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## 1997 MAZDA MX-3 OEM Service and Repair Workshop Manual

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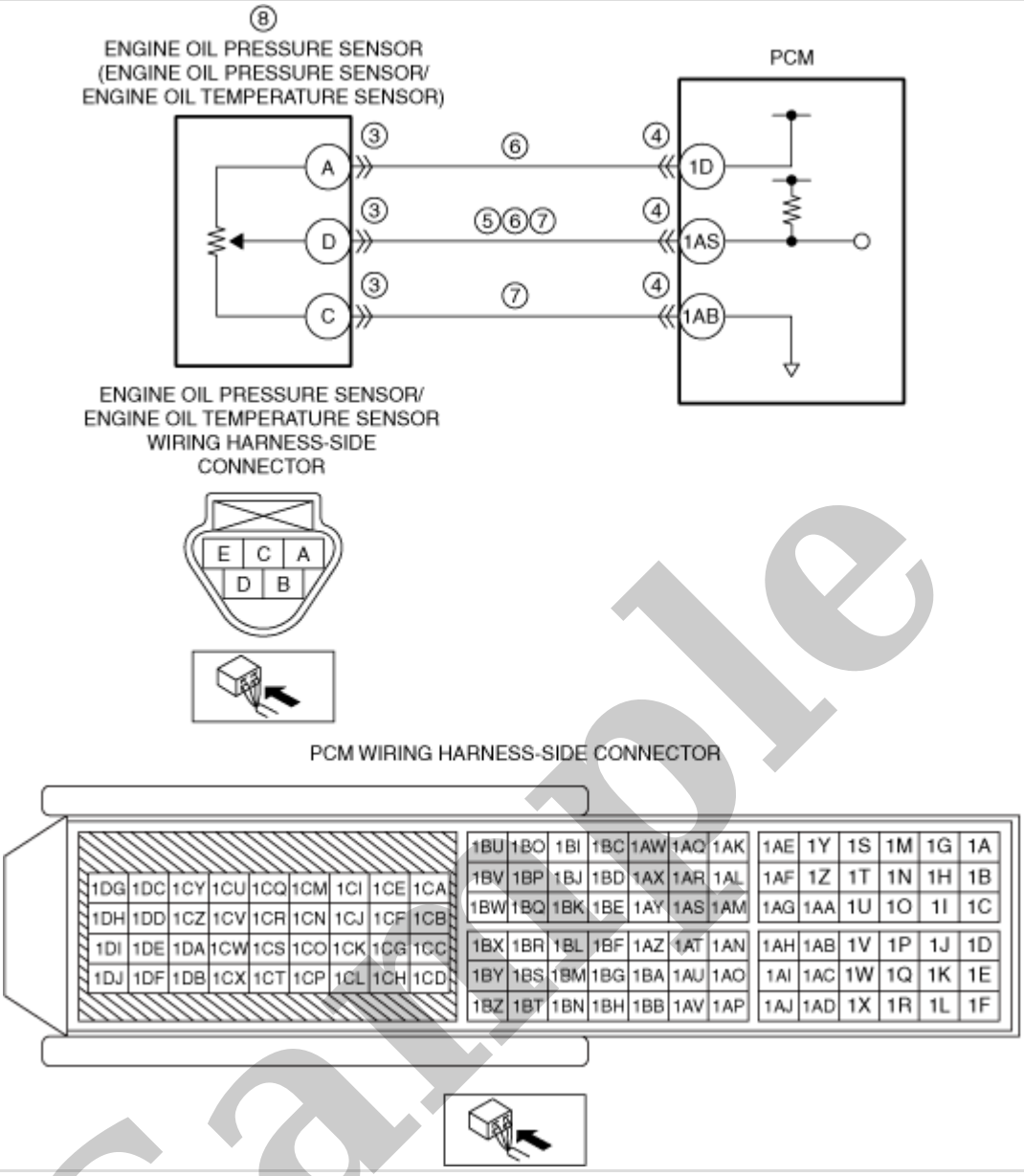
| STEP | INSPECTION | | ACTION |
|---|---|---|---|
| 3 | **INSPECT ENGINE OIL PRESSURE SENSOR/ENGINE OIL TEMPERATURE SENSOR CONNECTOR CONDITION**<br>• Switch the ignition off.<br>• Disconnect the engine oil pressure sensor/engine oil temperature sensor connector.<br>• Inspect for poor connection (such as damaged/pulled-out pins, corrosion).<br>• Is there any malfunction? | Yes | Repair or replace the connector and/or terminals, then go to Step 9. |
| | | No | Go to the next step. |
| 4 | **INSPECT PCM CONNECTOR CONDITION**<br>• Disconnect the PCM connector.<br>• Inspect for poor connection (such as damaged/pulled-out pins, corrosion).<br>• Is there any malfunction? | Yes | Repair or replace the connector and/or terminals, then go to Step 9. |
| | | No | Go to the next step. |
| 5 | **INSPECT ENGINE OIL PRESSURE SENSOR CIRCUIT FOR SHORT TO GROUND**<br>• Verify that the engine oil pressure sensor/engine oil temperature sensor and PCM connectors are disconnected.<br>• Inspect for continuity between the following terminals (wiring harness-side) and body ground:<br>— Engine oil pressure sensor/engine oil temperature sensor terminal A<br>— Engine oil pressure sensor/engine oil temperature sensor terminal D<br>• Is there continuity? | Yes | Refer to the wiring diagram and verify whether or not there is a common connector between the following terminals:<br>• Engine oil pressure sensor/engine oil temperature sensor terminal A—PCM terminal 1D<br>• Engine oil pressure sensor/engine oil temperature sensor terminal D—PCM terminal 1AS<br>**If there is a common connector:**<br>• Determine the malfunctioning part by inspecting the common connector and the terminal for corrosion, damage, or pin disconnection, and the common wiring harness for a short to ground.<br>• Repair or replace the malfunctioning part.<br>**If there is no common connector:**<br>• Repair or replace the wiring harness which has a short to ground.<br>Go to Step 9. |
| | | No | Go to the next step. |
| 6 | **INSPECT ENGINE OIL PRESSURE SENSOR SIGNAL CIRCUIT AND GROUND CIRCUIT FOR SHORT TO EACH OTHER**<br>• Verify that the engine oil pressure sensor/engine oil temperature sensor and PCM connectors are disconnected.<br>• Inspect for continuity between engine oil pressure sensor/engine oil temperature sensor terminals D and C (wiring harness-side).<br>• Is there continuity? | Yes | Refer to the wiring diagram and verify whether or not there is a common connector between the following terminals:<br>• Engine oil pressure sensor/engine oil temperature sensor terminal D—PCM terminal 1AS<br>• Engine oil pressure sensor/engine oil temperature sensor terminal C—PCM terminal 1AB<br>**If there is a common connector:**<br>• Determine the malfunctioning part by inspecting the common connector and the terminal for corrosion, damage, or pin disconnection, and the common wiring harness for a short to each other.<br>• Repair or replace the malfunctioning part.<br>**If there is no common connector:**<br>• Repair or replace the wiring harness which has a short to each other.<br>Go to Step 9. |
| | | No | Go to the next step. |

| DTC P0523:00 | Engine oil pressure sensor circuit high input |
|---|---|




Diagnostic Procedure

| STEP | INSPECTION | | ACTION |
|---|---|---|---|
| 1 | RECORD VEHICLE STATUS AT TIME OF DTC DETECTION TO UTILIZE WITH REPEATABILITY VERIFICATION<br>Note<br>• Recording can be facilitated using the screen capture function of the PC.<br>• Record the FREEZE FRAME DATA/snapshot data on the repair order. | – | Go to the next step. |

# DTC P3498:00, P349B:00 [PCM (SKYACTIV-G 2.5 (WITH CYLINDER DEACTIVATION))]

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**Note**

**• To determine the malfunctioning part, proceed with the diagnostics from "Function Inspection Using M-MDS".**

## Details On DTCs

| | | |
|---|---|---|
| DESCRIPTION | **Cylinder deactivation control system**<br>**• P3498:00: No.1 cylinder valve is stuck closed**<br>**• P349B:00: No.4 cylinder valve is stuck closed** | |
| DETECTION CONDITION | Determination conditions | • The crankshaft fluctuation rate exceeds the specified value for every 200 rotations of the crankshaft after recovery from cylinder deactivation control. |
| | Preconditions | • Battery voltage: 9–18 V *1<br>• Engine speed: 500–6,500 rpm *1<br>• Engine coolant temperature: 20 °C {68 °F} or more *1<br>• Fuel-cut control not implemented<br>• Crankshaft installation tolerance learning completed<br>• Engine condition is stabilized (not directly after gear change)<br>*1: Standard can be verified by displaying PIDs using the M-MDS |
| | Malfunction determination period | • 200 rotations of crankshaft (misfire which may damage catalytic converter) |
| | Drive cycle | • 1 |
| | Self test type | • CMDTC self test |
| | Sensor used | • CKP sensor<br>• MAF sensor<br>• MAP sensor |
| FAIL-SAFE FUNCTION | • Limits intake air amount<br>• Implement fuel-cut control (If cylinder is filled with fuel when valve is stuck closed, fuel-cut on No.1 or 4 cylinder is performed because engine could be damaged at compression stroke). | |
| VEHICLE STATUS WHEN DTCs ARE OUTPUT | • Possibility of engine damage occurring.<br>— Check engine light turns on<br>— Pending code is recorded<br>— Illuminates master warning light. (Without multi-information display)<br>— The master warning indication is displayed on the multi-information display. (With multi-information display)<br>• Rough idling, poor acceleration, stalling | |

| STEP | INSPECTION | RESULTS | ACTION |
|---|---|---|---|
| 1 | **PURPOSE: VERIFY RELATED REPAIR INFORMATION AVAILABILITY**<br>• Verify related Service Bulletins and/or on-line repair information availability.<br>• Is any related repair information available? | Yes | Perform repair or diagnosis according to the available repair information.<br>• If the vehicle is not repaired, go to the next step. |
| | | No | Go to the next step. |
| 2 | **PURPOSE: IDENTIFY TRIGGER DTC FOR FREEZE FRAME DATA**<br>• Is the DTC P3498:00 or P349B:00 on FREEZE FRAME DATA? | Yes | Go to the next step. |
| | | No | Go to the troubleshooting procedure for DTC on FREEZE FRAME DATA.<br>(See DTC TABLE [PCM (SKYACTIV-G 2.5 (WITH CYLINDER DEACTIVATION))].) |
| 3 | **PURPOSE: RECORD FREEZE FRAME DATA/SNAPSHOT DATA AND DIAGNOSTIC MONITORING TEST RESULTS TO UTILIZE WITH REPEATABILITY VERIFICATION**<br>**Note**<br>**• Recording can be facilitated using the screen capture function of the PC.**<br>• Record the FREEZE FRAME DATA/snapshot data and DIAGNOSTIC MONITORING TEST RESULTS (misfire related) on the repair order. | – | Go to the next step. |
| 4 | **PURPOSE: VERIFY RELATED PENDING CODE AND/OR DTC**<br>• Switch the ignition off, then ON (engine off).<br>• Perform the Pending Trouble Code Access Procedure and DTC Reading Procedure. (See ON-BOARD DIAGNOSTIC TEST [PCM (SKYACTIV-G 2.5 (WITH CYLINDER DEACTIVATION))].)<br>• Are any other PENDING CODEs and/or DTCs present? | Yes | Go to the applicable PENDING CODE or DTC inspection.<br>(See DTC TABLE [PCM (SKYACTIV-G 2.5 (WITH CYLINDER DEACTIVATION))].) |
| | | No | Go to the next step. |
| 5 | **PURPOSE: VERIFY IF THERE IS PID ITEM CAUSING DRASTIC CHANGES OF ACCELERATION FLUCTUATION BY INPUT SIGNAL TO PCM**<br>• Start the engine.<br>• Access the following PIDs using the M-MDS: (See ON-BOARD DIAGNOSTIC TEST [PCM (SKYACTIV-G 2.5 (WITH CYLINDER DEACTIVATION))].)<br>— APP1<br>— APP2<br>— ECT<br>— IAT<br>— MAF<br>— MAP<br>— MAP_V<br>— RPM<br>— TP_REL<br>— VSS<br>• Is there a PID item affected by acceleration fluctuation? | Yes | Inspect the suspected sensor and related wiring harness.<br>• If there is any malfunction:<br>— Repair or replace the malfunctioning part.<br>— Go to Troubleshooting Diagnostic Procedure to perform the procedure from Step 10.<br>• If there is no malfunction:<br>— Go to the next step. |
| | | No | Go to the next step. |

## Troubleshooting Diagnostic Procedure

**Intention of troubleshooting procedure**

• Step 1–2

— Perform an ignition system parts inspection.

• Step 3–4

| STEP | INSPECTION | RESULTS | ACTION |
|---|---|---|---|
| 14 | PURPOSE: INSPECT FOR MALFUNCTION DUE TO INTERNAL ENGINE WEAR, DAMAGE<br>• Inspect for the following engine internal parts:<br>— Cylinder<br>— Piston ring<br>— Intake valve<br>— Exhaust valve<br>— Such as cylinder head gasket<br>• Are all items normal? | Yes | Engine internal parts are normal.<br>• Go to the next step. |
| | | No | Repair or replace the malfunctioning part according to the inspection results, then go to the next step. |
| 15 | PURPOSE: VERIFICATION OF VEHICLE REPAIR COMPLETION<br>• Always reconnect all disconnected connectors.<br>• Clear the DTC from the PCM memory using the M-MDS. (See CLEARING DTC [PCM (SKYACTIV-G 2.5 (WITH CYLINDER DEACTIVATION))].)<br>• Start the engine and warm it up completely.<br>**Caution**<br>**• While performing this step, always operate the vehicle in a safe and lawful manner.**<br>**• When the M-MDS is used to observe monitor system status while driving, be sure to have another technician with you, or record the data in the M-MDS using the PID/DATA MONITOR AND RECORD capturing function and inspect later.**<br>• Drive the vehicle under the snapshot data condition.<br>• Perform the Pending Trouble Code Access Procedure. (See ON-BOARD DIAGNOSTIC TEST [PCM (SKYACTIV-G 2.5 (WITH CYLINDER DEACTIVATION))].)<br>• Is the PENDING CODE for this DTC present? | Yes | Repeat the inspection from Step 1.<br>• If the malfunction recurs, replace the PCM. (See PCM REMOVAL/INSTALLATION [SKYACTIV-G 2.5 (WITH CYLINDER DEACTIVATION)].)<br>Go to the next step. |
| | | No | Go to the next step. |
| 16 | VERIFY AFTER REPAIR PROCEDURE<br>• Perform the "AFTER REPAIR PROCEDURE". (See AFTER REPAIR PROCEDURE [PCM (SKYACTIV-G 2.5 (WITH CYLINDER DEACTIVATION))].)<br>• Are any DTCs present? | Yes | Go to the applicable DTC inspection. (See DTC TABLE [PCM (SKYACTIV-G 2.5 (WITH CYLINDER DEACTIVATION))].) |
| | | No | DTC troubleshooting completed. |

• Step 2–3

— Verify that primary malfunction is resolved and there are no other malfunctions.

| STEP | INSPECTION | RESULTS | ACTION |
|---|---|---|---|
| 1 | PURPOSE: DETERMINE INTEGRITY OF BATTERY<br>• Inspect the battery. (See BATTERY INSPECTION.)<br>• Is there any malfunction? | Yes | Replace the battery, then go to the next step.<br>(See BATTERY REMOVAL/INSTALLATION [SKYACTIV-G 2.5 (WITH CYLINDER DEACTIVATION)].) |
| | | No | Go to the next step. |
| 2 | PURPOSE: VERIFICATION OF VEHICLE REPAIR COMPLETION<br>• Always reconnect all disconnected connectors.<br>• Clear the DTC from the PCM memory using the M-MDS. (See CLEARING DTC [PCM (SKYACTIV-G 2.5 (WITH CYLINDER DEACTIVATION))].)<br>• Implement the repeatability verification procedure. (See Repeatability Verification Procedure.)<br>• Perform the Pending Trouble Code Access Procedure. (See ON-BOARD DIAGNOSTIC TEST [PCM (SKYACTIV-G 2.5 (WITH CYLINDER DEACTIVATION))].)<br>• Is the PENDING CODE for this DTC present? | Yes | Repeat the inspection from Step 1.<br>• If the malfunction recurs, replace the PCM. (See PCM REMOVAL/INSTALLATION [SKYACTIV-G 2.5 (WITH CYLINDER DEACTIVATION)].)<br>Go to the next step. |
| | | No | Go to the next step. |
| 3 | PURPOSE: VERIFY IF THERE IS ANY OTHER MALFUNCTION<br>• Is any other DTC or pending code stored? | Yes | Go to the applicable DTC inspection.<br>(See DTC TABLE [PCM (SKYACTIV-G 2.5 (WITH CYLINDER DEACTIVATION))].) |
| | | No | DTC troubleshooting completed. |

| Step | Inspection | Results | Action |
|---|---|---|---|
| 6 | VERIFY THAT VEHICLE IS REPAIRED<br>• Install/connect the part removed/disconnected during the troubleshooting procedure.<br>• Clear the DTC recorded in the memory. (See CLEARING DTC [PCM (SKYACTIV-G 2.5 (WITH CYLINDER DEACTIVATION))].)<br>• Replicate the vehicle conditions at the time the DTC was detected using the following procedure.<br>— Set the A/C temperature control to MAX COLD.<br>— Turn the A/C switch on to operate the air conditioner.<br>— Verify that cold air is flowing from the air vent.<br>• Perform the DTC inspection for the PCM. (See ON-BOARD DIAGNOSTIC TEST [PCM (SKYACTIV-G 2.5 (WITH CYLINDER DEACTIVATION))].)<br>• Is the same Pending DTC present? | Yes | Repeat the inspection from Step 1.<br>• If the malfunction recurs, replace the PCM. (See PCM REMOVAL/INSTALLATION [SKYACTIV-G 2.5 (WITH CYLINDER DEACTIVATION)].)<br>Go to the next step. |
| | | No | Go to the next step. |
| 7 | VERIFY AFTER REPAIR PROCEDURE<br>• Perform the "AFTER REPAIR PROCEDURE". (See AFTER REPAIR PROCEDURE [PCM (SKYACTIV-G 2.5 (WITH CYLINDER DEACTIVATION))].)<br>• Are any DTCs present? | Yes | Go to the applicable DTC inspection. (See DTC TABLE [PCM (SKYACTIV-G 2.5 (WITH CYLINDER DEACTIVATION))].) |
| | | No | DTC troubleshooting completed. |

| Step | Inspection | Results | Action |
|---|---|---|---|
| 1 | RECORD VEHICLE STATUS WHEN DTC WAS DETECTED TO UTILIZE WITH REPEATABILITY VERIFICATION<br>• Record the freeze frame data/snapshot data.<br>Note<br>• Recording can be facilitated using the screen capture function of the PC. | – | Go to the next step. |
| 2 | VERIFY RELATED REPAIR INFORMATION OR SERVICE INFORMATION AVAILABILITY<br>• Verify related Service Bulletins, on-line repair information, or Service Information availability.<br>• Is any related Information available? | Yes | Perform repair or diagnosis according to the available information.<br>• If the vehicle is not repaired, go to the next step. |
| | | No | Go to the next step. |
| 3 | INSPECT A/C RELAY FOR MALFUNCTION<br>• Inspect the A/C relay. (See RELAY INSPECTION.)<br>• Is there any malfunction? | Yes | Replace the A/C relay, then go to Step 9. (See RELAY LOCATION.) |
| | | No | Go to the next step. |
| 4 | INSPECT FBCM CONNECTOR FOR MALFUNCTION<br>• Disconnect the FBCM connector.<br>• Inspect for poor connection (such as damaged/pulled-out pins, corrosion).<br>• Is there any malfunction? | Yes | Repair or replace the connector and/or terminals, then go to Step 9. |
| | | No | Go to the next step. |
| 5 | INSPECT A/C RELAY POWER SUPPLY CIRCUIT FOR SHORT TO GROUND<br>• Verify that A/C relay is removed.<br>• Verify that the FBCM connector is disconnected.<br>• Inspect for continuity between A/C relay terminal A (wiring harness-side) and body ground.<br>• Is there continuity? | Yes | Refer to the wiring diagram and verify whether or not there is a common connector between A/C relay terminal A and FBCM terminal 1C.<br>If there is a common connector:<br>• Determine the malfunctioning part by inspecting the common connector and the terminal for corrosion, damage, or pin disconnection, and the common wiring harness for a short to ground.<br>• Repair or replace the malfunctioning part.<br>If there is no common connector:<br>• Repair or replace the wiring harness which has a short to ground.<br>Go to Step 9. |
| | | No | Go to the next step. |
| 6 | INSPECT A/C RELAY POWER SUPPLY CIRCUIT FOR OPEN CIRCUIT<br>• Verify that A/C relay is removed.<br>• Verify that the FBCM connector is disconnected.<br>• Inspect for continuity between A/C relay terminal A (wiring harness-side) and FBCM terminal 1C (wiring harness-side).<br>• Is there continuity? | Yes | Go to the next step. |
| | | No | Refer to the wiring diagram and verify whether or not there is a common connector between A/C relay terminal A and FBCM terminal 1C.<br>If there is a common connector:<br>• Determine the malfunctioning part by inspecting the common connector and the terminal for corrosion, damage, or pin disconnection, and the common wiring harness for an open circuit.<br>• Repair or replace the malfunctioning part.<br>If there is no common connector:<br>• Repair or replace the wiring harness which has an open circuit.<br>Go to Step 9. |
| 7 | INSPECT PCM CONNECTOR FOR MALFUNCTION<br>• Disconnect the PCM connector.<br>• Inspect for poor connection (such as damaged/pulled-out pins, corrosion).<br>• Is there any malfunction? | Yes | Repair or replace the connector and/or terminals, then go to Step 9. |
| | | No | Go to the next step. |

| | |
|---|---|
| DESCRIPTION | Electric variable valve timing control system:<br><br>• P0011:00: Over-advanced<br>• P0012:00: Over-retarded |
| POSSIBLE CAUSE | • Electric variable valve timing motor/driver connectors or terminals malfunction<br>• Short to ground or open circuit in electric variable valve timing relay power supply circuit<br>— Short to ground in wiring harness between MAIN 200 A fuse and electric variable valve timing relay terminal D<br>— MAIN 200 A fuse and/or EVVT 20 A fuse malfunction<br>— Open circuit in wiring harness between battery positive terminal and electric variable valve timing relay terminal D<br>• Short to ground in wiring harness between electric variable valve timing relay terminal C and electric variable valve timing motor/driver terminal 2B<br>• Open circuit in wiring harness between electric variable valve timing relay terminal C and electric variable valve timing motor/driver terminal 2B<br>• PCM connector or terminals malfunction<br>• Electric variable valve timing relay malfunction<br>• Electric variable valve timing motor malfunction<br>• Electric variable valve timing actuator malfunction<br>— Electric variable valve timing actuator is stuck in advanced position<br>— Electric variable valve timing actuator is stuck in retarded position<br>• Timing chain malfunction<br>— Poor assembly of timing chain<br>— Looseness or jumping<br>• Mis-detection of intake CMP sensor<br>• Mis-detection of CKP sensor<br>• PCM malfunction |

## System Wiring Diagram