

PIN VOLTAGE/PID VALUE CHARTS

John & Corky's Automotive Specialist

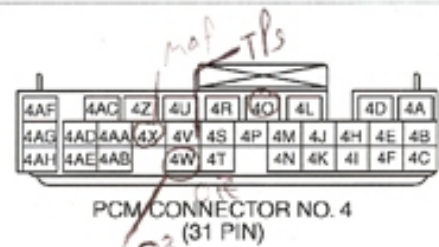
Fig. 13: PCM Pin Voltage Chart (Miata - 1 Of 6)  
 MAZDA MOTORS CORP.  
 2002 Mazda MX-5 Miata



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"> <li>Inspect fuel injector</li> <li>Inspect related harness.</li> </ul>	
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	Below 1.0	<ul style="list-style-type: none"> <li>Inspect cooling fan relay.</li> <li>Inspect related harness.</li> </ul>
			Others		B+	
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	Below 1.0	<ul style="list-style-type: none"> <li>Inspect condenser fan relay.</li> <li>Inspect related harness.</li> </ul>
			Others		B+	
2D	Fuel injector control	Fuel injector No.2	Inspect by using the wave profile.		<ul style="list-style-type: none"> <li>Inspect fuel injector</li> <li>Inspect related harness.</li> </ul>	
2E	EGR valve #1 coil control	EGR valve (terminal E)	Ignition switch on	Below 1.0	<ul style="list-style-type: none"> <li>Inspect EGR valve.</li> <li>Inspect related harness.</li> </ul>	
			Idle			
2F	EGR valve #2 coil control	EGR valve (terminal A)	Ignition switch on	B+	<ul style="list-style-type: none"> <li>Inspect EGR valve.</li> <li>Inspect related harness.</li> </ul>	
			Idle			
2G	Fuel injector control	Fuel injector No.3	Inspect by using the wave profile.		<ul style="list-style-type: none"> <li>Inspect fuel injector</li> <li>Inspect related harness.</li> </ul>	
2H	EGR valve #3 coil control	EGR valve (terminal B)	Ignition switch on	B+	<ul style="list-style-type: none"> <li>Inspect EGR valve.</li> <li>Inspect related harness.</li> </ul>	
			Idle			
2I	EGR valve #4 coil control	EGR valve (terminal F)	Ignition switch on	Below 1.0	<ul style="list-style-type: none"> <li>Inspect EGR valve.</li> <li>Inspect related harness.</li> </ul>	
			Idle			
2J	Fuel injector control	Fuel injector No.4	Inspect by using the wave profile.		<ul style="list-style-type: none"> <li>Inspect fuel injector</li> <li>Inspect related harness.</li> </ul>	

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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"> <li>Inspect A/C relay.</li> <li>Inspect related harness.</li> </ul>
				Others	B+	
2L	—	—	—	—	—	—
2M	FP control	FP RLY	Ignition switch on	B+	<ul style="list-style-type: none"> <li>Inspect FP RLY.</li> <li>Inspect related harness.</li> </ul>	
			Cranking	Below 1.0		
			Idle			
2N	VTCS control	VTCS solenoid valve	ECT above 60°C(140°F) while idling	B+	<ul style="list-style-type: none"> <li>Inspect VTCS solenoid valve</li> <li>Inspect related harness.</li> </ul>	
			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"> <li>Inspect IAC valve inspection.</li> <li>Inspect related harness.</li> </ul>	
2Q	IAC (negative)	IAC valve	Inspect by using the wave profile.		<ul style="list-style-type: none"> <li>Inspect IAC valve inspection.</li> <li>Inspect related harness.</li> </ul>	
2R	MIL control	MIL (in instrument cluster)	Ignition switch ON	Below 1.0	<ul style="list-style-type: none"> <li>Inspect MIL.</li> <li>Inspect related harness.</li> </ul>	
			Idle (MIL OFF)	B+		
3A	Fuel injector GND	GND	Under any condition	Below 1.0	<ul style="list-style-type: none"> <li>Inspect EGR valve.</li> <li>Inspect related harness.</li> </ul>	
3B	PCM GND	GND	Under any condition	Below 1.0	<ul style="list-style-type: none"> <li>Inspect related harness.</li> </ul>	
3C	Purge control	Purge solenoid valve	Inspect by using the wave profile.		<ul style="list-style-type: none"> <li>Inspect purge solenoid valve.</li> <li>Inspect related harness.</li> </ul>	
3D	EGR boost sensor switching control	EGR boost sensor solenoid valve	Ignition switch on	B+	<ul style="list-style-type: none"> <li>Inspect EGR boost sensor solenoid valve.</li> <li>Inspect related harness.</li> </ul>	
			Idle			
3E	CDCV control	CDCV	Ignition switch on	B+	<ul style="list-style-type: none"> <li>Inspect related harness.</li> </ul>	
			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"> <li>Inspect ignition coil.</li> <li>Inspect related harness.</li> </ul>	
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"> <li>Inspect ignition coil.</li> <li>Inspect related harness.</li> </ul>
3J	HO2S heater (Front) control	HO2S (Front)	Ignition switch on	Below 1.0	<ul style="list-style-type: none"> <li>Inspect HO2S heater (Front).</li> <li>Inspect related harness.</li> </ul>
			Idle		
3K	---	---	---	---	---
3L	---	---	---	---	---
3M	Generator field coil control	Generator (terminal D)	Inspect by using the wave profile.		<ul style="list-style-type: none"> <li>Inspect generator.</li> <li>Inspect related harness.</li> </ul>
			Verify that voltage is raised when electrical load (headlight, A/C) is turned on at idle.		
3N	---	---	---	---	---
3O	Engine speed	DLC terminal IG-TCM (AT), tachometer	Inspect by using the wave profile.		<ul style="list-style-type: none"> <li>Inspect related harness.</li> </ul>
3P	HO2S heater (Rear) control	HO2S (Rear)	Ignition switch on	B+	<ul style="list-style-type: none"> <li>Inspect HO2S heater (Rear).</li> <li>Inspect related harness.</li> </ul>
			Idle (Heater operating)	Below 1.0	
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"> <li>Inspect related harness.</li> </ul>
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"> <li>Inspect Immobilizer unit.</li> <li>Inspect related harness.</li> </ul>
3T	Vehicle speed	VSS	Inspect by using the wave profile.		<ul style="list-style-type: none"> <li>Inspect vehicle speedometer sensor.</li> <li>Inspect related harness.</li> </ul>
3U	Generator warning light control	Generator warning light (in instrument cluster)	Ignition switch on	Below 1.0	<ul style="list-style-type: none"> <li>Inspect generator warning light inspection.</li> <li>Inspect related harness.</li> </ul>
			Idle (DTC P0111, P0112, P1631, P1633 or P1634 is not stored.)	B+	
3V	SGC	CMP sensor	Inspect by using the wave profile.		<ul style="list-style-type: none"> <li>Inspect CMP sensor.</li> <li>Inspect related harness.</li> </ul>
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"> <li>Inspect CKP sensor.</li> <li>Inspect related harness.</li> </ul>
3Z	—	—	—		—	—
4A	Output device GND	GND	Under any condition		Below 1.0	<ul style="list-style-type: none"> <li>Inspect related harness.</li> </ul>
4B	Brake	Brake switch	Brake pedal released		Below 1.0	<ul style="list-style-type: none"> <li>Inspect brake switch.</li> <li>Inspect related harness.</li> </ul>
			Brake pedal depressed		B+	
4C	PSP	PSP switch	Idle	Steering wheel straight ahead position	B+	<ul style="list-style-type: none"> <li>Inspect PSP switch.</li> <li>Inspect related harness.</li> </ul>
				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"> <li>Inspect oil control valve (OCV).</li> <li>Inspect related harness.</li> </ul>
4E	DTM switching	DLC terminal TEN	Ignition switch on	Open terminal TEN	B+	<ul style="list-style-type: none"> <li>Inspect related harness</li> </ul>
				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"> <li>Inspect refrigerant pressure switch.</li> <li>Inspect related harness.</li> </ul>
				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"> <li>Inspect neutral switch.</li> <li>Inspect related harness.</li> </ul>
				Others	B+	
4I	Load/no load distinction	Clutch switch (MT)	Ignition switch on	Clutch pedal released	B+	<ul style="list-style-type: none"> <li>Inspect clutch switch</li> <li>Inspect related harness.</li> </ul>
				Clutch pedal depressed	Below 1.0	
4J	VTCS vacuum switch	VTCS vacuum switch	Ignition switch on		B+	<ul style="list-style-type: none"> <li>Inspect VTCS vacuum switch</li> <li>Inspect related harness.</li> </ul>
			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"> <li>Inspect related harness.</li> </ul>
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"> <li>Inspect KS.</li> <li>Inspect related harness.</li> </ul>

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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"> <li>Inspect IAT sensor.</li> <li>Inspect related harness.</li> </ul>
				IAT 30°C (86°F)	1.9	
4O	Analogue sensor GND	GND	Under any condition		Below 1.0	<ul style="list-style-type: none"> <li>Inspect related harness.</li> </ul>
4P	ECT	ECT sensor	Ignition switch on	ECT 20°C (68°F)	Approx. 3.0	<ul style="list-style-type: none"> <li>Inspect ECT sensor.</li> <li>Inspect related harness.</li> </ul>
				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"> <li>Inspect oil control valve (OCV).</li> <li>Inspect related harness.</li> </ul>
4S	—	—	—	—	—	—
4T	Generator output voltage	Generator (terminal P)	Ignition switch on		Below 1.0	<ul style="list-style-type: none"> <li>Inspect generator.</li> <li>Inspect related harness.</li> </ul>
			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"> <li>Inspect TP sensor.</li> <li>Inspect related harness.</li> </ul>
				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"> <li>Inspect HO2S (Front).</li> <li>Inspect related harness.</li> </ul>
4X	MAF	MAF sensor	Ignition switch on		0.9—2.0	<ul style="list-style-type: none"> <li>Inspect MAF sensor.</li> <li>Inspect related harness.</li> </ul>
			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. <b>Note</b> <ul style="list-style-type: none"> <li>If PCM/TCM communication is not correct, DTC P1601 is stored.</li> </ul>		—	<ul style="list-style-type: none"> <li>Inspect related harness.</li> </ul>
4AA	HO2S (Rear)	HO2S (Rear)	Ignition switch on		0—1.0	<ul style="list-style-type: none"> <li>Inspect HO2S heater (Rear).</li> <li>Inspect related harness.</li> </ul>
			Idle	Engine cold	0—0.5	
				After warm up	0—1.0	
			Acceleration	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"> <li>Inspect FTP sensor.</li> <li>Inspect related harness.</li> </ul>

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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.  <b>Note</b> • If PCM/TCM communication is not correct, DTC P1601 is stored.		<ul style="list-style-type: none"> <li>Inspect related harness.</li> </ul>	
4AD	Fuel tank level	Fuel gauge sender unit	Ignition switch on	Fuel tank full	0.2—0.5*	<ul style="list-style-type: none"> <li>Inspect fuel gauge sender unit.</li> <li>Inspect related harness.</li> </ul>
				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"> <li>Inspect EGR boost sensor.</li> <li>Inspect related harness.</li> </ul>
				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"> <li>Inspect main relay.</li> <li>Inspect related harness.</li> </ul>	
			Ignition switch off	Below 1.0		
4AG	Back-up power supply	Battery	Under any condition	B+	<ul style="list-style-type: none"> <li>Inspect related harness.</li> </ul>	
4AH	—	—	—	—	—	

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

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