ENGINE PERFORMANCE

Self-Diagnostics

INTRODUCTION

If no faults were found while performing **BASIC TESTING** , proceed with self-diagnostics. If no fault codes or only pass codes are present after entering self-diagnostics, ee to **TESTS W/O CODES** article in the ENGINE PERFORMANCE section for diagnosis by symptom (i.e. ROUGH IDLE, NO START, etc.).

SELF-DIAGNOSTIC SYSTEM

HARD FAILURES

Hard failures cause CHECK ENGINE light to illuminate and remain on until the malfunction is repaired. If light comes on and remains on (light may flash) during vehicle operation, cause of malfunction must be determined using diagnostic (code) charts. If a sensor fails, control unit will use a substitute value in its calculations to continue engine operation. In this condition, vehicle is functional, but loss of good driveability will most likely be encountered.

INTERMITTENT FAILURES

Intermittent failures may cause CHECK ENGINE light to flicker or illuminate and go out after the intermittent fault goes away. The corresponding trouble code, however, will be retained in control unit memory. If related fault does not reoccur within a certain time frame, related trouble code will be erased from control unit memory. Intermittent failures may be caused by sensor, connector or wiring related problems. See INTERMITTENTS in **TESTS W/O CODES** article in the ENGINE PERFORMANCE section.

RETRIEVING CODES

Trouble Code Access

1. Use Self Diagnostic Checker (49 H018 9A1) and System Selector (49 B019 9A0) to retrieve trouble codes. Connect one lead of self diagnostic checker to ground and the other to system selector. Connect system selector to diagnostic connector. If system selector is not available, connect a jumper wire between terminals TEN and GND. See **Fig. 1** .
2. With ignition on and engine stopped, observe CHECK ENGINE light or Malfunction Indicator Light (MIL). Note trouble codes. Check TROUBLE CODE IDENTIFICATION for possible cause. If light remains on continuously, MIL circuit is grounded or ECU is defective.

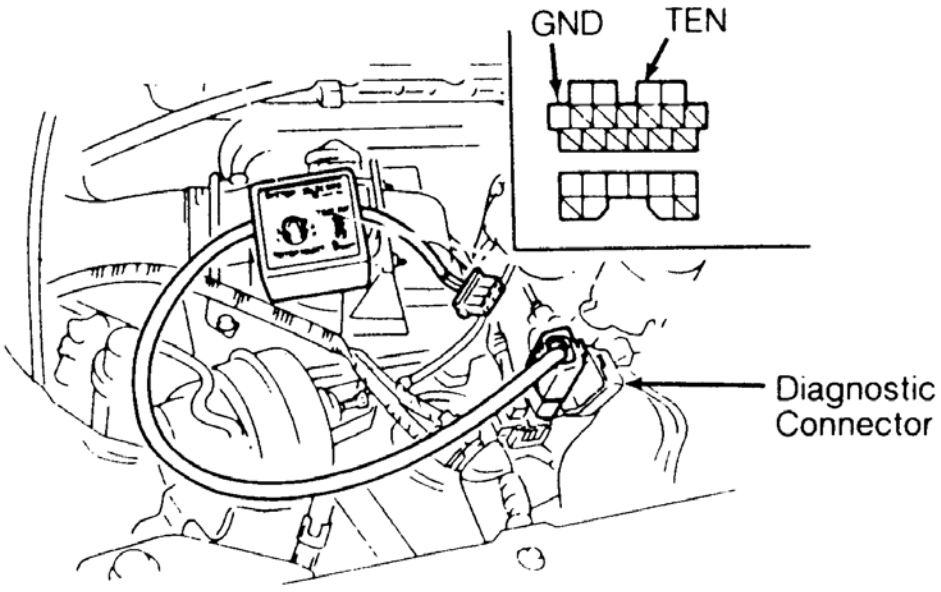


Fig. 1: Locating Self-Diagnostic Connector (Miata)
Courtesy of MAZDA MOTORS CORP.

CLEARING CODES

Disconnect negative battery cable for at least 5 seconds. Reconnect battery cable. Ground test connector with jumper wire. Turn ignition on and verify no codes are displayed.

TROUBLE CODE IDENTIFICATION

NOTE: This article may refer to the on-board computer as either Electronic Control Module (ECM) or Powertrain Control Module-Engine (PCME).

NOTE: See PIN VOLTAGE CHARTS article in the ENGINE PERFORMANCE section to identify ECU connector terminals.

NOTE: This article may refer to the on-board computer as either Electronic Control Module (ECM) or Powertrain Control Module-Engine (PCME).

NOTE: See PIN VOLTAGE CHARTS article to identify ECU connector terminals.

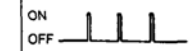
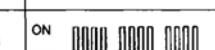
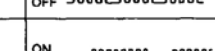
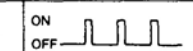
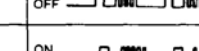
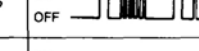
Malfunction display		Sensor or subsystem	On-board diagnosis system	Fail-safe
Code No.	Pattern of output signal (Self-Diagnosis System Checker)			
01		IGF signal	No IGF-signal	—
03		SGT signal	No SGT signal	Cancels fuel injection
04		SGC signal	No SGC signal	Cancels fuel injection and electronic spark distribution
08		Mass airflow sensor	Open or short circuit	Basic fuel injection amount fixed as for two driving modes (1) Idle switch: ON (2) Idle switch: OFF
09		Engine coolant temperature sensor	Open or short circuit	Maintains constant 35°C {95°F} command
10		Intake air temperature sensor (Mass airflow sensor)	Open or short circuit	Maintains constant 20°C {68°F} command
12		Throttle position sensor	Open or short circuit	Maintains constant command of throttle valve wide open throttle
14		Barometric absolute pressure sensor	Open or short circuit	Maintains constant command of sea level pressure
15		Heated oxygen sensor (Inactivation)	Sensor output continues less than 0.55V 180 sec. after engine exceeds 1,500 rpm	Cancels engine closed loop operation
16		EGR function sensor	Open or short circuit	Maintains constant command of EGR valve
17		Heated oxygen sensor (Inversion)	Sensor output continues unchanged 20 sec. after engine exceeds 1,500 rpm	Cancels engine closed loop operation
25		PRC solenoid valve	Open or short circuit	—
26		Purge solenoid valve	Open or short circuit	—
28		EGR solenoid valve (vacuum)	Open or short circuit	—
29		EGR solenoid valve (vent)	Open or short circuit	—
34		Idle air control valve	Open or short circuit	—

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Fig. 2: Trouble Code Identification Table
Courtesy of MAZDA MOTORS CORP.

TROUBLE CODE IDENTIFICATION TABLE

TROUBLE CODE IDENTIFICATION

DTC	Description
CODE 1	Ignition Signal
CODE 3	SGT Signal - Crank Angle

CODE 4	SGC Signal - Crank Angle
CODE 8	Airflow Meter
CODE 9	Coolant Thermosensor
CODE 10	Intake Air Thermosensor
CODE 12	Throttle Sensor
CODE 14	Atmospheric Pressure Sensor
CODE 15	Oxygen Sensor
CODE 16	EGR Function Sensor - CKT Diagram
CODE 17	Feedback System
CODE 25	PRC Solenoid Valve
CODE 26	Purge Control Solenoid Valve
CODE 28	EGR Vacuum Solenoid Valve
CODE 29	EGR Vent Solenoid Valve
CODE 34	Idle Speed Control

CODE 1: (IGNITION SIGNAL)

CODE No.	01 (IGF-SIGNAL)		
STEP	INSPECTION		ACTION
1	*Are there any poor connections at ignition coil connectors?*	Yes	*Repair or replace connector*
		No	Go to next step
2	Does tachometer operate?	Yes	Go to next step
		No	*Check for open circuit in wiring from ignition oil to PCME terminal 2I*
3	Is resistance of ignition coil OK? Resistance: Secondary 8.7—12.9 kΩ	Yes	Go to next step
		No	Replace ignition coil
4	Is ignition coil terminal A voltage OK?	Yes	Go to next step
		No	Check for open circuit in wiring from ignition coil to ignition switch
5	Is there continuity between ignition coil terminal C and ground?	Yes	Go to next step
		No	*Check for open circuit in wiring from ignition coil to ground*
6	Are PCME terminals 1G and 1H voltages OK?	Yes	Replace PCME
		No	Check for circuit in wiring from ignition coil to PCME

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Fig. 3: Trouble Code No. 1 Diagnostic Chart (Ignition Signal)
Courtesy of MAZDA MOTORS CORP.

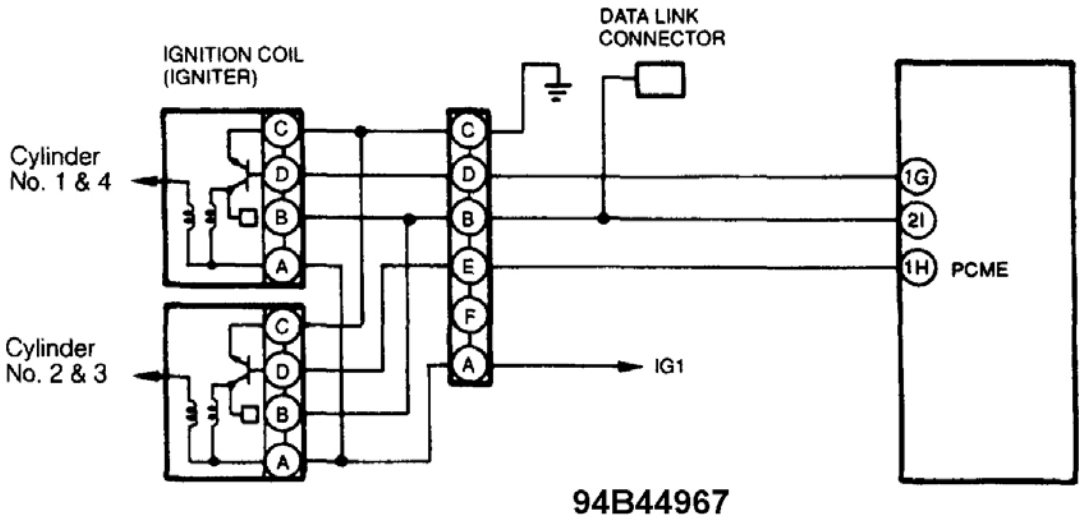

Fig. 4: Trouble Code No. 1 Ignition System Circuit Diagram
Courtesy of MAZDA MOTORS CORP.

CODE 3: (SGT SIGNAL - CRANK ANGLE)

Trouble Code No. 2 (Ne Signal-Crank Angle)

STEP	INSPECTION	ACTION	
1	Are there any poor connections in crank angle sensor circuit?	Yes	Repair or replace connector
		No	Go to next step
2	Is Code No.03 present at same time?	Yes	Go to next step
		No	Go to Step 5
3	Is there continuity between crank angle sensor terminal-wire (B/LG) and ground?	Yes	Go to next step
		No	Check for open circuit in wiring from crank agnle sensor to ground
4	Is there battery voltage at crank angle sensor terminal-wire (W/R)?	Yes	Go to next step
		No	Check for open circuit in wiring from crank angle sensor to main relay
5	Is there continuity between crank angle sensor and ECU? (Crank angle sensor: C (W) — ECU: 2E)	Yes	Go to next step
		No	Check for open circuit in wiring from crank angle sensor to ECU
6	Is there approx. 5V at ECU terminal 2E? (With crank angle sensor connector disconnected)	Yes	Go to next step
		No	Replace ECU ★
7	Is there approx. 5V at crank angle sensor terminal-wire (W)? (At harness-side connector with connector disconnected)	Yes	Replace crank angle sensor ★
		No	Check for short circuit in wiring from crank angle sensor to ECU

★ : See PIN VOLTAGES and SENSOR OPERATING RANGE Charts.

Fig. 5: Trouble Code No. 3 Diag. Chart (SGT Signal - Crank Angle)
Courtesy of MAZDA MOTORS CORP.

CODE 4: (SGC SIGNAL - CRANK ANGLE)

Trouble Code No. 3 (G Signal-Crank Angle)

STEP	INSPECTION	ACTION	
1	Are there any poor connections in crank angle sensor circuit?	Yes	Repair or replace connector
		No	Go to next step
2	Is Code No.02 also present?	Yes	Go to next step
		No	Go to Step 5
3	Is there continuity between crank angle sensor terminal-wire (B/LG) and ground?	Yes	Go to next step
		No	Check for open circuit in wiring from crank angle sensor to ground
4	Is there battery voltage at crank angle sensor terminal-wire (W/R)?	Yes	Go to next step
		No	Check for open circuit in wiring from crank angle sensor to main relay
5	Is there continuity between crank angle sensor and ECU?	Yes	Go to next step
	Crank angle sensor: D (Y/L) — ECU: 2G	No	Check for open circuit in wiring from crank angle sensor to ECU
6	Is there approx. 5V at ECU terminal 2E? (With crank angle sensor connector disconnected)	Yes	Go to next step
		No	Replace ECU ★
7	Is there approx. 5V at crank angle sensor terminal-wire (Y/L)? (At harness-side connector with connector disconnected)	Yes	Replace crank angle sensor ★
		No	Check for short circuit in wiring from crank angle sensor to ECU

Fig. 6: Trouble Code No. 4 Diag. Chart (SGC Signal - Crank Angle)
Courtesy of MAZDA MOTORS CORP.

CODE 8: (AIRFLOW METER)

AIRFLOW METER WIRE COLORS

Terminal	Wire Color
"E"	BLK/LT. GRN
"B"	RED

Airflow Meter Wire Colors

Terminal	Wire Color
"E"	BLK/LT. GRN
"B"	RED

CODE No.	08 (MASS AIRFLOW SENSOR)		
STEP	INSPECTION		ACTION
1	Are there any poor connections in mass airflow sensor circuit?	Yes	Repair or replace connector
		No	Go to next step
2	Is Code No.10 present at same time?	Yes	Check for open circuit in wiring from mass airflow sensor terminal E to ground
		No	Go to next step
3	Is there continuity between mass airflow sensor connector and PCME? * (Mass airflow sensor: E – PCME: 2F; B – PCME: 2O)	Yes	Go to next step
		No	Check for open circuit in wiring from mass airflow sensor to PCME
4	Are PCME terminals 2O and 2F voltages OK? *	Yes	Replace PCME
		No	Check for short circuit in wiring from mass airflow sensor to PCME

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Fig. 7: Trouble Code No. 8 Diagnostic Chart (Airflow Meter)
Courtesy of MAZDA MOTORS CORP.

CODE 9: (COOLANT THERMOSENSOR)

Trouble Code No. 9 (Coolant Thermosensor)

STEP	INSPECTION		ACTION
1	Are there any poor connections in water thermosensor circuit?	Yes	Repair or replace connector
		No	Go to next step
2	Is there continuity between water thermosensor and ECU? (Water thermosensor: A (L/W) – ECU: 2Q; B (B/LG) – ECU: 2D)	Yes	Go to next step
		No	Check for open circuit in wiring from water thermosensor to ECU
3	Is resistance of water thermosensor OK? (Coolant temp. –20°C (–4°F) – Resistance 14.6—17.8 kΩ; 20°C (68°F) – 2.2—2.7 kΩ; 80°C (176°F) – 290—350Ω)	Yes	Go to next step
		No	Replace water thermosensor ★
4	Is same Code No. present after performing after-repair procedure? ★	Yes	Go to next step
		No	Water thermosensor and circuit OK
5	Are ECU terminals 2Q and 2D voltages OK? ★	Yes	Replace ECU ★
		No	Check for short circuit in wiring from water thermosensor to ECU

Fig. 8: Trouble Code No. 9 Diagnostic Chart (Coolant Thermosensor)
Courtesy of MAZDA MOTORS CORP.

CODE 10: (INTAKE AIR THERMOSENSOR)

AIRFLOW METER WIRE COLORS

Terminal	Wire Color
"C"	BLK/BLU
"D"	RED/BLK

Airflow Meter Wire Colors

Terminal	Wire Color
"C"	BLK/BLU
"D"	RED/BLK

CODE No.	10 (INTAKE AIR TEMPERATURE SENSOR — IN MASS AIRFLOW SENSOR)		
STEP	INSPECTION		ACTION
1	Are there any poor connections in intake air temperature sensor circuit?	Yes	Repair or replace connector
		No	Go to next step
2	Is there continuity between intake air temperature sensor (in mass airflow sensor) and PCME? * Intake air temperature sensor: C — PCME: 2D Intake air temperature sensor: D — PCME: 2P	Yes	Go to next step
		No	Check for open circuit in wiring from intake air temperature sensor (in mass airflow sensor) to PCME
3	Is resistance of intake air temperature sensor (in mass airflow sensor) OK? Terminal: C—D; Temperature: 20°C (68°F); Resistance: 2.21—2.69 kΩ	Yes	Go to next step
		No	Replace mass airflow sensor
4	Is same Code No. present after performing after repair procedure?	Yes	Go to next step
		No	Intake air temperature sensor and circuit OK
5	Are powertrain control module (engine) terminals 2P and 2D voltages OK?	Yes	Replace PCME
		No	Check for short circuit in wiring from intake air temperature sensor to PCME

* – See PIN VOLTAGE CHARTS article.

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Fig. 9: Trouble Code No. 10 Diag. Chart (Intake Air Thermosensor)
Courtesy of MAZDA MOTORS CORP.

CODE 12: (THROTTLE SENSOR)

THROTTLE POSITION SENSOR WIRE COLORS

Terminal	Wire Color
"A"	BLK/BLU
"C"	RED/BLK
"D"	LT. GRN/WHT

Throttle Position Sensor Wire Colors

Terminal	Wire Color
"A"	BLK/BLU
"C"	RED/BLK
"D"	LT. GRN/WHT

CODE No.	12 (THROTTLE POSITION SENSOR)		
STEP	INSPECTION		ACTION
1	Check throttle position sensor circuit for poor connection	Yes	Repair or replace connector
		No	Go to next step
2	Check wire harness between throttle position sensor and PCME for continuity * Throttle position sensor / PCME: D / 2K; C / 2M; A / 2D	Yes	Go to next step
		No	Repair or replace
3	Check if PCME terminal 2M voltage is OK *	Yes	Replace PCME
		No	Check for short circuit in wiring from throttle position sensor to PCME

* - See PIN VOLTAGE CHARTS article.

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Fig. 10: Trouble Code No. 12 Diagnostic Chart (Throttle Sensor)
Courtesy of MAZDA MOTORS CORP.

CODE 14: (ATMOSPHERIC PRESSURE SENSOR)

TROUBLE CODE NO. 14 (ATMOSPHERIC PRESSURE SENSOR)

Replace ECU

* - See PIN VOLTAGE CHARTS article.

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Fig. 11: Trouble Code No. 14 Diag. Chart (Atmospheric Pressure Sensor)
Courtesy of MAZDA MOTORS CORP.

CODE 15: (OXYGEN SENSOR)

Trouble Code No. 15 (Oxygen Sensor)

Note
• If Code Nos.15 and 17 are both present, first perform the checking procedure for Code No.17

STEP	INSPECTION	ACTION	
1	Are there any poor connections in oxygen sensor circuit?	Yes	Repair or replace connector
		No	Go to next step
2	Is oxygen sensor output voltage OK?	Yes	Go to next step
		No	Replace oxygen sensor
3	Is there continuity between oxygen sensor and ECU terminal 2N?	Yes	Go to next step
		No	Check for open circuit in wiring from oxygen sensor to ECU
4	Is ECU terminal 2N voltage OK?	Yes	Go to next step
		No	Check for short circuit in wiring from oxygen sensor to ECU
5	Is sensitivity of oxygen sensor OK?	Yes	Replace ECU
		No	Replace oxygen sensor

Fig. 12: Trouble Code No. 15 Diagnostic Chart (Oxygen Sensor)
Courtesy of MAZDA MOTORS CORP.

CODE 16: (EGR FUNCTION SENSOR) CKT DIAGRAM

CODE No.	16 (EGR FUNCTION SENSOR)		
STEP	INSPECTION		ACTION
1	Does EGR function sensor circuit have a poor connection?	Yes	Repair or replace connector
		No	Go to next step
2	Is EGR control valve OK?	Yes	Go to next step
		No	Replace EGR control valve
3	Is resistance of EGR function sensor OK? Resistance: (A) ↔ (B) Approx. 2.7 kΩ (A) ↔ (C) 0.5—2.7 kΩ (B) ↔ (C) 0.1—2.4 kΩ	Yes	Go to next step
		No	Replace EGR control valve
4	Is there continuity between EGR function sensor and PCME? *	Yes	Replace PCME
		No	Check for open circuit in wiring from EGR function sensor to PCME
5	Is there 4.5—5.5V at C terminal of EGR function sensor connector? *	Yes	Go to next step
		No	Check for short circuit in wiring from EGR function sensor terminal C to PCME
6	Is PCME terminal 2J voltage OK? *	Yes	Replace PCME
		No	Short circuit in wiring harness EGR function sensor terminal C to PCME

EGR function sensor	PCME
C	2J
B	2K
A	2D

* – See PIN VOLTAGE CHARTS article.

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Fig. 13: Trouble Code No. 16 Diagnostic Chart (EGR Function Sensor)

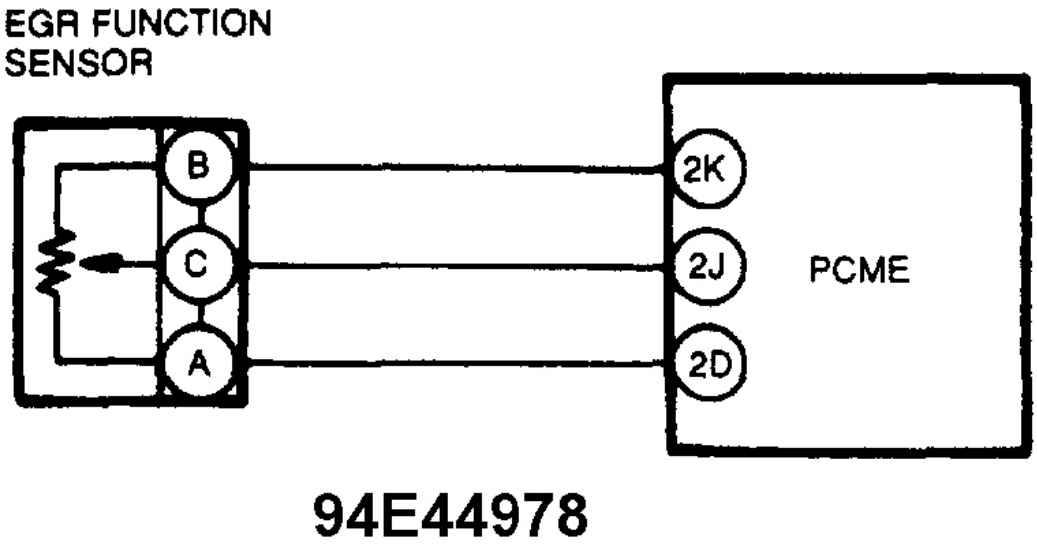


Fig. 14: Trouble Code No. 16 Circuit Diagram (Miata)
Courtesy of MAZDA MOTORS CORP.

CODE 17: (FEEDBACK SYSTEM)

Trouble Code No. 17 (Feedback System)

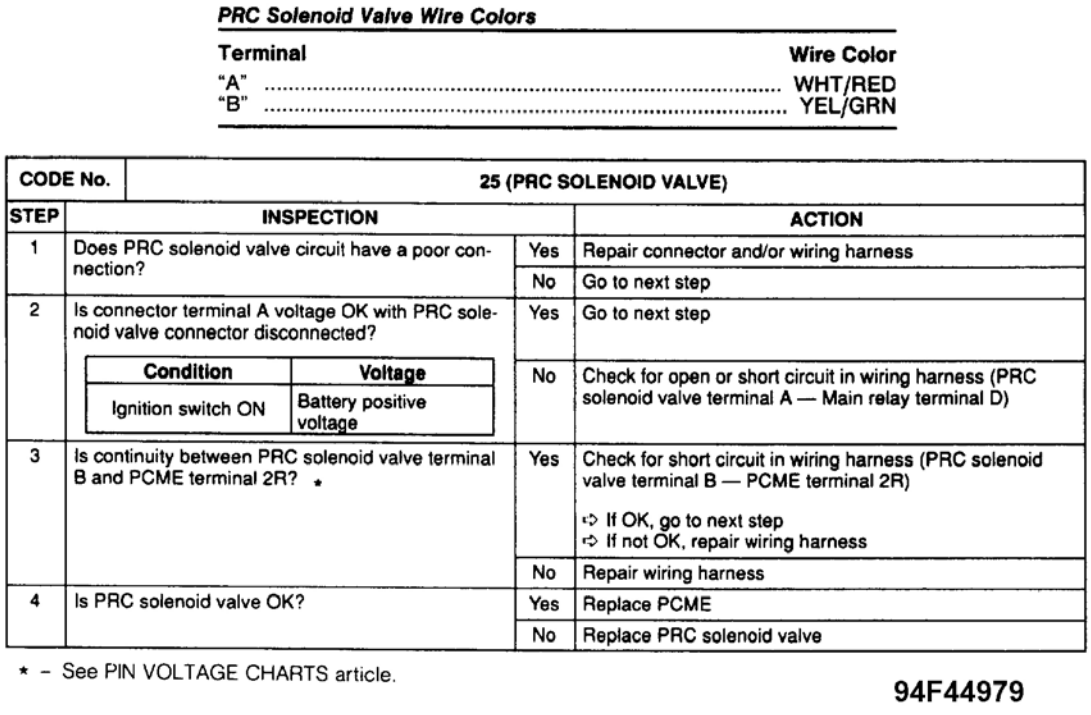
STEP	INSPECTION		ACTION
1	Warm up engine and run it at 2,500—3,000 rpm for 3 min.		
2	Does monitor lamp of Self-Diagnosis Checker illuminate at idle?	Yes	Go to next step
		No	Check for air leak in vacuum hoses or emission components Check for contaminated oxygen sensor Check for insufficient fuel injection
3	Are spark plugs clean?	Yes	Go to next step
		No	Clean or replace spark plugs
4	Is oxygen sensor voltage OK?	Yes	Go to next step
		No	Replace oxygen sensor
5	Is same Code No. present after performing after-repair procedure?	Yes	Go to next step
		No	Check for short circuit in wiring from oxygen sensor to ECU terminal 2N
6	Is there continuity between oxygen sensor and ECU terminal 2N?	Yes	Go to next step
		No	Check for open circuit in wiring from oxygen sensor to ECU
7	Is ECU terminal 2N voltage OK? ★	Yes	Replace ECU
		No	Check for short circuit in wiring from oxygen sensor to ECU

Fig. 15: Trouble Code No. 17 Diagnostic Chart (Feedback System)
Courtesy of MAZDA MOTORS CORP.

CODE 25: (PRC SOLENOID VALVE)

PRC SOLENOID VALVE WIRE COLORS

Terminal	Wire Color
"A"	WHT/RED
"B"	YEL/GRN



PRC Solenoid Valve Wire Colors

Terminal	Wire Color
"A"	WHT/RED
"B"	YEL/GRN

CODE No.	25 (PRC SOLENOID VALVE)		
STEP	INSPECTION		ACTION
1	Does PRC solenoid valve circuit have a poor connection?	Yes	Repair connector and/or wiring harness
		No	Go to next step
2	Is connector terminal A voltage OK with PRC solenoid valve connector disconnected? Condition: Ignition switch ON — Voltage: Battery positive voltage	Yes	Go to next step
		No	Check for open or short circuit in wiring harness (PRC solenoid valve terminal A — Main relay terminal D)
3	Is continuity between PRC solenoid valve terminal B and PCME terminal 2R? *	Yes	Check for short circuit in wiring harness (PRC solenoid valve terminal B — PCME terminal 2R) ➪ If OK, go to next step ➪ If not OK, repair wiring harness
		No	Repair wiring harness
4	Is PRC solenoid valve OK?	Yes	Replace PCME
		No	Replace PRC solenoid valve

* – See PIN VOLTAGE CHARTS article.

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Fig. 16: Trouble Code No. 25 Diagnostic Chart (PRC Solenoid Valve)
Courtesy of MAZDA MOTORS CORP.

CODE 26: (PURGE CONTROL SOLENOID VALVE)

Trouble Code No. 26 (Purge Control Solenoid Valve)

STEP	INSPECTION		ACTION
1	Are there any poor connections in solenoid valve circuit?	Yes	Repair or replace connector
		No	Go to next step
2	Is resistance of solenoid valve OK? **Resistance: 25 ± 2Ω**	Yes	Go to next step
		No	Replace solenoid valve
3	Is there battery voltage at terminal wire (W/R) of solenoid valve circuit?	Yes	Go to next step
		No	Check for open circuit in wiring from solenoid valve to main relay
4	Is there continuity between solenoid valve and ECU? Solenoid valve: B (Y/R) — ECU: 2X	Yes	Go to next step
		No	Check for open circuit in wiring from solenoid valve to ECU
5	Is ECU terminal (2X) voltage OK? ★	Yes	Replace ECU
		No	Check for short circuit in wiring from solenoid valve to ECU

★ - See PIN VOLTAGES and SENSOR OPERATING RANGE Charts.

Fig. 17: Trouble Code No. 26 (Purge Control Solenoid Valve)
Courtesy of MAZDA MOTORS CORP.

CODE 28: (EGR VACUUM SOLENOID VALVE)

EGR VACUUM SOLENOID VALVE WIRE COLORS

Terminal	Wire Color
"A"	WHT/RED
"B"	YEL/RED

EGR Vacuum Solenoid Valve Wire Colors

Terminal	Wire Color
"A"	WHT/RED
"B"	YEL/RED

CODE No.	28 (EGR SOLENOID VALVE(VACUUM))		
STEP	INSPECTION		ACTION
1	If there a poor connection in EGR solenoid valve (vacuum) circuit?	Yes	Repair or replace connector
		No	Go to next step
2	Is connector terminal A voltages with EGR solenoid valve (vacuum) connector disconnected OK? Condition: IG switch ON — Voltage: Battery positive voltage	Yes	Go to next step
		No	Check for open or short circuit in wiring from EGR solenoid valve (vacuum) terminal A to main relay terminal
3	Is continuity between EGR solenoid valve (vacuum) terminal B and PCME terminal 1T OK? ★	Yes	Check for short circuit in wiring from EGR solenoid valve (vacuum) terminal B to PCME terminal 1T ★ ➪ If OK, go to next step ➪ If not OK, repair or replace wiring harness
		No	Repair or replace wire harness
4	Is EGR solenoid valve (vacuum) OK?	Yes	Replace PCME
		No	Replace EGR solenoid valve (vacuum)

★ - See PIN VOLTAGE CHARTS article.

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Fig. 18: Trouble Code No. 28 (EGR Vacuum Solenoid Valve)
Courtesy of MAZDA MOTORS CORP.

CODE 29: (EGR VENT SOLENOID VALVE)

EGR VENT SOLENOID VALVE WIRE COLORS

Terminal	Wire Color
"A"	WHT/RED
"B"	YEL/BLK

EGR Vent Solenoid Valve Wire Colors

Terminal	Wire Color
"A"	WHT/RED
"B"	YEL/BLK

CODE No.	29 (EGR SOLENOID VALVE(VENT))		
STEP	INSPECTION		ACTION
1	If there a poor connection in EGR solenoid valve (vent) circuit?	Yes	Repair or replace connector
		No	Go to next step
2	Is connector terminal A voltages with EGR solenoid valve (vent) connector disconnected OK? Condition: IG switch ON; Voltage: Battery positive voltage	Yes	Go to next step
		No	Check for open or short circuit in wiring from EGR solenoid valve (vent) terminal A to main relay terminal
3	Is continuity between EGR solenoid valve (vent) terminal B and PCME terminal 1R OK? *	Yes	Check for short circuit in wiring from EGR solenoid valve (vent) terminal B to PCME terminal 1R * ➪ If OK, go to next step ➪ If not OK, repair or replace wiring harness
		No	Repair or replace wire harness
4	Is EGR solenoid valve (vent) OK?	Yes	Replace PCME
		No	Replace EGR solenoid valve (vent)

* - See PIN VOLTAGE CHARTS article.

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Fig. 19: Trouble Code No. 29 (EGR Vent Solenoid Valve)
Courtesy of MAZDA MOTORS CORP.

CODE 34: (IDLE SPEED CONTROL)

Trouble Code 34 (Idle Speed Control)

STEP	INSPECTION		ACTION
1	Are there any poor connections in ISC valve circuit?	Yes	Repair or replace connector
		No	Go to next step
2	Is resistance of ISC valve OK? **Resistance: 12 ± 1Ω**	Yes	Go to next step
		No	Replace ISC valve
3	Is there battery voltage at terminal-wire (W/R) of ISC valve circuit?	Yes	Go to next step
		No	Check for open circuit in wiring from ISC valve to main relay
4	Is there continuity between ISC valve and ECU? ISC valve: B (L/O) — ECU: 2W	Yes	Go to next step
		No	Check for open circuit in wiring from ISC valve to ECU
5	Is ECU terminal 2W voltage OK? ★	Yes	Replace ECU
		No	Check for short circuit in wiring from ISC valve to ECU

★ - See PIN VOLTAGES and SENSOR OPERATING RANGE Charts.

Fig. 20: Trouble Code No. 34 Diagnostic Chart (Idle Speed Control)
Courtesy of MAZDA MOTORS CORP.

SUMMARY

If no hard fault codes (or only pass codes) are present, driveability symptoms exist or intermittent codes exist, proceed to **TESTS W/O CODES** article in the ENGINE PERFORMANCE section for diagnosis by symptom (i.e. ROUGH IDLE, NO START, etc.) or intermittent diagnostic procedures.