

PIN VOLTAGE/PID VALUE CHARTS

John & Corky's Automotive Specialist

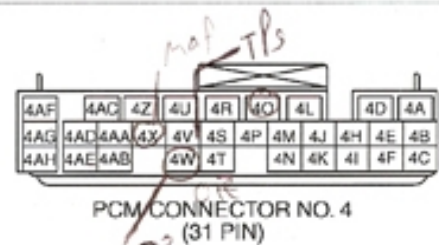
Fig. 13: PCM Pin Voltage Chart (Miata - 1 Of 6)
MAZDA MOTORS CORP.
2002 Mazda MX-5 Miata



PCM CONNECTOR NO. 2
(17 PIN)



PCM CONNECTOR NO. 3
(24 PIN)



PCM CONNECTOR NO. 4
(31 PIN)

VIEW FROM HARNESS SIDE

Terminal	Signal	Connected to	Test condition	Voltage (V)	Action
2A	Fuel injector control	Fuel injector No.1	Inspect by using the wave profile.		<ul style="list-style-type: none"> Inspect fuel injector Inspect related harness.
2B	Cooling fan control	Cooling fan relay	Idle ECT above 97°C (207°F), A/C operating, Throttle valve fully open with terminal TEN (DLC) shorted to GND Others	Below 1.0 B+	<ul style="list-style-type: none"> Inspect cooling fan relay. Inspect related harness.
2C	Condenser fan control	Condenser fan relay	Idle ECT above 108°C (226°F), A/C operating, Throttle valve fully open with terminal TEN (DLC) shorted to ground Others	Below 1.0 B+	<ul style="list-style-type: none"> Inspect condenser fan relay. Inspect related harness.
2D	Fuel injector control	Fuel injector No.2	Inspect by using the wave profile.		<ul style="list-style-type: none"> Inspect fuel injector Inspect related harness.
2E	EGR valve #1 coil control	EGR valve (terminal E)	Ignition switch on Idle	Below 1.0	<ul style="list-style-type: none"> Inspect EGR valve. Inspect related harness.
2F	EGR valve #2 coil control	EGR valve (terminal A)	Ignition switch on Idle	B+	<ul style="list-style-type: none"> Inspect EGR valve. Inspect related harness.
2G	Fuel injector control	Fuel injector No.3	Inspect by using the wave profile.		<ul style="list-style-type: none"> Inspect fuel injector Inspect related harness.
2H	EGR valve #3 coil control	EGR valve (terminal B)	Ignition switch on Idle	B+	<ul style="list-style-type: none"> Inspect EGR valve. Inspect related harness.
2I	EGR valve #4 coil control	EGR valve (terminal F)	Ignition switch on Idle	Below 1.0	<ul style="list-style-type: none"> Inspect EGR valve. Inspect related harness.
2J	Fuel injector control	Fuel injector No.4	Inspect by using the wave profile.		<ul style="list-style-type: none"> Inspect fuel injector Inspect related harness.

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Fig. 14: PCM Pin Voltage Chart (Miata - 2 Of 6)
Courtesy of MAZDA MOTORS CORP.
2002 Mazda MX-5 Miata

Terminal	Signal	Connected to	Test condition		Voltage (V)	Action
2K	A/C control	A/C relay	Idle	A/C and fan switches are on.	Below 1.0	<ul style="list-style-type: none"> Inspect A/C relay. Inspect related harness.
				Others	B+	
2L	—	—	—	—	—	—
2M	FP control	FP RLY	Ignition switch on		B+	<ul style="list-style-type: none"> Inspect FP RLY. Inspect related harness.
			Cranking		Below 1.0	
			Idle		Below 1.0	
2N	VTCS control	VTCS solenoid valve	ECT above 60°C(140°F) while idling		B+	<ul style="list-style-type: none"> Inspect VTCS solenoid valve Inspect related harness.
			ECT below 60°C(140°F) and engine speed at 3.500rpm		Below 1.0	
2O	—	—	—	—	—	—
2P	IAC (positive)	IAC valve	Inspect by using the wave profile.			<ul style="list-style-type: none"> Inspect IAC valve inspection. Inspect related harness.
2Q	IAC (negative)	IAC valve	Inspect by using the wave profile.			<ul style="list-style-type: none"> Inspect IAC valve inspection. Inspect related harness.
2R	MIL control	MIL (in instrument cluster)	Ignition switch ON		Below 1.0	<ul style="list-style-type: none"> Inspect MIL. Inspect related harness.
			Idle (MIL OFF)		B+	
3A	Fuel injector GND	GND	Under any condition		Below 1.0	<ul style="list-style-type: none"> Inspect EGR valve. Inspect related harness.
3B	PCM GND	GND	Under any condition		Below 1.0	<ul style="list-style-type: none"> Inspect related harness.
3C	Purge control	Purge solenoid valve	Inspect by using the wave profile.			<ul style="list-style-type: none"> Inspect purge solenoid valve. Inspect related harness.
3D	EGR boost sensor switching control	EGR boost sensor solenoid valve	Ignition switch on		B+	<ul style="list-style-type: none"> Inspect EGR boost sensor solenoid valve. Inspect related harness.
			Idle			
3E	CDCV control	CDCV	Ignition switch on		B+	<ul style="list-style-type: none"> Inspect related harness.
			Diagnosis exceeded		Below 1.0	
3F	IGT control (No.1, No.4 cylinders)	Ignition coil	Inspect by using the wave profile.			<ul style="list-style-type: none"> Inspect ignition coil. Inspect related harness.
3G	—	—	—	—	—	—
3H	—	—	—	—	—	—

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Fig. 15: PCM Pin Voltage Chart (Miata - 3 Of 6)
Courtesy of MAZDA MOTORS CORP.
2002 Mazda MX-5 Miata

Terminal	Signal	Connected to	Test condition	Voltage (V)	Action
3I	IGT control (No.2, No.3 cylinders)	Ignition coil	Inspect by using the wave profile.		<ul style="list-style-type: none"> Inspect ignition coil. Inspect related harness.
3J	HO2S heater (Front) control	HO2S (Front)	Ignition switch on Idle	Below 1.0	<ul style="list-style-type: none"> Inspect HO2S heater (Front). Inspect related harness.
3K	—	—	—	—	—
3L	—	—	—	—	—
3M	Generator field coil control	Generator (terminal D)	Inspect by using the wave profile. Verify that voltage is raised when electrical load (headlight, A/C) is turned on at idle.		<ul style="list-style-type: none"> Inspect generator. Inspect related harness.
3N	—	—	—	—	—
3O	Engine speed	DLC terminal IG-TCM (AT), tachometer	Inspect by using the wave profile.		<ul style="list-style-type: none"> Inspect related harness.
3P	HO2S heater (Rear) control	HO2S (Rear)	Ignition switch on Idle (Heater operating)	B+ Below 1.0	<ul style="list-style-type: none"> Inspect HO2S heater (Rear). Inspect related harness.
3Q	K-LINE (Serial communication)	DLC terminal KLN DLC 2	Carry out inspection according to DTC DTC output is a part of serial communication Judgement by terminal voltage is not possible	—	<ul style="list-style-type: none"> Inspect related harness.
3R	—	—	—	—	—
3S	Immobilizer communication	Immobilizer unit	Because of this terminal for serial communication, good/no good judgment by terminal voltage is not possible. Carry out inspection according to diagnostic trouble codes.		<ul style="list-style-type: none"> Inspect Immobilizer unit. Inspect related harness.
3T	Vehicle speed	VSS	Inspect by using the wave profile.		<ul style="list-style-type: none"> Inspect vehicle speedometer sensor. Inspect related harness.
3U	Generator warning light control	Generator warning light (in instrument cluster)	Ignition switch on Idle (DTC P0111, P0112, P1631, P1633 or P1634 is not stored.)	Below 1.0 B+	<ul style="list-style-type: none"> Inspect generator warning light inspection. Inspect related harness.
3V	SGC	CMP sensor	Inspect by using the wave profile.		<ul style="list-style-type: none"> Inspect CMP sensor. Inspect related harness.
3W	—	—	—	—	—
3X	—	—	—	—	—

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Fig. 16: PCM Pin Voltage Chart (Miata - 4 Of 6)
Courtesy of MAZDA MOTORS CORP.
2002 Mazda MX-5 Miata

Terminal	Signal	Connected to	Test condition		Voltage (V)	Action
3Y	NE	CKP sensor	Inspect by using the wave profile.			<ul style="list-style-type: none"> Inspect CKP sensor. Inspect related harness.
3Z	—	—	—		—	—
4A	Output device GND	GND	Under any condition		Below 1.0	<ul style="list-style-type: none"> Inspect related harness.
4B	Brake	Brake switch	Brake pedal released		Below 1.0	<ul style="list-style-type: none"> Inspect brake switch. Inspect related harness.
			Brake pedal depressed		B+	
4C	PSP	PSP switch	Idle	Steering wheel straight ahead position	B+	<ul style="list-style-type: none"> Inspect PSP switch. Inspect related harness.
				Steering wheel fully turned	Below 1.0	
4D	Oil control valve (OCV) control (positive)	Oil control valve (OCV)	Inspect by using the wave profile.			<ul style="list-style-type: none"> Inspect oil control valve (OCV). Inspect related harness.
4E	DTM switching	DLC terminal TEN	Ignition switch on	Open terminal TEN	B+	<ul style="list-style-type: none"> Inspect related harness
				Short to GND terminal TEN	Below	
4F	A/C	Refrigerant pressure switch	Ignition switch ON	A/C and fan switches are on.	Below 1.0	<ul style="list-style-type: none"> Inspect refrigerant pressure switch. Inspect related harness.
				Others	B+	
4G	—	—	—		—	—
4H	Load/no load distinction	Neutral switch (MT)	Ignition switch on	Transmission in neutral position	Below 1.0	<ul style="list-style-type: none"> Inspect neutral switch. Inspect related harness.
				Others	B+	
4I	Load/no load distinction	Clutch switch (MT)	Ignition switch on	Clutch pedal released	B+	<ul style="list-style-type: none"> Inspect clutch switch Inspect related harness.
				Clutch pedal depressed	Below 1.0	
4J	VTCS vacuum switch	VTCS vacuum switch	Ignition switch on		B+	<ul style="list-style-type: none"> Inspect VTCS vacuum switch Inspect related harness.
			ECT above 60°C(140°F) while idling		B+	
			ECT below 60°C(140°F) and engine speed at 3.500rpm		Below 1.0	
4K	—	—	—		—	—
4L	Constant voltage (Vref)	TP sensor, EGR boost sensor,FTP sensor	Ignition switch on		Approx. 5.0	<ul style="list-style-type: none"> Inspect related harness.
4M	Knocking	KS	Ignition switch on (Using digital type voltmeter, because measurement voltage is less than true voltage when using analog type voltmeter.)		Approx. 2.4	<ul style="list-style-type: none"> Inspect KS. Inspect related harness.

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Fig. 17: PCM Pin Voltage Chart (Miata - 5 Of 6)
Courtesy of MAZDA MOTORS CORP.
2002 Mazda MX-5 Miata

Terminal	Signal	Connected to	Test condition		Voltage (V)	Action
4N	IAT	IAT sensor	Ignition switch on	IAT 20°C (68°F)	2.3—2.4	<ul style="list-style-type: none"> Inspect IAT sensor. Inspect related harness.
				IAT 30°C (86°F)	1.9	
4O	Analogue sensor GND	GND	Under any condition		Below 1.0	<ul style="list-style-type: none"> Inspect related harness.
4P	ECT	ECT sensor	Ignition switch on	ECT 20°C (68°F)	Approx. 3.0	<ul style="list-style-type: none"> Inspect ECT sensor. Inspect related harness.
				ECT 80°C (176°F)	Approx. 0.9	
4Q	—	—	—		—	—
4R	Oil control valve (OCV) control (negative)	Oil control valve (OCV)	Inspect by using the wave profile.			<ul style="list-style-type: none"> Inspect oil control valve (OCV). Inspect related harness.
4S	—	—	—		—	—
4T	Generator output voltage	Generator (terminal P)	Ignition switch on		Below 1.0	<ul style="list-style-type: none"> Inspect generator. Inspect related harness.
			Idle (No electrical load)		3-8	
4U	—	—	—		—	—
4V	TP	TP sensor	Ignition switch on	Closed TP (AP released)	0.1—1.1	<ul style="list-style-type: none"> Inspect TP sensor. Inspect related harness.
				WOT (AP fully depressed)	3.0—4.6	
4W	HO2S (Front)	HO2S (Front)	Inspect by using the wave profile.			<ul style="list-style-type: none"> Inspect HO2S (Front). Inspect related harness.
4X	MAF	MAF sensor	Ignition switch on		0.9—2.0	<ul style="list-style-type: none"> Inspect MAF sensor. Inspect related harness.
			Idle (After warm up)		1.7—2.4	
4Y	—	—	—		—	—
4Z	PCM—TCM communication (From PCM to TCM)(AT)	TCM (terminal O)	Because this terminal is for serial communication, good/no good judgement by terminal voltage is not possible. Carry out inspection according to DTC. Note <ul style="list-style-type: none"> If PCM/TCM communication is not correct, DTC P1601 is stored. 			<ul style="list-style-type: none"> Inspect related harness.
4AA	HO2S (Rear)	HO2S (Rear)	Ignition switch on		0—1.0	<ul style="list-style-type: none"> Inspect HO2S heater (Rear). Inspect related harness.
			Idle	Engine cold	0—0.5	
					0—1.0	
			Acceleration	After warm up	0.5—1.0	
			Deceleration		0—0.5	
4AB	FTP	FTP sensor	Ignition switch on	FTP 0 kPa (0 mmHg, 0 inHg) (BARO)	Approx. 2.5	<ul style="list-style-type: none"> Inspect FTP sensor. Inspect related harness.

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Fig. 18: PCM Pin Voltage Chart (Miata - 6 Of 6)
Courtesy of MAZDA MOTORS CORP.
2002 Mazda MX-5 Miata

Terminal	Signal	Connected to	Test condition		Voltage (V)	Action
4AC	PCM—TCM communication (From TCM to PCM) (AT)	TCM (terminal AL)	Because this terminal is for serial communication, good/no good judgement by terminal voltage is not possible. Carry out inspection according to DTC. Note <ul style="list-style-type: none">If PCM/TCM communication is not correct, DTC P1601 is stored.			<ul style="list-style-type: none">Inspect related harness.
4AD	Fuel tank level	Fuel gauge sender unit	Ignition switch on	Fuel tank full	0.2—0.5*	<ul style="list-style-type: none">Inspect fuel gauge sender unit.Inspect related harness.
				Fuel tank empty	3.4—4.4*	
				Fuel tank half	1.8—2.8*	
4AE	BARO/EGR boost	EGR boost sensor	Ignition switch on, Idle	Below 400 m (0.25 mile) above sea level	4.1—4.3	<ul style="list-style-type: none">Inspect EGR boost sensor.Inspect related harness.
				With pressure gauge: Vacuum reading -26.6 kPa (-200 mmHg, -7.85 inHg)	3.0—3.4	
4AF	Power supply	Main relay	Ignition switch on		B+	<ul style="list-style-type: none">Inspect main relay.Inspect related harness.
			Ignition switch off		Below 1.0	
4AG	Back-up power supply	Battery	Under any condition		B+	<ul style="list-style-type: none">Inspect related harness.
4AH	—	—	—		—	—

* : The voltages above will be measured when the battery voltage is 12—14V.

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