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2013 MAZDA 3 / Axela Hatchback OEM Service and Repair Workshop Manual

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Sample

DTC P0707:00 [TCM (GW6A-EL, GW6AX-EL)]

SM2898306

id0502o981710

DTC P0707:00	Transaxle range sensor circuit low input
DETECTION CONDITION	- Under the following condition, incorrect voltage in any one of transaxle range sensors 1 to 4: - Battery voltage is 8 V or more.
FAIL-SAFE FUNCTION	- Inhibits learning control. - Inhibits manual mode. - Inhibits neutral idle control. - Inhibits AAS.
POSSIBLE CAUSE	Transaxle range sensor (built-into TCM) malfunction
SYSTEM WIRING DIAGRAM	Not applicable

Diagnostic procedure

STEP	INSPECTION		ACTION
1	RECORD VEHICLE STATUS WHEN DTC WAS DETECTED TO UTILIZE WITH REPEATABILITY VERIFICATION Note - Recording can be facilitated using the screen capture of the PC function. - Record the freeze frame data/snap shot data.	–	Go to the next step.
2	VERIFY RELATED REPAIR INFORMATION AVAILABILITY - Verify related Service Bulletins and/or on-line repair information availability. - Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. If the vehicle is not repaired, replace the control valve body. (See CONTROL VALVE BODY REMOVAL/INSTALLATION [GW6A-EL, GW6AX-EL].) Go to the next step.
		No	Replace the control valve body, then go to the next step. (See CONTROL VALVE BODY REMOVAL/INSTALLATION [GW6A-EL, GW6AX-EL].)

STEP	INSPECTION	ACTION	
3	VERIFY DTC TROUBLESHOOTING COMPLETED • Clear the DTC using the M-MDS. (See ON-BOARD DIAGNOSTIC SYSTEM DTC INSPECTION [TCM (GW6A-EL, GW6AX-EL)].) • Perform the following procedure to ensure that the DTC has been resolved: 1. Switch the ignition ON (engine off or on). • Perform the DTC inspection using the M-MDS. (See ON-BOARD DIAGNOSTIC SYSTEM DTC INSPECTION [TCM (GW6A-EL, GW6AX-EL)].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See ON-BOARD DIAGNOSTIC SYSTEM DTC TABLE [TCM (GW6A-EL, GW6AX-EL)] .)
		No	DTC troubleshooting completed.

Sample

DTC P0712:00 [TCM (GW6A-EL, GW6AX-EL)]

SM2898309

id0502o981740

DTC P0712:00	TFT sensor circuit low input
DETECTION CONDITION	- Under the following condition, the TFT sensor voltage is 0.12 V or less for 5 s: - Battery voltage is 8 V or more.
FAIL-SAFE FUNCTION	- Inhibits learning control. - Inhibits neutral idle control.
POSSIBLE CAUSE	- TFT sensor malfunction - Coupler component malfunction - TCM malfunction
SYSTEM WIRING DIAGRAM	Not applicable

Diagnostic procedure

STEP	INSPECTION		ACTION
1	RECORD VEHICLE STATUS WHEN DTC WAS DETECTED TO UTILIZE WITH REPEATABILITY VERIFICATION Note • Recording can be facilitated using the screen capture of the PC function. • Record the freeze frame data/snap shot data.	–	Go to the next step.
2	VERIFY RELATED REPAIR INFORMATION AVAILABILITY • Verify related Service Bulletins and/or on-line repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, replace the control valve body. (See CONTROL VALVE BODY REMOVAL/INSTALLATION [GW6A-EL, GW6AX-EL].) Go to the next step.
		No	Replace the control valve body, then go to the next step. (See CONTROL VALVE BODY REMOVAL/INSTALLATION [GW6A-EL, GW6AX-EL].)

STEP	INSPECTION		ACTION
3	VERIFY DTC TROUBLESHOOTING COMPLETED • Clear the DTC using the M-MDS. (See ON-BOARD DIAGNOSTIC SYSTEM DTC INSPECTION [TCM (GW6A-EL, GW6AX-EL)].) • Perform the following procedure to ensure that the DTC has been resolved: 1. Switch the ignition ON (engine off or on) and wait for 5 s or more. 2. Inspect the value at the following TCM PIDs using the M-MDS. (See ON-BOARD DIAGNOSTIC SYSTEM PID/DATA MONITOR INSPECTION [TCM (GW6A-EL, GW6AX-EL)].) — ECU_A — ECU_B — ECU_C 3. Verify that the average temperature of ECU_A, ECU_B, and ECU_C is 0 °C {32 °F} or more. • Perform the DTC inspection using the M-MDS. (See ON-BOARD DIAGNOSTIC SYSTEM DTC INSPECTION [TCM (GW6A-EL, GW6AX-EL)].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See ON-BOARD DIAGNOSTIC SYSTEM DTC TABLE [TCM (GW6A-EL, GW6AX-EL)] .)
		No	DTC troubleshooting completed.

Step	Inspection	Results	Action
3	PERFORM INITIAL LEARNING, N TO D POSITION LEARNING, AND N TO R POSITION LEARNING - Perform the Initial Learning. (See INITIAL LEARNING [FW6A-EL, FW6AX-EL].) - Perform N to D position learning using the following procedure: - The ATF temperature is 30 °C {86 °F} or more. - Shift the selector lever from P position to N position. - Shift the selector lever from N position to D position and wait for 5 s or more while holding the lever in the D position. - Shift the selector lever from D position to N position and wait for 5 s or more while holding the lever in the N position. - Perform the procedures (3) to (4) above ten times. - Perform N to R position leaning using the following procedure: - The ATF temperature is 60 °C {140 °F} or more. - Shift the selector lever from P position to N position. - Shift the selector lever from N position to R position and wait for 5 s or more while holding the lever in the R position. - Shift the selector lever from R position to N position and wait for 5 s or more while holding the lever in the N position. - Perform the procedures (3) to (4) above ten times. - Does the symptom disappear?	Yes	Symptom troubleshooting is completed.
		No	Go to the next step.
4	INSPECT ENGINE CONTROL SYSTEM FOR MALFUNCTION - Perform the symptom troubleshooting "NO.9 FAST IDLE/RUNS ON". (See NO.9 FAST IDLE/RUNS ON [SKYACTIV-G 2.5 (WITHOUT CYLINDER DEACTIVATION)].) (See NO.9 FAST IDLE/RUNS ON [SKYACTIV-G 2.5 (WITH CYLINDER DEACTIVATION)].) - Is there any malfunction?	Yes	Repair or replace any malfunctioning parts according to the inspection result.
		No	Go to the next step.
5	INSPECT SIGNAL PARTS FOR MALFUNCTION - Inspect the value at the following PCM PIDs using the M-MDS. (See ON-BOARD DIAGNOSTIC TEST [PCM (SKYACTIV-G 2.5 (WITHOUT CYLINDER DEACTIVATION))].) (See ON-BOARD DIAGNOSTIC TEST [PCM (SKYACTIV-G 2.5 (WITH CYLINDER DEACTIVATION))].) — APP (APP sensor) — RPM (CKP sensor) - Is there any malfunction?	Yes	Repair or replace any malfunctioning parts according to the inspection result.
		No	Go to the next step.
6	INSPECT ENGINE MOUNT/SUSPENSION FOR POOR TIGHTENING Is there any malfunction?	Yes	Repair or replace any malfunctioning parts according to the inspection result. (See ENGINE REMOVAL/INSTALLATION [SKYACTIV-G 2.5 (WITHOUT CYLINDER DEACTIVATION)].) (See ENGINE REMOVAL/INSTALLATION [SKYACTIV-G 2.5 (WITH CYLINDER DEACTIVATION)].)
		No	Symptom troubleshooting is completed.

EXCESSIVE SHIFT SHOCK ON TORQUE CONVERTER CLUTCH (TCC) [FW6A-EL, FW6AX-EL]

SM2898384

id05031710220

TROUBLESHOOTING ITEM	Excessive shift shock on torque converter clutch (TCC)
DESCRIPTION	• Strong shock is felt when TCC is engaged.
POSSIBLE CAUSE	1. Insufficient TCM learning (Insufficient TCC learning) 2. Signal malfunction — APP sensor malfunction — CKP sensor malfunction 3. Torque converter malfunction 4. Engine control system malfunction

Diagnostic procedure

- Note**
- If a DTC is stored in the PCM, the malfunction may be resolved by repairing the malfunctioning location.

Step	Inspection	Results	Action
1	PERFORM INITIAL LEARNING AND TCC LEARNING • Perform the initial learning. (See INITIAL LEARNING [FW6A-EL, FW6AX-EL].) • Perform TCC learning using the following procedure: (1) The ATF temperature is 20 °C {68 °F} or more. (2) Constantly maintain the accelerator pedal opening angle between 20% to 60%. (3) Accelerate the vehicle from a stop to 1st gear and from 1st to 2nd gear. (4) Perform the shifting above (3) ten times. • Does the symptom disappear?	Yes	Symptom troubleshooting is completed.
		No	Go to the next step.
2	INSPECT SIGNAL PARTS FOR MALFUNCTION • Inspect the value at the following PCM PIDs using the M-MDS. (See ON-BOARD DIAGNOSTIC TEST [PCM (SKYACTIV-G 2.5 (WITHOUT CYLINDER DEACTIVATION))].) (See ON-BOARD DIAGNOSTIC TEST [PCM (SKYACTIV-G 2.5 (WITH CYLINDER DEACTIVATION))].) — APP (APP sensor) — RPM (CKP sensor) • Is there any malfunction?	Yes	Repair or replace any malfunctioning parts according to the inspection result.
		No	Replace the automatic transaxle. (See AUTOMATIC TRANSAXLE REMOVAL/INSTALLATION [FW6A-EL].) (See AUTOMATIC TRANSAXLE REMOVAL/INSTALLATION [FW6AX-EL].)

TRANSAXLE OVERHEATS [FW6A-EL, FW6AX-EL]

SM2898387

id05031710260

TROUBLESHOOTING ITEM	Transaxle overheats
DESCRIPTION	• Burnt smell emitted from the transaxle. • Smoke is emitted from the transaxle.
POSSIBLE CAUSE	1. Signal malfunction — APP sensor malfunction — Brake switch malfunction — CKP sensor malfunction — ECT sensor malfunction 2. ATF malfunction 3. Oil cooler malfunction 4. Control valve body malfunction

Diagnostic procedure

Step	Inspection	Results	Action
1	INSPECT SIGNAL PARTS FOR MALFUNCTION • Inspect the value at the following PCM PIDs using the M-MDS. (See ON-BOARD DIAGNOSTIC TEST [PCM (SKYACTIV-G 2.5 (WITHOUT CYLINDER DEACTIVATION))].) (See ON-BOARD DIAGNOSTIC TEST [PCM (SKYACTIV-G 2.5 (WITH CYLINDER DEACTIVATION))].) — APP (APP sensor) — BOO (Brake switch) — ECT (ECT sensor) — RPM (CKP sensor) • Is there any malfunction?	Yes	Repair or replace any malfunctioning parts according to the inspection result.
		No	Go to the next step.
2	INSPECT ATF LEVEL • Inspect the ATF level. (See AUTOMATIC TRANSAXLE FLUID (ATF) INSPECTION [FW6A-EL, FW6AX-EL].) • Is there any malfunction?	Yes	Adjust the ATF level to the specification. (See AUTOMATIC TRANSAXLE FLUID (ATF) ADJUSTMENT [FW6A-EL, FW6AX-EL] .)
		No	Go to the next step.
3	VISUALLY INSPECT OIL COOLER • Visually inspect the oil cooler. • Is there any malfunction?	Yes	Repair or replace any malfunctioning parts according to the inspection result. (See OIL COOLER REMOVAL/INSTALLATION [FW6A-EL, FW6AX-EL] .)
		No	Go to the next step.

Step	Inspection	Results	Action
3	DETERMINE IF MALFUNCTION IS DUE TO TCC SOLENOID VALVE OPERATION MALFUNCTION OR AUTOMATIC TRANSAXLE INTERNAL MALFUNCTION • Verify the malfunction symptom. • Does the engine stall in the D or M position?	Yes	Replace the control valve body. (See CONTROL VALVE BODY REMOVAL/INSTALLATION [FW6A-EL, FW6AX-EL].)
		No	Replace the automatic transaxle. (See AUTOMATIC TRANSAXLE REMOVAL/INSTALLATION [FW6A-EL].) (See AUTOMATIC TRANSAXLE REMOVAL/INSTALLATION [FW6AX-EL].)

Sample