

## D - ADJUSTMENTS

### 1996 ENGINE PERFORMANCE Mazda - On-Vehicle Adjustments

## ENGINE MECHANICAL

Before performing any on-vehicle adjustments to fuel or ignition systems, ensure engine mechanical condition is okay.

## VALVE CLEARANCE

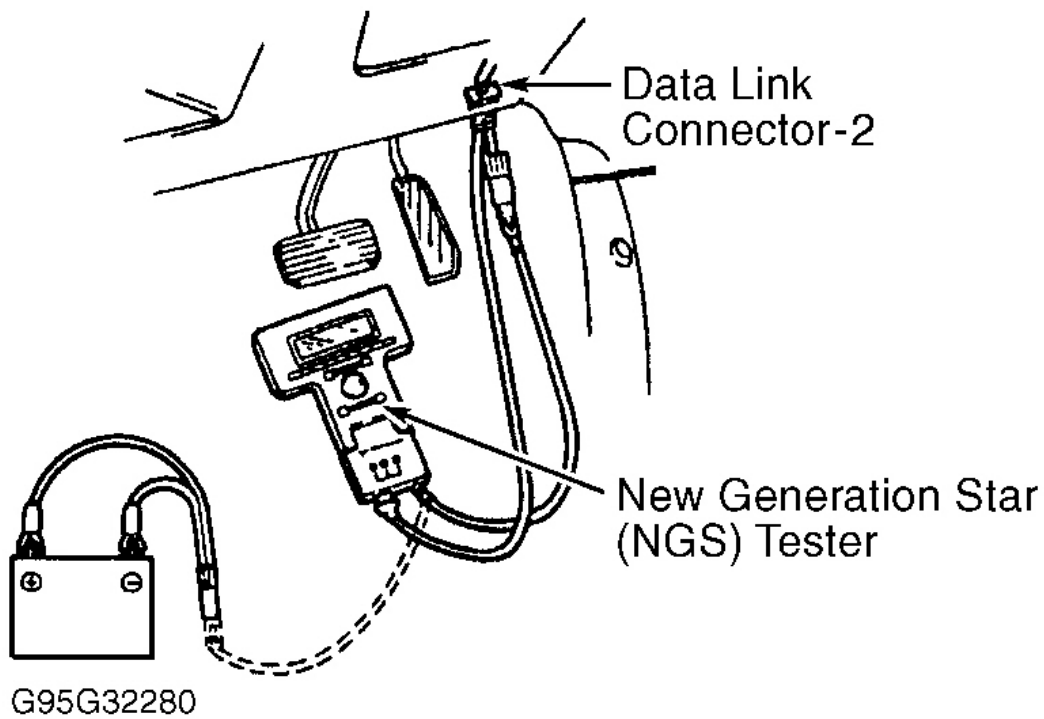
**NOTE:** All models are equipped with hydraulic lash adjusters. Valve clearance is not adjustable.

## IGNITION TIMING

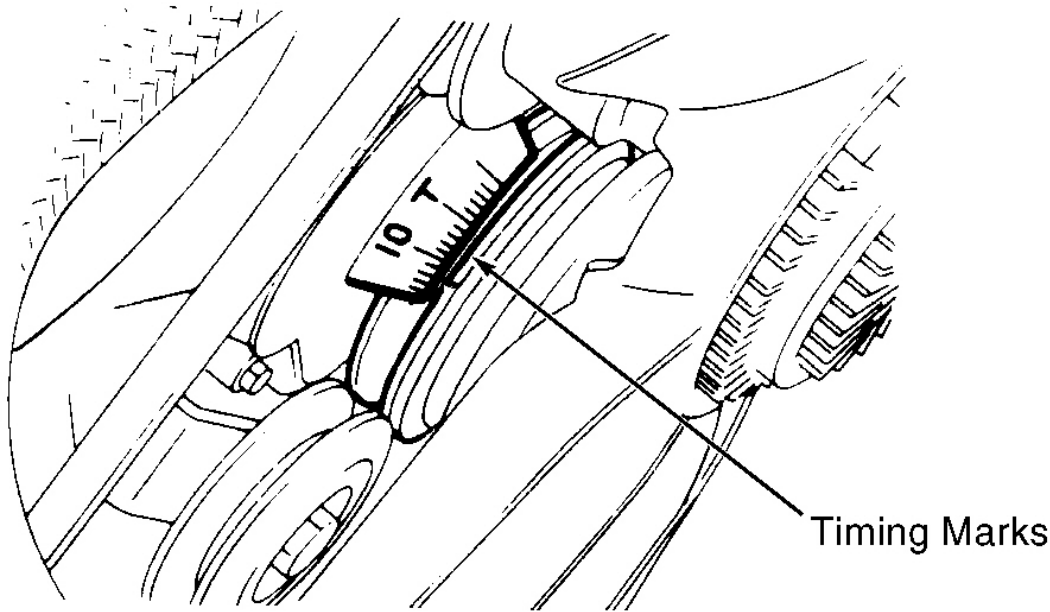
**NOTE:** Before adjusting ignition timing, warm engine to normal operating temperature. Turn off all accessories. Place transmission in Neutral (M/T) or Park (A/T). Ensure idle speed is correct. See IDLE SPEED under IDLE SPEED & MIXTURE. If ignition timing is not within specification, loosen distributor or crankshaft position sensor lock bolt. Rotate distributor or crankshaft position sensor until timing marks are aligned. Tighten lock bolt.

**NOTE:** Use Blue 1-pin connector located in right front corner of engine compartment as a source of battery power for positive lead of tachometer or timing light (battery is in trunk). DO NOT ground this connector, or 20-amp WIPER fuse will blow.

1. Connect New Generation Star (NGS) Tool (49 T088 0A0) to data link connector 2 located under left side of dash. See **Fig. 1** . Using NSG tool, select PID/DATA MONITOR AND RECORD and monitor RPM. Connect Diagnostic Tool (49 B019 9A0) to data link connector. Set SYSTEM SELECT to position 1 and TEST SWITCH to SELF-TEST.
2. Connect timing light to high-tension lead No. 1. Set timing to specification. See IGNITION TIMING SPECIFICATIONS TABLE . See **Fig. 2** .
3. If ignition timing is not within specification, loosen distributor or camshaft position sensor lock bolt. Rotate distributor or camshaft position sensor until timing marks are aligned. Tighten lock bolt. On all models, disconnect NGS tool from data link connector 2 and diagnostic tool from data link connector.



**Fig. 1: Locating Data Link Connector 2 (Typical)**  
Courtesy of MAZDA MOTORS CORP.



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**Fig. 2: Locating Ignition Timing Marks (Typical)**  
 Courtesy of MAZDA MOTORS CORP.

**IGNITION TIMING SPECIFICATIONS**

Application	Degrees BTDC @ RPM
M/T	10 @ 850
A/T <sup>(1)</sup>	10 @ 800
(1) Place automatic transmission in Park.	

**IDLE SPEED & MIXTURE**

**NOTE:** Idle mixture is not adjustable. If idle mixture is incorrect, see appropriate G - TESTS W/CODES article.

**COLD (FAST) IDLE SPEED**

**NOTE:** Fast idle speed is computer controlled. Adjustment is not necessary.

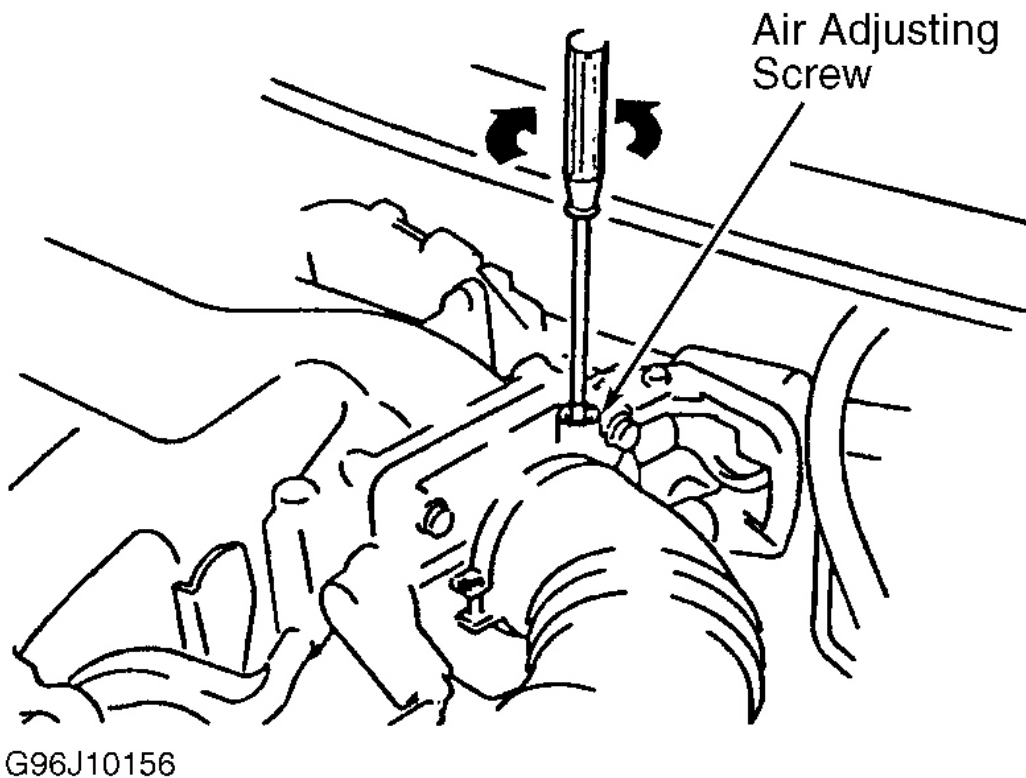
**IDLE SPEED**

**NOTE:** Before adjusting idle speed, warm engine to normal operating temperature.

Turn off all accessories. Place transmission in Neutral (M/T) or Park (A/T). **DO NOT** adjust idle using throttle adjusting screw. Throttle adjusting screw is preset and if adjusted, will adversely affect engine performance.

**NOTE:** On Miata, use Blue 1-pin connector located in right front corner of engine compartment as a source of battery power for positive lead of tachometer or timing light (battery is in trunk). **DO NOT** ground this connector, or 20-amp WIPER fuse will blow.

1. Connect New Generation Star (NGS) Tool (49 T088 0A0) to data link connector 2 located under left side of dash. See **Fig. 1** . Using NSG tool, select PID/DATA MONITOR AND RECORD and monitor RPM. Connect Diagnostic Tool (49 B019 9A0) to data link connector. Set SYSTEM SELECT to position 1 and TEST SWITCH to SELF-TEST.
2. If idle speed is not within specification, rotate air adjusting screw on throttle body. See **Fig. 3** . See **IDLE SPEED SPECIFICATIONS TABLE** . Disconnect NGS tool from data link connector 2 and diagnostic tool from data link connector.



**Fig. 3: Rotating Air Adjusting Screw (Typical)**  
Courtesy of MAZDA MOTORS CORP.

**IDLE SPEED SPECIFICATIONS**

Application	RPM
M/T	850
A/T <sup>(1)</sup>	800
(1) Place automatic transmission in Park.	

**THROTTLE POSITION (TP) SENSOR**

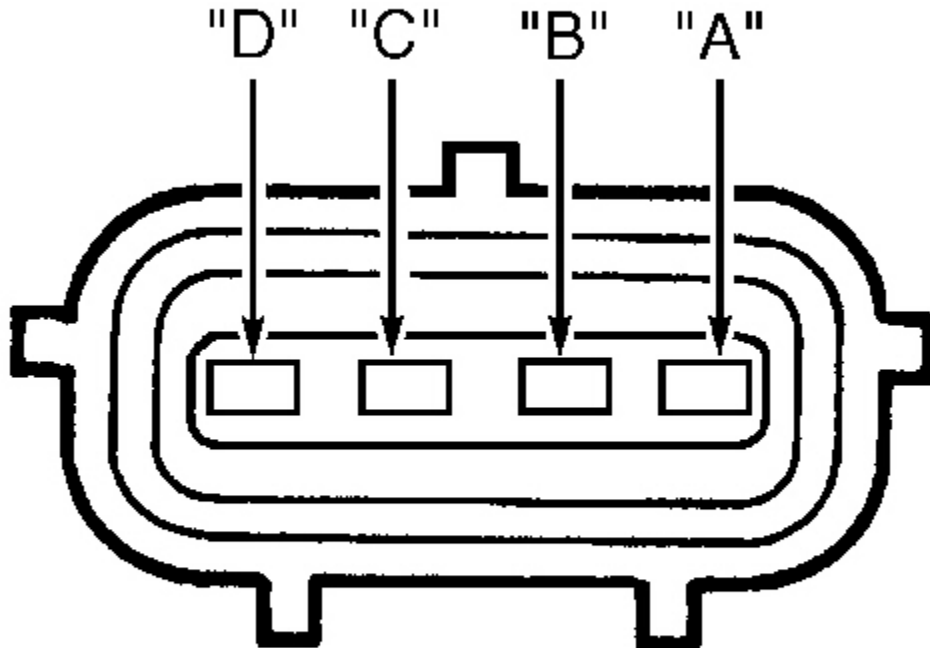
**NOTE:** DO NOT adjust throttle adjusting screw. Throttle adjusting screw is preset and if adjusted, will adversely affect engine performance.

**THROTTLE POSITION (TP) SENSOR CONTINUITY****Inspection**

1. Turn ignition switch to OFF position and place throttle valve in closed throttle position. Disconnect TP sensor connector. Connect ohmmeter between terminals "A" and "B" of TP sensor connector. See **Fig. 4** . Continuity should exist. If continuity exists, go to next step. If continuity does not exist, adjust TP sensor.
2. Insert a .016" (.4 mm) feeler gauge between throttle lever and throttle stop screw. Connect ohmmeter between terminals "A" and "B" of TP sensor connector. See **Fig. 4** . Continuity should not exist. If continuity exists, adjust TP sensor.

**Adjustment**

1. Turn ignition switch to OFF position and throttle valve to closed throttle position. Disconnect TP sensor connector. Connect ohmmeter between terminals "A" and "B" of TP sensor connector. See **Fig. 4** . Insert a feeler gauge of specified thickness between throttle lever and throttle stop screw. See **TP SENSOR CONTINUITY TABLE** .
2. Loosen TP sensor screws. Rotate TP sensor until ohmmeter indicates continuity as specified. See **TP SENSOR CONTINUITY TABLE** . Tighten TP sensor screws. Open throttle valve fully a few times. Recheck TP sensor adjustment. If TP sensor is not adjusted as specified, replace TP sensor.



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**Fig. 4: Identifying TP Sensor Connector Terminals**  
 Courtesy of MAZDA MOTORS CORP.

**TP SENSOR CONTINUITY**

Condition <sup>(1)</sup>	Continuity Between Terminals "A" & "B"
.012" (.3 mm)	Yes
.016" (.4 mm)	No

(1) Insert feeler gauge of specified thickness between throttle lever and throttle stop screw.

**THROTTLE POSITION (TP) SENSOR VOLTAGE**

**Inspection & Adjustment Using NGS Tool**

1. Connect New Generation Star (NGS) Tool (49 T088 0A0) to data link connector 2 located under left side of dash. See **Fig. 1** . Turn ignition switch to ON position. Using NGS tool, select PID/DATA MONITOR AND RECORD. Select TP V to monitor.
2. Manually rotate throttle linkage and check voltage readings. See **TP SENSOR VOLTAGE TABLE** . If

voltage readings are not as specified, close throttle. Loosen TP sensor screws. Rotate TP sensor until voltage indicates as specified. Tighten TP sensor screws.

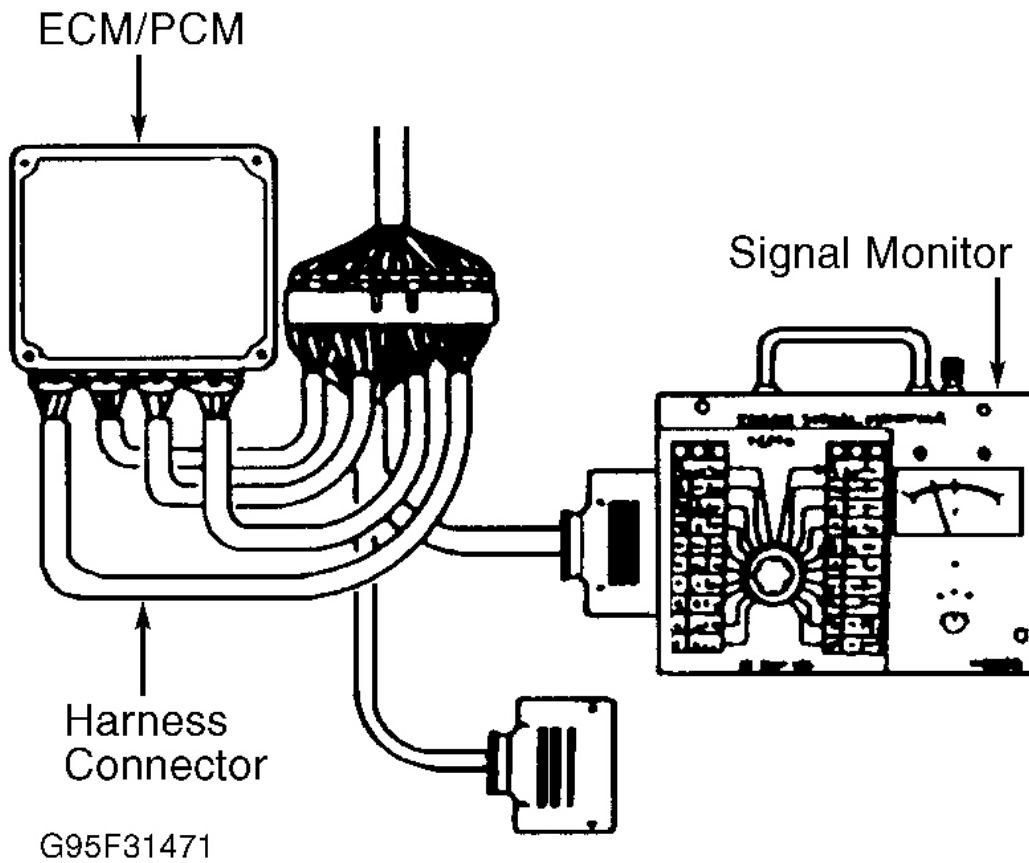
3. Open throttle valve fully a few times. Recheck TP sensor adjustment. If TP sensor is not adjusted as specified, replace TP sensor. Turn ignition switch to OFF position. Disconnect NGS tool from data link connector 2.

**Inspection & Adjustment Using Signal Monitor**

1. Turn ignition switch to OFF position. Connect Harness Adapter (49 T018 902) and Signal Monitor (49 9200 162A) to ECM/PCM. See **Fig. 5** . Set signal monitor to specified ECM/PCM terminal. See **TP SENSOR VOLTAGE TABLE** . Turn ignition switch to ON position.
2. Manually rotate throttle linkage and check voltage readings. See **TP SENSOR VOLTAGE TABLE** . If voltage readings are not as specified, close throttle. Loosen TP sensor screws. Rotate TP sensor until voltage indicates as specified. Tighten TP sensor screws.
3. Open throttle valve fully a few times. Recheck TP sensor adjustment. If TP sensor is not adjusted as specified, replace TP sensor. Turn ignition switch to OFF position and disconnect test equipment. Reconnect ECM/PCM connector.

**TP SENSOR VOLTAGE**

<b>ECM/PCM Wire Color</b>	<b>Closed Throttle Volts</b>	<b>WOT Volts</b>
Red/Black (3F) <sup>(1)</sup>	0.1-1.1	3.1-4.5
(1) ECM/PCM terminal pin No. in parentheses.		



**Fig. 5: Checking TP Sensor Voltage Signal**  
Courtesy of MAZDA MOTORS CORP.

## THROTTLE POSITION SWITCH

**NOTE:** Throttle position switch is part of TP sensor, which is adjusted automatically when TP sensor is adjusted. See THROTTLE POSITION (TP) SENSOR .