

J - PIN VOLTAGE CHARTS

1991 Mazda Miata

1991 ENGINE PERFORMANCE Pin Voltage Charts

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INTRODUCTION

Pin voltage charts are supplied to reduce diagnostic time. Checking pin voltages at the ECU determines whether it's receiving and transmitting proper voltage signals. Charts may also help determine if ECU harness is shorted or opened.

NOTE: All voltage tests should be performed with a Digital Volt-Ohmmeter (DVOM) with a minimum 10-megohm input impedance, unless stated otherwise in testing procedures. Voltage readings may vary slightly due to battery condition or charging rate.

MIATA

Terminal	Input	Output	Connection to	Test condition	Voltage	Remark
1A	—	—	Battery	Constant	Approx. 12V	For backup
1B	○		Main relay	Ignition switch OFF	Approx. 0V	
				Ignition switch ON	Approx. 12V	
1C	○		Ignition switch (Start position)	While cranking	Approx. 10V	
				Ignition switch ON	Approx. 0V	
1D		○	Self-Diagnosis Checker (Monitor lamp)	Test switch at "SELF-TEST" Lamp illuminated for 3 sec. after ignition switch OFF→ON	Approx. 5V	With Self-Diagnosis Checker and System Selector
				Lamp not illuminated after 3 sec.	Approx. 12V	
				Test switch at "O ₂ MONITOR" at idle Monitor lamp illuminated	Approx. 5V	
				Test switch at "O ₂ MONITOR" at idle Monitor lamp not illuminated	Approx. 12V	
1E		○	Malfunction indicator lamp	Lamp illuminated for 3 sec. after ignition switch OFF→ON	Below 2.5V	With System Selector test switch at "SELF-TEST"
				Lamp not illuminated after 3 sec.	Approx. 12V	
				Lamp illuminated	Below 2.5V	
				Lamp not illuminated	Approx. 12V	
1F		○	Self-Diagnosis Checker (Code number)	Buzzer sound for 3 sec. after ignition switch OFF→ON	Below 2.5V	• With Self-Diagnosis Checker and System Selector • With System Selector test switch at "SELF-TEST"
				Buzzer not sounded after 3 sec.	Approx. 12V	
				Buzzer sounded	Below 2.5V	
				Buzzer not sounded	Approx. 12V	
1G		○	Igniter	Ignition switch ON	Approx. 0V	
				Idle	Approx. 0.2V	
1H		○	Igniter	Ignition switch ON	Approx. 0V	
				Idle	Approx. 0.2V	
1I	—	—	—	—	—	—
1J		○	A/C relay	Ignition switch ON	Approx. 12V	
				A/C switch ON at idle	Below 2.5V	
				A/C switch OFF at idle	Approx. 12V	
1K	○		Diagnosis connector	System Selector test switch at "O ₂ MONITOR"	Approx. 12V	
				System Selector test switch at "SELF-TEST"	Approx. 0V	
1L	—	—	—	—	—	—
1M	—	—	—	—	—	—
1N	○		Throttle sensor (Idle point)	Accelerator pedal released	Approx. 0V	Ignition switch ON
				Accelerator pedal depressed	Approx. 12V	
1O	○		Stoplight switch	Brake pedal released	0V	
				Brake pedal depressed	Approx. 12V	
1P	○		P/S pressure switch	Ignition switch ON	Approx. 12V	
				P/S ON (at idle)	0V	
				P/S OFF (at idle)	Approx. 12V	
1Q	○		A/C switch	A/C switch ON (Ignition switch ON)	Below 2.5V	Blower motor ON
				A/C switch OFF (Ignition switch ON)	Approx. 12V	

Fig. 1: ECU Pin Voltage Chart (1 of 3)
Courtesy of Mazda Motors Corp.

MIATA (Cont.)

Terminal	Input	Output	Connection to	Test condition	Voltage	Remark
1R	○		Fan switch	Fan operating (Engine coolant temperature over 97°C (207°F) or diagnosis connector terminal TFA grounded)	Approx. 0V	Ignition switch ON
				Fan not operating (Idle)	Approx. 12V	
1S	○		Blower control switch	Blower control switch at mid, high or super high position	Approx. 0V	
				Blower control switch OFF or low	Approx. 12V	
1T	—	—	—	—	—	
1U	○		Headlight switch	Headlights ON (Tail, parking, low beam/high beam)	Approx. 12V	
				Headlights OFF	0V	
1V	○		Neutral or clutch switch (M/T)	Neutral position or clutch pedal depressed	Approx. 0V	
				Other conditions	Approx. 12V	
			Inhibitor switch (4A/T)	N or P range	Approx. 0V	
				Other conditions	Approx. 12V	
2A	—	—	Ground (Injector)	Constant	0V	
2B	—	—	Ground (Output)	Constant	0V	
2C	—	—	Ground (CPU)	Constant	0V	
2D	—	—	Ground (Input)	Constant	0V	
2E	○		Crank angle sensor (Ne-signal)	Ignition switch ON	Approx. 0V or 5V	
				Idle	Approx. 2V	
2F	—	—	—	—	—	
2G	○		Crank angle sensor (G-signal)	Ignition switch ON	Approx. 0V or 5V	
				Idle	Approx. 1.5V	
2H	○		Ground	Constant	0V	
			Open	Federal and Canada spec	Approx. 2V	
2I	○		Igniter	Ignition switch ON	Below 0.5V	
				Idle	Approx. 1V	
2K		○	Airflow meter	Constant	4.5—5.5V	
2L	○		Throttle sensor (Power terminal)	Accelerator pedal released	Approx. 5V	
				Accelerator pedal fully depressed	Approx. 0V	
2M	○		Throttle sensor (4A/T)	Accelerator pedal released	Approx. 0.5V	
				Accelerator pedal fully depressed	Approx. 4.0V	
2N	○		Oxygen sensor	Ignition switch ON	0V	
				Idle (Cold engine)	0V	
				Idle (After warm-up)	0—1V	
				Increase engine speed (After warm-up)	0.5—1V	
				Deceleration	0—0.4V	
2O	○		Airflow meter	Ignition switch ON	Approx. 3.8V	
				Idle	Approx. 3.3V	
2P	○		Airflow sensor (Intake air thermosensor)	At 20°C (68°F)	Approx. 2.5V	
2Q	○		Water thermosensor	Engine coolant temperature 20°C (68°F)	Approx. 2.5V	
				After warm-up	Approx. 0.4V	
2R	—	—	—	—	—	

Fig. 2: ECU Pin Voltage Chart (2 of 3)
Courtesy of Mazda Motors Corp.

MIATA (Cont.)

Terminal	Input	Output	Connection to	Test condition	Voltage	Remark
2S	—	—	—	—	—	—
2T	—	—	—	—	—	—
2U		○	Injector (Nos.1, 3) (Nos.2, 4)	Ignition switch ON	Approx. 0 V	* Engine Signal Monitor: Green and red lights flash
				Idle	Approx. 0V*	
2V		○		Deceleration from 3,000 rpm to 1,900 rpm (After warm-up)	Approx. 12V	
2W		○	ISC valve	Ignition switch ON	Approx. 7V	
				Idle	Approx. 9V	
2X		○	Solenoid valve (Purge control)	Ignition switch ON	Approx. 12V	
				Idle	Approx. 12V	
2Y	—	—	—	—	—	—
2Z		○	4A/T control unit	Ignition switch ON	Approx. 0V	

ECU CONNECTOR TERMINAL IDENTIFICATION

2Y	2W	2U	2S	2Q	2O	2M	2K	2I	2G	2E	2C	2A	1U	1S	1Q	1O	1M	1K	1I	1G	1E	1C	1A
2Z	2X	2V	2T	2R	2P	2N	2L	2J	2H	2F	2D	2B	1V	1T	1R	1P	1N	1L	1J	1H	1F	1D	1B

Fig. 3: ECU Pin Voltage Chart & Terminal Id (3 of 3)
Courtesy of Mazda Motors Corp.