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

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SLOW ENGAGING AFTER OPERATING SELECTOR LEVER FROM N TO D POSITION [FW6A-EL, FW6AX-EL]

SM2898391

id05031710450

TROUBLESHOOTING ITEM	Slow engaging after operating selector lever from N to D position
DESCRIPTION	• When depressing the accelerator pedal just after operating the selector lever from N to D position with the ATF temperature at 60 °C {140 °F} or more, it takes 3 s or more to engage. • Malfunction symptom only occurs once when accelerating from a standstill. • Engagement after operating the selector lever from N to R position is normal. • Engagement when shifting gears while driving is normal. • DTCs are not stored.
POSSIBLE CAUSE	1. Low clutch piston malfunction 2. Low clutch hydraulic system sealing malfunction

Diagnostic Procedure

Step	Inspection	Results	Action
1	VERIFY MALFUNCTION SYMPTOM • Is the malfunction symptom at the same level compared to a vehicle of the same model (FW6A-EL, FW6AX-EL vehicles)?	Yes	Complete the symptom troubleshooting.
		No	Go to the next step.
2	VERIFY DTCs • Are any DTCs detected?	Yes	Repair the malfunctioning location according to the applicable DTC troubleshooting. (See ON-BOARD DIAGNOSTIC SYSTEM DTC TABLE [TCM (FW6A-EL, FW6AX-EL)] .)
		No	Go to the next step.
3	PERFORM INITIAL LEARNING AND N TO D RANGE LEARNING • Perform the initial learning. (See INITIAL LEARNING [FW6A-EL, FW6AX-EL].) • Perform the N to D position learning using the following procedure: (1) Set the ATF temperature to 30 °C {86 °F} or more. (2) Shift the selector lever to N position. (3) Shift the selector lever to D position and wait for 5 s or more. (4) Shift the selector lever to N position and wait for 5 s or more. (5) Perform steps (3) to (4) 10 times. • Has the malfunction symptom been eliminated?	Yes	Complete the symptom troubleshooting.
		No	Replace the automatic transaxle. (See AUTOMATIC TRANSAXLE REMOVAL/INSTALLATION [FW6A-EL] .) (See AUTOMATIC TRANSAXLE REMOVAL/INSTALLATION [FW6AX-EL] .)

MANUAL SHIFT MODE INDICATION DOES NOT ILLUMINATE IN M POSITION/MANUAL
SHIFT MODE INDICATION ILLUMINATES IN D POSITION [FW6A-EL, FW6AX-EL]

SM2898394

id05031711360

TROUBLESHOOTING ITEM	Manual shift mode indication does not illuminate in M position/Manual shift mode indication illuminates in D position
DESCRIPTION	• Manual shift mode indication in instrument cluster does not illuminate in M position or manual shift mode indication in instrument cluster in P, R, N and D positions with the ignition switched ON (engine off or on).
POSSIBLE CAUSE	1. Instrument cluster malfunction

Diagnostic procedure

Step	Inspection	Results	Action
1	INSPECT INSTRUMENT CLUSTER FOR MALFUNCTION • Inspect the instrument cluster. (See INSTRUMENT CLUSTER INSPECTION.) • Is there any malfunction?	Yes	Replace the instrument cluster. (See INSTRUMENT CLUSTER REMOVAL/INSTALLATION.)
		No	Symptom troubleshooting is completed.

	Repair order	Check with customer	Diagnosis	Repair	Explanation to customer
Calculation					
In-charge					

Customer statement (When? What? What time(s)? Where it occurs. Warning light illumination? Can anyone replicate problem?)

Q

Vehicle body number:	Registration date:	Date of malfunction occurrence:	Odometer reading	km (mile)
Engine (SOHC/DOHC(RE/DE)) (Cab /E/G/ Turbo/ Miller cycle/ LPG/Direct injection)				
			Transmission (MT/HAT/EC-A7/CVT)	

Environmental conditions				Driving conditions							Pattern of use			
Weather	Ambient temp.	Drove scenario	Grade	Occurrence frequency	Fuel	Warm-up condition	Driving operation	Driving posture	Load	Accelerator opening angle	Shift position	Eng RPM	Vehicle speed	Pattern of use
Sunny	-10°C (14°F) or less	Depositive	Flat	Once/day	Regular	Cold	When starting	Vehicle stopped	Headlights on	0/8	1	Idle	5 km/h (3 mph)	Work _____ %
Cloudy	-10—0°C (14—32°F)	Traffic jam (city)	Upgrade	2-3 times/day	High Oct.	Hot/warmed	After starting	Straight-on driving	Exterior lights on	1/8	2	Less than 1,000	30 km/h (19 mph)	Minor use _____ %
Sunny	10—15°C (50—59°F)	Standard city street	Downgrade	2-3 times/day	High Oct.	Hot/warmed	After starting	Powering	AUTO (City)	2/8	3	Less than 1,000	30 km/h (19 mph)	Trips _____ %
Sunny	15—20°C (59—68°F)	Suburban	Upgrade	Once/week	Low Oct.	Normal	Normal driving	Left turn	Blower: 1 step	3/8	4	Less than 2,000	40 km/h (25 mph)	Other _____ %
High wind	20—30°C (68—86°F)	Highway	Upgrade	Once/week	Other	Other	Idling	Left turn	Blower: 2 steps	4/8	5	Less than 3,000	60 km/h (37 mph)	
Wind gusts	20—35°C (68—87°F)	Uneven road	Other	2-3 times/week			Racing	Other	Blower: 3 steps	5/8	6	Less than 4,000	80 km/h (50 mph)	
N/A	25—30°C (77—86°F)			4-5 times/week		Water temp. gauge	Acceler. from stop		Blower: 4 steps	6/8	7	Less than 5,000	100 km/h (62 mph)	Between ENG. start → Stop
Other	30—35°C (86—95°F)	Wet road surface		Once/month	Fuel gauge		Normal driving		Power steering lock to lock	7/8	N	Less than 6,000	120 km/h (75 mph)	Approx. _____ km (miles)
Other	35—40°C (95—104°F)	Wet road surface		2-3 times/month			Deceleration		Rear defrost on	8/8	R	Less than 6,500	140 km/h (87 mph)	Distance, time _____ hrs.
Other	40—45°C (104—113°F)	Snow bound road		4-5 times/month			Braking		Wipers on			Less than 6,500	160 km/h (99 mph)	
Other	45°C (113°F) or more	Loose road		Other			Shift braking		Audio on			Less than 6,500	180 km/h (112 mph)	No. of occupants: _____
	N/A	Other					Clutch disengage		Other			7,000 or more	200 km/h (125 mph)	Load condition: _____
							Sudden accel.						220 km/h (137 mph)	Other
							Light accel.						240 km/h (150 mph)	
							Shifting						260 km/h (162 mph)	
							Other						280 km/h (174 mph)	
													300 km/h (186 mph)	
													320 km/h (200 mph)	
													340 km/h (211 mph)	
													360 km/h (224 mph)	
													380 km/h (236 mph)	
													400 km/h (250 mph)	
													420 km/h (262 mph)	
													440 km/h (274 mph)	
													460 km/h (286 mph)	
													480 km/h (298 mph)	
													500 km/h (311 mph)	
													520 km/h (324 mph)	
													540 km/h (336 mph)	
													560 km/h (348 mph)	
													580 km/h (360 mph)	
													600 km/h (373 mph)	
													620 km/h (386 mph)	
													640 km/h (399 mph)	
													660 km/h (412 mph)	
													680 km/h (425 mph)	
													700 km/h (438 mph)	
													720 km/h (451 mph)	
													740 km/h (464 mph)	
													760 km/h (477 mph)	
													780 km/h (490 mph)	
													800 km/h (503 mph)	
													820 km/h (516 mph)	
													840 km/h (529 mph)	
													860 km/h (542 mph)	
													880 km/h (555 mph)	
													900 km/h (568 mph)	
													920 km/h (581 mph)	
													940 km/h (594 mph)	
													960 km/h (607 mph)	
													980 km/h (620 mph)	
													1000 km/h (633 mph)	
													1020 km/h (646 mph)	
													1040 km/h (659 mph)	
													1060 km/h (672 mph)	
													1080 km/h (685 mph)	
													1100 km/h (698 mph)	
													1120 km/h (711 mph)	
													1140 km/h (724 mph)	
													1160 km/h (737 mph)	
													1180 km/h (750 mph)	
													1200 km/h (763 mph)	
													1220 km/h (776 mph)	
													1240 km/h (789 mph)	
													1260 km/h (802 mph)	
													1280 km/h (815 mph)	
													1300 km/h (828 mph)	
													1320 km/h (841 mph)	
													1340 km/h (854 mph)	
													1360 km/h (867 mph)	
													1380 km/h (880 mph)	
													1400 km/h (893 mph)	
													1420 km/h (906 mph)	
													1440 km/h (919 mph)	
													1460 km/h (932 mph)	
													1480 km/h (945 mph)	
													1500 km/h (958 mph)	
													1520 km/h (971 mph)	
													1540 km/h (984 mph)	
													1560 km/h (997 mph)	
													1580 km/h (1010 mph)	
													1600 km/h (1023 mph)	
													1620 km/h (1036 mph)	
													1640 km/h (1049 mph)	
													1660 km/h (1062 mph)	
													1680 km/h (1075 mph)	
													1700 km/h (1088 mph)	
													1720 km/h (1101 mph)	
													1740 km/h (1114 mph)	
													1760 km/h (1127 mph)	
													1780 km/h (1140 mph)	
													1800 km/h (1153 mph)	
													1820 km/h (1166 mph)	
													1840 km/h (1179 mph)	
													1860 km/h (1192 mph)	
													1880 km/h (1205 mph)	
													1900 km/h (1218 mph)	
													1920 km/h (1231 mph)	
													1940 km/h (1244 mph)	
													1960 km/h (1257 mph)	
													1980 km/h (1270 mph)	
													2000 km/h (1283 mph)	
													2020 km/h (1296 mph)	
													2040 km/h (1309 mph)	
													2060 km/h (1322 mph)	
													2080 km/h (1335 mph)	
													2100 km/h (1348 mph)	
													2120 km/h (1361 mph)	
													2140 km/h (1374 mph)	
													2160 km/h (1387 mph)	
													2180 km/h (1400 mph)	
													2200 km/h (1413 mph)	
													2220 km/h (1426 mph)	
													2240 km/h (1439 mph)	
													2260 km/h (1452 mph)	
													2280 km/h (1465 mph)	
													2300 km/h (1478 mph)	
													2320 km/h (1491 mph)	
													2340 km/h (1504 mph)	
													2360 km/h (1517 mph)	
													2380 km/h (1530 mph)	
													2400 km/h (1543 mph)	
													2420 km/h (1556 mph)	
													2440 km/h (1569 mph)	
													2460 km/h (1582 mph)	
													2480 km/h (1595 mph)	
													2500 km/h (1608 mph)	
													2520 km/h (1621 mph)	
													2540 km/h (1634 mph)	
													2560 km/h (1647 mph)	
													2580 km/h (1660 mph)	
													2600 km/h (1673 mph)	
													2620 km/h (1686 mph)	
													2640 km/h (1699 mph)	
													2660 km/h (1712 mph)	
													2680 km/h (1725 mph)	
													2700 km/h (1738 mph)	
													2720 km/h (1751 mph)	
													2740 km/h (1764 mph)	
													2760 km/h (1777 mph)	
													2780 km/h (1790 mph)	
													2800 km/h (1803 mph)	
													2820 km/h (1816 mph)	
													2840 km/h (1829 mph)	
													2860 km/h (1842 mph)	
													2880 km/h (1855 mph)	
													2900 km/h (1868 mph)	
													2920 km/h (1881 mph)	
													2940 km/h (1894 mph)	
													2960 km/h (1907 mph)	
													2980 km/h (1920 mph)	
													3000 km/h (1933 mph)	

OTC, measured data, fuel pressure, intake manifold vacuum, throttle sensor, electro motive force, air flow, electro motive force, other, maintenance, repair, accident history, installation of commercial devices

SYMPTOM TROUBLESHOOTING ITEM TABLE [FW6A-EL, FW6AX-EL]

SM2898367

id05031710030

- Use the chart below to verify the symptoms of the trouble in order to diagnose the appropriate area.

Note

- When driving on high-altitude roads, the TCM determines that the driving mode is the AAS mode, and may change to a different shift timing from the normal timing.

Troubleshooting item	Description	Page
Vehicle does not move in D, M or R position	• Vehicle does not move when accelerator pedal is depressed. • The engine revs up but the vehicle does not move even though the accelerator pedal is depressed. • Tires are locked and do not move even though the accelerator pedal is depressed.	(See VEHICLE DOES NOT MOVE IN D, M OR R POSITION [FW6A-EL, FW6AX-EL].)
Vehicle moves in P position, or parking gear does not disengage when P is disengaged	• Vehicle rolls when on a downward slope in P position. • Vehicle does not move in D, M and R position when accelerator pedal is depressed, and engine remains in stalled condition.	(See VEHICLE MOVES IN P POSITION, OR PARKING GEAR DOES NOT DISENGAGE WHEN P IS DISENGAGED [FW6A-EL, FW6AX-EL].)
Excessive creep	• Vehicle accelerates in D and R position when accelerator pedal is not depressed.	(See EXCESSIVE CREEP [FW6A-EL, FW6AX-EL].)
No creep at all	• Vehicle does not move in D, M or R position when idling on flat paved road.	(See NO CREEP AT ALL [FW6A-EL, FW6AX-EL].)
Low maximum speed and poor acceleration	• Vehicle acceleration is poor at start. • Delayed acceleration when accelerator pedal is depressed while driving.	(See LOW MAXIMUM SPEED AND POOR ACCELERATION [FW6A-EL, FW6AX-EL].)
No shifting	• Single shift position only. • Sometimes shifts correctly.	(See NO SHIFTING [FW6A-EL, FW6AX-EL].)
Does not shift to 5GR or 6GR	• Vehicle does not upshift from 4GR to 5GR or 5GR to 6GR even though vehicle speed is increased. • At a vehicle speed range where the transaxle should shift up to 5GR and 6GR gears in D position based on the shift pattern, the transaxle does not shift to 5GR and 6GR gears by gradually releasing the accelerator pedal.	(See DOES NOT SHIFT TO 5GR OR 6GR [FW6A-EL, FW6AX-EL].)
Abnormal shifting	• Shifts incorrectly (incorrect shift pattern).	(See ABNORMAL SHIFTING [FW6A-EL, FW6AX-EL].)
Frequent shifting	• Downshifting occurs suddenly even when accelerator pedal is depressed slightly in D position.	(See FREQUENT SHIFTING [FW6A-EL, FW6AX-EL].)
Shift point is high or low	• Shift point considerably different from automatic shift diagram. • Shift delays when accelerating. • Shift occurs suddenly when accelerating and engine speed does not increase.	(See SHIFT POINT IS HIGH OR LOW [FW6A-EL, FW6AX-EL].)
No kickdown	• Does not downshift when accelerator pedal is fully depressed within kickdown range.	(See NO KICKDOWN [FW6A-EL, FW6AX-EL].)
Engine flares up or slips when upshifting or downshifting	• When accelerator pedal is depressed, engine speed increases normally but vehicle speed increases slowly. • When accelerator pedal is depressed while driving, engine speed increases but vehicle speed does not.	(See ENGINE FLARES UP OR SLIPS WHEN UPSHIFTING OR DOWNSHIFTING [FW6A-EL, FW6AX-EL].)

VEHICLE DOES NOT MOVE IN D, M OR R POSITION [FW6A-EL, FW6AX-EL]

SM2898369

id05031710050

TROUBLESHOOTING ITEM	Vehicle does not move in D, M or R position
DESCRIPTION	• Vehicle does not move when accelerator pedal is depressed. • The engine revs up but the vehicle does not move even though the accelerator pedal is depressed. • Tires are locked and do not move even though the accelerator pedal is depressed.
POSSIBLE CAUSE	1. Improper operation of parking mechanism 2. Manual shaft (manual valve) stuck 3. Torque converter malfunction

Diagnostic procedure

Step	Inspection	Results	Action
1	INSPECT PARKING MECHANISM FOR MALFUNCTION • When the vehicle is stopped on a flat, level road and the engine is off, does the vehicle move when pushed? (In D, N or R position with the brake pedal released.)	Yes	Go to the next step.
		No	Replace the parking mechanism. (See AUTOMATIC TRANSAXLE REMOVAL/INSTALLATION [FW6A-EL].) (See AUTOMATIC TRANSAXLE REMOVAL/INSTALLATION [FW6AX-EL].)

EXCESSIVE CREEP [FW6A-EL, FW6AX-EL]

SM2898371

id05031710070

TROUBLESHOOTING ITEM	Excessive creep
DESCRIPTION	• Vehicle accelerates in D and R position when accelerator pedal is not depressed.
POSSIBLE CAUSE	1. Not within idle speed specification

Diagnostic procedure

Step	Inspection	Results	Action
1	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	Symptom troubleshooting is completed.

NO SHIFTING [FW6A-EL, FW6AX-EL]

SM2898374

id05031710100

TROUBLESHOOTING ITEM	No shifting
DESCRIPTION	• Single shift position only. • Sometimes shifts correctly.
POSSIBLE CAUSE	1. Signal malfunction — APP sensor malfunction — BARO sensor malfunction — Brake switch malfunction — CKP sensor malfunction — ECT sensor malfunction — IAT sensor No.1 malfunction — MAF sensor malfunction 2. Low-G (XY) sensor (built into SAS control module) malfunction Note • When driving on high-altitude roads, the TCM determines that the driving mode is the AAS mode, and may change to a different shift timing from the normal timing. • When SPORT mode is selected, a gear lower than NORMAL mode is selected, and the gear is maintained for a longer period of time. • If the engine coolant temperature is low, a gear lower than when in normal mode is selected.

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) — BARO (BARO sensor) — BOO (Brake switch) — ECT (ECT sensor) — IAT (IAT sensor No.1) — MAF (MAF 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.

Step	Inspection	Results	Action
2	VERIFY IF MALFUNCTION CAUSE IS LOW-G (XY) SENSOR • Is there any malfunction?	Yes	Replace the SAS control module. (See SAS CONTROL MODULE REMOVAL/INSTALLATION [TWO-STEP DEPLOYMENT CONTROL SYSTEM - US/CANADA/ISRAEL SPEC.] .) (See SAS CONTROL MODULE REMOVAL/INSTALLATION [STANDARD DEPLOYMENT CONTROL SYSTEM - MEXICO SPEC.] .)
		No	Symptom troubleshooting is completed.

Sample

FREQUENT SHIFTING [FW6A-EL, FW6AX-EL]

SM2898377

id05031710130

TROUBLESHOOTING ITEM	Frequent shifting
DESCRIPTION	• Downshifting occurs suddenly even when accelerator pedal is depressed slightly in D position.
POSSIBLE CAUSE	1. Signal malfunction — APP sensor malfunction 2. Low-G (XY) sensor (built into SAS control module) malfunction

Diagnostic procedure

Step	Inspection	Results	Action
1	INSPECT SIGNAL PARTS FOR MALFUNCTION • Inspect the value at the following PCM PID 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) • Is there any malfunction?	Yes	Repair or replace any malfunctioning parts according to the inspection result.
		No	Go to the next step.
2	VERIFY IF MALFUNCTION CAUSE LOW-G (XY) SENSOR • Is there any malfunction?	Yes	Replace the SAS control module. (See SAS CONTROL MODULE REMOVAL/INSTALLATION [TWO-STEP DEPLOYMENT CONTROL SYSTEM - US/CANADA/ISRAEL SPEC.] .) (See SAS CONTROL MODULE REMOVAL/INSTALLATION [STANDARD DEPLOYMENT CONTROL SYSTEM - MEXICO SPEC.] .)
		No	Symptom troubleshooting is completed.