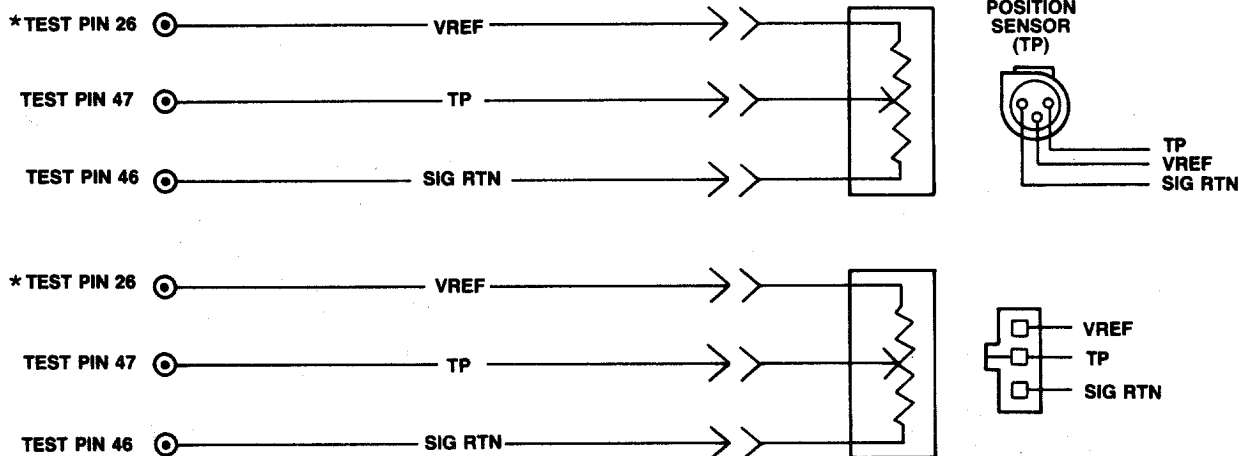


# Throttle Position Sensor (TPS)

# Pinpoint Test

# DH

**DH**


\* 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 23, 53, 63 or 73 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:

- 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.

# Throttle Position Sensor (TPS)

## Pinpoint Test

### DH

TEST STEP		RESULT	ACTION TO TAKE
<b>DH1</b>	<b>SERVICE CODE 23: THE FOLLOWING CHECK MUST BE MADE BEFORE SERVICING THIS CODE</b>		
	<ul style="list-style-type: none"> <li>Check for code 68; Key On, Engine Off or codes 58, 31 or 41 Engine Running.</li> </ul>	Code(s) present No codes present	DISREGARD Code 23 at this time and RETURN to Quick Test Step 3.0B for code 68 or Step 5.0B for codes 31, 41 or 58. PROCEED as directed. GO to <b>DH2</b> .
<b>DH2</b>	<b>CHECK FOR STUCK THROTTLE PLATE</b>		
	<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> </ul>	Throttle not stuck Throttle stuck	GO to <b>DH3</b> . CORRECT faults. RERUN Quick Test.
<b>DH3</b>	<b>GENERATE CODE 63</b>		
	<ul style="list-style-type: none"> <li>Refer to illustration 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>Perform Key On, Engine Off self-test and record codes.</li> </ul> <p><b>NOTE: Ignore all other codes at this time.</b></p>	Code 63 present Code 63 not present	GO to <b>DH4</b> . GO to <b>DH5</b> .
<b>DH4</b>	<b>CHECK VOLTAGE VREF TO SIGNAL RETURN</b>		
	<ul style="list-style-type: none"> <li>Refer to illustration DH.</li> <li>Key Off, wait 10 seconds.</li> <li>Disconnect TP vehicle harness connector at throttle body. Inspect for damaged pins, corrosion, and pins pushed out. Service as necessary.</li> <li>DVOM on 20V scale.</li> <li>Key On, Engine Off.</li> <li>Measure voltage at the TP vehicle harness connector between VREF and Signal Return.</li> </ul>	Voltage reading between 4V and 6V Voltage reading less than 4V or greater than 6V	REPLACE TP sensor. REFER to Section 3 before replacement for adjustment procedures for EFI applications. RERUN Quick Test. GO to Pinpoint Test Step <b>C1</b> .

# Throttle Position Sensor (TPS)

## Pinpoint Test

### DH

TEST STEP		RESULT	ACTION TO TAKE
<b>DH5</b>	<b>CHECK TP SIGNAL FOR SHORT TO POWER</b>		
<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 and inspect for damaged pins, corrosion, loose wires. 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> </ul>		Either resistance is less than 10,000 ohms Both resistances are 10,000 ohms or greater	SERVICE harness short. RERUN Quick Test. REPLACE processor. RERUN Quick Test.
<b>DH10</b>	<b>SERVICE CODE 63: GENERATE CODE 53</b>		
<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 DH13.</b></p> <ul style="list-style-type: none"> <li>● Check for Code 53 (Code 23)</li> </ul> <p><b>NOTE: Ignore all other codes at this time.</b></p>		Code 53 present (Code 23 present) Code 53 not present (Code 23 not present)	REPLACE TP sensor, REFER to Section 3 before replacement for adjustment procedures for EFI applications and RERUN Quick Test. GO to <b>DH11</b> .
<b>DH11</b>	<b>SERVICE CODE 63: CHECK VOLTAGE VREF TO SIGNAL RETURN</b>		
<ul style="list-style-type: none"> <li>● Refer to illustration DH.</li> <li>● Key Off, wait 10 seconds.</li> <li>● Disconnect TP vehicle harness connector at throttle body. Inspect for damaged pins, corrosion, and pins pushed out. Service as necessary.</li> <li>● DVOM on 20V scale.</li> <li>● Key On, Engine Off.</li> <li>● Measure voltage at the TP vehicle harness connector between VREF and Signal Return.</li> </ul>		Voltage reading between 4V and 6V Voltage reading less than 4V or greater than 6V	GO to <b>DH12</b> . GO to Pinpoint Test Step <b>C1</b>

# Throttle Position Sensor (TPS)

## Pinpoint Test

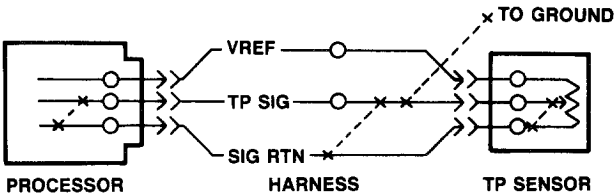
### DH

TEST STEP		RESULT	ACTION TO TAKE
<b>DH12</b>	CHECK CONTINUITY OF TP CIRCUIT		
<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 and inspect for damaged pins, corrosion, loose wires. 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> </ul>		Reading 5 ohms or greater	SERVICE faulty circuit. CONNECT throttle position sensor. REMOVE Breakout box and RERUN Quick Test.
		Readings less than 5 ohms	GO to <b>DH13</b> .
<b>DH13</b>	CHECK RESISTANCE OF TP CIRCUIT TO GROUND/SIGNAL RETURN		
<ul style="list-style-type: none"> <li>● Key Off, wait 10 seconds, TP harness disconnected.</li> <li>● Disconnect processor 60 Pin connector and inspect for damaged pins, corrosion, loose wires. 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> </ul>		Either reading is less than 10,000 ohms	SERVICE circuit short and RERUN Quick Test.
		Both readings are 10,000 ohms or greater	REPLACE processor. CONNECT throttle position sensor. REMOVE Breakout box and RERUN Quick Test.
<b>DH20</b>	SERVICE CODE 73: TP SENSOR MOVES IN ENGINE RESPONSE TEST		
<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 20V scale.</li> <li>● Connect DVOM to test Pins 47 and 46 at the Breakout box.</li> <li>● Perform Engine Running Quick Test, Step 5.0.</li> <li>● Verify DVOM reading exceeds 3.5V during brief WOT at Engine Response Check.</li> </ul>		Reading exceeds 3.5V during Engine Response Check	REPLACE processor. RERUN Quick Test.
		Reading does not exceed 3.5V during Engine Response Check	VERIFY TP Sensor is properly attached to throttle body. If OK, REPLACE TP Sensor. Refer to Section 3 before replacement for adjustment procedures for EFI applications. RERUN Quick Test.

# Throttle Position Sensor (TPS)

## Pinpoint Test

DH

TEST STEP	RESULT	ACTION TO TAKE
<p><b>DH90</b> CONTINUOUS TEST SERVICE CODE 53: EXERCISE TP 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>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> <li>Is a fault indicated?</li> </ul> 	<p>Yes</p> <p>No</p>	<p>GO to <b>DH91</b>.</p> <p>GO to <b>DH92</b>.</p>
<p><b>DH91</b> MEASURE THROTTLE POSITION SIGNAL VOLTAGE WHILE EXERCISING TP 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 47 to test Pin 46.</li> <li>DVOM on 20V scale.</li> <li>Key On, engine Off.</li> <li>While observing DVOM, repeat Step DH90.</li> <li>Does the fault occur below 4.25V?</li> </ul>	<p>Yes</p> <p>No</p>	<p>DISCONNECT and INSPECT connectors. If connector and terminals are good, REPLACE TP sensor, REFER to Shop Manual Group 24 and RERUN Quick Test.</p> <p>Throttle position sensor overtravel may have caused the continuous code 53. Sensor service is not required. To verify harness integrity, GO to <b>DH92</b>.</p>

<h1>Throttle Position Sensor (TPS)</h1>	<h1>Pinpoint Test</h1>	<h1>DH</h1>
---	------------------------	-------------

TEST STEP	RESULT	ACTION TO TAKE
<p><b>DH92</b> CHECK EEC-IV HARNESS</p> <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 DH90, 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> <li>● Is a fault indicated?</li> </ul>	<p>Yes</p> <p>No</p>	<p>ISOLATE fault and make necessary repairs. REFER to appropriate figure. RERUN Quick Test.</p> <p>GO to <b>DH93</b>.</p>
<p><b>DH93</b> CHECK PROCESSOR AND HARNESS CONNECTORS</p> <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. REPEAT Quick Test.</p> <p>Unable to duplicate fault at this time. Continuous code 53 testing complete.</p>
<p><b>DH94</b> CONTINUOUS TEST SERVICE CODE 63: EXERCISE TP 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>● 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> <li>● Is a fault indicated?</li> </ul> <div style="text-align: center; margin-top: 10px;"> <p>The diagram shows a Processor on the left with three terminals: VREF, TP SIG, and SIG RTN. A Harness connects these to a TP Sensor on the right. The TP Sensor has a terminal connected to ground. Arrows indicate the flow of electrical connections between the components.</p> </div>	<p>Yes</p> <p>No</p>	<p>DISCONNECT and INSPECT connectors. If connector and terminals are good, REPLACE TP sensor, REFER to Shop Manual Group 24 and RERUN Quick Test.</p> <p>GO to <b>DH95</b>.</p>

# Throttle Position Sensor (TPS)

# Pinpoint Test

# DH

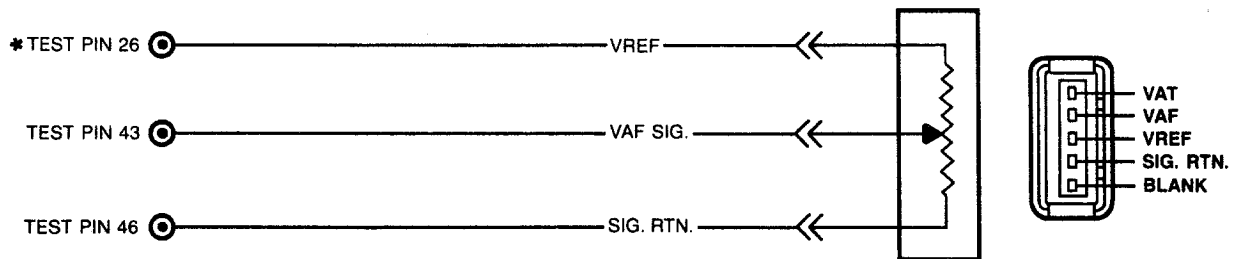
TEST STEP		RESULT	ACTION TO TAKE
<b>DH95</b>	<b>CHECK EEC-IV HARNESS</b>		
<ul style="list-style-type: none"> <li>● Observe VOM or STAR LED for a fault indication while performing the following:</li> <li>● Referring to the illustration in Step DH94 grasp the harness close to the sensor connector. Wiggle, 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> <li>● Is a fault indicated?</li> </ul>		Yes	ISOLATE fault and make necessary repairs. REFER to appropriate figure. RERUN Quick Test.
		No	Go to <b>DH96</b> .
<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.</li> <li>● Inspect both connectors and connector terminals for obvious damage or faults.</li> <li>● Are connectors and terminals OK?</li> </ul>		No	SERVICE as necessary. RERUN Quick Test.
		Yes	Unable to duplicate fault at this time. Continuous code 63 testing complete.

# Vane Air Flow Sensor (VAF)

## Pinpoint Test

### DK

DK



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

## STOP-WARNING

You should enter this Pinpoint Test only when a service code 26, 56, 66 or 76 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:

- Check for unmetered air (air leaks) between VAF meter and throttle body.
- Vacuum leaks.
- Engine sealing (PCV sealing, CANP, valve cover seal dipstick seated).

This Pinpoint Test is intended to diagnose only the following:

- VAF meter.
- Processor.
- Harness circuits: VREF, VAF Sig. and Signal Return.

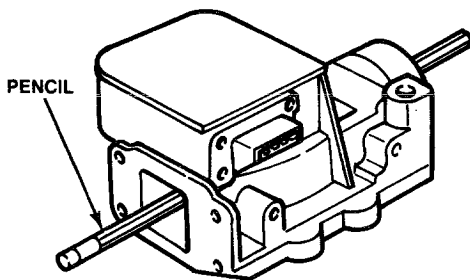


# Vane Air Flow Sensor (VAF)

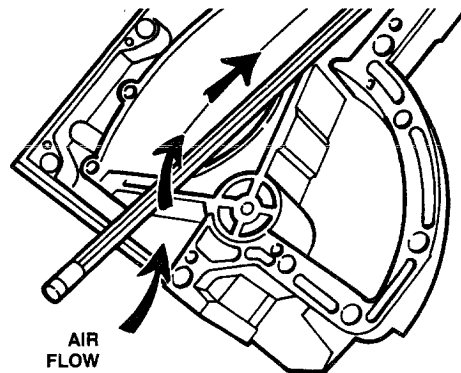
# Pinpoint Test

DK

TEST STEP	RESULT	ACTION TO TAKE
<b>FAULT CODE 26</b>		
<b>DK1</b> CHECK FOR CONTAMINATION		
<p><b>NOTE:</b> Code 26 (Key On, Engine Off, or Engine Running) indicates the vane air flow input to the processor is out of closed (Engine Not Running) or at idle limits (Engine Off 0.15-0.50V; Engine at idle 1.50-2.70V). There have been no opens or shorts in the VAF circuit or a code 56 (signal always high) or 66 (signal always low) would have been generated.</p>		
<ul style="list-style-type: none"> <li>● Key Off, wait 10 seconds.</li> <li>● Remove air cleaner element and check for contamination (oil residue, foreign material, etc.) that may impede VAF sensor vane movement.</li> <li>● Is service code 26 present in Key On, Engine Off portion of Quick Test?</li> </ul>	<p>Yes</p> <p>No</p>	<p>REINSTALL air cleaner element. REPLACE vane meter. RERUN Quick Test.</p> <p>GO to <b>DK2</b>.</p>
<b>DK2</b> VAF SENSOR CHECK		
<ul style="list-style-type: none"> <li>● Key Off, air cleaner element reinstalled.</li> <li>● Check for unmetered air leaks between vane meter and throttle body.</li> <li>● Disconnect processor 60 Pin connector. Inspect for damaged pins, corrosion, loose wires, etc. Service as necessary.</li> <li>● Install Breakout box. Connect processor to Breakout box harness.</li> <li>● DVOM on 20V scale.</li> <li>● Key On, engine Off.</li> <li>● Place new unsharpened pencil as shown below.</li> <li>● Measure voltage between test Pins 43 and 46 at the Breakout box.</li> <li>● Does DVOM read between 2.8V and 3.7V?</li> </ul>	<p>Yes</p> <p>No</p>	<p>Vane meter is capable of outputting an acceptable signal. The VAF code 26 has been caused by incorrect engine speed or an unmetered air leak (vacuum leak). SERVICE as necessary. REMOVE Breakout box. RERUN Quick Test.</p> <p>REMOVE Breakout box. REPLACE processor. RERUN Quick Test.</p>



VANE METER



VAF SENSOR AIR VANE

# Vane Air Flow Sensor (VAF)

# Pinpoint Test

**DK**

TEST STEP	RESULT	ACTION TO TAKE
<b>FAULT CODE 56</b>		
<b>DK10</b>   INDUCE OPPOSITE CODE		
<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 66 present?</li> </ul> <p><b>NOTE: Disconnecting vane meter disconnects both VAF and VAT sensors. A code 54 should also be present. Disregard all codes except VAF codes at this time.</b></p>	<p>Yes</p> <p>No</p>	<p>GO to <b>DK11</b>.</p> <p>GO to <b>DK12</b>.</p>
<b>DK11</b>   CHECK VAF TO SIGNAL RETURN VOLTAGE		
<ul style="list-style-type: none"> <li>● Key Off, wait 10 seconds.</li> <li>● Harness disconnected from vane meter.</li> <li>● Key On, Engine Off.</li> <li>● DVOM on 20V scale.</li> <li>● Measure voltage at the vane meter vehicle harness connector between VREF and Signal Return.</li> </ul>	<p>Reading is between 4.0V and 6.0V</p> <p>Reading is less than 4.0V or greater than 6.0V</p>	<p>REPLACE vane meter. RECONNECT harness. RERUN Quick Test.</p> <p>GO to Pinpoint Test Step <b>C1</b>.</p>
<b>DK12</b>   CHECK VAF SIGNAL FOR SHORT		
<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, leave processor disconnected.</li> <li>● DVOM on 200,000 ohm scale.</li> <li>● Measure resistance between test Pin 43 and test Pins 26 and 57 at the Breakout box.</li> </ul>	<p>Either reading is less than 10,000 ohms</p> <p>Both readings are 10,000 ohms or greater</p>	<p>SERVICE circuit shorts. REMOVE Breakout box. RECONNECT processor and vane meter. RERUN Quick Test.</p> <p>REPLACE processor. REMOVE Breakout box. RECONNECT processor and vane meter. RERUN Quick Test.</p>

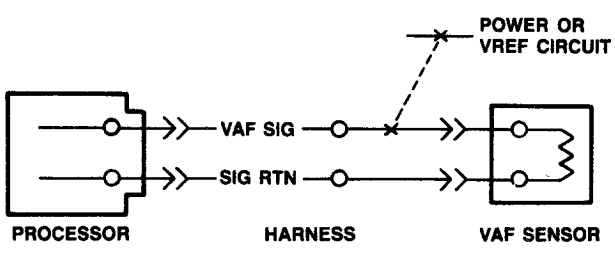
<b>Vane Air Flow Sensor (VAF)</b>	<b>Pinpoint Test</b>	<b>DK</b>
-----------------------------------	----------------------	-----------

TEST STEP	RESULT	ACTION TO TAKE
<b>FAULT CODE 66</b>		
<b>DK20</b>   INDUCE OPPOSITE CODE		
<ul style="list-style-type: none"> <li>● Key Off, wait 10 seconds.</li> <li>● Disconnect vehicle harness from vane meter.</li> <li>● Install jumper wire in vane meter vehicle harness connector between VREF and VAF signal.</li> <li>● Perform Key On, Engine Off Quick Test.</li> </ul> <p><b>NOTE: If no codes are generated, immediately remove jumper and go directly to DK23.</b></p> <ul style="list-style-type: none"> <li>● Is code 56 present?</li> </ul> <p><b>NOTE: Disconnecting vane meter disconnects both VAF and VAT sensors. Code 54 should also be present. Disregard all codes except VAF codes at this time.</b></p>	<p>Yes</p> <p style="text-align: center;">▶</p> <p>No</p> <p style="text-align: center;">▶</p>	<p>REPLACE vane meter. REMOVE jumper wire. RECONNECT vane meter. RERUN Quick Test.</p> <p>REMOVE jumper wire and GO to <b>DK21</b>.</p>
<b>DK21</b>   CHECK VREF TO SIGNAL RETURN VOLTAGE		
<ul style="list-style-type: none"> <li>● Key off, wait 10 seconds.</li> <li>● Harness disconnected from vane meter.</li> <li>● Key On, Engine Off.</li> <li>● DVOM on 20V scale.</li> <li>● Measure voltage at the vane meter vehicle harness connector between VREF and Signal Return.</li> </ul>	<p>Reading is between 4.0 and 6.0V</p> <p style="text-align: center;">▶</p> <p>Reading is less than 4.0V or greater than 6.0V</p> <p style="text-align: center;">▶</p>	<p>GO to <b>DK22</b>.</p> <p>GO to Pinpoint Test Step <b>C1</b>.</p>
<b>DK22</b>   CHECK CONTINUITY OF VAF SIGNAL		
<ul style="list-style-type: none"> <li>● Key Off, 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; leave processor disconnected.</li> <li>● DVOM on 200 ohm scale.</li> <li>● Measure resistance between VAF signal, at the vane meter vehicle harness connector, and test Pin 43 at the Breakout box.</li> </ul>	<p>Reading is less than 5 ohms</p> <p style="text-align: center;">▶</p> <p>Reading is 5 ohms or greater</p> <p style="text-align: center;">▶</p>	<p>GO to <b>DK23</b>.</p> <p>SERVICE circuit open. REMOVE Breakout box. RECONNECT processor and vane meter. RERUN Quick Test.</p>

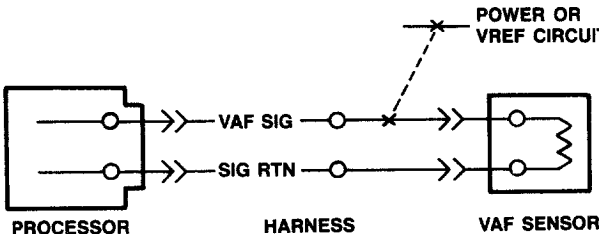
<h1>Vane Air Flow Sensor (VAF)</h1>	<h2>Pinpoint Test</h2>	<h1>DK</h1>
-------------------------------------	------------------------	-------------

TEST STEP	RESULT	ACTION TO TAKE
<p><b>DK23</b> CHECK VAF SIGNAL FOR SHORT</p> <ul style="list-style-type: none"> <li>● Key Off, wait 10 seconds.</li> <li>● Processor disconnected.</li> <li>● Harness disconnected from vane meter.</li> <li>● DVOM on 200,000 ohm scale.</li> <li>● Measure resistance at the vane meter vehicle harness between VAF signal and signal return and between VAF signal and negative battery terminal.</li> </ul>	<p>Either reading is less than 10,000 ohms</p> <p>Both readings are 10,000 ohms or greater</p>	<p>SERVICE circuit shorts. RECONNECT vane meter. RERUN Quick Test.</p> <p>REPLACE processor. REMOVE Breakout box. RECONNECT processor and vane meter. RERUN Quick Test.</p>
<p><b>FAULT CODE 76</b></p> <p><b>DK30</b> CHECK FOR VOLTAGE INCREASE IN VAF SIGNAL TO SIGNAL RETURN</p> <p><b>NOTE: A sharp snap of the throttle may not be sufficient to pass this test. Be sure to move throttle to WOT and return.</b></p> <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. Connect processor to Breakout box harness.</li> <li>● DVOM on 20V scale.</li> <li>● Connect DVOM to test Pins 43 and 46.</li> <li>● Perform Engine Running Quick Test while monitoring DVOM.</li> <li>● After dynamic response prompt code 1(0) operator does a brief WOT. DVOM should increase more than 2.0V from reading before WOT.</li> <li>● Observe service codes at end of test.</li> </ul>	<p>Reading increased more than 2.0V and code 76 is still present</p> <p>Reading did not increase more than 2.0V</p> <p>Reading increased more than 2.0V and code 76 is not present</p>	<p>REPLACE processor. REMOVE Breakout box. RERUN Quick Test.</p> <p>CHECK air cleaner duct for obstruction. If OK, REPLACE vane meter.</p> <p>Vane meter is OK, SERVICE other codes as necessary.</p>

<h1>Vane Air Flow Sensor (VAF)</h1>	<h1>Pinpoint Test</h1>	<h1>DK</h1>
-------------------------------------	------------------------	-------------

TEST STEP	RESULT	ACTION TO TAKE
<b>DK90</b> SERVICE CODE 56 CONTINUOUS TEST: CHECK VAF 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 VAF sensor (simulate road shock).</li> <li>● Wiggle VAF connector.</li> <li>● Is a fault indicated?</li> </ul>	Yes	DISCONNECT and INSPECT connectors. If connector and terminals are good, REPLACE VAF sensor. RERUN Quick Test.
 <p style="font-size: small; margin-top: 5px;">                         The diagram shows a Processor on the left with two terminals. The top terminal is labeled 'VAF SIG' and the bottom 'SIG RTN'. These connect to a Harness in the middle. From the Harness, the 'VAF SIG' line goes to a terminal on the VAF Sensor. The 'SIG RTN' line goes to another terminal on the VAF Sensor. A dashed line labeled 'POWER OR VREF CIRCUIT' connects to the top terminal of the VAF Sensor.                     </p>	No	GO to <b>DK91</b> .
<b>DK91</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 DK90, 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> <li>● Is a fault indicated?</li> </ul>	Yes	ISOLATE fault and make necessary repairs. REFER to appropriate figure. RERUN Quick Test.
	No	GO to <b>DK92</b> .
<b>DK92</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>● Are connectors and terminals OK?</li> </ul>	No	SERVICE as necessary. RERUN Quick Test.
	Yes	Unable to duplicate fault at this time. Continuous code 56 testing complete.

<h2 style="margin: 0;">Vane Air Flow Sensor (VAF)</h2>	<h2 style="margin: 0;">Pinpoint Test</h2>	<h2 style="margin: 0;">DK</h2>
--	---	--------------------------------

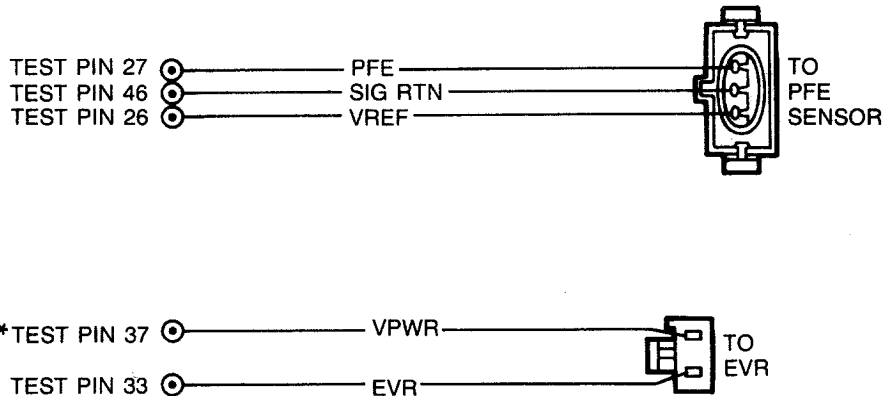
TEST STEP	RESULT	ACTION TO TAKE
<p><b>DK93</b> SERVICE CODE 66 CONTINUOUS TEST: CHECK VAF SENSOR</p> <ul style="list-style-type: none"> <li>● Using continuous monitor mode, observe VOM or STAR LED for indication of a fault while performing the following:</li> <li>● Lightly tap on VAF sensor (simulate road shock).</li> <li>● Wiggle VAF 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 sensor. RERUN Quick Test.</p> <p>GO to <b>DK94</b>.</p>
<p><b>DK94</b> CHECK EEC-IV HARNESS</p> <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 DK93 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> <li>● Is a fault indicated?</li> </ul>	<p>Yes</p> <p>No</p>	<p>ISOLATE fault and make necessary repairs. REFER to appropriate figure. RERUN Quick Test.</p> <p>Go to <b>DK95</b>.</p>
<p><b>DK95</b> CHECK PROCESSOR AND HARNESS CONNECTORS</p> <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 66 testing complete.</p>

## Pressure Feedback EGR (PFE) EGR Valve Regulator (EVR)

## Pinpoint Test

# DL

DL



\* 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 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:

- PFE sensor.
- Harness circuits: VREF, PFE, Signal Return, EVR, VPWR.
- EVR (EGR valve regulator).
- EGR valve assembly.
- Processor assembly.

**Pressure Feedback EGR (PFE)  
EGR Valve Regulator (EVR)**

**Pinpoint  
Test**

**DL**

TEST STEP		RESULT	ACTION TO TAKE
<b>SERVICE CODE 31</b>			
<b>DL1</b>	<b>ATTEMPT TO GENERATE OPPOSITE CODE (35)</b>		
<ul style="list-style-type: none"> <li>● Key Off.</li> <li>● Disconnect PFE vehicle harness at sensor.</li> <li>● Jumper VREF to PFE signal at vehicle harness sensor 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 Step DL4.</b></p> <ul style="list-style-type: none"> <li>● Check for code 35.</li> </ul> <p><b>NOTE: Ignore all other codes at this time.</b></p>		<p>Code 35 present</p> <p>Code 35 not present</p>	<p>REMOVE Jumper. REPLACE PFE sensor. RERUN Quick Test.</p> <p>REMOVE jumper. GO to <b>DL2</b>.</p>
<b>DL2</b>	<b>MEASURE VREF TO SIGNAL RETURN VOLTAGE</b>		
<ul style="list-style-type: none"> <li>● Key Off.</li> <li>● PFE harness disconnected.</li> <li>● DVOM on 20V scale.</li> <li>● Key On, Engine Off.</li> <li>● Measure voltage at PFE vehicle harness connector between VREF and Signal Return.</li> <li>● Refer to illustration DL.</li> </ul>		<p>Voltage reading between 4V and 6V</p> <p>Voltage reading less than 4V or greater than 6V</p>	<p>GO to <b>DL3</b>.</p> <p>GO to <b>C1</b>.</p>
<b>DL3</b>	<b>CHECK CONTINUITY OF PFE SIGNAL</b>		
<ul style="list-style-type: none"> <li>● Key Off.</li> <li>● PFE harness disconnected.</li> <li>● DVOM on 200 ohm scale.</li> <li>● Disconnect processor 60 Pin connector and inspect for damaged pins, corrosion, loose wires, etc. Service as necessary.</li> <li>● Connect Breakout box to harness. Processor connected to Breakout box.</li> <li>● Measure resistance between PFE signal at vehicle harness sensor connector and test Pin 27 at the Breakout box.</li> </ul>		<p>Reading 5 ohms or greater</p> <p>Reading less than 5 ohms</p>	<p>SERVICE faulty circuit. CONNECT PFE sensor. REMOVE Breakout box. RERUN Quick Test.</p> <p>Go To <b>DL4</b>.</p>



**Pressure Feedback EGR (PFE)  
EGR Valve Regulator (EVR)**

**Pinpoint  
Test**

**DL**

TEST STEP		RESULT	ACTION TO TAKE
<b>DL4</b>	CHECK RESISTANCE OF PFE SIGNAL TO GROUND AND SIGNAL RETURN		
	<ul style="list-style-type: none"> <li>● Key Off.</li> <li>● PFE harness disconnected.</li> <li>● Breakout box installed.</li> <li>● Processor disconnected.</li> <li>● DVOM on 200,000 ohm scale.</li> <li>● Measure resistance between PFE signal at PFE vehicle harness connector and ground.</li> <li>● Measure resistance between PFE signal at the PFE vehicle harness connector and test Pin 46 (Signal Return) at the Breakout box.</li> </ul>	<p>Either reading is less than 10,000 ohms</p> <p>Both readings are 10,000 ohms or greater.</p>	<p>SERVICE short circuit. CONNECT PFE. REMOVE Breakout box. RERUN Quick Test.</p> <p>REPLACE processor. CONNECT PFE sensor. REMOVE Breakout box. RERUN Quick Test.</p>
<b>SERVICE CODE 35</b>			
<b>DL5</b>	ATTEMPT TO GENERATE OPPOSITE CODE (31)		
	<ul style="list-style-type: none"> <li>● Key Off.</li> <li>● Disconnect PFE vehicle harness at sensor. Inspect for damaged pins, corrosion, loose wires, etc. Service as necessary.</li> <li>● Perform Key On, Engine Off Self-Test, and record codes.</li> <li>● Check for code 31.</li> </ul> <p><b>NOTE: Ignore all other codes at this time.</b></p>	<p>Code 31 present</p> <p>Code 31 not present</p>	<p>GO to <b>DL6</b>.</p> <p>GO to <b>DL7</b>.</p>
<b>DL6</b>	MEASURE VREF TO SIGNAL RETURN VOLTAGE		
	<ul style="list-style-type: none"> <li>● Key Off.</li> <li>● PFE harness disconnected.</li> <li>● DVOM on 20V scale.</li> <li>● Key On, Engine Off.</li> <li>● Measure voltage at PFE vehicle harness connector between VREF and Signal Return.</li> <li>● Refer to illustration DL.</li> </ul>	<p>Voltage reading between 4V and 6V</p> <p>Voltage reading less than 4V or greater than 6V</p>	<p>REPLACE PFE sensor. RERUN Quick Test.</p> <p>GO to <b>C1</b>.</p>

<b>Pressure Feedback EGR (PFE) EGR Valve Regulator (EVR)</b>	<b>Pinpoint Test</b>	<b>DL</b>
--	--------------------------	-----------

TEST STEP	RESULT	ACTION TO TAKE		
<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 10%; text-align: center;"><b>DL7</b></td> <td><b>CHECK PFE CIRCUIT FOR SHORT TO POWER</b></td> </tr> </table> <ul style="list-style-type: none"> <li>● Key Off.</li> <li>● PFE harness disconnected.</li> <li>● Disconnect processor 60 Pin connector and 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 the resistance between test Pin 27 and test Pins 26 and 57 at the Breakout box.</li> </ul>	<b>DL7</b>	<b>CHECK PFE CIRCUIT FOR SHORT TO POWER</b>	<p>Either resistance is less than 10,000 ohms</p> <p>Both resistances are 10,000 ohms or greater</p>	<p>SERVICE harness short. REMOVE Breakout box. CONNECT PFE sensor. RERUN Quick Test.</p> <p>REPLACE processor. REMOVE Breakout box. CONNECT PFE sensor. RERUN Quick Test.</p>
<b>DL7</b>	<b>CHECK PFE CIRCUIT FOR SHORT TO POWER</b>			
<b>SERVICE CODE: 34</b>				
<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 10%; text-align: center;"><b>DL8</b></td> <td><b>PFE SENSOR OUT OF RANGE</b></td> </tr> </table> <ul style="list-style-type: none"> <li>● PFE system can sense a lack of pressure in the vehicle exhaust system. An efficient garage exhaust ventilation system, installed during Key On, Engine Off Quick Test, may deflect the PFE sensor and generate a code 34. Remove the ventilation system and retest.</li> <li>● Is code 34 present?</li> </ul>	<b>DL8</b>	<b>PFE SENSOR OUT OF RANGE</b>	<p>No</p> <p>Yes</p>	<p>ADDRESS any other codes in Key On, Engine Off, if none CONTINUE with remaining Quick Test.</p> <p>GO to <b>DL9</b>.</p>
<b>DL8</b>	<b>PFE SENSOR OUT OF RANGE</b>			
<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 10%; text-align: center;"><b>DL9</b></td> <td><b>CHECK PRESSURE FEED TUBE TO PFE SENSOR</b></td> </tr> </table> <ul style="list-style-type: none"> <li>● Remove the pressure feed tube from PFE sensor.</li> <li>● Inspect complete tube, including PFE inlet for blockage.</li> <li>● Is blockage present?</li> </ul>	<b>DL9</b>	<b>CHECK PRESSURE FEED TUBE TO PFE SENSOR</b>	<p>No</p> <p>Yes</p>	<p>GO to <b>DL10</b>.</p> <p>SERVICE as necessary. RERUN Quick Test.</p>
<b>DL9</b>	<b>CHECK PRESSURE FEED TUBE TO PFE SENSOR</b>			

## Pressure Feedback EGR (PFE) EGR Valve Regulator (EVR)

## Pinpoint Test

# DL

TEST STEP		RESULT	ACTION TO TAKE
<b>DL10</b>	MEASURE VREF TO SIGNAL RETURN VOLTAGE		
<ul style="list-style-type: none"> <li>● Key Off.</li> <li>● Disconnect PFE sensor and inspect for damaged pins, corrosion, loose wires, etc. Service as necessary.</li> <li>● DVOM on 20V scale.</li> <li>● Key On, Engine Off.</li> <li>● Measure voltage at PFE vehicle harness connector between VREF and Signal Return.</li> <li>● Refer to Illustration DL.</li> </ul>		Voltage reading between 4V and 6V	REPLACE PFE sensor. RERUN Quick Test.
		Voltage reading less than 4V or greater than 6V	GO to Pinpoint Test <b>C1</b> .
<b>SERVICE CODE 84</b>			
<b>DL11</b>	MEASURE EVR SOLENOID RESISTANCE		
<ul style="list-style-type: none"> <li>● Key Off.</li> <li>● DVOM on 200 ohm scale.</li> <li>● Disconnect EVR solenoid connector and measure solenoid resistance.</li> </ul>		Resistance is between 30 and 70 ohms	GO to <b>DL12</b> .
		Resistance is less than 30 ohms or greater than 70 ohms	REPLACE EVR solenoid assembly. RERUN Quick Test.
<b>DL12</b>	CHECK FOR VPWR AT EVR SOLENOID		
<ul style="list-style-type: none"> <li>● EVR solenoid disconnected from harness.</li> <li>● DVOM on 20V scale.</li> <li>● Key On, Engine Off.</li> <li>● Measure voltage between battery negative terminal and VPWR circuit at EVR solenoid vehicle harness connector.</li> </ul>		Reading is less than 10.5V	SERVICE VPWR open circuit. RERUN Quick Test.
		Reading is 10.5V or greater	GO to <b>DL13</b> .
<b>DL13</b>	CHECK CONTINUITY OF EVR CIRCUIT		
<ul style="list-style-type: none"> <li>● Key Off.</li> <li>● EVR solenoid disconnected from harness.</li> <li>● Disconnect processor 60 Pin connector and inspect for damaged pins, corrosion, loose wires, etc. 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 EVR signal at the EVR solenoid vehicle harness connector.</li> </ul>		Reading less than 5 ohms	GO to <b>DL14</b> .
		Reading 5 ohms or greater	SERVICE open circuit. REMOVE Breakout box. CONNECT process EVR solenoid. RERUN Quick Test.

<b>Pressure Feedback EGR (PFE) EGR Valve Regulator (EVR)</b>	<b>Pinpoint Test</b>	<b>DL</b>
--	--------------------------	-----------

TEST STEP	RESULT	ACTION TO TAKE
<b>DL14</b>   CHECK EVR CIRCUIT FOR SHORT TO POWER AND GROUND		
<ul style="list-style-type: none"> <li>● Key Off.</li> <li>● Breakout box installed, processor disconnected.</li> <li>● EVR solenoid disconnected.</li> <li>● DVOM on 200,000 ohm scale.</li> <li>● Measure resistance between test Pin 33 (EVR) and test Pins 37 and 57 (VPWR) and 40, 46 and 60 (GRD) at the Breakout box.</li> </ul>	Any reading less than 10,000 ohms	SERVICE short circuit. REMOVE Breakout box. RECONNECT harness to processor and EVR solenoid. RERUN Quick Test. If code is repeated, REPLACE processor.
	All reading 10,000 ohms or greater	REPLACE processor. REMOVE Breakout box. RECONNECT harness to processor and EVR solenoid. RERUN Quick Test.
<b>SERVICE CODE 32</b>		
<b>DL20</b>   VERIFY ENGINE RUNNING CODES		
The PFE system can sense a lack of pressure in the vehicle exhaust system. An efficient garage exhaust ventilation system installed during Key On, Engine Run Quick Test may, on some calibrations, deflect the PFE sensor and generate a code 32. Temporarily, remove garage forced ventilation system and properly vent to atmosphere.	Yes	GO to <b>DL21</b> .
<ul style="list-style-type: none"> <li>● RERUN Engine Running Quick Test.</li> <li>● Is code 32 present?</li> </ul>	No	ADDRESS any other codes in Engine Running. If none, CONTINUE with remaining Quick Test.

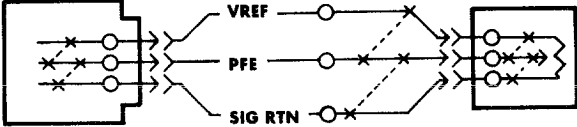
## Pressure Feedback EGR (PFE) EGR Valve Regulator (EVR)

## Pinpoint Test

## DL

TEST STEP		RESULT	ACTION TO TAKE
<b>DL21</b>	<b>ATTEMPT TO SEPARATE EVR FROM PFE</b>		
<ul style="list-style-type: none"> <li>● Key Off.</li> <li>● Disconnect EGR valve vacuum line at valve and plug line.</li> <li>● Perform Engine Running Quick Test.</li> <li>● Is code 31 or 32 present?</li> </ul>		Yes	GO to <b>DL22</b> .
		No	GO to <b>DL23</b> .
<b>DL22</b>	<b>CHECK PFE SENSOR SUPPLY TUBE</b>		
<ul style="list-style-type: none"> <li>● Key Off.</li> <li>● Check PFE sensor supply tube for obstructions and/or leaks.</li> <li>● Are there any obstructions or leaks?</li> </ul>		Yes	SERVICE as necessary. RECONNECT all lines and RERUN Quick Test.
		No	GO to EGR Diagnostic, Section 6.
<b>DL23</b>	<b>CHECK EVR FILTER</b>		
<ul style="list-style-type: none"> <li>● Key Off.</li> <li>● Remove and inspect EVR filter for contamination.</li> </ul> <p><b>NOTE: Blockage of filter will cause vacuum to be applied to EGR valve prematurely.</b></p> <ul style="list-style-type: none"> <li>● Is filter contaminated?</li> </ul>		Yes	REPLACE filter. RECONNECT all lines. RERUN Quick Test.
		No	REPLACE EVR solenoid. RERUN Quick Test.
<b>ENGINE RUNNING SERVICE CODE 34 AND 35</b>			
<b>DL25</b>	<b>CHECK FOR EXCESSIVE EXHAUST BACK PRESSURE</b>		
<ul style="list-style-type: none"> <li>● Service codes 34 and 35 in Engine Running Self-Test indicate excessive exhaust back pressure; There are two possible causes: (A). The exhaust system is restricted, and (B). PFE sensor has shifted high.</li> <li>● Key Off.</li> <li>● Substitute known good PFE sensor in place of original.</li> <li>● Rerun Key On, Engine Running Quick Test.</li> <li>● Is code 34 or 35 present?</li> </ul>		No	Original PFE was the cause of the original 34 or 35. REPLACE PFE sensor. RERUN Quick Test.
		Yes	GO to Section 5, Catalyst and Exhaust Systems Restricted Exhaust System Diagnosis.

<h2 style="margin: 0;">Pressure Feedback EGR (PFE) EGR Valve Regulator (EVR)</h2>	<h2 style="margin: 0;">Pinpoint Test</h2>	<h1 style="margin: 0;">DL</h1>
---	---	--------------------------------

TEST STEP	RESULT	ACTION TO TAKE
<p><b>SERVICE CODE 33</b></p>		
<p><b>DL30</b>   VERIFY VACUUM IS PRESENT AT VALVE</p> <ul style="list-style-type: none"> <li>● Key Off.</li> <li>● Standard vacuum gauge in. Hg (Mercury).</li> <li>● Tee in vacuum gauge at EGR valve.</li> <li>● Perform Engine Running Quick Test while observing vacuum gauge.</li> </ul> <p><b>NOTE: Disregard code output.</b></p>	<p>Vacuum reading 1 in. Hg or less</p> <p>Vacuum reading greater than 1 in. Hg</p>	<p>GO to <b>DL31</b>.</p> <p>GO to EGR Valve Diagnostic Section 6.</p>
<p><b>DL31</b>   VACUUM SUPPLY VERIFICATION</p>		
<ul style="list-style-type: none"> <li>● Key Off.</li> <li>● Check vacuum line from EVR solenoid to EGR valve and source to EVR solenoid for loose or disengaged connections, cracks, etc.</li> <li>● Is vacuum present at EVR solenoid during run?</li> </ul>	<p>Yes</p> <p>No</p>	<p>REPLACE EVR solenoid. RERUN Quick Test.</p> <p>SERVICE as necessary. RERUN Quick Test.</p>
<p><b>DL90</b>   SERVICE CODE 31 OR 35 CONTINUOUS TEST: EXERCISE PFE 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 PFE sensor.</li> <li>● Slowly apply 5 in. Hg vacuum to the sensor.</li> <li>● Slowly bleed vacuum off the PFE sensor.</li> <li>● Lightly tap on PFE sensor (simulate road shock).</li> <li>● Wiggle PFE 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>DL91</b>.</p>
		

**Pressure Feedback EGR (PFE)  
EGR Valve Regulator (EVR)**

**Pinpoint  
Test**

**DL**

TEST STEP		RESULT	ACTION TO TAKE
<b>DL91</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 DL90 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>DL92</b>.</p>
<b>DL92</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 and/or identify fault at this time. Continuous code 31 or 35 testing complete.</p>
<b>DL93</b>	<b>SERVICE CODE 34: CONTINUOUS TEST — INSPECT PFE SUPPLY TUBE FOR BLOCKAGE</b>		
<ul style="list-style-type: none"> <li>● Key Off.</li> <li>● Remove PFE sensor and inspect sensor supply inlet for liquids and/or any type of blockage.</li> <li>● Inspect PFE supply tube to EGR valve base for liquids and/or blockage.</li> <li>● Is supply tube free of any blockage?</li> </ul>		<p>No</p> <p>Yes</p>	<p>CLEAN and/or SERVICE as necessary. RERUN Quick Test.</p> <p>Unable to duplicate and/or identify fault at this time. Continuous code 34 testing complete.</p>

## Pressure Feedback EGR (PFE) EGR Valve Regulator (EVR)

## Pinpoint Test

# DL

TEST STEP		RESULT	ACTION TO TAKE
<b>DL94</b>	<b>SERVICE CODE 32: CONTINUOUS TEST — INSPECT EGR VALVE FOR SMOOTH OPERATION.</b>		
	<ul style="list-style-type: none"> <li>● Key Off.</li> <li>● Connect a vacuum pump to the EGR valve.</li> <li>● Apply 10 in. Hg of vacuum to EGR valve.</li> <li>● While observing EGR valve, release vacuum.</li> <li>● Does EGR valve function in a smooth manner?</li> </ul> <p><b>NOTE: Repeat test if necessary to ensure accurate result.</b></p>	No	GO to EGR Valve Diagnostic Section 6.
		Yes	GO to <b>DL95</b> .
<b>DL95</b>	<b>INSPECT VACUUM LINES BETWEEN EVR SOLENOID AND EGR VALVE</b>		
	<ul style="list-style-type: none"> <li>● Inspect EGR valve vacuum supply line from EVR solenoid for kinks and/or obstructions.</li> <li>● Is vacuum supply line to EGR valve free of any obstructions?</li> </ul>	No	SERVICE as necessary. RERUN Quick Test.
		Yes	GO to <b>DL96</b> .
<b>DL96</b>	<b>EVR REGULATOR FILTER INSPECTION</b>		
	<ul style="list-style-type: none"> <li>● Carefully check EVR filter for contamination and/or obstructions.</li> <li>● Is EVR filter condition acceptable?</li> </ul>	No	REPLACE EVR filter. RERUN Quick Test.
		Yes	Unable to duplicate and/or identify fault at this time. Continuous code 34 testing complete.
<b>DL97</b>	<b>SERVICE CODE 33: CONTINUOUS TEST — INSPECT EGR VALVE FOR FREE OPERATION</b>		
	<ul style="list-style-type: none"> <li>● Key Off.</li> <li>● Connect a vacuum pump to the EGR valve.</li> <li>● While observing the EGR valve, slowly apply 10 in. Hg vacuum.</li> </ul> <p><b>NOTE: EGR valve should begin to open with a very small amount of vacuum, approximately 1 to 1.5 in. Hg and be fully open with about 4 in. Hg vacuum.</b></p> <ul style="list-style-type: none"> <li>● Does EGR valve move freely and smoothly?</li> </ul>	No	GO to EGR Valve Diagnostic Section 6.
		Yes	GO to <b>DL98</b> .



**Pressure Feedback EGR (PFE)  
EGR Valve Regulator (EVR)**

**Pinpoint  
Test**

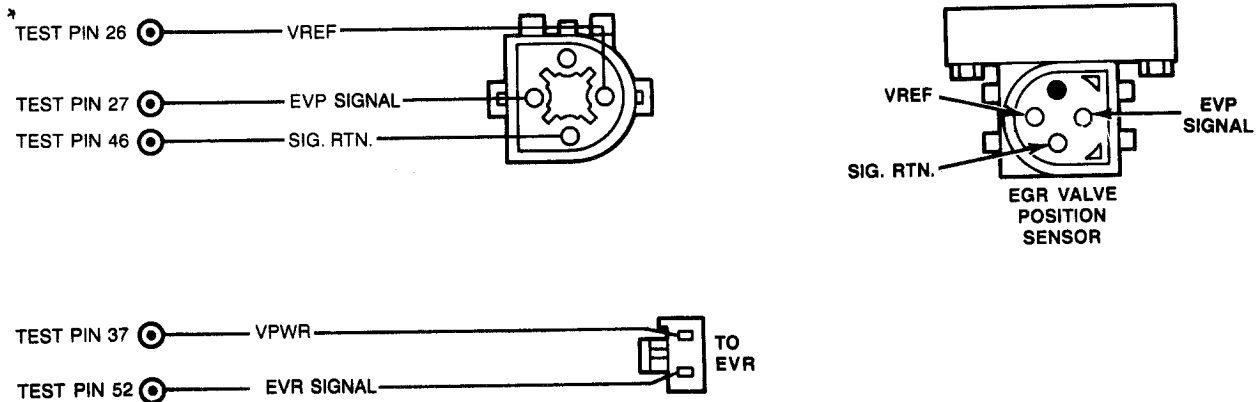
**DL**

TEST STEP		RESULT	ACTION TO TAKE
<b>DL98</b>	<b>EVR HARNESS CHECK</b>		
<ul style="list-style-type: none"> <li>● Key Off.</li> <li>● Disconnect processor 60 Pin connector and inspect for damaged pins, corrosion, loose wires, etc. Service as necessary.</li> <li>● Connect Breakout box to harness. Processor connected to Breakout box.</li> <li>● Enter output state check.</li> <li>● DVOM on 20 V scale.</li> <li>● Connect DVOM negative test lead to test Pin 40 at the Brakeout box and DVOM positive test lead to test Pin 33.</li> <li>● Cycle throttle if necessary to indicate 10.5 V or greater.</li> <li>● Remain at this position.</li> <li>● While observing DVOM, grasp the harness closest to the EVR connector. Wiggle, shake or bend a small section of the EEC-IV system harness while working your way to the dash panel. Lightly tap EVR solenoid to simulate road vibration.</li> <li>● Does DVOM indicate less than 10.5 V?</li> </ul>		<p>Yes</p> <p>No</p>	<p>SERVICE as necessary. RERUN Quick Test.</p> <p>Unable to duplicate and/or identify fault at this time. Continuous code 33 testing complete.</p>

## EGR Valve Position Sensor (EVP) EGR Valve Regulator (EVR)

## Pinpoint Test

# DM

**DM**


\*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: VREF, EVP, Signal Return, EVR, VPWR.
- EVR (EGR valve regulator).
- EGR valve assembly.
- Processor assembly.

## EGR Valve Position Sensor (EVP) EGR Valve Regulator (EVR)

## Pinpoint Test

## DM

TEST STEP		RESULT	ACTION TO TAKE
<b>FAULT CODE 31</b>			
<b>DM1</b>	RUN ENGINE RUNNING QUICK TEST WITH EGR VACUUM SIGNAL LINE DISCONNECTED AT EGR VALVE		
<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>● Perform Engine Running Quick Test.</li> <li>● Check for code 31.</li> </ul>		Code 31 present	GO to <b>DM2</b> .
		No code 31 present, but codes 32 and 34 are present	GO to <b>DM11</b> .
<b>DM2</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 and capped.</li> <li>● Disconnect vehicle harness from EVP sensor.</li> <li>● DVOM on 200,000 ohm scale.</li> <li>● Connect vacuum pump to EGR valve.</li> <li>● Measure resistance between EVP signal and VREF at EVP sensor 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 5,500 ohms to no less than 100 ohms	GO to <b>DM3</b> .
		Reading is less than 100 ohms or greater than 5,500 ohms	REPLACE EVP sensor. RECONNECT signal line and harness. RERUN Quick Test.
		Reading does not decrease or unable to hold vacuum	GO to <b>DM16</b> .
<b>DM3</b>	MEASURE VREF TO SIGNAL RETURN VOLTAGE		
<ul style="list-style-type: none"> <li>● Key On, Engine Off. 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 4V and 6V	GO to <b>DM4</b> .
		Reading is less than 4V or greater than 6V	GO to Pinpoint Test Step <b>C1</b> .

## EGR Valve Position Sensor (EVP) EGR Valve Regulator (EVR)

## Pinpoint Test

## DM

TEST STEP		RESULT	ACTION TO TAKE
<b>DM4</b>	MEASURE CONTINUITY OF EVP SIGNAL		
	<ul style="list-style-type: none"> <li>● Key Off, wait 10 seconds.</li> <li>● Harness disconnected from EVP sensor.</li> <li>● Disconnect harness from 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>DM5</b> .  SERVICE open circuit. REMOVE Breakout box. RECONNECT processor and EVP sensor. RERUN Quick Test.
<b>DM5</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 and 46 at the 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>DM6</b> .
<b>DM6</b>	SUBSTITUTE EVP SENSOR AND EGR VALVE		
	<ul style="list-style-type: none"> <li>● Key Off, wait 10 seconds.</li> <li>● Electrically connect a 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>DM7</b> .

## EGR Valve Position Sensor (EVP) EGR Valve Regulator (EVR)

## Pinpoint Test

## DM

TEST STEP		RESULT	ACTION TO TAKE
<b>DM7</b>	EVP SENSOR CHECK		
<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	REPLACE EVP sensor on original EGR valve. RERUN Quick Test.
		No	REFER to EGR Systems, Section 6.
<b>FAULT CODES 32, 33 AND 34</b>			
<b>DM11</b>	OUTPUT STATE CHECK (REFER TO APPENDIX)		
<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. GO to <b>DM12</b> .
<b>DM12</b>	CHECK EVR SOLENOID FOR ELECTRICAL CYCLING		
<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 to EVR circuits VPWR and EVR signal.</li> <li>● While observing DVOM, depress and release the throttle several times to cycle output on and off.</li> </ul>		Solenoid output cycles on and off	REMAIN in output state check. GO to <b>DM13</b> .
		Output does not cycle on and off	REMOVE jumper, GO to <b>DM17</b> .

## EGR Valve Position Sensor (EVP) EGR Valve Regulator (EVR)

## Pinpoint Test

## DM

TEST STEP		RESULT	ACTION TO TAKE
<b>DM13</b>	CHECK EVR SOLENOID FOR VACUUM CYCLING		
<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 EVR solenoid and connect vacuum pump.</li> <li>● Connect a vacuum gauge in the common output (top) vacuum line to EGR valve.</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>		Vacuum output cycles on and off in less than 2 seconds	RECONNECT all vacuum lines. GO to <b>DM14</b> .
		Vacuum does not cycle on and off in less than 2 seconds	CHECK EVR filter for obstructions. REPLACE as necessary. If OK, REPLACE solenoid assembly. RECONNECT all vacuum lines. RERUN Quick Test.
<b>DM14</b>	CHECK VACUUM LINES		
<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 schematic decal for leaks, kinks, cracks or obstructions.</li> </ul>		Vacuum lines OK	GO to <b>DM15</b> .
		Vacuum lines are not OK	SERVICE as necessary. RERUN Quick Test.
<b>DM15</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 at the EVP sensor between EVP Signal and VREF while increasing vacuum to 33 kPa (10 in. Hg).</li> <li>● Observe resistance as vacuum increases.</li> </ul>		Reading does not decrease gradually	GO to <b>DM16</b> .
		Reading gradually decreases from no more than 5,500 ohms to no less than 100 ohms	REPLACE processor. RECONNECT EVP sensor and EGR vacuum line. RERUN Quick Test.

## EGR Valve Position Sensor (EVP) EGR Valve Regulator (EVR)

## Pinpoint Test

## DM

TEST STEP		RESULT	ACTION TO TAKE
<b>DM16</b>	MANUALLY EXERCISE EVP SENSOR		
<ul style="list-style-type: none"> <li>● Key Off, harness disconnected.</li> <li>● Remove EVP sensor from EGR valve.</li> <li>● Measure resistance at the EVP sensor between EVP Signal and VREF 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 and 100 ohms</p>	<p>REFER to EGR Systems, 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>DM17</b>	MEASURE EVR SOLENOID RESISTANCE		
<ul style="list-style-type: none"> <li>● Key Off, wait 10 seconds.</li> <li>● DVOM on 200 ohm scale.</li> <li>● Disconnect EVR solenoid connector and measure solenoid resistance.</li> </ul>		<p>Resistance is between 30 and 70 ohms</p> <p>Resistance is less than 30 ohms or greater than 70 ohms</p>	<p>CONNECT EVR solenoids. GO to <b>DM18</b>.</p> <p>REPLACE EVR solenoid assembly. RERUN Quick Test.</p>
<b>DM18</b>	CHECK FOR VOLTAGE ON VEHICLE POWER CIRCUIT		
<ul style="list-style-type: none"> <li>● Disconnect EVR solenoid from harness.</li> <li>● Key On, Engine Off.</li> <li>● DVOM on 20V scale.</li> <li>● Measure voltage between battery negative terminal and VPWR at the EVR solenoid vehicle harness connector.</li> </ul>		<p>Reading is less than 10.5V</p> <p>Readings are 10.5V or greater</p>	<p>SERVICE harness circuit open. RERUN Quick Test.</p> <p>GO to <b>DM19</b>.</p>
<b>DM19</b>	CHECK CONTINUITY OF EVR CIRCUITS		
<ul style="list-style-type: none"> <li>● Key Off, wait 10 seconds.</li> <li>● EVR 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 52 at the Breakout box and EVR signal at the EVR solenoid vehicle harness connector.</li> </ul>		<p>Reading less than 5 ohms</p> <p>Reading 5 ohms or greater</p>	<p>GO to <b>DM20</b>.</p> <p>SERVICE open circuit. REMOVE Breakout box. RECONNECT harness to processor. RERUN Quick Test.</p>

**EGR Valve Position Sensor (EVP)  
EGR Valve Regulator (EVR)**

**Pinpoint  
Test**

**DM**

TEST STEP		RESULT	ACTION TO TAKE
<b>DM20</b>	CHECK FOR SHORT TO GROUND		
<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>• EVR solenoid disconnected.</li> <li>• Measure resistance between test Pin 52 and test Pins 40, 46 and 60 at the Breakout box.</li> </ul>		Any resistance reading is less than 10,000 ohms	SERVICE short to ground. RERUN Quick Test.
		All resistance readings are 10,000 ohms or greater	GO to <b>DM21</b> .
<b>DM21</b>	CHECK EVR SIGNAL FOR SHORTS TO POWER		
<ul style="list-style-type: none"> <li>• EVR solenoid 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 52 and test Pins 37 and 57 at the Breakout box.</li> </ul>		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.
		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>DM30</b>	RPM TOO LOW FOR EGR TEST		
<ul style="list-style-type: none"> <li>• Check for code 12.</li> </ul>		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> .
		Code 12 not present	GO to <b>DM31</b> .



**EGR Valve Position Sensor (EVP)  
EGR Valve Regulator (EVR)**

**Pinpoint  
Test**

**DM**

TEST STEP		RESULT	ACTION TO TAKE
<b>DM31</b>	RETEST AT 1500 RPM		
<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 1500 rpm.</li> <li>● Record engine running service codes.</li> <li>● Check for code 35.</li> </ul>		Code 35 present	REPLACE processor. RERUN Quick Test.
		Code 35 not present	RERUN Quick Test. SERVICE codes as necessary.
<b>DM90</b>	SERVICE CODE 31 CONTINUOUS TEST: EXERCISE EVP 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>● 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>		Yes	GO to <b>DM91</b> .
		No	GO to <b>DM92</b> .
<p>The diagram illustrates the electrical connections between three components: PROCESSOR, HARNESS, and EVP SENSOR. On the left, the PROCESSOR has three terminals. The top terminal is connected to a line labeled 'VREF'. The middle terminal is connected to a line labeled 'EVP SIG'. The bottom terminal is connected to a line labeled 'SIG RTN'. These lines pass through the HARNESS (represented by a bundle of wires) and connect to the EVP SENSOR on the right. The EVP SENSOR has three terminals corresponding to these lines. There are 'X' marks on the wires, indicating potential test points or connections.</p>			

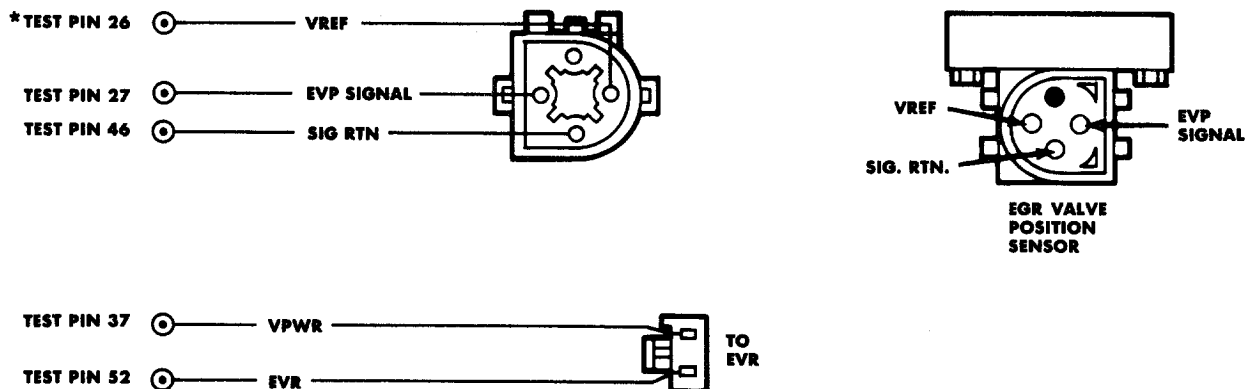
<b>EGR Valve Position Sensor (EVP) EGR Valve Regulator (EVR)</b>	<b>Pinpoint Test</b>	<b>DM</b>
--	--------------------------	-----------

TEST STEP	RESULT	ACTION TO TAKE
<b>DM91</b> MEASURE EVP SIGNAL VOLTAGE WHILE EXERCISING EVP SENSOR <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 DM90.</li> <li>● Does the fault occur below 4.25V?</li> </ul>	Yes           No	DISCONNECT and INSPECT connector. If connector and terminals are good, REPLACE EVP sensor. RERUN Quick Test.           EGR valve overshoot may have caused continuous code 31. Sensor service is not required. To VERIFY harness integrity, GO to <b>DM92</b> .
<b>DM92</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 DM90, 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> <li>● Is a fault indicated?</li> </ul>	Yes           No	ISOLATE fault and SERVICE as necessary. REFER to appropriate figure. RERUN Quick Test.           GO to <b>DM93</b> .
<b>DM93</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>● Are connectors and terminals OK?</li> </ul>	No           Yes	SERVICE as necessary. RERUN Quick Test.           Unable to duplicate fault at this time. Continuous Code 31 testing complete.

## EGR Valve Position Sensor (EVP) EGR Valve Regulator (EVR)

## Pinpoint Test

# DN

**DN**


\* 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 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: VREF, EVP, Signal Return, EVR, VPWR.
- EVR (EGR valve regulator).
- EGR valve assembly.
- Processor assembly.

<b>EGR Valve Position (EVP) EGR Valve Regulator (EVR)</b>	<b>Pinpoint Test</b>	<b>DN</b>
---	--------------------------	-----------

TEST STEP	RESULT	ACTION TO TAKE
<b>SERVICE CODE: 31</b>		
<b>DN1</b>   ATTEMPT TO GENERATE CODE (35)		
<ul style="list-style-type: none"> <li>● Key Off.</li> <li>● Disconnect EVP vehicle harness at sensor.</li> <li>● Jumper VREF to EVP signal at vehicle harness sensor connector.</li> <li>● Perform Key On, Engine Off Self-Test.</li> <li>● Check for code 35.</li> </ul> <p><b>NOTE: Ignore all other codes at this time.</b></p>	<p>Code 35 present</p> <p>Code 35 not present</p>	<p>REPLACE EVP sensor. RERUN Quick Test.</p> <p>REMOVE jumper. GO to <b>DN2</b>.</p>
<b>DN2</b>   MEASURE VOLTAGE BETWEEN VREF AND SIGNAL RETURN		
<ul style="list-style-type: none"> <li>● Key Off.</li> <li>● EVP disconnected from harness.</li> <li>● DVOM on 20 V scale.</li> <li>● Key On, Engine Off.</li> <li>● Measure voltage at EVP vehicle harness connector between VREF and Signal Return.</li> <li>● Refer to illustration DL.</li> </ul>	<p>Voltage reading between 4V and 6V</p> <p>Voltage reading less than 4V or greater than 6V</p>	<p>GO to <b>DN3</b>.</p> <p>GO to <b>C1</b>.</p>
<b>DN3</b>   CHECK CONTINUITY OF EVP SIGNAL		
<ul style="list-style-type: none"> <li>● Key Off, EVP harness disconnected.</li> <li>● DVOM on 200 ohm scale.</li> <li>● Disconnect processor 60 Pin connector and inspect for damaged pins, corrosion, loose wires, etc. Service as necessary.</li> <li>● Connect Breakout box to harness. Processor connected to Breakout box.</li> <li>● Measure resistance between EVP signal at vehicle harness connector and test Pin 27 at the Breakout box.</li> </ul>	<p>Reading 5 ohms or greater</p> <p>Reading less than 5 ohms</p>	<p>SERVICE open circuit. CONNECT EVP sensor. REMOVE Breakout box. RERUN Quick Test.</p> <p>GO to <b>DN4</b>.</p>

**EGR Valve Position (EVP)  
EGR Valve Regulator (EVR)**

**Pinpoint  
Test**

**DN**

TEST STEP		RESULT	ACTION TO TAKE
<b>DN4</b>	<b>CHECK RESISTANCE OF EVP SIGNAL TO GROUND AND SIGNAL RETURN</b>		
	<ul style="list-style-type: none"> <li>● Key Off.</li> <li>● EVP harness disconnected.</li> <li>● Breakout box installed.</li> <li>● Processor disconnected.</li> <li>● DVOM on 200,000 ohm scale.</li> <li>● Measure resistance between EVP signal at EVP vehicle harness connector and ground.</li> <li>● Measure resistance between EVP signal at EVP vehicle harness connector and test Pin 46 (Signal Return) at the Breakout box.</li> </ul>	<p>Either reading is less than 10,000 ohms</p> <p>Both readings are 10,000 ohms or greater</p>	<p>SERVICE short circuit. CONNECT EVP. REMOVE Breakout box. RERUN Quick Test.</p> <p>REPLACE processor. CONNECT EVP sensor. REMOVE Breakout box. RERUN Quick Test.</p>
<b>SERVICE CODE: 35</b>			
<b>DN5</b>	<b>ATTEMPT TO GENERATE CODE 31</b>		
	<ul style="list-style-type: none"> <li>● Key Off.</li> <li>● Disconnect EVP vehicle harness at sensor. Inspect for damaged pins, corrosion, loose wires, etc. Service as necessary.</li> <li>● Perform Key On, Engine Off Self-Test, and record codes.</li> <li>● Check for code 31.</li> </ul> <p><b>NOTE: Ignore all other codes at this time.</b></p>	<p>Code 31 present</p> <p>Code 31 not present</p>	<p>GO to <b>DN6</b>.</p> <p>GO to <b>DN7</b>.</p>
<b>DN6</b>	<b>MEASURE VREF TO SIGNAL RETURN VOLTAGE</b>		
	<ul style="list-style-type: none"> <li>● Key Off.</li> <li>● EVP harness disconnected.</li> <li>● DVOM on 20V scale.</li> <li>● Key On, Engine Off.</li> <li>● Measure voltage at EVP vehicle harness connector between VREF and Signal Return.</li> <li>● Refer to illustration DN.</li> </ul>	<p>Voltage reading between 4V and 6V</p> <p>Voltage reading less than 4V or greater than 6V</p>	<p>REPLACE EVP sensor. RERUN Quick Test.</p> <p>GO to <b>C1</b>.</p>

**EGR Valve Position (EVP)  
EGR Valve Regulator (EVR)**

**Pinpoint  
Test**

**DN**

TEST STEP		RESULT	ACTION TO TAKE
<b>DN7</b>	<b>CHECK EVP CIRCUIT FOR SHORT TO POWER</b>		
<ul style="list-style-type: none"> <li>● Key Off.</li> <li>● EVP disconnected from harness.</li> <li>● Disconnect processor 60 Pin connector and 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 the resistance between test Pin 27 and test Pins 26 and 57 at the Breakout box.</li> </ul>		<p>Either resistance is less than 10,000 ohms</p> <p>Both resistances are 10,000 ohms or greater</p>	<p>SERVICE harness short. REMOVE Breakout box, CONNECT EVP sensor. RERUN Quick Test.</p> <p>REPLACE processor. REMOVE Breakout box. CONNECT EVP sensor. RERUN Quick Test.</p>
<b>SERVICE CODE: 84</b>			
<b>DN10</b>	<b>MEASURE EVR SOLENOID RESISTANCE</b>		
<ul style="list-style-type: none"> <li>● Key Off.</li> <li>● DVOM on 200 ohm scale.</li> <li>● Disconnect EVR solenoid connector and measure solenoid resistance.</li> </ul>		<p>Resistance is between 30 and 70 ohms</p> <p>Resistance is less than 30 ohms or greater than 70 ohms</p>	<p>GO to <b>DN11</b>.</p> <p>REPLACE EVR solenoid assembly. RERUN Quick Test.</p>
<b>DN11</b>	<b>CHECK FOR VPWR AT EVR SOLENOID</b>		
<ul style="list-style-type: none"> <li>● EVR solenoid disconnected from harness.</li> <li>● DVOM on 20V scale.</li> <li>● Key On, Engine Off.</li> <li>● Measure voltage between battery negative terminal and VPWR circuit at EVR solenoid vehicle harness connector.</li> </ul>		<p>Reading is less than 10.5V</p> <p>Reading is 10.5V or greater</p>	<p>SERVICE VPWR open circuit. RERUN Quick Test.</p> <p>GO to <b>DN12</b>.</p>

**EGR Valve Position (EVP)  
EGR Valve Regulator (EVR)**

**Pinpoint  
Test**







**DN**

TEST STEP		RESULT	ACTION TO TAKE
<b>DN12</b>	CHECK CONTINUITY OF EVR CIRCUIT		
<ul style="list-style-type: none"> <li>● Key Off.</li> <li>● EVR solenoid disconnected from harness.</li> <li>● Disconnect processor 60 Pin connector and inspect for damaged pins, corrosion, loose wires, etc. 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 EVR signal at the EVR solenoid vehicle harness connector.</li> </ul>		<p>Reading less than 5 ohms</p> <p>Reading 5 ohms or greater</p>	<p>GO to <b>DN13</b>.</p> <p>SERVICE open circuit. REMOVE Breakout box. CONNECT process EVR solenoid. RERUN Quick Test.</p>
<b>DN13</b>	CHECK EVR CIRCUIT FOR SHORT TO POWER AND GROUND		
<ul style="list-style-type: none"> <li>● Key Off.</li> <li>● Breakout box installed, processor disconnected.</li> <li>● EVR solenoid disconnected.</li> <li>● DVOM on 200,000 ohm scale.</li> <li>● Measure resistance between test Pin 33 (EVR) and test Pins 37 and 57 (VPWR) and 40, 46 and 60 (GRD) at the Breakout box.</li> </ul>		<p>Any reading less than 10,000 ohms</p> <p>All readings 10,000 ohms or greater</p>	<p>SERVICE short circuit. REMOVE Breakout box. RECONNECT processor and EVR solenoid. RERUN Quick Test. If code is repeated, REPLACE processor.</p> <p>REPLACE processor. REMOVE Breakout box. RECONNECT processor and EVR solenoid. RERUN Quick Test.</p>
<b>DN30</b>	SERVICE CODE: 32		
<ul style="list-style-type: none"> <li>● Replace EVP sensor, rerun Quick Test.</li> </ul>			

**EGR Valve Position Sensor (EVP)  
EGR Valve Regulator (EVR)**

**Pinpoint  
Test**

**DN**

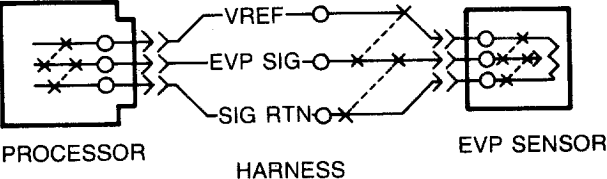
TEST STEP		RESULT	ACTION TO TAKE
<b>DN35</b>	<b>SERVICE CODE 34: EGR VALVE OPERATION</b>		
<ul style="list-style-type: none"> <li>● Key Off.</li> <li>● Disconnect vacuum hose from EGR valve and plug hose.</li> <li>● Perform Engine Running Quick Test.</li> <li>● Is code 34 present?</li> </ul>		Yes   No 	GO to <b>DN36</b> .  REPLACE EVR solenoid and RERUN Quick Test.
<b>DN36</b>	<b>EVP OPERATION</b>		
<ul style="list-style-type: none"> <li>● Key Off, harness disconnected.</li> <li>● Remove EVP sensor from EGR valve.</li> <li>● Measure resistance at the EVP sensor between Signal Return and VREF 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>		Both readings decrease and increase smoothly between 5,500 ohms and 100 ohms   Either reading decreases or increases abruptly between 5,500 and 100 ohms 	REFER to EGR System, Section 6. RECONNECT EVP sensor and EGR supply vacuum line.  REPLACE EVP sensor. RECONNECT harness and EGR supply vacuum line. RERUN Quick Test.
<b>DN40</b>	<b>SERVICE CODE 33: CHECK EVP RESISTANCE WHILE APPLYING VACUUM TO EGR VALVE</b>		
<ul style="list-style-type: none"> <li>● Key Off.</li> <li>● Disconnect 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 at the EVP sensor between EVP signal and VREF while increasing vacuum to 33 kPa (10 in. Hg).</li> <li>● Observe resistance as vacuum increases.</li> </ul>		If resistance reading does not decrease gradually   Reading gradually decreases from no more than 5,500 ohms to no less than 100 ohms 	REFER to EGR System, Section 6.  GO to <b>DN41</b> .



**EGR Valve Position Sensor (EVP)  
EGR Valve Regulator (EVR)**

**Pinpoint  
Test**

**DN**

TEST STEP	RESULT	ACTION TO TAKE
<p><b>DN41</b> CHECK VACUUM LINES</p> <ul style="list-style-type: none"> <li>● Key Off, wait 10 seconds.</li> <li>● Vacuum lines reconnected.</li> <li>● Check EGR vacuum line system from EGR valve to EVR, and from EVR to carburetor for obstructions, kicks, leaks, etc.</li> </ul>	<p>Vacuum lines OK</p> <p>Vacuum lines are not OK</p>	<p>CHECK EVR filter for obstructions. REPLACE as necessary. If OK, REPLACE EVR solenoid. RECONNECT all vacuum lines. RERUN Quick Test.</p> <p>SERVICE as necessary. RERUN Quick Test.</p>
<p><b>DN90</b> SERVICE CODE 32 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>Yes</p> <p>No</p>	<p>GO to <b>DN91</b>.</p> <p>GO to <b>DN92</b>.</p>

**EGR Valve Position Sensor (EVP)  
EGR Valve Regulator (EVR)**

**Pinpoint  
Test**

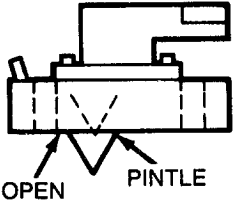
**DN**

TEST STEP		RESULT	ACTION TO TAKE
<b>DN91</b>	<b>MEASURE EVP SIGNAL VOLTAGE WHILE EXERCISING EVP SENSOR</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, 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 27 to test Pin 46.</li> <li>● DVOM on 20V scale.</li> <li>● Key On, Engine Off.</li> <li>● While observing DVOM, repeat Step DN90.</li> <li>● Does the fault occur below 4.25V?</li> </ul>		Yes	DISCONNECT and INSPECT connector. If connector and terminals are good, REPLACE EVP sensor. RERUN Quick Test.
		No	EGR valve overshoot may have caused continuous code 31. Sensor service is not required. To VERIFY harness integrity, GO to <b>DN92</b> .
<b>DN92</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 DN90, 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> <li>● Is a fault indicated?</li> </ul>		Yes	ISOLATE fault and SERVICE as necessary. REFER to appropriate figure. RERUN Quick Test.
		No	GO to <b>DN93</b> .
<b>DN93</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>		No	SERVICE as necessary. RERUN Quick Test.
		Yes	Unable to duplicate fault at this time. Continuous Code 31 testing complete.

## EGR Valve Position Sensor (EVP) EGR Valve Regulator (EVR)

## Pinpoint Test

## DN

TEST STEP	RESULT	ACTION TO TAKE
<p><b>DN95</b> LEAK TEST</p> <ul style="list-style-type: none"> <li>● Key Off.</li> <li>● Connect a vacuum pump to EGR valve.</li> <li>● Apply 20 in. Hg to EGR valve.</li> <li>● Does valve maintain vacuum and does EGR valve open?</li> </ul>  <p>NOTE: TO OPEN; PINTLE SHOULD MOVE WITHIN THE BASE OF VALVE.</p>	<p>Yes</p> <p>No</p>	<p>GO to <b>DN96</b>.</p> <p>GO to EGR diagnostic, Section 6.</p>
<p><b>DN96</b> EVR CHECK</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>● Grasp the harness close to the EVR solenoid connector, wiggle, shake or bend a small section of the harness while working your way to the processor.</li> <li>● Inspect connectors, terminals for obvious damage or faults.</li> <li>● Are any faults detected or indicated?</li> </ul>	<p>Yes</p> <p>No</p>	<p>ISOLATE fault and SERVICE as necessary. RERUN Quick Test.</p> <p>Unable to duplicate fault at this time, testing complete.</p>

**EGR Valve Position Sensor (EVP)  
EGR Valve Regulator (EVR)**

**Pinpoint  
Test**

**DN**

TEST STEP		RESULT	ACTION TO TAKE
<b>DN98</b>	<b>CHECK EVP RESISTANCE WHILE APPLYING VACUUM TO EGR VALVE</b>		
<ul style="list-style-type: none"> <li>● Key Off.</li> <li>● Disconnect harness from EVP sensor.</li> <li>● 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 at 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 EGR Diagnostic Section 6.</p> <p>GO to <b>DN99</b>.</p>
<b>DN99</b>			
<ul style="list-style-type: none"> <li>● Key Off.</li> <li>● Disconnect vacuum hose from EGR valve and plug hose.</li> <li>● Perform Engine Running Quick Test.</li> <li>● Is code 34 present?</li> </ul>		<p>Yes</p> <p>No</p>	<p>CHECK EVR filter for obstructions. REPLACE as necessary. If OK, REPLACE EVR solenoid. RECONNECT all vacuum lines. RERUN Quick Test.</p> <p>Unable to duplicate fault at this time.</p>