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## 2017 MAZDA BT-50 OEM Service and Repair Workshop Manual

Go to manual page

# AUTO OPEN OPERATION NOT PERFORMED [POWER LIFTGATE (PLG) SYSTEM]

SM2899190

id0903c909020

Caution

• If the power supply voltage of the power liftgate (PLG) control module is less than 5 V, the fail-safe function disables the power liftgate (PLG) system operation. To cancel the fail-safe function, it is necessary to disconnect and reconnect the negative battery terminal while the power supply voltage of the power liftgate (PLG) control module is 10.5 V or more.
• If the negative battery terminal is disconnected with the power liftgate (PLG) fully opened or half-open, the auto open/close operation is disabled. In this case, it is necessary to perform the power liftgate (PLG) initial setting when the negative battery terminal is reconnected. (See POWER LIFTGATE (PLG) INITIALIZATION PROCEDURE.)

| | |
|---|---|
| Description | • Auto open operation is not performed with the ignition switched ON (engine off or on). |
| Possible Causes | Note<br><br>The power liftgate may not operate under the following conditions:<br>• Vehicle is parked on a steep incline.<br>• Vehicle is parked on a steep decline.<br>• Strong winds are present.<br>• The power liftgate has a substantial amount of snow on it.<br>• Liftgate opener switch malfunction<br>• Liftgate latch and lock actuator malfunction<br>• Power liftgate (PLG) front switch malfunction<br>• Remote transmitter malfunction<br>• Power liftgate (PLG) drive unit malfunction<br>• Power liftgate (PLG) control module malfunction<br>• Open circuit in wiring harness between the following terminals:<br>— Power liftgate (PLG) control module terminal 1Z and liftgate opener switch terminal B<br>— Power liftgate (PLG) control module terminal 1AC and power liftgate (PLG) front switch terminal F<br>— Power liftgate (PLG) control module terminal 1Y and power liftgate (PLG) front switch terminal D<br>• Short to ground in wiring harness between the following terminals:<br>— Power liftgate (PLG) control module terminal 1Z and liftgate opener switch terminal B<br>— Power liftgate (PLG) control module terminal 1AC and power liftgate (PLG) front switch terminal F<br>— Power liftgate (PLG) control module terminal 1Y and power liftgate (PLG) front switch terminal D |



## Diagnostic Procedure

| Step | Inspection | | Action |
|---|---|---|---|
| 1 | **DETERMINE IF MALFUNCTION CAUSE IS POWER LIFTGATE (PLG) CONTROL MODULE OR SWITCH**<br>• Operate all the following switches and verify that the auto close operation is not performed.<br>— Liftgate opener switch<br>— Power liftgate (PLG) front switch<br>— Power liftgate (PLG) rear switch<br>— Power liftgate (PLG) button of remote transmitter<br>• Is the auto close operation performed by any of the switches? | Yes | Verify the operation condition by operating each switch.<br>• If the auto close operation is not performed by the liftgate opener switch:<br>Go to Step 2.<br>• If the auto close operation is not performed by the power liftgate (PLG) front switch:<br>Go to Step 4.<br>• If the auto close operation is not performed by the power liftgate (PLG) rear switch:<br>Go to Step 6.<br>• If the auto close operation is not performed by the remote transmitter:<br>Go to Step 8. |
| | | No | Go to Step 9. |
| 2 | **VERIFY IF MALFUNCTION CAUSE IS OPEN CIRCUIT IN WIRING HARNESS BETWEEN POWER LIFTGATE (PLG) CONTROL MODULE AND LIFTGATE LATCH AND LOCK ACTUATOR**<br>• Disconnect the negative battery terminal. (See NEGATIVE BATTERY TERMINAL DISCONNECTION/CONNECTION.)<br>• Inspect the wiring harness for continuity between the following terminals (vehicle wiring harness side).<br>— Power liftgate (PLG) control module terminal 1Z and liftgate opener switch terminal B<br>• Is there continuity? | Yes | Go to the next step. |
| | | No | • Repair or replace the wiring harness which has an open circuit.<br>• After performing the repair, go to Step 9. |
| 3 | **VERIFY IF MALFUNCTION CAUSE IS SHORT TO GROUND IN WIRING HARNESS BETWEEN POWER LIFTGATE (PLG) CONTROL MODULE AND LIFTGATE OPENER SWITCH**<br>• Disconnect the negative battery terminal. (See NEGATIVE BATTERY TERMINAL DISCONNECTION/CONNECTION.)<br>• Disconnect the power liftgate (PLG) control module connector.<br>• Inspect the wiring harness for continuity between the following terminals (vehicle wiring harness side).<br>— Power liftgate (PLG) control module terminal 1Z and ground<br>• Is there continuity? | Yes | • Repair or replace the wiring harness which is shorted to ground.<br>• After performing the repair, go to Step 9. |
| | | No | Replace the liftgate opener switch, then go to Step 9.<br>(See LIFTGATE OPENER SWITCH REMOVAL/INSTALLATION.) |
| 4 | **VERIFY IF MALFUNCTION CAUSE IS OPEN CIRCUIT IN WIRING HARNESS BETWEEN POWER LIFTGATE (PLG) CONTROL MODULE AND POWER LIFTGATE (PLG) FRONT SWITCH**<br>• Disconnect the negative battery terminal. (See NEGATIVE BATTERY TERMINAL DISCONNECTION/CONNECTION.)<br>• Inspect the wiring harness for continuity between the following terminals (vehicle wiring harness side).<br>— Power liftgate (PLG) control module terminal 1AC and power liftgate (PLG) front switch terminal F<br>— Power liftgate (PLG) control module terminal 1Y and power liftgate (PLG) front switch terminal D<br>• Is there continuity? | Yes | Go to the next step. |
| | | No | • Repair or replace the wiring harness which has an open circuit.<br>• After performing the repair, go to Step 9. |

# POWER LIFTGATE (PLG) BUZZER NOT ACTIVATED [POWER LIFTGATE (PLG) SYSTEM]

SM2899193

id0903c909050

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|---|---|
| Description | • The power liftgate (PLG) buzzer is not activated during power liftgate (PLG) operation. |
| Possible Causes | • Open circuit in wiring harness between the following terminals:<br>— Power liftgate (PLG) control module terminal 1R and power liftgate (PLG) buzzer terminal B<br>— Power liftgate (PLG) buzzer terminal A and ground<br>• Short to ground in wiring harness between the following terminals:<br>— Power liftgate (PLG) control module terminal 1R and power liftgate (PLG) buzzer terminal B<br>• Power liftgate (PLG) buzzer malfunction |

## Diagnostic Procedure

| Step | Inspection | | Action |
|---|---|---|---|
| 1 | VERIFY IF MALFUNCTION CAUSE IS SHORT TO GROUND IN WIRING HARNESS BETWEEN POWER LIFTGATE (PLG) CONTROL MODULE AND POWER LIFTGATE (PLG) BUZZER<br>• Disconnect the negative battery terminal. (See NEGATIVE BATTERY TERMINAL DISCONNECTION/CONNECTION.)<br>• Disconnect the power liftgate (PLG) control module connector.<br>• Inspect the wiring harness for continuity between the following terminals (vehicle wiring harness side).<br>— Power liftgate (PLG) control module terminal 1R and ground<br>• Is there continuity? | Yes | • Repair or replace the wiring harness which is shorted to ground.<br>• After performing the repair, go to Step 3. |
| | | No | Go to the next step. |
| 2 | VERIFY IF MALFUNCTION CAUSE IS OPEN CIRCUIT IN WIRING HARNESS BETWEEN POWER LIFTGATE (PLG) CONTROL MODULE AND POWER LIFTGATE (PLG) BUZZER<br>• Disconnect the negative battery terminal. (See NEGATIVE BATTERY TERMINAL DISCONNECTION/CONNECTION.)<br>• Inspect the wiring harness for continuity between the following terminals (vehicle wiring harness side).<br>— Power liftgate (PLG) control module terminal 1R and power liftgate (PLG) buzzer terminal B<br>• Is there continuity? | Yes | Go to the next step. |
| | | No | • Repair or replace the wiring harness which has an open circuit.<br>• After performing the repair, go to the next step. |
| 3 | VERIFY IF MALFUNCTION CAUSE IS OPEN CIRCUIT IN WIRING HARNESS BETWEEN POWER LIFTGATE (PLG) BUZZER AND GROUND<br>• Disconnect the negative battery terminal. (See NEGATIVE BATTERY TERMINAL DISCONNECTION/CONNECTION.)<br>• Inspect the wiring harness for continuity between the following terminals (vehicle wiring harness side).<br>— Power liftgate (PLG) buzzer terminal A and ground<br>• Is there continuity? | Yes | Replace the power liftgate (PLG) buzzer, then go to the next step. (See POWER LIFTGATE (PLG) BUZZER REMOVAL/INSTALLATION.) |
| | | No | • Repair or replace the wiring harness which has an open circuit.<br>• After performing the repair, go to the next step. |

| Step | Inspection | | Action |
|---|---|---|---|
| 6 | **INSPECT WIRING HARNESS BETWEEN HEADLIGHT LEVELING ACTUATOR AND AUTO LEVELING CONTROL MODULE FOR SHORT TO GROUND**<br>• Inspect for continuity between body ground and the following terminals.<br>— Auto leveling control module terminal P<br>— Auto leveling control module terminal O<br>— Auto leveling control module terminal M<br>• Is there continuity? | Yes | Refer to the wiring diagram and verify if there is a common connector between the following terminals.<br>• Auto leveling control module terminal P–Headlight leveling actuator (LH)/(RH) terminal I<br>• Auto leveling control module terminal O–Headlight leveling actuator (LH)/(RH) terminal F<br>• Auto leveling control module terminal M–Headlight leveling actuator (LH)/(RH) terminal L<br>**If there is a common connector:**<br>• Inspect the common connector and terminals for corrosion, damage, or disconnection and the common wiring harnesses for short to ground to determine the malfunctioning location.<br>• Repair or replace the malfunctioning location and go to Step 7.<br>**If there is no common connector:**<br>• Repair or replace the wiring harness which is shorted to ground and go to Step 7. |
| | | No | Go to the next step. |
| 7 | **VERIFY IF MALFUNCTION CAUSE IS CORRECTED**<br>• Switch the ignition to ACC or ON (engine off or on).<br>• Does the LED headlight warning light illumination turn off? | Yes | Troubleshooting completed. (explain the contents of the servicing to the customer) |
| | | No | Verify the malfunction symptom in the symptom troubleshooting chart and perform the other applicable malfunction diagnosis. (See SYMPTOM TROUBLESHOOTING [HEADLIGHT AUTO LEVELING SYSTEM].) |

# FUEL GAUGE READING IS NOT CORRECT [INSTRUMENT CLUSTER]

SM2899198

id0903d501280

## Possible cause

- Instrument cluster malfunction
- Rear body control module (RBCM) malfunction
- Fuel gauge sender unit malfunction
- Open or short circuit in wiring harness between fuel gauge sensor unit and rear body control module (RBCM)

## Diagnostic Procedure

| Step | Inspection | Action | |
|---|---|---|---|
| 1 | **PERFORM CAN MALFUNCTION DIAGNOSIS AND DTC INSPECTION**<br>• Perform the CAN malfunction diagnosis according to the recommendation of FOREWORD [INSTRUMENT CLUSTER] malfunction diagnosis, and if there is no CAN malfunction, perform inspection for DTCs. (See DTC INSPECTION [INSTRUMENT CLUSTER].)<br>• Is the DTC displayed? | Yes | Go to the applicable DTC inspection. (See DTC TABLE [INSTRUMENT CLUSTER].) |
| | | No | Go to the next step. |
| 2 | **INSPECTION OF INSTRUMENT CLUSTER**<br>• Perform inspection of the fuel gauge/LCD display referring to the instrument cluster inspection. (See INSTRUMENT CLUSTER INSPECTION.)<br>• Is the display normal? | Yes | Go to the next step. |
| | | No | Replace the instrument cluster. (See INSTRUMENT CLUSTER REMOVAL/INSTALLATION.) |
| 3 | **DETERMINE IF MALFUNCTION CAUSE IS FUEL GAUGE SENDER**<br>• Display the following rear body control module (RBCM) PIDs using the M-MDS.<br>— FUEL_SEN_M<br>• Verify the voltage in the display monitor while shaking the vehicle.<br>• Does the voltage change? | Yes | Go to the next step. |
| | | No | Go to Step 5. |
| 4 | **DETERMINE IF MALFUNCTION CAUSE IS REAR BODY CONTROL MODULE (RBCM)**<br>• Display the following instrument cluster PIDs using the M-MDS.<br>— FUEL_SEN_M<br>• Verify the resistance in the display monitor while shaking the vehicle.<br>• Does the resistance change? | Yes | Replace the instrument cluster. (See INSTRUMENT CLUSTER REMOVAL/INSTALLATION.) |
| | | No | Replace the rear body control module (RBCM). (See REAR BODY CONTROL MODULE (RBCM) REMOVAL/INSTALLATION.) |

# ACTIVE DRIVING DISPLAY DOES NOT DISPLAY [INSTRUMENT CLUSTER]

SM2899200

id0903d501960

**Note**

**• If there is any vehicle malfunction complaint lodged by a customer, perform FOREWORD [INSTRUMENT CLUSTER] malfunction diagnosis according to the troubleshooting procedure. (See FOREWORD [INSTRUMENT CLUSTER].)**

## Possible Cause

• Active driving display malfunction
• Instrument cluster malfunction

## Diagnostic Procedure

| Step | Inspection | Action | |
|---|---|---|---|
| 1 | VISUALLY INSPECT ACTIVE DRIVING DISPLAY<br>• Switch the ignition ON (engine on).<br>• Visually inspect the active driving display for damage, dust, or dirt.<br>• Is there damage, foreign matter penetration, or dirt on the active driving display? | Yes | If the active driving display is damaged:<br>• Replace the active driving display. (See ACTIVE DRIVING DISPLAY REMOVAL/INSTALLATION.)<br>If there is foreign matter penetration or dirt on the active driving display:<br>• Remove foreign matter or dirt on the active driving display. |
| | | No | Go to the next step. |
| 2 | INSPECT ACTIVE DRIVING DISPLAY<br>• Inspect the active driving display. (See ACTIVE DRIVING DISPLAY INSPECTION.)<br>• Is the active driving display normal? | Yes | Go to the next step. |
| | | No | Replace the active driving display. (See ACTIVE DRIVING DISPLAY REMOVAL/INSTALLATION.) |
| 3 | VERIFY IF MALFUNCTION CAUSE IS CORRECTED<br>• Is the active driving display operating normally? | Yes | Troubleshooting completed (explain the contents of the servicing to the customer). |
| | | No | Replace the instrument cluster. (See INSTRUMENT CLUSTER REMOVAL/INSTALLATION.) |

# ENGINE COOLANT TEMPERATURE GAUGE INDICATION IS DEFECTIVE [INSTRUMENT CLUSTER]

SM2899203

id0903d502220

## Possible cause

• ECT sensor malfunction
• Instrument cluster malfunction

## Diagnostic Procedure

| Step | Inspection | Action | |
|---|---|---|---|
| 1 | PERFORM CAN MALFUNCTION DIAGNOSIS AND DTC INSPECTION<br>• Perform the CAN malfunction diagnosis according to the recommendation of FOREWORD [INSTRUMENT CLUSTER] malfunction diagnosis, and if there is no CAN malfunction, perform inspection for DTCs. (See DTC INSPECTION [INSTRUMENT CLUSTER].)<br>• Is the DTC displayed? | Yes | Go to the applicable DTC inspection. (See DTC TABLE [INSTRUMENT CLUSTER].) |
| | | No | Go to the next step. |
| 2 | INSPECT ECT SENSOR<br>• Inspect the ECT sensor. (See ENGINE COOLANT TEMPERATURE (ECT) SENSOR INSPECTION [SKYACTIV-D 2.2].) (See ENGINE COOLANT TEMPERATURE (ECT) SENSOR INSPECTION [SKYACTIV-G 2.5T].) (See ENGINE COOLANT TEMPERATURE (ECT) SENSOR INSPECTION [SKYACTIV-G 2.5 (WITHOUT CYLINDER DEACTIVATION)].) (See ENGINE COOLANT TEMPERATURE (ECT) SENSOR INSPECTION [SKYACTIV-G (WITHOUT EGR COOLER)].) (See ENGINE COOLANT TEMPERATURE (ECT) SENSOR INSPECTION [SKYACTIV-G (WITH EGR COOLER)].)<br>• Is the ECT sensor normal? | Yes | Replace the instrument cluster. (See INSTRUMENT CLUSTER REMOVAL/INSTALLATION.) |
| | | No | Replace the ECT sensor. (See ENGINE COOLANT TEMPERATURE (ECT) SENSOR REMOVAL/INSTALLATION [SKYACTIV-G 2.5 (WITH CYLINDER DEACTIVATION)].) (See ENGINE COOLANT TEMPERATURE (ECT) SENSOR REMOVAL/INSTALLATION [SKYACTIV-G 2.5 (WITHOUT CYLINDER DEACTIVATION)].) (See ENGINE COOLANT TEMPERATURE (ECT) SENSOR REMOVAL/INSTALLATION [SKYACTIV-D 2.2].) |

# SYMPTOM TROUBLESHOOTING [INSTRUMENT CLUSTER]

SM2899206

id0903d571510

| Troubleshooting item |
| --- |
| FUEL GAUGE READING IS NOT CORRECT<br>(See FUEL GAUGE READING IS NOT CORRECT [INSTRUMENT CLUSTER].) |
| LOW ENGINE COOLANT TEMPERATURE INDICATOR LIGHT/HIGH ENGINE COOLANT TEMPERATURE WARNING LIGHT ILLUMINATES OR FLASHES CONTINUOUSLY<br>(See LOW ENGINE COOLANT TEMPERATURE INDICATOR LIGHT/HIGH ENGINE COOLANT TEMPERATURE WARNING LIGHT ILLUMINATES OR FLASHES CONTINUOUSLY [INSTRUMENT CLUSTER].) |
| ACTIVE DRIVING DISPLAY DOES NOT DISPLAY<br>(See ACTIVE DRIVING DISPLAY DOES NOT DISPLAY [INSTRUMENT CLUSTER].) |
| ACTIVE DRIVING DISPLAY DOES NOT OPERATE<br>(See ACTIVE DRIVING DISPLAY DOES NOT OPERATE [INSTRUMENT CLUSTER].) |
| ACTIVE DRIVING DISPLAY DOES NOT DIM AUTOMATICALLY<br>(See ACTIVE DRIVING DISPLAY DOES NOT DIM AUTOMATICALLY [INSTRUMENT CLUSTER].) |
| ACTIVE DRIVING DISPLAY IS NOT SET TO CORRECT POSITION<br>(See ACTIVE DRIVING DISPLAY IS NOT SET TO CORRECT POSITION [INSTRUMENT CLUSTER].) |

| Step | Inspection | | Action |
|---|---|---|---|
| 14 | INSPECT IF MALFUNCTION CAUSE IS OPEN CIRCUIT IN WIRING HARNESS BETWEEN REQUEST SWITCH AND LF CONTROL UNIT<br>• Disconnect the negative battery terminal. (See NEGATIVE BATTERY TERMINAL DISCONNECTION/CONNECTION.)<br>• Disconnect the LF control unit and request switch connector.<br>• Inspect for continuity between the following terminals (vehicle wiring harness).<br>— Request switch (LF) terminal D and LF control unit terminal C<br>— Request switch (RF) terminal D and LF control unit terminal A<br>• Is there continuity? | Yes | Go to the next step. |
| | | No | • Repair or replace the wiring harness for an open circuit.<br>• After repair, go to the next step. |
| 15 | VERIFY IF MALFUNCTION CAUSE WAS CORRECTED<br>• Does the advanced keyless entry system operate normally? | Yes | Troubleshooting completed. (Explain the contents of the servicing to the customer.) |
| | | No | If the malfunction has not been resolved, repeat the inspection from Step 1. |