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2012 MAZDA Flair OEM Service and Repair Workshop Manual

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Snapshot data item	Unit	Description	Corresponding PID/DATA monitor item
G_INHIBIT_R	Off/On	R position is inhibited due to malfunction. (Fail-safe)	–
G_INHIBIT_N	Off/On	N position is inhibited due to malfunction. (Fail-safe)	–
OIL_PRES_SW4	Off/On	Oil pressure switch No.4 condition	OP_SW4
OIL_PRES_SW3	Off/On	Oil pressure switch No.3 condition	OP_SW3
SHIFT_CTRL	DEFAULT/MANUAL/C_CONTROL/HIGH_TEMP/D_MANUAL/FAIL_SAFE	Shift control mode	SHIFT_CTRL
SLIP_VALUE	RPM	Actual slip value between TSS and OSS	–
HTM_DIS	km {MILE}	Travel distance since determination of ATF high temperature mode	HTM_DIS
MST_REC_SFT	–	The gear shift position before shifting gears is displayed.	SE_TYPE
SFT_CTL_STS	–	The shift control execution condition is displayed.	SC_STATE
SERIAL_DTC	–	DTC	–
TR	–	Transaxle range sensor position.	TR

Note

- Refer to PID/DATA monitor table for confirm the transaxle control system operation status while the TCM does not store the DTC. (See **ON-BOARD DIAGNOSTIC SYSTEM PID/DATA MONITOR INSPECTION [TCM (FW6A-EL, FW6AX-EL)]**.)
- Snapshot data items are not displayed, according to detected DTC.

Clearing DTCs Procedures

1.Connect the M-MDS to the DLC-2.

2.After the vehicle is identified, select the following items from the initialization screen of the M-MDS.

- (1)Select “Self Test”.
- (2)Select “Modules”.
- (3)Select “TCM”.
- (4)Select “Retrieve CMDTCs”.

3.Verify the DTC according to the directions on the screen.

4.Press the clear button on the DTC screen to clear the DTC.

5.Switch the ignition off.

6.Close all of the doors, hood, trunk lid, and liftgate, lock the doors, and wait for 3 min.

7.Switch the ignition ON (engine off or on) and wait for 5 s or more.

Item	Unit/Condition	Test condition	Specification (Reference)	Output part name
DGP_SPD	KPH {MPH}	Displays vehicle speed with trailing wheels since the differential protection control operated due to excessive rotation difference between left/right drive wheels		—
ECT	°C {°F}	Displays ECT		ECT sensor
ECU_A	°C {°F}	Displays ECU internal temperature A		ECU internal temperature sensor A
ECU_B	°C {°F}	Displays ECU internal temperature B		ECU internal temperature sensor B
ECU_C	°C {°F}	Displays ECU internal temperature C		ECU internal temperature sensor C
GEAR_RA	Ratio	Selector lever in 1GR at D position	Approx. 3.5526	• Shift solenoid No.1 • Shift solenoid No.2 • Shift solenoid No.3 • Shift solenoid No.4
		Selector lever in 2GR at D position	Approx. 2.0228	
		Selector lever in 3GR at D position	Approx. 1.4522	
		Selector lever in 4GR at D position	Approx. 1.0000	
		Selector lever in 5GR at D position	Approx. 0.7084	
		Selector lever in 6GR at D position	Approx. 0.5993	
GEAR_SEL	1/2/3/4/5/6	Selector lever in 1GR at D position	1	• Shift solenoid No.1 • Shift solenoid No.2 • Shift solenoid No.3 • Shift solenoid No.4
		Selector lever in 2GR at D position	2	
		Selector lever in 3GR at D position	3	
		Selector lever in 4GR at D position	4	
		Selector lever in 5GR at D position	5	
		Selector lever in 6GR at D position	6	
HI_TEMP	—	Displays ATF high temperature mode determination amount. (ATF temperature 132 °C {270 °F} or more)		—
HTM_DIS	km {MILE}	Displays traveled distance after determining the ATF high temperature mode. (ATF temperature 132 °C {270 °F} or more)		—
LINEDES	kPa {kgf/cm ² , psi}	Idle at P position after warm-up	Approx. 500 kPa {5.10 kgf/cm ² , 72.5 psi}	—
LN_C_CLUTCH	kPa {kgf/cm ² , psi}	Displays hydraulic control learning value data		—
LN_O_CLUTCH	kPa {kgf/cm ² , psi}	Displays hydraulic control learning value data		—
LN_OV_SCOPE	—	Displays hydraulic control learning value data		—
LN_T_CLUTCH	kPa {kgf/cm ² , psi}	Displays hydraulic control learning value data		—

Item	Unit/Condition	Test condition	Specification (Reference)	Output part name
OP_SW4	Off/On	Selector lever at P position	Off	Oil pressure switch No.4
		Selector lever at R position	Off	
		Selector lever at N position	Off	
		Selector lever in 1GR at D position	Off	
		Selector lever in 2GR at D position	Off	
		Selector lever in 3GR at D position	Off	
		Selector lever in 4GR at D position	On	
		Selector lever in 5GR at D position	On	
		Selector lever in 6GR at D position	On	
OP_SW4_OFF	kPa {kgf/cm ² , psi}	After performing on-board diagnostic test mode	More than 50 kPa {0.51 kgf/cm ² , 7.3 psi} (0 kPa {0 kgf/cm ² , 0 psi} before performing on-board diagnostic test mode)	Oil pressure switch No.4
OP_SW4_ON	kPa {kgf/cm ² , psi}	After performing on-board diagnostic test mode	Less than 260 kPa {2.65 kgf/cm ² , 37.7 psi} (0 kPa {0 kgf/cm ² , 0 psi} before performing on-board diagnostic test mode)	Oil pressure switch No.4
OSS	RPM	Vehicle stopped	0 RPM	Output shaft speed sensor
		Vehicle speed 30 km/h {19 mph} in 4GR at D position	Approx. 1000 RPM	
RPM	RPM	Displays engine speed		PCM
SC_STATE	Not Active/Active	The shift control execution condition is displayed.		–
SE_TYPE	No valid data/Bf_1st Af_2nd/Bf_1st Af_3rd/Bf_1st Af_4th/Bf_1st Af_5th/Bf_1st Af_6th/Bf_2nd Af_1st/Bf_2nd Af_3rd/Bf_2nd Af_4th/Bf_2nd Af_5th/Bf_2nd Af_6th/Bf_3rd Af_1st/Bf_3rd Af_2nd/Bf_3rd Af_4th/Bf_3rd Af_5th/Bf_3rd Af_6th/Bf_4th Af_1st/Bf_4th Af_2nd/Bf_4th Af_3rd/Bf_4th Af_5th/Bf_4th Af_6th/Bf_5th Af_1st/Bf_5th Af_2nd/Bf_5th Af_3rd/Bf_5th Af_4th/Bf_5th Af_6th/Bf_6th Af_1st/Bf_6th Af_2nd/Bf_6th Af_3rd/Bf_6th Af_4th/Bf_6th Af_5th	The gear shift position before shifting gears is displayed. Note Bf indicates gear position before shifting Af indicates gear position after shifting (Example of display) Bf_1st Af_2nd • Bf_1st:Gear position at 1st gear before shifting • Af_2nd:Gear position at 2nd gear after shifting		–
SHIFT_CTRL	DEFAULT/MANUAL/C_CONTROL/HIGH_TEMP/D_MANUAL/FAIL_SAFE	D position normal mode	DEFAULT	–
		M position manual mode	MANUAL	
		Cruise control (cruise control system)	C_CONTROL	
		Automatic transaxle protection mode (ATF high temperature mode)	HIGH_TEMP	
		D position direct mode	D_MANUAL	
		Fail-safe mode	FAIL_SAFE	
SS_ON-OFF	Off/On	On/off solenoid is off.	Off	On/off solenoid
		On/off solenoid is on.	On	

Item	Unit/Condition	Test condition	Specification (Reference)	Output part name
SSLU	A	Vehicle stopped at P position	Approx. 0 A	TCC control solenoid
		Vehicle stopped at R position	Approx. 0 A	
		Vehicle stopped at N position	Approx. 0 A	
		Under the following conditions: • Driving in D position 1GR • Accelerator pedal opening angle is approx. 10 %	Approx. 430 mA	
		Under the following conditions: • Driving in D position 2GR • Accelerator pedal opening angle is approx. 10 %	Approx. 430 mA	
		Under the following conditions: • Driving in D position 3GR • Accelerator pedal opening angle is approx. 10 %	Approx. 430 mA	
		Under the following conditions: • Driving in D position 4GR • Accelerator pedal opening angle is approx. 10 %	Approx. 430 mA	
		Under the following conditions: • Driving in D position 5GR • Accelerator pedal opening angle is approx. 10 %	Approx. 430 mA	
		Under the following conditions: • Driving in D position 6GR • Accelerator pedal opening angle is approx. 10 %	Approx. 430 mA	

Item	Unit/Condition	Test condition	Specification (Reference)	Output part name
SSP	A	Vehicle stopped at P position	Approx. 980 mA	Pressure control solenoid
		Vehicle stopped at R position	Approx. 930 mA	
		Vehicle stopped at N position	Approx. 980 mA	
		Under the following conditions: • Driving in D position 1GR • Accelerator pedal opening angle is approx. 10 %	Approx. 400–800 mA	
		Under the following conditions: • Driving in D position 2GR • Accelerator pedal opening angle is approx. 10 %	Approx. 400–800 mA	
		Under the following conditions: • Driving in D position 3GR • Accelerator pedal opening angle is approx. 10 %	Approx. 400–800 mA	
		Under the following conditions: • Driving in D position 4GR • Accelerator pedal opening angle is approx. 10 %	Approx. 400–800 mA	
		Under the following conditions: • Driving in D position 5GR • Accelerator pedal opening angle is approx. 10 %	Approx. 400–800 mA	
		Under the following conditions: • Driving in D position 6GR • Accelerator pedal opening angle is approx. 10 %	Approx. 400–800 mA	

Item	Unit/Condition	Test condition	Specification (Reference)	Output part name
TS_SE	No valid data/Bf_1st Af_2nd/Bf_1st Af_3rd/Bf_1st Af_4th/Bf_1st Af_5th/Bf_1st Af_6th/Bf_2nd Af_1st/Bf_2nd Af_3rd/Bf_2nd Af_4th/Bf_2nd Af_5th/Bf_2nd Af_6th/Bf_3rd Af_1st/Bf_3rd Af_2nd/Bf_3rd Af_4th/Bf_3rd Af_5th/Bf_3rd Af_6th/Bf_4th Af_1st/Bf_4th Af_2nd/Bf_4th Af_3rd/Bf_4th Af_5th/Bf_4th Af_6th/Bf_5th Af_1st/Bf_5th Af_2nd/Bf_5th Af_3rd/Bf_5th Af_4th/Bf_5th Af_6th/Bf_6th Af_1st/Bf_6th Af_2nd/Bf_6th Af_3rd/Bf_6th Af_4th/Bf_6th Af_5th	Displays gear position before/after shifting when AT slip occurred. Note Bf indicates gear position before shifting Af indicates gear position after shifting (Example of display) Bf_1st Af_2nd • Bf_1st:Gear position at 1st gear before shifting • Af_2nd:Gear position at 2nd gear after shifting		–
TS_VS	KPH {MPH}	Displays vehicle speed before/after shifting when AT slip occurred.		–
TSS	RPM	Vehicle stopped at D position	0 RPM	Turbine/input shaft speed sensor
		Engine speed 1,000 rpm at P position	900–1,100 RPM	
UPSHIFT_REV	Off/On	Shift-up due to engine request is not recorded. (Shift up request can be reset by clearing the DTCs.)	Off	–
		Shift-up due to engine request is recorded.	On	
VPWR	V	Displays TCM power supply voltage		• Battery • TCM
VSS	KPH {MPH}	Displays vehicle speed		Output shaft speed sensor

ON-BOARD DIAGNOSTIC SYSTEM SIMULATION INSPECTION [TCM (FW6A-EL, FW6AX-EL)]

SM2898228

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1.Connect the M-MDS to the DLC-2.

2.After the vehicle is identified, select the following items from the initialization screen of the M-MDS.

- (1)Select “Data Logger”.
- (2)Select “Modules”.
- (3)Select “TCM”.

3.Select the simulation items from the PID table.

4.Perform the active command modes function, inspect the operations for each parts.

• If the operation of output parts cannot be verified after the active command mode inspection is performed, this could indicate the possibility of an open or short circuit, sticking, or operation malfunction in the output parts.

Simulation table

Item	Description	Unit/Condition	Operation condition
SS_ON-OFF	On/off solenoid condition	Off/On	Under the following conditions: • Vehicle stopped • Idling at P or N position
SS1_C	Shift solenoid No.1 target current	A	Under the following conditions: • Vehicle stopped • Idling at P or N position
SS2_C	Shift solenoid No.2 target current	A	Under the following conditions: • Vehicle stopped • Idling at P or N position
SS3_C	Shift solenoid No.3 target current	A	Under the following conditions: • Vehicle stopped • Idling at P or N position
SS4_C	Shift solenoid No.4 target current	A	Under the following conditions: • Vehicle stopped • Idling at P or N position
SSLU_C	TCC control solenoid target current	A	Under the following conditions: • ATF temperature (PID: TFT) is 20 °C {68 °F} or more. • Output shaft speed (PID: OSS) is 10 rpm or more. • Turbine/input shaft speed (PID: TSS) is 1,000 rpm or more. • Brake pedal released

STEP	INSPECTION		ACTION
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, go to the next step.
		No	Go to the next step.
3	VERIFY STORED DTC IN START STOP UNIT • Perform the start stop unit DTC inspection using the M-MDS. (See DTC INSPECTION [START STOP UNIT].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See DTC TABLE [START STOP UNIT].)
		No	Go to the next step.
4	INSPECT IGNITION CIRCUIT FOR OPEN CIRCUIT • Switch the ignition off. • Disconnect the negative battery terminal. (See NEGATIVE BATTERY TERMINAL DISCONNECTION/CONNECTION.) • Disconnect the following connectors. — IG1 relay — Start stop unit • Inspect for continuity between the following terminals (wiring harness-side): — IG1 relay terminal E–Start stop unit terminal 2S • 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 IG1 relay terminal E and start stop unit terminal 2S. If there is a common connector: • 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. • Repair or replace the malfunctioning part. If there is no common connector: • Repair or replace the wiring harness which has an open circuit. Go to Step 6.
5	VERIFY ENGINE START • Always reconnect all disconnected connectors. • Reconnect the negative battery terminal. (See NEGATIVE BATTERY TERMINAL DISCONNECTION/CONNECTION.) • Does the engine start normally?	Yes	Replace the control valve body, then go to the next step. (See CONTROL VALVE BODY REMOVAL/INSTALLATION [FW6A-EL, FW6AX-EL].)
		No	Replace the start stop unit, then go to the next step. (See START STOP UNIT REMOVAL/INSTALLATION.)
6	VERIFY DTC TROUBLESHOOTING COMPLETED • Clear the DTC using the M-MDS. (See ON-BOARD DIAGNOSTIC SYSTEM DTC INSPECTION [TCM (FW6A-EL, FW6AX-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 10 s or more. 2. Switch the ignition off. • Perform the DTC inspection using the M-MDS. (See ON-BOARD DIAGNOSTIC SYSTEM DTC INSPECTION [TCM (FW6A-EL, FW6AX-EL)].) • Are any DTCs present?	Yes	Go to the applicable DTC inspection. (See ON-BOARD DIAGNOSTIC SYSTEM DTC TABLE [TCM (FW6A-EL, FW6AX-EL)].)
		No	DTC troubleshooting completed.

DTC P06B8:00 [TCM (FW6A-EL, FW6AX-EL)]

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DTC P06B8:00	NVRAM malfunction
DETECTION CONDITION	- Under the following condition, TCM internal NVRAM data retention/read/write disabled: - Battery voltage is 8 V or more.
FAIL-SAFE FUNCTION	Not applicable
POSSIBLE CAUSE	- TCM initial learning error - Control valve body malfunction — TCM internal NVRAM 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, go to the next step.
		No	Go to the next step.
3	PERFORM INITIAL LEARNING - Perform the initial learning. (See INITIAL LEARNING [FW6A-EL, FW6AX-EL].) - Clear the DTC using the M-MDS. (See ON-BOARD DIAGNOSTIC SYSTEM DTC INSPECTION [TCM (FW6A-EL, FW6AX-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 (FW6A-EL, FW6AX-EL)].) - Is the DTC P06B8:00 also present?	Yes	Replace the control valve body, then go to the next step. (See CONTROL VALVE BODY REMOVAL/INSTALLATION [FW6A-EL FW6AX-EL] .)
		No	DTC troubleshooting completed.