

# Vane Air Temperature Sensor (VAT)

# Pinpoint Test

# DA

**DA**

**NOTE: AMBIENT TEMP. MUST BE GREATER THAN 50°F TO PASS THIS TEST.**

TYPICAL RESISTANCE BETWEEN TEST PINS 25 & 46	5800Ω	2700Ω	300Ω	180Ω	125Ω
AT TEMPERATURE	32°F	65°F	185°F	220°F	240°F

**\*TEST PIN LOCATED ON BREAKOUT BOX.  
ALL CONNECTIONS VIEWED INTO MATING SURFACE.**

## STOP-WARNING

**You should enter this Pinpoint Test only when a service code 24, 54 or 64 is received in Quick Test Step 3.0, 5.0 or 6.0.**

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

- Test performed in unusually low (cold) or high (hot) ambient conditions.
- Ambient temperature must be greater than 50°F for this test.

This pinpoint test is intended to diagnose only the following:

- VAT sensor.
- Circuits: VAT, and Signal Return.
- Vehicle harness.
- Processor assembly.

## Vane Air Temperature Sensor (VAT)

## Pinpoint Test

## DA

TEST STEP		RESULT	ACTION TO TAKE
<b>DA1</b>	SERVICE CODE 24: CHECK AMBIENT TEMPERATURE		
	<ul style="list-style-type: none"> <li>Ambient temperature must be greater than 50°F for this test.</li> </ul>	Yes	GO to <b>DA2</b> .
		No	RERUN Quick Test.
<b>DA2</b>	CHECK FOR V REF AT THROTTLE POSITION SENSOR		
	<ul style="list-style-type: none"> <li>Refer to illustration Q.</li> <li>Key Off, wait 10 seconds.</li> <li>DVOM on 20V scale.</li> <li>Disconnect TP sensor.</li> <li>Key On, Engine Off.</li> <li>Measure voltage at the TP vehicle harness connector between VREF and signal return.</li> </ul>	Less than 4.0V or greater than 6.0V	GO to Pinpoint Test Step <b>C1</b> .
		4.0V to 6.0V	RECONNECT TP sensor, GO to <b>DA3</b> .
<b>DA3</b>	VAT SENSOR CHECK		
	<p><b>NOTE: Ambient temperature must be greater than 50°F for this test.</b></p> <ul style="list-style-type: none"> <li>Key Off, wait 10 seconds.</li> <li>Harness disconnected from the vane meter.</li> <li>DVOM on 200,000 ohm scale.</li> <li>Measure resistance at the VAT sensor between VAT signal and Signal Return.</li> <li>Is reading from 125 ohms (240°F) to 3700 ohms (50°F)?</li> </ul>	Yes	REPLACE processor. RECONNECT harness to vane meter. RERUN Quick Test.
		No	REPLACE vane meter. RERUN Quick Test.

# Vane Air Temperature Sensor (VAT)

# Pinpoint Test

**DA**

TEST STEP		RESULT	ACTION TO TAKE
<b>DA10</b>	<b>SERVICE CODE 54: INDUCE OPPOSITE CODE</b>		
<ul style="list-style-type: none"> <li>● Key Off, wait 10 seconds.</li> <li>● Disconnect vehicle harness from vane meter. Inspect for damaged pins, corrosion, loose wires, etc. Service as necessary.</li> <li>● Insert a jumper wire (paper clip) at the vane meter vehicle harness connector between VAT Signal and Signal Return.</li> <li>● Run Key On, Engine Off Quick Test.</li> <li>● Is Code 64 present?</li> </ul>		<p>Yes</p> <p>No</p>	<p>REPLACE vane meter. REMOVE jumper wire. CONNECT harness to vane meter. RERUN Quick Test.</p> <p>REMOVE jumper wire. GO to <b>DA11</b>.</p>
<b>DA11</b>	<b>CHECK CONTINUITY OF VAT SIGNAL AND SIGNAL RETURN</b>		
<ul style="list-style-type: none"> <li>● Key Off, wait 10 seconds.</li> <li>● Harness disconnected from vane meter, jumper wire removed.</li> <li>● Disconnect processor 60 pin connector. Inspect for damaged pins, corrosion, loose wires, etc. Service as necessary.</li> <li>● Install Breakout box leaving processor disconnected.</li> <li>● DVOM on 200 ohm scale.</li> <li>● Measure resistance between VAT signal at the vane meter vehicle harness connector, and test Pin 25 at the Breakout box.</li> <li>● Measure resistance between signal return at the vane meter vehicle harness connector, and test Pin 46 at the Breakout box.</li> </ul>		<p>Both readings are less than 5 ohms</p> <p>Either reading is 5 ohms or greater</p>	<p>REPLACE processor. REMOVE Breakout box. RECONNECT harness to vane meter and processor. RERUN Quick Test.</p> <p>CORRECT open circuit. REMOVE Breakout box. RECONNECT harness to vane meter and processor. RERUN Quick Test.</p>

## Vane Air Temperature Sensor (VAT)

## Pinpoint Test

## DA

TEST STEP		RESULT	ACTION TO TAKE
<b>DA20</b>	<b>SERVICE CODE 64: INDUCE OPPOSITE CODE</b>		
<ul style="list-style-type: none"> <li>● Key off, wait 10 seconds.</li> <li>● Disconnect vehicle harness from vane meter. Inspect for damaged pins, corrosion, loose wires, etc. Service as necessary.</li> <li>● Run Key On, Engine Off Quick Test.</li> <li>● Is code 54 present?</li> </ul>		Yes	REPLACE vane meter. RECONNECT harness to vane meter. RERUN Quick Test.
		No	GO to <b>DA21</b> .
<b>DA21</b>	<b>CHECK FOR V REF AT THROTTLE POSITION SENSOR</b>		
<ul style="list-style-type: none"> <li>● Refer to illustration Q.</li> <li>● Key Off, wait 10 seconds.</li> <li>● DVOM on 20V scale.</li> <li>● Disconnect TP sensor.</li> <li>● Key On, Engine Off.</li> <li>● Measure voltage at the TP vehicle harness connector between VREF and signal return.</li> </ul>		Less than 4.0V or greater than 6.0V	GO to Pinpoint Test Step <b>C1</b> .
		4.0V to 6.0V	RECONNECT TP sensor, GO to <b>DA22</b> .
<b>DA22</b>	<b>CHECK VAT SIGNAL FOR SHORTS</b>		
<ul style="list-style-type: none"> <li>● Key Off, wait 10 seconds.</li> <li>● Harness disconnected from vane meter.</li> <li>● Disconnect processor 60 pin connector. Inspect for damaged pins, corrosion, loose wires, etc. Service as necessary.</li> <li>● Install Breakout box leaving processor disconnected.</li> <li>● DVOM on 200,000 ohm scale.</li> <li>● Measure resistance between Test Pin 25 and Test Pins 40, 46 and 60 at the Breakout box.</li> </ul>		Any reading less than 10,000 ohms	CORRECT circuit shorts. REMOVE Breakout box. RECONNECT processor and vane meter. RERUN Quick Test.
		All readings are 10,000 ohms or greater	REPLACE processor. REMOVE Breakout box. RECONNECT processor. RERUN Quick Test.

# Vane Air Temperature Sensor (VAT)

## Pinpoint Test

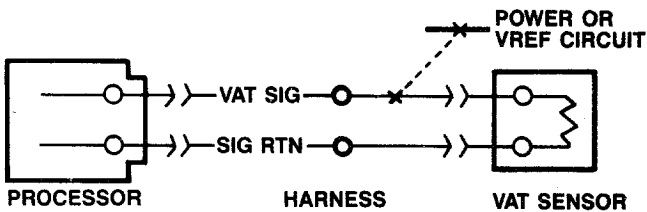
DA

TEST STEP		RESULT	ACTION TO TAKE
<b>DA90</b>	<b>SERVICE CODE 54: CONTINUOUS TEST: CHECK VAT SENSOR</b>		
<ul style="list-style-type: none"> <li>Using continuous monitor mode, observe VOM or STAR LED for indication of a fault while performing the following:</li> <li>Lightly tap on VAT sensor (simulate road shock).</li> <li>Wiggle VAT connector.</li> <li>Is a fault indicated?</li> </ul>		<p>Yes</p> <p>No</p>	<p>DISCONNECT and INSPECT connectors. If connector and terminals are good, REPLACE VAT sensor. RERUN Quick Test.</p> <p>GO to <b>DA91</b>.</p>
<p>The diagram illustrates the electrical circuit for the VAT sensor. On the left, a box labeled 'PROCESSOR' has two terminals connected to 'VAT SIG' and 'SIG RTN' lines. These lines pass through a 'HARNESS' box. On the right, a box labeled 'VAT SENSOR' has two terminals connected to 'VAT SIG' and 'SIG RTN' lines. A dashed line with an 'X' indicates a break in the 'POWER OR VREF CIRCUIT' between the harness and the sensor.</p>			
<b>DA91</b>	<b>CHECK EEC-IV HARNESS</b>		
<ul style="list-style-type: none"> <li>Observe VOM or STAR LED for a fault indication while performing the following:</li> <li>Referring to the illustration in Step DA90, grasp the harness closest 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> <li>Is fault indicated?</li> </ul>		<p>Yes</p> <p>No</p>	<p>ISOLATE fault and make necessary repairs. RERUN Quick Test.</p> <p>GO to <b>DA92</b>.</p>
<b>DA92</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.</li> <li>Inspect both connectors and connector terminals for obvious damage or faults.</li> <li>Connectors and terminals are OK.</li> </ul>		<p>No</p> <p>Yes</p>	<p>SERVICE as necessary. RERUN Quick Test.</p> <p>Unable to duplicate fault at this time. Continuous code 54 testing complete.</p>

# Vane Air Temperature Sensor (VAT)

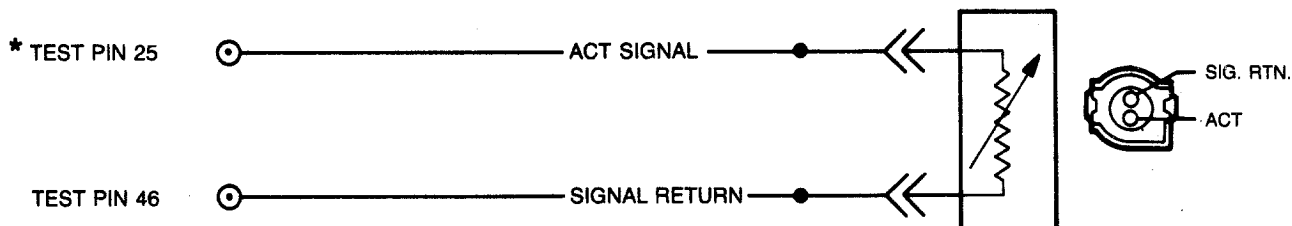
## Pinpoint Test

DA

TEST STEP		RESULT	ACTION TO TAKE
<b>DA93</b>	<b>SERVICE CODE 64: CONTINUOUS TEST: CHECK VAT SENSOR</b>		
<ul style="list-style-type: none"> <li>Using continuous monitor mode, observe VOM or STAR LED for indication of a fault while performing the following:</li> <li>Lightly tap on VAT sensor (simulate road shock).</li> <li>Wiggle VAT connector.</li> <li>Is fault indicated?</li> </ul> 		<p>Yes</p> <p>No</p>	<p>DISCONNECT and INSPECT connectors. If connector and terminals are good, REPLACE VAT sensor. RERUN Quick Test.</p> <p>GO to <b>DA94</b>.</p>
<b>DA94</b>	<b>CHECK EEC-IV HARNESS</b>		
<ul style="list-style-type: none"> <li>Observe VOM or STAR LED for a fault indication while performing the following:</li> <li>Referring to the illustration in Step DA93, grasp the harness closest 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> <li>Is fault indicated?</li> </ul>		<p>Yes</p> <p>No</p>	<p>ISOLATE fault and make necessary service. RERUN Quick Test.</p> <p>GO to <b>DA95</b>.</p>
<b>DA95</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.</li> <li>Inspect both connectors and connector terminals for obvious damage or faults.</li> <li>Connectors and terminals are OK.</li> </ul>		<p>No</p> <p>Yes</p>	<p>SERVICE as necessary. RERUN Quick Test.</p> <p>Unable to duplicate fault at this time. Continuous code 64 testing complete.</p>

# Air Charge Temperature Sensor (ACT)

## Pinpoint Test

**DB**
**DB**


TYPICAL RESISTANCE BETWEEN TEST PINS 25 AND 46	58.750 $\Omega$	40.500 $\Omega$	3600 $\Omega$	1840 $\Omega$
AT TEMPERATURE	50°F	65°F	180°F	220°F

\* TEST PIN LOCATED ON BREAKOUT BOX.  
ALL CONNECTIONS VIEWED INTO MATING SURFACE.

**NOTE:** Ambient temperature must be greater than 50°F for this test.

## STOP-WARNING

You should enter this Pinpoint Test only when a service code 24, 54 or 64 is received in Quick Test Step 3.0, 5.0 or 6.0.

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

- Cooling system.
- Air cleaner duct problems.
- Improper engine oil level.

This pinpoint test is intended to diagnose only the following:

- ACT sensor.
- Harness circuits: ACT Signal and Signal Return.
- Processor assembly.

# Air Charge Temperature Sensor (ACT)

## Pinpoint Test

### DB

TEST STEP		RESULT	ACTION TO TAKE
<b>DB1</b>	<b>SERVICE CODE 24: CHECK PROPER INSTALLATION</b>		
	<ul style="list-style-type: none"> <li>For vehicle with ACT mounted in intake manifold, GO to step DB2.</li> <li>Is ACT mounted properly in air cleaner?</li> </ul>	Yes  No	GO to <b>DB2</b> .  INSTALL ACT properly. RERUN Quick Test.
<b>DB2</b>	<b>CHECK FOR V REF AT THROTTLE POSITION SENSOR</b>		
	<ul style="list-style-type: none"> <li>Key Off, wait 10 seconds.</li> <li>DVOM on 20V scale.</li> <li>Disconnect TP sensor.</li> <li>Key On, Engine Off.</li> <li>Measure voltage at the TP vehicle harness connector between VREF and signal return.</li> </ul>	Less than 4.0V or greater than 6.0V  4.0V to 6.0V	GO to Pinpoint Test Step <b>C1</b> .  RECONNECT TP sensor, GO to <b>DB3</b> .
<b>DB3</b>	<b>CHECK ACT SENSOR — ENGINE OFF</b>		
	<ul style="list-style-type: none"> <li>Key Off, wait 10 seconds.</li> <li>Harness disconnected from ACT sensor.</li> <li>DVOM on 200,000 ohm scale.</li> <li>Measure resistance of ACT sensor.</li> </ul> <p><b>NOTE: Make sure engine is warmed up prior to this test.</b></p>	Reading is between 1,100 and 58,000 ohms (approximately 50°F)  Reading is less than 1,100 ohms or greater than 58,000	GO to <b>DB4</b> .  CHECK heat stove duct valve operation. If OK, REPLACE ACT sensor. RECONNECT harness to ACT sensor. RERUN Quick Test.
<b>DB4</b>	<b>CHECK ACT SENSOR — ENGINE RUNNING</b>		
	<ul style="list-style-type: none"> <li>Key Off. Harness disconnected from ACT sensor.</li> <li>DVOM on 200,000 ohm scale.</li> <li>Run engine for 2 minutes.</li> <li>Measure resistance of ACT sensor with engine running.</li> </ul>	Reading is between 2,400 and 29,000 ohms  Reading is less than 2,400 ohms or greater than 29,000 ohms	REPLACE processor. RECONNECT harness to ACT sensor. RERUN Quick Test.  CHECK heat stove duct valve operation. If OK, REPLACE ACT sensor. RERUN Quick Test.



<b>Air Charge Temperature Sensor (ACT)</b>	<b>Pinpoint Test</b>	<b>DB</b>
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	TEST STEP	RESULT	ACTION TO TAKE
<b>DB10</b>	<b>SERVICE CODE 54: INDUCE OPPOSITE CODE</b>		
	<ul style="list-style-type: none"> <li>● Key Off, wait 10 seconds.</li> <li>● Disconnect vehicle harness from ACT sensor. Inspect for damaged pins, corrosion, loose wires, etc. Service as necessary.</li> <li>● Insert a jumper wire at the ACT vehicle harness connector between ACT Signal and Signal Return.</li> <li>● Run Key On, Engine Off Quick Test.</li> <li>● Is code 64 present?</li> </ul>	<p>Yes</p> <p>No</p>	<p>REPLACE ACT sensor. REMOVE jumper wire. RECONNECT harness to ACT sensor. RERUN Quick Test.</p> <p>REMOVE jumper wire. GO to <b>DB11</b>.</p>
<b>DB11</b>	<b>CONTINUITY CHECK ACT SIGNAL AND SIGNAL RETURN</b>		
	<ul style="list-style-type: none"> <li>● Key Off, wait 10 seconds.</li> <li>● Harness disconnected from ACT sensor.</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>● DVOM on 200 ohm scale.</li> <li>● Measure resistance between ACT signal, at the ACT vehicle harness connector, and test Pin 25 at the Breakout box.</li> <li>● Measure resistance between Signal Return, at the ACT vehicle harness connector, and test Pin 46 at the Breakout box.</li> </ul>	<p>Both readings are less than 5 ohms</p> <p>Either reading is 5 ohms or greater</p>	<p>REPLACE processor. REMOVE Breakout box. RECONNECT processor and ACT sensor. RERUN Quick Test.</p> <p>CORRECT circuit opens. REMOVE Breakout box. RECONNECT processor and ACT sensor. RERUN Quick Test.</p>

# Air Charge Temperature Sensor (ACT)

# Pinpoint Test

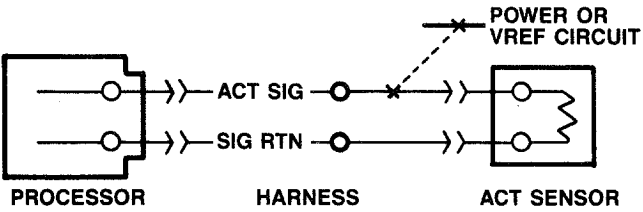
# DB

TEST STEP		RESULT	ACTION TO TAKE
<b>DB20</b>	SERVICE CODE 64: INDUCE OPPOSITE CODE		
<ul style="list-style-type: none"> <li>● Key Off, wait 10 seconds.</li> <li>● Disconnect vehicle harness from ACT sensor. Inspect for damaged pins, corrosion, loose wires, etc. Service as necessary.</li> <li>● Run Key On, Engine Off Quick Test.</li> <li>● Is code 54 present?</li> </ul>		Yes	REPLACE ACT sensor. RECONNECT harness to ACT sensor. RERUN Quick Test.
		No	GO to <b>DB21</b> .
<b>DB21</b>	CHECK FOR V REF AT THROTTLE POSITION SENSOR		
<ul style="list-style-type: none"> <li>● Key Off, wait 10 seconds.</li> <li>● DVOM on 20V scale.</li> <li>● Disconnect TP sensor.</li> <li>● Key On, Engine Off.</li> <li>● Measure voltage at the TP vehicle harness connector between VREF and Signal Return.</li> </ul>		Less than 4.0V or greater than 6.0V	GO to Pinpoint Test Step <b>C1</b> .
		4.0V to 6.0V	RECONNECT TP sensor, GO to <b>DB22</b> .
<b>DB22</b>	CHECK ACT SIGNAL FOR SHORTS TO GROUND		
<ul style="list-style-type: none"> <li>● Key Off, wait 10 seconds.</li> <li>● Harness disconnected from ACT sensor.</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 test Pin 25 and test Pins 40, 46 and 60 at the Breakout box.</li> </ul>		Any reading less than 10,000 ohms	CORRECT circuit shorts. REMOVE Breakout box. RECONNECT processor and ACT sensor. RERUN Quick Test.
		All readings are 10,000 ohms or greater	REPLACE processor. REMOVE Breakout box. RECONNECT processor and ACT sensor. RERUN Quick Test.

# Air Charge Temperature (ACT)

## Pinpoint Test

DB

TEST STEP		RESULT	ACTION TO TAKE
<b>DB90</b>	<b>SERVICE CODE 54: CONTINUOUS TEST: CHECK ACT SENSOR</b>		
<ul style="list-style-type: none"> <li>Using continuous monitor mode, observe VOM or STAR LED for indication of a fault while performing the following:</li> <li>Lightly tap on ACT sensor (simulate road shock).</li> <li>Wiggle ACT connector.</li> <li>Is a fault indicated?</li> </ul> 		<p>Yes</p> <p>No</p>	<p>DISCONNECT and INSPECT connectors. If connector and terminals are good, REPLACE ACT sensor. RERUN Quick Test.</p> <p>GO to <b>DB91</b>.</p>
<b>DB91</b>	<b>CHECK EEC-IV HARNESS</b>		
<ul style="list-style-type: none"> <li>Observe VOM or STAR LED for a fault indication while performing the following:</li> <li>Referring to the illustration in Step DB90, grasp the harness closest 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> <li>Is fault indicated?</li> </ul>		<p>Yes</p> <p>No</p>	<p>ISOLATE fault and make necessary repairs. RERUN Quick Test.</p> <p>GO to <b>DB92</b>.</p>
<b>DB92</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.</li> <li>Inspect both connectors and connector terminals for obvious damage or faults.</li> <li>Connectors and terminals are OK.</li> </ul>		<p>No</p> <p>Yes</p>	<p>SERVICE as necessary. RERUN Quick Test.</p> <p>Unable to duplicate fault at this time. Continuous code 54 testing complete.</p>

<h1 style="margin: 0;">Air Charge Temperature (ACT)</h1>	<h1 style="margin: 0;">Pinpoint Test</h1>	<h1 style="margin: 0;">DB</h1>
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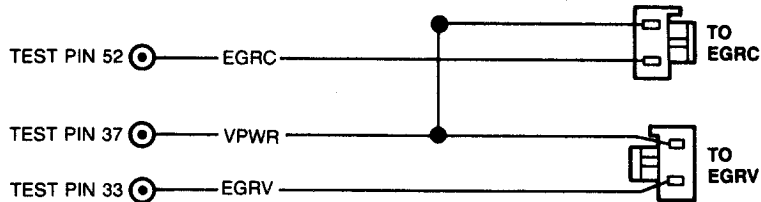
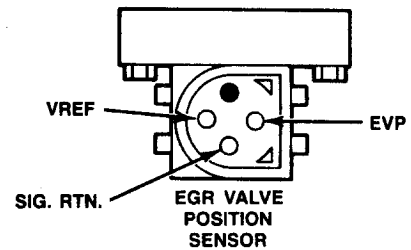
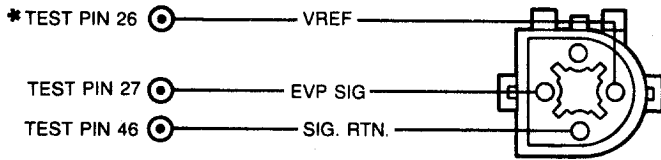
TEST STEP	RESULT	ACTION TO TAKE
<b>DB93</b> SERVICE CODE 64: CONTINUOUS TEST: CHECK ACT SENSOR		
<ul style="list-style-type: none"> <li>● Using continuous monitor mode, observe VOM or STAR LED for fault while performing the following:</li> <li>● Lightly tap on ACT sensor (simulate road shock).</li> <li>● Wiggle ACT connector.</li> <li>● Is fault indicated?</li> </ul>	Yes	DISCONNECT and INSPECT connectors. If connector and terminals are good, REPLACE ACT sensor. RERUN Quick Test.
<ul style="list-style-type: none"> <li>● Is fault indicated?</li> </ul>	No	GO to <b>DB94</b> .
<b>DB94</b> CHECK EEC-IV HARNESS		
<ul style="list-style-type: none"> <li>● Observe VOM or STAR LED for a fault indication while performing the following:</li> <li>● Referring to the illustration in Step DB93, grasp the harness closest 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> <li>● Is fault indicated?</li> </ul>	Yes	ISOLATE fault and make necessary repairs. RERUN Quick Test.
<ul style="list-style-type: none"> <li>● Is fault indicated?</li> </ul>	No	GO to <b>DB95</b> .
<b>DB95</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.</li> <li>● Inspect both connectors and connector terminals for obvious damage or faults.</li> <li>● Connectors and terminals are OK.</li> </ul>	No	SERVICE as necessary. RERUN Quick Test.
	Yes	Unable to duplicate fault at this time. Continuous code 64 testing complete.

**EGR Valve Position Sensor (EVP)  
Control/Vent (EGRC/EGRV)**

**Pinpoint  
Test**

**DD**

**DD**



\* TEST PINS LOCATED ON BREAKOUT BOX.  
ALL HARNESS CONNECTORS VIEWED INTO MATING SURFACE.

**STOP-WARNING**

You should enter this Pinpoint Test only when a Service Code 31, 32, 33, 34, 35, 83 or 84 is received in Quick Test Step 3.0, 5.0 or 6.0.

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

- Damaged EGR valve.

This Pinpoint Test is intended to diagnose only the following:

- EVP sensor.
- Harness circuits: EVP, Signal Return, VREF, EGRV, EGRC, VPWR.
- EGR solenoids.
- EGR Valve assembly.
- Processor assembly.

<b>EGR Valve Position Sensor (EVP) Control/Vent (EGRC/EGRV)</b>	<b>Pinpoint Test</b>	<b>DD</b>
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TEST STEP	RESULT	ACTION TO TAKE
<b>FAULT CODE 31</b>		
<b>DD1</b>   RUN ENGINE RUNNING QUICK TEST WITH EGR VACUUM SIGNAL LINE DISCONNECTED AT EGR VALVE	Code 31 present	GO to <b>DD2</b> .
<ul style="list-style-type: none"> <li>● Key Off, wait 10 seconds.</li> <li>● Disconnect EGR vacuum line at EGR valve and cap EGR vacuum line.</li> <li>● Run Engine Running Quick Test.</li> <li>● Check for code 31.</li> </ul>	No code 31 present, but codes 32, 34 are present	GO to <b>DD11</b> .
<b>DD2</b>   CHECK EVP RESISTANCE WHILE APPLYING VACUUM TO EGR VALVE		
<ul style="list-style-type: none"> <li>● Key Off, wait 10 seconds.</li> <li>● Vacuum signal line disconnected.</li> <li>● Disconnect vehicle harness at EVP sensor.</li> <li>● DVOM on 200,000 ohm scale.</li> <li>● Connect vacuum pump to EGR valve.</li> <li>● Measure resistance at the EVP sensor between EVP SIG and VREF while gradually increasing vacuum to 33 kPa (10 in. Hg).</li> <li>● Observe resistance as vacuum increases.</li> </ul>	Reading gradually decreases from no greater than 5500 ohms to no less than 100 ohms	GO to <b>DD3</b> .
<ul style="list-style-type: none"> <li>● Key Off, wait 10 seconds.</li> <li>● Vacuum signal line disconnected and capped, harness disconnected from EVP sensor.</li> <li>● DVOM on 20V scale.</li> <li>● Measure voltage at the EVP vehicle harness connector between VREF and Signal Return.</li> </ul>	Reading is less than 100 ohms or greater than 5500 ohms	REPLACE EVP sensor. RECONNECT signal line and harness. RERUN Quick Test.
<ul style="list-style-type: none"> <li>● Key On, Engine Off.</li> <li>● Vacuum signal line disconnected and capped, harness disconnected from EVP sensor.</li> <li>● DVOM on 20V scale.</li> <li>● Measure voltage at the EVP vehicle harness connector between VREF and Signal Return.</li> </ul>	Reading does not decrease or unable to hold vacuum	GO to <b>DD16</b> .
<b>DD3</b>   MEASURE VREF TO SIGNAL RETURN VOLTAGE		
<ul style="list-style-type: none"> <li>● Key On, Engine Off.</li> <li>● Vacuum signal line disconnected and capped, harness disconnected from EVP sensor.</li> <li>● DVOM on 20V scale.</li> <li>● Measure voltage at the EVP vehicle harness connector between VREF and Signal Return.</li> </ul>	Reading is between 4 and 6V	GO to <b>DD4</b> .
<ul style="list-style-type: none"> <li>● Key On, Engine Off.</li> <li>● Vacuum signal line disconnected and capped, harness disconnected from EVP sensor.</li> <li>● DVOM on 20V scale.</li> <li>● Measure voltage at the EVP vehicle harness connector between VREF and Signal Return.</li> </ul>	Reading is less than 4V or greater than 6V	GO to Pinpoint Test Step <b>C1</b> .

## EGR Valve Position Sensor (EVP) Control/Vent (EGRC/EGRV)

## Pinpoint Test

# DD

TEST STEP		RESULT	ACTION TO TAKE
<b>DD4</b>	MEASURE CONTINUITY OF EVP SIGNAL CIRCUIT		
	<ul style="list-style-type: none"> <li>● Key Off, wait 10 seconds.</li> <li>● Harness disconnected from EVP sensor.</li> <li>● Disconnect processor 60 Pin connector and inspect for damaged pins, corrosion, loose wires. Service as necessary.</li> <li>● Install Breakout box leaving processor disconnected.</li> <li>● DVOM on 200 ohm scale.</li> <li>● Measure resistance between test Pin 27 at the Breakout box and EVP signal at the EVP vehicle harness connector.</li> </ul>	Less than 5 ohms 5 ohms or greater	GO to <b>DD5</b> .  SERVICE open circuit. REMOVE Breakout box. RECONNECT processor and EVP sensor. RERUN Quick Test.
<b>DD5</b>	CHECK EVP SIGNAL FOR SHORTS TO VREF AND SIGNAL RETURN		
	<ul style="list-style-type: none"> <li>● Key Off, harness disconnected from EVP sensor. Breakout box installed with processor not connected.</li> <li>● DVOM on 200,000 ohm scale.</li> <li>● Measure resistance between test Pin 27 and test Pins 26, 40, 46 and 60 at Breakout box.</li> </ul>	Any reading less than 10,000 ohms  All readings 10,000 ohms or greater	SERVICE short circuit. REMOVE Breakout box. RECONNECT processor and EVP sensor. RERUN Quick Test.  GO to <b>DD6</b> .
<b>DD6</b>	SUBSTITUTE EVP SENSOR AND EGR VALVE		
	<ul style="list-style-type: none"> <li>● Key Off, wait 10 seconds.</li> <li>● Electrically connect known good EVP sensor and EGR valve assembly.</li> <li>● Remove Breakout box.</li> <li>● Reconnect processor.</li> <li>● Perform Key On, Engine Off Quick Test.</li> <li>● Is code 31 present?</li> </ul>	Yes  No	REPLACE processor. Connect original EVP sensor and EGR valve assembly. RERUN Quick Test.  GO to <b>DD7</b> .

**EGR Valve Position Sensor (EVP)  
Control/Vent (EGRC/EGRV)**

**Pinpoint  
Test**

**DD**

TEST STEP		RESULT	ACTION TO TAKE
<b>DD7</b>	<b>EVP SENSOR CHECK</b>		
<ul style="list-style-type: none"> <li>● Key Off, wait 10 seconds.</li> <li>● Install original EVP sensor on known good EGR valve.</li> <li>● EVP sensor connected.</li> <li>● Rerun Key On, Engine Off Quick Test.</li> <li>● Is code 31 present?</li> </ul>		Yes	INSTALL new EVP sensor. RERUN Quick Test.
		No	REFER to EGR System, Section 6.
<b>FAULT CODES 32, 33 AND 34</b>			
<b>DD11</b>	<b>OUTPUT STATE CHECK (REFER TO APPENDIX)</b>		
<p><b>NOTE: Do not use STAR tester for this test step. Use VOM/DVOM.</b></p> <ul style="list-style-type: none"> <li>● Key Off, wait 10 seconds.</li> <li>● DVOM on 20V scale.</li> <li>● Connect DVOM negative test lead to STO and positive test lead to battery positive.</li> <li>● Jumper STI to signal return.</li> <li>● Perform Key On, Engine Off Self-Test until the completion of the Continuous Test Codes.</li> <li>● DVOM will indicate zero volts.</li> <li>● Depress and release the throttle.</li> <li>● Did DVOM reading change to a high voltage reading?</li> </ul>		No	DEPRESS throttle to WOT and RELEASE. If STO voltage does not go high, GO to Pinpoint Test Step <b>Q40</b> .
		Yes	Remain in output state check and GO to <b>DD12</b> .
<b>DD12</b>	<b>CHECK EGR SOLENOIDS FOR ELECTRICAL CYCLING</b>		
<ul style="list-style-type: none"> <li>● Key On, Engine Off.</li> <li>● In output state check.</li> <li>● DVOM on 20V scale.</li> <li>● Connect DVOM between EGRV, VPWR and EGRV signal.</li> <li>● While observing DVOM, depress and release the throttle several times to cycle output on and off.</li> <li>● Repeat for EGRC, VPWR and EGRC signal.</li> </ul>		Both solenoid outputs cycle on and off	REMAIN in output state check. GO to <b>DD13</b> .
		Either output does not cycle on and off	Exit output state check. GO to <b>DD17</b> .



**EGR Valve Position Sensor (EVP)  
Control/Vent (EGRC/EGRV)**

**Pinpoint  
Test**

**DD**

TEST STEP		RESULT	ACTION TO TAKE
<b>DD13</b>	<b>CHECK EGR SOLENOIDS FOR VACUUM CYCLING</b>		
<ul style="list-style-type: none"> <li>● Key On, Engine Off.</li> <li>● In output state check.</li> <li>● Disconnect and cap vacuum line from bottom port of EGRC solenoid and connect a vacuum pump.</li> <li>● Connect a vacuum gauge in the common output (top) vacuum line to EGR valve.</li> <li>● Disconnect but <b>do not</b> cap vacuum vent line from EGRV solenoid.</li> <li>● While cycling outputs on and off (by depressing and releasing throttle), observe vacuum gauge at the output. Maintain vacuum at source.</li> </ul>		<p>Vacuum output cycles on and off in less than 2 seconds</p> <p>Vacuum does not cycle on and off in less than 2 seconds</p>	<p>RECONNECT all vacuum lines. GO to <b>DD14</b>.</p> <p>CHECK filter for obstructions. REPLACE as necessary. If OK, REPLACE solenoid assembly. RECONNECT all vacuum lines. RERUN Quick Test.</p>
<b>DD14</b>	<b>CHECK VACUUM LINES</b>		
<ul style="list-style-type: none"> <li>● Key Off, wait 10 seconds.</li> <li>● Vacuum lines reconnected.</li> <li>● Check entire EEC vacuum line system per VECI emission schematic decal for kinks, cracks, obstructions or leaks.</li> </ul>		<p>Vacuum lines OK</p> <p>Vacuum lines not OK</p>	<p>GO to <b>DD15</b>.</p> <p>SERVICE as necessary. RERUN Quick Test.</p>

## EGR Valve Position Sensor (EVP) Control/Vent (EGRC/EGRV)

## Pinpoint Test







# DD

TEST STEP		RESULT	ACTION TO TAKE
<b>DD15</b>	CHECK EVP RESISTANCE WHILE APPLYING VACUUM TO EGR VALVE		
<ul style="list-style-type: none"> <li>● Key Off.</li> <li>● Disconnect vehicle harness from EVP sensor. Inspect for damaged pins, corrosion, and pins pushed out. Service as necessary.</li> <li>● DVOM on 200,000 ohm scale.</li> <li>● Disconnect vacuum line at EGR valve.</li> <li>● Connect vacuum pump to EGR valve.</li> <li>● Measure resistance of the EVP sensor between EVP Signal Pin and VREF Pin while increasing vacuum to 33 kPa (10 in. Hg).</li> <li>● Observe resistance as vacuum increases.</li> </ul>		<p>Reading does not decrease gradually</p> <p>Reading gradually decreases from no more than 5,500 ohms to no less than 100 ohms</p>	<p>GO to <b>DD16</b>.</p> <p>REPLACE processor. RECONNECT EVP sensor and EGR vacuum line. RERUN Quick Test.</p>
<b>DD16</b>	MANUALLY EXERCISE EVP SENSOR		
<ul style="list-style-type: none"> <li>● Key Off, harness disconnected from EVP sensor.</li> <li>● Remove EVP sensor from EGR valve.</li> <li>● Measure resistance of the EVP sensor between EVP Signal Pin and VREF Pin while gradually applying pressure to EVP sensor shaft.</li> <li>● Observe resistance as shaft is slowly pushed in and slowly released.</li> <li>● Look for sudden changes in resistance readings.</li> </ul>		<p>Both readings decrease and increase smoothly between 5,500 ohms and 100 ohms</p> <p>Either reading decreases or increases abruptly between 5,500 ohms and 100 ohms</p>	<p>REFER to EGR System, Section 6. RECONNECT EVP sensor and EGR supply vacuum line. RERUN Quick Test.</p> <p>REPLACE EVP sensor. RECONNECT harness and EGR supply vacuum line. RERUN Quick Test.</p>
<b>DD17</b>	MEASURE EGRV/EGRC SOLENOID RESISTANCE		
<ul style="list-style-type: none"> <li>● Key Off, wait 10 seconds.</li> <li>● DVOM on 200 ohm scale.</li> <li>● Disconnect EGRV solenoid connector and measure solenoid resistance. Inspect for damaged pins, corrosion and pins pushed out. Service as necessary.</li> <li>● Disconnect EGRC solenoid connector and measure solenoid resistance. Inspect for damaged pins, corrosion and pins pushed out. Service as necessary.</li> </ul>		<p>Both resistances are between 30 and 70 ohms</p> <p>Either resistance is less than 30 ohms or greater than 70 ohms</p>	<p>CONNECT EGRC/EGRV solenoids. GO to <b>DD18</b>.</p> <p>REPLACE EGRC/EGRV solenoid assembly. RERUN Quick Test.</p>

## EGR Valve Position Sensor (EVP) Control/Vent (EGRC/EGRV)

## Pinpoint Test

# DD

TEST STEP		RESULT	ACTION TO TAKE
<b>DD18</b>	<b>CHECK FOR VOLTAGE ON VEHICLE POWER CIRCUIT</b>		
<ul style="list-style-type: none"> <li>● Disconnect EGR vent and EGR control solenoids from harness.</li> <li>● Key On, Engine Off.</li> <li>● DVOM on 20V scale.</li> <li>● Measure voltage between battery negative terminal and VPWR circuit on both EGR solenoids.</li> </ul>		Either reading is less than 10.5V   Both readings are 10.5V or greater 	SERVICE harness circuit open. RERUN Quick Test.  GO to <b>DD19</b> .
<b>DD19</b>	<b>CHECK CONTINUITY OF EGRV AND EGRC CIRCUITS</b>		
<ul style="list-style-type: none"> <li>● Key Off, wait 10 seconds.</li> <li>● EGR vent and EGR control solenoid disconnected from harness.</li> <li>● Disconnect processor 60 Pin connector and inspect for damaged pins, corrosion, loose wires. Service as necessary.</li> <li>● Install Breakout box to processor harness connector. Leave processor disconnected.</li> <li>● DVOM on 200 ohm scale.</li> <li>● Measure resistance between test Pin 33 at the Breakout box and EGRV signal at the EGRV solenoid vehicle harness connector.</li> <li>● Measure resistance between test Pin 52 at the Breakout box and EGRC signal at the EGRC solenoid vehicle harness connector.</li> </ul>		Both readings less than 5 ohms   Either reading 5 ohms or greater 	GO to <b>DD20</b> .  SERVICE open circuit. REMOVE Breakout box. RECONNECT harness to processor. RERUN Quick Test.
<b>DD20</b>	<b>CHECK FOR SHORT TO GROUND</b>		
<ul style="list-style-type: none"> <li>● Key Off, wait 10 seconds.</li> <li>● DVOM on 200,000 ohm scale.</li> <li>● Leave Breakout box installed and processor disconnected.</li> <li>● EGRV/EGRC solenoids disconnected.</li> <li>● Measure resistance between test Pins 33 and/or 52 and test Pins 40, 46 and 60 at the Breakout box.</li> </ul>		Resistance reading is less than 10,000 ohms   Resistance reading is 10,000 ohms or greater 	SERVICE short to ground. RERUN Quick Test.  GO to <b>DD21</b> .

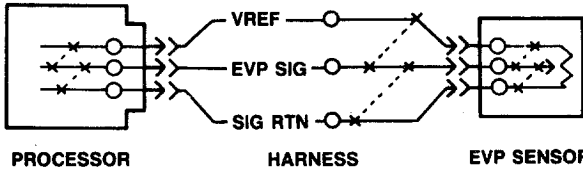
<h2 style="margin: 0;">EGR Valve Position Sensor (EVP) Control/Vent (EGRC/EGRV)</h2>	<h2 style="margin: 0;">Pinpoint Test</h2>	<h2 style="margin: 0;">DD</h2>
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TEST STEP	RESULT	ACTION TO TAKE
<b>DD21</b> CHECK EGRV AND EGRC SIGNALS FOR SHORTS TO POWER	Any reading less than 10,000 ohms	SERVICE circuit short. REMOVE Breakout box. RECONNECT harness to processor. RERUN Quick Test. If code is repeated, REPLACE processor.
<ul style="list-style-type: none"> <li>● EGR vent and EGR control solenoids disconnected from harness.</li> <li>● Key Off, Breakout box installed. Processor disconnected.</li> <li>● DVOM on 200,000 ohm scale.</li> <li>● Measure resistance between test Pin 33 and test Pins 37 and 57 at the Breakout box.</li> <li>● Measure resistance between test Pin 52 and test Pins 37 and 57 at the Breakout box.</li> </ul>	All readings 10,000 ohms or greater	REPLACE processor. REMOVE Breakout box. RECONNECT harness to processor. RERUN Quick Test.
<b>FAULT CODE 35</b>		
<b>DD30</b> RPM TOO LOW FOR EGR TEST	Code 12 present	Vehicles equipped with air bypass (EFI), GO to <b>KE1</b> .  Vehicles equipped with DC motor control, GO to <b>KF1</b> .
<ul style="list-style-type: none"> <li>● Check for code 12.</li> </ul>	Code 12 not present	GO to <b>DD31</b> .
<b>DD31</b> RETEST AT 1,500 RPM	Code 35 present	REPLACE processor. RERUN Quick Test.
<ul style="list-style-type: none"> <li>● Key Off, wait 10 seconds.</li> <li>● Install tachometer.</li> <li>● Perform Key On, Engine Running Quick Test while maintaining 1,500 rpm.</li> <li>● Record Engine Running service codes.</li> <li>● Check for code 35.</li> </ul>	Code 35 not present	RERUN Quick Test. SERVICE codes as necessary.

**EGR Valve Position Sensor (EVP)  
Control/Vent (EGRC/EGRV)**

**Pinpoint  
Test**

**DD**

TEST STEP	RESULT	ACTION TO TAKE
<p><b>DD90</b> SERVICE CODE 31 CONTINUOUS TEST: EXERCISE EVP SENSOR</p> <ul style="list-style-type: none"> <li>Using continuous monitor mode, observe VOM or STAR LED for indication of a fault while performing the following:</li> <li>Connect a vacuum pump to the EGR valve.</li> <li>Very slowly apply 20 kPa (6 in. Hg) vacuum to the EGR valve.</li> <li>Slowly bleed vacuum off the EGR valve and lightly tap on EVP sensor (simulate road shock).</li> <li>Wiggle EVP sensor connector.</li> <li>Is a fault indicated?</li> </ul>  <p style="text-align: center;">PROCESSOR                  HARNESS                  EVP SENSOR</p>	<p>Yes</p> <p>No</p>	<p>GO to <b>DD91</b>.</p> <p>GO to <b>DD92</b>.</p>
<p><b>DD91</b> MEASURE EVP SIGNAL VOLTAGE WHILE EXERCISING EVP SENSOR</p> <ul style="list-style-type: none"> <li>Key Off, wait 10 seconds.</li> <li>Disconnect processor 60 Pin connector and inspect for damaged pins, corrosion, loose wires. 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 27 to test Pin 46.</li> <li>DVOM on 20V scale.</li> <li>Key On, Engine Off.</li> <li>While observing DVOM, repeat Step DD90.</li> <li>Does the fault occur below 4.25V?</li> </ul>	<p>Yes</p> <p>No</p>	<p>DISCONNECT and INSPECT connector. If connector and terminals are good, REPLACE EVP sensor. RERUN Quick Test.</p> <p>EGR valve overshoot may have caused continuous code 31. Sensor service is not required. To verify harness integrity, GO to <b>DD92</b>.</p>

## EGR Valve Position Sensor (EVP) Control/Vent (EGRC/EGRV)

## Pinpoint Test

# DD

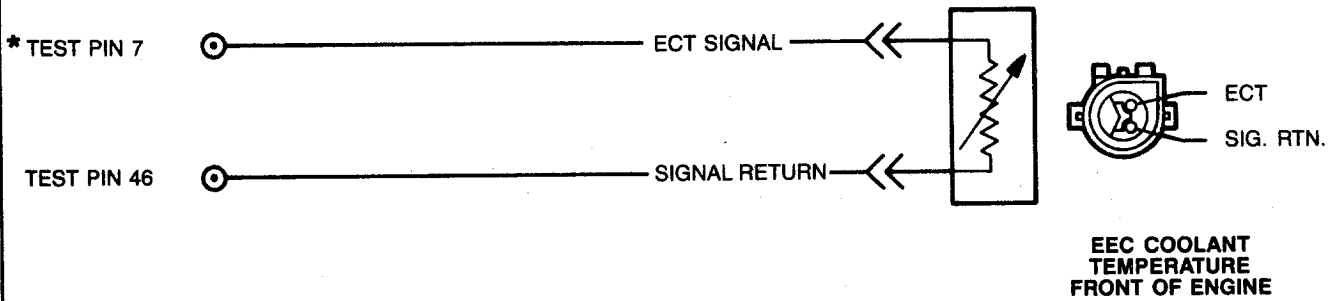
TEST STEP		RESULT	ACTION TO TAKE
<b>DD92</b>	<b>CHECK EEC-IV HARNESS</b>		
<ul style="list-style-type: none"> <li>● Observe VOM or STAR LED for a fault indication while performing the following:</li> <li>● Referring to the illustration in Step DD90, grasp the harness closest to the sensor connector. 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> <li>● Is a fault indicated?</li> </ul>		<p>Yes</p> <p>No</p>	<p>ISOLATE fault and SERVICE as necessary. REFER to appropriate figure. RERUN Quick Test.</p> <p>GO to <b>DD93</b>.</p>
<b>DD93</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.</li> <li>● Inspect both connectors and connector terminals for obvious damage or faults.</li> <li>● Are connectors and terminals OK?</li> </ul>		<p>No</p> <p>Yes</p>	<p>SERVICE as necessary. RERUN Quick Test.</p> <p>Unable to duplicate fault at this time. Continuous code 31 testing complete.</p>

# Engine Coolant Temperature Sensor (ECT)

# Pinpoint Test

# DE

DE



**NOTE: TO PASS THIS TEST, ENGINE COOLANT TEMPERATURE MUST BE:  
 KEY ON, ENGINE OFF (50°F TO 240°F)  
 ENGINE RUNNING (180°F TO 240°F)**

TYPICAL RESISTANCE BETWEEN TEST PINS 7 & 46	58,750Ω	40,500Ω	3600Ω	1840Ω
AT TEMPERATURE	50°F	65°F	180°F	220°F

**\*TEST PIN LOCATED ON BREAKOUT BOX.  
 ALL CONNECTIONS VIEWED INTO MATING SURFACE.**

## STOP-WARNING

**You should enter this Pinpoint Test only when a service code 21, 51 or 61 is received in Quick Test Step 3.0, 5.0 or 6.0.**

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

- Coolant level.
- Oil level.
- Blocked or obstructed air flow.
- Engine not at normal operating temperature.
- Electro drive cooling fan.








This pinpoint test is intended to diagnose only the following:

- ECT sensor.
- Harness sensor circuits: ECT and Signal Return.
- Processor assembly.

# Engine Coolant Temperature Sensor (ECT)

# Pinpoint Test

# DE

TEST STEP		RESULT	ACTION TO TAKE
<b>DE1</b>	<b>SERVICE CODE 21: CHECK ENGINE OPERATING TEMPERATURE</b>		
	<ul style="list-style-type: none"> <li>● Run engine for 2 minutes at 2,000 rpm.</li> <li>● Check that upper radiator hose is hot and pressurized.</li> <li>● Rerun Quick Test.</li> </ul>	Vehicle stalls   Code 21 present   Code 21 not present 	Do not service code 21 at this time. REFER to diagnosis by symptoms.  GO to <b>DE2</b> .  SERVICE other codes as necessary.
<b>DE2</b>	<b>CHECK FOR V REF AT THROTTLE POSITION SENSOR</b>		
	<ul style="list-style-type: none"> <li>● Refer to illustration Q.</li> <li>● Key Off, wait 10 seconds.</li> <li>● DVOM on 20V scale.</li> <li>● Disconnect TP sensor.</li> <li>● Key On, Engine Off.</li> <li>● Measure voltage at the TP vehicle harness connector between VREF and signal return.</li> </ul>	Less than 4.0V or greater than 6.0V   4.0V to 6.0V 	GO to Pinpoint Test Step <b>C1</b> .  RECONNECT TP sensor, GO to <b>DE3</b> .
<b>DE3</b>	<b>ECT SENSOR CHECK</b>		
	<p><b>NOTE: Engine may have cooled down. Always warm engine before taking ECT resistance measurement.</b></p> <ul style="list-style-type: none"> <li>● Key Off, wait 10 seconds.</li> <li>● Harness disconnected from ECT sensor.</li> <li>● DVOM on 200,000 ohm scale.</li> <li>● Measure resistance of the ECT sensor.</li> <li>● Is the resistance reading:                             <ul style="list-style-type: none"> <li>— 1300 ohms (240°F) to 7700 ohms (140°F) for engine off?</li> <li>— 1550 ohms (230°F) to 4550 ohms (180°F) for engine running?</li> </ul> </li> </ul>	Yes           No 	REPLACE processor. RECONNECT harness to ECT sensor. RERUN Quick Test.          REPLACE ECT sensor. RECONNECT harness to ECT sensor. RERUN Quick Test.



<b>Engine Coolant Temperature Sensor (ECT)</b>	<b>Pinpoint Test</b>	<b>DE</b>
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	TEST STEP	RESULT	ACTION TO TAKE
<b>DE10</b>	<b>SERVICE CODE 51: INDUCE OPPOSITE CODE</b>		
	<ul style="list-style-type: none"> <li>● Key Off, wait 10 seconds.</li> <li>● Disconnect vehicle harness from ECT sensor. Inspect for damaged pins, corrosion, loose wires, etc. Service as necessary.</li> <li>● Insert a jumper wire at the ECT sensor vehicle harness connector between ECT Signal and Signal Return.</li> <li>● Run Key On, Engine Off Quick Test.</li> <li>● Is code 61 present?</li> </ul>	<p>Yes</p> <p style="text-align: center;">▶</p> <p>No</p> <p style="text-align: center;">▶</p>	<p>REPLACE ECT sensor. REMOVE jumper wire. RECONNECT ECT sensor. RERUN Quick Test.</p> <p>GO to <b>DE11</b>.</p>
<b>DE11</b>	<b>CHECK CONTINUITY OF ECT SIGNAL AND SIGNAL RETURN</b>		
	<ul style="list-style-type: none"> <li>● Key Off, wait 10 seconds.</li> <li>● Harness disconnected from ECT sensor, jumper wire removed.</li> <li>● Disconnect processor 60 pin connector. Inspect for damaged pins, corrosion, loose wires, etc. Service as necessary.</li> <li>● Install Breakout box to harness leaving processor disconnected.</li> <li>● DVOM on 200 ohm scale.</li> <li>● Measure resistance between ECT signal at the ECT vehicle harness connector and test Pin 7 at the Breakout box.</li> <li>● Measure resistance between Signal Return at the ECT sensor vehicle harness connector, and test Pin 46 at the Breakout box.</li> </ul>	<p>Both readings are less than 5 ohms.</p> <p style="text-align: center;">▶</p> <p>Either reading is 5 ohms or greater</p> <p style="text-align: center;">▶</p>	<p>REPLACE processor. REMOVE Breakout box. RECONNECT processor and ECT sensor. RERUN Quick Test.</p> <p>SERVICE open circuit(s). REMOVE Breakout box. RECONNECT processor and ECT sensor. RERUN Quick Test.</p>

# Engine Coolant Temperature Sensor (ECT)

# Pinpoint Test

# DE

TEST STEP		RESULT	ACTION TO TAKE
<b>DE20</b>	SERVICE CODE 61: INDUCE OPPOSITE CODE		
<ul style="list-style-type: none"> <li>● Key Off, wait 10 seconds.</li> <li>● Disconnect vehicle harness from ECT sensor. Inspect for damaged pins, corrosion, loose wires, etc. Service as necessary.</li> <li>● Run Key On, Engine Off Quick Test.</li> <li>● Is code 51 present?</li> </ul>		Yes	REPLACE ECT sensor. RECONNECT ECT sensor. RERUN Quick Test.
		No	GO to <b>DE21</b> .
<b>DE21</b>	CHECK FOR V REF AT THROTTLE POSITION SENSOR		
<ul style="list-style-type: none"> <li>● Refer to illustration Q.</li> <li>● Key Off, wait 10 seconds.</li> <li>● DVOM on 20V scale.</li> <li>● Disconnect TP sensor.</li> <li>● Key On, Engine Off.</li> <li>● Measure voltage at the TP vehicle harness connector between VREF and signal return.</li> </ul>		Less than 4.0V or greater than 6.0V	GO to Pinpoint Test Step <b>C1</b> .
		4.0V to 6.0V	RECONNECT TP sensor, GO to <b>DE22</b> .
<b>DE22</b>	CHECK ECT SIGNAL FOR SHORT		
<ul style="list-style-type: none"> <li>● Key Off, wait 10 seconds.</li> <li>● Harness disconnected from ECT sensor.</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>● DVOM on 200,000 ohm scale.</li> <li>● Measure resistance between test Pin 7 and test Pins 40, 46 and 60 at the Breakout box.</li> </ul>		Either reading is less than 10,000 ohms	SERVICE circuit shorts. REMOVE Breakout box. RECONNECT processor and ECT sensor. RERUN Quick Test.
		Both readings are 10,000 ohms or greater	REPLACE processor. REMOVE Breakout box. RECONNECT processor and ECT harness. RERUN Quick Test.

<h2 style="text-align: center;">Engine Coolant Temperature Sensor (ECT)</h2>	<h2 style="text-align: center;">Pinpoint Test</h2>	<h2 style="text-align: center;">DE</h2>
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TEST STEP	RESULT	ACTION TO TAKE
<b>DE90</b> SERVICE CODE 21: CONTINUOUS TEST: TEST DRIVE VEHICLE		
<ul style="list-style-type: none"> <li>● Key Off and wait 10 seconds.</li> <li>● Disconnect all Self-Test equipment and prepare vehicle for test drive.</li> <li>● Drive vehicle. Try to simulate different drive modes or mode in which drive complaint is noticed. Attempt to maintain drive complaint mode for one minute or more, if possible.</li> <li>● Upon completion of drive evaluation, repeat Key On, Engine Off Self-Test.</li> <li>● Is code 21 present in the continuous test results?</li> </ul>	<p style="text-align: center;">Yes</p> <p style="text-align: center;">No</p>	<p>VERIFY thermostat operating properly. If OK, REPLACE ECT sensor. RERUN Quick Test.</p> <p>Unable to duplicate fault. Code 21 testing complete.</p>

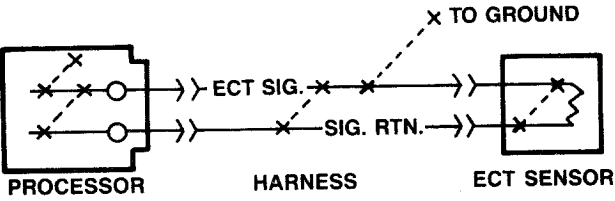
# Engine Coolant Temperature (ECT)

# Pinpoint Test

**DE**

TEST STEP		RESULT	ACTION TO TAKE
<b>DE91</b>	<b>SERVICE CODE 51: CONTINUOUS TEST: CHECK ECT SENSOR</b>		
<ul style="list-style-type: none"> <li>Using continuous monitor mode, observe VOM or STAR LED for indication of a fault while performing the following:</li> <li>Lightly tap on ECT sensor (simulate road shock).</li> <li>Wiggle ECT connector.</li> <li>Is a fault indicated?</li> </ul>		<p>Yes</p> <p>No</p>	<p>DISCONNECT and INSPECT connectors. If connector and terminals are good, REPLACE ECT sensor. RERUN Quick Test.</p> <p>GO to <b>DE92</b>.</p>
<p>PROCESSOR                  HARNESS                  ECT SENSOR</p>			
<b>DE92</b>	<b>CHECK EEC-IV HARNESS</b>		
<ul style="list-style-type: none"> <li>Observe VOM or STAR LED for a fault indication while performing the following:</li> <li>Referring to the illustration in Step DE91, grasp the harness closest 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> <li>Is fault indicated?</li> </ul>		<p>Yes</p> <p>No</p>	<p>ISOLATE fault and make necessary repairs. RERUN Quick Test.</p> <p>GO to <b>DE93</b>.</p>
<b>DE93</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.</li> <li>Inspect both connectors and connector terminals for obvious damage or faults.</li> <li>Connectors and terminals are OK.</li> </ul>		<p>No</p> <p>Yes</p>	<p>SERVICE as necessary. RERUN Quick Test.</p> <p>Unable to duplicate fault at this time. Continuous code 51 testing complete.</p>

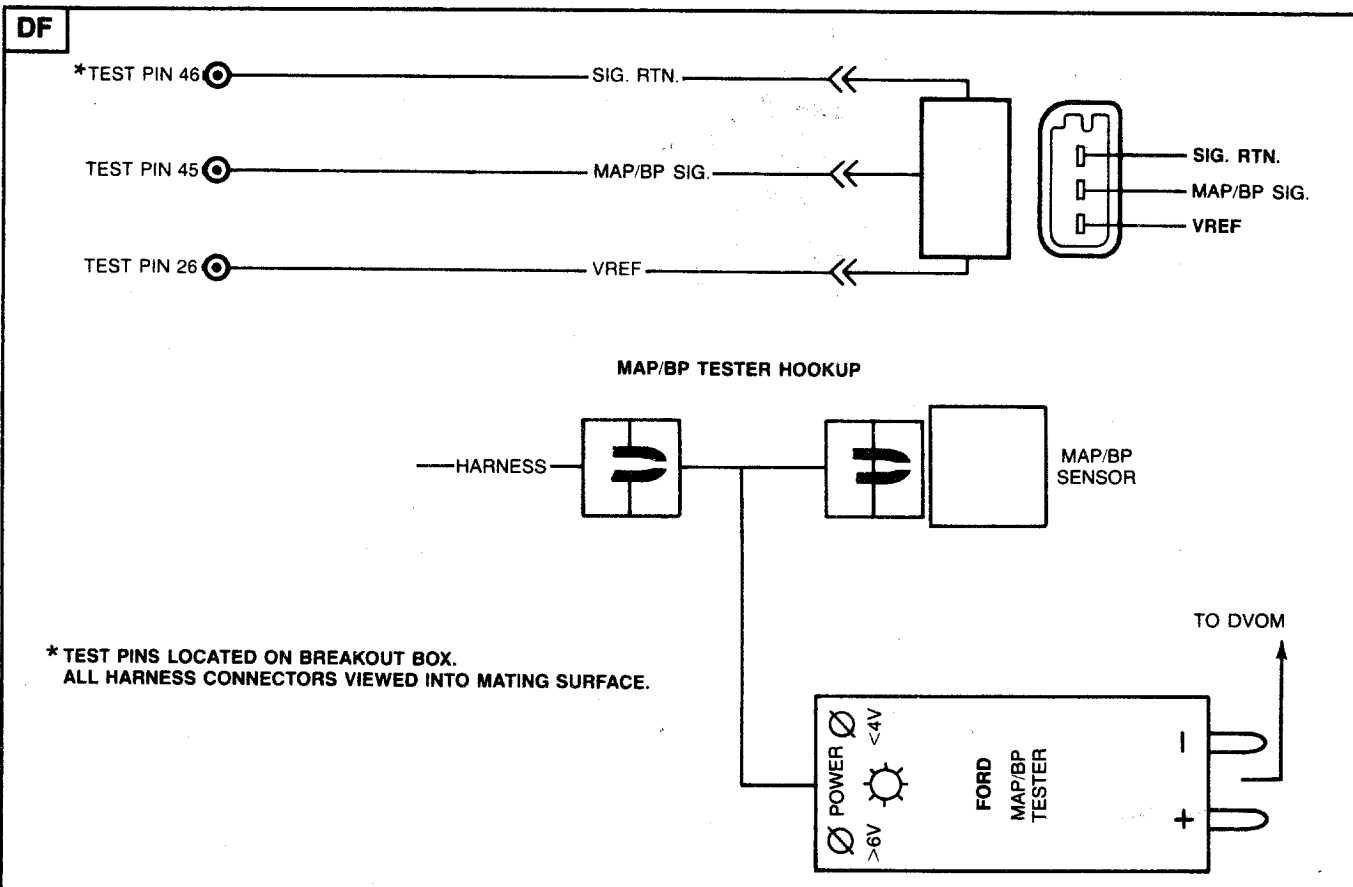
<h1>Engine Coolant Temperature (ECT)</h1>	<h1>Pinpoint Test</h1>	<h1>DE</h1>
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TEST STEP	RESULT	ACTION TO TAKE
<b>DE94</b> SERVICE CODE 61: CONTINUOUS TEST: CHECK ECT SENSOR		
<ul style="list-style-type: none"> <li>● Using continuous monitor mode, observe VOM or STAR LED for indication of a fault while performing the following:</li> <li>● Lightly tap on ECT sensor (simulate road shock).</li> <li>● Wiggle ECT connector.</li> </ul> <p style="margin-left: 20px;">Voltage greater than 5 volts or STAR LED Off.</p> <ul style="list-style-type: none"> <li>● Is fault indicated?</li> </ul>	<p>Yes</p> <p style="text-align: center;">▶</p> <p>No</p> <p style="text-align: center;">▶</p>	<p>DISCONNECT and INSPECT connectors. If connector and terminals are good, REPLACE ECT sensor. RERUN Quick Test.</p> <p>GO to <b>DE95</b>.</p>
 <p style="font-size: small; margin-top: 5px;">PROCESSOR                      HARNESS                      ECT SENSOR</p>		
<b>DE95</b> CHECK EEC-IV HARNESS		
<ul style="list-style-type: none"> <li>● Observe VOM or STAR LED for a fault indication while performing the following:</li> <li>● Referring to the illustration in Step DE94, grasp the harness closest 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> <ul style="list-style-type: none"> <li>● Is fault indicated?</li> </ul>	<p>Yes</p> <p style="text-align: center;">▶</p> <p>No</p> <p style="text-align: center;">▶</p>	<p>ISOLATE fault and make necessary repairs. RERUN Quick Test.</p> <p>GO to <b>DE96</b>.</p>
<b>DE96</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.</li> <li>● Inspect both connectors and connector terminals for obvious damage or faults.</li> <li>● Connectors and terminals are OK.</li> </ul>	<p>No</p> <p style="text-align: center;">▶</p> <p>Yes</p> <p style="text-align: center;">▶</p>	<p>SERVICE as necessary. RERUN Quick Test.</p> <p>Unable to duplicate fault at this time. Continuous code 61 testing complete.</p>

## Manifold Absolute Pressure (MAP)/ Barometric Pressure (BP) Sensor

## Pinpoint Test

# DF



## STOP-WARNING

You should enter this Pinpoint Test only when a Service Code 22 or 72 is received in Quick Test Step 3.0, 5.0 or 6.0 or when directed here from Diagnostics by Symptom in the Engine Supplement Section.

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

- Unusually high/low atmospheric barometer reading (MAP/BP).
- Kinked or obstructed vacuum lines (MAP).
- Basic engine (valves, vacuum leaks, timing, carburetor, EGR valve (MAP), etc.).
- Key On, Engine Off — MAP sensor must **not** see vacuum.
- Engine Running — MAP sensor must see actual manifold vacuum.

This Pinpoint Test is intended to diagnose only the following:

- MAP/BP sensor.
- Harness circuits: VREF, MAP/BP Signal, and Signal Return.
- Processor assembly.

## Manifold Absolute Pressure (MAP)/ Barometric Pressure (BP) Sensor

## Pinpoint Test

## DF

TEST STEP	RESULT	ACTION TO TAKE
<b>FAULT CODE 22, ENGINE OFF</b>		
<b>DF1</b>   CONNECTING MAP/BP TESTER		
<ul style="list-style-type: none"> <li>● Key Off.</li> <li>● Disconnect the MAP/BP sensor from the vehicle harness.</li> <li>● Connect the MAP/BP tester between the vehicle harness and the MAP/BP sensor.</li> <li>● Insert tester banana plugs into DVOM.</li> <li>● Set DVOM to 20V scale.</li> <li>● Refer to illustration DF.</li> </ul>	Tester properly hooked up	GO to <b>DF2</b> .
<b>DF2</b>   POWER TO MAP/BP SENSOR TEST		
<ul style="list-style-type: none"> <li>● MAP/BP tester connected.</li> <li>● Key On.</li> </ul>	(ONLY) Green light, VREF is OK	GO to <b>DF4</b> .
	"Less than 4V" light (RED) or no lights, VREF is too low	GO to <b>DF3</b> .
	OR	
	"Greater than 6V" light (Red), VREF is too high	
<b>DF3</b>   VREF ISOLATION		
<ul style="list-style-type: none"> <li>● MAP/BP tester connected.</li> <li>● Key On.</li> <li>● Disconnect MAP/BP</li> <li>● Repeat Test Step DF2.</li> </ul>	(ONLY) Green light, VREF is OK	REPLACE MAP/BP sensor. RERUN Quick Test.
	"Less than 4V" light (RED) or no lights, VREF is too low	REMOVE MAP/BP tester. GO to Pinpoint Test Step <b>C1</b> .
	OR	
	"Greater than 6V" light (Red), VREF is too high	

## Manifold Absolute Pressure (MAP)/ Barometric Pressure (BP) Sensor

## Pinpoint Test

## DF

TEST STEP		RESULT	ACTION TO TAKE																		
<b>DF4</b>	<b>MAP/BP TESTER OUTPUT READING</b>																				
<ul style="list-style-type: none"> <li>MAP tester connected, refer to Note.</li> <li>Key On.</li> <li>Approximate Altitude (Ft.)</li> </ul> <table border="1"> <thead> <tr> <th></th> <th>Voltage Output (+/- .04 Volts)</th> </tr> </thead> <tbody> <tr><td>0</td><td>1.59</td></tr> <tr><td>1000</td><td>1.56</td></tr> <tr><td>2000</td><td>1.53</td></tr> <tr><td>3000</td><td>1.50</td></tr> <tr><td>4000</td><td>1.47</td></tr> <tr><td>5000</td><td>1.44</td></tr> <tr><td>6000</td><td>1.41</td></tr> <tr><td>7000</td><td>1.39</td></tr> </tbody> </table> <p><b>NOTE: Measure several known good MAP sensors on available vehicles. The measured voltage will be typical for your location on the day of testing.</b></p> <ul style="list-style-type: none"> <li>Is reading in range for your altitude?</li> </ul>			Voltage Output (+/- .04 Volts)	0	1.59	1000	1.56	2000	1.53	3000	1.50	4000	1.47	5000	1.44	6000	1.41	7000	1.39	<p>Yes</p> <p>No (Sensor output is out-of-range)</p>	<p>GO to <b>DF5</b>.</p> <p>GO to <b>DF6</b>.</p>
	Voltage Output (+/- .04 Volts)																				
0	1.59																				
1000	1.56																				
2000	1.53																				
3000	1.50																				
4000	1.47																				
5000	1.44																				
6000	1.41																				
7000	1.39																				
<b>DF5</b>	<b>CHECK CONTINUITY OF MAP/BP SIGNAL</b>																				
<ul style="list-style-type: none"> <li>Key Off, wait 10 seconds.</li> <li>Harness disconnected from MAP/BP sensor.</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>DVOM on 200 ohm scale.</li> <li>Measure resistance between MAP/BP signal at the MAP/BP sensor vehicle harness connector and test Pin 45 at the Breakout box.</li> </ul>		<p>Reading less than 5 ohms</p> <p>Reading is 5 ohms or greater</p>	<p>REPLACE processor. CONNECT harness and MAP/BP sensor. RERUN Quick Test.</p> <p>SERVICE circuit opens. REMOVE Breakout box. RECONNECT processor and MAP/BP sensor. RERUN Quick Test.</p>																		
<b>DF6</b>	<b>CHECK MAP/BP SIGNAL FOR SHORTS TO VREF; SIGNAL RETURN AND GROUND</b>																				
<ul style="list-style-type: none"> <li>Key Off, wait 10 seconds.</li> <li>Disconnect processor 60 Pin connector and inspect for damaged pins, corrosion, loose wires. Service as necessary.</li> <li>Install Breakout box, leave processor disconnected.</li> <li>Harness disconnected from MAP/BP sensor.</li> <li>DVOM on 200,000 ohm scale.</li> <li>Measure resistance between test Pin 45 and test Pins 26, 46, 40 and 60 at the Breakout box.</li> </ul>		<p>Any reading less than 10,000 ohms</p> <p>All readings are 10,000 ohms or greater</p>	<p>SERVICE circuit shorts. REMOVE Breakout box. RECONNECT processor and MAP/BP Sensor. RERUN Quick Test.</p> <p>REPLACE MAP/BP sensor. REMOVE Breakout box. RECONNECT electrical connections. RERUN Quick Test.</p>																		



<b>Manifold Absolute Pressure (MAP)/ Barometric Pressure (BP) Sensor</b>	<b>Pinpoint Test</b>	<b>DF</b>
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TEST STEP	RESULT	ACTION TO TAKE
<b>CODE 22 ENGINE RUNNING</b>		
<b>DF7</b> CHECK MAP SENSOR		
<ul style="list-style-type: none"> <li>● Key Off, wait 10 seconds.</li> <li>● Disconnect vacuum line from MAP sensor.</li> <li>● Install vacuum pump to MAP sensor.</li> <li>● Apply 18 in. Hg vacuum to MAP sensor.</li> <li>● Does MAP sensor hold vacuum?</li> </ul>	<p>Yes</p> <p>No</p>	<p>RELEASE vacuum. GO to <b>DF8</b>.</p> <p>REPLACE MAP sensor. CONNECT vacuum line to MAP sensor. RERUN Quick Test.</p>
<b>DF8</b> ATTEMPT TO ELIMINATE CODE 22 (ENGINE RUNNING)		
<ul style="list-style-type: none"> <li>● Key Off, wait 10 seconds.</li> <li>● Plug MAP vacuum supply hose.</li> <li>● Start engine and maintain 1500 ± 100 engine rpm.</li> <li>● Slowly apply 15 in. Hg vacuum to MAP sensor.</li> <li>● While maintaining rpm, perform Engine Running Quick Test.</li> <li>● Is code 22 still present?</li> </ul> <p><b>NOTE: Disregard any other codes at this time.</b></p>	<p>Yes</p> <p>No</p>	<p>REPLACE MAP sensor. CONNECT vacuum line to MAP sensor. RERUN Quick Test.</p> <p>INSPECT vacuum supply hose to MAP sensor. SERVICE as necessary. If OK, SERVICE other engine running codes. If none, GO to Diagnostic Routines, Section 2 for a low vacuum problem.</p>
<b>FAULT CODE 72</b>		
<b>DF10</b> CHECK THAT VACUUM TO MAP SENSOR DECREASES DURING DYNAMIC RESPONSE		
<ul style="list-style-type: none"> <li>● Key Off, wait 10 seconds.</li> <li>● Tee a vacuum gauge in the intake manifold vacuum line at the MAP sensor.</li> <li>● Perform Engine Running Quick Test while observing vacuum.</li> <li>● Record engine service codes.</li> <li>● Did vacuum decrease by more than 30 kPa (10 in. Hg) during dynamic response test?</li> <li>● Is code 72 present?</li> </ul>	<p>Vacuum decrease is 30 kPa (10 in. Hg) or greater and code 72 is not present</p> <p>Vacuum decrease is 30 kPa (10 in. Hg) or greater and code 72 is present</p> <p>Vacuum decrease is less than 30 kPa (10 in. Hg)</p>	<p>DISCONNECT vacuum equipment and SERVICE other codes as necessary.</p> <p>REPLACE MAP sensor and RERUN Quick Test.</p> <p>GO to <b>DF11</b>.</p>



**Manifold Absolute Pressure (MAP)/  
Barometric Pressure (BP) Sensor**

**Pinpoint  
Test**

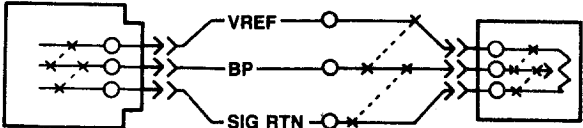
**DF**

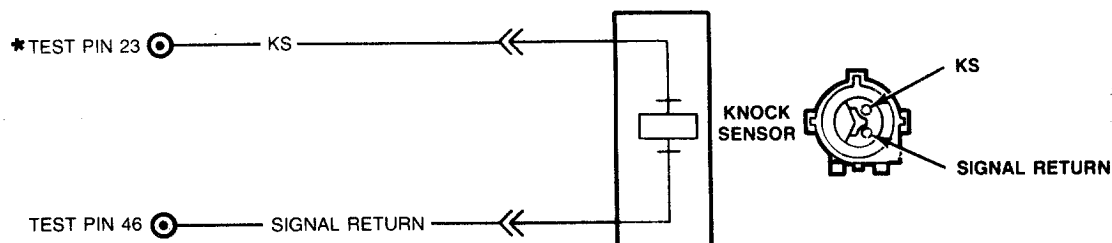
TEST STEP		RESULT	ACTION TO TAKE
<b>DF22</b>	VACUUM LINE CHECK		
<ul style="list-style-type: none"> <li>• Check MAP sensor vacuum line for holes, disconnections, kinks or blockage.</li> <li>• Are vacuum lines OK?</li> </ul>		Yes	GO to Diagnostics by Symptom in the Engine Supplement Section.
		No	SERVICE vacuum lines to MAP sensor. RERUN Quick Test.

## Manifold Absolute Pressure (MAP)/ Barometric Pressure (BP) Sensor

## Pinpoint Test

# DF

TEST STEP		RESULT	ACTION TO TAKE
<b>DF90</b>	<b>SERVICE CODE 22: CONTINUOUS TEST: EXERCISE MAP SENSOR</b>		
<ul style="list-style-type: none"> <li>Using continuous monitor mode, observe VOM or STAR LED for indication of a fault while performing the following:</li> <li>Connect a vacuum pump to the MAP sensor.</li> <li>Slowly apply 84 kPa (25 in. Hg.) vacuum to the sensor.</li> <li>Slowly bleed vacuum off the MAP sensor.</li> <li>Lightly tap on MAP sensor (simulate road shock).</li> <li>Wiggle MAP connector.</li> <li>Is fault indicated?</li> </ul> 		<p>Yes</p> <p>No</p>	<p>DISCONNECT and INSPECT connectors. If connector and terminals are good, REPLACE sensor. RERUN Quick Test.</p> <p>GO to <b>DF91</b>.</p>
<b>DF91</b>	<b>CHECK EEC-IV HARNESS</b>		
<ul style="list-style-type: none"> <li>Observe VOM or STAR LED for a fault indication while performing the following:</li> <li>Referring to the illustration in Step DF90, grasp the harness closest 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> <li>Is a fault indicated?</li> </ul>		<p>Yes</p> <p>No</p>	<p>ISOLATE fault and SERVICE as necessary. RERUN Quick Test.</p> <p>GO to <b>DF92</b>.</p>
<b>DF92</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.</li> <li>Inspect both connectors and connector terminals for obvious damage or faults.</li> <li>Are connectors and terminals OK?</li> </ul>		<p>No</p> <p>Yes</p>	<p>SERVICE as necessary. RERUN Quick Test.</p> <p>Unable to duplicate fault at this time. Continuous code 22 testing complete.</p>

**Knock Sensor****Pinpoint  
Test****DG****DG**

\* TEST PINS LOCATED ON BREAKOUT BOX.  
ALL HARNESS CONNECTORS VIEWED INTO MATING SURFACE.

**STOP-WARNING**

**You should enter this Pinpoint Test only when a service code 25 is received in Quick Test Step 5.0 or you are directed here from Diagnostics by Symptom in the Engine Supplement Section.**

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

- Fuel (quality).
- Basic engine.
- Spark timing.

This Pinpoint Test is intended to diagnose only the following:

- Knock sensor.
- Harness circuits: KS and Signal Return.
- Processor assembly.

# Knock Sensor

## Pinpoint Test

## DG

TEST STEP		RESULT	ACTION TO TAKE
<b>DG1</b>	<b>SERVICE CODE 25: GENERATE KNOCK MANUALLY</b>		
<p><b>NOTE: With knock conditions sensitive to fuel, altitude and weather, perform Step DG1 before servicing any components.</b></p> <ul style="list-style-type: none"> <li>• Vehicle prepared to run (Engine Running Self-Test).</li> <li>• Equipment needed: 4 oz. hammer.</li> <li>• Prepare to rap/tap on exhaust manifold, directly above the knock sensor, when the Dynamic Response Signal is given. <b>NOTE: There is no need to actually depress throttle at this point.</b></li> <li>• Perform Engine Running Self-Test.</li> <li>• Rap moderately on exhaust manifold when meter indicates Dynamic Response Test is ready.</li> <li>• 15 seconds later a code will be generated.</li> <li>• Check for code 25.</li> </ul> <p><b>NOTE: Ignore all other codes at this point.</b></p>		<p>No</p> <p>Yes</p> <p><b>NOTE: Service code 25 may be received whenever the engine is not tapped</b></p>	<p>Knock system OK. REPEAT Engine Running Self-Test and SERVICE any other codes from that test.</p> <p>GO to <b>DG2</b>.</p>
<b>DG2</b>	<b>TEST KNOCK CIRCUIT FOR VOLTAGE</b>		
<ul style="list-style-type: none"> <li>• Key Off, wait 10 seconds.</li> <li>• Disconnect knock sensor connector and inspect.</li> <li>• Set DVOM on 20V scale.</li> <li>• Key On, Engine Off.</li> <li>• Measure voltage at the vehicle harness connector between KS and signal return.</li> </ul>		<p>Voltage is between 1 and 4V</p> <p>Voltage is less than 1V</p> <p>Voltage is greater than 4V</p>	<p>GO to <b>DG6</b>.</p> <p>GO to <b>DG3</b>.</p> <p>GO to <b>DG5</b>.</p>
<b>DG3</b>	<b>CHECK CONTINUITY OF KS AND SIGNAL RETURN CIRCUITS</b>		
<ul style="list-style-type: none"> <li>• Key Off, wait 10 seconds.</li> <li>• Disconnect processor 60 Pin connector and inspect for damaged pins, corrosion, loose wires. Service as necessary.</li> <li>• Connect Breakout box to harness. Leave processor disconnected.</li> <li>• Knock sensor disconnected.</li> <li>• DVOM on 200 ohm scale.</li> <li>• Measure resistance between Signal Return at the vehicle harness and test Pin 46 at the Breakout box and between KS at the vehicle harness and test Pin 23 at the Breakout box.</li> </ul>		<p>Both resistances less than 5 ohms</p> <p>Either resistance 5 ohms or greater</p>	<p>GO to <b>DG4</b>.</p> <p>SERVICE open circuit. RERUN Quick Test.</p>

**Knock Sensor****Pinpoint  
Test****DG**

TEST STEP		RESULT	ACTION TO TAKE
<b>DG4</b>	CHECK KS CIRCUIT FOR SHORT TO GROUND		
<ul style="list-style-type: none"> <li>● Key Off, wait 10 seconds.</li> <li>● Breakout box installed.</li> <li>● Processor disconnected.</li> <li>● Knock sensor disconnected.</li> <li>● DVOM on 200,000 ohm scale.</li> <li>● Measure resistance between KS at the vehicle harness and test Pins 40, 46 and 60 at the Breakout box.</li> </ul>		All resistances 10,000 ohms or greater	GO to <b>DG6</b> .
		Any resistance less than 10,000 ohms	SERVICE harness short. RERUN Quick Test.
<b>DG5</b>	CHECK KS CIRCUIT FOR SHORT TO VOLTAGE		
<ul style="list-style-type: none"> <li>● Key Off, wait 10 seconds.</li> <li>● Disconnect processor 60 Pin connector and inspect for damaged pins, corrosion, loose wires. Service as necessary.</li> <li>● Connect Breakout box to harness. Leave processor disconnected.</li> <li>● Knock sensor disconnected.</li> <li>● Key On, Engine Off.</li> <li>● DVOM on 20V scale.</li> <li>● Measure voltage between test Pin 23 and test Pin 40 at the Breakout box.</li> </ul>		0.5V or greater	SERVICE harness short to power. RERUN Quick Test.
		Less than 0.5V	GO to <b>DG6</b> .
<b>DG6</b>	TEST PROCESSOR WITH SUBSTITUTE KNOCK SENSOR		
<ul style="list-style-type: none"> <li>● Key Off, wait 10 seconds.</li> <li>● Remove Breakout box and reconnect processor.</li> <li>● Equipment Required:               <ul style="list-style-type: none"> <li>— Equivalent knock sensor (same part number).</li> <li>— 4 oz. hammer.</li> </ul> </li> <li>● Plug substitute sensor in harness (do not install).</li> <li>● Perform Engine Running Self-Test.</li> <li>● Lightly tap knock sensor when Dynamic Test Ready Signal is given.</li> <li>● 15 seconds later, a code will be generated.</li> <li>● Check for code 25.</li> </ul> <p><b>NOTE: Ignore all other codes at this time.</b></p>		No	INSTALL new knock sensor. RERUN Quick Test.
		Yes	REPLACE processor and REMOVE substitute sensor. RERUN Quick Test with original sensor.