |
|   |                                                                                                                                                                                                                                    | No  | DTC troubleshooting completed.                                                                            |

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| DTC<br>P0731:00        | Gear 1 incorrect ratio                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| DETECTION<br>CONDITION | <ul style="list-style-type: none"><li>• Conditions: ATF temperature 20 °C {68 °F} or more, speed sensor normal, TCM communication normal, accelerator pedal position 10% or more, driving in D position, 1GR</li><li>• Circumstances: Not in 1GR ratio detected</li><li>• Time period: Determined after 5 times lasting 0.5 or more seconds</li></ul> <p><b>Diagnostic support note:</b></p> <ul style="list-style-type: none"><li>• The MIL illuminates if the TCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the TCM.</li><li>• The AT warning light illuminates.</li><li>• PENDING CODE is available.</li><li>• FREEZE FRAME DATA is available.</li><li>• The DTC is stored in the TCM memory.</li></ul> |
| FAIL-SAFE<br>FUNCTION  | <ul style="list-style-type: none"><li>• Emergency mode 2</li></ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| POSSIBLE<br>CAUSE      | <ul style="list-style-type: none"><li>• Deteriorated ATF</li><li>• ATF level low</li><li>• Line pressure malfunction</li><li>• Stall speed malfunction</li><li>• Solenoid valve malfunction<ul style="list-style-type: none"><li>▪ Line pressure control solenoid</li><li>▪ Shift solenoid D</li><li>▪ Shift solenoid E</li><li>▪ Shift solenoid F</li></ul></li></ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                   |

|                                      |                                                                                                                                                                                                                                                                                 |
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|                                      | <p>Clutch/brake malfunction</p> <ul style="list-style-type: none"> <li>▪ C2 clutch</li> <li>▪ C3 clutch</li> <li>▪ B1 brake</li> </ul> <ul style="list-style-type: none"> <li>• ATX malfunction</li> <li>• Control valve body malfunction</li> <li>• TCM malfunction</li> </ul> |
| <b>SYSTEM<br/>WIRING<br/>DIAGRAM</b> | —                                                                                                                                                                                                                                                                               |

### Diagnostic procedure

| STEP | INSPECTION                                                                                                                                                                                                                                           | ACTION |                                                                                                                                                                                     |
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| 1    | <b>VERIFY FREEZE FRAME DATA HAS BEEN RECORDED</b> <ul style="list-style-type: none"> <li>• Has the FREEZE FRAME DATA been recorded on the repair order?</li> </ul>                                                                                   | Yes    | Go to the next step.                                                                                                                                                                |
|      |                                                                                                                                                                                                                                                      | No     | Record the FREEZE FRAME DATA on the repair order, then go to the next step.                                                                                                         |
| 2    | <b>VERIFY RELATED REPAIR INFORMATION AVAILABILITY</b> <ul style="list-style-type: none"> <li>• Verify related Service Bulletins and/or on-line repair information availability.</li> <li>• Is any related repair information available?</li> </ul>   | Yes    | Perform repair or diagnosis according to the available repair information. <ul style="list-style-type: none"> <li>• If the vehicle is not repaired, go to the next step.</li> </ul> |
|      |                                                                                                                                                                                                                                                      | No     | Go to the next step.                                                                                                                                                                |
| 3    | <b>INSPECT FOR ATF LEAKAGE</b> <ul style="list-style-type: none"> <li>• Verify that there is no ATF leaking from the transaxle case, and the connecting surfaces of the transaxle and the engine.</li> <li>• Is any ATF leakage verified?</li> </ul> | Yes    | After repairing the spot where there is ATF leakage, adjust the ATF level, then go to Step 8.<br><br>(See <b>AUTOMATIC TRANSAXLE FLUID (ATF) LEVEL ADJUSTMENT [AY6A-EL]</b> .)      |
|      |                                                                                                                                                                                                                                                      | No     | Go to the next step.                                                                                                                                                                |
| 4    | <b>INSPECT ATF CONDITION</b> <ul style="list-style-type: none"> <li>• Inspect the ATF condition.<br/><br/>               (See <b>AUTOMATIC TRANSAXLE FLUID (ATF) INSPECTION [AY6A-EL]</b> .)</li> <li>• Is it normal?</li> </ul>                     | Yes    | Go to the next step.                                                                                                                                                                |
|      |                                                                                                                                                                                                                                                      | No     | Replace the ATF, then go to Step 8.<br><br>(See <b>AUTOMATIC TRANSAXLE FLUID (ATF) REPLACEMENT [AY6A-EL]</b> .)                                                                     |

|   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |     |                                                                                                      |
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| 5 | <b>INSPECT LINE PRESSURE</b> <ul style="list-style-type: none"> <li>Perform the "Line Pressures Test".<br/>(See <b>MECHANICAL SYSTEM TEST [AY6A-EL]</b>.)</li> <li>Is there any malfunction?</li> </ul>                                                                                                                                                                                                                                                                                                                                                                 | Yes | Repair or replace malfunctioning part according to test result, then go to Step 8.                   |
|   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | No  | Go to the next step.                                                                                 |
| 6 | <b>INSPECT STALL SPEED</b> <ul style="list-style-type: none"> <li>Perform the "Stall Test".<br/>(See <b>MECHANICAL SYSTEM TEST [AY6A-EL]</b>.)</li> <li>Is there any malfunction?</li> </ul>                                                                                                                                                                                                                                                                                                                                                                            | Yes | Repair or replace malfunctioning part according to test result, then go to Step 8.                   |
|   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | No  | Go to the next step.                                                                                 |
| 7 | <b>INSPECT SOLENOID VALVE</b> <ul style="list-style-type: none"> <li>Inspect the following solenoid valves: <ul style="list-style-type: none"> <li>Line pressure control solenoid<br/>(See <b>LINE PRESSURE CONTROL SOLENOID INSPECTION [AY6A-EL]</b>.)</li> <li>Shift solenoid D<br/>(See <b>SHIFT SOLENOID D INSPECTION [AY6A-EL]</b>.)</li> <li>Shift solenoid E<br/>(See <b>SHIFT SOLENOID E INSPECTION [AY6A-EL]</b>.)</li> <li>Shift solenoid F<br/>(See <b>SHIFT SOLENOID F INSPECTION [AY6A-EL]</b>.)</li> </ul> </li> <li>Is there any malfunction?</li> </ul> | Yes | Replace malfunctioning part according to test result, then go to the next step.                      |
|   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | No  | Go to the next step.                                                                                 |
| 8 | <b>VERIFY DTC TROUBLESHOOTING COMPLETED</b> <ul style="list-style-type: none"> <li>Make sure to reconnect all the disconnected connectors.</li> <li>Clear the DTC using the M-MDS.</li> <li>Perform the following procedure to ensure that the DTC has been resolved: <ul style="list-style-type: none"> <li>Start the engine.</li> <li>Warm up the engine to normal operating temperature.</li> </ul> </li> </ul>                                                                                                                                                      | Yes | Replace the TCM, then go to the next step.<br><br>(See <b>TCM REMOVAL/ INSTALLATION [AY6A-EL]</b> .) |
|   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | No  | Go to the next step.                                                                                 |

|   |                                                                                                                                                                                                                                    |           |                                                                                                                                         |
|---|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|-----------------------------------------------------------------------------------------------------------------------------------------|
|   | <ul style="list-style-type: none"> <li>◦ Drive the vehicle in D position, at 10 km/h {6 mph} or more for 2 s or more.</li> <li>• Is the PENDING CODE same as the DTC present?</li> </ul>                                           |           |                                                                                                                                         |
| 9 | <b>VERIFY NO DTCs ARE PRESENT</b> <ul style="list-style-type: none"> <li>• Perform the "Reading DTCs Procedure".<br/>(See <b>ON-BOARD DIAGNOSTIC SYSTEM DTC INSPECTION [AY6A-EL]</b>.)</li> <li>• Are any DTCs present?</li> </ul> | Yes<br>No | Go to the applicable DTC inspection.<br>(See <b>ON-BOARD DIAGNOSTIC SYSTEM DTC TABLE [AY6A-EL]</b> .)<br>DTC troubleshooting completed. |