

# Computers and Control Systems: Pinpoint Tests

## DH - Throttle Position (TP) Sensor

### Throttle Position Sensor (TPS)

### Pinpoint Test

### DH

#### Note

You should enter this Pinpoint Test only when a Service Code 23, 53, 63 or 73 is received in Quick Test Step 3.0, 5.0 or 6.0.

#### Remember

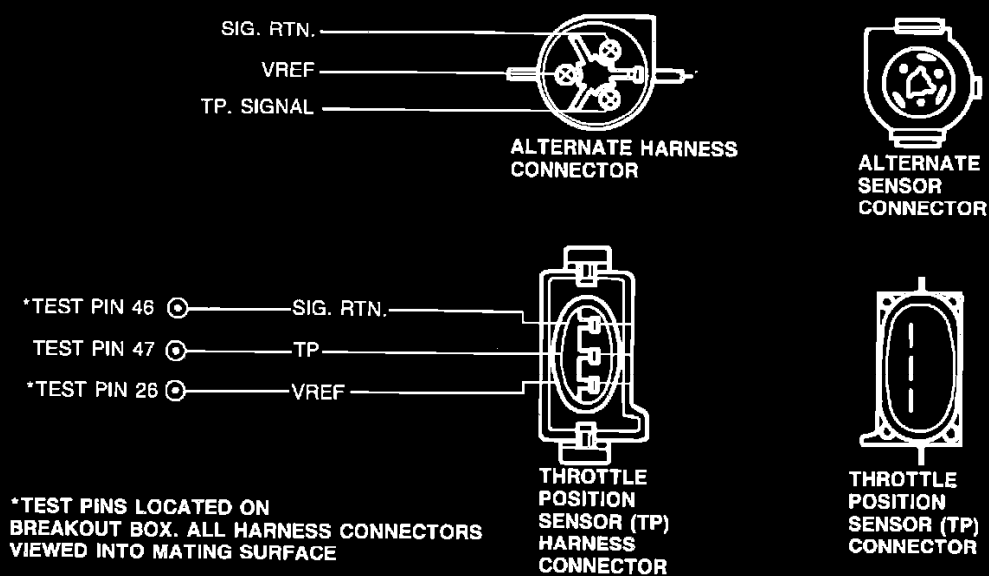
To prevent the replacement of good components, be aware that the following non-EEC areas may be at fault:

- Idle speeds/throttle stop adjustment.
- Binding throttle shaft/linkage or speed control linkage.
- Choke/high cam system, if equipped.

This Pinpoint Test is intended to diagnose only the following:

- TP sensor.
- Sensor harness circuits: VREF, TP SIGNAL, and SIGNAL RETURN.
- Processor assembly.

#### Pinpoint Test Schematic



Pinpoint Test DH - Throttle Position Sensor (TPS)

Throttle Position Sensor (TPS)		Pinpoint Test	DH
TEST STEP		RESULT	ACTION TO TAKE
<b>DH1</b>	SERVICE CODE 23: THE FOLLOWING CHECK MUST BE MADE BEFORE SERVICING THIS CODE		
<ul style="list-style-type: none"> <li>• Check for Code 68; Key On Engine Off or Codes 58, 31 or 41 Engine Running.</li> <li>• Are any of the above Codes present?</li> </ul>		Yes	RETURN to the Key On Engine Off or Engine Running service code chart as appropriate. PROCEED as directed.
		No	GO to <b>DH2</b> .
<b>DH2</b>	CHECK FOR STUCK THROTTLE PLATE		
<ul style="list-style-type: none"> <li>• Visually inspect carburetor/throttle body and throttle linkage for binding or sticking.</li> <li>• Verify the throttle linkage is at mechanical/closed throttle. Check for: binding throttle linkage, speed control linkage, vacuum line/electrical harness interference, etc.</li> <li>• Does throttle move freely and return to closed throttle position?</li> </ul>		Yes	GO to <b>DH3</b> .
		No	SERVICE as necessary. RERUN Quick Test.
<b>DH3</b>	SERVICE CODE 53: ATTEMPT TO GENERATE CODE 63		
<ul style="list-style-type: none"> <li>• Refer to schematic in Pinpoint Test DH.</li> <li>• Key off, wait 10 seconds.</li> <li>• Disconnect TP sensor vehicle harness connector at the throttle body. Inspect for damaged pins, corrosion, loose wires, etc. Service as necessary.</li> <li>• RERUN Key On Engine Off Self-Test.</li> <li>• Is Code 63 present?</li> </ul> <p><b>NOTE: Ignore all other codes at this time.</b></p>		Yes	GO to <b>DH4</b> .
		No	GO to <b>DH5</b> .

Pinpoint Test DH1 Thru DH3 - Throttle Position Sensor (TPS)

Throttle Position Sensor (TPS)		Pinpoint Test	DH
TEST STEP		RESULT	ACTION TO TAKE
<b>DH4</b>	CHECK VOLTAGE VREF TO SIGNAL RETURN		
<ul style="list-style-type: none"> <li>Refer to schematic in Pinpoint Test DH.</li> <li>Key off, wait 10 seconds.</li> <li>Disconnect TP vehicle harness connector at throttle body. Inspect for damaged pins, corrosion, loose wires, etc. Service as necessary.</li> <li>DVOM on 20 volt scale.</li> <li>Key on, engine off.</li> <li>Measure voltage between VREF and SIGNAL RETURN at the TP vehicle harness connector.</li> <li>Is voltage between 4.0 and 6.0 volts?</li> </ul>		Yes	REPLACE TP sensor.  RERUN Quick Test.
		No	GO to Pinpoint Test Step <b>C1</b> .
<b>DH5</b>	CHECK TP SIGNAL FOR SHORT TO POWER		
<ul style="list-style-type: none"> <li>Key off, wait 10 seconds, TP harness disconnected.</li> <li>DVOM on 200,000 ohm scale.</li> <li>Disconnect processor 60 pin connector. Inspect for damaged pins, corrosion, loose wires, etc. Service as necessary.</li> <li>Install breakout box, leave processor disconnected.</li> <li>Measure resistance between Test Pin 47 and Test Pins 26 and 57 at the breakout box.</li> <li>Are both resistances greater than 10,000 ohms?</li> </ul>		No	SERVICE short circuit. REMOVE breakout box. RECONNECT TP sensor and processor. RERUN Quick Test.
		Yes	REMOVE breakout box. REPLACE processor. RECONNECT TP sensor and processor. RERUN Quick Test.
<b>DH10</b>	SERVICE CODE 63: ATTEMPT TO GENERATE CODE 53		
<ul style="list-style-type: none"> <li>Key off, wait 10 seconds, TP harness disconnected.</li> <li>Jumper VREF to TP signal at TP vehicle harness connector.</li> <li>Perform Key On Engine Off Self-Test.</li> </ul> <p><b>NOTE: If no codes are generated, immediately remove jumper and go directly to <b>DH13</b>.</b></p> <ul style="list-style-type: none"> <li>Is Code 53/23 present?</li> </ul> <p><b>NOTE: Ignore all other codes at this time.</b></p>		Yes	REPLACE TP sensor  REMOVE jumper wire. RECONNECT TP sensor. RERUN Quick Test.
		No	GO to <b>DH11</b> .

Pinpoint Test DH4 Thru DH10 - Throttle Position Sensor (TPS)

<b>Throttle Position Sensor (TPS)</b>		<b>Pinpoint Test</b>	<b>DH</b>
<b>TEST STEP</b>		<b>RESULT</b>	<b>ACTION TO TAKE</b>
<b>DH11</b>	<b>SERVICE CODE 63: CHECK VOLTAGE VREF TO SIGNAL RETURN</b>		
<ul style="list-style-type: none"> <li>Refer to schematic in Pinpoint Test DH.</li> <li>Key off, wait 10 seconds.</li> <li>Disconnect TP vehicle harness connector at throttle body. Inspect for damaged pins, corrosion, loose wires, etc. Service as necessary.</li> <li>DVOM on 20 volt scale.</li> <li>Key on engine off.</li> <li>Measure voltage between VREF and SIGNAL RETURN at the TP vehicle harness connector.</li> <li>Is voltage between 4.0 and 6.0 volts?</li> </ul>		Yes No	GO to <b>DH12</b> . GO to Pinpoint Test Step <b>C1</b> .
<b>DH12</b>	<b>CHECK CONTINUITY OF TP CIRCUIT</b>		
<ul style="list-style-type: none"> <li>Key off, wait 10 seconds. TP harness disconnected.</li> <li>DVOM on 200 ohm scale.</li> <li>Disconnect processor 60 pin connector. Inspect for damaged pins, corrosion, loose wires, etc. Service as necessary.</li> <li>Connect breakout box. Processor connected to breakout box.</li> <li>Measure resistance between TP SIGNAL at the vehicle harness connector and Test Pin 47 at the breakout box.</li> <li>Is the resistance less than 5.0 ohms?</li> </ul>		No Yes	SERVICE open circuit. RECONNECT harness to sensor. REMOVE breakout box and RERUN Quick Test. GO to <b>DH13</b> .
<b>DH13</b>	<b>CHECK RESISTANCE OF TP CIRCUIT TO GROUND/SIGNAL RETURN</b>		
<ul style="list-style-type: none"> <li>Key off, wait 10 seconds, TP harness disconnected.</li> <li>Disconnect processor 60 pin connector. Inspect for damaged pins, corrosion, loose wires, etc. Service as necessary.</li> <li>DVOM on 200,000 ohm scale.</li> <li>Measure resistance between TP SIGNAL at TP vehicle harness connector and Test Pin 46 at the breakout box and between TP SIGNAL at TP vehicle harness connector and ground.</li> <li>Are all resistances greater than 10,000 ohms?</li> </ul>		No Yes	SERVICE short circuit. REMOVE breakout box. RECONNECT processor and TP sensor. RERUN Quick Test. REMOVE breakout box. REPLACE processor. RECONNECT processor and TP sensor. RERUN Quick Test.

Pinpoint Test DH11 Thru DH13 - Throttle Position Sensor (TPS)

Throttle Position Sensor (TPS)		Pinpoint Test	DH
TEST STEP		RESULT	ACTION TO TAKE
<b>DH20</b>	<b>SERVICE CODE 73: TP SENSOR MOVES IN ENGINE RESPONSE TEST</b>		
<p><b>NOTE: Code 73 indicates the TP Sensor did not exceed 25 percent of its rotation in the Engine Response Check.</b></p> <ul style="list-style-type: none"> <li>• Key off.</li> <li>• Install breakout box.</li> <li>• DVOM on 20 volt scale.</li> <li>• Connect DVOM to Test Pins 47 and 46 at the breakout box.</li> <li>• Perform Engine Running Self-Test, Step 5.0.</li> <li>• Does voltage increase to greater than 3.5 volts during the dynamic response test?</li> </ul>		<p>Yes</p> <p>No</p>	<p>REMOVE breakout box. REPLACE processor. RERUN Quick Test.</p> <p>VERIFY TP Sensor is properly installed to throttle body. If OK, REPLACE TP Sensor.</p> <p>RERUN Quick Test.</p>
<b>DH90</b>	<b>CONTINUOUS MEMORY CODE 53: EXERCISE TP SENSOR</b>		
<ul style="list-style-type: none"> <li>• Enter Key On Engine Off Continuous Monitor mode. Refer to Appendix in Section 16.</li> <li>• Observe VOM or STAR LED for indication of a fault while performing the following: <ul style="list-style-type: none"> <li>— Move throttle slowly to WOT position.</li> <li>— Release throttle slowly to closed position and lightly tap on TP sensor (simulate road shock).</li> <li>— Wiggle TP harness connector.</li> </ul> </li> <li>• Does VOM or STAR LED indicate a fault?</li> </ul>		<p>Yes</p> <p>No</p>	<p>GO to <b>DH91</b>.</p> <p>GO to <b>DH92</b>.</p>
<p>Diagram illustrating the wiring connections for the Throttle Position Sensor (TPS) test. The diagram shows the Processor, Harness, and TP Sensor connected to a Power or VREF Circuit. The Processor is connected to VREF, TP SIG, and SIG. RTN. The TP Sensor is connected to VREF, TP SIG, and SIG. RTN. A dashed line labeled 'POWER OR VREF CIRCUIT' indicates a connection between the VREF terminals of the Processor and the TP Sensor.</p>			

Pinpoint Test DH20 &amp; DH90 - Throttle Position Sensor (TPS)

Throttle Position Sensor (TPS)		Pinpoint Test	DH
TEST STEP		RESULT	ACTION TO TAKE
<b>DH91</b>	MEASURE THROTTLE POSITION SIGNAL VOLTAGE WHILE EXERCISING TP SENSOR		
<ul style="list-style-type: none"> <li>• Key off, wait 10 seconds.</li> <li>• Disconnect processor 60 pin connector. Inspect for damaged pins, corrosion, loose wires, etc. Service as necessary.</li> <li>• Install breakout box and reconnect processor.</li> <li>• VOM or STAR LED still connected to STO as in previous step.</li> <li>• Connect a DVOM from Test Pin 47 to Test Pin 46.</li> <li>• DVOM on 20 volt scale.</li> <li>• Key on engine off.</li> <li>• While observing DVOM, repeat Step <b>DH90</b>.</li> <li>• Does the fault occur below 4.25 volts?</li> </ul>		Yes	<p>DISCONNECT and INSPECT connectors. If connector and terminals are good, REPLACE TP sensor</p> <p>CLEAR Continuous Memory Code 53.</p> <p>RERUN Quick Test.</p>
		No	<p>Throttle position sensor overtravel may have caused the Continuous Memory Code 53. VERIFY harness integrity, GO to <b>DH92</b>.</p>
<b>DH92</b>	CHECK EEC-IV HARNESS		
<ul style="list-style-type: none"> <li>• Still in Key On Engine Off Continuous Monitor mode.</li> <li>• Observe VOM or STAR LED for a fault indication while performing the following: <ul style="list-style-type: none"> <li>— Referring to the illustration in Step <b>DH90</b>, grasp the harness close to the sensor connector. Wiggle, shake or bend a small section of the EEC-IV system harness while working your way to the dash panel. Also wiggle, shake or bend the EEC-IV harness from the dash panel to the processor.</li> </ul> </li> <li>• Does VOM or STAR LED indicate a fault?</li> </ul>		Yes	<p>ISOLATE fault. SERVICE as necessary. REFER to appropriate figure. CLEAR Continuous Memory Code 53.</p> <p>RERUN Quick Test.</p>
		No	<p>GO to <b>DH93</b>.</p>

Pinpoint Test DH91 &amp; DH92 - Throttle Position Sensor (TPS)

Throttle Position Sensor (TPS)		Pinpoint Test	DH
TEST STEP		RESULT	ACTION TO TAKE
<b>DH93</b>	CHECK PROCESSOR AND HARNESS CONNECTORS		
<ul style="list-style-type: none"> <li>• Key off, wait 10 seconds.</li> <li>• Disconnect processor 60 pin connector. Inspect for damaged pins, corrosion, loose wires, etc. Service as necessary.</li> <li>• Are connectors and terminals OK?</li> </ul>		<p>No</p> <p>Yes</p>	<p>SERVICE as necessary. CLEAR Continuous Memory Code 53.</p> <p>RERUN Quick Test.</p> <p>Unable to duplicate fault at this time. CLEAR Continuous Memory Code 53.</p> <p>Continuous Memory Code 53 testing complete.</p>
<b>DH94</b>	CONTINUOUS MEMORY CODE 63: EXERCISE TP SENSOR		
<ul style="list-style-type: none"> <li>• Enter Key On Engine Off Continuous Monitor mode. Refer to Appendix in Section 16.</li> <li>• Observe VOM or STAR LED for indication of a fault while performing the following: <ul style="list-style-type: none"> <li>— Move throttle slowly to WOT position.</li> <li>— Release throttle slowly to closed condition.</li> <li>— Lightly tap on TP sensor (simulate road shock).</li> <li>— Wiggle TP harness connector.</li> </ul> </li> <li>• Does VOM or STAR LED indicate a fault?</li> </ul>		<p>Yes</p> <p>No</p>	<p>INSPECT connectors. If connector and terminals are good, REPLACE TP sensor</p> <p>CLEAR Continuous Memory Code 63.</p> <p>RERUN Quick Test.</p> <p>GO to <b>DH95</b>.</p>
<p>Diagram illustrating the wiring connections for the Throttle Position Sensor (TPS) system. The Processor is connected to the Harness, which is connected to the TP Sensor. The connections are labeled: VREF-O, TP SIG-O, and SIG. RTN. A dashed line indicates a connection from the TP SIG-O terminal to GROUND.</p>			

Pinpoint Test DH93 &amp; DH94 - Throttle Position Sensor (TPS)

Throttle Position Sensor (TPS)		Pinpoint Test	DH
TEST STEP		RESULT	ACTION TO TAKE
<b>DH95</b>	<b>CHECK EEC-IV HARNESS</b>		
<ul style="list-style-type: none"> <li>• Still in Key On Engine Off Continuous Monitor mode.</li> <li>• Observe VOM or STAR LED for a fault indication while performing the following:               <ul style="list-style-type: none"> <li>— Referring to the illustration in Step <b>DH94</b> grasp the harness close to the sensor connector. Wiggle, shake or bend a small section of the EEC-IV system harness while working your way to the dash panel. Also wiggle, shake or bend the EEC-IV harness from the dash panel to the processor.</li> </ul> </li> <li>• Does VOM or STAR LED indicate a fault?</li> </ul>		<p>Yes</p> <p>No</p>	<p>ISOLATE fault. SERVICE as necessary. REFER to appropriate figure. CLEAR Continuous Memory Code 63.</p> <p>RERUN Quick Test.</p> <p>GO to <b>DH96</b>.</p>
<b>DH96</b>	<b>CHECK PROCESSOR AND HARNESS CONNECTORS</b>		
<ul style="list-style-type: none"> <li>• Key off, wait 10 seconds.</li> <li>• Disconnect processor 60 pin connector. Inspect for damaged pins, corrosion, loose wires, etc.</li> <li>• Are connectors and terminals OK?</li> </ul>		<p>No</p> <p>Yes</p>	<p>SERVICE as necessary. CLEAR Continuous Memory Code 63.</p> <p>RERUN Quick Test.</p> <p>Unable to duplicate fault at this time. CLEAR Continuous Memory Code 63.</p> <p>Continuous Memory Code 63 testing complete.</p>

Pinpoint Test DH95 &amp; DH96 - Throttle Position Sensor (TPS)