

# H - TESTS W/O CODES

## 1991 Mazda Miata

1991 ENGINE PERFORMANCE  
Trouble Shooting No Codes

B2200, B2600i, Miata, MPV, MX-6, Navajo, Protege, RX7,  
323, 626, 929

### INTRODUCTION

Before diagnosing symptoms or intermittent faults, perform steps in F - BASIC TESTING and appropriate G - TEST W/CODES articles. Use this article to diagnose driveability problems existing when a hard fault code is not present or vehicle is not equipped with a self-diagnostic system.

NOTE: Some driveability problems may have been corrected by manufacturer with a revised computer calibration chip or computer control unit. Check with manufacturer for latest chip or computer application.

Symptom checks can direct the technician to malfunctioning component(s) for further diagnosis. A symptom should lead to a specific component, system test or adjustment.

Use intermittent test procedures to locate driveability problems that DO NOT occur when the vehicle is being tested. These test procedures should also be used if a soft (intermittent) trouble code was present, but no problem was found during self-diagnostic testing.

NOTE: For specific testing procedures, see I - SYS/COMP TESTS article in the ENGINE PERFORMANCE section. For specifications, see D - ADJUSTMENTS or C - SPECIFICATIONS article in the ENGINE PERFORMANCE section.

### SYMPTOM DIAGNOSIS

Symptom checks cannot be used properly unless the problem occurs while the vehicle is being tested. To reduce diagnostic time, ensure steps in F - BASIC TESTING and appropriate G - TEST W/CODES article were performed before diagnosing a symptom. Symptoms available for diagnosis include the following:

- \* Difficult Or No Start (Crankes Okay)
- \* Rough Or Unstable Idle
- \* Excessive Fast Idle
- \* Engine Stalls
- \* Engine Misfires Or Has Lack Of Power
- \* Engine Runs Rough On Deceleration
- \* Backfire In Exhaust System
- \* Poor Fuel Mileage
- \* Excessive Oil Consumption
- \* Abnormal Noise Or Knocking
- \* Fails Emission Test

### DIFFICULT OR NO START (CRANKS OKAY)

#### CARBURETED MODELS (B2200 FEDERAL)

- \* Check battery condition.

- \* Ensure sufficient secondary spark is available.
- \* Verify choke valve is closed (engine cold).
- \* Verify choke valve is open (engine hot).
- \* Ensure fuel level is at specified mark on carburetor sight glass.
- \* Ensure fuel system pressure is correct.
- \* Check mixture control valve operation.
- \* Check for correct vacuum hose routing.
- \* Check slow fuel-cut solenoid valve operation. A click should be heard from solenoid valve as ignition switch is cycled on and off.
- \* Check duty solenoid valve for correct switching.
- \* Check charcoal canister operation by clamping hose(s) shut. If problem goes away, check vacuum hose routing. If routing is correct, replace charcoal canister.
- \* Ensure winter grade fuel is not being used in warm climate conditions.
- \* Ensure exhaust system is not restricted.

## FUEL INJECTED MODELS

- \* Check battery condition.
- \* Check Electronic Fuel Injection (EFI) main fuse located in fuse box (if equipped).
- \* Ensure inertia switch circuit is not open (Navajo).
- \* Verify crank angle sensor at connector has correct resistance values (Navajo and RX7).
- \* Verify optical sensor at connector has correct resistance values (Miata, Protege and 323).
- \* Check for leaky fuel injectors or pressure regulator causing warm-engine no start.
- \* Check main relay operation. A click should be heard from main relay as ignition switch is cycled on and off.
- \* Verify distributor connector parallel terminal resistance is correct.
- \* Ensure distributor pick-up coil resistance is correct.
- \* Ensure fuel system pressure is correct.
- \* Ensure pressure regulator control system is okay.
- \* Ensure secondary air injection system is functioning correctly (if equipped).
- \* Check air intake system for restriction.
- \* Check EGR valve and solenoid for correct operation.
- \* Check for cracks or poor connections at airflow meter or throttle body.
- \* Ensure ignition coil has correct resistance.

## ROUGH OR UNSTABLE IDLE

### CARBURETED MODELS (B2200 FEDERAL)

- \* Ensure there are no vacuum leaks.
- \* Verify vacuum hose routing is correct.
- \* Ensure fuel level is at specified mark on carburetor sight glass.
- \* Check PCV operation by clamping hose shut. If problem goes away, replace PCV valve.
- \* Check EGR operation.
- \* Verify ignition timing is correct.
- \* Briefly remove each spark plug wire to determine if problem can be isolated.
- \* Verify mixture control solenoid operation is correct.

## FUEL INJECTED MODELS

- \* Use sound amplification tool to verify fuel injector(s) working noise.
- \* Ensure fuel system pressure is correct.
- \* Verify ignition timing is correct.
- \* Check PCV system for restrictions.
- \* Check airflow meter.
- \* Check coolant thermosensor for correct resistance.
- \* Check air valve or ISC valve for malfunction.
- \* Check for cracks or poor connections at airflow meter or throttle body.
- \* Check O2 sensor for fluctuating 0 to 1.0-volt output while increasing and decreasing engine RPM.
- \* Verify throttle position sensor has correct adjustment and resistance value.
- \* Check for purge valve malfunction.

## EXCESSIVE FAST IDLE

### CARBURETED MODELS (B2200 FEDERAL)

- \* Ensure no vacuum leaks are present.
- \* Check choke adjustment and operation.
- \* Check throttle cable adjustment.
- \* Verify ignition timing is correct.
- \* Verify dashpot disengages throttle lever at 1900-2100 RPM.

## FUEL INJECTED MODELS

- \* Verify correct throttle body dashpot adjustment.
- \* Check By-Pass Air Control (BAC) valve and ISC valve operation.
- \* Check air intake system for leaks or restriction.
- \* Check pressure regulator control system.
- \* Ensure fuel system pressure is correct.
- \* Check coolant thermosensor.
- \* Check airflow meter for cracks. Verify correct airflow operation and resistance value.

## ENGINE STALLS

### CARBURETED MODELS (B2200 FEDERAL)

- \* Verify correct air cleaner intake control door operation.
- \* Ensure correct choke adjustment and operation.
- \* Check choke diaphragm vacuum source.
- \* Check choke diaphragm for damage.
- \* Ensure idle mixture adjustment is correct.
- \* Ensure there are no vacuum leaks.
- \* Check PCV operation by clamping hose shut. If problem goes away, replace PCV valve.
- \* Check A/C cut-off system.
- \* Check HAC valve operation.
- \* Check EGR valve operation.

### FUEL INJECTED MODELS (COLD)

- \* Ensure air intake system is unrestricted.
- \* Remove By-Pass Air Control (BAC) valve hose and check valve for restrictions. If no restrictions are found, check

- resistance at BAC valve terminals.
- \* Check EGR valve and solenoid for correct operation.
- \* Check intake air and water thermosensor.
- \* Check airflow meter or ISC valve malfunction.
- \* Check A/C cut-off system (if equipped).
- \* Ensure fuel system pressure is correct.
- \* Check for cracks or poor connections at airflow meter or throttle body.
- \* Verify correct throttle position sensor adjustment and resistance value.

## **FUEL INJECTED MODELS (WARM)**

- \* Check PCV system for restrictions.
- \* Check air valve or ISC valve for malfunction.
- \* Check connections at airflow meter or throttle body.
- \* Ensure fuel system pressure is correct. Use ohmmeter to verify correct fuel injector resistance.
- \* Check throttle bore for dirt or carbon.

## **ENGINE MISFIRES OR HAS LACK OF POWER**

### **CARBURETED MODELS (B2200 FEDERAL)**

- \* Ensure fuel level is at specified mark on carburetor sight glass.
- \* Verify sufficient fuel is dispensed at accelerator pump jets as throttle valve is opened.
- \* Ensure fuel system pressure is correct.
- \* Verify base timing is correct and timing advance system is functional.
- \* Check EGR valve operation.
- \* Check A/C cut-off system (if equipped).
- \* Check carburetor mixture control duty cycle using dwell meter.

### **FUEL INJECTED MODELS**

- \* Verify air intake system is unrestricted.
- \* Check EGR valve and solenoid for correct operation (if equipped).
- \* Check No. 1 and No. 2 purge control valve operation.
- \* Check vacuum switching valve operation.
- \* Check coil resistance.
- \* Check airflow meter for cracks.
- \* Check airflow operation and resistance value.
- \* Check atmospheric pressure sensor.
- \* Check secondary air injection system (RX7).
- \* Check Variable Dynamic Intake System (VDIS RX7).
- \* Check Variable Resonance Induction System (VRIS) for correct operation (MPV 3.0L, 929 SOHC and DOHC).
- \* Check Variable Inertia Charge System (VICS) for correct operation (Protege 1.8L DOHC).
- \* Verify connector at crank angle sensor has correct resistance values.
- \* Check A/C cut-off system (if equipped).
- \* Check Triple Induction Control System (TICS) for correct operation (929 SOHC).
- \* Ensure fuel system pressure is correct. Use ohmmeter to verify fuel injector terminal resistance.

Check turbo system for damage or wear (if equipped). Turbo

system inspection should include the following components:

- \* Air by-pass valve
- \* Engine Control Unit (ECU)
- \* Intake air thermosensor in airflow meter
- \* Knock sensor and knock control unit
- \* Turbo wastegate solenoid valve.

## **ENGINE RUNS ROUGH ON DECELERATION**

### **FUEL INJECTED MODELS**

- \* Verify idle speed is correct.
- \* Verify correct throttle body dashpot adjustment.
- \* Check coolant thermosensor and throttle position sensor.
- \* Check triple induction control system for correct operation (929 SOHC).
- \* Check air valve or ISC valve for malfunction.
- \* Ensure fuel system pressure is correct.
- \* Check O2 sensor operation.
- \* Check airflow meter operation.

## **BACKFIRE IN EXHAUST SYSTEM**

### **CARBURETED MODELS (B2200 FEDERAL)**

- \* Verify base timing is correct and timing advance system is functional.
- \* Verify that air intake system is clear of restrictions.
- \* Check neutral switch (M/T) or inhibitor switch (A/T).
- \* Check mixture control valve.
- \* Check pulse air injection system.
- \* Verify dashpot disengages throttle lever at 1900-2100 RPM.
- \* Check air cleaner reed valves.
- \* Verify there are no leaks in exhaust system.

### **FUEL INJECTED MODELS**

- \* Verify base timing is correct and timing advance system is functional.
- \* Check throttle body dashpot adjustment.
- \* Check secondary air injection system (RX7).
- \* Check water thermosensor and throttle position sensor.
- \* Check air valve, ISC switch and idle switch operation.
- \* Check intake air system and throttle body electrical connections.
- \* Ensure fuel system pressure is correct.
- \* Verify there are no leaks in exhaust system.

## **POOR FUEL MILEAGE**

### **CARBURETED MODELS (B2200 FEDERAL)**

- \* Verify correct carburetor idle speed and fuel mixture adjustment.
- \* Verify base timing is correct and timing advance system is functional.
- \* Ensure air intake system is unrestricted.
- \* Verify choke is fully open after engine is warm.
- \* Ensure fuel level is at specified mark on carburetor sight

- glass.
- \* Check carburetor mixture control duty cycle using dwell meter.

## FUEL INJECTED MODELS

- \* Verify correct throttle body dashpot adjustment.
- \* Ensure correct throttle position sensor adjustment and resistance value.
- \* Check intake air and water thermosensor.
- \* Ensure fuel system pressure is correct.
- \* Ensure exhaust system is unrestricted.

## EXCESSIVE OIL CONSUMPTION

- \* Check for restricted PCV system.
- \* Check turbo system for malfunction.
- \* Check for worn engine parts.

## ABNORMAL NOISE OR KNOCKING

### FUEL INJECTED MODELS

- \* Check engine oil and coolant level.

Check engine control system for malfunctioning component.  
System inspection should include the following components:

- \* Airflow meter
- \* Idle switch
- \* Vacuum leaks
- \* Neutral safety switch (A/T)
- \* Clutch switch (M/T)
- \* EGR valve position sensor
- \* Knock sensor (if equipped)
- \* Throttle position sensor
- \* Coolant thermosensor
- \* Coolant thermoswitch
- \* Inhibitor switch (A/T)
- \* Electronic Controlled Automatic Transmission (ECAT) unit.

Check turbo system for damage or wear (if equipped). Turbo system inspection should include the following components:

- \* Air by-pass valve
- \* Engine Control Unit (ECU)
- \* Intake air thermosensor in airflow meter
- \* Knock sensor and knock control unit
- \* Turbo wastegate solenoid valve.

## FAILS EMISSION TEST

- \* Ensure exhaust system is not restricted.
- \* Check EGR valve and solenoid for correct operation.
- \* Check fuel-cut system for malfunction. Fuel-cut system includes: throttle body dashpot unit, throttle position sensor and coolant thermosensor.
- \* Check No. 1 and No. 2 purge control valve operation.
- \* Check vacuum switching valve operation.
- \* Check secondary air injection system (B2200 and RX7).

- \* Check airflow meter for cracks.
- \* Verify correct airflow meter operation and resistance value.
- \* Check atmospheric pressure sensor.
- \* Check air valve and ISC switch.
- \* Ensure fuel system pressure is correct.
- \* Verify intake air system and throttle body electrical connections.
- \* Check pressure regulator and pressure regulator solenoid.
- \* Check water and intake air thermosensors.
- \* Verify throttle position sensor adjustment.

## **INTERMITTENTS**

### **INTERMITTENT PROBLEM DIAGNOSIS**

Intermittent fault testing requires duplicating circuit or component failure to identify the problem. These procedures may lead to the computer setting a fault code (on some systems) which may help in diagnosis.

If problem vehicle does not produce fault codes, monitor voltage or resistance values using a DVOM while attempting to reproduce conditions causing intermittent fault. A status change on DVOM indicates a fault has been located.

Use a DVOM to pinpoint faults. When monitoring voltage, ensure ignition switch is in ON position or engine is running. Ensure ignition switch is in OFF position or negative battery cable is disconnected when monitoring circuit resistance. Status changes on DVOM during test procedures indicate area of fault.

## **TEST PROCEDURES**

### **INTERMITTENT SIMULATION**

To reproduce the conditions creating an intermittent fault, use the following methods:

- \* Lightly vibrate component.
- \* Heat component.
- \* Wiggle or bend wiring harness.
- \* Spray component with water.
- \* Remove/apply vacuum source.

Monitor circuit/component voltage or resistance while simulating intermittent. If engine is running, monitor for self-diagnostic codes. Use test results to identify a faulty component or circuit.