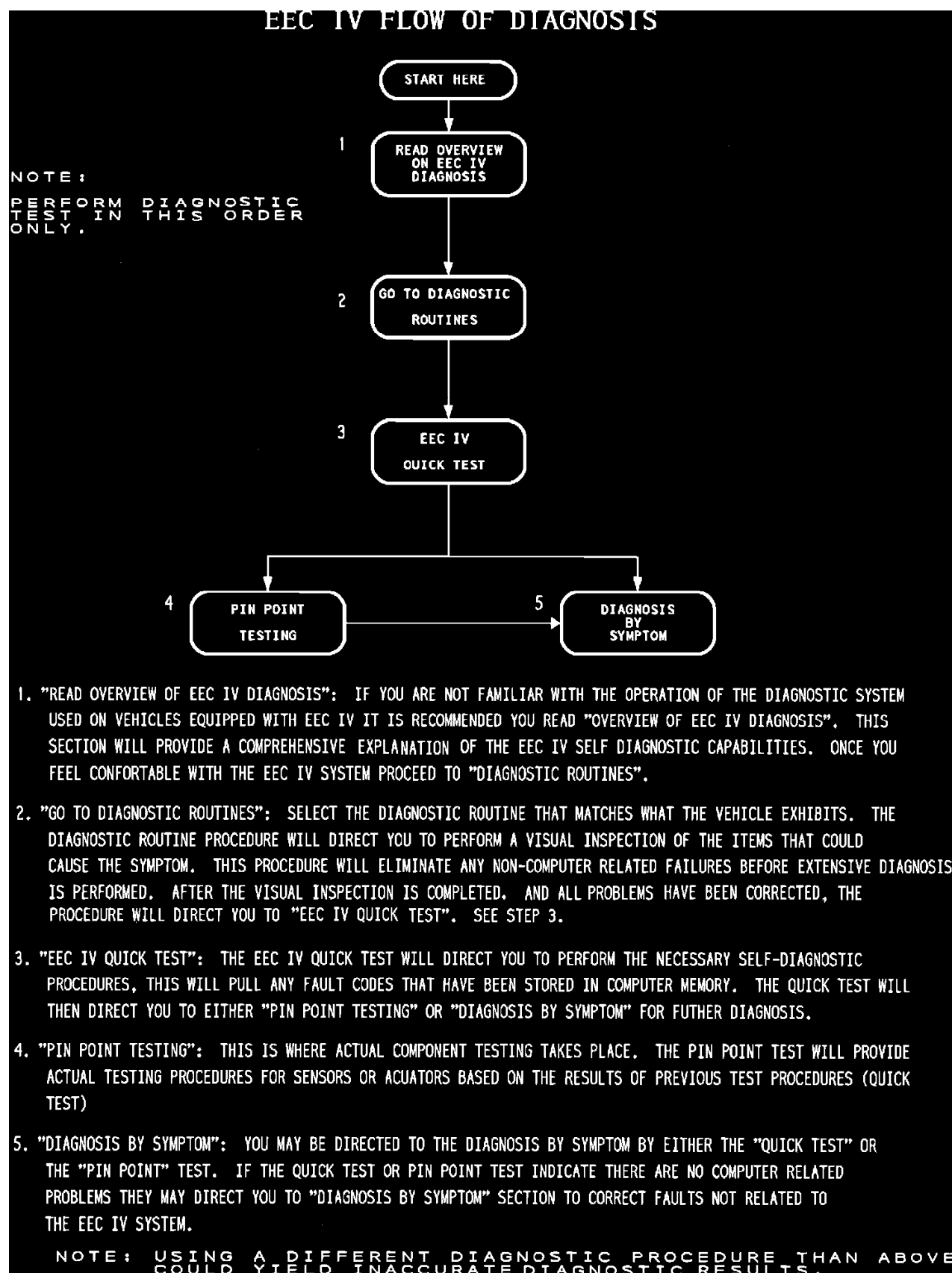


## Computers and Control Systems: Testing and Inspection



Flow Of Diagnosis

### Testing Notes - Start Here

The technician should be aware that diagnosis and testing starts at Diagnosis by Symptom and is narrowed to testing of a "specific" subsystem and it's

related wiring and components or to Computers and Control Systems / Testing and Inspection for additional diagnostic testing.

Following the appropriate diagnostic routines may prevent misdiagnosis and unnecessary component replacement. See: Symptom Related Diagnostic Procedures

Customer Information Worksheet			
			Repair Order No. _____
CUSTOMER NAME _____		DATE _____	
PLEASE HELP US HELP YOU by checking all the spaces that describe the drive problem that brought you here today.			
When did problem start to occur? <input type="checkbox"/> suddenly <input type="checkbox"/> gradually; approximate miles _____			
Problem Description			
Engine Starting Problems	Engine Quits Running Problems	Engine Idle Problems With The Vehicle Not Moving	Engine/Transmission Problems While The Vehicle Is Moving
<input type="checkbox"/> Will Not Start - Will Not Even Crank <input type="checkbox"/> Cranks But Will Not Start <input type="checkbox"/> Tries To Start, But Won't <input type="checkbox"/> Starts, But Takes A Long Time	<b>Engine Quits:</b> <input type="checkbox"/> Right After Starting <input type="checkbox"/> While Idling <input type="checkbox"/> When Put Into Gear <input type="checkbox"/> On Acceleration <input type="checkbox"/> During Steady Speed Driving <input type="checkbox"/> On Deceleration <input type="checkbox"/> Right After the Vehicle Is Brought To A Stop <input type="checkbox"/> When Parking	<input type="checkbox"/> Engine Speed Is Too Slow All The Time <input type="checkbox"/> Engine Speed Is Too Slow When The A/C Is On <input type="checkbox"/> Engine Speed Is Too Fast <input type="checkbox"/> Engine Speed Is Rough Or Uneven	<input type="checkbox"/> Runs Rough <input type="checkbox"/> Bucks and Jerks <input type="checkbox"/> Heavies/Stumbles On Acceleration <input type="checkbox"/> Misfires - Cuts Out <input type="checkbox"/> Engine Knocks or Rattles <input type="checkbox"/> Lack of Power <input type="checkbox"/> Backfires <input type="checkbox"/> Poor Fuel Economy <input type="checkbox"/> Transmission Shifting Concerns
About how often does the problem happen? <input type="checkbox"/> All the time <input type="checkbox"/> Most of the time <input type="checkbox"/> Occasionally			
When does the problem usually occur? <input type="checkbox"/> Morning <input type="checkbox"/> Later In the day <input type="checkbox"/> Anytime			
About how long after starting the engine does the problem happen? <input type="checkbox"/> Within 2 minutes of starting the engine. <input type="checkbox"/> Between 2 and 10 minutes after the engine starts. <input type="checkbox"/> At least 10 minutes or longer after starting the engine. <input type="checkbox"/> It could happen any time after starting the engine.			
About how long does the engine have to be off before the problem will happen again? <input type="checkbox"/> 4 hours or more. <input type="checkbox"/> More than 30 minutes but less than 4 hours. <input type="checkbox"/> Less than 30 minutes of being turned off. <input type="checkbox"/> It does not matter how long the engine was off.			
Do weather conditions affect the problem? <input type="checkbox"/> No <input type="checkbox"/> Yes If yes, which ones? <input type="checkbox"/> Hot <input type="checkbox"/> Cold <input type="checkbox"/> Rain <input type="checkbox"/> Fog <input type="checkbox"/> Snow <input type="checkbox"/> Humid <input type="checkbox"/> Dry			
Does outside temperature affect the problem? <input type="checkbox"/> No <input type="checkbox"/> Yes If yes, what temperature? _____ °F			
Please check any of these driving conditions that cause the problem. <input type="checkbox"/> Accelerating <input type="checkbox"/> Steady Speed <input type="checkbox"/> Decelerating (approximate vehicle speed _____ MPH) <input type="checkbox"/> Turning Right/Left _____ MPH			
Type of fuel used? <input type="checkbox"/> Regular unleaded <input type="checkbox"/> Premium unleaded <input type="checkbox"/> Gasohol <input type="checkbox"/> Other			
Was The Check Engine Light On? <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Flashing			
Were Other Warning Lights On? <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Flashing Which Ones? _____			
Additional Comments: _____ _____ _____ _____			
Please use the back of this sheet if needed.			

### Customer Information Worksheet

## Verifying Customer Complaint

### COMPLAINT VERIFICATION

Whenever possible, the technician should personally verify the complaint. Having experienced the malfunction, the technician is less likely to repair non-existent faults.

## MALFUNCTION VERIFICATION

Today's sophisticated automotive systems are easily misunderstood, which can lead to repairs that attempt to force a particular system to perform in a way that it was never intended to operate. Therefore, the troubleshooting technician should compare the system operation to the nominal system operation.

## PREVIOUS REPAIRS

Vehicle repair history can provide explanations to unusual complaints that seem to elude normal troubleshooting attempts. Incorrect components or unapproved repairs can have subtle influences on seemingly unrelated systems.

## Checking the Basics

### CHECKING THE BASICS

All troubleshooting must begin by "**Checking the Basics**". Certain basic faults can be undetectable by the self-diagnostic systems of the fuel and ignition control units and in some cases can actually interfere with the self-checking and fault memory operation.

Fault codes should be retrieved at this time. This will prevent loss of codes in the event of power disruption to the control module, or similar event that could cause loss of codes.

Prior to any teardown, repair or component replacement, the following steps should always be considered:

#### Battery State of Charge

Batteries in a state of partial discharge can have a dramatic effect on control units and related components.

#### Positive Battery Cable Integrity

All positive electrical connections must be in perfect condition for trouble-free electronic system operation.

#### Fuse Integrity

Fuses are employed to prevent possible damage to electrical components and wiring harnesses. The fuses and their connections must be without dynamic resistance. Dynamic resistance can only be checked using the voltage drop method of testing.

#### Negative Ground Connections

As all electrical circuits are a circle, all negative battery connections must also be checked and verified to be in perfect condition. A poor "common" ground point will cause seemingly unrelated systems to influence one another. High current systems which encounter a poor "common" ground can back feed through other electrical systems causing unusual operation and perhaps premature component failure. As with the positive side of the electrical system, the ground side should be checked dynamically using the voltage drop technique.

#### Powertrain Cable Attachments

Metal cables attached to the engine or transmission that appear overheated and/or discolored indicate the need to thoroughly test all ground connections.

#### Power Supply Relays

The system relay as well as its plug connection can be a source of intermittent operation which will not set a fault in control unit fault memory.

#### Vehicle Sensors

Sensors should be checked statically and dynamically. Physical mounting and condition of the sensor must be assured.

#### Ignition System

The ignition primary and secondary systems should be inspected for loose connections, damaged insulation, moisture, and corrosion.

#### Fuel Delivery

Fuel delivery must begin at once when cranking and the pressure in the fuel rails must be within specifications. Fuel pressure retention must be maintained between the fuel pump outlet and the pressure regulator after engine shutdown.

#### Air/Fuel Ratio

When troubleshooting idle quality or driveability complaints, it is necessary to consider the following:

- Presence of unmetered air leaks
- Evaporative purge system
- Excessive engine oil dilution
- Color and odor of exhaust
- Condition of air and PCV filter
- Condition of air flow meter electrical connections

## Quick Test Description

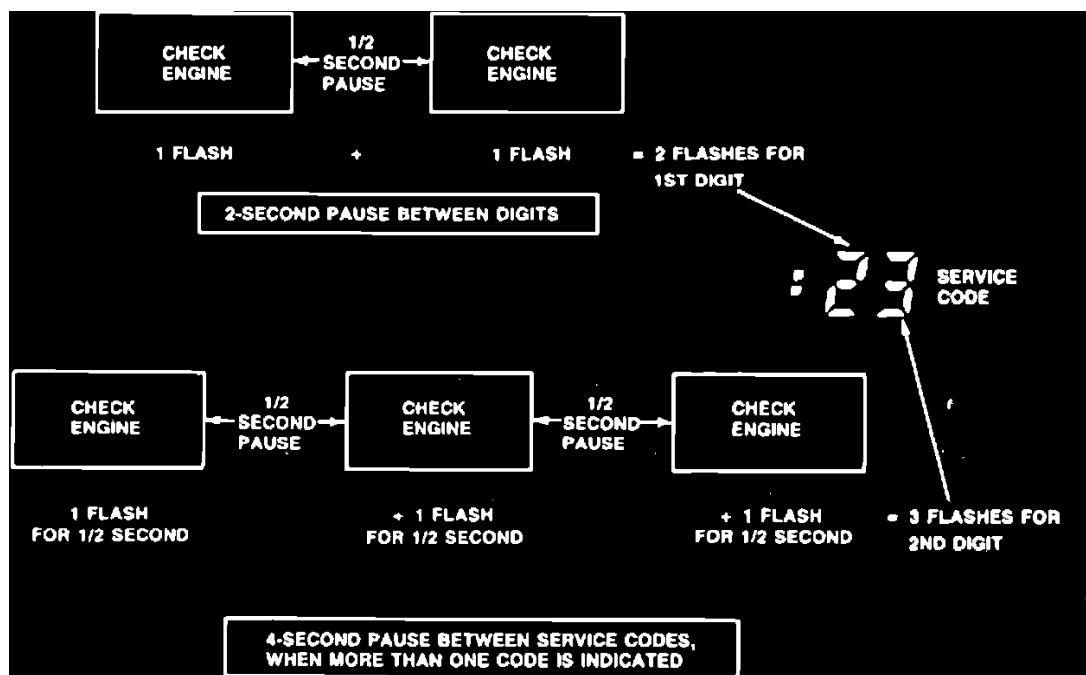


Fig. 33 Code Interpretation Using Check Engine Light

The MIL light is intended to alert the driver of certain malfunctions in the engine control system. If such a fault occurs, the EEC-IV processor will substitute a value or values and continue operating. In some cases this action may result in a slight change in vehicle driveability.

The check engine light can be used to read codes. The check engine light on the front dash panel will remain on when a hard fault is present. During the Self-test sequence, a service code is reported by the check engine light. It will represent itself as a flash on the check engine light display on the dash panel, **Fig. 33**. A single digit number of three will be reported by three flashes. However, as previously stated, a service code is represented by a two digit number, such as 2-3. As a result, the Self-test service code of 2-3 will appear on the check engine light display as two flashes, then after a two second pause, the light will flash three times.

Continuous Memory codes are separated from Key On Engine Off codes by a six second delay, a single half-second flash, then another six second delay.

## How to Use Quick & Pinpoint Test Charts

**NOTE:** The QUICK TEST procedure should be used **ONLY** when the Diagnostic Routines direct you here.

To test and service the EEC-IV subsystem correctly, perform the Quick Test first, and, if the vehicle passes all three phases of the quick test (Key ON/Engine OFF, Engine Running and Continuous Test) without running (performing) any Pinpoint Tests (actually correcting faults), the EEC-IV subsystem is satisfactory and the vehicles problem, if any, exists elsewhere (other than the EEC-IV subsystem). However, if a step of the quick test fails, perform only the Pinpoint Tests (by determining the code or codes and actually repairing the problem) specified by the failed step procedure. Do not begin any Pinpoint Test without following the instructions at the beginning of the Pinpoint Test procedure. After all tests and services have been completed, repeat the entire quick test procedure to ensure the EEC-IV subsystem operates satisfactory.

When conducting the pinpoint test procedure(s) the test charts given, indicate the type test that will be made and the chart number (A through Z). Within each pinpoint test procedure, references are made to substeps within the actual test procedure. For example, the first pinpoint test that you are referred to (from the quick test procedures) will be Pinpoint test, No Start Problem. The test letter indicated is located on the upper righthand corner of the pinpoint test chart. As you perform the procedure, references to A, A1, A2, etc. These references are pinpoint test substeps. These substeps are not found on the pinpoint test indexes. These references are located in the Quick test charts, and found under each main test letter.

Each pinpoint test assumes that a fault (malfunction) has been detected in the system with direction to enter a specific repair routine. Conducting any pinpoint test without direction from the quick test procedures may produce incorrect results and replacement of satisfactory components. Correct test results are dependent on the proper operation of non-related EEC components/systems. Do not replace any components unless it has been determined that they should be replaced. If more than one service code is received, always start the service with the first code received. Do not measure voltage or resistance at the processor or connect any test lights to the processor unless specified to do so with the quick and/or pinpoint test procedures. Isolate both ends of a circuit, then turn ignition switch to OFF position when checking for shorts of circuit continuity, unless specified to do so with the quick and/or pinpoint test procedures. Disconnect solenoids and/or switches from the harness before measuring for continuity or resistance. When using the pinpoint tests, follow each step in order, starting from the first step in the appropriate test. Follow each step until the fault (malfunction) is found. After completing any repairs to the EEC-IV system, ensure all components are properly connected and repeat functional test. During the test procedure, an open is defined as any resistance obtained greater than 5 ohms, unless otherwise specified within the quick and/or pinpoint test charts. A short is

defined as any resistance value obtained of less than 10,000 ohms to ground.

## QUICK TESTS TESTING STEPS

To conduct accurate and safe EEC-IV quick test procedures, the proper equipment must be used and correctly installed or serious EEC-IV system and/or system component(s) damage may result. As stated previously, the tools listed or suitable equivalents must be used to conduct and complete these test procedures. The quick test steps are as follows:

1. Visual check and vehicle preparation. Check system for obvious faults or malfunctions. Properly prepare vehicle for system test.
2. Equipment Hookup. Ensure that the proper equipment for gathering test data is ready, prior to testing this system.
3. Service codes. The service codes are as follows: fast codes, engine identification code, engine service code and continuous codes.
4. Key ON/Engine OFF Self-Test. This step checks the processor inputs against calibrated sensor values.
5. Continuous Self-Test, checks the sensor inputs for opens and/or shorts while the vehicle is in operation.
6. Output Cycling Test. The processor activates all outputs when the throttle is cycled for additional diagnostics.
7. Computed Timing Check, verifies the systems ability to compute and maintain engine timing in the self-test.
8. Engine Running Test, checks sensors and actuators under operating conditions.
9. Pinpoint Tests. Is the corrective action to take only when a problem is detected by the functional test.

## Star Tester & Self-Test Connector Hook-Up

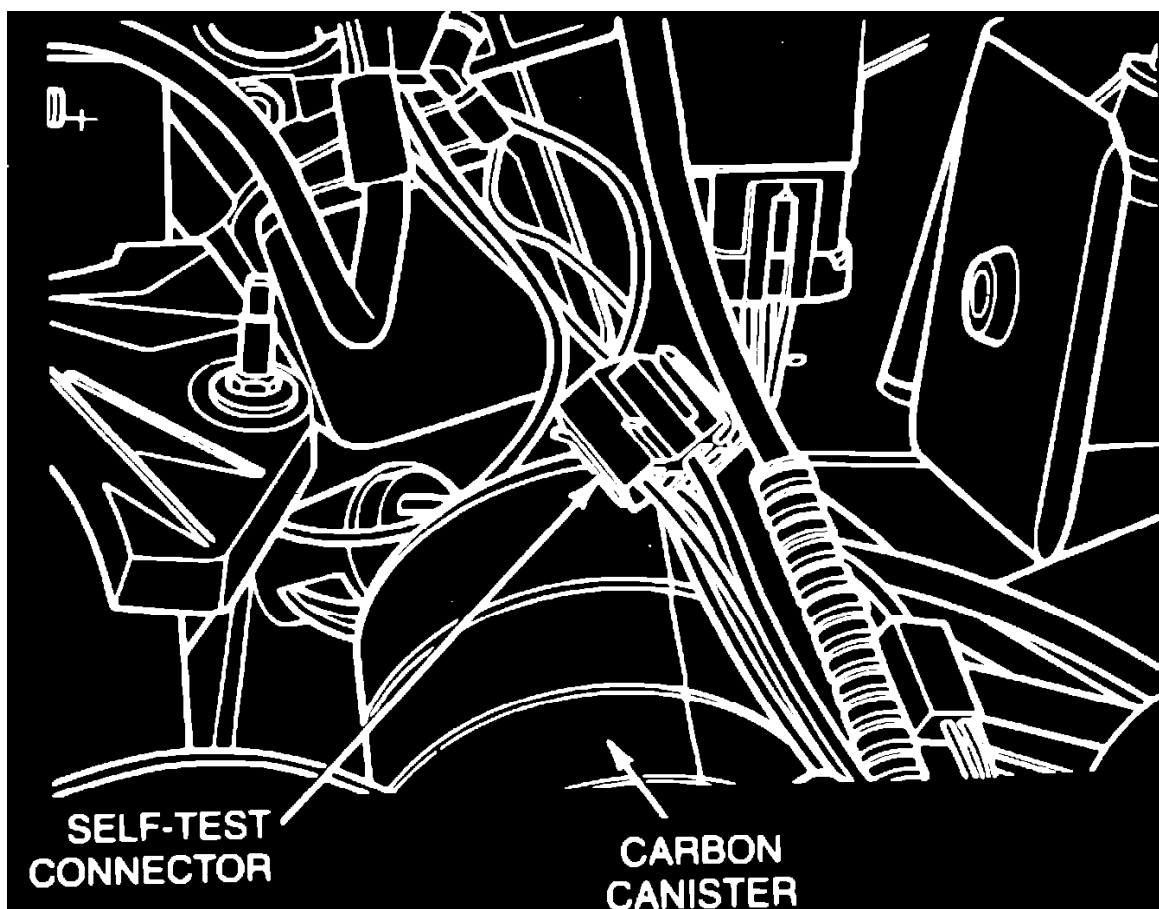
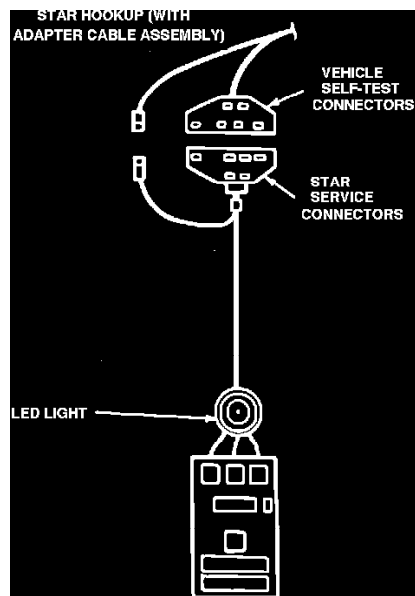
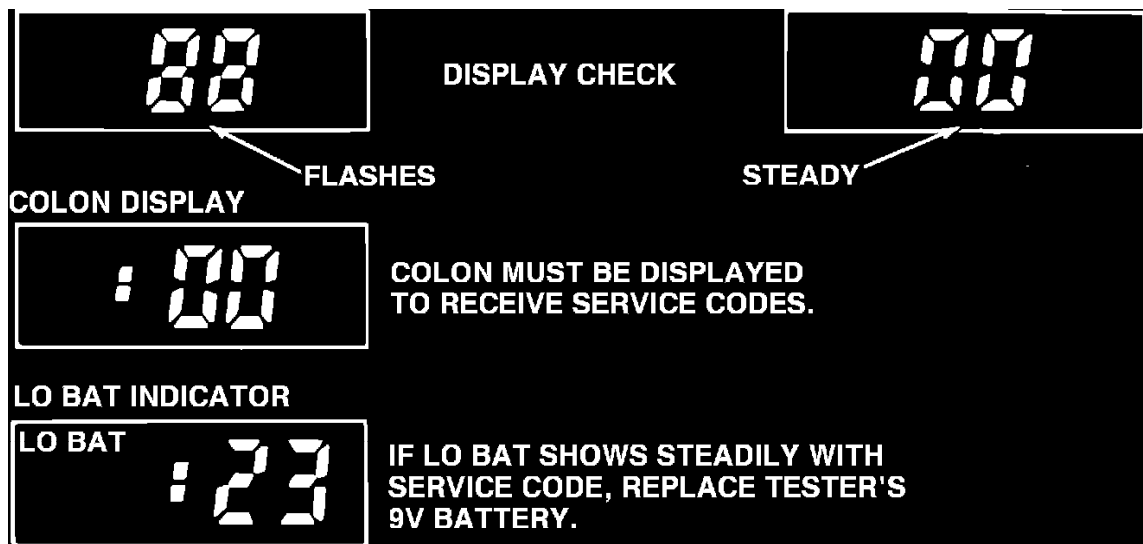


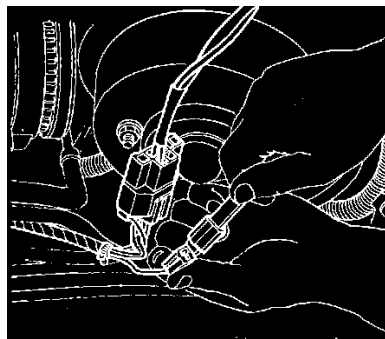
Fig. 17 Self-test connector location. F series



STAR tester &amp; self-test electrical connector assembly



Star Tester Display



Connecting STAR Tester

The self-test connector and tester hook-up is identical on all models. A two piece self-test connector on the vehicle, plugs into a matching two-piece service connector at the end of the STAR/Self-Test adapter cable assembly, **Fig. 13**. To connect the STAR tester proceed as follows:

1. Turn ignition switch to OFF position.
2. Connect the color-coded adapter cable leads on to the STAR tester.
3. Connect the adapter cables two service connectors to the matching self-test connectors on the vehicle, **Fig. 14**.

To check the STAR tester, turn the power switch, located on the right side of the tester to the ON position. The tester will run a display check and the numerals 88 will begin to flash, **Fig. 15**. A steady 00 will then appear to signify that the tester is ready to start the self-test and receive service codes.

# Analog Voltmeter Hook-Up

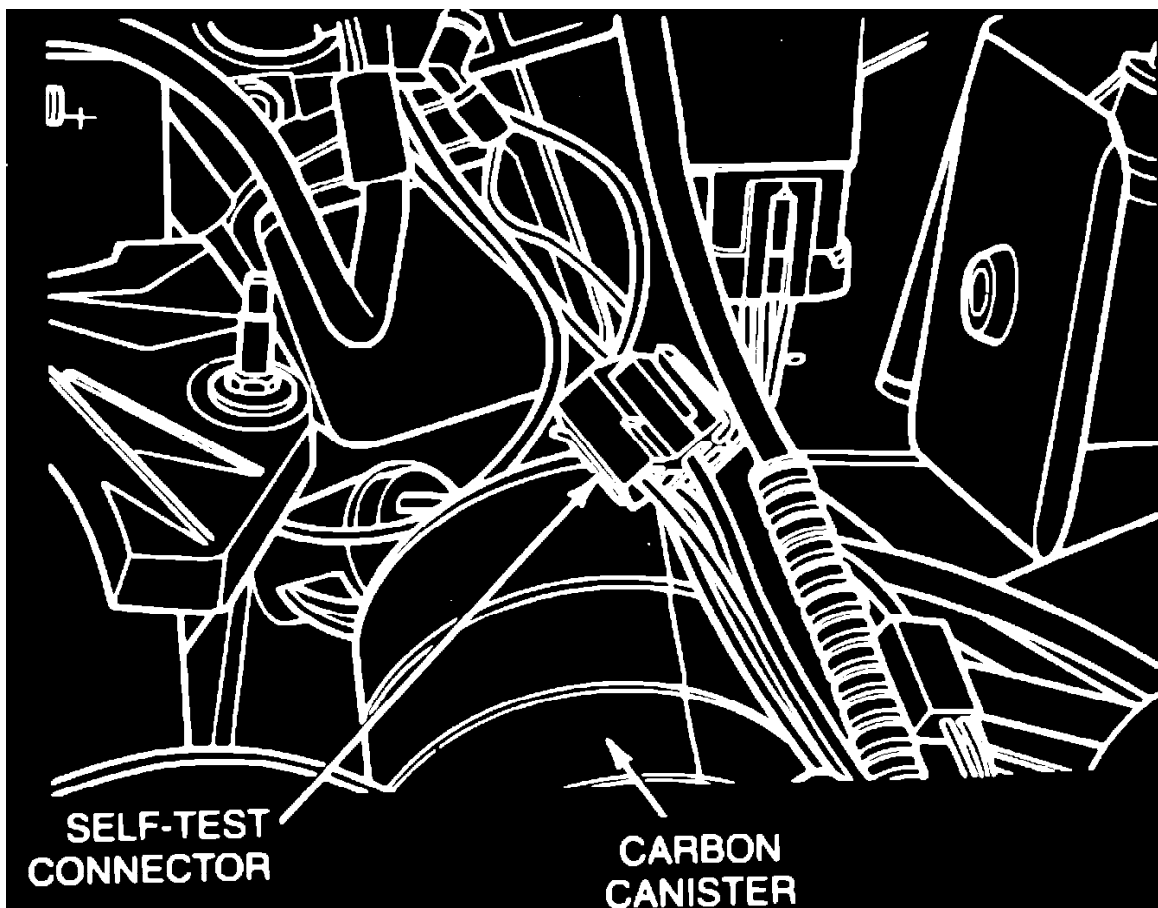


Fig. 17 Self-test connector location. F series

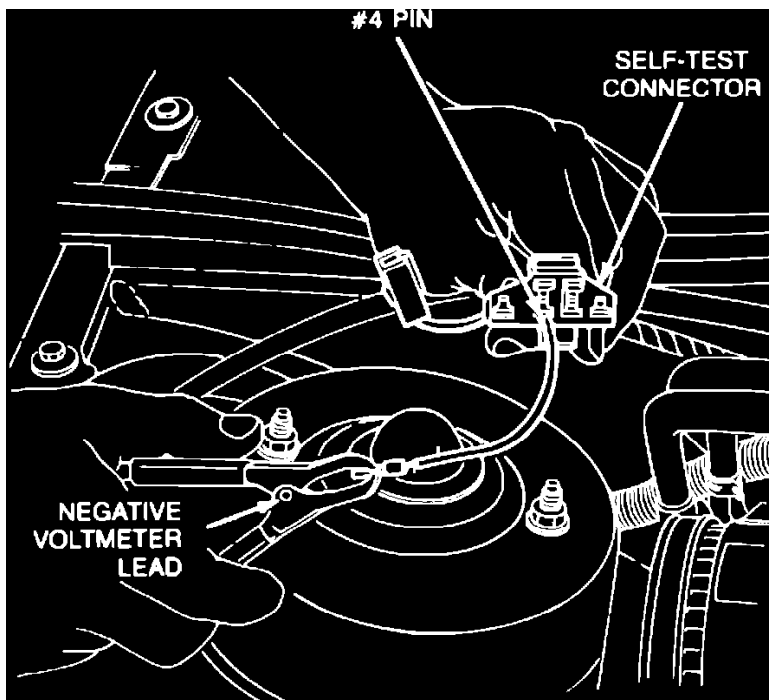


Fig. 19 Clamping negative lead from voltmeter on to other end of jumper wire

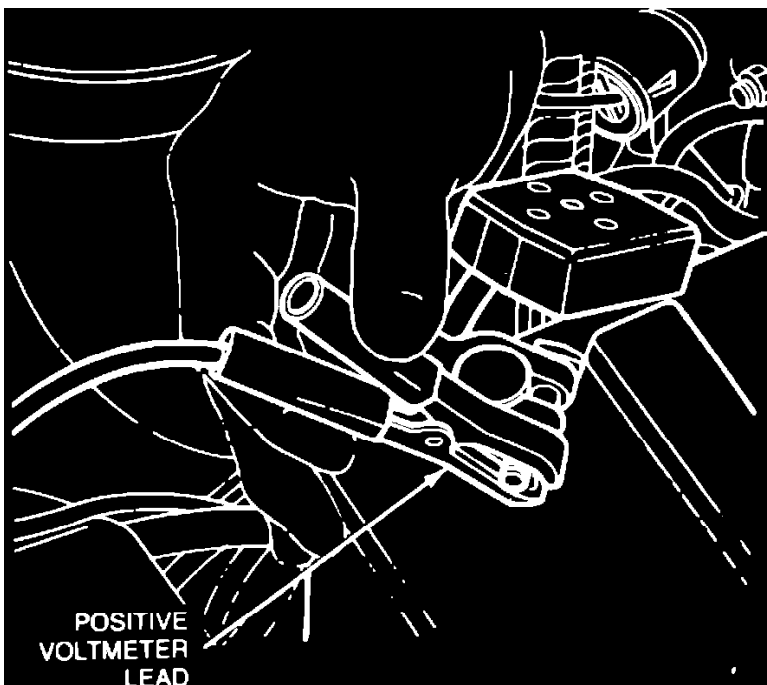


Fig. 20 Clamping positive lead from voltmeter on to battery terminal

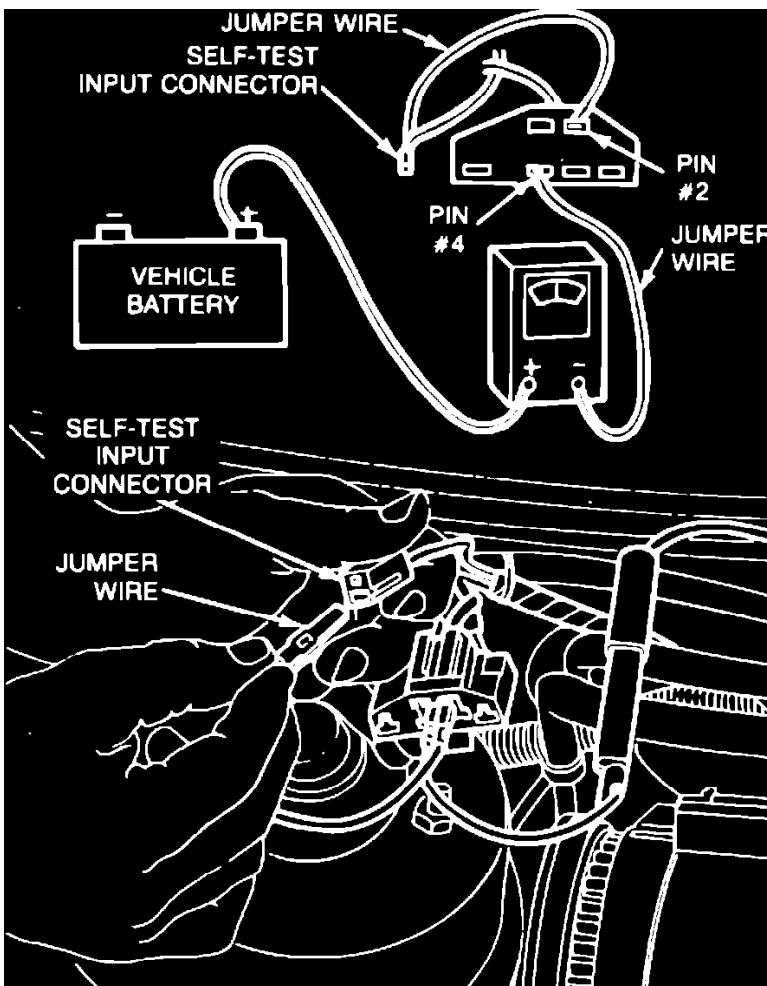


Fig. 21 Inserting 1 end of the second jumper wire into No. 2 pin on self-test connector

To connect the voltmeter on to the self-test connector and proceed as follows:

1. Insert one end of jumper wire into the No. 4 pin on the self-test connector.
2. Clamp negative lead from the voltmeter on to the other end of jumper wire, Fig. 19.
3. Clamp positive lead from voltmeter on to positive battery terminal, Fig. 20.

4. Insert one end of the second jumper wire into No. 2 pin on the self-test connector, and other end into the self-test input connector, **Fig. 21**. The final connection also activates the ECA self-test sequence when the ignition switch is turned to the ON position.

## Timing Light Hook-Up

The timing light is needed to check the computed ignition timing, which is controlled by the ECA. The timing light should be connected to the battery and No. 1 spark plug wire.

## Initial Inspection

Perform thorough underhood inspection. Problems can frequently be resolved at this stage without further testing. Visually inspect the following:

- Vacuum hoses for proper routing, tight connections, splits, kinks, obvious tampering.
  - Vacuum fittings for improperly capped or plugged ports. Be sure to check hidden areas around the throttle body and other components..
- NOTE:** Some manufacturers use an orifice-insert within a vacuum line as a delay device. Do not mistake such a device for tampering and remove it.
- Electronic Engine Control system wiring harness for proper connections, bent or broken pins, corrosion, loose wires, and proper routing.
  - Ignition wires for proper routing, cracking, hardness, and tight connections at distributor, coil, and spark plugs.
  - Electrical wiring and harness connections for tight fit, abrasions, breaks, etc. Ground connections must be clean and tight.
  - Verify that components are properly installed and have not been modified or damaged. Ensure that any replaced components are correct for the application.
  - Check for air or vacuum leaks around intake and exhaust manifolds, throttle body, air flow meter, and air induction hoses.
  - Catalytic converter(s), muffler, exhaust pipes, brackets, and hangers for modification or damage.
  - Engine coolant for proper level and mixture.
  - Transmission fluid level and quality.
  - Engine oil for proper level and quality.

## Pre-Test Inspection

Correct test results for the Quick Test are dependent on the proper operation of related non-EEC components systems. It may be necessary to correct faults in these areas before EEC will pass Quick Test.

Before hooking up any equipment to diagnose the EEC system, make the following checks:

1. Verify the condition of air cleaner and ducting. These components may be removed and reinstalled as necessary for service and/or inspection.
2. Check all engine vacuum hoses for:
  - Leaks of pinched hoses.
  - Proper emission routing per Vehicle Emission Control Information (VECI) Decal.
3. Check the EEC system wiring harness electrical connections for:
  - Proper connections.
  - Loose or detached connectors, wires and terminals.
  - Corrosion.
  - Proper routing of harness.

It may be necessary to disconnect or disassemble the connector assembly to perform some of the inspections. (Note the location of each pin before disassembly.)

4. Check processor, sensors and actuators for physical damage.
5. Perform all safety steps required to start and run operational vehicle tests.
6. Apply the emergency brake. Place shift lever in Park; Neutral for manual transmission.

7. Turn Off all electrical loads such as the radio, lamps, air conditioner, etc. Be sure doors are closed whenever readings are made.

8. Verify engine coolant is at the specified level.

9. Start engine and idle until the upper radiator hose is hot and pressurized and the throttle is off fast idle. While the engine is operating, check for leaks around the exhaust manifold, EGO sensor, and vacuum hose connections.

**NOTE:**

If engine will not start, idles rough or runs rough continue through Quick Test Step 3.0. If any of the above conditions are still present after a pass code 11 in the Key On, Engine Off self-test, go to Pinpoint Test Step A2 for no start or diagnostics.

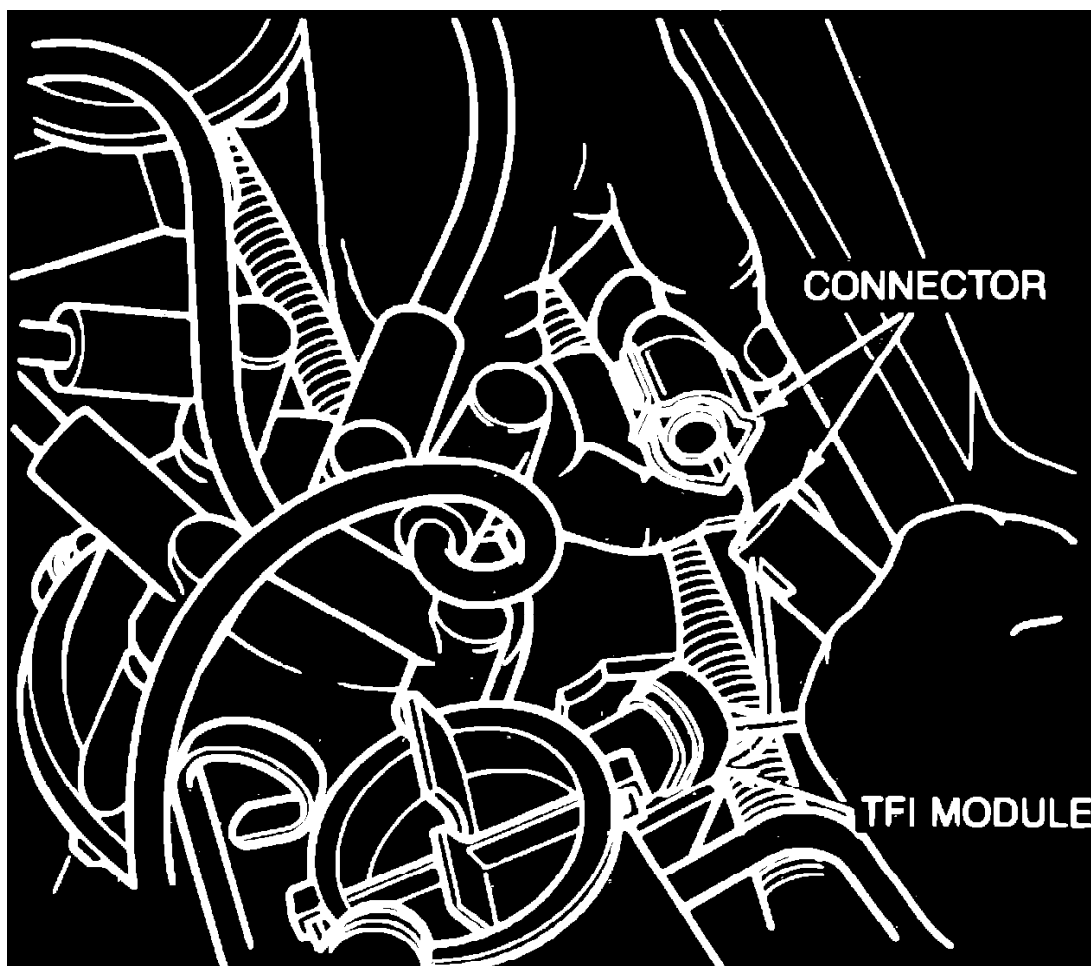
10. Turn ignition Key Off.

11. Service items as required, and proceed to equipment hook-up, Step 2.0.

## With Analog Volt Meter

The computed ignition timing check is performed in the same manner as with the STAR tester, except that the self-test sequence is activated by connecting the jumper wire between the two electrical connectors.

## With Star Tester



**Fig. 33 Checking in-line base timing electrical connector connection**

1. Ensure the in-line base timing electrical connector is securely connected, **Fig. 33**.
2. Start engine. If engine does not start refer to the appropriate Pinpoint Test charts.
3. Depress self-test button on STAR tester. Engine speed should increase. Do not note any codes that appear in the tester display window at this time.
4. Check computed ignition timing as follows:
  - a. Connect a suitable timing light onto engine as described previously.
  - b. With the EEC-IV system in the self-test mode, check ignition timing.

c. Ignition timing obtained should be 20° more than the specified base ignition timing.

d. If computed timing is not 20° more than the base timing, the system must be checked.

5. Deactivate the STAR tester by depressing self-test button. The colon should disappear along with any service codes displayed.

## Code Interpretation

### READING CODE W/ANALOG VOLTMETER

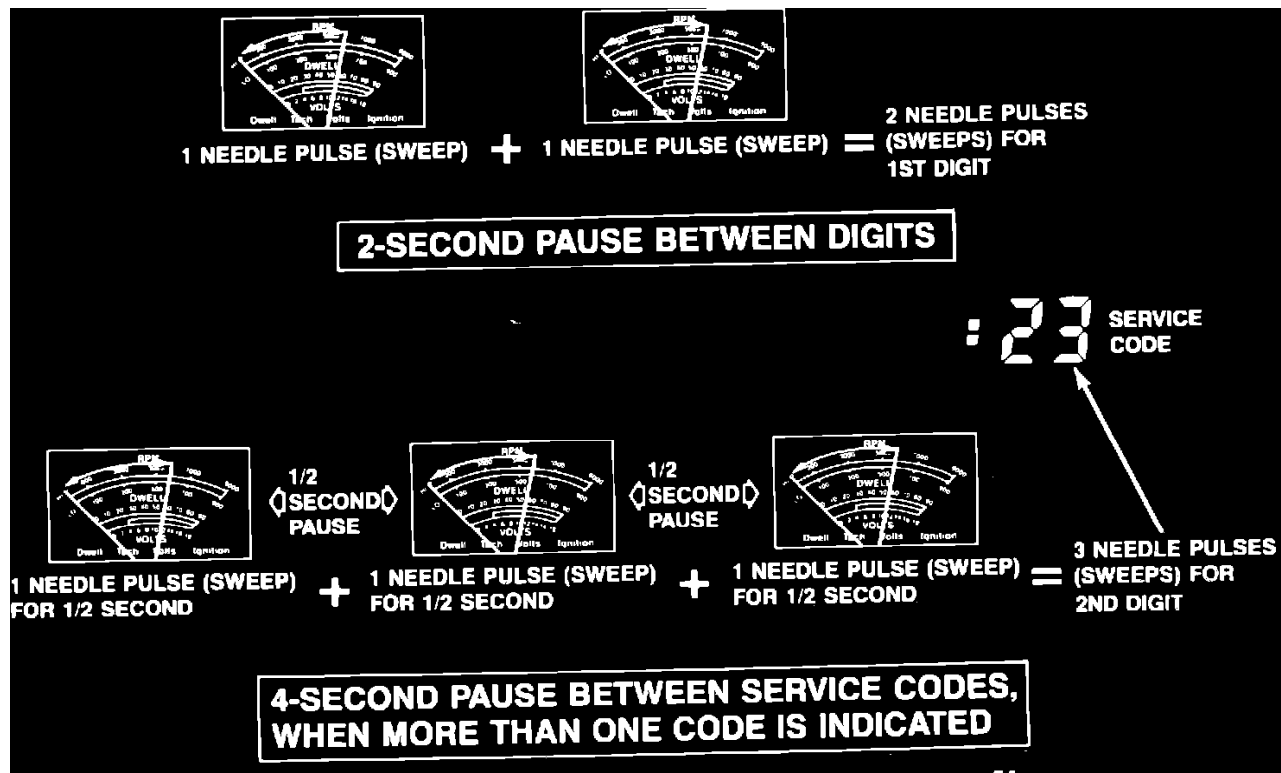
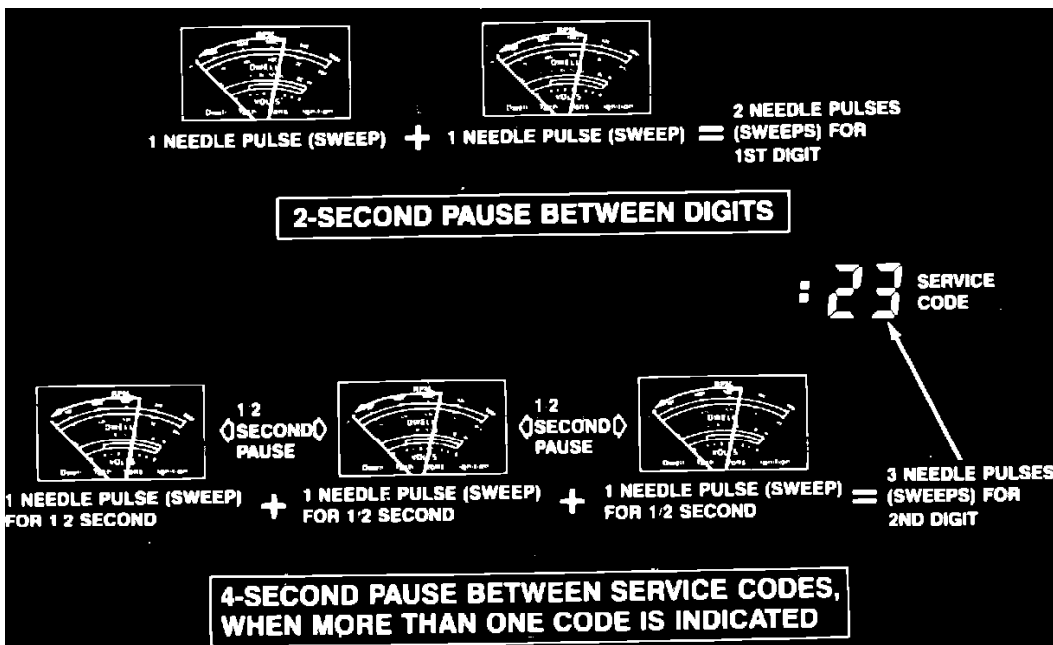


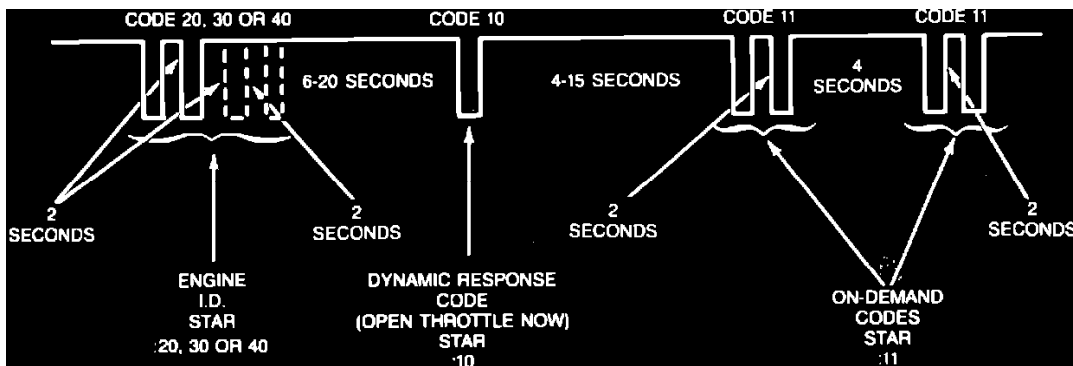
Fig. 28 Code interpretation using analog voltmeter

When a service code is reported on the analog voltmeter for a functional test, it will represent itself as a pulsing or sweeping movement of the voltmeter's needle across the dial face, **Fig. 28**. A single digit of three will be reported by three needle pulses (sweeps). However as previously stated, a service code is represented by a two digit number, such as 2-3. The self-test service code of 2-3 will appear on the voltmeter as two needle pulses (sweeps), then after a two second pause, the needle will pulse (sweep) three times. The continuous testing codes are separated from the functional codes by a six-second delay, a single half-second sweep and another six-second delay. They are produced on the voltmeter in the same manner as the functional codes.

## Engine Running Test



Code interpretation using analog voltmeter



Engine running test output codes

1. Start and operate engine at approximately 1500 RPM for 2 minutes to allow EGO sensor to reach normal operating temperature.
2. Turn ignition switch to OFF position and insert jumper wire as shown in Fig. 25, and wait 10 seconds.
3. Start engine, if system checks out satisfactorily for hard faults, service codes should be as follows:
  - a. Voltmeter needle should sweep two, three or four times without a pause, depending on the number of cylinders in the engine, Fig. 35.
  - b. Next, the voltmeter needle sweeps once after a six to twenty second pause. This is the dynamic response code.
  - c. After a four to fifteen second pause (to momentarily place the throttle in a wide open position) the voltmeter needle will fluctuate from zero to three volts for the fast codes.
  - d. Finally the voltmeter needle will sweep twice (with a two second pause in between the sweeps) representing another code 11. After four seconds this code will be repeated.

**Key On Engine Off (KOEO) Self Test**

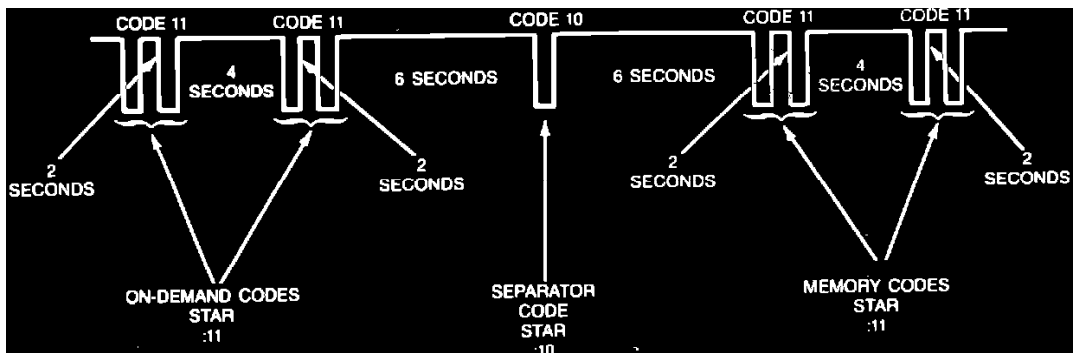


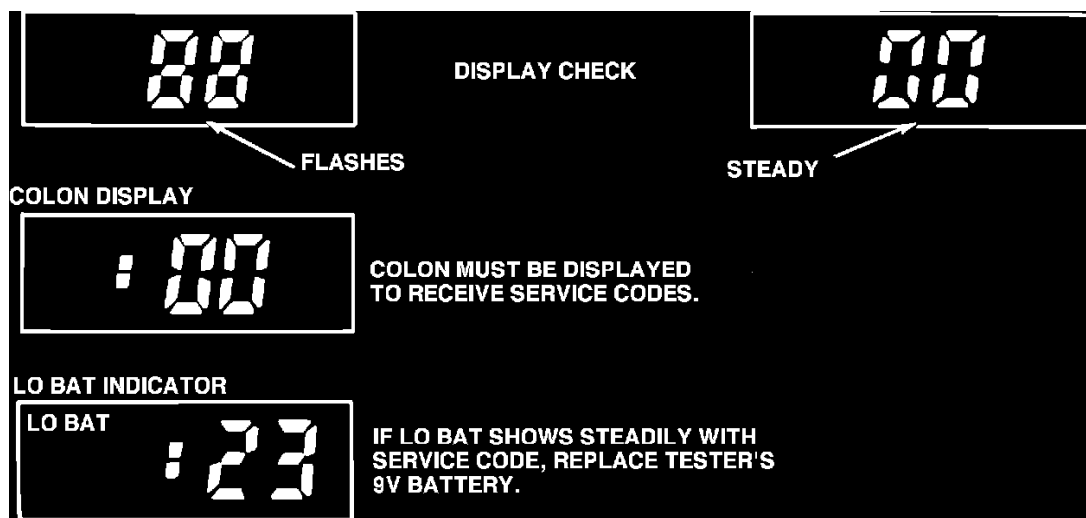
Fig. 34 Key ON/Engine OFF self-test output codes

1. Connect voltmeter onto engine as described previously.
2. Set voltmeter to the 0 to 15 volt scale.
3. Connect jumper wire from the No. 2 pin on the self-test connector to the self-test input connector.
4. Turn ignition switch to ON position.
5. With the system inputs satisfactory for hard and/or intermittent faults, service codes obtained will be as follows:
  - a. Voltmeter will fluctuate from zero to three volts for the fast codes.
  - b. The voltmeter sweeps twice, with a two second pause in between, representing a code 11. The code 11 will be repeated once.
  - c. A six second pause is next, followed by a single sweep of the voltmeter needle representing the separator code. Another six second pause follows the separator code.
  - d. Finally the code 11 will be represented twice, with a four second pause. Refer to **Fig. 34** for Key ON/Engine OFF self-test output code.

## Code Interpretation

Prior to conducting the self-test, a preliminary check-out and vehicle preparation should be performed, test equipment must be connected and functioning properly.

### READING CODES W/SELF-TEST AUTOMATIC READOUT (STAR) OR EQUIVALENT



#### Checking STAR tester

After connecting the STAR tester as described previously and turning power switch to ON position, the tester will indicate a display check and the numerals 88 will begin to flash, **Fig. 17**. A steady 00 will then appear, signifying that the STAR tester is ready to start the self-test procedure and receive the test service codes.

To receive the service codes, press the button at the front of the STAR tester. The button will stay down and a colon will appear in the display window in front of the 00 numerals. The colon must be displayed to receive the service codes. To clear the display window during the self-test, turn ignition switch to OFF position and press tester button once (colon will disappear), then press tester button down again (colon will appear). Every time the STAR tester is turned OFF, the low battery indicator (LO BAT) should show briefly at the upper left corner of the display window. If the LO BAT indicator shows steadily at any other time during the operation of the STAR tester with any service code, turn power switch to OFF position and replace tester's 9 volt battery.

The STAR tester will display the last service code received, even after disconnecting it from the vehicle. It will retain the service code on the display until the power is turned OFF or the button is released, and then pushed down again.

## Engine Running Test

1. Start and operate engine at approximately 1500 RPM for 2 minutes to allow EGO sensor to reach normal operating temperature.
2. Turn ignition switch to OFF position and depress self-test button on STAR tester. The colon should appear in the tester display window.
3. Wait approximately 10 seconds, then start engine.
4. The first code to appear in the display window should be an engine identification code (20, 30 or 40).
5. After the engine identification code has appeared, the next code (dynamic response code 10) will appear. Within 15 seconds of receiving a code 10, momentarily place throttle in wide open position, then quickly allow throttle to return to idle position.
6. After the code 10 appears, the fast codes will follow. The fast codes will be viewed only as a slight flicker of the LED on the STAR tester. If the throttle is not momentarily placed in the wide open position within 15 seconds from the time the dynamic response code appears and quickly returned to idle, a code 77 will be displayed. Refer to Self-Test Service Codes.
7. If the system checks out satisfactorily for hard faults, a code 11 (system pass) will appear in the display window. This code indicates that there are no hard faults in any of the system outputs. This part of the self-test does not check for intermittent faults.
8. Any other codes displayed should be noted. These codes indicate that a hard fault in one or more of the system outputs exists. Repeat this test to

verify that these codes exist.

9. Compare service codes obtained during this part of the self-test to the codes listed previously. Repair all hard faults as required.
10. Repeat Key ON/Engine OFF test part if intermittent faults were detected. Repair intermittent faults at this time.

## Key On/Engine Off Test

1. Turn power switch on the side of the STAR tester to ON position.
2. Depress button in the center of the tester. A colon should appear in the left side of the display window.
3. Turn ignition switch to ON position. The red LED light on the tester should come ON.
4. If the LED light does not come ON, there is an open circuit within the EEC-IV system. Ensure that all electrical connectors are secure. If the LED still does not come ON, the ECA will indicate the open circuit as a hard fault (malfunction) during the self-test procedure. If the LED comes ON when tightening or wiggling the harness or electrical connectors, the ECA will indicate the open circuit as an intermittent fault during the self-test procedure. Prepare to note the service codes as a reference. The LED light on the STAR tester will flash ON and OFF as the service codes are generated by the ECA.
5. If the system inputs are satisfactory for hard faults (malfunctions), the first code to appear in the tester window will be the numeral 11 (system pass). Any other codes that may appear before the separator code (10) should be noted. The codes indicate that a hard fault (malfunction) exists in one or more of the system inputs.
6. A separator code (10) will appear in the tester window when the ECA has stopped checking for malfunctions.
7. If system inputs are satisfactory for intermittent faults, the numeral 11 will appear in the tester display window after the separator code (10). Any other codes that appear should be noted. These codes indicate there is an intermittent fault stored in the ECA's memory. The last code to appear in the tester display window will remain there until the tester is de-activated.
8. Compare service codes obtained in this test to the codes listed previously. Do not attempt to repair intermittent faults until after the engine running test has been performed. Repair all hard faults first, then, repair the intermittent faults. Repeat this test if service codes obtained indicate hard and/or intermittent faults exist in the EEC-IV system.

## Code Interpretation

The Super Star II tester has the ability to read fast codes as well as slow codes, while a built-in self test memory will retain codes as they are received. After installation of the Super Star II tester, turn power On. The display will briefly illuminate 888, all the prompts on the left side of the display will illuminate and the speaker will beep. The tester is ready when both the STI-LO and STO-LO are on and the display is blank.

## Key On Engine Off Self Test

1. Connect tester to vehicle self-test connector.
2. Position select switch to EEC-IV system.
3. Select fast code mode or slow code mode.
4. Turn tester power On.
5. Turn vehicle ignition On.
6. Depress test button on tester to test position.
7. Read self test codes.

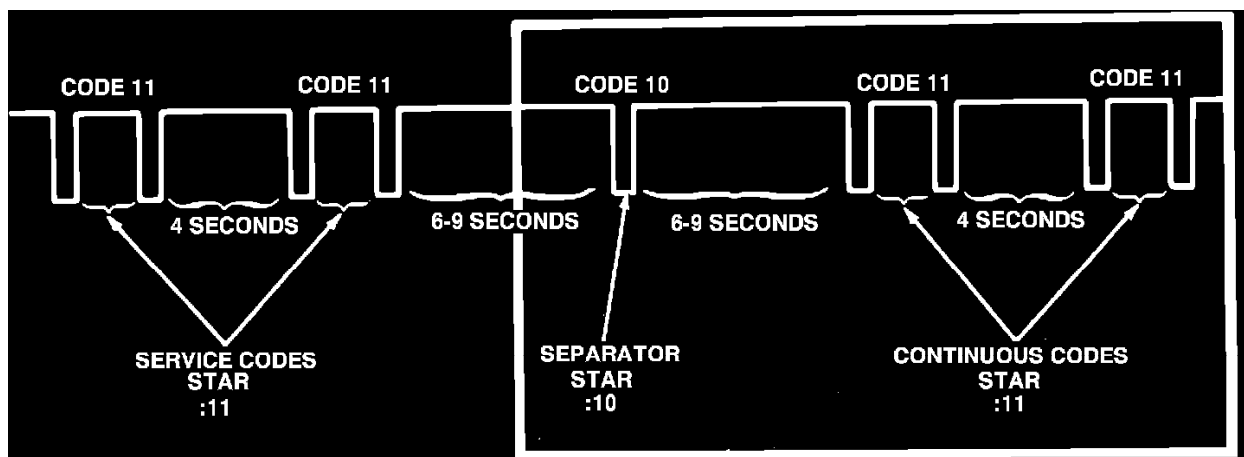
## Key On Engine Running Self Test

1. Connect tester to vehicle self test connector.
2. Position select switch to EEC-IV system.
3. Select fast code mode or slow code mode.
4. Turn tester power On.
5. Turn vehicle ignition On.
6. Run engine until normal operating temperature is obtained.
7. Turn engine Off.
8. Start engine, then depress test button on tester to test position.
9. Read engine I.D. codes, then on some models a dynamic response code, then the service codes.

## Brake On/Off Switch Test

On vehicles equipped with the brake on/off switch (BOO), the brake pedal must be depressed and released after the ID code. This tests the ability of the EEC-IV system to detect a change of state in the brake on/off switch.

## Continuous Monitor Test



**Fig. 32 Self-test code output format. Continuous monitor test**

The continuous monitor test service codes are separate from the Quick Test Key ON/Engine OFF codes by a single separator pulse, **Fig. 32**. The continuous monitor codes should never be used for diagnosis until the Key ON/Engine OFF and Engine Running tests result in a pass code 11. The service codes that were displayed (repeated) in both the continuous monitor and engine running test are considered repaired. The unique service code(s) displayed only in continuous monitor test are considered the intermittent service codes. During this mode of testing, inputs to the processor for circuit opens or shorts are monitored. The continuous monitor test codes must be retrieved within 20 engine temperature warm up cycles. On the twenty first engine temperature cycle, the service code will be automatically erased. The continuous monitor codes can also be erased by deactivating quick test, while the service codes are being outputted.

The continuous monitor test is intended as an aid in diagnosing intermittent failures in the sensor input circuits. The self-test output is energized whenever the continuous memory mode senses a fault and de-energized when the system is satisfactory. To enter the Key ON/Engine OFF continuous monitor test, verify that the self-test is not activated and then turn the ignition switch to RUN position. The self-test output will be activated whenever a continuous fault is detected and if the duration is long enough, a fault will be stored. The Engine Running continuous monitor test mode is entered approximately 2 minutes after the service codes from the Engine Running portion of the quick test. The Engine Running test can only be entered once per ignition cycle. An alternate quick method (eliminates waiting for self-test to complete its cycle) is to enter the running test, stop, and re-enter (do not switch ignition OFF). The continuous monitor test provides a means of entering this mode of self-test and no attempt to re-create the intermittent failure (tap, wiggle the harness and/or the suspected sensor). If the volt-ohmmeter/STAR tester indicates a fault (short or open circuit) the corresponding service code will be stored. Proceed with the following example on how to use the continuous test systematically.

If a service code 51 was displayed (engine coolant temperature sensor), proceed as follows:

1. Visually inspect the sensor closely.
2. Enter the continuous monitor test, then lightly tap on the sensor.
3. Push and/or pull on the sensor harness electrical connector (do not disconnect).
4. Test, then wiggle (shake) harness vigorously working from the sensor connector toward the dash panel from the dash panel to the processor. Work in short sections.
5. If the volt-ohmmeter has not given a positive indication of an intermittent fault, carefully disconnect sensor from harness connector. Remove terminals from connector. Inspect terminals at both ends for corrosion, bad crimps and improperly seated terminals.
6. After inspection connect harness connector on to sensor.
7. Disconnect processor from harness.
8. Inspect terminals, then remove terminals only associated with the sensor being inspected.
9. If the volt-ohmmeter does not give a positive intermittent fault indication, connect and erase the continuous test service codes.
10. To erase the service codes, proceed as follows:
  - a. Initiate Key ON/Engine OFF self-test.
  - b. Remove jumper wire from self-test input terminal as soon as the first service code is received (even if an 11 is the first code).
  - c. Repeat self-test with the jumper wire to verify service codes have been erased.

## Engine Running Test

At this time, a test of the EEC-IV system is conducted with the engine running. The sensors are checked under actual operating conditions and at normal operating temperature.

## Key-On/Engine Off

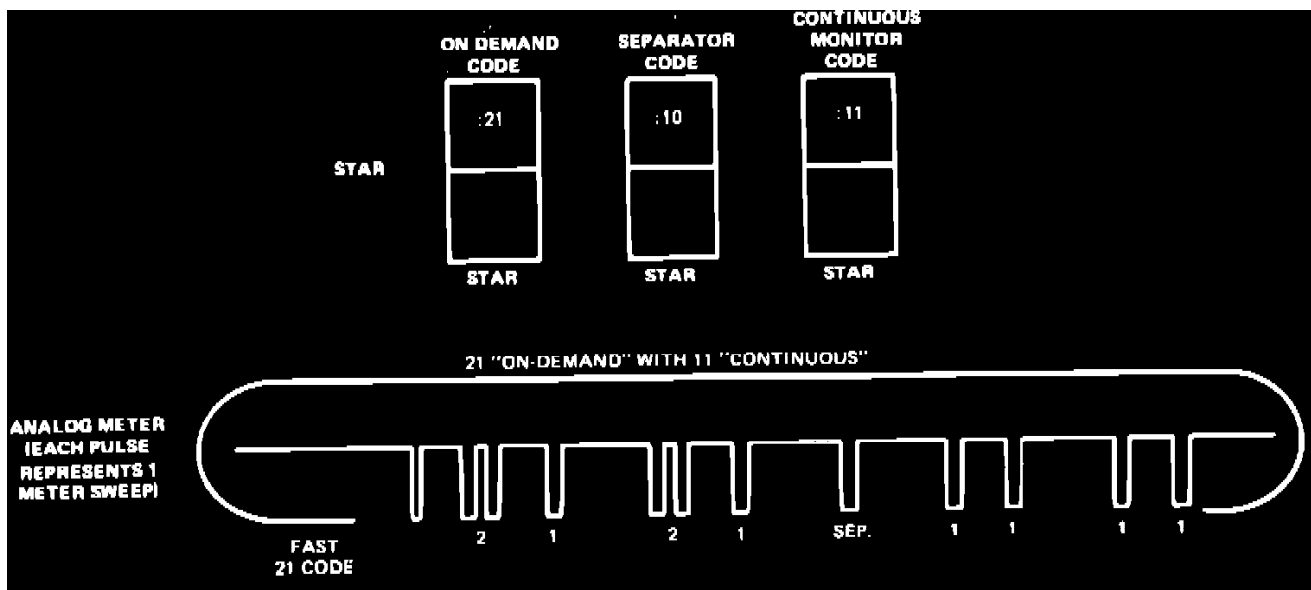


Fig. 26 Self-test code output format. Key ON/Engine OFF

At this time, a test of the EEC-IV system is conducted with the power applied and the engine OFF. For self-test to detect errors in this test, the fault must be present at the time of testing Fig. 26. For intermittent errors, refer to Continuous Test.

### Power Steering Pressure Switch Test

On vehicles equipped with a power steering pressure switch, the steering wheel must be turned one-half turn and released after the ID code. This tests the ability of the EEC-IV system to detect a change of state in the power steering pressure switch.

### Service Code Output Format

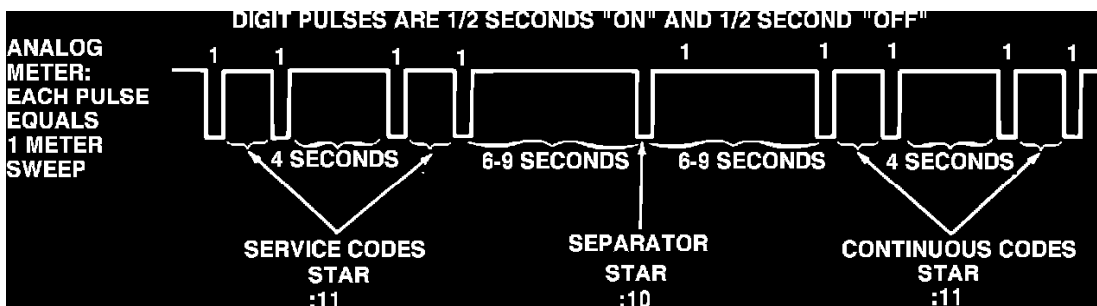


Fig. 22 Service code format

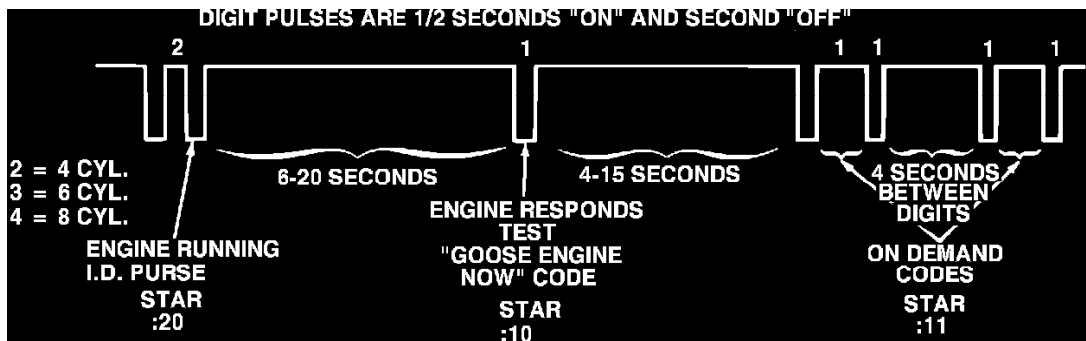
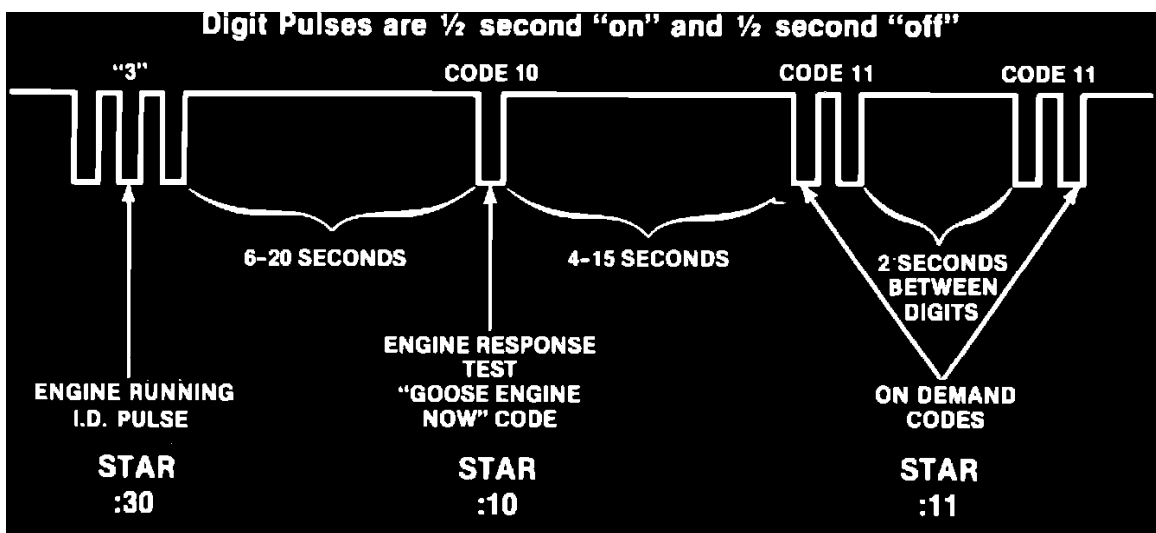


Fig. 23 Time pulse format. Except V6-171 engine



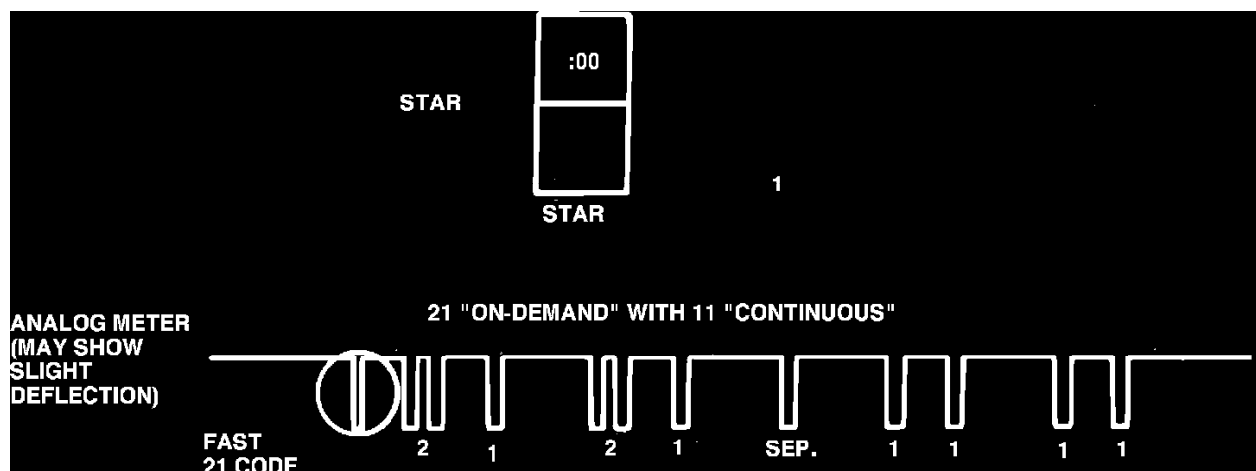
**Fig. 24 Time pulse format. V6-171 engine**

The EEC-IV system transmits its information by the use of the self-test service codes. These service codes are two digit numbers representing the results of the self-test. The service codes are transmitted on the self-test output (found in the self-test electrical connector) in the form of time pulses, and read by the use of a voltmeter or a STAR tester.

The pulse format is (refer to **Figs. 22, 23 and 24**) as follows:

1. One-half second on-time for each digit.
2. Two seconds off-time between digits.
3. Four seconds off-time between codes.
4. Six to nine seconds off-time before and after the half-second separator pulse.

## Fast Codes Description



**Fig. 27 Self-test code output format. Fast Codes**

Fast codes are given prior to regular service codes. These codes contain the identical information as the regular service codes but are transmitted at 100 times the normal rate, **Fig. 27**. These codes should be ignored.

## Continuous Memory Diagnostic Test Codes Description

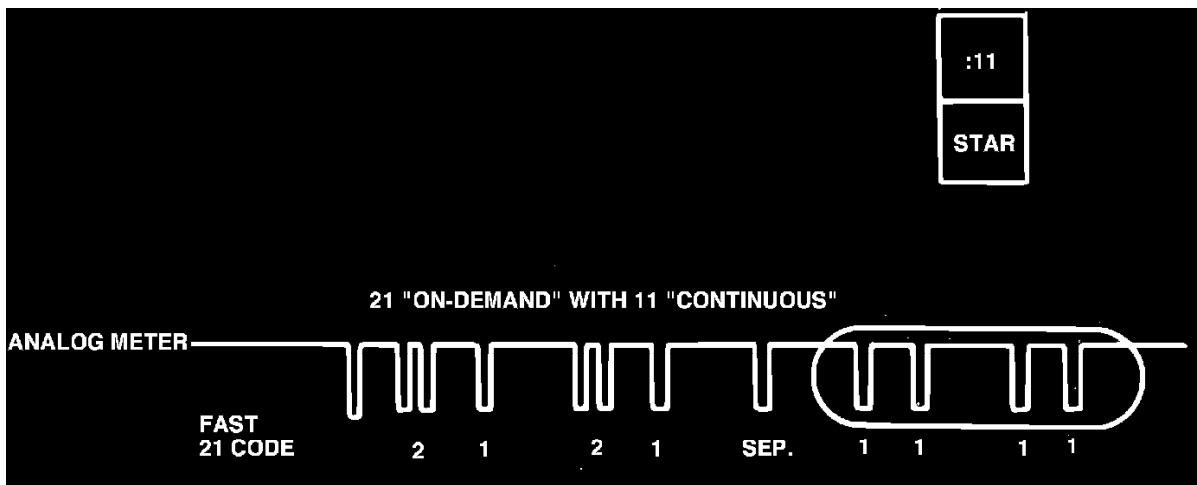


Fig. 29 Self-test code output format. Continuous codes

The continuous codes are issued as a result of information stored (memory codes) during continuous monitor testing, while the vehicle was in normal operation. These codes are displayed only during the Key ON/Engine OFF testing and after the separator codes, Fig. 29.

### Dynamic Response (Goose) Code Description

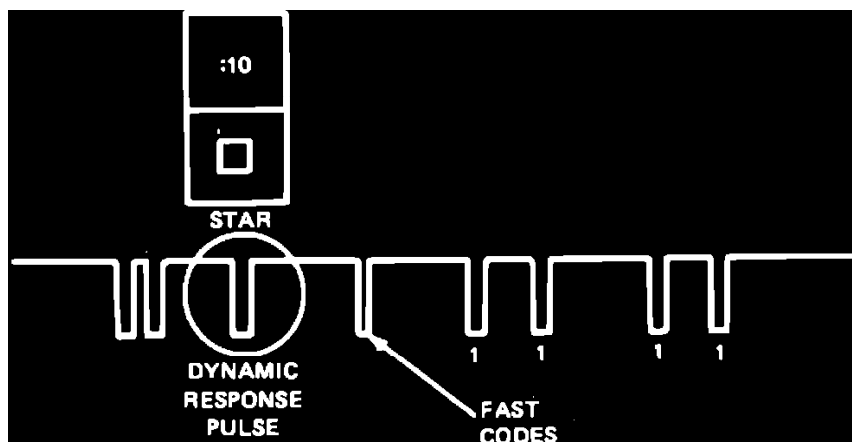


Fig. 31 Self-test code output format. Dynamic response check

The dynamic response check verifies the movement of the TP, VAF and MAP sensors during the brief wide open throttle application performed during the engine running test. The signal for the test is a single pulse (on voltmeter) or code 10 on the STAR tester, Fig. 31.

### Engine ID Code Description

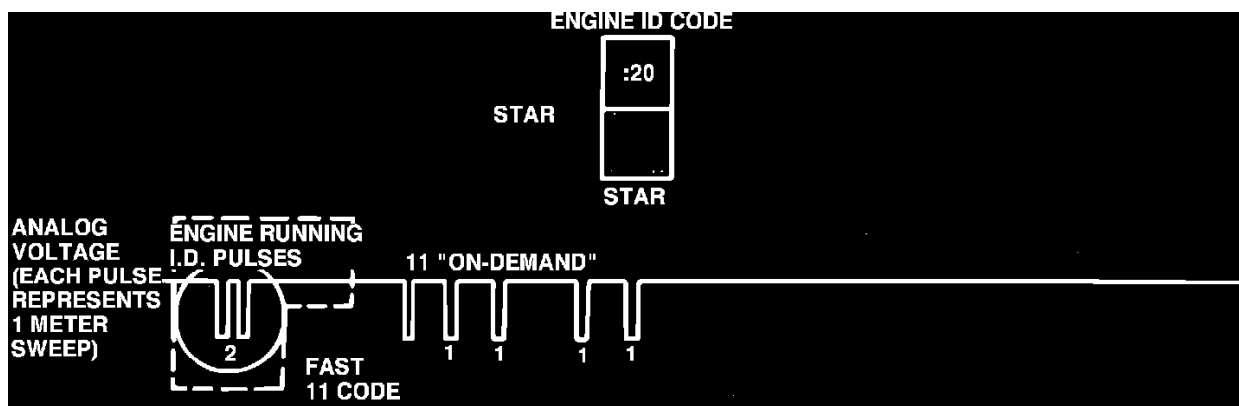
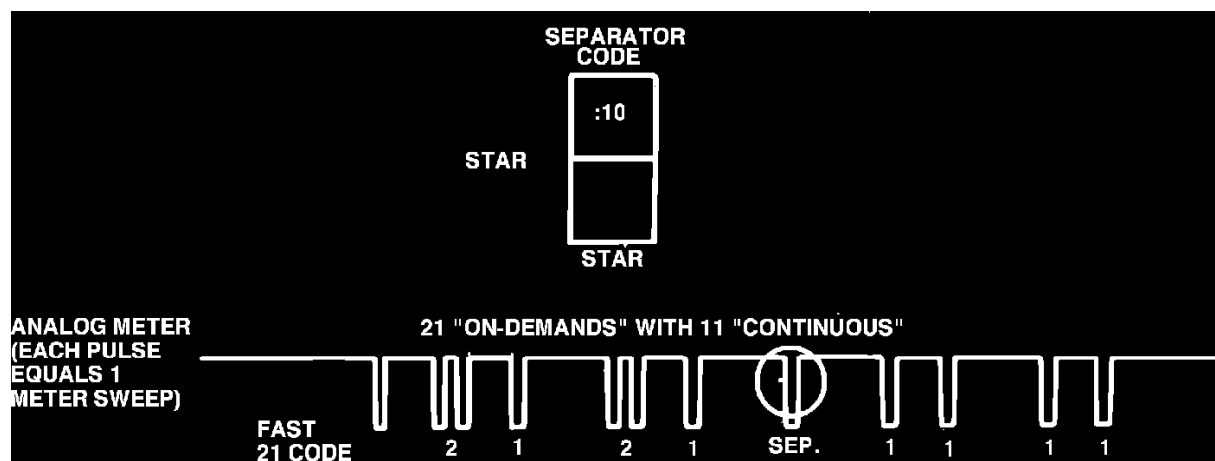


Fig. 30 Self-test code output format. Engine identification codes

Engine identification codes are issued at the beginning of the engine running test and are one digit numbers represented by the number of pulses transmitted. The engine identification code is equal to the number of engine cylinders when the number is multiplied by two and the zero dropped.

These codes are used to verify that the proper processor is installed and that the self-test has been entered, **Fig. 30**.

## Separator Pulse Description



**Fig. 28** Self-test code output format. Separator pulse

A single 1/2 second separator pulse is issued 6 - 9 seconds after the last functional test code (Key ON/Engine OFF only). Then 6 - 9 seconds after the single 1/2 second separator pulse, the continuous codes will be issued, **Fig. 28**.

## QUICK TEST: Visual Check Vehicle Preparation

**1.0**

### SPECIAL NOTES:

- Correct results of the QUICK TEST are dependent on the proper operation of related non-EEC-IV components.
- It may be necessary to disconnect or disassemble harness connector assemblies to do some of the inspections. Pin locations should be noted before disassembly.
- If the engine will not start, starts but stalls, idles rough, or runs rough; continue through QUICK TEST STEP 3.0 and follow the instructions in Step 3.0B.

### VISUAL CHECK

1. Inspect the air cleaner and inlet ducting.
2. Check all engine vacuum hoses for damage, leaks, cracks, blockage, proper routing, etc.
3. Check EEC-IV system wiring harness for proper connections, bent or broken pins, corrosion, loose wires, proper routing, etc.
4. Check the processor, sensors and actuators for physical damage.
5. Check the engine coolant for proper level.
6. Make all necessary repairs before continuing with QUICK TEST.

### VEHICLE PREPARATION

1. Perform **ALL** safety steps required to start and run vehicle tests - apply parking brake, place shift lever firmly into PARK position (NEUTRAL on manual transmission), block drive wheels, etc.
2. Turn off **ALL** electrical loads — radios, lights, A/C-heater blower fans, etc.
3. Start engine and run until at operating temperature.
4. Turn engine off and proceed to QUICK TEST STEP 2.0.

### Quick Test 1.0 - Visual Check, Vehicle Preparation

## QUICK TEST: Equipment Hookup

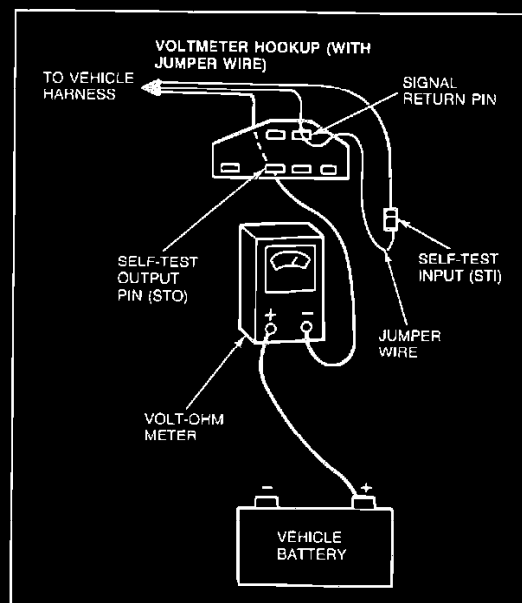
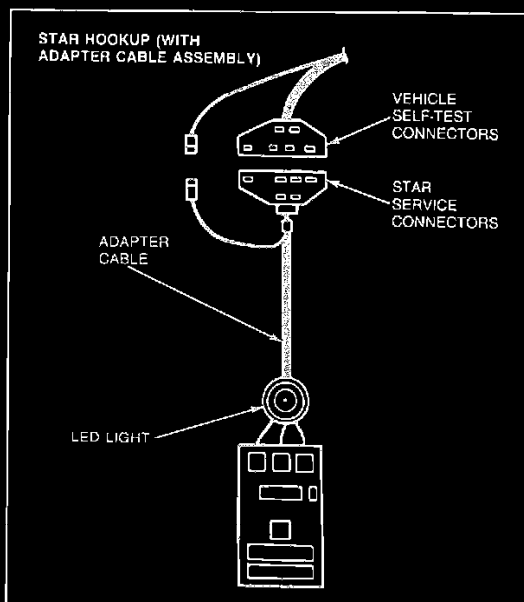
# 2.0

### SPECIAL NOTES:

- Refer to the illustrations for Self-Test connector pin orientation and VOM and STAR hookup.
- After the equipment is properly hooked up, proceed to QUICK TEST STEP 3.0A.

### USING THE STAR TESTER

1. Turn the ignition key off.
2. Connect the color coded adapter cable to the STAR tester.
3. Connect the adapter cable leads to the proper Self-Test connectors.
4. Connect the timing light.



### USING AN ANALOG VOLT/OHM METER (VOM)

1. Turn the ignition key off.
2. Set the VOM on a DC voltage range to read from 0 to 15 volts.
3. Connect the VOM from the Battery + terminal to the Self-Test Output pin of the large Self-Test connector.
4. Connect the timing light.

## QUICK TEST: Equipment Hookup

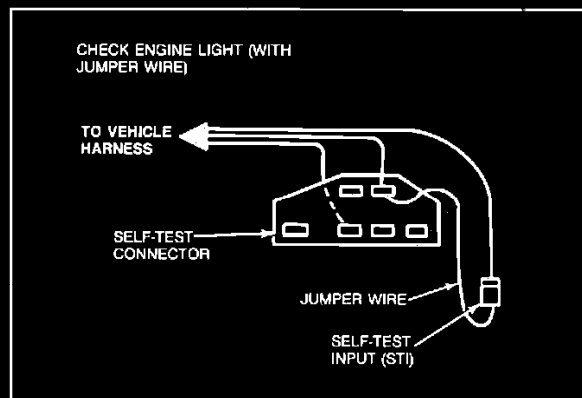
**2.0**

### USING THE "CHECK ENGINE" LIGHT (MIL)

No special equipment hookup is required.

### USING THE MESSAGE CENTER ON CONTINENTAL APPLICATIONS ONLY

No special equipment hookup is required.



### Quick Test 2.0 - Equipment Hookup (Continued)

### 3.0A - Performing the Key On Engine Off Self-Test

## QUICK TEST: Key On Engine Off Self-Test

**3.0****A** PERFORMING THE KEY ON ENGINE OFF SELF-TEST**SPECIAL NOTES:**

- It may be necessary to service non-EEC-IV faults before running Quick Test.
- Continuous Memory Codes recorded in this step will be used for diagnosis in Step 6.0 after a PASS code 11 is received in both the Key On Engine Off and the Engine Running Self-Tests.
- Deviation from this procedure may cause the output of false codes.
- Refer to Quick Test for further information on how to read code output.
- On all vehicles equipped with a **2.5L or 4.9L ENGINE**, the clutch must be depressed during the Key On Engine Off Self-Test.
- On all vehicles equipped with a **7.3L DIESEL ENGINE**, the throttle must be depressed (WOT) during the entire Key On Engine Off Self-Test.

**HOW TO RUN THE KEY ON ENGINE OFF SELF-TEST****DO**

- Verify that the vehicle has been properly prepared according to **QUICK TEST STEPS 1.0** and **2.0**.
- **Activate Self-Test.**
- Place ignition key in the **ON** position.
- For **7.3L Diesel** vehicles only, depress the throttle.
  - STAR Tester: Latch the center button in the down position.
  - Analog VOM: Jumper STI to SIG RTN at the Self-Test connectors.
  - "Check Engine" Light (MIL): Jumper STI to SIG RTN at the Self-Test connectors. Service Codes will be flashed on the "Check Engine" Light.
  - Message Center (Continental Applications Only): Refer to Self-Test.
- Record all service codes displayed.
- Go to part **B** of Key On Engine Off Self-Test.

**DON'T**

- Depress throttle during Key On Engine Off Self-Test on gasoline engine applications.

**Quick Test 3.0A - KOEO Self-Test**

\*\*\* UPDATED BY TSB #8918A10 09-15-89

**3.0B - Key-On, Engine-Off Self-Test (Codes)**

## QUICK TEST: Key On Engine Off Self-Test

3.0

B CODE OUTPUT				
Key On Engine Off	Separator	Continuous Memory	ACTION TO TAKE	
11	—	1(0)	— 11	<ul style="list-style-type: none"> <li>• Both tests indicate a PASS.               <ul style="list-style-type: none"> <li>— If engine idles rough or runs rough, Go to Pinpoint Test Step <b>S2</b>. If this symptom is not present, Go to QUICK TEST STEP 4.0 (except for 7.3L Diesel, Go to Quick Test Step 5.0).</li> <li>— If engine is a no start, Go directly to Pinpoint Test Step <b>A1</b>.</li> </ul> </li> </ul>
ANY CODE(S)	—	1(0)	— 11	<ul style="list-style-type: none"> <li>• Key On Engine Off Self-Test indicates a FAULT.               <ul style="list-style-type: none"> <li>— Go to part C of Key On Engine Off Self-Test.</li> <li>— Always start with the first code displayed.</li> </ul> </li> </ul>
11	—	1(0)	— ANY CODE(S) EXCEPT 15, 19, 28, 45, 46, 48, 49, 50, 56, 62, 66, 67, 69, 88 or 99	<ul style="list-style-type: none"> <li>• Continuous Memory indicates a FAULT.               <ul style="list-style-type: none"> <li>— DO NOT SERVICE CONTINUOUS MEMORY CODES AT THIS TIME.</li> <li>— If engine idles rough or runs rough, Go to Pinpoint Test Step <b>S2</b>. If this symptom is not present, Go to QUICK TEST STEP 4.0.</li> <li>— REFER TO CODE OUTPUT for appropriate vehicle application and direction.</li> </ul> </li> </ul>
ANY CODE(S)	—	1(0)	— ANY CODE(S)	<ul style="list-style-type: none"> <li>• Both tests indicate a FAULT.               <ul style="list-style-type: none"> <li>— DO NOT SERVICE CONTINUOUS MEMORY CODES AT THIS TIME.</li> <li>— Go to part C of Key On Engine Off Self-Test.</li> <li>— Always start with the first code displayed.</li> </ul> </li> </ul>
11	—	1(0)	— 15	<ul style="list-style-type: none"> <li>• Go To Pinpoint Test Step <b>QB1</b>.</li> </ul>

### Quick Test 3.0B - KOEO Code Output

# QUICK TEST: Key On Engine Off Self-Test

# 3.0

C LIGHT TRUCK SERVICE CODE CHART							
Key On Engine Off Service Code	Pinpoint Test Step Direction						
	2.3L EFI	2.9L EFI	3.0L EFI	4.9L EFI	5.0L EFI	5.8L EFI	7.5L EFI
15 GO to ▶	QB3	QB3	QB3	QB3	QB3	QB3	QB3
19 GO to ▶▶	QD1	QD1	QD1	QD1	QD1	QD1	QD1
21 GO to ▶▶	DE1	DE1	DE1	DE1	DE1	DE1	DE1
22 GO to ▶▶	DF1	DF1	DF1	DF1	DF1	DF1	DF1
23 GO to ▶▶▶	DH1	DH1	DH1	DH1	DH1	DH1	DH1
24 GO to ▶▶▶	DB1	DB1	DB1	DB1	DB1	DB1	DB1
31 GO to ▶▶▶	DD2	—	—	DN1	DN1	DN1	DN1
32 GO to ▶▶▶	—	—	—	DN25	DN25	DN25	DN25
34 GO to ▶▶▶	—	—	—	DN20	DN20	DN20	DN20
35 GO to ▶▶▶	—	—	—	DN5	DN5	DN5	DN5
51 GO to ▶▶▶	DE10	DE10	DE10	DE10	DE10	DE10	DE10
52 GO to ▶▶▶	FF1	—	FF1	FF1	FF1	—	—
53 GO to ▶▶▶	DH3	DH3	DH3	DH3	DH3	DH3	DH3
54 GO to ▶▶▶	DB10	DB10	DB10	DB10	DB10	DB10	DB10
61 GO to ▶▶▶	DE20	DE20	DE20	DE20	DE20	DE20	DE20
63 GO to ▶▶▶	DH10	DH10	DH10	DH10	DH10	DH10	DH10
64 GO to ▶▶▶	DB20	DB20	DB20	DB20	DB20	DB20	DB20
67 GO to ▶▶▶	FA1	FA1	FA1	FA1	FA1	FA1	FA1
81 GO to ▶▶▶	—	—	—	KC8	KC8	KC8	KC8
82 GO to ▶▶▶	—	—	—	KC8	KC8	KC8	KC8
83 GO to ▶▶▶	DD17	—	—	—	—	—	—
84 GO to ▶▶▶	DD17	—	—	DN10	DN10	DN10	DN10
85 GO to ▶▶▶	—	—	KD6	KD6	—	KD6	KD6
86 GO to ▶▶▶	—	KR10	KR10	—	—	—	—
87 GO to ▶▶▶	J7	J7	J7	J7	J7	J7	J7
89 GO to ▶▶▶	KR1	KR1	KR1	—	—	—	—
95 GO to ▶▶▶	—	J20	J20	J20	J20	J20	J20
96 GO to ▶▶▶	—	J30	J30	J30	J30	J30	J30
NO CODES CODES NOT LISTED ▶▶▶	Go To Pinpoint Test Step QA1						

## Quick Test 3.0C - KOEO Self-Test

**QUICK TEST: Computed  
Timing Check****4.0****SPECIAL NOTES:**

- If engine is a NO START, go directly to Pinpoint Test Step **A1**.
- If engine starts but stalls, or stalls during timing check Go to Pinpoint Test Step **S1**.
- If the "Check Engine" Light (MIL) is on, do not run Quick Test timing check. Verify Key On Engine Off Self-Test is a PASS.
- Self-Test timing is equal to Base Timing plus 20 degrees BTDC  $\pm$  3 degrees (see VECI decal for correct base timing).

**Example**

If base timing is 10 degrees BTDC, Self-Test timing is equal to: 10 degrees + 20 degrees = 30 degrees BTDC  $\pm$  3 degrees or 27 degrees to 33 degrees BTDC.

**HOW TO RUN QUICK TEST TIMING CHECK**

1. Turn the key off and wait 10 seconds.
2. Start engine.
3. Activate Engine Running Self-Test.
4. Check timing after the last service code has been displayed. The timing will remain fixed for two minutes, unless Self-Test is deactivated.

**Is Self-Test Timing within specification?**

**YES** Go To QUICK TEST STEP 5.0.

**NO** Go To Pinpoint Test Step **P1**.

**Quick Test 4.0 - Computed Timing Check****5.0A - Engine Running Self-Test - Code Output**

## QUICK TEST: Engine Running Self-Test

**5.0****A** PERFORMING THE ENGINE RUNNING SELF TEST**SPECIAL NOTES:**

- If the engine starts but stalls, or stalls during Self-Test, Go to Pinpoint Test Step **[S1]**.
- On vehicles equipped with the Brake On/Off Switch (BOO), the brake pedal **MUST** be depressed and released **AFTER** the ID code.
- On vehicles equipped with the Power Steering Pressure Switch (PSPS), within 1 to 2 seconds after the ID code, the steering wheel must be turned at least one-half turn and released.
- On vehicles equipped with E4OD transmission, the Overdrive Cancel Switch (OCS) must be cycled after the ID code.
- The Dynamic Response code is a single pulse (or a 10 code on the STAR Tester) that occurs 6-20 seconds after the engine running identification code.
- When the Dynamic Response code occurs, perform a brief wide-open throttle.

**HOW TO RUN THE ENGINE RUNNING SELF-TEST****DO**

- Deactivate Self-Test.
- Start and run engine at 2,000 rpm for two minutes. This action warms up the EGO sensor.
- Turn engine off, wait 10 seconds.
- **Activate Self-Test** according to Quick Test Step 3.0 A.
- Start engine.
- After the ID code, depress and release the brake pedal if appropriate. See Special Note above.
- After the ID code, within 1 to 2 seconds, turn the steering wheel at least one-half turn and then release it, if appropriate. See Special Note above.
- If a dynamic response code occurs, perform a brief wide-open throttle (WOT).
- Record all service codes displayed.
- Go to part **B** of Engine Running Self-Test.

**DON'T**

- Depress the throttle unless a Dynamic Response Code is displayed.

**Quick Test 5.0A - KOEO Self-Test**

## QUICK TEST: Engine Running Self-Test

# 5.0

B   CODE OUTPUT			
Engine ID	Dynamic Response	Engine Running	ACTION TO TAKE
2(0), 3(0) or 4(0)	1(0) or no display	11	<ul style="list-style-type: none"> <li>• Engine Running Self-Test indicates a PASS.               <ul style="list-style-type: none"> <li>— If Continuous Memory Codes were present, Go to QUICK TEST STEP 6.0.</li> <li>— If Continuous Memory is a PASS Code 11 and a symptom is present, Go to DIAGNOSTIC BY SYMPTOM</li> </ul> </li> </ul>
2(0), 3(0) or 4(0)	1(0) or no display	ANY CODE(S)	<ul style="list-style-type: none"> <li>• Engine Running Self-Test indicates a FAULT.               <ul style="list-style-type: none"> <li>— Go to <b>PART C</b> of Engine Running Self-Test.</li> <li>— Always start with the first code displayed.</li> </ul> </li> </ul>
98	NO DISPLAY	ANY CODE(S)	<ul style="list-style-type: none"> <li>• Code 98 in place of the I.D. code indicates that the vehicle DID NOT PASS Key On Engine Off Self-Test. Engine Running Self-Test will not initiate until a PASS Code 11 is obtained in Key On Engine Off Self-Test.               <ul style="list-style-type: none"> <li>— Run Key On Engine Off Self-Test and address all codes displayed.</li> </ul> </li> </ul>
NO CODE DISPLAYED CODES NOT LISTED			<ul style="list-style-type: none"> <li>• Self-Test did not activate.               <ul style="list-style-type: none"> <li>— Rerun Engine Running Self-Test to verify the above condition.</li> <li>— If condition is still present, Go to Pinpoint Test Step <b>QA1</b>.</li> </ul> </li> </ul>

### Quick Test 5.0B - KOEO Code Output

# QUICK TEST: Engine Running Self-Test

# 5.0

C		LIGHT TRUCK SERVICE CODE CHART						
Engine Running Service Code		Pinpoint Test Step Direction						
		2.3L EFI	2.9L EFI	3.0L EFI	4.9L EFI	5.0L EFI	5.8L EFI	7.5L EFI
12 GO to	▶	KE1	KE1	KE1	KE1	KE1	KE1	KE1
13 GO to	▶▶	KE15	KE11	KE11	KE11	KE11	KE11	KE11
16 GO to	▶▶	KE1	—	—	—	—	—	—
17 GO to	▶▶	KE13	KE13	KE13	KE13	KE13	KE13	KE13
18 GO to	▶▶	—	—	—	P1	P1	P1	P1
21 GO to	▶▶	DE1	DE1	DE1	DE1	DE1	DE1	DE1
22 GO to	▶▶	DF7	DF7	DF7	DF7	DF7	DF7	DF7
23 GO to	▶▶	DH1	DH1	DH1	DH1	DH1	DH1	DH1
24 GO to	▶▶	DB1	DB1	DB1	DB1	DB1	DB1	DB1
25 GO to	▶▶	DG1	DG1	—	DG1	DG1	DG1	—
31 GO to	▶▶▶	DD1	—	—	DN1	DN1	DN1	DN1
32 GO to	▶▶▶	DD11	—	—	DN25	DN25	DN25	DN25
33 GO to	▶▶	DD11	—	—	DN40	DN40	DN40	DN40
34 GO to	▶▶	DD11	—	—	DN50	DN50	DN50	DN50
35 GO to	▶▶	DD30	—	—	DN5	DN5	DN5	DN5
38 GO to	▶▶	—	—	—	—	—	—	—
41 GO to	▶▶	H11	H11	H11	H11	H11	H11	H11
42 GO to	▶▶	H23	H23	H23	H23	H23	H23	H23
44 GO to	▶▶	—	—	—	KC1	KC1	KC1	KC1
45 GO to	▶▶	—	—	—	KC1	KC1	KC1	KC1
46 GO to	▶▶	—	—	—	KC1	KC1	KC1	—
52 GO to	▶▶	FF5	—	FF5	FF5	FF5	—	—
72 GO to	▶▶	DF10	DF10	DF10	DF10	DF10	DF10	DF10
73 GO to	▶▶	DH20	DH20	DH20	DH20	DH20	DH20	DH20
74 GO to	▶▶	FD1	FD1	FD1	—	—	—	—
75 GO to	▶▶	FD5	FD5	FD5	—	—	—	—
77 GO to	▶▶	M1	M1	M1	M1	M1	M1	M1
98 GO to	▶	GO TO QUICK TEST STEP 5.0B						
NO CODES CODES NOT LISTED	▶▶	Go to Pinpoint Test Step QA1						

## Quick Test 5.0C - KOER Self-Test

**QUICK TEST: Continuous  
Self-Test****6.0****A CONTINUOUS MEMORY CODES****SPECIAL NOTES:**

- Verify that a **Pass Code 11** was received in both Key On Engine Off and Engine Running Self-Tests before continuing with this test.
- Refer to the Appendix for a detailed description of how to use the Continuous Monitor Mode.

**DETERMINING THE CONTINUOUS MEMORY CODES TO BE SERVICED**

- Refer to the Continuous Memory Codes recorded in Quick Test Step 3.0 A.
- The cause of some of the Continuous Memory Codes may have been eliminated during either Key On Engine Off or Engine Running Self-Test service.
- Address only those Continuous Memory Codes for which a similar code has not been previously serviced.
- Go to **Part B** of Continuous Self-Test.

**Quick Test 6.0A - Cont. Self-Test**

## QUICK TEST: Continuous Self-Test

# 6.0

B LIGHT TRUCK SERVICE CODE CHART							
Continuous Memory Service Code	Pinpoint Test Step Direction						
	2.3L EFI	2.9L EFI	3.0L EFI	4.9L EFI	5.0L EFI	5.8L EFI	7.5L EFI
14 GO to ▶▶	Y1	Y1	Y1	Y1	Y1	Y1	Y1
15 GO to ▶▶	QB1	QB1	QB1	QB1	QB1	QB1	QB1
18 GO to ▶▶	N1	N1	N1	N1	N1	N1	N1
22 GO to ▶▶	DF90	DF90	DF90	DF90	DF90	DF90	DF90
29 GO to ▶▶	DP1	DP1	DP1	DP1	DP1	DP1	—
31 GO to ▶▶	DD90	—	—	DN92	DN92	DN92	DN92
32 GO to ▶▶	—	—	—	DN90	DN90	DN90	DN90
33 GO to ▶▶	—	—	—	DN95	DN95	DN95	DN95
34 GO to ▶▶	—	—	—	DN98	DN98	DN98	DN98
35 GO to ▶▶	—	—	—	DN92	DN92	DN92	DN92
41 GO to ▶▶	H29	H29	H29	H29	H29	H29	H29
51 GO to ▶▶	DE91	DE91	DE91	DE91	DE91	DE91	DE91
53 GO to ▶▶	DH90	DH90	DH90	DH90	DH90	DH90	DH90
54 GO to ▶▶	DB90	DB90	DB90	DB90	DB90	DB90	DB90
61 GO to ▶▶	DE94	DE94	DE94	DE94	DE94	DE94	DE94
63 GO to ▶▶	DH94	DH94	DH94	DH94	DH94	DH94	DE94
64 GO to ▶▶	DB93	DB93	DB93	DB93	DB93	DB93	DB93
87 GO to ▶▶	J95	J95	J95	J95	J95	J95	J95
95 GO to ▶▶	—	J90	J90	J90	J90	J90	J90
96 GO to ▶▶	—	J92	J92	J92	J92	J92	J92
NO CODES CODES NOT LISTED ▶▶	Go to Pinpoint Test Step QA1						

### Quick Test 6.0B - Continuous Self-Test

## Clearing Diagnostic Trouble Codes

- Turn ignition switch to OFF position.
- Deactivate STAR tester by depressing self-test button. The colon should disappear from the display window.
- Turn ignition switch to ON position.
- Activate STAR tester by depressing self-test button. As soon as the tester begins to display service codes (even code 11), deactivate self-test sequence by depressing the self-test button.
- The colon as well as any service code displayed should disappear from the tester window. Any memory codes held in storage will be erased at this time.
- Ensure that the memory codes have been erased by turning ignition switch to OFF position and repeating steps 3 and 4. Do not erase intermittent faults from the ECA memory until they have been corrected.

### Keep Alive Memory (KAM)

To clear keep alive memory, disconnect negative battery cable for a minimum of five minutes. After clearing memory, it is necessary to drive vehicle a minimum of 10 miles to allow processor time to relearn value.

## Diagnostic Trouble Code Descriptions

The following listed self-test service codes may not all be used on one particular engine or group of engines. Determination of what combination of codes are used can be conducted during the Self-Test procedure. These codes are transmitted on the self-test output (found in the self-test connector) in the form of timed pulses (as stated previously) and can be read with the use of an analog voltmeter or the STAR tester. **The numerals 20, 30 or 40 are always (and only) displayed at the beginning of the engine running test, and always refer to the number of cylinders in the engine. A code 11 (system pass) will always indicate that the system checked out satisfactorily during any phase of the self-test conducted at that time. All other service codes will refer to a specific problem area or component within the EEC-IV system.**

CODE 11 System ``pass"

CODE 12 RPM out of spec (extended idle)

CODE 13 RPM out of spec (normal idle)

CODE 14 PIP was erratic (continuous test)

CODE 15 ROM test failed  
CODE 16 \*\*RPM too low (fuel lean test)  
CODE 17 \*\*RPM too low (upstream/lean test)  
CODE 18 No tach. Ignition Diagnostic Monitor, Pinpoint Test N.  
CODE 19 No power to processor or idle speed incorrect  
CODE 21 ECT out of range  
CODE 22 MAP out of range  
CODE 23 TPS out of range  
CODE 24 ACT out of range  
CODE 25 Knock not sensed in test  
CODE 26 MAF (VAF) out of range  
CODE 28 Ambient temp. below 50~F (1.9L EFI & 2.3L Turbo only)  
CODE 31 EVP out of limits  
CODE 32 EGR not controlling  
CODE 33 EVP not closing properly  
CODE 34 No EGR flow  
CODE 35 RPM too low (EGR test)  
CODE 36 Fuel always lean (at idle)  
CODE 37 Fuel always rich (at idle)  
CODE 41 System always lean  
CODE 42 System always rich  
CODE 43 EGO cool down occurred  
CODE 44 Air management system inoperative  
CODE 45 Air always upstream  
CODE 46 Air not always bypassed  
CODE 47 \*\*\*Up air/lean test always rich  
CODE 48 Injectors unbalanced  
CODE 51 ECT input too high  
CODE 52 Power steering pressure switch is open or steering wheel not turned during KOER self-test  
CODE 53 TPS input too high  
CODE 54 ACT (VAT) input too high  
CODE 55 Electrical charging under voltage  
CODE 56 MAF (VAF) input too high  
CODE 58 Idle tracking switch input too high (engine running test)  
CODE 59 Trans. hydraulic switch (THS 3/4) failed in open position (3.0L & 3.8L A/T only)  
CODE 61 ECT input too low  
CODE 62 Trans. hydraulic switch (THS 3/4) failed  
CODE 63 TPS input too low  
CODE 64 ACT (VAT) input too low  
CODE 65 Electrical charging over voltage  
CODE 66 MAF (VAF) input too low  
CODE 67 Neutral drive switch--drive or accelerator on (engine off)  
CODE 68 ITS open or AC on (engine-off test)  
CODE 69 Trans. hydraulic switch (THS 3/2) failed  
CODE 72 No MAP change in ``goose test"  
CODE 73 No TPS change in ``goose test"  
CODE 74 Brake on/off switch always open or not activated during test  
CODE 75 Brake on/off switch always closed or circuit shorted  
CODE 76 No MAF (VAF) change in ``goose test"  
CODE 77 Operator did not do ``goose test"  
CODE 79 Neutral drive switch (NDS) or A/C input signal interrupted  
CODE 81 Thermactor air bypass (TAB) circuit fault  
CODE 82 Thermactor air diverter (TAD) circuit fault  
CODE 83 EGR control (EGRC) circuit fault  
CODE 84 EGR vent (EGRV) circuit fault  
CODE 85 Canister purge (CANP) circuit fault  
CODE 86 WOT A/C cut-off circuit fault (all 3.8L and 5.0L Continental)  
CODE 87 Fuel pump circuit fault  
CODE 88 Throttle kicker circuit fault (5.0L)  
CODE 89 Check Continuity Of VPWR Circuit  
CODE 91 Right EGO always lean  
CODE 92 Right EGO always rich  
CODE 93 Right EGO cool down occurred  
CODE 94 Right secondary air inoperative  
CODE 95 Right air always upstream  
CODE 96 Right air always not bypassed

CODE 97 RPM drop (with fuel lean) but right EGO rich

CODE 98 RPM drop (with fuel rich) but right EGO lean

CODE 99 ECA has not stored enough information to control idle speed (CFI engines only)

\*\* - On 1986 and later vehicles, this code represents RPM too high/low or throttle pedal was depressed during KOER Self-Test

\*\*\* - Low flow of unmetered air on 1987-88 1.9L EFI engine

## QUICK TEST: Key On Engine Off Self-Test

# 3.0

C		LIGHT TRUCK SERVICE CODE CHART						
Key On Engine Off Service Code		Pinpoint Test Step Direction						
		2.3L EFI	2.9L EFI	3.0L EFI	4.9L EFI	5.0L EFI	5.8L EFI	7.5L EFI
15 GO to	▶	QB3	QB3	QB3	QB3	QB3	QB3	QB3
19 GO to	▶▶	QD1	QD1	QD1	QD1	QD1	QD1	QD1
21 GO to	▶▶	DE1	DE1	DE1	DE1	DE1	DE1	DE1
22 GO to	▶▶	DF1	DF1	DF1	DF1	DF1	DF1	DF1
23 GO to	▶▶▶	DH1	DH1	DH1	DH1	DH1	DH1	DH1
24 GO to	▶▶▶	DB1	DB1	DB1	DB1	DB1	DB1	DB1
31 GO to	▶▶▶	DD2	—	—	DN1	DN1	DN1	DN1
32 GO to	▶▶▶	—	—	—	DN25	DN25	DN25	DN25
34 GO to	▶▶▶	—	—	—	DN20	DN20	DN20	DN20
35 GO to	▶▶▶	—	—	—	DN5	DN5	DN5	DN5
51 GO to	▶▶▶	DE10	DE10	DE10	DE10	DE10	DE10	DE10
52 GO to	▶▶▶	FF1	—	FF1	FF1	FF1	—	—
53 GO to	▶▶▶	DH3	DH3	DH3	DH3	DH3	DH3	DH3
54 GO to	▶▶▶▶	DB10	DB10	DB10	DB10	DB10	DB10	DB10
61 GO to	▶▶▶▶	DE20	DE20	DE20	DE20	DE20	DE20	DE20
63 GO to	▶▶▶▶	DH10	DH10	DH10	DH10	DH10	DH10	DH10
64 GO to	▶▶▶▶	DB20	DB20	DB20	DB20	DB20	DB20	DB20
67 GO to	▶▶▶▶	FA1	FA1	FA1	FA1	FA1	FA1	FA1
81 GO to	▶▶▶▶	—	—	—	KC8	KC8	KC8	KC8
82 GO to	▶▶▶▶▶	—	—	—	KC8	KC8	KC8	KC8
83 GO to	▶▶▶▶▶	DD17	—	—	—	—	—	—
84 GO to	▶▶▶▶▶	DD17	—	—	DN10	DN10	DN10	DN10
85 GO to	▶▶▶▶▶	—	—	KD6	KD6	—	KD6	KD6
86 GO to	▶▶▶▶▶	—	KR10	KR10	—	—	—	—
87 GO to	▶▶▶▶▶	J7	J7	J7	J7	J7	J7	J7
89 GO to	▶▶▶▶▶▶	KR1	KR1	KR1	—	—	—	—
95 GO to	▶▶▶▶▶▶	—	J20	J20	J20	J20	J20	J20
96 GO to	▶▶▶▶▶▶	—	J30	J30	J30	J30	J30	J30
NO CODES CODES NOT LISTED	▶▶▶▶▶▶▶	Go To Pinpoint Test Step QA1						

### Quick Test 3.0C - KOEO Self-Test

# QUICK TEST: Engine Running Self-Test

# 5.0

C		LIGHT TRUCK SERVICE CODE CHART						
Engine Running Service Code		Pinpoint Test Step Direction						
		2.3L EFI	2.9L EFI	3.0L EFI	4.9L EFI	5.0L EFI	5.8L EFI	7.5L EFI
12 GO to	▶	KE1	KE1	KE1	KE1	KE1	KE1	KE1
13 GO to	▶▶	KE15	KE11	KE11	KE11	KE11	KE11	KE11
16 GO to	▶▶	KE1	—	—	—	—	—	—
17 GO to	▶▶	KE13	KE13	KE13	KE13	KE13	KE13	KE13
18 GO to	▶▶	—	—	—	P1	P1	P1	P1
21 GO to	▶▶	DE1	DE1	DE1	DE1	DE1	DE1	DE1
22 GO to	▶▶	DF7	DF7	DF7	DF7	DF7	DF7	DF7
23 GO to	▶▶	DH1	DH1	DH1	DH1	DH1	DH1	DH1
24 GO to	▶▶	DB1	DB1	DB1	DB1	DB1	DB1	DB1
25 GO to	▶▶	DG1	DG1	—	DG1	DG1	DG1	—
31 GO to	▶▶▶	DD1	—	—	DN1	DN1	DN1	DN1
32 GO to	▶▶▶	DD11	—	—	DN25	DN25	DN25	DN25
33 GO to	▶▶	DD11	—	—	DN40	DN40	DN40	DN40
34 GO to	▶▶	DD11	—	—	DN50	DN50	DN50	DN50
35 GO to	▶▶	DD30	—	—	DN5	DN5	DN5	DN5
38 GO to	▶▶	—	—	—	—	—	—	—
41 GO to	▶▶	H11	H11	H11	H11	H11	H11	H11
42 GO to	▶▶	H23	H23	H23	H23	H23	H23	H23
44 GO to	▶▶	—	—	—	KC1	KC1	KC1	KC1
45 GO to	▶▶	—	—	—	KC1	KC1	KC1	KC1
46 GO to	▶▶	—	—	—	KC1	KC1	KC1	—
52 GO to	▶▶	FF5	—	FF5	FF5	FF5	—	—
72 GO to	▶▶	DF10	DF10	DF10	DF10	DF10	DF10	DF10
73 GO to	▶▶	DH20	DH20	DH20	DH20	DH20	DH20	DH20
74 GO to	▶▶	FD1	FD1	FD1	—	—	—	—
75 GO to	▶▶	FD5	FD5	FD5	—	—	—	—
77 GO to	▶▶	M1	M1	M1	M1	M1	M1	M1
98 GO to	▶	GO TO QUICK TEST STEP 5.0B						
NO CODES CODES NOT LISTED	▶▶	Go to Pinpoint Test Step QA1						

## Quick Test 5.0C - KOER Self-Test

# QUICK TEST: Continuous Self-Test

# 6.0

B LIGHT TRUCK SERVICE CODE CHART							
Continuous Memory Service Code	Pinpoint Test Step Direction						
	2.3L EFI	2.9L EFI	3.0L EFI	4.9L EFI	5.0L EFI	5.8L EFI	7.5L EFI
14 GO to ▶▶	Y1	Y1	Y1	Y1	Y1	Y1	Y1
15 GO to ▶▶	QB1	QB1	QB1	QB1	QB1	QB1	QB1
18 GO to ▶▶	N1	N1	N1	N1	N1	N1	N1
22 GO to ▶▶	DF90	DF90	DF90	DF90	DF90	DF90	DF90
29 GO to ▶▶	DP1	DP1	DP1	DP1	DP1	DP1	—
31 GO to ▶▶	DD90	—	—	DN92	DN92	DN92	DN92
32 GO to ▶▶	—	—	—	DN90	DN90	DN90	DN90
33 GO to ▶▶	—	—	—	DN95	DN95	DN95	DN95
34 GO to ▶▶	—	—	—	DN98	DN98	DN98	DN98
35 GO to ▶▶	—	—	—	DN92	DN92	DN92	DN92
41 GO to ▶▶	H29	H29	H29	H29	H29	H29	H29
51 GO to ▶▶	DE91	DE91	DE91	DE91	DE91	DE91	DE91
53 GO to ▶▶	DH90	DH90	DH90	DH90	DH90	DH90	DH90
54 GO to ▶▶	DB90	DB90	DB90	DB90	DB90	DB90	DB90
61 GO to ▶▶	DE94	DE94	DE94	DE94	DE94	DE94	DE94
63 GO to ▶▶	DH94	DH94	DH94	DH94	DH94	DH94	DE94
64 GO to ▶▶	DB93	DB93	DB93	DB93	DB93	DB93	DB93
87 GO to ▶▶	J95	J95	J95	J95	J95	J95	J95
95 GO to ▶▶	—	J90	J90	J90	J90	J90	J90
96 GO to ▶▶	—	J92	J92	J92	J92	J92	J92
NO CODES CODES NOT LISTED ▶▶	Go to Pinpoint Test Step QA1						

## Quick Test 6.0B - Continuous Self-Test

### Testing Notes

- Verify that a pass code 11/111 was received in Key On Engine Off (KOEO), Engine Running (KOER), and Continuous self tests before continuing with this test.
- If a symptom is present and the EEC system is suspect, continue to symptom charts. See: Symptom Related Diagnostic Procedures/Symptom Cross Reference Chart
- If the EEC system is not suspected or if symptom or application is not contained in the diagnosis by symptom charts, go to Diagnosis By Symptom (Diagnostic Routines). See: Symptom Related Diagnostic Procedures/Diagnostic Routines

## Diagnostic Routine Chart

### GASOLINE ENGINES

Title	Routine	OASIS Number
Cranks Normally But Won't Start	201	610200
Starts Normally But Won't Run (Stalls)	202	620100
Cranks Normally But Slow to Start	203	610300
Rough Idle	204	620800
Misses Under Load	205	630300
Low Idle (Stalls on Deceleration or Quick Stop)	206	630103
Hesitates or Stalls on Acceleration	207	631900
Backfire (Induction or Exhaust)	208	630600
Lack of Power	209	630400
Surges at Steady Speed	210	630200
High Idle (Engine Diesels)	211	620700, 640100
Engine Noise	212	4400
Poor Fuel Economy	213	640200
High Oil Consumption	214	4101
Spark Knock/Pinging	215	632500
Engine Vibrates at Normal/High Speeds	216	7210
Engine Runs Cold	217	4300
Engine Runs Hot	218	4300
Exhaust Smoke	219	—
Gas Smell	220	—
"CHECK ENGINE" /"SERVICE ENGINE SOON" Light Always On or Never On "CHECK ENGINE"/"CHECK DCL" Message On	221	—
State Emission Test Failure	222	—
Improper Shift <b>1989, 90 only</b>	223	5101, 5102
Shift Indicator Light and Audible Chimes "ON" <b>1990 only</b>	224	—

Diagnostic Routine Chart - Gasoline Engines

NOTE: You should only enter Diagnostic by Symptom when directed here

Symptom	Pinpoint Test Step Direction						
	2.3L EFI	2.9L EFI	3.0L EFI	4.9L EFI	5.0L EFI	5.8L EFI	7.5L EFI
Engine runs rough or misses Engine stalls Lack of power Rough idle Erratic rpm Surges Stalls in Self-Test	S1	S1	S1	S1	S1	S1	S1
Stall during parking maneuvers	FF3	FF3	FF3	FF3	FF3	—	—
A/C Compressor runs continuously	KM25	—	—	—	—	—	—
Surges with A/C on at idle	KM20	—	—	—	—	—	—
A/C does not cut off under WOT conditions	KM10	KM10	KM10	—	—	—	—
A/C not functioning	KM1	KM1	KM1	—	—	—	—
Low idle with A/C On	FA10	FA10	FA10	FA10	FA10	FA10	FA10
"CHECK ENGINE" light always on	—	ML1	ML1	ML1	ML1	ML1	ML1
"CHECK ENGINE" light never on	—	ML5	ML5	ML5	ML5	ML5	ML5
Stumble after hot restart	H20	H20	H20	H20	H20	H20	H20
Fuel pump runs with engine off	J22	—	—	—	—	—	—
Gasoline fumes under hood	—	—	—	—	—	—	KD1
Spark knock	DG1	—	—	DG1	DG1	—	—
Poor idle quality Rolling idle Shifts harshly Poor fuel economy	—	—	T90	—	—	—	—

## 201 CRANKS NORMALLY BUT WON'T START

**NOTE:** Extended cranking, because of a "No Start" condition, can load the exhaust system with raw fuel, which can ruin the catalytic converter after the engine starts. To prevent this, disconnect the thermactor air supply and run engine until surplus fuel is used up before reconnecting.

System	Component	Reference
Ignition	Electrical Connections Secondary Ignition Wires Ignition Coil Ignition Module Rotor Alignment Distributor Cap, Adapter, Rotor & Stator Spark Plugs Fouled Ignition Switch	Ignition Systems
External Carburetor/Fuel Charging Assy./ Throttle Body	Electrical and Vacuum Connections Choke Plate and Linkage Cold Enrichment Rod and Linkage (7200) Venturi Valve (7200) Throttle Linkages	Visual, Fuel Systems
EGR	Valve	EGR Section
Internal Carburetor	Float/Inlet Needle and Seat Idle Air Bleeds and Fuel Passages	Fuel Systems
Fuel Delivery	Filter Pump Water/Dirt/Rust Contamination in Fuel Lines Tank (Fuel Supply) Dual Tanks (Selector Switch) Sender Filter Inertia Switch	Visual, Fuel Pump Section
EEC	Quick Test	Computer Engine Control Section
MCU	Component Diagnostics	MCU Diagnosis
Basic Engine	Camshaft Timing Compression	Engine Section

### Diagnostic Routine 201

## 202 STARTS NORMALLY BUT WON'T RUN (STALLS)

<b>System</b>	<b>Component</b>	<b>Reference</b>
External Carburetor/Fuel Charging Assy/Throttle Body	Electrical and Vacuum Connections Fast Idle Speed Choke Plate and Linkage Cold Enrichment Rod And Linkage (7200) Choke Pulldown Adjustment & Diaphragm Venturi Valve (7200) Choke Cap Indexing	Visual, Fuel System
Ignition	Electrical Connections Secondary Ignition Wires Ignition Coil Ignition Module Rotor Alignment Distributor Cap, Adapter, Rotor & Stator Ignition Switch Ballast Resistor	Ignitions Systems
EGR	Valve	EGR Section
Fuel Delivery	Filter Pump Water/Dirt/Rust Contamination in Fuel Lines Tank (Fuel Supply) Sender Filter Inertia Switch	Visual, Fuel Pump Section
EEC	Quick Test	Computer Engine Control Section
MCU	Component Diagnostics	MCU Diagnosis
Internal Carburetor	Float/Inlet Needle and Seat Idle Air Bleeds and Fuel Passages	Fuel System
Exhaust	Component (Restricted)	Exhaust System
Basic Engine	Camshaft and Valve Train	Engine Section

### Diagnostic Routine 202

## 203 CRANKS NORMALLY BUT SLOW TO START

**NOTE:** It is a good practice to confirm that the correct starting procedure was being used by the customer before proceeding with diagnosis.

<b>System</b>	<b>Component</b>	<b>Reference</b>
External Carburetor/Fuel Charging Assy/Throttle Body	Electrical and Vacuum Connections Choke Plate and Linkage Cold Enrichment Rod and Linkage (7200) Choke Cap Indexing Accelerator Pump Venturi Valve (7200) Bowl Vents	Visual, Fuel System
Fuel Delivery	Filter Pump Water/Dirt/Rust Contamination in Fuel Lines Sender Filter	Visual, Fuel Pump Section
Internal Carburetor/Injectors	Hot Idle Compensator (may be external) Float/Inlet Needle and Seat Stepper Motor (7200) Cold Enrichment System (7200) Injectors	Visual, Fuel System
Ignition	Scope Engine for: Spark Plugs, Coil, Secondary Ignition Wires Distributor Cap, Adapter & Rotor Spark Plugs Fouled	Visual, Ignition System
Induction and Vacuum Distribution	Vacuum Leaks Air Cleaner Element Restricted	Visual, Audible, Engine Section
Cooling	Electric Fan (Hot Start Only)	Cooling System
EGR	Valve	EGR Section
PCV	Valve	PCV Section
EVAP	Components	Fuel System
EEC	Quick Test	Computer Engine Control Section
MCU	Component Diagnostics	MCU Diagnosis

### Diagnostic Routine 203

## 204 ROUGH IDLE

System	Component	Reference
Cooling	Fan or Electric Fan (Loose or Cracked)	Visual
Vacuum Distribution	Vacuum Leaks	Visual and Audible
External Carburetor/Fuel Charging Assy Throttle Body	Curb or Fast Idle Speeds Electrical and Vacuum Connections Choke Plate and Linkage Cold Enrichment Rod and Linkage (7200) Venturi Valve (7200) Choke Pulldown Bowl Vent	Visual, Fuel System
Ignition	Scope Engine For: Spark Plug, Coil, Secondary Wires, Distributor Cap, Adapter and Rotor	Ignition System
Carburetor	Idle Mixture	Fuel System
EGR	Valve Vacuum Regulator	EGR Section
PCV	Valve	PVC Section
EVAP	Components	Fuel System
Ignition Timing	Base plus Advance and Retard Functions	Ignition System
Internal Carburetor/Injectors	Idle, Air Bleeds or Fuel Passages Float/Inlet Needle and Seat Stepper Motor (7200) Hot Idle Compensator (may be external) Altitude Compensator Cold Enrichment System (7200) Injectors Fuel Rail	Visual, Fuel System
EEC	Quick Test	Computer Engine Control Section
MCU	Component Diagnostics	MCU Diagnosis
Turbocharger		Fuel Systems
Exhaust	Pipes, Muffler, Catalyst Resonator, Heat Control Valve	Exhaust System
Basic Engine	Compression Valve Train Camshaft Intake Manifold Gaskets	Engine Section

### Diagnostic Routine 204

## 205 MISSES UNDER LOAD

System	Component	Reference
Ignition	Scope Engine For: Spark Plug, Coil, Secondary Wires, Distributor Cap, Adapter and Rotor	Ignition System
EEC	Quick Test	Computer Engine Control Section
MCU	Component Diagnostics	MCU Diagnosis
Fuel Delivery	Filter Pump Lines Sender Filter	Visual, Fuel System
External Carburetor/Fuel Charging Assy/Throttle Body	Electrical and Vacuum Connections Choke and Linkage Cold Enrichment Rod and Linkage (7200) Venturi Valves (7200)	Visual, Fuel System
Internal Carburetor/Injectors	Basic: Idle, Main, and Accelerator Pump Float/Inlet Needle and Seat Main Metering Fuel Enrichment Injectors	Visual, Fuel System
Ignition Timing	Base plus Advance and Retard Functions	Ignition System

### Diagnostic Routine 205

## 206 LOW IDLE (STALLS ON DECEL OR QUICK STOP)

System	Component	Reference
External Carburetor/Fuel Charging Assy/Throttle Body	Curb or Fast Idle Speed Electrical and Vacuum Connections Throttle Devices Venturi Valve (7200)	Visual, Fuel System
EGR	Valve	EGR Section
Internal Carburetor	Idle Airbleeds or Fuel Passages Stepper Motor (7200) Hot Idle Compensator (may be external) Float/Inlet Needle and Seat Cold Enrichment System (7200)	Visual, Fuel System
Turbocharger	Retard Switches	Fuel System
EEC	Quick Test	Computer Engine Control Section
MCU	Component Diagnostics	MCU Diagnosis
Idle Speed Control	Components	Aisan Carburetor Only

### Diagnostic Routine 206

## 207 HESITATES OR STALLS ON ACCELERATION

<b>System</b>	<b>Component</b>	<b>Reference</b>
External Carburetor/Fuel Charging Assy/Throttle Body	Choke Plate and Linkage Electrical & Vacuum Connections Cold Enrichment Rod and Linkage (7200) Accelerator Pump Venturi Valve (7200)	Visual, Fuel System
Induction and Vacuum Distribution	Vacuum Leaks	Visual and Audible
Induction	Air Cleaner Duct and Valve	Evaporative Emission System
Ignition	Scope Engine For: Spark Plug, Coil, Secondary Wires, Distributor Cap, Adapter and Rotor	Ignition System
External Carburetor/Fuel Charging Assy/Throttle Body	Curb or Fast Idle Speeds	Fuel System
EGR	Valve	EGR Section
Fuel Delivery	Filter Pump Water/Dirt/Rust Contamination in Fuel Lines Sender Filter	Visual, Fuel Pump Section
Internal Carburetor/Injectors	VV Diaphragm (7200) Power Valve Stepper Motor (7200) Main System (Restriction) Injectors	Fuel System
EEC	Quick Test	Computer Engine Control Section
MCU	Component Diagnostics	MCU Diagnosis
Turbocharger	Turbocharger Assembly	Fuel System
Ignition Timing	Base plus Advance and Retard Functions	Ignition System
Exhaust (Restriction)	With Backpressure EGR System	Exhaust System

### Diagnostic Routine 207

## 208 BACKFIRE (INDUCTION OR EXHAUST)

System	Component	Reference
Vacuum Distribution	Vacuum Leak(s)	Visual and Audible
Ignition	Scope Engine For: Spark Plug, Coil, Secondary Wires, Distributor Cap and Rotor, Crossed Wires	Ignition System
External Carburetor	Choke Plate and Linkage	Visual and Fuel System
Basic Engine	Intake Manifold Gaskets Compression Check Camshaft Valves	Engine Section
Thermactor	Thermactor System Components	Thermactor Section
Pulse Air	Pulse Air System Components	Thermactor II Section
EEC	Quick Test	Computer Engine Control Section
MCU	Component Diagnostics	MCU Diagnosis
Ignition Timing	Base plus Advance and Retard Functions	Ignition System
Exhaust	Components (Restricted)	Exhaust System
Fuel Delivery	Filter Pump Water, Dirt, Rust, Contamination in Fuel Lines Sender Filter	Visual, Fuel Pump Section

### Diagnostic Routine 208

## 209 LACK OF POWER

System	Component	Reference
External Carburetor/Fuel Charging Assy/Throttle Body	Electrical and Vacuum Connections Choke Plate and Linkage Accelerator Pump Venturi Valves (7200)	Visual, Fuel System
Induction	Air Cleaner Duct and Valve and Element	Evaporative Emission System
Fuel Delivery	Filter Pump Lines Sender Filter	Visual, Fuel Pump Section
EGR	Valve	EGR Section
Internal Carburetor/Injectors	Float Inlet/Needle and Seat Accelerator Pump Main Metering System Fuel Enrichment Altitude Compensator Stepper Motor (7200) Pullover Rod Sticking (1949) Injectors	Visual, Fuel System
Basic Engine	Compression Check Camshaft Valves	Engine Section
Drive Train	Clutch, Automatic Transmission, Brakes	Differential & Transaxle Section
EEC	Quick Test	Computer Engine Control Section
MCU	Component Diagnostics	MCU Diagnosis
Turbocharger	Turbocharger Assembly	Fuel System
Exhaust	Components (Restricted)	Exhaust System
Ignition Timing	Base plus Advance Retard Functions	Ignition System

### Diagnostic Routine 209

**210 SURGE AT STEADY SPEED**

<b>System</b>	<b>Component</b>	<b>Reference</b>
External Carburetor/Fuel Charging Assy (Throttle Body)	Choke Plate and Linkage Electrical & Vacuum Connections Venturi Valves (7200)	Visual, Fuel System
Vacuum Distribution	Vacuum Leaks	Visual, Audible
Fuel Delivery	Filter Pump Lines Sender Filter	Visual, Fuel Pump Section
Internal Carburetor/Injectors	Idle, Main Systems Float/Inlet Needle and Seat Fuel Enrichment Systems Altitude Compensator Injectors	Visual, Fuel System
EGR	Valve	EGR Section
EEC	Quick Test	Computer Engine Control System
MCU	Component Diagnostics	MCU Diagnosis
Turbocharger	Turbocharger Assembly	Fuel System
EVAP	Components	Fuel Systems
Basic Engine	Valve Train and Camshaft Intake Manifold Gaskets	Engine Section
Thermactor	Thermactor System Components	Thermactor Section
Ignition Timing	Base plus Advance and Retard Functions	Ignition Section

## Diagnostic Routine 210

**212 ENGINE NOISE**

<b>Symptom</b>	<b>Component</b>	<b>Reference</b>
Squeal, Click, or Chirp	Oil Level (low) Valve Train Drive Belts (loose) Belt Driven Components EEC Solenoids	Visual, Audible, Emissions, Engine, Cooling Sections
Rumble, Grind	Belt Driven Components	
Rattle	Component (loose)	
Hiss	Thermactor System (leak) Vacuum Distribution System (leak) Induction System (leak) Spark Plug (loose)	Visual, Audible, Thermactor & Engine Sections
	Cooling System (leak)	Visual and Audible
	EVAP System (leak)	Evaporative Emission Section
Snap	Secondary Ignition	Visual and Audible
Rap, Roar	Exhaust System (leak) Pulse Air System (air cleaner)	Visual, Audible, Exhaust & Thermactor Section
Whine	Turbocharger (some whine is normal)	Audible
Knock	Connection Rod Bearing (worn) Main Bearing (worn) Piston Pin (loose) Piston to Bore Clearance (cold engine)	Engine Section
	Fuel Pump	Fuel System
	Detonation	Routine 215

## Diagnostic Routine 212

## 213 POOR FUEL ECONOMY

**NOTE:** While fuel consumption is drastically increased for short-run operation, stop and go driving, trailer towing, extended winter warm-up periods, etc., as opposed to "trip" mileage, an attempt should be made to determine these factors when confronted with "poor mileage" conditions. However, since the operator is not always at fault, the following is appended:

System	Component	Reference
External Carburetor/Fuel Charging Assy/Throttle Body	Choke Plate and Linkage Cold Enrichment Rod and Linkage (7200) Electrical & Vacuum Connections	Visual , Fuel System
Induction	Air Cleaner Duct and Valve Air Cleaner Element (Restricted)	Evaporative Emission System
Ignition	Scope Engine For: Spark Plug, Coil, Secondary Wires, Distributor Cap, Adapter and Rotor	Ignition System
Internal Carburetor	Idle, Main Systems Enrichment Systems Float/Inlet Needle and Seat	Fuel System
EEC	Quick Test	Computer Engine Control Section
MCU	Component Diagnostics	MCU Diagnosis
Fuel Delivery	Fuel Return Line Blocked	Fuel System
Cooling	Thermostat	Cool System
Factors External to the Engine	Tire Pressure & Type Clutch Operation Converter Clutch Override Automatic Transmission Shift Pattern and Fluid Level Brake Drag Exhaust System Speedometer/Odometer Gear Ratio Axle Ratio Vehicle Load Road & Weather Conditions	Manual and Visual
Ignition Timing	Base plus Advance and Retard Functions	Ignition System

### Diagnostic Routine 213

## 214 HIGH OIL CONSUMPTION

**NOTE:** If the condition cannot be verified, clean engine, if necessary, change oil and filter (at customer's expense), seal and have customer drive 500 miles (804.5 Km) or enough distance to consume two quarts before returning for re-examination.

System	Component	Reference
External Leaks	Engine Assembly	Visual
Proper Dipstick	Overfilling (sometimes accomplished by the "short stick" gas station procedure).	Manual and Visual
Induction	Air Cleaner Element (Sealing)	Visual , Fuel System
PCV	Valve	PCV Section
Turbocharger	Compressor/Turbine Bearing, Seals, Center Drain, Etc.	Visual, Fuel Section
Internal Leaks (blue smoke from tailpipe)	Valve Guides Valve Stem Seals Intake Manifold and Gasket Cylinder Head Drain Passages Piston Rings	Engine Section

### Diagnostic Routine 214

## 215 SPARK KNOCK/PINGING

**NOTE:** If the above fails to correct the condition, it is recommended that the owner change his source of fuel and use higher octane fuel.

System	Component	Reference
EGR	Verify correct application, then diagnose.	EGR System
Induction	Air Cleaner Duct and Valve Assembly	Evaporative Emission System
Vacuum Distribution	Vacuum Leaks Spark Delay Valve PVS	Visual, Audible, Emission Components
Basic Engine	Oil Level Compression Check Intake Manifold Gasket	Engine Section
Cooling	Overheating	Routine 218
EEC	Quick Test	Computer Engine Control Section
MCU	Component Diagnostics	MCU Diagnosis
Turbocharger	Turbocharger Assembly	Fuel System
Thermactor	Thermactor System Components	Thermactor Section
Ignition Timing	Initial plus Advance and Retard Functions	Ignition System

### Diagnostic Routine 215

## 216 ENGINE VIBRATES AT NORMAL SPEEDS

System	Component	Reference
Engine Accessories	Fan Belt Driven Components Engine Mounts Engine Vibration Damper	Manual and Visual
Otherwise	Non-Engine Components: Drive Line, Tires, Wheel Balance	Manual and Visual

### Diagnostic Routine 216

## 217 ENGINE RUNS COLD

System	Component	Reference
Gauge System	Gauge, Sender	Body Electrical
Cooling	Thermostat	Cooling System

### Diagnostic Routine 217

## 218 ENGINE RUNS HOT

System	Component	Reference
Cooling	Coolant Level Radiator or A/C Condenser Pressure Cap and Overflow System External Leaks Belts and Belt Tension Fan and Fan Clutch Electric Fan (If So Equipped)	Cooling System
Gauge System	Gauge, Sender	Body Electrical
Cooling	Thermostat	Cooling System
Ignition Timing	Base Plus Advance and Retard Functions	Ignition System
Vacuum Distribution	Spark Delay Valve	Emission Components
EEC	Quick Test	Computer Engine Control Section
MCU	Component Diagnostics	MCU Diagnosis
Cooling	PVS	Emission Components
Basic Engine	Oil Level Internal Leak(s) Core Sand in Head/Block Water Pump	Engine Section
Brake	Brakes (dragging)	

### Diagnostic Routine 218

## 219 EXHAUST SMOKE

**NOTE: White Smoke is normal during warm-up.**

Symptom	Component	Reference
Black Smoke (rich mixture)	Choke Plate and Linkage Cold Enrichment Rod and Linkage (7200)	Fuel System
	Air Cleaner Element (Restricted)	Visual
	Internal Carburetor Components: Basic: Idle, Main and Accelerator Pump Metering Systems Enrichment Systems Fuel Inlet Needle/Seat Float Injectors	Visual, Fuel System
	EEC Components	Computer Engine Control Section
	MCU Components	MCU Diagnosis
	Blue Smoke (burning oil)	PCV Valve
Valve Guides/Stems/Seals Oil Drain Passages in Head		Engine Section
Turbo Bearing Seals		Fuel System
Rings (not seated) Cylinder bores (scuffed)		Engine Section
White Smoke (coolant in combustion)	Thermaxtor Vacuum Delay Valve (restricted) EGR Cooler Intake Manifold Cylinder Head/Gasket (leaks) Block (cracked/porous)	Emission Components, EGR System, Engine Section.

### Diagnostic Routine 219

## 220 GAS SMELL

System	Component	Reference
Fuel Delivery	Fuel Filter (leaks) Fuel Line to Carburetor (leaks) Fuel Pump (leaks) Fuel Line, Pump to Tank (leaks) Fuel Tank (leaks) Fuel Tank Filler Neck/Cap (leaks) Fuel Return Line (Blocked)	Visual , Fuel Systems
Internal Carburetor/Injectors	Float/Inlet Needle (stuck) Injectors (Leaking)	Fuel System
EVAP	Component (leaks)	Fuel System

### Diagnostic Routine 220

## 221 "CHECK ENGINE" LIGHT ALWAYS ON OR NEVER ON "CHECK ENGINE"/"CHECK DCL" MESSAGE ON

System	Component	Reference
NON-EEC	Emission Maintenance Warning Light	Warning Lights
EEC	Quick Test	Computer Engine Control Section

### Diagnostic Routine 221

## 222 STATE EMISSION TEST FAILURE

**NOTE:** Canada and some states or metropolitan areas in the United States require periodic Idle Emission Tests. All Ford products have been certified to pass these tests. If a Ford product fails an Idle Emission Test, it is probable that 1) The engine temperature was not warm and stabilized prior to the test. 2) The vehicle had idled too long just prior to the test. (Too long at idle will trigger the thermactor air system to dump thermactor air into the atmosphere to prevent over heating of the exhaust system.)

It is recommended that the following procedure be followed prior to testing idle emissions on Ford products:

- Turn engine off and wait 10 seconds.
- Start engine and idle for one minute.
- Run engine at 2500 ± 300 rpm for 30 seconds.
- Return engine speed to idle.
- Measure Idle emissions within 30 seconds.

Complaints of Idle Emission Test failure should be verified by using the above procedure prior to starting any services.

### Diagnostic Routine 222 (Part 1)

<b>System</b>	<b>Component</b>	<b>Reference</b>
EEC	Quick Test	<b>Computer Engine Control Section</b>
MCU	Component Diagnostics	MCU Diagnosis
Ignition	Scope Engine For: Spark Plug, Coil, Secondary Wires, Distributor Cap, Adapter and Rotor	<b>Ignition System</b>
Vacuum Distribution	Vacuum Leaks/Blockage	Visual and Audible
Ignition Timing	Base plus Advance and Retard Functions	<b>Ignition</b>
Carburetor	Idle Mixture	<b>Fuel System</b>
External Carburetor/Fuel Charging Assy Throttle Body	Curb or Fast Idle Speeds Electrical and Vacuum Connections Choke Plate and Linkage Cold Enrichment Rod and Linkage (7200) Venturi Valve (7200) Choke Pulldown Bowl Vent	Visual, <b>Fuel System</b>
Internal Carburetor/Injectors	Idle, Air Bleeds or Fuel Passages Float/Inlet Needle and Seat Stepper Motor (7200) Hot Idle Compensator (may be external) Altitude Compensator Cold Enrichment System (7200) Injectors Fuel Rail	Visual, <b>Emission Components, Fuel System</b>
EGR	Valve Vacuum Regulator	<b>EGR Section</b>
PCV	Valve	<b>PCV Section</b>
EVAP	Components	<b>Fuel Section</b>
Thermactor	Thermactor Air Dump	<b>Evaporative Emission Section</b>
Exhaust	Pipes, Muffler, Catalyst Resonator, Heat Control Valve	<b>Exhaust Section</b>
Cooling	Unstabilized Engine Temperature	Visual, Routine 218
Turbocharger	Turbocharger Assembly	<b>Fuel System</b>
Basic Engine	Scheduled Maintenance Compression Valve Train Camshaft Intake Manifold Gaskets	<b>Engine Section</b>

Diagnostic Routine 222 (Part 2)

## EEC-IV No Start

## Pinpoint Test

# A

### Note

You should enter this Pinpoint Test only when Steps 1.0 through 3.0 have been successfully completed and the engine is still a no start, or when directed here from Pinpoint Test P. This Pinpoint Test will not diagnose ignition system problems.

### Remember

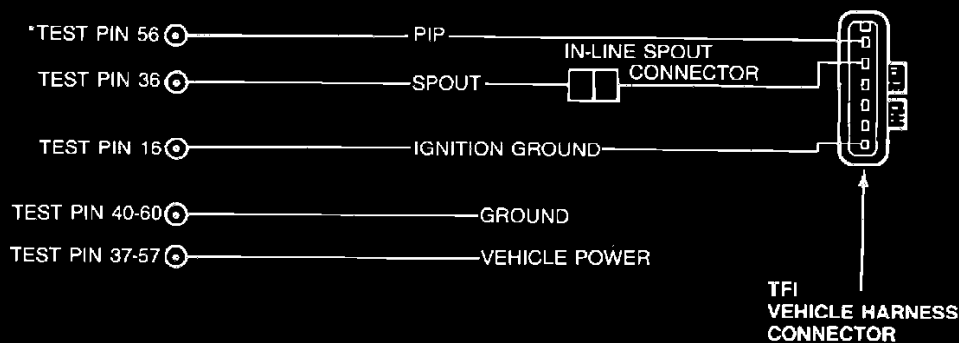
To prevent the replacement of good components, be aware that the following non-EEC areas may be at fault:

- Fuel: quantity and quality
- Ignition: general condition, moisture, cracks, damage, etc.
- Engine: internal, valves, timing belt, camshaft.
- Starter and battery circuit

This Pinpoint Test is intended to diagnose only the following:

- Spark (as related to EEC-IV).
- Circuits: PIP, SPOUT, IGNITION GROUND, VPWR.

### Pinpoint Test Schematic



\*TEST PINS LOCATED ON BREAKOUT BOX.

ALL HARNESS CONNECTORS VIEWED INTO MATING SURFACE.

NOTE: WHEN BREAKOUT BOX IS INSTALLED, ENSURE THAT TIMING SWITCH IS IN "COMPUTED" POSITION UNLESS OTHERWISE NOTED.

### Pinpoint Test A - EEC-IV No Start

EEC-IV No Start		Pinpoint Test	A
<p><b>WARNING:</b> Stop this test at the first sign of a fuel leak and service as required.  <b>CAUTION:</b> No open flame — No smoking during fuel delivery checks.</p>			
TEST STEP		RESULT	ACTION TO TAKE
<b>A1</b>	ATTEMPT TO START ENGINE	Engine cranks, but does not start, or stalls out	GO to <b>A2</b> .
<b>A2</b>	CHECK FOR VREF AT THROTTLE POSITION SENSOR	<ul style="list-style-type: none"> <li>No</li> <li>Yes</li> </ul>	<ul style="list-style-type: none"> <li>GO to Pinpoint Test Step <b>C1</b>.</li> <li>RECONNECT TP sensor. GO to <b>A3</b>.</li> </ul>
<b>A3</b>	CHECK FOR SPARK AT PLUGS	<ul style="list-style-type: none"> <li>Yes</li> <li>No</li> </ul>	<ul style="list-style-type: none"> <li>GO to <b>A13</b>.</li> <li>GO to <b>A4</b>.</li> </ul>
<b>A4</b>	CHECK FOR SPARK AT COIL	<ul style="list-style-type: none"> <li>Yes</li> <li>No</li> </ul>	<ul style="list-style-type: none"> <li>Diagnosis for cap, rotor, wires.</li> <li>GO to <b>A5</b>.</li> </ul>

Pinpoint Test A1 Thru A4 - EEC-IV No Start

<b>EEC-IV No Start</b>		<b>Pinpoint Test</b>	<b>A</b>
<b>TEST STEP</b>		<b>RESULT</b>	<b>ACTION TO TAKE</b>
<b>A5</b>	<b>CHECK CONTINUITY OF IGNITION GROUND CIRCUIT</b>		
<ul style="list-style-type: none"> <li>• Key off, wait 10 seconds.</li> <li>• Disconnect processor 60 pin connector. Inspect for damaged pins, corrosion, loose wires, etc. Service as necessary.</li> <li>• Install breakout box. Leave processor disconnected.</li> <li>• DVOM on 200 ohm scale.</li> <li>• Disconnect TFI.</li> <li>• Measure resistance between Test Pin 16 at the breakout box and TFI harness connector IGNITION GROUND circuit.</li> <li>• Is resistance less than 5.0 ohms?</li> </ul>		Yes ▶  No ▶	GO to <b>A6</b> .  SERVICE open circuit. REMOVE breakout box. RECONNECT processor. RERUN Quick Test.
<b>A6</b>	<b>ISOLATION OF PROBLEM TO SPOUT CIRCUIT</b>		
<ul style="list-style-type: none"> <li>• Breakout box installed.</li> <li>• Connect TFI.</li> <li>• Connect processor to breakout box.</li> <li>• Timing switch to "Dist" position on breakout box.</li> <li>• Attempt to start vehicle.</li> <li>• Does the vehicle start?</li> </ul>		Yes ▶  No ▶	GO to <b>A10</b> .  GO to <b>A7</b> .
<b>A7</b>	<b>CHECK SPOUT SIGNAL</b>		
<ul style="list-style-type: none"> <li>• Key on, engine off.</li> <li>• Breakout box installed, processor connected.</li> <li>• Timing switch to "Computed" position on breakout box.</li> <li>• DVOM on 20 volt scale.</li> <li>• Measure voltage between Test Pin 36 at the breakout box and battery negative post during crank.</li> <li>• Is voltage between 3.0 and 6.0 volts?</li> </ul>		No ▶  Yes ▶	GO to <b>A8</b> .  EEC OK, diagnosis.

Pinpoint Test A5 Thru A7 - EEC-IV No Start







## EEC-IV No Start

## Pinpoint Test

# A

TEST STEP	RESULT	ACTION TO TAKE
<b>A8</b>   CHECK SPOUT FOR SHORTS <ul style="list-style-type: none"> <li>• Key off, wait 10 seconds.</li> <li>• Breakout box installed.</li> <li>• Disconnect processor.</li> <li>• Disconnect TFI.</li> <li>• DVOM on 200,000 ohm scale.</li> <li>• Measure resistance between Test Pin 36 and Test Pins 16, 20, 26, 40, 60 (short to GROUND), 37, 57 (short to POWER) and 56 (short to PIP) at the breakout box.</li> <li>• Are all resistances greater than 10,000 ohms?</li> </ul>	Yes  No	GO to <b>A9</b> .  SERVICE short circuit. REMOVE breakout box. RECONNECT processor and TFI. RERUN Quick Test, if vehicle does not start. GO to <b>A9</b> .
<b>A9</b>   ISOLATE SHORT(S) IN PROCESSOR <ul style="list-style-type: none"> <li>• Key off, wait 10 seconds.</li> <li>• Breakout box installed.</li> <li>• Reconnect processor to breakout box.</li> <li>• TFI disconnected.</li> <li>• DVOM on 200 ohm scale.</li> <li>• Measure resistance between Test Pin 36 and Test Pins 37 and 57 (short to POWER) also, Test Pins 40 and 60 (short to GROUND) at the breakout box.</li> <li>• Are all resistances greater than 5.0 ohms?</li> </ul>	Yes  No	RECONNECT TFI. GO to <b>A10</b> .  REMOVE breakout box. REPLACE processor. RERUN Quick Test.
<b>A10</b>   CHECK PIP SIGNAL <ul style="list-style-type: none"> <li>• Key off.</li> <li>• Breakout box installed, processor connected to breakout box.</li> <li>• DVOM to 20 volt scale.</li> <li>• Measure voltage between Test Pin 56 and Test Pin 16 at the breakout box.</li> <li>• Crank engine, record reading.</li> <li>• Is voltage between 3.0 and 6.0 volts?</li> </ul>	Yes  No	REMOVE breakout box. REPLACE processor. RERUN Quick Test.  GO to <b>A11</b> .

### Pinpoint Test A8 Thru A10 - EEC-IV No Start

EEC-IV No Start		Pinpoint Test	A
TEST STEP		RESULT	ACTION TO TAKE
<b>A11</b>	CHECK CONTINUITY OF PIP CIRCUIT		
<ul style="list-style-type: none"> <li>• Key off, wait 10 seconds.</li> <li>• Breakout box installed.</li> <li>• Disconnect processor.</li> <li>• Disconnect TFI.</li> <li>• DVOM on 200 ohm scale.</li> <li>• Measure resistance between Test Pin 56 at the breakout box and TFI harness connector PIP circuit.</li> <li>• Is resistance less than 5.0 ohms?</li> </ul>		Yes  No 	GO to <b>A12</b> .  SERVICE open circuit. REMOVE breakout box. RECONNECT processor and TFI. RERUN Quick Test.
<b>A12</b>	CHECK PIP CIRCUIT FOR SHORTS		
<ul style="list-style-type: none"> <li>• Key off.</li> <li>• Breakout box installed.</li> <li>• Processor disconnected.</li> <li>• Disconnect TFI.</li> <li>• DVOM on 200,000 ohm scale.</li> <li>• Measure resistance between Test Pin 56 and Test Pins 16, 20, 26, 40, 60 (shorts to GROUND) and Test Pins 37 and 57 (shorts to POWER) and Test Pin 36 (short to SPOUT) at the breakout box.</li> <li>• Are all resistances greater than 10,000 ohms?</li> </ul>		No  Yes 	SERVICE short circuit. REMOVE breakout box. RECONNECT processor and TFI. RERUN Quick Test.  REMOVE breakout box. RECONNECT processor and TFI.
<b>A13</b>	SPOUT SIGNAL VERIFICATION		
<ul style="list-style-type: none"> <li>• Key off, wait 10 seconds.</li> <li>• Disconnect processors 60 pin connector. Inspect for damaged pins, corrosion, loose wires, etc. Service as necessary.</li> <li>• Install breakout box.</li> <li>• Connect processor to breakout box.</li> <li>• DVOM on 20 volt scale.</li> <li>• Measure voltage between Test Pin 36 at the breakout box and CHASSIS GROUND, during crank.</li> <li>• Ensure timing switch is in "Computed" position on breakout box.</li> <li>• Is voltage between 3.0 and 6.0 volts?</li> </ul>		Yes  No 	Vehicles with Mass Air GO to <b>A21</b> . All others GO to <b>A22</b> .  GO to <b>A10</b> .

Pinpoint Test A11 Thru A13 - EEC-IV No Start

EEC-IV No Start		Pinpoint Test	A
TEST STEP		RESULT	ACTION TO TAKE
<b>A21</b>	CHECK MAF SENSOR OUTPUT		
<ul style="list-style-type: none"> <li>• Key on, engine off.</li> <li>• DVOM on 20 volt scale.</li> <li>• Measure voltage between Test Pin 50 and battery negative post.</li> <li>• Is voltage between 0.5 and 1.5 volts?</li> </ul>		Yes ▶  No ▶	GO to <b>A21</b> .  GO to Pinpoint Test Step <b>DC6</b> .
<b>A22</b>	CHECK FUEL PUMP		
<ul style="list-style-type: none"> <li>• <b>No smoking nearby.</b></li> <li>• Connect pressure gauge.</li> <li>• Note initial pressure reading.</li> <li>• Observe pressure gauge as you pressurize fuel system. (Turn key to RUN for 1 second, then turn key to OFF. Wait 10 seconds. Repeat 5 times.)</li> <li>• Does fuel pressure increase?</li> </ul> <p><b>WARNING: If fuel starts leaking, turn key OFF immediately. No smoking.</b></p>		Yes ▶  No ▶	All EFI GO to Pinpoint Test Step <b>S1</b> . All CFI GO to Pinpoint Test Step <b>S2</b> .  TURN key OFF, and CONTINUE to <b>A23</b> .
<b>A23</b>	CHECK INERTIA SWITCH		
<ul style="list-style-type: none"> <li>• Key off.</li> <li>• Fuel pressure gauge installed.</li> <li>• Locate fuel pump inertia switch. Refer to Owner Guide for location.</li> <li>• Inspect inertia switch reset button.</li> <li>• Is reset button in DOWN position?</li> </ul>		No ▶  Yes ▶	RESET inertia switch. RERUN Quick Test. If still a no start GO to <b>A22</b> .  • 2.3L EFI TC 2.5L HSC-CFI, 3.0L EFI and 3.8L FWD EFI passenger car GO to <b>X-11</b> . • All others, GO to <b>J1</b> .

Pinpoint Test A21 Thru A23 - EEC-IV No Start

**Vehicle Battery****Pinpoint  
Test****B****Note**

You should enter this Pinpoint Test only when directed here from Pinpoint Tests C, J or P or when a Continuous Memory Code 72 or 78 is received in Quick Test Step 6.0C.

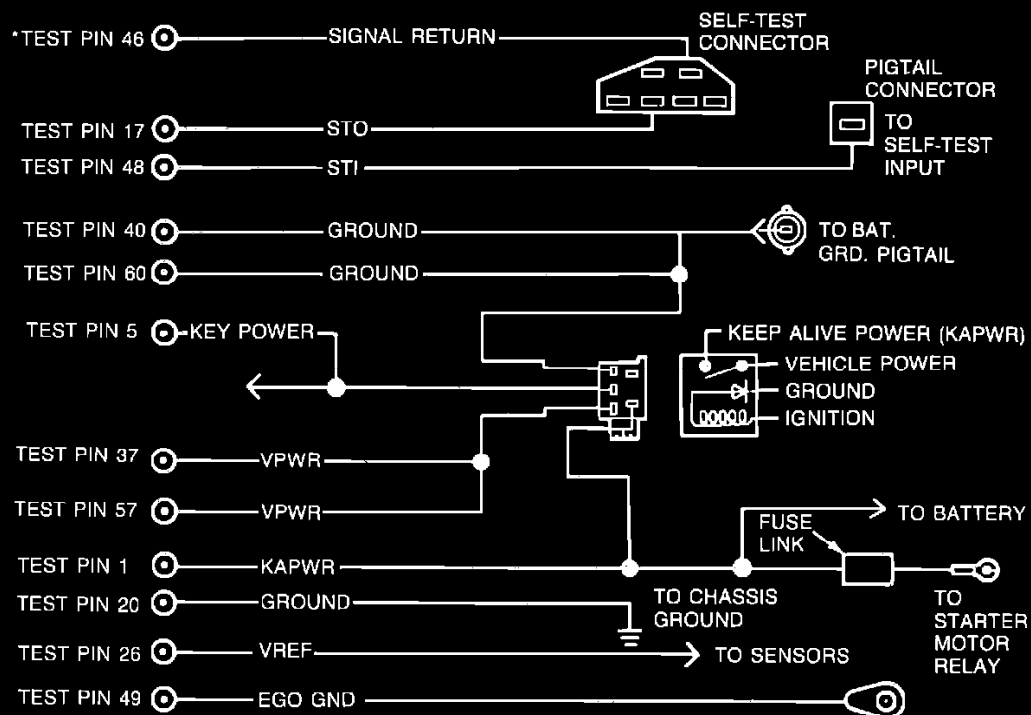
**Remember**

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

- Ignition switch.
- Battery Cables.
- Alternator.
- Voltage Regulator.
- Ground Straps.

This Pinpoint Test is intended to diagnose only the following:

- Processor.
- Harness circuits: SIGNAL RETURN, STO, STI, GROUND, VPWR, KAPWR, VREF, IGNITION.
- Battery Voltage.
- Power Relay.

**Pinpoint Test Schematic**

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

Pinpoint Test B - Wiring Diagram

**Vehicle Battery****Pinpoint  
Test****B****Note**

You should enter this Pinpoint Test only when directed here from Pinpoint Tests C, J or P or when a Continuous Memory Code 72 or 78 is received in Quick Test Step 6.0C.

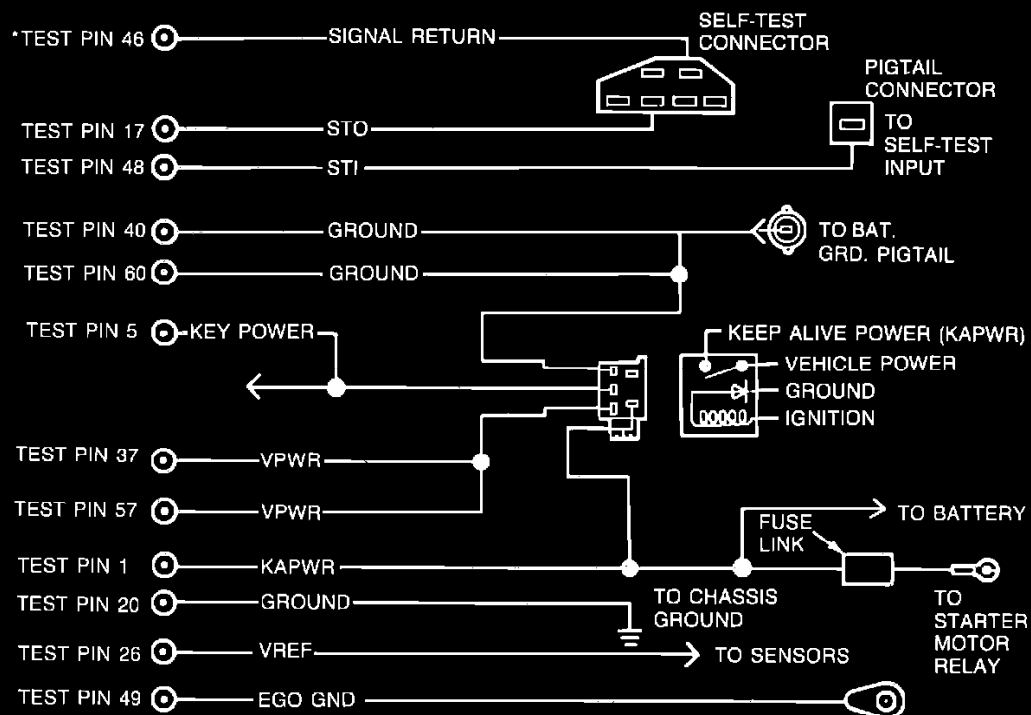
**Remember**

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

- Ignition switch.
- Battery Cables.
- Alternator.
- Voltage Regulator.
- Ground Straps.







This Pinpoint Test is intended to diagnose only the following:

- Processor.
- Harness circuits: SIGNAL RETURN, STO, STI, GROUND, VPWR, KAPWR, VREF, IGNITION.
- Battery Voltage.
- Power Relay.

**Pinpoint Test Schematic**







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

Pinpoint Test B - Wiring Diagram

Vehicle Battery		Pinpoint Test	B
TEST STEP	RESULT	ACTION TO TAKE	
<b>B1</b>   BATTERY VOLTAGE CHECK			
<ul style="list-style-type: none"> <li>• Key on, engine off.</li> <li>• DVOM on 20 volt scale.</li> <li>• Measure voltage across battery terminals.</li> <li>• Is voltage greater than 10.5 volts?</li> </ul>	Yes  No 	GO to <b>B2</b> .  SERVICE discharged battery.	
<b>B2</b>   CHECK EEC GROUND TO BATTERY GROUND			
<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.</li> <li>• Connect processor to breakout box.</li> <li>• DVOM on 200 ohm scale.</li> <li>• Measure resistance between Test Pin 40 at the breakout box and negative post of the battery and Test Pin 60 at the breakout box and negative post of the battery.</li> <li>• Are both resistances less than 5 ohms?</li> </ul>	Yes  No 	GO to <b>B3</b> .  REMOVE breakout box. RECONNECT processor. SERVICE open in EEC ground circuit. RERUN Quick Test.	
<b>B3</b>   PROCESSOR GROUND ISOLATION			
<ul style="list-style-type: none"> <li>• Key off, wait 10 seconds.</li> <li>• Breakout box installed.</li> <li>• Processor connected.</li> <li>• DVOM on 200 ohm scale.</li> <li>• Measure resistance between Test Pin 46 and Test Pin 40 and between Test Pin 46 and Test Pin 60 both at the breakout box.</li> <li>• Are both resistances less than 5 ohms?</li> </ul>	Yes  No 	GO to <b>B4</b> .  REMOVE breakout box. REPLACE processor. RERUN Quick Test.	

Pinpoint Test B1 Thru B3 - Vehicle Battery

**Vehicle Battery****Pinpoint  
Test****B**

TEST STEP		RESULT	ACTION TO TAKE
<b>B4</b>	CHECK CONTINUITY OF SIGNAL RETURN CIRCUIT		
	<ul style="list-style-type: none"> <li>• Key off, wait 10 seconds.</li> <li>• Breakout box installed.</li> <li>• Processor connected.</li> <li>• DVOM on 200 ohm scale.</li> <li>• Measure resistance between Test Pin 46 at the breakout box and SIGNAL RETURN in the Self-Test connector.</li> <li>• Is resistance less than 5.0 ohms?</li> </ul>	Yes  No 	GO to <b>B5</b> .  REMOVE breakout box. RECONNECT processor. SERVICE open circuit. RERUN Quick Test.
<b>B5</b>	CHECK KEEP ALIVE POWER (KAPWR) CIRCUIT FOR VOLTAGE		
	<ul style="list-style-type: none"> <li>• Key on, engine off.</li> <li>• Breakout box installed.</li> <li>• Processor connected.</li> <li>• DVOM on 20 volt scale.</li> <li>• Measure voltage between Test Pin 1 at the breakout box and the battery negative post.</li> <li>• Is voltage greater than 10.5 volts?</li> </ul>	Yes  No 	GO to <b>B6</b> .  CHECK KAPWR and VPWR circuits for shorts to ground and KAPWR circuit from power relay to battery positive post for opens. SERVICE as necessary. REMOVE breakout box. RECONNECT processor. RERUN Quick Test.
<b>B6</b>	CHECK IGNITION CIRCUIT FOR VOLTAGE		
	<ul style="list-style-type: none"> <li>• Key on, engine off.</li> <li>• Breakout box installed.</li> <li>• Processor connected.</li> <li>• DVOM on 20 volt scale.</li> <li>• Measure voltage between the battery negative post and IGNITION circuit at EEC power relay.</li> <li>• Is voltage greater than 10.5 volts?</li> </ul>	Yes  No 	GO to <b>B7</b> .  SERVICE open in ignition switch circuits. REMOVE breakout box. RECONNECT processor. RERUN Quick Test.

**Pinpoint Test B4 Thru B6 - Vehicle Battery**

Vehicle Battery		Pinpoint Test	B
TEST STEP		RESULT	ACTION TO TAKE
<b>B7</b>	CHECK CONTINUITY OF EEC POWER RELAY GROUND CIRCUIT		
<ul style="list-style-type: none"> <li>• Key off, wait 10 seconds.</li> <li>• Breakout box installed.</li> <li>• Processor connected.</li> <li>• DVOM on 200 ohm scale.</li> <li>• Measure resistance between GROUND circuit at the EEC power relay and negative battery post.</li> <li>• Is the resistance less than 5 ohms?</li> </ul>		Yes ▶  No ▶	GO to <b>B8</b> .  SERVICE open circuit. REMOVE breakout box. RECONNECT processor. RERUN Quick Test.
<b>B8</b>	CHECK VOLTAGE OF VPWR CIRCUIT AT EEC POWER RELAY		
<ul style="list-style-type: none"> <li>• Key on, engine off.</li> <li>• Breakout box installed.</li> <li>• Processor connected.</li> <li>• DVOM on 20 volt scale.</li> <li>• Measure voltage between the battery negative post and VPWR circuit at EEC power relay.</li> <li>• Is the voltage greater than 10.5 volts?</li> </ul>		Yes ▶  No ▶	SERVICE open in VPWR circuit, if OK, SERVICE short to ground in VPWR circuit. REMOVE breakout box. RECONNECT processor. RERUN Quick Test.  REPLACE power relay. REMOVE breakout box. RECONNECT processor. RERUN Quick Test.

Pinpoint Test B7 &amp; B8 - Vehicle Battery

Vehicle Battery		Pinpoint Test	B
TEST STEP		RESULT	ACTION TO TAKE
<b>B10</b>	WIGGLE TEST VPWR CIRCUITS		
<p><b>NOTE:</b> A momentary interrupt ("hiccup") in the vehicle performance may be due to</p> <ul style="list-style-type: none"> <li>• EEC-IV wiring harness not properly routed.</li> <li>• Electrical or radio noises. <ul style="list-style-type: none"> <li>— High Tension power lines</li> <li>— Some CB radio frequencies.</li> </ul> </li> </ul> <ul style="list-style-type: none"> <li>• Key on, engine off.</li> <li>• STAR tester or VOM hooked up to Self-Test connector.</li> <li>• Self-Test deactivated.</li> <li>• Enter key on, engine off continuous monitor mode.</li> <li>• Observe STAR/VOM for indication of a fault while performing the following. <ul style="list-style-type: none"> <li>— Shake, bend and twist the EEC-IV harness from the EEC time delay power relay to the processor.</li> </ul> </li> <li>• Is a fault indicated?</li> </ul>		<p>Yes</p> <p>No</p>	<p>SERVICE VPWR circuit. CLEAR Continuous Memory Code. RERUN Quick Test.</p> <p>INSPECT EEC-IV time delay power relay and harness connectors for damaged pins, corrosion, etc. SERVICE as necessary. If OK, REPLACE EEC-IV time delay relay. CLEAR Continuous Memory Code. Quick Test.</p>

Pinpoint Test B10 - Vehicle Battery

## Reference Voltage

Pinpoint  
Test

C

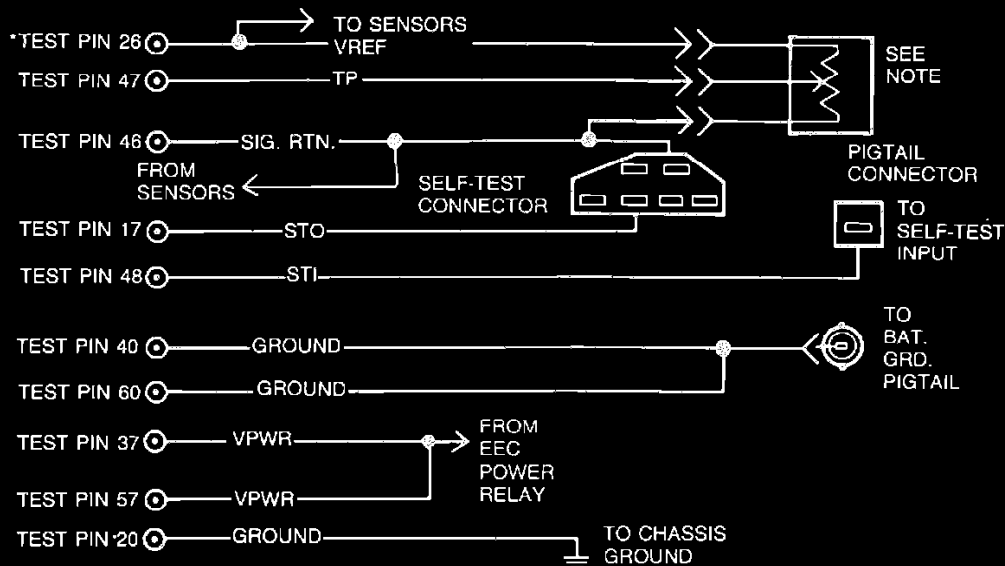
**Note**

You should enter this Pinpoint Test only when a check for VREF has failed in the sensor Pinpoint Tests (D-Series) or Pinpoint Tests A or Q.

**Remember**

This Pinpoint Test is intended to diagnose only the following:

- Processor.
- Sensor harness circuits: SIGNAL RETURN, STO, STI, GROUND, VPWR, KAPWR, VREF, IGNITION.

**Pinpoint Test Schematic**

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

## Pinpoint Test C - Reference Voltage

Reference Voltage		Pinpoint Test	C
TEST STEP		RESULT	ACTION TO TAKE
<b>C1</b>	CHECK VEHICLE BATTERY POWER CIRCUIT		
<ul style="list-style-type: none"> <li>• Key off, wait 10 seconds.</li> <li>• Disconnect 60 pin connector. Inspect for damaged pins, corrosion, loose wires, etc. Service as necessary.</li> <li>• Breakout box installed.</li> <li>• Processor connected.</li> <li>• Key on, engine off.</li> <li>• DVOM on 20 volt scale.</li> <li>• Measure voltage between Test Pin 37 at the breakout box and SIGNAL RETURN in Self-Test connector.</li> <li>• Is voltage greater than 10.5 volts?</li> </ul>		Yes ▶  No ▶	GO to <b>C2</b> .  RECONNECT SENSOR. 2.3L EFI TC, 2.5L HSC CFI, 3.8L and 3.0L EFI passenger car GO to <b>X-1</b> . All others, GO to <b>B1</b> .
<b>C2</b>	CHECK VREF VOLTAGE		
<ul style="list-style-type: none"> <li>• Key on, engine off.</li> <li>• Breakout box installed.</li> <li>• Processor connected.</li> <li>• DVOM on 20 volt scale.</li> <li>• Measure voltage between Test Pin 26 and Test Pin 46 at the breakout box.</li> <li>• What is the voltage?</li> </ul>		Greater than 6.0 volts ▶  Less than 4.0 volts ▶  Between 4.0 volts and 6.0 volts ▶	GO to <b>C4</b> .  GO to <b>C5</b> .  GO to <b>C3</b> .
<b>C3</b>	CHECK VREF AND SIGNAL RETURN FOR CONTINUITY		
<ul style="list-style-type: none"> <li>• Breakout box installed.</li> <li>• Processor disconnected.</li> <li>• Sensor that sent you here disconnected.</li> <li>• Key off.</li> <li>• DVOM on 200 ohm scale.</li> <li>• Measure resistance from Test Pin 26 at breakout box to VREF at vehicle harness connector of the sensor that sent you here.</li> <li>• Measure resistance from Test Pin 46 at breakout box to signal return at vehicle harness connector of the sensor that sent you here.</li> <li>• Are both resistances less than 5.0 ohms?</li> </ul>		Yes ▶  No ▶	RECONNECT sensors. Reference voltage OK. RERUN Quick Test.  SERVICE open in VREF or SIGNAL RETURN. REMOVE breakout box. RECONNECT processor and sensor. RERUN Quick Test.

## Pinpoint Test C1 Thru C3 - Reference Voltage

Reference Voltage		Pinpoint Test	C
TEST STEP		RESULT	ACTION TO TAKE
<b>C4</b>	<b>CHECK FOR EXCESS VOLTAGE ON VREF CIRCUIT</b>		
<ul style="list-style-type: none"> <li>• Key off, wait 10 seconds.</li> <li>• Breakout box installed.</li> <li>• Disconnect processor.</li> <li>• Key on, engine off.</li> <li>• DVOM on 20 volt scale.</li> <li>• Measure voltage between Test Pin 26 at the breakout box and battery ground.</li> <li>• Is voltage less than 0.5 volts?</li> </ul>		Yes	▶ REMOVE breakout box. RECONNECT sensor. REPLACE processor. RERUN Quick Test.
		No	▶ SERVICE short to battery power in EEC harness. REMOVE breakout box. RECONNECT processor and sensor. RERUN Quick Test. If condition persists, REPLACE processor.
<b>C5</b>	<b>CHECK FOR SHORTED THROTTLE POSITION SENSOR</b>		
<ul style="list-style-type: none"> <li>• Key off, wait 10 seconds.</li> <li>• Breakout box installed.</li> <li>• Processor connected.</li> <li>• Disconnect Throttle Position (TP) sensor from vehicle harness.</li> <li>• Key on, engine off.</li> <li>• DVOM on 20 volt scale.</li> <li>• Measure voltage between Test Pin 26 and Test Pin 46 at the breakout box.</li> <li>• Is voltage less than 4.0 volts?</li> </ul>		Yes	▶ Vehicles equipped with EVP/PFE sensor, GO to <b>C6</b> . All other vehicles, GO to <b>C7</b> .
		No	▶ REPLACE TP sensor. REMOVE breakout box. RECONNECT processor. RERUN Quick Test.
<b>C6</b>	<b>CHECK FOR SHORTED EVP/PFE SENSOR</b>		
<ul style="list-style-type: none"> <li>• Key off, wait 10 seconds.</li> <li>• Breakout box installed.</li> <li>• Processor connected.</li> <li>• Disconnect EVP/PFE sensor.</li> <li>• Key on, engine off.</li> <li>• DVOM on 20 volt scale.</li> <li>• Measure voltage between Test Pin 26 and Test Pin 46 at the breakout box.</li> <li>• Is voltage less than 4.0 volts?</li> </ul>		Yes	▶ GO to <b>C7</b> .
		No	▶ REPLACE EVP/PFE sensor. REMOVE breakout box. RECONNECT processor and sensor(s). RERUN Quick Test.

Pinpoint Test C4 Thru C6 - Reference Voltage

Reference Voltage		Pinpoint Test	C
TEST STEP		RESULT	ACTION TO TAKE
<b>C7</b>	CHECK FOR SHORTED MAP/BP SENSOR		
<ul style="list-style-type: none"> <li>• Key off, wait 10 seconds.</li> <li>• Breakout box installed.</li> <li>• Processor connected.</li> <li>• Disconnect MAP/BP sensor.</li> <li>• Key on, engine off.</li> <li>• DVOM on 20 volt scale.</li> <li>• Measure voltage between Test Pin 26 and Test Pin 46 at the breakout box.</li> <li>• Is voltage less than 4.0 volts?</li> </ul>		<p>Yes ▶</p> <p>No ▶</p>	<p>Vehicles equipped with VAF sensor, GO to <b>C8</b>.</p> <p>All other vehicles, GO to <b>C9</b>.</p> <p>REPLACE MAP/BP sensor. REMOVE breakout box. RECONNECT processor and sensor(s). RERUN Quick Test.</p>
<b>C8</b>	CHECK FOR SHORTED VANE AIR METER (VAF) SENSOR		
<ul style="list-style-type: none"> <li>• Key off, wait 10 seconds.</li> <li>• Breakout box installed.</li> <li>• Processor connected.</li> <li>• Disconnect vane air meter (VAF) sensor.</li> <li>• Key on, engine off.</li> <li>• DVOM on 20 volt scale.</li> <li>• Measure voltage between Test Pin 26 and Test Pin 46 at the breakout box.</li> <li>• Is voltage less than 4.0 volts?</li> </ul>		<p>Yes ▶</p> <p>No ▶</p>	<p>GO to <b>C9</b>.</p> <p>REPLACE VAF sensor. REMOVE breakout box. RECONNECT processor and sensor(s). RERUN Quick Test.</p>
<b>C9</b>	SHORT TO GROUND IN VREF		
<ul style="list-style-type: none"> <li>• Key off, wait 10 seconds.</li> <li>• Breakout box installed.</li> <li>• Processor disconnected.</li> <li>• Disconnect TP and MAP/BP, EVP/PFE and VAF, if so equipped.</li> <li>• DVOM on 200 ohm scale.</li> <li>• Measure resistance between Test Pin 26 and Test Pins 20, 40, 46 and 60 at the breakout box.</li> <li>• Is any resistance less than 5 ohms?</li> </ul>		<p>Yes ▶</p> <p>No ▶</p>	<p>REMOVE breakout box. RECONNECT processor. SERVICE short to ground. CONNECT all sensors. RERUN Quick Test. If original condition still exists, REPLACE processor.</p> <p>REMOVE breakout box. RECONNECT sensors. REPLACE processor. RERUN Quick Test.</p>

Pinpoint Test C7 Thru C9 - Reference Voltage

## Vane Air Temperature Sensor (VAT)

## Pinpoint Test

## DA

### Note

You should enter this Pinpoint Test only when a Service Code 28, 58 or 68 is received in Quick Test Step 3.0, 5.0 or 6.0.

### Remember

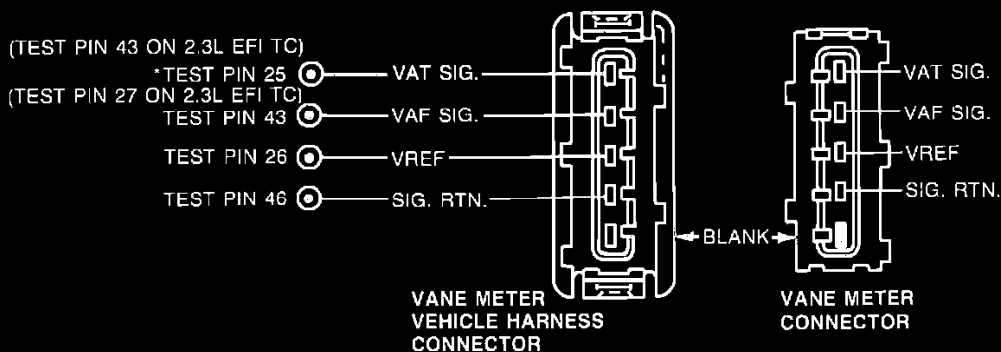
To prevent the replacement of good components, be aware that the following non-EEC areas may be at fault:

- 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.

### Pinpoint Test Schematic



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

TYPICAL RESISTANCE BETWEEN TEST PINS 25 (OR 43) & 46	5800 ohms	2700 ohms	300 ohms	180 ohms	125 ohms
AT TEMPERATURE	32°F	65°F	185°F	220°F	240°F

\*TEST PINS LOCATED ON BREAKOUT BOX.

ALL HARNESS CONNECTORS VIEWED INTO MATING SURFACE.

Pinpoint Test DA - Vane Air Temp. Sensor (VAT)

Vane Air Temperature Sensor (VAT)		Pinpoint Test	DA
TEST STEP		RESULT	ACTION TO TAKE
<b>DA1</b>	SERVICE CODE 28: CHECK AMBIENT TEMPERATURE		
<p><b>NOTE: Ambient temperature must be greater than 50°F for this test.</b></p> <ul style="list-style-type: none"> <li>• Is the ambient temperature greater than 50°F?</li> </ul>		<p>Yes</p> <p>No</p>	<p>GO to <b>DA2</b>.</p> <p>RERUN Quick Test.</p>
<b>DA2</b>	CHECK FOR VREF AT THROTTLE POSITION SENSOR		
<ul style="list-style-type: none"> <li>• Refer to illustration QA.</li> <li>• Key off, wait 10 seconds.</li> <li>• Disconnect TP sensor.</li> <li>• DVOM on 20 volt scale.</li> <li>• Key on, engine off.</li> <li>• Measure voltage between VREF and SIGNAL RETURN at the TP vehicle harness connector.</li> <li>• Is voltage between 4.0 volts and 6.0 volts?</li> </ul>		<p>Yes</p> <p>No</p>	<p>RECONNECT TP sensor, GO to <b>DA3</b>.</p> <p>GO to Pinpoint Test Step <b>C1</b>.</p>
<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>• Disconnect harness from the vane meter.</li> <li>• DVOM on 200,000 ohm scale.</li> <li>• Measure resistance between VAT signal and SIGNAL RETURN at the VAT sensor.</li> <li>• Is resistance between 125 ohms (240°F) and 3700 ohms (50°F)?</li> </ul>		<p>Yes</p> <p>No</p>	<p>REPLACE processor. RECONNECT harness to vane meter. RERUN Quick Test.</p> <p>REPLACE vane meter. RERUN Quick Test.</p>

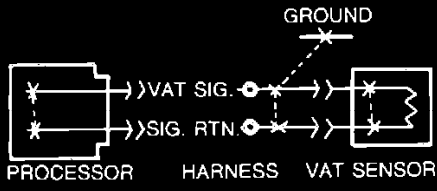
Pinpoint Test DA1 Thru DA3 - Vane Air Temp. Sensor (VAT)

<b>Vane Air Temperature Sensor (VAT)</b>		<b>Pinpoint Test</b>	<b>DA</b>
<b>TEST STEP</b>		<b>RESULT</b>	<b>ACTION TO TAKE</b>
<b>DA10</b>	<b>SERVICE CODE 58: 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) between VAT SIGNAL and SIGNAL RETURN at the vane meter vehicle harness connector.</li> <li>• Rerun Key On Engine Off Self-Test.</li> <li>• Is Code 68 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 (Test Pin 43 on 2.3L EFI TC) 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> <li>• Are both resistances less than 5 ohms?</li> </ul>		<p>Yes</p> <p>No</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>

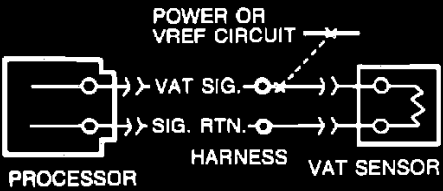
Pinpoint Test DA10 &amp; DA11 - Vane Air Temp. Sensor (VAT)

<b>Vane Air Temperature Sensor (VAT)</b>		<b>Pinpoint Test</b>	<b>DA</b>
<b>TEST STEP</b>		<b>RESULT</b>	<b>ACTION TO TAKE</b>
<b>DA20</b>	<b>SERVICE CODE 68: 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 Self-Test.</li> <li>• Is Code 58 present?</li> </ul>		<p>Yes ▶</p> <p>No ▶</p>	<p>REPLACE vane meter. RECONNECT harness to vane meter. RERUN Quick Test.</p> <p>GO to <b>DA21</b>.</p>
<b>DA21</b>	<b>CHECK FOR VREF AT THROTTLE POSITION SENSOR</b>		
<ul style="list-style-type: none"> <li>• Refer to illustration QA.</li> <li>• Key off, wait 10 seconds.</li> <li>• Disconnect TP sensor.</li> <li>• DVOM on 20 volt scale.</li> <li>• Key on, engine off.</li> <li>• Measure voltage at the TP vehicle harness connector between VREF and SIGNAL RETURN.</li> <li>• Is voltage between 4.0 volts and 6.0 volts?</li> </ul>		<p>Yes ▶</p> <p>No ▶</p>	<p>RECONNECT TP sensor, GO to <b>DA22</b>.</p> <p>GO to Pinpoint Test Step <b>C1</b>.</p>
<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, leave processor disconnected.</li> <li>• DVOM on 200,000 ohm scale.</li> <li>• Measure resistance between Test Pin 25 (Test Pin 43 on 2.3L EFI TC) and Test Pins 40, 46 and 60 at the breakout box.</li> <li>• Are all resistances greater than 10,000 ohms?</li> </ul>		<p>Yes ▶</p> <p>No ▶</p>	<p>REPLACE processor. REMOVE breakout box. RECONNECT processor. RERUN Quick Test.</p> <p>CORRECT circuit shorts. REMOVE breakout box. RECONNECT processor and vane meter. RERUN Quick Test.</p>

Pinpoint Test DA20 Thru DA22 - Vane Air Temp. Sensor (VAT)

Vane Air Temperature Sensor (VAT)		Pinpoint Test	DA
TEST STEP		RESULT	ACTION TO TAKE
<b>DA90</b>	CONTINUOUS MEMORY CODE 58: CHECK VAT SENSOR		
<ul style="list-style-type: none"> <li>• Enter Key On Engine Off Continuous Monitor mode.</li> <li>• Observe VOM or STAR LED for indication of a fault while performing the following: <ul style="list-style-type: none"> <li>— Lightly tap on vane meter (simulate road shock).</li> <li>— Wiggle connector at vane meter.</li> </ul> </li> <li>• Is a fault indicated?</li> </ul>		Yes	DISCONNECT and INSPECT connectors. If connector and terminals are good, REPLACE vane meter. CLEAR Continuous Memory Code 58. Quick Test.
 <p>The diagram illustrates the electrical circuit for the Vane Air Temperature (VAT) sensor. It shows a Processor on the left, a Harness in the middle, and a VAT Sensor on the right. Two signal lines, labeled 'VAT SIG.' and 'SIG. RTN.', connect the Processor to the VAT Sensor through the Harness. A dashed line indicates a ground connection from the VAT Sensor back to the Processor. The VAT Sensor is represented by a rectangular box with a zigzag line inside, indicating its internal resistance.</p>		No	GO to <b>DA91</b> .
<b>DA91</b>	CHECK EEC-IV HARNESS		
<ul style="list-style-type: none"> <li>• Still in Key On Engine Off Continuous Monitor mode.</li> <li>• Observe VOM or STAR LED for a fault indication while performing the following: <ul style="list-style-type: none"> <li>— Referring to the illustration in Step 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> </ul> </li> <li>• Is a fault indicated?</li> </ul>		Yes	ISOLATE fault and SERVICE as necessary. CLEAR Continuous Memory Code 58. RERUN Quick Test.
		No	GO to <b>DA92</b> .

Pinpoint Test DA90 &amp; DA91 - Vane Air Temp. Sensor (VAT)

Vane Air Temperature Sensor (VAT)		Pinpoint Test	DA
TEST STEP	RESULT	ACTION TO TAKE	
<b>DA92</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>	<p>No</p> <p>Yes</p>	<p>▶ SERVICE as necessary. CLEAR Continuous Memory Code 58.  RERUN Quick Test.</p> <p>▶ Unable to duplicate fault at this time. CLEAR Continuous Memory Code 58.  Continuous Memory Code 58 testing complete.</p>	
<b>DA93</b> CONTINUOUS MEMORY CODE 68: CHECK VAT SENSOR  <ul style="list-style-type: none"> <li>• Enter Key On Engine Off Continuous Monitor mode. Refer to Appendix in Section 16.</li> <li>• Observe VOM or STAR LED for indication of a fault while performing the following:                             <ul style="list-style-type: none"> <li>— Lightly tap on vane meter (simulate road shock).</li> <li>— Wiggle connector at vane meter.</li> </ul> </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 vane meter. CLEAR Continuous Memory Code 68. RERUN Quick Test.</p> <p>▶ GO to <b>DA94</b> .</p>	

Pinpoint Test DA92 & DA93 - Vane Air Temp. Sensor (VAT)

<b>Vane Air Temperature Sensor (VAT)</b>		<b>Pinpoint Test</b>	<b>DA</b>
<b>TEST STEP</b>	<b>RESULT</b>	<b>ACTION TO TAKE</b>	
<b>DA94</b>   CHECK EEC-IV HARNESS			
<ul style="list-style-type: none"> <li>• Still in Key On Engine Off Continuous Monitor mode.</li> <li>• Observe VOM or STAR LED for a fault indication while performing the following:               <ul style="list-style-type: none"> <li>— Referring to the illustration in Step 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> </ul> </li> <li>• Is a fault indicated?</li> </ul>	<p>Yes</p> <p>▶</p> <p>No</p> <p>▶</p>	<p>ISOLATE fault and SERVICE as necessary. CLEAR Continuous Memory Code 68.</p> <p>RERUN Quick Test.</p> <p>GO to <b>DA95</b> .</p>	
<b>DA95</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>	<p>No</p> <p>▶</p> <p>Yes</p> <p>▶</p>	<p>SERVICE as necessary. CLEAR Continuous Memory Code 68.</p> <p>RERUN Quick Test.</p> <p>Unable to duplicate fault at this time. CLEAR Continuous Memory Code 68.</p> <p>Continuous Memory Code 68 testing complete.</p>	

Pinpoint Test DA4 &amp; DA95 - Vane Air Temp. Sensor (VAT)

## Air Charge Temperature Sensor (ACT)

## Pinpoint Test

## DB

### Note

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.

### Remember

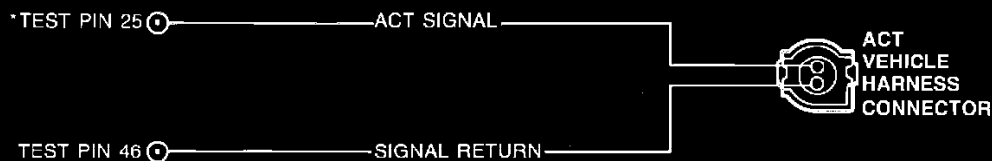
To prevent the replacement of good components, be aware that the following non-EEC areas may be at fault:

- 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.

### Pinpoint Test Schematic



NOTE: AMBIENT TEMPERATURE MUST BE GREATER THAN 50°F.

TYPICAL RESISTANCE BETWEEN TEST PINS 25 & 46	58.750 ohms	40.500 ohms	3600 ohms	1840 ohms
AT TEMPERATURE	50°F	65°F	180°F	220°F

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

Pinpoint Test DB - Air Charge Temperature Sensor (ACT)

## Air Charge Temperature Sensor (ACT)

## Pinpoint Test

## DB

TEST STEP		RESULT	ACTION TO TAKE
<b>DB1</b>	<b>SERVICE CODE 24: CHECK PROPER INSTALLATION OF ACT SENSOR</b>		
	<ul style="list-style-type: none"> <li>For vehicles with ACT sensor mounted in the intake manifold, GO to step <b>DB2</b>.</li> <li>Is ACT sensor mounted properly in the air cleaner?</li> </ul>	<p>Yes ▶</p> <p>No ▶</p>	<p>GO to <b>DB2</b>.</p> <p>INSTALL ACT sensor properly. RERUN Quick Test.</p>
<b>DB2</b>	<b>CHECK FOR VREF AT THROTTLE POSITION SENSOR</b>		
	<ul style="list-style-type: none"> <li>Refer to schematic in Pinpoint Test DH.</li> <li>Key off, wait 10 seconds.</li> <li>DVOM on 20 volt scale.</li> <li>Disconnect TP sensor.</li> <li>Key on, engine off.</li> <li>Measure voltage between VREF and SIGNAL RETURN at the TP sensor vehicle harness connector.</li> <li>Is voltage between 4.0 and 6.0 volts?</li> </ul>	<p>Yes ▶</p> <p>No ▶</p>	<p>RECONNECT TP sensor, GO to <b>DB3</b>.</p> <p>GO to Pinpoint Test Step <b>C1</b>.</p>
<b>DB3</b>	<b>CHECK ACT SENSOR WITH ENGINE OFF</b>		
	<p><b>NOTE: Make sure engine is warmed up prior to this test.</b></p> <ul style="list-style-type: none"> <li>Key off, wait 10 seconds.</li> <li>Disconnect harness from ACT sensor.</li> <li>DVOM on 200,000 ohm scale.</li> <li>Measure resistance of ACT sensor.</li> <li>Is resistance between 1,100 and 58,000 ohms?</li> </ul>	<p>Yes ▶</p> <p>No ▶</p>	<p>GO to <b>DB4</b>.</p> <p>CHECK heat stove duct valve operation. If OK, REPLACE ACT sensor. RECONNECT harness to ACT sensor. RERUN Quick Test.</p>
<b>DB4</b>	<b>CHECK ACT SENSOR WITH ENGINE RUNNING</b>		
	<ul style="list-style-type: none"> <li>Key off.</li> <li>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> <li>Is resistance between 2,400 and 29,000 ohms?</li> </ul>	<p>Yes ▶</p> <p>No ▶</p>	<p>REPLACE processor. RECONNECT harness to ACT sensor. RERUN Quick Test.</p> <p>CHECK heat stove duct valve operation. If OK, REPLACE ACT sensor. RERUN Quick Test.</p>

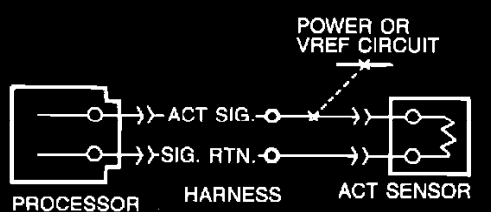
### Pinpoint Test DB1 Thru DB4 - Air Charge Temperature Sensor (ACT)

Air Charge Temperature Sensor (ACT)		Pinpoint Test	DB
TEST STEP		RESULT	ACTION TO TAKE
<b>DB10</b>	SERVICE CODE 54: ATTEMPT TO GENERATE CODE 64		
<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 Self-Test.</li> <li>• Is Code 64 present?</li> </ul>		Yes	REPLACE ACT sensor. REMOVE jumper wire. RECONNECT ACT sensor. RERUN Quick Test.
		No	REMOVE jumper wire. GO to <b>DB11</b> .
<b>DB11</b>	CHECK CONTINUITY OF ACT SIGNAL AND SIGNAL RETURN		
<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> <li>• Are both resistances less than 5 ohms?</li> </ul>		Yes	REPLACE processor. REMOVE breakout box. RECONNECT processor and ACT sensor. RERUN Quick Test.
		No	SERVICE open circuit(s). REMOVE breakout box. RECONNECT processor and ACT sensor. RERUN Quick Test.

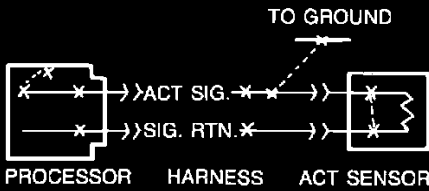
Pinpoint Test DB10 &amp; DB11 - Air Charge Temperature Sensor (ACT)

<b>Air Charge Temperature Sensor (ACT)</b>		<b>Pinpoint Test</b>	<b>DB</b>
<b>TEST STEP</b>		<b>RESULT</b>	<b>ACTION TO TAKE</b>
<b>DB20</b>	<b>SERVICE CODE 64: ATTEMPT TO GENERATE CODE 54</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>• Run Key On Engine Off Self-Test.</li> <li>• Is Code 54 present?</li> </ul>		<p>Yes ▶</p> <p>No ▶</p>	<p>REPLACE ACT sensor. RECONNECT ACT sensor. RERUN Quick Test.</p> <p>GO to <b>DB21</b>.</p>
<b>DB21</b>	<b>CHECK FOR VREF AT THROTTLE POSITION SENSOR</b>		
<ul style="list-style-type: none"> <li>• Refer to schematic in Pinpoint Test DH.</li> <li>• Key off, wait 10 seconds.</li> <li>• DVOM on 20 volt 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> <li>• Is voltage between 4.0 and 6.0 volts?</li> </ul>		<p>Yes ▶</p> <p>No ▶</p>	<p>RECONNECT TP sensor, GO to <b>DB22</b>.</p> <p>GO to Pinpoint Test Step <b>C1</b>.</p>
<b>DB22</b>	<b>CHECK ACT SIGNAL FOR SHORT TO GROUND</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 200,000 ohm scale.</li> <li>• Measure resistance between Test Pin 25 and Test Pins 40, 46 and 60 at the breakout box.</li> <li>• Are all resistances greater than 10,000 ohms?</li> </ul>		<p>Yes ▶</p> <p>No ▶</p>	<p>REPLACE processor. REMOVE breakout box. RECONNECT processor and ACT sensor. RERUN Quick Test.</p> <p>SERVICE short circuit. REMOVE breakout box. RECONNECT processor and ACT sensor. RERUN Quick Test.</p>

Pinpoint Test DB20 Thru DB22 - Air Charge Temperature Sensor (ACT)

Air Charge Temperature Sensor (ACT)		Pinpoint Test	DB
TEST STEP		RESULT	ACTION TO TAKE
<b>DB90</b>	CONTINUOUS MEMORY CODE 54: CHECK ACT SENSOR		
<ul style="list-style-type: none"> <li>• Enter Key On Engine Off Continuous Monitor mode.</li> <li>• Observe VOM or STAR LED for indication of a fault while performing the following: <ul style="list-style-type: none"> <li>— Lightly tap on ACT sensor (simulate road shock).</li> <li>— Wiggle ACT connector.</li> </ul> </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. CLEAR Continuous Memory Code 54. RERUN Quick Test.</p> <p>GO to <b>DB91</b>.</p>
<b>DB91</b>	CHECK EEC-IV HARNESS		
<ul style="list-style-type: none"> <li>• Still in Key On Engine Off Continuous Monitor mode.</li> <li>• Observe VOM or STAR LED for a fault indication while performing the following: <ul style="list-style-type: none"> <li>— Referring to the illustration in Step 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> </ul> </li> <li>• Is a fault indicated?</li> </ul>		<p>Yes</p> <p>No</p>	<p>ISOLATE fault and SERVICE as necessary. CLEAR Continuous Memory Code 54. RERUN Quick Test.</p> <p>GO to <b>DB92</b>.</p>

Pinpoint Test DB90 &amp; DB91 - Air Charge Temperature Sensor (ACT)

Air Charge Temperature Sensor (ACT)		Pinpoint Test	DB
TEST STEP		RESULT	ACTION TO TAKE
<b>DB92</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. CLEAR Continuous Memory Code 54. RERUN Quick Test.
		Yes	Unable to duplicate fault at this time. CLEAR Continuous Memory Code 54. Continuous Memory Code 54 testing complete.
<b>DB93</b>	CONTINUOUS MEMORY CODE 64: CHECK ACT SENSOR		
<ul style="list-style-type: none"> <li>• Enter Key On Engine Off Continuous Monitor mode. Refer to the Appendix in Section 16.</li> <li>• Observe VOM or STAR LED for an indication of a fault while performing the following: <ul style="list-style-type: none"> <li>— Lightly tap on ACT sensor (simulate road shock).</li> <li>— Wiggle ACT connector.</li> </ul> </li> <li>• Is a fault indicated?</li> </ul>		Yes	DISCONNECT and INSPECT connectors. If connector and terminals are good, REPLACE ACT sensor. CLEAR Continuous Memory Code 64. RERUN Quick Test.
 <p>TO GROUND</p> <p>PROCESSOR    HARNESS    ACT SENSOR</p>		No	GO to <b>DB94</b> .

Pinpoint Test DB92 &amp; DB93 - Air Charge Temperature Sensor (ACT)

Air Charge Temperature Sensor (ACT)		Pinpoint Test	DB
TEST STEP		RESULT	ACTION TO TAKE
<b>DB94</b>	<b>CHECK EEC-IV HARNESS</b>		
<ul style="list-style-type: none"> <li>• Still in Key On Engine Off Continuous Monitor mode.</li> <li>• Observe VOM or STAR LED for a fault indication while performing the following:               <ul style="list-style-type: none"> <li>— Referring to the illustration in Step 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> </ul> </li> <li>• Is a fault indicated?</li> </ul>		<p>Yes ▶</p> <p>No ▶</p>	<p>ISOLATE fault and SERVICE as necessary. CLEAR Continuous Memory Code 64. RERUN Quick Test.</p> <p>GO to <b>DB95</b> .</p>
<b>DB95</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. CLEAR Continuous Memory Code 64. RERUN Quick Test.</p> <p>Unable to duplicate fault at this time. CLEAR Continuous Memory Code 64. Continuous Memory Code 64 testing complete.</p>

Pinpoint Test DB94 &amp; DB95 - Air Charge Temperature Sensor (ACT)

**Mass Airflow Sensor (MAF)****Pinpoint  
Test****DC****Note**

You should enter this Pinpoint Test only when a Service Code 26, 56, or 66 is received in Quick Test Step 3.0, 5.0, or 6.0 or when directed here from Diagnostic By Symptom

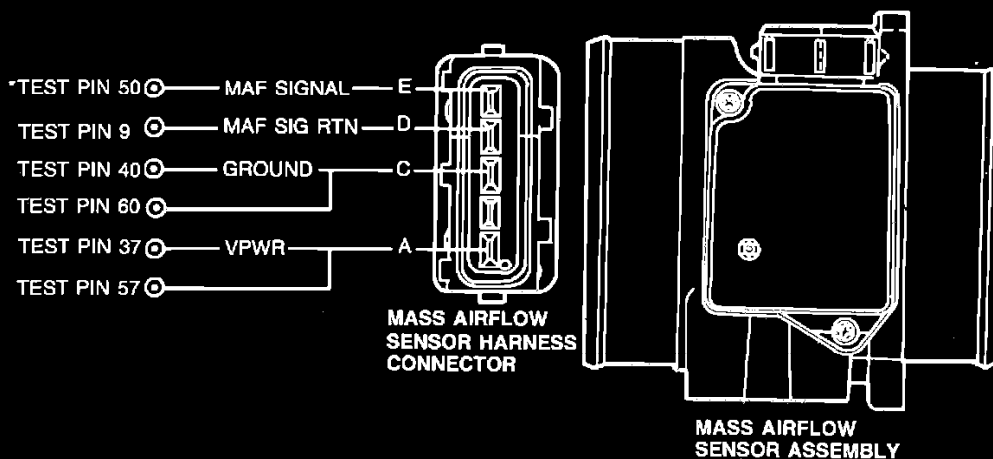
**Remember**

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

- Air cleaner element
- Inlet air duct
- Throttle body

This Pinpoint Test is intended to diagnose only the following:

- Mass Airflow sensor
- Processor assembly
- Harness circuits: VPWR, POWER GROUND, MAF SIGNAL, and MAF RTN







**Pinpoint Test Schematic**

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

**Pinpoint Test DC - Mass Airflow Sensor (MAF)**

<b>Mass Airflow Sensor (MAF)</b>		<b>Pinpoint Test</b>	<b>DC</b>
<b>TEST STEP</b>		<b>RESULT</b>	<b>ACTION TO TAKE</b>
<b>DC1</b>	<b>CHECK FOR VOLTAGE AT MAF SENSOR</b>		
<ul style="list-style-type: none"> <li>• Key off.</li> <li>• Disconnect MAF sensor from vehicle harness.</li> <li>• DVOM on 20 volt scale.</li> <li>• Measure voltage between MAF SIGNAL at the MAF sensor vehicle harness connector and battery negative post.</li> <li>• Is voltage greater than 1.5 volt?</li> </ul>		<p>Yes ▶</p> <p>No ▶</p>	<p>SERVICE short circuit. RECONNECT MAF sensor. RERUN Quick Test.</p> <p>REPLACE MAF sensor. RERUN Quick Test.</p>
<b>DC2</b>	<b>CHECK CONTINUITY OF PWR GND CIRCUIT</b>		
<ul style="list-style-type: none"> <li>• Key off.</li> <li>• MAF sensor disconnected.</li> <li>• DVOM on 200 ohm scale.</li> <li>• Measure resistance between PWR GND circuit at the MAF sensor vehicle harness connector and battery negative post.</li> <li>• Is resistance less than 5 ohms?</li> </ul>		<p>Yes ▶</p> <p>No ▶</p>	<p>GO to <b>DC3</b> .</p> <p>SERVICE open circuit. RECONNECT MAF sensor. RERUN Quick Test.</p>
<b>DC3</b>	<b>CHECK CONTINUITY OF MAF SIG RTN CIRCUIT</b>		
<ul style="list-style-type: none"> <li>• Key off.</li> <li>• MAF sensor disconnected.</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 MAF SIG RTN circuit at the MAF sensor vehicle harness connector and Test Pin 9 at the breakout box.</li> <li>• Is resistance less than 5 ohms?</li> </ul>		<p>Yes ▶</p> <p>No ▶</p>	<p>GO to <b>DC8</b> .</p> <p>REMOVE breakout box. RECONNECT all components. SERVICE open circuit. RERUN Quick Test.</p>

Pinpoint Test DC1 Thru DC3 - Mass Airflow Sensor (MAF)

Mass Airflow Sensor (MAF)		Pinpoint Test	DC
TEST STEP		RESULT	ACTION TO TAKE
<b>DC4</b>	<b>ENGINE RUNNING SERVICE CODE 26: CHECK VOLTAGE OF VPWR CIRCUIT</b>		
<ul style="list-style-type: none"> <li>• Key off.</li> <li>• Disconnect MAF sensor from vehicle harness.</li> <li>• DVOM on 20 volt scale.</li> <li>• Key on, engine off.</li> <li>• Measure voltage between VPWR circuit at the MAF sensor vehicle harness connector and battery negative post.</li> <li>• Is voltage greater than 10.5 volts?</li> </ul>		Yes  No 	GO to <b>DC5</b> .  GO to Pinpoint Test Step <b>B1</b> .
<b>DC5</b>	<b>CHECK MAF SENSOR GROUND</b>		
<ul style="list-style-type: none"> <li>• Key on, engine off.</li> <li>• MAF sensor disconnected.</li> <li>• DVOM on 20 volt scale.</li> <li>• Measure voltage between VPWR circuit and PWR GND circuit at the MAF sensor vehicle harness connector.</li> <li>• Is voltage greater than 10.5 volts?</li> </ul>		Yes  No 	GO to <b>DC6</b> .  RECONNECT MAF sensor. SERVICE open PWR GND circuit. RERUN Quick Test.
<b>DC6</b>	<b>CHECK CONTINUITY OF MAF SIGNAL AND VPWR CIRCUITS</b>		
<ul style="list-style-type: none"> <li>• Key off.</li> <li>• MAF sensor disconnected.</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 MAF SIGNAL at the MAF sensor vehicle harness connector and Test Pin 50 at the breakout box.</li> <li>• Measure resistance between VPWR at the MAF sensor vehicle harness connector and Test Pins 37/57 at the breakout box.</li> <li>• Are both resistances less than 5 ohms?</li> </ul>		Yes  No 	If vehicle is a no start or starts and stalls, GO to <b>DC2</b> . All others GO to <b>DC7</b> .  REMOVE breakout box. RECONNECT all components. SERVICE open circuit. RERUN Quick Test.

Pinpoint Test DC4 Thru DC6 - Mass Airflow Sensor (MAF)

<b>Mass Airflow Sensor (MAF)</b>		<b>Pinpoint Test</b>	<b>DC</b>
<b>TEST STEP</b>		<b>RESULT</b>	<b>ACTION TO TAKE</b>
<b>DC7</b>	<b>CHECK MAF SIGNAL FOR SHORTS TO GROUND AND MAF SIG RTN</b>		
<ul style="list-style-type: none"> <li>• Key off.</li> <li>• Breakout box installed.</li> <li>• MAF sensor and processor disconnected.</li> <li>• DVOM on 200,000 ohm scale.</li> <li>• Measure resistance between Test Pin 50 and Test Pins 40, 9, and 60 at the breakout box.</li> <li>• Are all resistances greater than 10,000 ohms?</li> </ul>		Yes	▶ GO to <b>DC2</b> .
		No	▶ REMOVE breakout box. RECONNECT all components. SERVICE short circuit(s). RERUN Quick Test.
<b>DC8</b>	<b>CHECK MAF SENSOR RESISTANCE</b>		
<ul style="list-style-type: none"> <li>• Key off.</li> <li>• Breakout box installed, processor disconnected.</li> <li>• Reconnect MAF sensor.</li> <li>• DVOM on 20,000 ohm scale.</li> <li>• Measure resistance between Test Pin 50 and Test Pins 9, 40/60, at the breakout box.</li> <li>• Are all resistances less than 10,000 ohms?</li> </ul>		Yes	▶ REMOVE breakout box. REPLACE processor. RERUN Quick Test.
		No	▶ REMOVE breakout box. RECONNECT processor. REPLACE MAF sensor. RERUN Quick Test.
<b>DC10</b>	<b>RUN KEY ON ENGINE OFF SELF-TEST WITH MAF SENSOR DISCONNECTED</b>		
<ul style="list-style-type: none"> <li>• Key off.</li> <li>• Disconnect MAF sensor from vehicle harness.</li> <li>• Rerun Key On Engine Off Self-Test.</li> <li>• Is Service Code 66 present?</li> </ul>		Yes	▶ REPLACE MAF sensor. RERUN Quick Test.
		No	▶ GO to <b>DC11</b> .
<b>DC11</b>	<b>CHECK MAF SIGNAL FOR SHORT TO VPWR</b>		
<ul style="list-style-type: none"> <li>• Key off.</li> <li>• MAF sensor disconnected.</li> <li>• Breakout box installed, processor disconnected.</li> <li>• DVOM on 200,000 ohm scale.</li> <li>• Measure resistance between MAF SIGNAL and VPWR at the MAF sensor vehicle harness connector.</li> <li>• Is resistance greater than 10,000 ohms?</li> </ul>		Yes	▶ REMOVE breakout box. RECONNECT MAF sensor. REPLACE processor. RERUN Quick Test.
		No	▶ REMOVE breakout box. RECONNECT all components. SERVICE short circuit. RERUN Quick Test.

Pinpoint Test DC7 Thru DC11 - Mass Airflow Sensor (MAF)

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

## Pinpoint Test

## DD

### Note

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.

### Remember

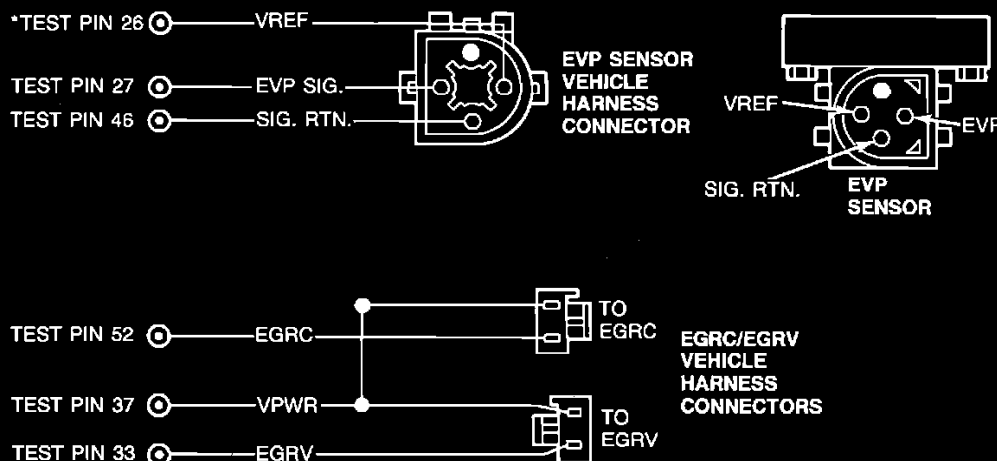
To prevent the replacement of good components, be aware that the following non-EEC areas may be at fault:

- Damaged EGR valve.

This Pinpoint Test is intended to diagnose only the following:

- EVP sensor.
- Harness circuits: EVP, SIGNAL RETURN, VREF, EGRV, EGRC, VPWR.
- EGRV/EGRC solenoids.
- EGR Valve assembly.
- Processor assembly.
- Vacuum lines (EGRV/EGRC, EGR)

### Pinpoint Test Schematic



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

Pinpoint Test DD - EGR Valve Position Sensor (EVP) Control/Vent (EGRC/EGRV)

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

## Pinpoint Test

## DD

TEST STEP		RESULT	ACTION TO TAKE
<b>DD1</b>	SERVICE CODE 31 RUN ENGINE RUNNING SELF-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>• Run Engine Running Self-Test.</li> <li>• Is Code 31 present?</li> </ul>	<p>Yes ▶</p> <p>No ▶</p>	<p>GO to <b>DD2</b> .</p> <p>RECONNECT vacuum line. GO to <b>DD11</b> .</p>
<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>• Disconnect EGR vacuum line at EGR valve and cap the vacuum line.</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>	<p>Reading gradually decreases from no greater than 5500 ohms to no less than 100 ohms ▶</p> <p>Reading is less than 100 ohms or greater than 5500 ohms ▶</p> <p>Reading does not decrease or unable to hold vacuum ▶</p>	<p>RECONNECT vacuum line. GO to <b>DD3</b> .</p> <p>REPLACE EVP sensor. RECONNECT signal line and harness. RERUN Quick Test.</p> <p>GO to <b>DD16</b> .</p>
<b>DD3</b>	CHECK FOR VREF AT THE EVP SENSOR		
	<ul style="list-style-type: none"> <li>• Key on, engine off.</li> <li>• Harness disconnected from EVP sensor.</li> <li>• DVOM on 20 volt scale.</li> <li>• Measure voltage at the EVP vehicle harness connector between VREF and SIGNAL RETURN.</li> <li>• Is voltage between 4.0 and 6.0 volts?</li> </ul>	<p>Yes ▶</p> <p>No ▶</p>	<p>GO to <b>DD4</b> .</p> <p>GO to Pinpoint Test Step <b>C1</b> .</p>

Pinpoint Test DD1 Thru DD3 - EGR Valve Position Sensor (EVP) Control/Vent (EGRC/EGRV)

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

## Pinpoint Test

## DD

TEST STEP		RESULT	ACTION TO TAKE
<b>DD4</b>	CHECK 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. 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 Test Pin 27 at the breakout box and EVP SIGNAL at the EVP vehicle harness connector.</li> <li>• Is resistance less than 5 ohms?</li> </ul>		Yes ▶  No ▶	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.</li> <li>• Harness disconnected from EVP sensor.</li> <li>• Breakout box installed.</li> <li>• Processor disconnected.</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> <li>• Are all resistances greater than 10,000 ohms?</li> </ul>		Yes ▶  No ▶	GO to <b>DD6</b> . .  SERVICE short circuit. REMOVE breakout box. RECONNECT processor and EVP sensor. RERUN Quick Test.
<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>• Connect processor to breakout box.</li> <li>• Perform Key On Engine Off Self-Test.</li> <li>• Is Code 31 present?</li> </ul>		Yes ▶  No ▶	REMOVE breakout box. REPLACE processor. CONNECT original EVP sensor and EGR valve assembly. RERUN Quick Test.  GO to <b>DD7</b> .

Pinpoint Test DD4 Thru DD6 - EGR Valve Position Sensor (EVP) Control/Vent (EGRC/EGRV)

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

### Pinpoint Test

### DD

TEST STEP	RESULT	ACTION TO TAKE
<b>DD7</b>   CHECK EVP SENSOR  <ul style="list-style-type: none"> <li>• Key off, wait 10 seconds.</li> <li>• Breakout box installed.</li> <li>• Processor connected.</li> <li>• Install original EVP sensor on known good EGR valve.</li> <li>• Connect harness to EVP sensor.</li> <li>• Rerun Key On Engine Off Self-Test.</li> <li>• Is Code 31 present?</li> </ul>	<p>Yes</p> <p>No</p>	<p>INSTALL new EVP sensor. REMOVE breakout box. RECONNECT processor. RERUN Quick Test.</p> <p>REMOVE breakout box. RECONNECT processor.</p>
<b>DD11</b>   SERVICE CODES 32, 33 and 34: OUTPUT STATE CHECK  <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 20 volt 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 Memory Codes.</li> <li>• DVOM will indicate less than 1.0 volt.</li> <li>• Depress and release the throttle.</li> <li>• Does voltage increase to greater than 10.5 volts?</li> </ul>	<p>No</p> <p>Yes</p>	<p>DEPRESS throttle to WOT and RELEASE. If STO voltage does not go high, GO to Pinpoint Test Step <b>QC1</b>.</p> <p>REMAIN in output state check, GO to <b>DD12</b>.</p>
<b>DD12</b>   CHECK EGRC/EGRV SOLENOIDS FOR ELECTRICAL CYCLING  <ul style="list-style-type: none"> <li>• Key on, engine off.</li> <li>• DVOM on 20 volt scale.</li> <li>• Reconnect DVOM to EGRV solenoid, between 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 solenoid, between VPWR and EGRC signal.</li> <li>• Do both solenoid outputs cycle on and off?</li> </ul>	<p>Yes</p> <p>No</p>	<p>REMAIN in output state check. GO to <b>DD13</b>.</p> <p>REMOVE jumper. GO to <b>DD17</b>.</p>

Pinpoint Test DD7 Thru DD12 - EGR Valve Position Sensor (EVP) Control/Vent (EGRC/EGRV)

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

## Pinpoint Test

## DD

TEST STEP		RESULT	ACTION TO TAKE
<b>DD13</b>	CHECK EGRC/EGRV SOLENOIDS FOR VACUUM CYCLING		
<ul style="list-style-type: none"> <li>• Key on, engine off.</li> <li>• Still in output state check.</li> <li>• Disconnect and cap vacuum line from bottom port of EGRC solenoid and connect a vacuum pump.</li> <li>• Disconnect vacuum line at EGR valve. Connect vacuum gauge to EGR vacuum line.</li> <li>• Disconnect, but <b>do not</b> cap, vacuum vent line from EGRV solenoid or remove filter from the top of the EGRV solenoid.</li> <li>• Apply vacuum.</li> <li>• While cycling outputs on and off (by depressing and releasing throttle), observe vacuum gauge. Maintain vacuum at source.</li> <li>• Does the vacuum cycle on and off in less than 2 seconds?</li> </ul>		<p>Yes</p> <p>No</p>	<p>REMOVE jumper. RECONNECT all vacuum lines. GO to <b>DD14</b>.</p> <p>CHECK filter and common output vacuum line for obstructions. REPLACE as necessary. If OK, REPLACE solenoid assembly. RECONNECT all vacuum lines. RERUN Quick Test.</p>
<b>DD14</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 VEI emission schematic decal for kinks, cracks, obstructions or leaks.</li> <li>• Are vacuum lines OK?</li> </ul>		<p>Yes</p> <p>No</p>	<p>GO to <b>DD15</b>.</p> <p>SERVICE as necessary. RERUN Quick Test.</p>
<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 between EVP SIGNAL and VREF at the EVP sensor connector while increasing vacuum to 33 kPa (10 in.-Hg.).</li> <li>• Observe resistance as vacuum increases.</li> <li>• Does the resistance gradually change between 5500 and 100 ohms?</li> </ul>		<p>Yes</p> <p>No</p>	<p>REPLACE processor. RECONNECT EVP sensor and EGR vacuum line. RERUN Quick Test.</p> <p>GO to <b>DD16</b>.</p>

Pinpoint Test DD13 Thru DD15 - EGR Valve Position Sensor (EVP) Control/Vent (EGRC/EGRV)

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

### Pinpoint Test

### DD

TEST STEP		RESULT	ACTION TO TAKE
<b>DD16</b>	<b>MANUALLY EXERCISE EVP SENSOR</b>		
<ul style="list-style-type: none"> <li>• Key off.</li> <li>• Harness disconnected from EVP sensor.</li> <li>• Remove EVP sensor from EGR valve.</li> <li>• Measure resistance between EVP SIGNAL and VREF at the EVP sensor connector while gradually applying pressure to EVP sensor shaft.</li> <li>• Observe resistance as shaft is slowly pushed in and slowly released.</li> <li>• Do either of the readings change suddenly between 5500 and 100 ohms?</li> </ul> <p><b>NOTE: It is normal for the EVP sensor total resistance to drop below 100 ohms when disconnected from the EGR valve. A defective part will change resistance suddenly between 5500 and 100 ohms.</b></p>		<p>Yes</p> <p>No</p>	<p>REPLACE EVP sensor. RECONNECT harness and EGR supply vacuum line. RERUN Quick Test.</p> <p>REFER to EGR System, Section 6. RECONNECT EVP sensor and EGR supply vacuum line. RERUN Quick Test.</p>
<b>DD17</b>	<b>CHECK EGRV/EGRC SOLENOID RESISTANCE</b>		
<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> <li>• Are both resistances between 30 and 70 ohms?</li> </ul>		<p>Yes</p> <p>No</p>	<p>GO to <b>DD18</b>.</p> <p>REPLACE EGRC/EGRV solenoid assembly. RERUN Quick Test.</p>
<b>DD18</b>	<b>CHECK FOR VPWR at EGRC/EGRV SOLENOIDS</b>		
<ul style="list-style-type: none"> <li>• Disconnect harness from EGRC/EGRV solenoids.</li> <li>• Key on, engine off.</li> <li>• DVOM on 20 volt scale.</li> <li>• Measure voltage between battery negative post and VPWR circuit on both EGR solenoid vehicle harness connectors.</li> <li>• Are both voltages greater than 10.5 volts?</li> </ul>		<p>Yes</p> <p>No</p>	<p>GO to <b>DD19</b>.</p> <p>SERVICE open circuit. RECONNECT EGRC/EGRV solenoids. RERUN Quick Test.</p>

Pinpoint Test DD16 Thru DD18 - EGR Valve Position Sensor (EVP) Control/Vent (EGRC/EGRV)

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

## Pinpoint Test

## DD

TEST STEP		RESULT	ACTION TO TAKE
<b>DD19</b>	CHECK CONTINUITY OF EGRC/EGRV CIRCUITS		
<ul style="list-style-type: none"> <li>• Key off, wait 10 seconds.</li> <li>• EGRC/EGRV solenoids disconnected from harness.</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 Test Pin 33 at the breakout box and EGRV circuit at the EGRV solenoid vehicle harness connector.</li> <li>• Measure resistance between Test Pin 52 at the breakout box and EGRC circuit at the EGRC solenoid vehicle harness connector.</li> <li>• Are both resistances less than 5 ohms?</li> </ul>		Yes  No	GO to <b>DD20</b> .  SERVICE open circuit. REMOVE breakout box. RECONNECT all components. RERUN Quick Test.
<b>DD20</b>	CHECK EGRC/EGRV CIRCUITS 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>• Breakout box installed, processor disconnected.</li> <li>• EGRC/EGRV solenoids disconnected.</li> <li>• Measure resistance between Test Pins 33 and Test Pins 40, 46 and 60 at the breakout box.</li> <li>• Measure resistance between Test Pin 52 and Test Pins 40, 46, and 60 at the breakout box.</li> <li>• Are all resistances greater than 10,000 ohms?</li> </ul>		Yes  No	GO to <b>DD21</b> .  SERVICE short circuit. REMOVE breakout box. RECONNECT all components. RERUN Quick Test.

Pinpoint Test DD19 & DD20 - EGR Valve Position Sensor (EVP) Control/Vent (EGRC/EGRV)


<b>EGR Valve Position Sensor (EVP) Control/Vent (EGRC/EGRV)</b>		<b>Pinpoint Test</b>	<b>DD</b>
<b>TEST STEP</b>		<b>RESULT</b>	<b>ACTION TO TAKE</b>
<b>DD21</b>	<b>CHECK EGRC/EGRV CIRCUITS FOR SHORTS TO POWER</b>		
<ul style="list-style-type: none"> <li>• Key off.</li> <li>• Breakout box installed, processor disconnected.</li> <li>• EGRC/EGRV solenoids disconnected from harness.</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> <li>• Are all resistances greater than 10,000 ohms?</li> </ul>		<p>Yes ▶</p> <p>No ▶</p>	<p>REPLACE processor. REMOVE breakout box. RECONNECT all components. RERUN Quick Test.</p> <p>SERVICE short circuit. REMOVE breakout box. RECONNECT all components. RERUN Quick Test. If code is repeated, REPLACE processor.</p>
<b>DD30</b>	<b>SERVICE CODE 35: RPM TOO LOW FOR EGR TEST</b>		
<ul style="list-style-type: none"> <li>• Is Code 12 also present?</li> </ul>		<p>Yes ▶</p> <p>No ▶</p>	<p>GO to <b>KE1</b> .</p> <p>GO to <b>DD31</b> .</p>
<b>DD31</b>	<b>RETEST AT 1,500 RPM</b>		
<ul style="list-style-type: none"> <li>• Key off, wait 10 seconds.</li> <li>• Install tachometer.</li> <li>• Rerun Engine Running Self-Test while maintaining 1,500 rpm.</li> <li>• Is Code 35 still present?</li> </ul> <p><b>NOTE: Ignore all other codes at this time.</b></p>		<p>Yes ▶</p> <p>No ▶</p>	<p>REPLACE processor. RERUN Quick Test.</p> <p>RERUN Quick Test. SERVICE codes as necessary.</p>

**Pinpoint Test DD21 Thru DD31 - EGR Valve Position Sensor (EVP) Control/Vent (EGRC/EGRV)**

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

### Pinpoint Test

**DD**

TEST STEP		RESULT	ACTION TO TAKE
<b>DD90</b>	CONTINUOUS MEMORY CODE 31: EXERCISE EVP SENSOR		
<ul style="list-style-type: none"> <li>Enter key on engine off continuous monitor mode.</li> <li>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. 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>		Yes  No	GO to <b>DD91</b> .  GO to <b>DD92</b> .
<b>DD91</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. 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 between Test Pin 27 and Test Pin 46.</li> <li>DVOM on 20 volt scale.</li> <li>Key on, engine off.</li> <li>While observing DVOM, repeat Test Step DD90.</li> <li>Does the fault occur below 4.25 volts?</li> </ul>		Yes  No	DISCONNECT and INSPECT connector. If connector and terminals are good, REPLACE EVP sensor. CLEAR Continuous Memory Code 31. RERUN Quick Test.  EGR valve overshoot may have caused Continuous Memory Code 31. Sensor service is not required. To verify harness integrity, GO to <b>DD92</b> .

Pinpoint Test DD90 & DD91 - EGR Valve Position Sensor (EVP) Control/Vent (EGRC/EGRV)

<b>EGR Valve Position Sensor (EVP) Control/Vent (EGRC/EGRV)</b>		<b>Pinpoint Test</b>	<b>DD</b>
<b>TEST STEP</b>		<b>RESULT</b>	<b>ACTION TO TAKE</b>
<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. CLEAR Continuous Memory Code 31.</p> <p>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>Yes ▶</p> <p>No ▶</p>	<p>Unable to duplicate fault at this time. CLEAR Continuous Memory Code 31. Continuous Memory Code 31 testing complete.</p> <p>SERVICE as necessary. CLEAR Continuous Memory Code 31. RERUN Quick Test.</p>

Pinpoint Test DD92 &amp; DD93 - EGR Valve Position Sensor (EVP) Control/Vent (EGRC/EGRV)

## Engine Coolant Temperature Sensor (ECT)

## Pinpoint Test

## DE

### Note

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.

### Remember

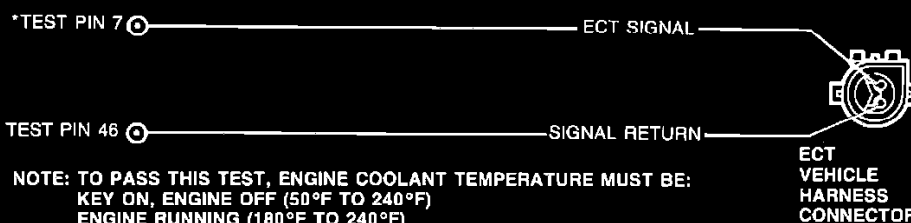
To prevent the replacement of good components, be aware that the following non-EEC areas may be at fault:

- Coolant level.
- Oil level.
- Blocked or obstructed airflow.
- Engine not at normal operating temperature.
- Electro drive cooling fan.
- Open thermostat.

This Pinpoint Test is intended to diagnose only the following:

- ECT sensor.
- Harness sensor circuits: ECT and SIGNAL RETURN.
- Processor assembly.

### Pinpoint Test Schematic



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	58,750 ohms	40,500 ohms	3600 ohms	1840 ohms
AT TEMPERATURE	50°F	65°F	180°F	220°F

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

Pinpoint Test DE - Engine Coolant Temperature Sensor (ECT)

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> <li>• Is Code 21 present?</li> </ul>		Vehicle stalls ▶  Yes ▶  No ▶	Do not service Code 21 at this time. REFER to Diagnostic by Symptoms.  GO to <b>DE2</b> .  SERVICE other codes as necessary.
<b>DE2</b>	<b>CHECK FOR VREF AT THROTTLE POSITION SENSOR</b>		
<ul style="list-style-type: none"> <li>• Refer to schematic in Pinpoint Test DH.</li> <li>• Key off, wait 10 seconds.</li> <li>• DVOM on 20 volt scale.</li> <li>• Disconnect TP sensor.</li> <li>• Key on, engine off.</li> <li>• Measure voltage between VREF and SIGNAL RETURN at the TP vehicle harness connector.</li> <li>• Is voltage between 4.0 and 6.0 volts?</li> </ul>		Yes ▶  No ▶	RECONNECT TP sensor, GO to <b>DE3</b> .  GO to Pinpoint Test Step <b>C1</b> .
<b>DE3</b>	<b>CHECK RESISTANCE OF ECT SENSOR</b>		
<p><b>NOTE: Engine may have cooled down. Always warm engine before taking ECT resistance measurement. Check for open thermostat.</b></p> <ul style="list-style-type: none"> <li>• Key off, wait 10 seconds.</li> <li>• Disconnect harness from ECT sensor.</li> <li>• DVOM on 200,000 ohm scale.</li> <li>• Measure resistance of the ECT sensor.</li> <li>• Is resistance:               <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 (170°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.

Pinpoint Test DE1 Thru DE3 - Engine Coolant Temperature Sensor (ECT)

<b>Engine Coolant Temperature Sensor (ECT)</b>		<b>Pinpoint Test</b>	<b>DE</b>
<b>TEST STEP</b>		<b>RESULT</b>	<b>ACTION TO TAKE</b>
<b>DE10</b>	<b>SERVICE CODE 51: ATTEMPT TO GENERATE CODE 61</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 Self-Test.</li> <li>• Is Code 61 present?</li> </ul>		<p>Yes ▶</p> <p>No ▶</p>	<p>REPLACE ECT sensor. REMOVE jumper wire. RECONNECT ECT sensor. RERUN Quick Test.</p> <p>REMOVE jumper wire. 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.</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 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> <li>• Are both resistances less than 5 ohms?</li> </ul>		<p>Yes ▶</p> <p>No ▶</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>

Pinpoint Test DE10 &amp; DE11 - Engine Coolant Temperature Sensor (ECT)

<b>Engine Coolant Temperature Sensor (ECT)</b>		<b>Pinpoint Test</b>	<b>DE</b>
<b>TEST STEP</b>		<b>RESULT</b>	<b>ACTION TO TAKE</b>
<b>DE20</b>	<b>SERVICE CODE 61: ATTEMPT TO GENERATE CODE 51</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>• Run Key On Engine Off Self-Test.</li> <li>• Is Code 51 present?</li> </ul>		<p>Yes ▶</p> <p>No ▶</p>	<p>REPLACE ECT sensor. RECONNECT ECT sensor. RERUN Quick Test.</p> <p>GO to <b>DE21</b>.</p>
<b>DE21</b>	<b>CHECK FOR VREF AT THROTTLE POSITION SENSOR</b>		
<ul style="list-style-type: none"> <li>• Refer to schematic in Pinpoint Test DH.</li> <li>• Key off, wait 10 seconds.</li> <li>• DVOM on 20 volt scale.</li> <li>• Disconnect TP sensor.</li> <li>• Key on, engine off.</li> <li>• Measure voltage between VREF and SIGNAL RETURN at the TP vehicle harness connector.</li> <li>• Is voltage between 4.0 and 6.0 volts?</li> </ul>		<p>Yes ▶</p> <p>No ▶</p>	<p>RECONNECT TP sensor, GO to <b>DE22</b>.</p> <p>GO to Pinpoint Test Step <b>C1</b>.</p>
<b>DE22</b>	<b>CHECK ECT SIGNAL FOR SHORT TO GROUND</b>		
<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> <li>• Are all resistances greater than 10,000 ohms?</li> </ul>		<p>Yes ▶</p> <p>No ▶</p>	<p>REPLACE processor. REMOVE breakout box. RECONNECT processor and ECT harness. RERUN Quick Test.</p> <p>SERVICE short circuit. REMOVE breakout box. RECONNECT processor and ECT sensor. RERUN Quick Test.</p>

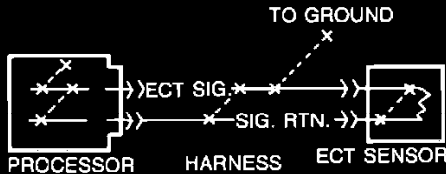
**Pinpoint Test DE20 Thru DE22 - Engine Coolant Temperature Sensor (ECT)**

Engine Coolant Temperature Sensor (ECT)		Pinpoint Test	DE
TEST STEP		RESULT	ACTION TO TAKE
<b>DE90</b>	<b>CONTINUOUS MEMORY CODE 21: TEST DRIVE VEHICLE</b>		
<ul style="list-style-type: none"> <li>• Key off, wait 10 seconds.</li> <li>• Clear Continuous Memory Code 21. Refer to Appendix in Section 16.</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, rerun Key On Engine Off Self-Test.</li> <li>• Is Code 21 present in the continuous test results?</li> </ul>		<p>Yes</p> <p>No</p>	<p>VERIFY thermostat operating properly. If OK, REPLACE ECT sensor. CLEAR Continuous Memory Code 21. RERUN Quick Test.</p> <p>Unable to duplicate fault. Code 21 testing complete.</p>
<b>DE91</b>	<b>CONTINUOUS MEMORY CODE 51: CHECK ECT SENSOR</b>		
<ul style="list-style-type: none"> <li>• Enter Key On Engine Off Continuous Monitor mode. Refer to Appendix in Section 16.</li> <li>• Observe VOM or STAR LED for indication of a fault while performing the following: <ul style="list-style-type: none"> <li>— Lightly tap on ECT sensor (simulate road shock).</li> <li>— Wiggle ECT connector.</li> </ul> </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. CLEAR Continuous Memory Code 51. RERUN Quick Test.</p> <p>GO to <b>DE92</b>.</p>
<p>Diagram illustrating the ECT sensor circuit connections:</p> <ul style="list-style-type: none"> <li>Processor is connected to the Harness.</li> <li>The Harness is connected to the ECT Sensor.</li> <li>The ECT Sensor is connected to the Harness.</li> <li>The Harness is connected to the Processor.</li> <li>The ECT SIG. line and the SIG. RTN. line are shown.</li> <li>A dashed line indicates a connection to the POWER OR VREF CIRCUIT.</li> </ul>			

Pinpoint Test DE90 &amp; DE91 - Engine Coolant Temperature Sensor (ECT)

Engine Coolant Temperature Sensor (ECT)		Pinpoint Test	DE
TEST STEP		RESULT	ACTION TO TAKE
<b>DE92</b>	<b>CHECK EEC-IV HARNESS</b>		
<ul style="list-style-type: none"> <li>• Still in Key On Engine Off Continuous Monitor mode.</li> <li>• Observe VOM or STAR LED for a fault indication while performing the following: <ul style="list-style-type: none"> <li>— Referring to the illustration in Step <b>DE91</b>, 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> </li> <li>• Is a fault indicated?</li> </ul>		<p>Yes ▶</p> <p>No ▶</p>	<p>ISOLATE fault and SERVICE as necessary. CLEAR Continuous Memory Code 51.</p> <p>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>• Are connectors and terminals OK?</li> </ul>		<p>No ▶</p> <p>Yes ▶</p>	<p>SERVICE as necessary. CLEAR Continuous Memory Code 51.</p> <p>RERUN Quick Test.</p> <p>Unable to duplicate fault at this time. CLEAR Continuous Memory Code 51. Continuous Code 51 testing complete.</p>

Pinpoint Test DE92 &amp; DE93 - Engine Coolant Temperature Sensor (ECT)

Engine Coolant Temperature Sensor (ECT)		Pinpoint Test	DE
TEST STEP		RESULT	ACTION TO TAKE
<b>DE94</b>	CONTINUOUS MEMORY CODE 61: CHECK ECT SENSOR		
<ul style="list-style-type: none"> <li>Enter Key On Engine Off Continuous Monitor mode.</li> <li>Observe VOM or STAR LED for indication of a fault while performing the following: <ul style="list-style-type: none"> <li>Lightly tap on ECT sensor (simulate road shock).</li> <li>Wiggle ECT connector.</li> </ul> </li> <li>Is a fault indicated?</li> </ul>		Yes	<p>DISCONNECT and INSPECT connectors. If connector and terminals are good, REPLACE ECT sensor. CLEAR Continuous Memory Code 61.</p> <p>RERUN Quick Test.</p>
 <p>The diagram illustrates the electrical circuit for the ECT sensor. It shows three main components: a PROCESSOR on the left, a HARNESS in the middle, and an ECT SENSOR on the right. A solid line labeled 'ECT SIG.' connects the processor to the harness, which then connects to the ECT sensor. Another solid line labeled 'SIG. RTN.' connects the processor to the harness, which then connects to the ECT sensor. A dashed line labeled 'TO GROUND' connects the ECT sensor to ground.</p>		No	GO to <b>DE95</b> .
<b>DE95</b>	CHECK EEC-IV HARNESS		
<ul style="list-style-type: none"> <li>Still in Key On Engine Off Continuous Monitor mode.</li> <li>Observe VOM or STAR LED for a fault indication while performing the following: <ul style="list-style-type: none"> <li>Referring to the illustration in Step <b>DE94</b>, 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> </li> <li>Is a fault indicated?</li> </ul>		Yes	<p>ISOLATE fault and SERVICE as necessary. CLEAR Continuous Memory Code 61.</p> <p>RERUN Quick Test.</p>
		No	GO to <b>DE96</b> .

Pinpoint Test DE94 &amp; DE95 - Engine Coolant Temperature Sensor (ECT)

Engine Coolant Temperature Sensor (ECT)		Pinpoint Test	DE
TEST STEP		RESULT	ACTION TO TAKE
<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>• Are connectors and terminals OK?</li> </ul>		No	SERVICE as necessary. CLEAR Continuous Memory Code 61.  RERUN Quick Test.
		Yes	Unable to duplicate fault at this time. CLEAR Continuous Memory Code 61.  Continuous Code 61 testing complete.

Pinpoint Test DE96 - Engine Coolant Temperature Sensor (ECT)

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

## Pinpoint Test

## DF

### Note

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 Pinpoint Test S or Diagnostic By Symptom in the Engine Supplement Section.

### Remember

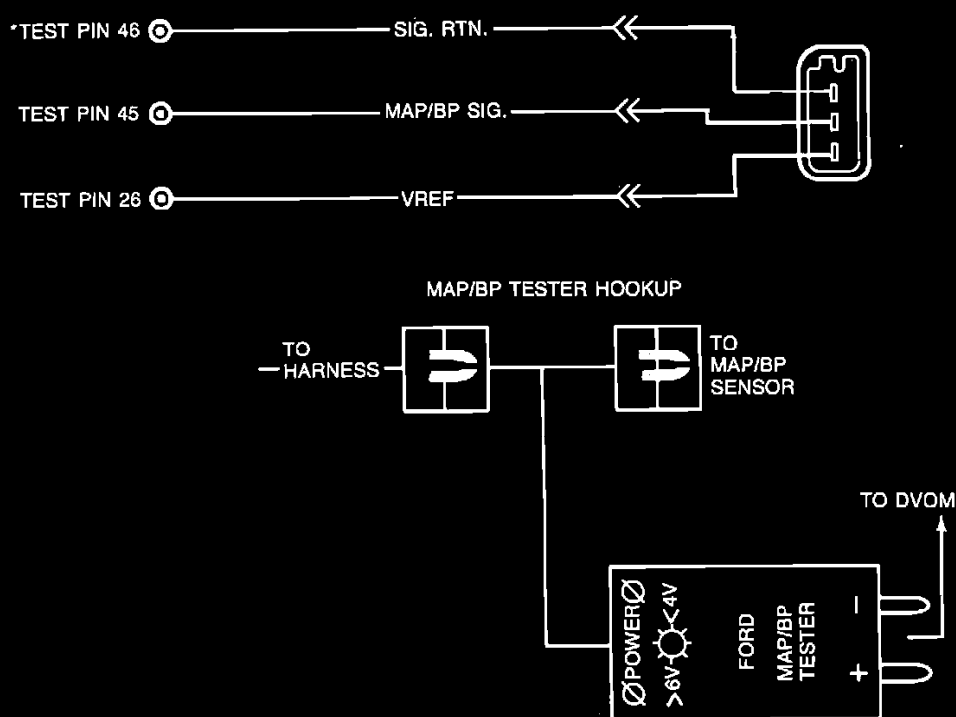
To prevent the replacement of good components, be aware that the following non-EEC areas may be at fault:

- Unusually high/low barometric pressure.
- Basic engine (valves, vacuum leaks, timing, EGR valve, etc.).
- Kinked or obstructed vacuum lines (MAP).

This Pinpoint Test is intended to diagnose only the following:

- MAP/BP sensor.
- Processor assembly.
- Harness circuits: VREF, MAP/BP SIGNAL, and SIGNAL RETURN.
- MAP vacuum line.

### Pinpoint Test Schematic



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

Pinpoint Test DF - Manifold Absolute Pressure (MAP)/Barometric Pressure (BP) Sensor

## 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   CONNECTING MAP/BP TESTER</b>		
<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 20 volt scale.</li> <li>• Refer to schematic in Pinpoint Test DF.</li> </ul>	<p>Tester properly hooked up</p>	<p>GO to <b>DF2</b>.</p>
<b>DF2   POWER TO MAP/BP SENSOR TEST</b>		
<ul style="list-style-type: none"> <li>• MAP/BP tester connected.</li> <li>• Key on.</li> <li>• Observe red and green lights.</li> </ul>	<p>(ONLY) Green light, VREF is OK</p> <p>"Less than 4V" light (RED) or no lights, VREF is too low</p> <p>OR</p> <p>"Greater than 6V" light (Red), VREF is too high</p>	<p>GO to <b>DF4</b>.</p> <p>GO to <b>DF3</b>.</p>
<b>DF3   VREF ISOLATION</b>		
<ul style="list-style-type: none"> <li>• MAP/BP tester connected.</li> <li>• Key on.</li> <li>• Disconnect MAP/BP</li> <li>• Observe red and green lights.</li> </ul>	<p>(ONLY) Green light, VREF is OK</p> <p>"Less than 4V" light (RED) or no lights, VREF is too low</p> <p>OR</p> <p>"Greater than 6V" light (Red), VREF is too high</p>	<p>REPLACE MAP/BP sensor. RERUN Quick Test.</p> <p>REMOVE MAP/BP tester. GO to Pinpoint Test Step <b>C1</b>.</p>

Pinpoint Test DF1 Thru DF3 - Manifold Absolute Pressure (MAP)/Barometric Pressure (BP) Sensor

## 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><u>Approximate Altitude (Ft.)</u>      <u>Voltage Output (+/- .04 Volts)</u> <table border="1"> <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> </table> </li> </ul> <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 voltage in range for your altitude?</li> </ul>		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>REMOVE MAP/BP Tester. GO to <b>DF5</b>.</p> <p>REMOVE MAP/BP Tester. GO to <b>DF6</b>.</p>
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> <li>Is resistance less than 5.0 ohms?</li> </ul>		<p>Yes</p> <p>No</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>																

Pinpoint Test DF4 & DF5 - Manifold Absolute Pressure (MAP)/Barometric Pressure (BP) Sensor

<b>Manifold Absolute Pressure (MAP)/ Barometric Pressure (BP) Sensor</b>		<b>Pinpoint Test</b>	<b>DF</b>
<b>TEST STEP</b>		<b>RESULT</b>	<b>ACTION TO TAKE</b>
<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. Inspect for damaged pins, corrosion, loose wires, etc. 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> <li>• Are all resistances greater than 10,000 ohms?</li> </ul>		<p>Yes</p> <p>No</p>	<p>REPLACE MAP/BP sensor. REMOVE breakout box. RECONNECT electrical connections. RERUN Quick Test.</p> <p>SERVICE circuit shorts. REMOVE breakout box. RECONNECT processor and MAP/BP Sensor. RERUN Quick Test.</p>
<b>CODE 22: ENGINE RUNNING</b>			
<b>DF7</b>	<b>CHECK FOR EGR CODES</b>		
<ul style="list-style-type: none"> <li>• Are Service Codes 31, 32, 33, 34 or 35 present?</li> </ul>		<p>Yes</p> <p>No</p>	<p>GO to Quick Test Step 5.0 for appropriate Pinpoint Test.</p> <p>GO to <b>DF8</b>.</p>
<b>DF8</b>	<b>CHECK MAP SENSOR</b>		
<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>DF9</b>.</p> <p>REPLACE MAP sensor. CONNECT vacuum line to MAP sensor. RERUN Quick Test.</p>

**Pinpoint Test DF6 Thru DF8 - Manifold Absolute Pressure (MAP)/Barometric Pressure (BP) Sensor**

Manifold Absolute Pressure (MAP)/ Barometric Pressure (BP) Sensor		Pinpoint Test	DF
TEST STEP		RESULT	ACTION TO TAKE
<b>DF9</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 Self-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.</p>
<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 Test while observing vacuum.</li> <li>• Did vacuum decrease by more than 30 kPa (10 in.-Hg.) during dynamic response test?</li> </ul>		<p>Yes ▶</p> <p>No ▶</p>	<p>REMOVE vacuum gauge. RECONNECT all components. REPLACE MAP sensor. RERUN Quick Test</p> <p>GO to <b>DF11</b>.</p>
<b>DF11</b>	CHECK VACUUM LINES		
<ul style="list-style-type: none"> <li>• Check vacuum line for proper routing. Refer to VECI decal. Check MAP sensor vacuum line for kinks or blockage.</li> <li>• Are vacuum lines OK?</li> </ul>		<p>Yes ▶</p> <p>No ▶</p>	<p>EEC-IV system OK.</p> <p>SERVICE as necessary and REPEAT <b>DF10</b>.</p>

Pinpoint Test DF9 Thru DF11 - Manifold Absolute Pressure (MAP)/Barometric Pressure (BP) Sensor


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

## Pinpoint Test

## DF

TEST STEP	RESULT	ACTION TO TAKE																
<b>DF20</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>• Plug tester banana plugs into DVOM.</li> <li>• Set DVOM to 20 volt scale.</li> <li>• Refer to schematic in Pinpoint Test DF.</li> </ul>	<p>Tester properly hooked up</p>	<p>GO to <b>DF21</b>.</p>																
<b>DF21</b>   MAP/BP TESTER OUTPUT READING  <ul style="list-style-type: none"> <li>• MAP Tester connected, refer to Note.</li> <li>• Key on.</li> <li>• <u>Approximate Altitude (Ft.)</u>      <u>Voltage Output (+/- .04 Volts)</u></li> </ul> <table style="margin-left: 40px;"> <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> </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 voltage in range for your altitude?</li> </ul>	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>For 1.9L EFI, 2.3L EFI TC engines and 5.0L SEFI Mustang GO to Diagnostic by Symptom</p> <p>For all others, GO to <b>DF22</b>.</p> <p>REPLACE MAP/BP sensor.</p>
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>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>	<p>Yes</p> <p>No</p>	<p>GO to Diagnostics by Symptom</p> <p>SERVICE vacuum lines to MAP sensor RERUN Quick Test.</p>																

Pinpoint Test DF20 Thru DF22 - Manifold Absolute Pressure (MAP)/Barometric Pressure (BP) Sensor

Manifold Absolute Pressure (MAP)/ Barometric Pressure (BP) Sensor		Pinpoint Test	DF
TEST STEP		RESULT	ACTION TO TAKE
<b>DF90</b>	SERVICE CODE 22: CONTINUOUS TEST: EXERCISE MAP SENSOR		
<ul style="list-style-type: none"> <li>Using Key On Engine Off Continuous Monitor mode, observe VOM or STAR LED for indication of a fault while performing the following: <ul style="list-style-type: none"> <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> </li> </ul> 		<p>Yes</p> <p>No</p>	<p>DISCONNECT and INSPECT connectors. If connector and terminals are good, REPLACE MAP sensor. RERUN Quick Test.</p> <p>GO to <b>DF91</b>.</p>
<b>DF91</b>	CHECK EEC-IV HARNESS		
<ul style="list-style-type: none"> <li>Remain in Key On Engine Off Continuous Monitor mode.</li> <li>Observe VOM or STAR LED for a fault indication while performing the following: <ul style="list-style-type: none"> <li>Referring to the illustration in Step 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> </ul> </li> <li>Is a fault indicated?</li> </ul>		<p>Yes</p> <p>No</p>	<p>ISOLATE fault and SERVICE as necessary. CLEAR Continuous Memory Code.</p> <p>RERUN Quick Test.</p> <p>GO to <b>DF92</b>.</p>

Pinpoint Test DF90 &amp; DF91 - Manifold Absolute Pressure (MAP)/Barometric Pressure (BP) Sensor

<b>Manifold Absolute Pressure (MAP)/ Barometric Pressure (BP) Sensor</b>		<b>Pinpoint Test</b>	<b>DF</b>
<b>TEST STEP</b>		<b>RESULT</b>	<b>ACTION TO TAKE</b>
<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. for additional continuous testing.</p>

**Pinpoint Test DF92 - Manifold Absolute Pressure (MAP)/Barometric Pressure (BP) Sensor**

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

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 Diagnostic By Symptom in the Engine Supplement Section.

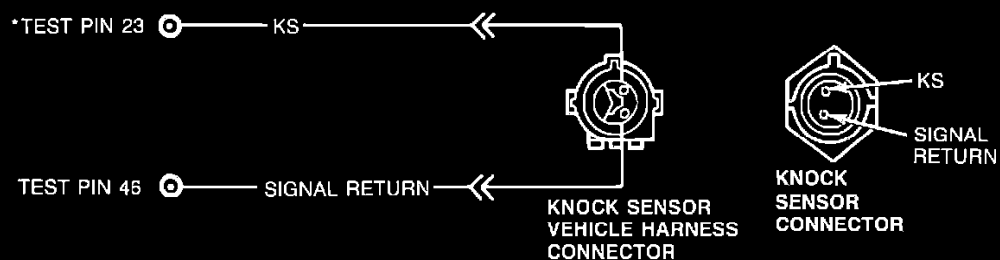
**Remember**

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.

**Pinpoint Test Schematic**

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

**Pinpoint Test DG - Knock Sensor**

Knock Sensor		Pinpoint Test	DG
TEST STEP	RESULT	ACTION TO TAKE	
<b>DG1</b> SERVICE CODE 25: GENERATE KNOCK MANUALLY			
<p><b>NOTE:</b> With knock conditions sensitive to fuel, altitude and weather, perform Step DG1 before servicing any components.</p> <ul style="list-style-type: none"> <li>• Locate knock sensor and prepare to rap/tap on exhaust manifold with a 4 oz. hammer.</li> <li>• Run Engine Running Self-Test (engine must be at operating temperature).</li> <li>• Tap exhaust manifold directly above the knock sensor immediately after the dynamic response code is given.</li> </ul> <p><b>NOTE:</b> It is not necessary to "goose" the throttle. Ignore all other codes except Code 25.</p> <ul style="list-style-type: none"> <li>• Is service Code 25 present?</li> </ul>	<p>Yes ▶</p> <p>No ▶</p>	<p>GO to <b>DG2</b> .</p> <p>Knock system OK, RERUN Engine Running Self-Test and SERVICE any other codes from that test.</p>	
<b>DG2</b> TEST KNOCK CIRCUIT FOR VOLTAGE			
<ul style="list-style-type: none"> <li>• Key off, wait 10 seconds.</li> <li>• Disconnect knock sensor connector.</li> <li>• DVOM on 20 volt scale.</li> <li>• Key on, engine off.</li> <li>• Measure voltage between KS and SIGNAL RETURN at the vehicle harness connector.</li> </ul>	<p>Voltage is between 1 and 4 volts ▶</p> <p>Voltage is less than 1 volt ▶</p> <p>Voltage is greater than 4 volts ▶</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> CHECK CONTINUITY OF KS AND SIGNAL RETURN CIRCUITS			
<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>• 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 knock sensor vehicle harness connector and Test Pin 46 at the breakout box and between KS at the knock sensor vehicle harness connector and Test Pin 23 at the breakout box.</li> <li>• Are both resistances less than 5.0 ohms?</li> </ul>	<p>Yes ▶</p> <p>No ▶</p>	<p>GO to <b>DG4</b> .</p> <p>REMOVE breakout box. RECONNECT processor and knock sensor. SERVICE open circuit. RERUN Quick Test.</p>	

Pinpoint Test DG1 Thru DG3 - Knock Sensor

<b>Knock Sensor</b>		<b>Pinpoint Test</b>	<b>DG</b>
<b>TEST STEP</b>		<b>RESULT</b>	<b>ACTION TO TAKE</b>
<b>DG4</b>	<b>CHECK KS CIRCUIT FOR SHORT TO GROUND</b>		
<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 knock sensor vehicle harness connector and Test Pins 40, 46 and 60 at the breakout box.</li> <li>• Are all resistances greater than 10,000 ohms?</li> </ul>		<p>Yes ▶</p> <p>No ▶</p>	<p>REMOVE breakout box. RECONNECT processor. GO to <b>DG6</b>.</p> <p>REMOVE breakout box. RECONNECT processor and knock sensor. SERVICE short circuit. RERUN Quick Test.</p>
<b>DG5</b>	<b>CHECK KS CIRCUIT FOR SHORT TO VOLTAGE</b>		
<ul style="list-style-type: none"> <li>• Key off, wait 10 seconds.</li> <li>• Disconnect processor 60 pin connector. Inspect for damaged pins, corrosion, loose wires, etc. 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 20 volt scale.</li> <li>• Measure voltage between Test Pin 23 and Test Pin 40 at the breakout box.</li> <li>• Is voltage less than 0.5 volts?</li> </ul>		<p>Yes ▶</p> <p>No ▶</p>	<p>REMOVE breakout box. RECONNECT processor. GO to <b>DG6</b>.</p> <p>REMOVE breakout box. RECONNECT processor and knock sensor. SERVICE short circuit. RERUN Quick Test.</p>
<b>DG6</b>	<b>TEST PROCESSOR WITH SUBSTITUTE KNOCK SENSOR</b>		
<ul style="list-style-type: none"> <li>• Key off, wait 10 seconds.</li> <li>• Connect a known good knock sensor to the vehicle harness.</li> <li>• Do not install this sensor on the engine.</li> <li>• Run Engine Running Self-Test. (Engine must be at operating temperature).</li> <li>• Tap the substitute knock sensor with a 4 oz. hammer immediately after the dynamic response code is given.</li> </ul> <p><b>NOTE: It is not necessary to "goose" the throttle. Ignore all other codes except Code 25.</b></p> <ul style="list-style-type: none"> <li>• Is service Code 25 present?</li> </ul>		<p>Yes ▶</p> <p>No ▶</p>	<p>REPLACE processor. RECONNECT original knock sensor. RERUN Quick Test.</p> <p>INSTALL new knock sensor. RERUN Quick Test.</p>

Pinpoint Test DG4 Thru DG6 - Knock Sensor

## Throttle Position Sensor (TPS)

## Pinpoint Test

## DH

### Note

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

### Remember

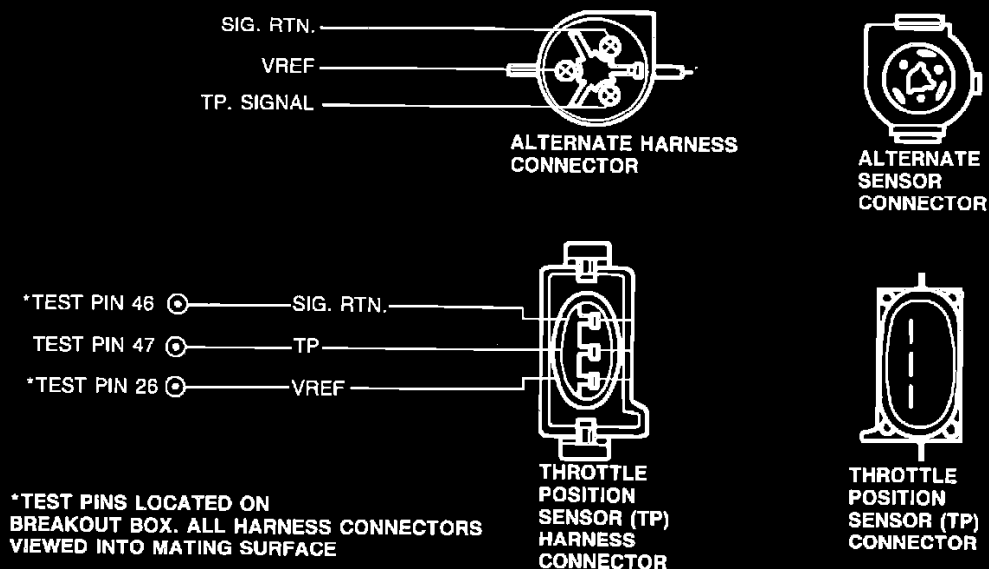
To prevent the replacement of good components, be aware that the following non-EEC areas may be at fault:

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

This Pinpoint Test is intended to diagnose only the following:

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

### Pinpoint Test Schematic



Pinpoint Test DH - Throttle Position Sensor (TPS)

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

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

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

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

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

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

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

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

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

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

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

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

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

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

## Vane Airflow Sensor (VAF)

## Pinpoint Test

## DK

### Note

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.

### Remember

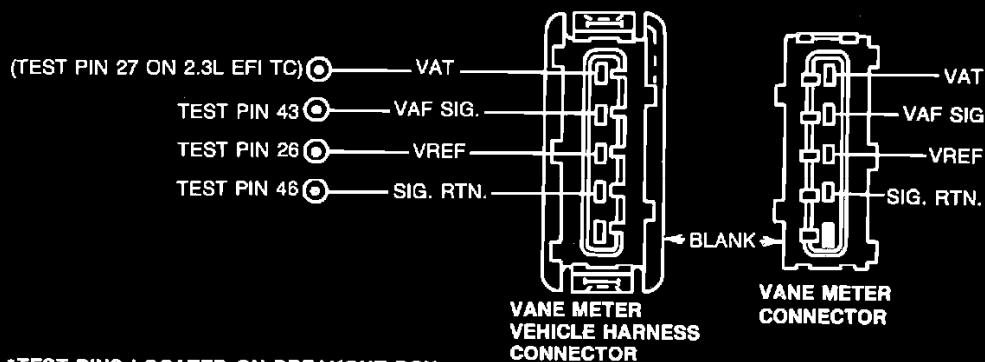
To prevent the replacement of good components, be aware that the following non-EEC areas may be at fault:

- 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 SIGNAL and SIGNAL RETURN.

### Pinpoint Test Schematic

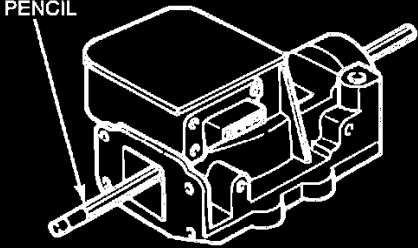
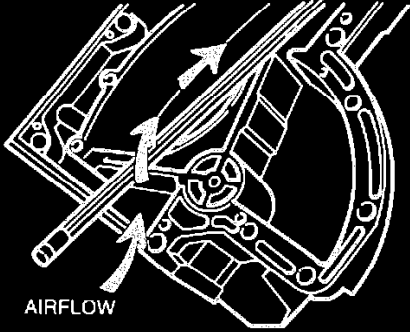


\*TEST PINS LOCATED ON BREAKOUT BOX.  
ALL HARNESS CONNECTORS VIEWED INTO MATING SURFACE.

Pinpoint Test DK - Vane Airflow Sensor (VAF)

<b>Vane Airflow Sensor (VAF)</b>		<b>Pinpoint Test</b>	<b>DK</b>
<b>TEST STEP</b>		<b>RESULT</b>	<b>ACTION TO TAKE</b>
<b>DK1</b>	<b>SERVICE CODE 26: CHECK VANE METER FOR CONTAMINATION AND FREEDOM OF MOVEMENT</b>		
<p><b>NOTE:</b> Code 26 indicates the vane airflow input to the processor is out of engine off or engine idle limits (engine off 0.15-0.50V/engine 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 and service as necessary.</li> <li>• Was service Code 26 present in Key On Engine Off Self-Test?</li> </ul>		<p>Yes</p> <p>No</p>	<p>REPLACE vane meter. REINSTALL air cleaner. RERUN Quick Test.</p> <p>GO to <b>DK2</b>.</p>
<b>DK2</b>	<b>CHECK VAF SENSOR</b>		
<ul style="list-style-type: none"> <li>• Key off.</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.</li> <li>• Connect processor to breakout box.</li> <li>• DVOM on 20 volt scale.</li> <li>• Key on, engine off.</li> <li>• Place new unsharpened pencil as shown.</li> <li>• Measure voltage between Test Pins 43 (Test Pin 27 on 2.3L EFI TC) and 46 at the breakout box.</li> <li>• Is voltage between 2.8 volts and 3.7 volts?</li> </ul>		<p>Yes</p> <p>No</p>	<p>Vane meter is capable of outputting an acceptable signal. The Code 26 has been caused by incorrect engine speed, unmetered air leak (vacuum leak) or the canister purge solenoid (1.9L EFI only). SERVICE as necessary. REMOVE breakout box. RERUN Quick Test.</p> <p>REMOVE breakout box. REPLACE processor. RERUN Quick Test.</p>

Pinpoint Test DK1 &amp; DK2 - Vane Airflow Sensor (VAF)

Vane Airflow Sensor (VAF)		Pinpoint Test	DK
TEST STEP	RESULT	ACTION TO TAKE	
<div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;">  <p>PENCIL</p> <p>VANE METER</p> </div> <div style="text-align: center;">  <p>AIRFLOW</p> <p>VAF SENSOR AIR VANE</p> </div> </div>			
<b>DK10</b>	SERVICE CODE 56: 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>• Rerun Key On Engine Off Self-Test.</li> <li>• Is Code 66 present?</li> </ul> <p><b>NOTE: Disconnecting vane meter disconnects both VAF and VAT sensors. A Code 58 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 20 volt scale.</li> <li>• Measure voltage at the vane meter vehicle harness connector between VREF and SIGNAL RETURN.</li> <li>• Is voltage between 4.0 and 6.0 volts?</li> </ul>	<p>Yes</p> <p>No</p>	<p>▶ REPLACE vane meter. RECONNECT harness. RERUN Quick Test.</p> <p>▶ GO to Pinpoint Test Step <b>C1</b> .</p>	

## Pinpoint Test DK10 &amp; DK11 - Vane Airflow Sensor (VAF)

<b>Vane Airflow Sensor (VAF)</b>		<b>Pinpoint Test</b>	<b>DK</b>
<b>TEST STEP</b>		<b>RESULT</b>	<b>ACTION TO TAKE</b>
<b>DK12</b>	<b>CHECK VAF SIGNAL FOR SHORT TO POWER</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, leave processor disconnected.</li> <li>• DVOM on 200,000 ohm scale.</li> <li>• Measure resistance between Test Pin 43 (Test Pin 27 on 2.3L EFI TC) and Test Pins 26 and 57 at the breakout box.</li> <li>• Are both resistances greater than 10,000 ohms?</li> </ul>		<p>Yes ▶</p> <p>No ▶</p>	<p>REPLACE processor. REMOVE breakout box. RECONNECT processor and vane meter. RERUN Quick Test.</p> <p>SERVICE circuit shorts. REMOVE breakout box. RECONNECT processor and vane meter. RERUN Quick Test.</p>
<b>DK20</b>	<b>SERVICE CODE 66: INDUCE OPPOSITE CODE</b>		
<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 Self-Test.</li> </ul> <p><b>NOTE: If no codes are generated, immediately remove jumper and go directly to <b>DK23</b>.</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 58 should also be present. Disregard all codes except VAF codes at this time.</b></p>		<p>Yes ▶</p> <p>No ▶</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>	<b>CHECK VREF AT THE VANE METER</b>		
<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 20 volt scale.</li> <li>• Measure voltage at the vane meter vehicle harness connector between VREF and SIGNAL RETURN.</li> <li>• Is voltage between 4.0 and 6.0 volts?</li> </ul>		<p>Yes ▶</p> <p>No ▶</p>	<p>GO to <b>DK22</b>.</p> <p>GO to Pinpoint Test Step <b>C1</b>.</p>

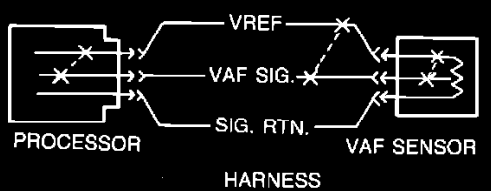
Pinpoint Test DK12 Thru DK21 - Vane Airflow Sensor (VAF)

<b>Vane Airflow Sensor (VAF)</b>		<b>Pinpoint Test</b>	<b>DK</b>
<b>TEST STEP</b>		<b>RESULT</b>	<b>ACTION TO TAKE</b>
<b>DK22</b>	<b>CHECK CONTINUITY OF VAF SIGNAL</b>		
<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 (Test Pin 27 on 2.3L EFI TC) at the breakout box.</li> <li>• Is resistance less than 5 ohms?</li> </ul>		<p>Yes</p> <p>No</p>	<p>GO to <b>DK23</b>.</p> <p>SERVICE open circuit. REMOVE breakout box. RECONNECT processor and vane meter. RERUN Quick Test.</p>
<b>DK23</b>	<b>CHECK VAF SIGNAL FOR SHORT TO GROUND</b>		
<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> <li>• Are both resistances greater than 10,000 ohms?</li> </ul>		<p>Yes</p> <p>No</p>	<p>REPLACE processor. REMOVE breakout box. RECONNECT processor and vane meter. RERUN Quick Test.</p> <p>SERVICE circuit shorts. RECONNECT vane meter. RERUN Quick Test.</p>

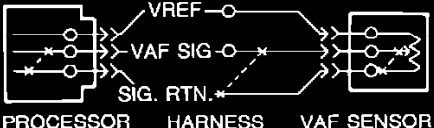
Pinpoint Test DK22 &amp; DK23 - Vane Airflow Sensor (VAF)

Vane Airflow Sensor (VAF)		Pinpoint Test	DK
TEST STEP		RESULT	ACTION TO TAKE
<b>DK30</b>	SERVICE CODE 76: CHECK FOR VOLTAGE INCREASE IN VAF SIGNAL DURING DYNAMIC RESPONSE		
<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.</li> <li>• Connect processor to breakout box harness.</li> <li>• DVOM on 20 volt scale.</li> <li>• Connect DVOM to Test Pins 43 (Test Pin 27 on 2.3L EFI TC) 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 2.0 volts from reading before WOT.</li> <li>• Observe service codes at end of test.</li> <li>• Did voltage increase more than 2.0 volts?</li> </ul>		<p>Yes</p> <p>No</p>	<p>GO to <b>DK31</b>.</p> <p>CHECK air cleaner duct for obstruction. If OK, REPLACE vane meter.</p>
<b>DK31</b>	CHECK SERVICE CODES FROM STEP DK 30		
<ul style="list-style-type: none"> <li>• Observe Engine Running service codes outputted in Pinpoint Test Step <b>DK30</b>.</li> <li>• Is Code 76 present?</li> </ul>		<p>Yes</p> <p>No</p>	<p>REPLACE processor. REMOVE breakout box. RERUN Quick Test.</p> <p>Vane meter is OK, SERVICE other codes as necessary.</p>

Pinpoint Test DK30 &amp; DK31 - Vane Airflow Sensor (VAF)

<b>Vane Airflow Sensor (VAF)</b>		<b>Pinpoint Test</b>	<b>DK</b>
<b>TEST STEP</b>		<b>RESULT</b>	<b>ACTION TO TAKE</b>
<b>DK90</b>	<b>CONTINUOUS CODE 56: CHECK VAF SENSOR</b>		
<ul style="list-style-type: none"> <li>• Enter Key On Engine Off Continuous Monitor mode.</li> <li>• Observe VOM or STAR LED for indication of a fault while performing the following: <ul style="list-style-type: none"> <li>— Lightly tap on VAF sensor (simulate road shock).</li> <li>— Wiggle VAF connector.</li> <li>— Is a fault indicated?</li> </ul> </li> </ul>		Yes	<p>DISCONNECT and INSPECT connectors. If connector and terminals are good, REPLACE VAF sensor. CLEAR Continuous Memory Code.</p> <p>RERUN Quick Test.</p>
 <p style="text-align: center;">PROCESSOR                      HARNESS                      VAF SENSOR</p>		No	GO to <b>DK91</b> .
<b>DK91</b>	<b>CHECK EEC-IV HARNESS</b>		
<ul style="list-style-type: none"> <li>• Still in Key On Engine Off Continuous Monitor mode.</li> <li>• Observe VOM or STAR LED for a fault indication while performing the following: <ul style="list-style-type: none"> <li>— Referring to the illustration in Step <b>DK90</b>, grasp the harness close to the sensor connector. Wiggle, shake or bend a small section of the EEC-IV system harness while working your way to the dash panel. Also wiggle, shake or bend the EEC-IV harness from the dash panel to the processor.</li> </ul> </li> <li>• Is a fault indicated?</li> </ul>		Yes	<p>ISOLATE fault and SERVICE as necessary. REFER to appropriate figure. CLEAR Continuous Memory Code.</p> <p>RERUN Quick Test.</p>
		No	GO to <b>DK92</b> .

Pinpoint Test DK90 &amp; DK91 - Vane Airflow Sensor (VAF)

<b>Vane Airflow Sensor (VAF)</b>		<b>Pinpoint Test</b>	<b>DK</b>
<b>TEST STEP</b>		<b>RESULT</b>	<b>ACTION TO TAKE</b>
<b>DK92</b>	<b>CHECK PROCESSOR AND HARNESS CONNECTORS</b>		
<ul style="list-style-type: none"> <li>• Key off, wait 10 seconds.</li> <li>• Disconnect processor 60 pin connector. Inspect both connectors and connector terminals for obvious damage or faults.</li> <li>• Are connectors and terminals OK?</li> </ul>		<p>Yes</p> <p>No</p>	<p>Unable to duplicate fault at this time. Continuous Memory Code 56 testing complete.</p> <p>SERVICE as necessary. CLEAR Continuous Memory Code.</p> <p>RERUN Quick Test.</p>
<b>DK93</b>	<b>CONTINUOUS CODE 66: CHECK VAF SENSOR</b>		
<ul style="list-style-type: none"> <li>• Enter Key On Engine Off Continuous Monitor mode. Refer to Appendix in Section 16.</li> <li>• Observe VOM or STAR LED for indication of a fault while performing the following: <ul style="list-style-type: none"> <li>— Lightly tap on VAF sensor (simulate road shock).</li> <li>— Wiggle VAF connector.</li> </ul> </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, CLEAR Continuous Memory Code.</p> <p>REPLACE sensor. RERUN Quick Test.</p> <p>GO to <b>DK94</b>.</p>
 <p>PROCESSOR    HARNESS    VAF SENSOR</p>			

Pinpoint Test DK92 &amp; DK93 - Vane Airflow Sensor (VAF)

<b>Vane Airflow Sensor (VAF)</b>		<b>Pinpoint Test</b>	<b>DK</b>
<b>TEST STEP</b>		<b>RESULT</b>	<b>ACTION TO TAKE</b>
<b>DK94</b>	<b>CHECK EEC-IV HARNESS</b>		
<ul style="list-style-type: none"> <li>• Still in key on engine off continuous monitor mode.</li> <li>• Observe VOM or STAR LED for a fault indication while performing the following:               <ul style="list-style-type: none"> <li>— Referring to the illustration in Step <b>DK93</b>, grasp the harness close to the sensor connector. Wiggle, shake or bend a small section of the EEC-IV system harness while working your way to the dash panel. Also wiggle, shake or bend the EEC-IV harness from the dash panel to the processor.</li> </ul> </li> <li>• Is a fault indicated?</li> </ul>		<p>Yes</p> <p>No</p>	<p>ISOLATE fault and SERVICE as necessary. REFER to appropriate figure. CLEAR Continuous Memory Code.</p> <p>RERUN Quick Test.</p> <p>GO to <b>DK95</b>.</p>
<b>DK95</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. CLEAR Continuous Memory Code.</p> <p>RERUN Quick Test.</p> <p>Unable to duplicate fault at this time. CLEAR Continuous Memory Code.</p> <p>Continuous Memory Code 66 testing complete.</p>

Pinpoint Test DK94 &amp; DK95 - Vane Airflow Sensor (VAF)

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

## Pinpoint Test

## DL

### Note

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.

### Remember

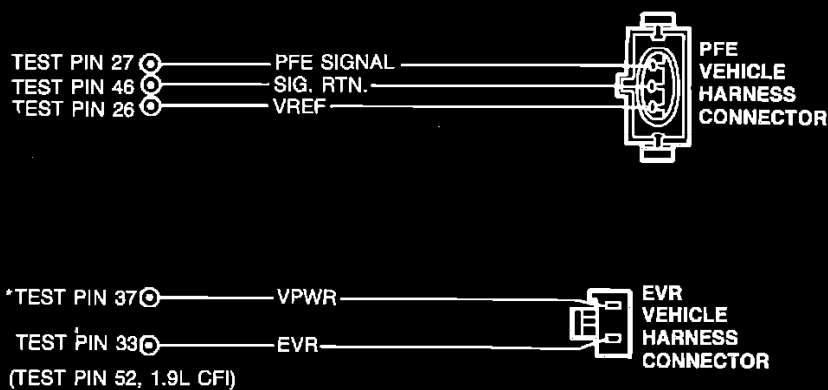
To prevent the replacement of good components, be aware that the following non-EEC area may be at fault:

- Damaged EGR valve.

This Pinpoint Test is intended to diagnose only the following:

- Harness circuits: VREF, PFE, SIGNAL RETURN, EVR, VPWR.
- PFE sensor.
- EVR
- EGR valve assembly.
- Processor assembly.
- Vacuum lines/tubes (EVR, PFE)

### Pinpoint Test Schematic



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

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

Pressure Feedback EGR (PFE) EGR Valve Regulator (EVR)		Pinpoint Test	DL
TEST STEP		RESULT	ACTION TO TAKE
<b>DL1</b>	SERVICE CODE 31: INDUCE CODE 35		
<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 <b>DL4</b>.</b></p> <ul style="list-style-type: none"> <li>• Is Code 35 present?</li> </ul> <p><b>NOTE: Ignore all other codes at this time.</b></p>		<p>Yes</p> <p>No</p>	<p>REMOVE Jumper. REPLACE PFE sensor. RERUN Quick Test.</p> <p>REMOVE jumper. GO to <b>DL2</b>.</p>
<b>DL2</b>	MEASURE VREF TO SIGNAL RETURN VOLTAGE		
<ul style="list-style-type: none"> <li>• Refer to schematic in Pinpoint Test DL.</li> <li>• Key off.</li> <li>• PFE harness disconnected.</li> <li>• DVOM on 20 volt scale.</li> <li>• Key on, engine off.</li> <li>• Measure voltage at PFE vehicle harness connector between VREF and SIGNAL RETURN.</li> <li>• Is voltage between 4 and 6 volts?</li> </ul>		<p>Yes</p> <p>No</p>	<p>GO to <b>DL3</b>.</p> <p>GO to Pinpoint Test Step <b>C1</b>.</p>
<b>DL3</b>	CHECK CONTINUITY OF PFE SIGNAL		
<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. Inspect for damaged pins, corrosion, loose wires, etc. Service as necessary.</li> <li>• Install breakout box, leave processor disconnected.</li> <li>• Measure resistance between PFE SIGNAL at vehicle harness sensor connector and Test Pin 27 at the breakout box.</li> <li>• Is resistance greater than 5 ohms?</li> </ul>		<p>Yes</p> <p>No</p>	<p>SERVICE open circuit. RECONNECT PFE sensor. REMOVE breakout box. RERUN Quick Test.</p> <p>GO to <b>DL4</b>.</p>

Pinpoint Test DL1 Thru DL3 - Pressure Feedback EGR (PFE)/EGR Valve Regulator (EVR)

## 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 at the breakout box.</li> <li>• Are both resistances greater than 10,000 ohms?</li> </ul>	<p>Yes</p> <p>No</p>	<p>REPLACE processor. RECONNECT PFE sensor. REMOVE breakout box. RERUN Quick Test.</p> <p>SERVICE short circuit. RECONNECT PFE. REMOVE breakout box. RERUN Quick Test.</p>
<b>DL5</b>	SERVICE CODE 35: INDUCE 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>• Rerun Key On Engine Off Self-Test.</li> <li>• Is Code 31 present?</li> </ul> <p><b>NOTE: Ignore all other codes at this time.</b></p>	<p>Yes</p> <p>No</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>• Refer to schematic in Pinpoint Test DL.</li> <li>• Key off.</li> <li>• PFE harness disconnected.</li> <li>• DVOM on 20 volt scale.</li> <li>• Key on, engine off.</li> <li>• Measure voltage at PFE vehicle harness connector between VREF and SIGNAL RETURN.</li> <li>• Is voltage between 4 and 6 volts?</li> </ul>	<p>Yes</p> <p>No</p>	<p>REPLACE PFE sensor. RERUN Quick Test.</p> <p>GO to Pinpoint Test Step <b>C1</b>.</p>

Pinpoint Test DL4 Thru DL6 - Pressure Feedback EGR (PFE)/EGR Valve Regulator (EVR)

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

## Pinpoint Test

## DL

TEST STEP		RESULT	ACTION TO TAKE
<b>DL7</b>	CHECK PFE CIRCUIT FOR SHORT TO POWER		
	<ul style="list-style-type: none"> <li>• Key off.</li> <li>• PFE harness disconnected.</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 the resistance between Test Pin 27 and Test Pins 26 and 57 at the breakout box.</li> <li>• Are both resistances greater than 10,000 ohms?</li> </ul>	<p>Yes ▶</p> <p>No ▶</p>	<p>REPLACE processor. REMOVE breakout box. RECONNECT PFE sensor. RERUN Quick Test.</p> <p>SERVICE short circuit. REMOVE breakout box. RECONNECT PFE sensor. RERUN Quick Test.</p>
<b>DL8</b>	SERVICE CODE 34: PFE SENSOR OUT OF RANGE		
	<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 Self-Test, may deflect the PFE sensor and generate a Code 34. Remove garage forced ventilation system and properly vent to atmosphere.</li> <li>• Rerun Key On Engine Off Self-Test.</li> <li>• Is Code 34 present?</li> </ul>	<p>Yes ▶</p> <p>No ▶</p>	<p>GO to <b>DL9</b>.</p> <p>ADDRESS any other codes in Key On, Engine Off. If none, CONTINUE with remaining Quick Test.</p>
<b>DL9</b>	CHECK PRESSURE FEED TUBE TO PFE SENSOR		
	<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>	<p>Yes ▶</p> <p>No ▶</p>	<p>SERVICE as necessary. RERUN Quick Test.</p> <p>GO to <b>DL10</b>.</p>

Pinpoint Test DL7 Thru DL9 - Pressure Feedback EGR (PFE)/EGR Valve Regulator (EVR)

## 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>Refer to schematic in Pinpoint Test DL.</li> <li>Key off.</li> <li>Disconnect PFE sensor. Inspect for damaged pins, corrosion, loose wires, etc. Service as necessary.</li> <li>DVOM on 20 volt scale.</li> <li>Key on, engine off.</li> <li>Measure voltage between VREF and SIGNAL RETURN at PFE vehicle harness connector.</li> <li>Is voltage between 4 and 6 volts?</li> </ul>	<p>Yes</p> <p>No</p>	<p>REPLACE PFE sensor. RERUN Quick Test.</p> <p>GO to Pinpoint Test Step <b>C1</b>.</p>
<b>DL11</b>	SERVICE CODE 84: MEASURE EVR SOLENOID RESISTANCE		
	<ul style="list-style-type: none"> <li>Key off.</li> <li>Disconnect EVR solenoid connector.</li> <li>DVOM on 200 ohm scale.</li> <li>Measure solenoid resistance.</li> <li>Is resistance between 30 and 70 ohms?</li> </ul>	<p>Yes</p> <p>No</p>	<p>GO to <b>DL12</b>.</p> <p>REPLACE EVR solenoid assembly. RERUN Quick Test.</p>
<b>DL12</b>	CHECK FOR VPWR AT EVR SOLENOID		
	<ul style="list-style-type: none"> <li>Key on engine off.</li> <li>EVR solenoid disconnected from harness.</li> <li>DVOM on 20 volt scale.</li> <li>Measure voltage between battery negative terminal and VPWR circuit at EVR solenoid vehicle harness connector.</li> <li>Is voltage less than 10.5 volts?</li> </ul>	<p>Yes</p> <p>No</p>	<p>SERVICE open circuit. RERUN Quick Test.</p> <p>GO to <b>DL13</b>.</p>
<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. 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 Test Pin 33 (Test Pin 52, 1.9L CFI) at the breakout box and EVR SIGNAL at the EVR solenoid vehicle harness connector.</li> <li>Is resistance less than 5 ohms?</li> </ul>	<p>Yes</p> <p>No</p>	<p>GO to <b>DL14</b>.</p> <p>SERVICE open circuit. REMOVE breakout box. RECONNECT processor and EVR solenoid. RERUN Quick Test.</p>

Pinpoint Test DL10 Thru DL13 - Pressure Feedback EGR (PFE)/EGR Valve Regulator (EVR)

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

## Pinpoint Test

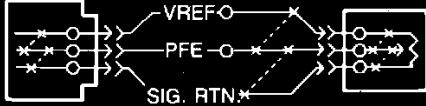
## DL

TEST STEP		RESULT	ACTION TO TAKE
<b>DL14</b>	CHECK EVR CIRCUIT FOR SHORT TO POWER OR 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 (Test Pin 52, 1.9L CFI) and Test Pins 37 and 57 at the breakout box.</li> <li>• Measure resistance between Test Pin 33 (Test Pin 52, 1.9L CFI) and Test Pins 40 and 60 at the breakout box.</li> <li>• Are any resistances less than 10,000 ohms?</li> </ul>	<p>Yes</p> <p>No</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>DL20</b>	SERVICE CODE 32: VERIFY ENGINE RUNNING CODES		
	<p>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 Running Self-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.</p> <ul style="list-style-type: none"> <li>• Rerun Engine Running Self-Test.</li> <li>• Is Code 32 present?</li> </ul>	<p>Yes</p> <p>No</p>	<p>GO to <b>DL21</b> .</p> <p>ADDRESS any other codes in Engine Running. If none, CONTINUE with remaining Self-Test.</p>
<b>DL21</b>	ATTEMPT TO SEPARATE EVR FROM PFE		
	<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 Self-Test.</li> <li>• Is Code 31 or 32 present?</li> </ul>	<p>Yes</p> <p>No</p>	<p>GO to <b>DL22</b> .</p> <p>GO to <b>DL23</b> .</p>
<b>DL22</b>	CHECK PFE SENSOR SUPPLY TUBE		
	<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>	<p>Yes</p> <p>No</p>	<p>SERVICE as necessary. RECONNECT all lines and RERUN Quick Test.</p> <p>GO to EGR Diagnostics</p>

Pinpoint Test DL14 Thru DL22 - Pressure Feedback EGR (PFE)/EGR Valve Regulator (EVR)

Pressure Feedback EGR (PFE) EGR Valve Regulator (EVR)		Pinpoint Test	DL
TEST STEP		RESULT	ACTION TO TAKE
<b>DL23</b>	CHECK EVR FILTER		
<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>		<p>Yes</p> <p>No</p>	<p>REPLACE filter. RECONNECT all lines. RERUN Quick Test.</p> <p>REPLACE EVR solenoid. RERUN Quick Test.</p>
<b>DL25</b>	SERVICE CODE 34 AND 35: CHECK FOR EXCESSIVE EXHAUST BACK PRESSURE		
<p><b>NOTE: Service Codes 34 and 35 in Engine Running Self-Test indicate excessive exhaust back pressure. There are two possible causes: (1). The exhaust system is restricted, and (2). PFE sensor has shifted high.</b></p> <ul style="list-style-type: none"> <li>• Key off.</li> <li>• Substitute known good PFE sensor in place of original.</li> <li>• Rerun Engine Running Self-Test.</li> <li>• Is Code 34 or 35 present?</li> </ul>		<p>Yes</p> <p>No</p>	<p>GO to Section 5, Catalyst and Exhaust Systems Restricted Exhaust System Diagnosis.</p> <p>Original PFE was the cause of the original Service Code 34 or 35. REPLACE PFE sensor. RERUN Quick Test.</p>
<b>DL30</b>	SERVICE CODE 33: VERIFY VACUUM IS PRESENT AT VALVE		
<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>• Rerun Engine Running Self-Test while observing vacuum gauge.</li> <li>• Is vacuum reading less than 1 in.-Hg. throughout the test?</li> </ul> <p><b>NOTE: Disregard code output.</b></p>		<p>Yes</p> <p>No</p>	<p>GO to <b>DL31</b>.</p> <p>GO to <b>DL34</b>.</p>
<b>DL31</b>	VACUUM SUPPLY VERIFICATION		
<ul style="list-style-type: none"> <li>• Key off.</li> <li>• Do vacuum lines from EVR solenoid to EGR valve and source to EVR solenoid have loose connections, cracks or obstructions?</li> </ul>		<p>Yes</p> <p>No</p>	<p>SERVICE as necessary. RERUN Quick Test.</p> <p>GO to <b>DL32</b>.</p>

Pinpoint Test DL23 Thru DL31 - Pressure Feedback EGR (PFE)/EGR Valve Regulator (EVR)

<b>Pressure Feedback EGR (PFE) EGR Valve Regulator (EVR)</b>		<b>Pinpoint Test</b>	<b>DL</b>
<b>TEST STEP</b>		<b>RESULT</b>	<b>ACTION TO TAKE</b>
<b>DL32</b>	<b>VERIFY VACUUM TO EVR</b>		
<ul style="list-style-type: none"> <li>Start engine and run at idle.</li> <li>Attach vacuum gauge to source line from manifold.</li> <li>Is vacuum present?</li> </ul>		<p>Yes</p> <p>No</p>	<p>REPLACE EVR solenoid. RERUN Quick Test.</p> <p>REPLACE vacuum line to EVR. RERUN Quick Test.</p>
<b>DL34</b>	<b>CHECK EGR CONTROL PFE SENSOR TUBE</b>		
<ul style="list-style-type: none"> <li>Key off.</li> <li>Is control pressure input tube to PFE sensor cracked, disconnected or obstructed?</li> </ul>		<p>Yes</p> <p>No</p>	<p>SERVICE as necessary. RERUN Quick Test.</p> <p>REPLACE PFE Sensor. RERUN Quick Test.</p>
<b>DL90</b>	<b>CONTINUOUS MEMORY CODE 31 OR 35: EXERCISE PFE SENSOR</b>		
<ul style="list-style-type: none"> <li>Enter Key On Engine Off Continuous Monitor mode.</li> <li>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. to the sensor.</li> <li>Slowly bleed vacuum off the PFE sensor.</li> <li>Lightly tap on PFE sensor (to 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 PFE sensor. CLEAR Continuous Memory Code 31/35.</p> <p>RERUN Quick Test.</p> <p>GO to <b>DL91</b>.</p>
			

Pinpoint Test DL32 Thru DL90 - Pressure Feedback EGR (PFE)/EGR Valve Regulator (EVR)

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>• Still in Key On Engine Off Continuous Monitor mode.</li> <li>• Observe VOM or STAR LED for a fault indication while performing the following:               <ul style="list-style-type: none"> <li>— Referring to the illustration in Step <b>DL90</b> 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> </li> <li>• Is a fault indicated?</li> </ul>		<p>Yes</p> <p>No</p>	<p>ISOLATE fault and SERVICE as necessary. CLEAR Continuous Memory Code 31/35.</p> <p style="text-align: center;">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>Yes</p> <p>No</p>	<p>Unable to duplicate and/or identify fault at this time. CLEAR Continuous Memory Code 31/35.</p> <p>Continuous Memory Code 31 or 35 testing complete.</p> <p>SERVICE as necessary. CLEAR Continuous Memory Code 31/35.</p> <p>RERUN Quick Test.</p>

Pinpoint Test DL91 &amp; DL92 - Pressure Feedback EGR (PFE)/EGR Valve Regulator (EVR)

Pressure Feedback EGR (PFE) EGR Valve Regulator (EVR)		Pinpoint Test	DL
TEST STEP		RESULT	ACTION TO TAKE
<b>DL93</b>	CONTINUOUS MEMORY CODE 34: INSPECT PFE SUPPLY TUBE FOR BLOCKAGE		
<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>Yes ▶</p> <p>No ▶</p>	<p>Unable to duplicate and/or identify fault at this time. CLEAR Continuous Memory Code 34.</p> <p>Continuous Code 34 testing complete.</p> <p>CLEAN and/or SERVICE as necessary. CLEAR Continuous Memory Code 34.</p> <p>RERUN Quick Test.</p>
<b>DL94</b>	CONTINUOUS MEMORY CODE 32: INSPECT EGR VALVE FOR SMOOTH OPERATION.		
<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>		<p>Yes ▶</p> <p>No ▶</p>	<p>GO to <b>DL95</b>.</p> <p>CLEAR Continuous Memory Code 32.</p> <p>GO to EGR Valve Diagnostics, Section 6.</p>
<b>DL95</b>	INSPECT VACUUM LINES BETWEEN EVR SOLENOID AND EGR VALVE		
<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>		<p>Yes ▶</p> <p>No ▶</p>	<p>GO to <b>DL96</b>.</p> <p>SERVICE as necessary. CLEAR Continuous Memory Code 32.</p> <p>RERUN Quick Test.</p>

**Pinpoint Test DL93 Thru DL95 - Pressure Feedback EGR (PFE)/EGR Valve Regulator (EVR)**

Pressure Feedback EGR (PFE) EGR Valve Regulator (EVR)		Pinpoint Test	DL
TEST STEP		RESULT	ACTION TO TAKE
<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>		Yes	Unable to duplicate and/or identify fault at this time. CLEAR Continuous Memory Code 32.  Continuous Memory Code 34 testing complete.
		No	REPLACE EVR filter. CLEAR Continuous Memory Code 32.  RERUN Quick Test.
<b>DL97</b>	<b>CONTINUOUS MEMORY CODE 33: 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>		Yes	GO to <b>DL98</b> .
		No	CLEAR Continuous Memory Code 33.  GO to EGR Valve Diagnostics, Section 6.

Pinpoint Test DL96 & DL97 - Pressure Feedback EGR (PFE)/EGR Valve Regulator (EVR)

<b>Pressure Feedback EGR (PFE) EGR Valve Regulator (EVR)</b>		<b>Pinpoint Test</b>	<b>DL</b>
<b>TEST STEP</b>		<b>RESULT</b>	<b>ACTION TO TAKE</b>
<b>DL98</b>	<b>EVR HARNESS CHECK</b>		
<ul style="list-style-type: none"> <li>• Key off.</li> <li>• Disconnect processor 60 pin connector. Inspect for damaged pins, corrosion, loose wires, etc. Service as necessary.</li> <li>• Install breakout box and connect processor to breakout box.</li> <li>• Enter Output State Check. Refer to Appendix in Section 16.</li> <li>• DVOM on 20 volt scale.</li> <li>• Connect DVOM negative test lead to Test Pin 40 at the breakout box and DVOM positive test lead to Test Pin 33. (Test Pin 52 for 1.9L CFI).</li> <li>• Cycle throttle if necessary to indicate greater than 10.5 volts.</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.</li> <li>• Lightly tap EVR solenoid to simulate road shock.</li> <li>• Does DVOM indicate less than 10.5 volts?</li> </ul>		<p>Yes</p> <p>No</p>	<p>SERVICE as necessary. CLEAR Continuous Memory Code 33.</p> <p>RERUN Quick Test.</p> <p>Unable to duplicate and/or identify fault at this time. CLEAR Continuous Memory Code 33.</p> <p>Continuous Memory Code 33 testing complete.</p>

**Pinpoint Test DL98 - Pressure Feedback EGR (PFE)/EGR Valve Regulator (EVR)**

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

## Pinpoint Test

## DN

### Note

You should enter this Pinpoint Test only when a Service Code 31, 32, 33, 34, 35, 38 or 84 is received in Quick Test Step 3.0, 5.0 or 6.0 or from Pinpoint Test Step S3.

### Remember

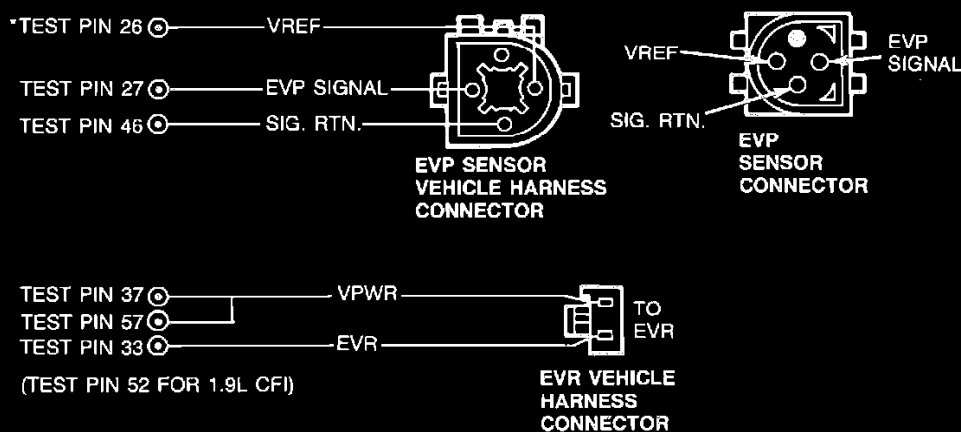
To prevent the replacement of good components, be aware that the following non-EEC area may be at fault:

- 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 and EVR vacuum lines.

### Pinpoint Test Schematic



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

Pinpoint Test DN - EGR Valve Position Sensor (EVP)/EGR Valve Regulator (EVR)

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

## Pinpoint Test

## DN

TEST STEP		RESULT	ACTION TO TAKE
<b>DN1</b>	SERVICE CODE 31: ATTEMPT TO GENERATE CODE 35		
	<ul style="list-style-type: none"> <li>• Key off, wait 10 seconds.</li> <li>• Disconnect EVP vehicle harness at sensor.</li> <li>• Jumper VREF to EVP signal at vehicle harness connector.</li> <li>• Rerun Key On Engine Off Self-Test.</li> <li>• Is Code 35 present?</li> </ul> <p><b>NOTE: Ignore all other codes at this time.</b></p>	<p>Yes</p> <p>No</p>	<p>REMOVE Jumper. REPLACE EVP sensor. RERUN Quick Test.</p> <p>REMOVE jumper. GO to <b>DN2</b>.</p>
<b>DN2</b>	CHECK VREF TO SIGNAL RETURN VOLTAGE		
	<ul style="list-style-type: none"> <li>• Key on, engine off.</li> <li>• EVP disconnected from harness.</li> <li>• DVOM on 20 volt scale.</li> <li>• Measure voltage between VREF and SIGNAL RETURN at EVP vehicle harness connector.</li> <li>• Is voltage between 4.0 and 6.0 volts?</li> </ul>	<p>Yes</p> <p>No</p>	<p>GO to <b>DN3</b>.</p> <p>GO to Pinpoint Test Step <b>C1</b>.</p>
<b>DN3</b>	CHECK CONTINUITY OF EVP SIGNAL		
	<ul style="list-style-type: none"> <li>• Key off, wait 10 seconds.</li> <li>• EVP Sensor disconnected.</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.</li> <li>• DVOM on 200 ohm scale.</li> <li>• Measure resistance between EVP SIGNAL at vehicle harness connector and Test Pin 27 at the breakout box.</li> <li>• Is resistance less than 5 ohms?</li> </ul>	<p>Yes</p> <p>No</p>	<p>GO to <b>DN4</b>.</p> <p>SERVICE open circuit. REMOVE breakout box. RECONNECT all components. RERUN Quick Test.</p>

Pinpoint Test DN1 Thru DN3 - EGR Valve Position Sensor (EVP)/EGR Valve Regulator (EVR)

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

## Pinpoint Test

## DN

TEST STEP		RESULT	ACTION TO TAKE
<b>DN4</b>	CHECK EVP SIGNAL FOR SHORT TO GROUND		
	<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 Test Pin 27 and Test Pins 40, 46 and 60 at the breakout box.</li> <li>• Are all resistances greater than 10,000 ohms?</li> </ul>	<p>Yes</p> <p>No</p>	<p>REPLACE processor. REMOVE breakout box. RECONNECT all components. RERUN Quick Test.</p> <p>SERVICE short circuit. REMOVE breakout box. RECONNECT all components. RERUN Quick Test.</p>
<b>DN5</b>	SERVICE CODE 35: ATTEMPT TO GENERATE CODE 31		
	<ul style="list-style-type: none"> <li>• Key off, wait 10 seconds.</li> <li>• Disconnect EVP sensor.</li> <li>• Rerun Key On Engine Off Self-Test.</li> <li>• Is Code 31 present?</li> </ul> <p><b>NOTE: Ignore all other codes at this time.</b></p>	<p>Yes</p> <p>No</p>	<p>GO to <b>DN6</b>.</p> <p>GO to <b>DN7</b>.</p>
<b>DN6</b>	CHECK VREF TO SIGNAL RETURN VOLTAGE		
	<ul style="list-style-type: none"> <li>• Key on, engine off.</li> <li>• EVP sensor disconnected.</li> <li>• DVOM on 20 volt scale.</li> <li>• Measure voltage between VREF and SIGNAL RETURN at EVP vehicle harness connector.</li> <li>• Is voltage between 4.0 and 6.0 volts?</li> </ul>	<p>Yes</p> <p>No</p>	<p>REPLACE EVP sensor. RERUN Quick Test.</p> <p>GO to Pinpoint Test Step <b>C1</b>.</p>

Pinpoint Test DN4 Thru DN6 - EGR Valve Position Sensor (EVP)/EGR Valve Regulator (EVR)

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

## Pinpoint Test

## DN

TEST STEP		RESULT	ACTION TO TAKE
<b>DN7</b>	CHECK EVP SIGNAL FOR SHORT TO POWER		
<ul style="list-style-type: none"> <li>• Key off.</li> <li>• EVP disconnected from harness.</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 the resistance between Test Pin 27 and Test Pins 26 and 57 at the breakout box.</li> <li>• Are both resistances greater than 10,000 ohms?</li> </ul>		<p>Yes</p> <p>No</p>	<p>REPLACE processor. REMOVE breakout box. RECONNECT EVP sensor. RERUN Quick Test.</p> <p>SERVICE short circuit. REMOVE breakout box, RECONNECT EVP sensor and processor. RERUN Quick Test.</p>
<b>DN10</b>	SERVICE CODE 84: CHECK RESISTANCE OF EVR SOLENOID		
<ul style="list-style-type: none"> <li>• Key off, wait 10 seconds.</li> <li>• Disconnect EVR solenoid.</li> <li>• DVOM on 200 ohm scale.</li> <li>• Measure solenoid resistance.</li> <li>• Is resistance between 30 and 70 ohms?</li> </ul>		<p>Yes</p> <p>No</p>	<p>GO to <b>DN11</b>.</p> <p>REPLACE EVR solenoid assembly. RERUN Quick Test.</p>
<b>DN11</b>	CHECK FOR VPWR AT EVR SOLENOID		
<ul style="list-style-type: none"> <li>• Key on, engine off.</li> <li>• EVR solenoid disconnected.</li> <li>• DVOM on 20 volt scale.</li> <li>• Measure voltage between battery negative post and VPWR circuit at the EVR solenoid vehicle harness connector.</li> <li>• Is voltage greater than 10.5 volts?</li> </ul>		<p>Yes</p> <p>No</p>	<p>GO to <b>DN12</b>.</p> <p>RECONNECT EVR solenoid. SERVICE open circuit. RERUN Quick Test.</p>

Pinpoint Test DN7 Thru DN11 - EGR Valve Position Sensor (EVP)/EGR Valve Regulator (EVR)

<b>EGR Valve Position Sensor (EVP) EGR Valve Regulator (EVR)</b>		<b>Pinpoint Test</b>	<b>DN</b>
<b>TEST STEP</b>		<b>RESULT</b>	<b>ACTION TO TAKE</b>
<b>DN12</b>	<b>CHECK CONTINUITY OF EVR CIRCUIT</b>		
<ul style="list-style-type: none"> <li>• Key off.</li> <li>• EVR solenoid disconnected from harness.</li> <li>• Disconnect processor 60 pin connector. Inspect for damaged pins, corrosion, loose wires, etc. Service as necessary.</li> <li>• Install breakout box to processor, leave processor disconnected.</li> <li>• DVOM on 200 ohm scale.</li> <li>• Measure resistance between Test Pin 33 (Test Pin 52 for 1.9L CFI) at the breakout box and EVR SIGNAL at the EVR solenoid vehicle harness connector.</li> <li>• Is resistance less than 5 ohms?</li> </ul>		<p>Yes ▶</p> <p>No ▶</p>	<p>GO to <b>DN13</b> .</p> <p>SERVICE open circuit. REMOVE breakout box. RECONNECT processor and EVR solenoid. RERUN Quick Test.</p>
<b>DN13</b>	<b>CHECK EVR CIRCUIT FOR SHORT TO POWER AND GROUND</b>		
<ul style="list-style-type: none"> <li>• Key off.</li> <li>• EVR solenoid disconnected.</li> <li>• Breakout box installed, processor disconnected.</li> <li>• DVOM on 200,000 ohm scale.</li> <li>• Measure resistance between Test Pin 33 (Test Pin 52 for 1.9L CFI) and Test Pins 37/57, 40/60 and 46 at the breakout box.</li> <li>• Are all resistances greater than 10,000 ohms?</li> </ul>		<p>Yes ▶</p> <p>No ▶</p>	<p>REPLACE processor. REMOVE breakout box. RECONNECT processor and EVR solenoid. RERUN Quick Test.</p> <p>SERVICE short circuit. REMOVE breakout box. RECONNECT processor and EVR solenoid. RERUN Quick Test. If code is repeated, REPLACE processor.</p>

**Pinpoint Test DN12 & DN13 - EGR Valve Position Sensor (EVP)/EGR Valve Regulator (EVR)**

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

## Pinpoint Test

## DN

TEST STEP		RESULT	ACTION TO TAKE
<b>DN20</b>	SERVICE CODE 34: CHECK FOR SERVICE CODE 84.		
	<ul style="list-style-type: none"> <li>• Key off, wait 10 seconds.</li> <li>• Is Code 84 present in Key On Engine Off Self-Test?</li> </ul>	Yes	▶ GO to <b>DN10</b> .
		No	▶ GO to <b>DN21</b> .
<b>DN21</b>	SUBSTITUTE EVP SENSOR ON ORIGINAL EGR VALVE		
<p><b>NOTE:</b> Key On Engine Off Service Code 34 indicates that the EGR valve and/or EVP sensor is not fully seated in the closed position. Because of the preload on the installed EVP sensor, it is very difficult to determine whether the EGR valve is seated or the EVP sensor is in contact with the EGR valve stem.</p>			
	<ul style="list-style-type: none"> <li>• Key off, wait 10 seconds.</li> <li>• Install a known good EVP sensor on original EGR valve.</li> <li>• Perform Key On Engine Off Quick Test.</li> <li>• Is Code 34 still present?</li> </ul>	Yes	▶ GO to Powertrain Management: Emission Control Systems: Exhaust Gas Recirculation.
		No	▶ The original Code 34 was the result of the original EVP sensor. SERVICE EVP sensor as necessary. RERUN Quick Test.
<b>DN25</b>	SERVICE CODE 32: SUBSTITUTE EVP SENSOR ON ORIGINAL EGR VALVE		
<p><b>NOTE:</b> Key On Engine Off and Engine Running Service Code 32 indicates that the EGR valve and/or EVP sensor is lower than normal in the closed position. Because of the preload of the EVP sensor it is very difficult to determine whether EGR valve has malfunctioned or the EVP sensor has abnormally high resistance.</p>			
	<ul style="list-style-type: none"> <li>• Key off, wait 10 seconds.</li> <li>• Install a known good EVP sensor on original EGR valve.</li> <li>• Rerun Key On Engine Off Self-Test.</li> <li>• Is Code 32 present?</li> </ul>	Yes	▶ GO to Powertrain Management: Emission Control Systems: Exhaust Gas Recirculation.
		No	▶ The original Code 32 was the result of the original EVP sensor. SERVICE EVP sensor as necessary. RERUN Quick Test.

Pinpoint Test DN20 Thru DN25 - EGR Valve Position Sensor (EVP)/EGR Valve Regulator (EVR)

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

## Pinpoint Test

## DN

TEST STEP		RESULT	ACTION TO TAKE
<b>DN40</b>	SERVICE CODE 33: VERIFY VACUUM IS PRESENT AT EGR VALVE		
<p><b>NOTE:</b> Engine Running Code 33 indicates that the EVP sensor input did not change after the EVR solenoid was instructed by the processor to open the EGR valve. Because a Code 84 was not received in the Key On Engine Off Self-Test, it is known that the EVR solenoid functions electrically. It is also known that the EVP sensor is in the expected closed valve range because Codes 32 and 34 were not received in either Key On Engine Off or Engine Running Tests.</p>			
<ul style="list-style-type: none"> <li>• Key off.</li> <li>• Tee in vacuum gauge at EGR valve.</li> <li>• Rerun Engine Running Self-Test while observing vacuum gauge.</li> <li>• Is vacuum greater than 1.5 in.-Hg. (5 kPa)?</li> </ul>		Yes	▶ REMOVE vacuum gauge. RECONNECT EGR valve. GO to <b>DN43</b> .
		No	▶ REMOVE vacuum gauge. RECONNECT EGR valve. GO to <b>DN41</b> .
<b>DN41</b>	VERIFY VACUUM SUPPLY TO EVR SOLENOID		
<ul style="list-style-type: none"> <li>• Key off.</li> <li>• Disconnect the vacuum source to the EVR solenoid.</li> <li>• Install a vacuum gauge at source vacuum.</li> <li>• Start engine and check vacuum.</li> <li>• Is vacuum greater than 10 in.-Hg. (33 kPa)?</li> </ul>		Yes	▶ GO to <b>DN42</b> .
		No	▶ CHECK source vacuum hose to EVR solenoid. SERVICE as necessary. RERUN Quick Test.
<b>DN42</b>	CHECK VACUUM HOSE BETWEEN EVR SOLENOID AND EGR VALVE		
<ul style="list-style-type: none"> <li>• Carefully check EGR vacuum hose from EGR valve to EVR for obstructions cracks, loose connectors, blockage, kinks and leaks, etc.</li> <li>• Is vacuum hose in good condition?</li> </ul>		Yes	▶ CHECK EVR solenoid filter for obstructions. REPLACE as necessary. If OK, REPLACE EVR solenoid assembly. RECONNECT vacuum hose. RERUN Quick Test.
		No	▶ SERVICE vacuum hose as necessary. RERUN Quick Test.

Pinpoint Test DN40 Thru DN42 - EGR Valve Position Sensor (EVP)/EGR Valve Regulator (EVR)

<b>EGR Valve Position Sensor (EVP) EGR Valve Regulator (EVR)</b>		<b>Pinpoint Test</b>	<b>DN</b>
<b>TEST STEP</b>		<b>RESULT</b>	<b>ACTION TO TAKE</b>
<b>DN43</b>	SUBSTITUTE KNOWN GOOD EVP SENSOR ON ORIGINAL EGR VALVE		
	<ul style="list-style-type: none"> <li>• Key off, wait 10 seconds.</li> <li>• Install a known good EVP sensor on original EGR valve.</li> <li>• Rerun Engine Running Self-Test.</li> <li>• Is Code 33 present?</li> </ul>	<p>Yes</p> <p>No</p>	<p>▶ GO to Section 6 for EGR valve diagnostics.</p> <p>▶ The original Code 33 was the result of the original EVP sensor. SERVICE EVP sensor as necessary. RERUN Quick Test.</p>
<b>DN50</b>	SERVICE CODE 34: EGR VALVE OPERATION, ENGINE RUNNING SELF-TEST WITH EGR VACUUM DISCONNECTED		
	<ul style="list-style-type: none"> <li>• Key off.</li> <li>• Disconnect vacuum hose from EGR valve and plug hose.</li> <li>• Rerun Engine Running Self-Test.</li> <li>• Is Code 34 present?</li> </ul>	<p>Yes</p> <p>No</p>	<p>▶ GO to <b>DN51</b> .</p> <p>▶ CHECK EVR filter for obstructions. REPLACE as necessary. If OK, REPLACE EVR solenoid assembly. RECONNECT all vacuum hoses. RERUN Quick Test.</p>
<b>DN51</b>	CHECK EVP RESISTANCE WHILE APPLYING VACUUM TO EGR VALVE		
	<ul style="list-style-type: none"> <li>• Key off, wait 10 seconds.</li> <li>• Disconnect harness from EVP sensor.</li> <li>• Disconnect vacuum hose at EGR valve.</li> <li>• Connect vacuum pump to EGR valve.</li> <li>• DVOM on 200,000 ohm scale.</li> <li>• Measure resistance at the EVP sensor between EVP SIGNAL and VREF while increasing vacuum to 10 in. Hg. (33 kPa).</li> <li>• Observe resistance as vacuum increases.</li> <li>• Does resistance decrease gradually from no more than 5,500 ohms to no less than 100 ohms?</li> </ul>	<p>Yes</p> <p>No</p>	<p>▶ GO to Section 6 for EGR valve diagnostics.</p> <p>▶ REPLACE EVP sensor. RECONNECT vacuum hose. RERUN Quick Test.</p>

**Pinpoint Test DN43 Thru DN51 - EGR Valve Position Sensor (EVP)/EGR Valve Regulator (EVR)**



<b>EGR Valve Position Sensor (EVP) EGR Valve Regulator (EVR)</b>		<b>Pinpoint Test</b>	<b>DN</b>
<b>TEST STEP</b>		<b>RESULT</b>	<b>ACTION TO TAKE</b>
<b>DN90</b>	CONTINUOUS MEMORY CODE 32: CHECK EVP SIGNAL VOLTAGE WHILE EXERCISING EVP SENSOR		
<p><b>NOTE: The EVP circuit indicated that the EGR valve was closed further than normal with the engine at stabilized operating temperature and at idle.</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.</li> <li>• Connect processor to breakout box.</li> <li>• Disconnect vacuum hose at EGR valve.</li> <li>• Connect a vacuum pump to the EGR valve.</li> <li>• DVOM on 20 volt scale.</li> <li>• Key on, engine off.</li> <li>• Measure resistance between Test Pin 27 and Test Pin 46 at the breakout box while doing the following. <ul style="list-style-type: none"> <li>— Slowly increase vacuum at EGR valve to 6 in.-Hg. (20 kPa), then slowly bleed vacuum off the EGR valve and lightly tap on EVP sensor (simulate road shock).</li> </ul> </li> <li>• Does voltage drop to less than 0.29 volts?</li> </ul>		<p>Yes</p> <p>▶</p>	<p>EGR valve may have caused Continuous Memory Code 32. CLEAR Continuous Memory Code 32.</p> <p>GO to EGR valve diagnostics.</p>
		<p>No</p> <p>▶</p>	<p>Unable to duplicate Code 32 fault at this time. CLEAR Continuous Memory Code 32.</p> <p>Continuous Memory Code 32 testing complete.</p>

**Pinpoint Test DN90 - EGR Valve Position Sensor (EVP)/EGR Valve Regulator (EVR)**

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

## Pinpoint Test

## DN

TEST STEP	RESULT	ACTION TO TAKE
<b>DN92</b> CONTINUOUS MEMORY CODE 31 AND/OR 35: CHECK EEC-IV HARNESS		
<p><b>NOTE:</b> The EVP circuit indicated an open in the EVP signal or VREF, or a short to SIGNAL RETURN with the engine at stabilized operating temperature and at idle.</p> <p>CODE 31:</p>  <p>PROCESSOR      HARNESS      EVP SENSOR</p> <p><b>NOTE:</b> The EVP circuit indicated a short to VREF and/or VPWR, or an open in SIGNAL RETURN with the engine at stabilized operating temperature and at idle.</p> <p>CODE 35:</p>  <p>PROCESSOR      HARNESS      EVP SENSOR</p> <ul style="list-style-type: none"> <li>• Still in Key On Engine Off Continuous Monitor mode.</li> <li>• Observe VOM or STAR LED for a fault indication while performing the following:             <ul style="list-style-type: none"> <li>— Refer to illustration above by code for possible circuit faults.</li> <li>— Grasp the harness close to the sensor connector. Wiggle, shake or bend a small section of the EEC-IV system harness while working your way to the dash panel. Also wiggle, shake or bend the EEC-IV harness from the dash panel to the processor.</li> </ul> </li> <li>• Is a fault indicated?</li> </ul>	<p>Yes</p> <p>No</p>	<p>ISOLATE fault and SERVICE as necessary. REFER to appropriate figure. CLEAR Continuous Memory Code 31 and/or 35.</p> <p>RERUN Quick Test.</p> <p>GO to <b>DN93</b>.</p>

Pinpoint Test DN92 - EGR Valve Position Sensor (EVP)/EGR Valve Regulator (EVR)

<b>EGR Valve Position Sensor (EVP) EGR Valve Regulator (EVR)</b>		<b>Pinpoint Test</b>	<b>DN</b>
<b>TEST STEP</b>		<b>RESULT</b>	<b>ACTION TO TAKE</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. Inspect for damaged pins, corrosion, loose wires, etc. on both the processor and harness connectors.</li> <li>• Are connectors and terminals OK?</li> </ul>		<p>Yes</p> <p>No</p>	<p>Unable to duplicate fault at this time. CLEAR Continuous Memory Code 31 and/or 35.</p> <p>Continuous Memory Code 31 or 35 testing complete.</p> <p>SERVICE as necessary. CLEAR Continuous Memory Code 31 and/or 35.</p> <p>RERUN Quick Test.</p>
<b>DN95</b>	<b>CONTINUOUS MEMORY CODE 33: LEAK TEST</b>		
<p><b>NOTE: The EVP circuit indicated that the EGR valve did not open with the engine at stabilized temperature and with an EVR solenoid duty cycle present.</b></p> <ul style="list-style-type: none"> <li>• Key off, wait 10 seconds.</li> <li>• Disconnect vacuum hose at EGR valve.</li> <li>• Connect a vacuum pump to EGR valve.</li> <li>• Apply 20 in.-Hg. (66 kPa) to EGR valve.</li> <li>• Does EGR valve open and maintain vacuum?</li> </ul>		<p>Yes</p> <p>No</p>	<p>REMOVE vacuum pump. RECONNECT EGR valve. GO to <b>DN96</b>.</p> <p>REMOVE vacuum pump. RECONNECT EGR valve. CLEAR Continuous Memory Code 33.</p> <p>GO to Section 6 for EGR valve diagnostics.</p>

Pinpoint Test DN93 &amp; DN95 - EGR Valve Position Sensor (EVP)/EGR Valve Regulator (EVR)

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

## Pinpoint Test

## DN

TEST STEP	RESULT	ACTION TO TAKE
<p><b>DN96</b>   EVR CHECK</p> <ul style="list-style-type: none"> <li>• Using continuous monitor mode.</li> <li>• Observe VOM or STAR LED for indication of a fault while performing the following:               <ul style="list-style-type: none"> <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> </ul> </li> <li>• Inspect connectors, terminals for obvious damage or faults.</li> <li>• Are any faults detected?</li> </ul>	<p>Yes</p> <p>No</p>	<p>ISOLATE fault and SERVICE as necessary. CLEAR Continuous Memory Code 33.</p> <p>RERUN Quick Test.</p> <p>Unable to duplicate fault at this time. CLEAR Continuous Memory Code 33.</p> <p>Testing complete.</p>
<p><b>DN98</b>   CONTINUOUS MEMORY CODE 34; CHECK EVP RESISTANCE WHILE APPLYING VACUUM TO EGR VALVE</p> <p><b>NOTE: The EVP circuit indicated that the EGR valve was open with the engine at stabilized operating temperature and at idle.</b></p> <ul style="list-style-type: none"> <li>• Key off.</li> <li>• Disconnect harness from EVP sensor.</li> <li>• Disconnect vacuum hose at EGR valve.</li> <li>• Connect vacuum pump to EGR valve.</li> <li>• DVOM on 200,000 ohm scale.</li> <li>• Measure resistance between EVP SIGNAL pin and VREF pin at the EVP sensor while increasing vacuum to 10 in.-Hg (33 kPa).</li> <li>• Observe resistance as vacuum increases.</li> <li>• Does resistance gradually change from no more than 5,500 ohms to no less than 100 ohms as the vacuum increases?</li> </ul>	<p>Yes</p> <p>No</p>	<p>REMOVE vacuum pump. RECONNECT EGR valve. CLEAR Continuous Memory Code 34.</p> <p>GO to <b>DN99</b>.</p> <p>REMOVE vacuum pump. RECONNECT EGR valve. CLEAR Continuous Memory Code 34.</p> <p>GO to EGR valve diagnostics.</p>

Pinpoint Test DN96 & DN98 - EGR Valve Position Sensor (EVP)/EGR Valve Regulator (EVR)

<b>EGR Valve Position Sensor (EVP) EGR Valve Regulator (EVR)</b>		<b>Pinpoint Test</b>	<b>DN</b>
<b>TEST STEP</b>		<b>RESULT</b>	<b>ACTION TO TAKE</b>
<b>DN99</b>	<b>EVR CHECK</b>		
<ul style="list-style-type: none"> <li>• Key off.</li> <li>• Disconnect vacuum hose from EGR valve and plug hose.</li> <li>• Rerun Engine Running Self-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. CLEAR Continuous Memory Code 34.</p> <p>RERUN Quick Test.</p> <p>Unable to duplicate fault at this time. CLEAR Continuous Memory Code 34.</p> <p>Continuous Memory Code 34 testing complete.</p>

**Pinpoint Test DN99 - EGR Valve Position Sensor (EVP)/EGR Valve Regulator (EVR)**

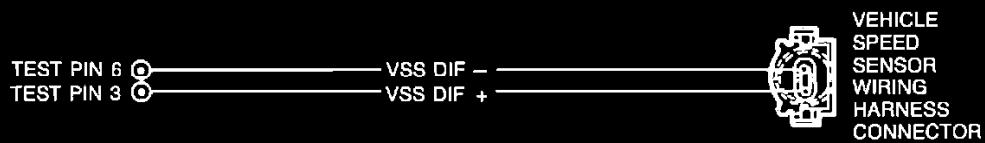
**Vehicle Speed Sensor****Pinpoint  
Test****DP****Note**

You should enter this Pinpoint Test only when Service Codes 27 or 29 are received in Quick Test Step 6.0.

**Remember**


This Pinpoint Test is intended to diagnose only the following:

- VSS Harness Circuits
- Vehicle Speed Sensor
- Processor Assembly

**Pinpoint Test Schematic****Pinpoint Test DP - Vehicle Speed Sensor**

Vehicle Speed Sensor		Pinpoint Test	DP
TEST STEP	RESULT	ACTION TO TAKE	
<b>DP1</b>   DRIVE CYCLE FOR CHECKING VEHICLE SPEED SENSOR (VSS)			
<ul style="list-style-type: none"> <li>Record and clear EEC-IV Continuous Memory Codes.</li> <li>Warm engine to operating temperature.</li> <li>Perform the drive cycle below as appropriate for the vehicle being tested.</li> </ul> <p><b>AUTOMATIC TRANSMISSION</b></p> <p><b>NOTE: On 2.3L EFI TC applications, idle the engine for a full 5 minutes then immediately begin the drive cycle.</b></p> <p>Place the gear selector in LOW and moderately accelerate to 25 mph, then coast down to an idle and stop the vehicle. Shut engine off.</p> <p><b>MANUAL TRANSMISSION</b></p> <p>Starting in first gear, shift to second gear and moderately accelerate to 40 mph, then coast down to an idle and stop vehicle. Shut engine off.</p> <ul style="list-style-type: none"> <li>Run Key On Engine Off Self-Test.</li> <li>Is Code 29 (Code 27 for 2.3L EFI TC vehicles) present in Continuous Memory?</li> </ul>	Yes  No	GO to <b>DP2</b> .  Unable to duplicate fault at this time. If any other codes are present, return to Quick Test for directions. If codes are not present, test is completed.	
<b>DP2</b>   CHECK VEHICLE SPEED SENSOR			
<ul style="list-style-type: none"> <li>Key off, wait 10 seconds.</li> <li>Locate and disconnect Vehicle Speed Sensor.</li> <li>DVOM on 200,000 ohm scale.</li> <li>Measure resistance across Vehicle Speed Sensor.</li> <li>Is resistance between 190 and 240 ohms?</li> </ul>	Yes  No	GO to <b>DP3</b> .  REPLACE sensor. REPEAT Test Step <b>DP1</b> .	

Pinpoint Test DP1 &amp; DP2 - Vehicle Speed Sensor

Vehicle Speed Sensor		Pinpoint Test	DP
TEST STEP	RESULT	ACTION TO TAKE	
<b>DP3</b> CHECK CONTINUITY OF VEHICLE SPEED SENSOR (VSS) HARNESS			
<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.</li> <li>• Processor and VSS disconnected.</li> <li>• DVOM on 200 ohm scale.</li> <li>• Measure resistance between Test Pin 3 at the breakout box and the VSS vehicle harness connector as shown below.</li> <li>• Measure resistance between Test Pin 6 at the breakout box and the VSS vehicle harness connector, as shown below.</li> </ul> <div style="text-align: center;">  <p>TEST PIN 6 — VSS DIF - TEST PIN 3 — VSS DIF +</p> </div> <ul style="list-style-type: none"> <li>• Are both resistances less than 5 ohms?</li> </ul>	Yes  No	GO to <b>DP4</b> .  SERVICE open circuit(s). REPEAT Test Step <b>DP1</b> . REMOVE breakout box. RECONNECT processor and VSS.	
<b>DP4</b> CHECK VSS HARNESS FOR SHORTS TO POWER OR GROUND			
<ul style="list-style-type: none"> <li>• Key off.</li> <li>• Processor disconnected.</li> <li>• VSS disconnected.</li> <li>• DVOM on 2,000 ohm scale.</li> <li>• Measure resistance between Test Pin 3 and Test Pins 37, 40 and 6 at the breakout box.</li> <li>• Measure resistance between Test Pin 6 and Test Pins 37 at the breakout box.</li> <li>• Are all resistances greater than 500 ohms?</li> </ul>	Yes  No	REMOVE breakout box. RECONNECT processor. GO to <b>DP5</b> .  REMOVE breakout box. RECONNECT processor and VSS. SERVICE short circuits(s). REPEAT Test Step <b>DP1</b> .	

Pinpoint Test DP3 &amp; DP4 - Vehicle Speed Sensor

Vehicle Speed Sensor		Pinpoint Test	DP
TEST STEP		RESULT	ACTION TO TAKE
<b>DP5</b>	REPEAT DRIVE CYCLE WITH A KNOWN GOOD VSS INSTALLED		
<ul style="list-style-type: none"> <li>• Substitute VSS with known good sensor.</li> <li>• Processor and VSS connected.</li> <li>• Perform Drive Cycle outlined in Test Step <b>DP1</b> then return to this Step.</li> <li>• Is Code 29 (Code 27 for 2.3L EFI TC vehicles) present in continuous memory?</li> </ul>		Yes	REMOVE breakout box. REINSTALL original VSS. REPLACE processor. REPEAT Test Step <b>DP1</b> .
		No	The original Continuous Memory Code 29 or 27 was the result of the original VSS. REPLACE VSS. RERUN Quick Test.

Pinpoint Test DP5 - Vehicle Speed Sensor

**Neutral Drive Switch  
A/C Input**

**Pinpoint  
Test**

**FA**

**Note**

You should enter this Pinpoint Test only when a Service Code 67 or 79 is received in Quick Test Step 3.0, 5.0, 6.0, or you have been directed here from Diagnostic By Symp

**Remember**

This Pinpoint Test is intended to diagnose only the following:

- A/C input to processor
- Neutral clutch switch
- Neutral drive switch
- Processor
- Harness circuits: NDS, NGS, ACC, ACCS and SIGNAL RETURN

TEST STEP		RESULT	ACTION TO TAKE
<b>FA1</b>	<b>CODE 67 SYSTEM IDENTIFICATION</b>		
	1.9L CFI M/T, 5.0L M/T TK .....		GO to <b>FA9</b> .
	2.9L M/T TK, 3.0L M/T TK, 5.8L M/T TK, 5.0L M/T SEFI .....		GO to <b>FA2</b> .
	1.9L EFI M/T, 2.3L EFI M/T Car and Truck .....		GO to <b>FA2</b> .
	2.3L Turbo M/T .....		GO to <b>FA6</b> .
	2.5L M/T, 4.9L M/T TK .....		GO to <b>FA5</b> .
	All other systems .....		GO to <b>FA7</b> .

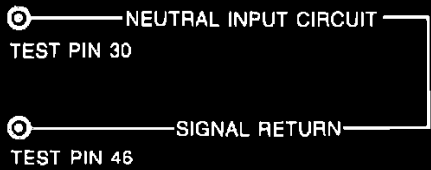
**Pinpoint Test FA1 - Neutral Drive Switch A/C Input**

Neutral Drive Switch A/C Input		Pinpoint Test	FA
TEST STEP		RESULT	ACTION TO TAKE
<b>FA2</b>	CHECK NEUTRAL GEAR/CLUTCH INPUT		
<p>NEUTRAL DRIVE CIRCUIT</p> <p>NEUTRAL GEAR SWITCH OPEN IN ANY GEAR</p> <p>TEST PIN 30</p> <p>CLUTCH SWITCH OPEN WHEN CLUTCH PEDAL IS UP</p> <p>TEST PIN 46 — SIG. RTN.</p> <ul style="list-style-type: none"> <li>• Key off, wait 10 seconds.</li> <li>• Verify A/C is off, if so equipped.</li> <li>• Disconnect processor 60 pin connector. Inspect for damaged pins, corrosion, loose wires, etc. Service as necessary.</li> <li>• Install breakout box.</li> <li>• Connect processor.</li> <li>• DVOM on 200 ohm scale.</li> <li>• Measure resistance between Test Pin 30 and Test Pin 46. <ol style="list-style-type: none"> <li>1. With transmission in NEUTRAL and clutch up.</li> <li>2. With transmission in GEAR and clutch down.</li> </ol> </li> <li>• Are both resistances less than 5 ohms?</li> </ul>		<p>Yes</p> <p>No</p>	<p>▶ GO to <b>FA9</b>.</p> <p>▶ GO to <b>FA3</b>.</p>
<b>FA3</b>	CHECK NEUTRAL GEAR/CLUTCH SWITCH		
<ul style="list-style-type: none"> <li>• Key off.</li> <li>• DVOM on 200 ohm scale.</li> <li>• Breakout box installed.</li> <li>• Locate Neutral Gear switch (on transmission) and Clutch switch (at clutch pedal linkage).</li> <li>• Disconnect vehicle harness at both switches and inspect connectors for pushed back pins.</li> <li>• Measure resistance across the Neutral Gear switch terminals with transmission in NEUTRAL and across the Clutch switch terminals with the clutch pedal down.</li> <li>• Are both resistances less than 5 ohms?</li> </ul>		<p>Yes</p> <p>No</p>	<p>▶ GO to <b>FA4</b>.</p> <p>▶ REPLACE open switch(es). REMOVE breakout box. RECONNECT all components. RERUN Quick Test.</p>

Pinpoint Test FA2 &amp; FA3 - Neutral Drive Switch A/C Input

Neutral Drive Switch A/C Input		Pinpoint Test	FA
TEST STEP		RESULT	ACTION TO TAKE
<b>FA4</b>	CHECK NEUTRAL GEAR/CLUTCH HARNESS		
<ul style="list-style-type: none"> <li>• Key off.</li> <li>• DVOM on 200 ohm scale.</li> <li>• Breakout box installed.</li> <li>• Vehicle harness disconnected at the Neutral Gear switch and Clutch switch.</li> <li>• Measure resistance between Test Pin 30 and the Neutral Gear switch harness connector and between Test Pin 30 and the Clutch switch harness connector.</li> <li>• Measure resistance between Test Pin 46 and the Neutral Gear switch harness connector and between Test Pin 46 and the Clutch switch harness connector.</li> <li>• Are all resistances less than 5 ohms?</li> </ul>		Yes ▶  No ▶	GO to <b>FA9</b> .  SERVICE open circuit. REMOVE breakout box. RECONNECT all components. RERUN Quick Test.
<b>FA5</b>	CHECK CLUTCH PEDAL SWITCH		
<p><b>NOTE: The clutch pedal must be down during KOEO test; if not, a code 67 will result.</b></p> <ul style="list-style-type: none"> <li>• Key off.</li> <li>• Disconnect processor 60 pin connector. Inspect for damaged pins, corrosion, loose wires, etc. Service as necessary.</li> <li>• Install breakout box.</li> <li>• DVOM on 200 ohm scale.</li> <li>• Clutch pedal down.</li> <li>• Measure resistance between Test Pin 30 and Test Pin 46, between Test Pin 30 and Test Pin 40.</li> <li>• Are resistances less than 5 ohms?</li> </ul>		Yes ▶  No ▶	GO to <b>FA9</b> .  REMOVE breakout box. RECONNECT all components. SERVICE open circuit.

Pinpoint Test FA4 &amp; FA5 - Neutral Drive Switch A/C Input

Neutral Drive Switch A/C Input		Pinpoint Test	FA
TEST STEP		RESULT	ACTION TO TAKE
<b>FA6</b>	CHECK NEUTRAL INPUT — 2.3L TC M/T		
 <ul style="list-style-type: none"> <li>• Key off, wait 10 seconds.</li> <li>• Verify A/C is off, if so equipped.</li> <li>• Disconnect processor 60 pin connector. Inspect for damaged pins, corrosion, loose wires, etc. Service as necessary.</li> <li>• Install breakout box.</li> <li>• Leave processor disconnected.</li> <li>• DVOM on 200 ohm scale.</li> <li>• Measure resistance between Test Pin 30 and Test Pin 46 at the breakout box.</li> <li>• Is resistance less than 5 ohms?</li> </ul>		<p>Yes</p> <p>No</p>	<p>GO to <b>FA9</b>.</p> <p>REMOVE breakout box. RECONNECT all components. SERVICE open circuit. RERUN Quick Test.</p>

Pinpoint Test FA6 - Neutral Drive Switch A/C Input


Neutral Drive Switch A/C Input		Pinpoint Test	FA
TEST STEP		RESULT	ACTION TO TAKE
<b>FA7</b>	<b>CHECK NEUTRAL DRIVE INPUT</b>		
<ul style="list-style-type: none"> <li>• Key off, wait 10 seconds.</li> <li>• Verify heater control is in OFF position, if so equipped.</li> <li>• Verify transmission is in NEUTRAL or PARK.</li> <li>• Disconnect processor 60 pin connector. Inspect for damaged pins, corrosion, loose wires, etc. Service as necessary.</li> <li>• Install breakout box.</li> <li>• Connect processor to breakout box.</li> <li>• Key on, engine off.</li> <li>• DVOM on 20 volt scale.</li> <li>• Measure voltage between Test Pin 30 at the breakout box and chassis ground.</li> <li>• Is voltage less than 1.0 volt?</li> </ul> <div style="text-align: center;"> <p>NEUTRAL DRIVE CIRCUIT</p> </div>		<p>Yes</p> <p>No</p>	<p>GO to <b>FA9</b> .</p> <p>Go to <b>FA8</b> .</p>
<b>FA8</b>	<b>CHECK NEUTRAL DRIVE SWITCH</b>		
<ul style="list-style-type: none"> <li>• Key off, wait 10 seconds.</li> <li>• Breakout box installed.</li> <li>• DVOM on 200 ohm scale.</li> <li>• Locate the Neutral Drive switch.</li> <li>• Disconnect vehicle harness from the Neutral Drive switch and measure resistance across the switch.</li> <li>• Is resistance less than 5 ohms?</li> </ul>		<p>Yes</p> <p>No</p>	<p>REMOVE breakout box. RECONNECT all components. SERVICE open in vehicle harness Neutral Drive circuit. RERUN Quick Test.</p> <p>REMOVE breakout box. RECONNECT all components. REPLACE Neutral Drive switch. RERUN Quick Test.</p>

Pinpoint Test FA7 &amp; FA8 - Neutral Drive Switch A/C Input


## Neutral Drive Switch A/C Input

## Pinpoint Test

## FA

TEST STEP	RESULT	ACTION TO TAKE
<p><b>FA9</b> CHECK A/C INPUT</p> <p><b>NOTE:</b> Before entering this test, verify A/C is off. If A/C was on, rerun Quick Test. If code 67 or 79 is present, continue with this test.</p> <ul style="list-style-type: none"> <li>• Breakout box installed.</li> <li>• Disconnect processor.</li> <li>• Key on, engine off.</li> <li>• DVOM on 20 volt scale.</li> <li>• Measure voltage between Test Pin 10 at the breakout box and chassis ground.</li> <li>• Is voltage greater than 1.0 volt?</li> </ul> 	<p>Yes</p> <p>No</p>	<p>REMOVE breakout box. RECONNECT all components. SERVICE short to power in A/C clutch circuit. RERUN Quick Test.</p> <p>REMOVE breakout box. RECONNECT all components. REPLACE processor. RERUN Quick Test.</p>

Pinpoint Test FA9 - Neutral Drive Switch A/C Input

Neutral Drive Switch A/C Input		Pinpoint Test	FA
TEST STEP		RESULT	ACTION TO TAKE
<b>FA10</b>	CHECK A/C INPUT CIRCUIT		
<p><b>NOTE:</b> A low idle with A/C on could be the result of the processor not receiving, or recognizing the A/C input on Pin 10.</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.</li> <li>• Leave processor disconnected.</li> <li>• DVOM on 20 volt scale.</li> <li>• Key on.</li> <li>• A/C on.</li> <li>• Measure voltage between Test Pin 10 and Test Pin 40.</li> <li>• Is voltage greater than 10.5 volts?</li> </ul>		<p>Yes</p> <p>No</p>	<p>REMOVE breakout box. RECONNECT all components. REPLACE processor. RERUN Quick Test.</p> <p>REMOVE breakout box. RECONNECT all components. SERVICE open in A/C circuit.</p> <p>RERUN Quick Test.</p>
			
<b>FA20</b>	CHECK NDS CIRCUIT FOR SHORT TO GROUND OR CLOSED NEUTRAL DRIVE SWITCH		
<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.</li> <li>• Connect processor to breakout box.</li> <li>• Place transmission in DRIVE.</li> <li>• DVOM on 200,000 ohm scale.</li> <li>• Measure resistance between Test Pin 30 and Test Pin 40/60 at the breakout box.</li> <li>• Is resistance greater than 10,000 ohms?</li> </ul>		<p>Yes</p> <p>No</p>	<p>high idle</p> <p>REMOVE breakout box. RECONNECT processor. SERVICE short circuit or closed neutral drive switch. RE-EVALUATE symptom.</p>

Pinpoint Test FA10 &amp; FA20 - Neutral Drive Switch A/C Input

**Brake On/Off (BOO)****Pinpoint  
Test****FD****Note**

You should enter this Pinpoint Test only when a Service Code 74 or 75 is received in Quick Test Step 5.0.

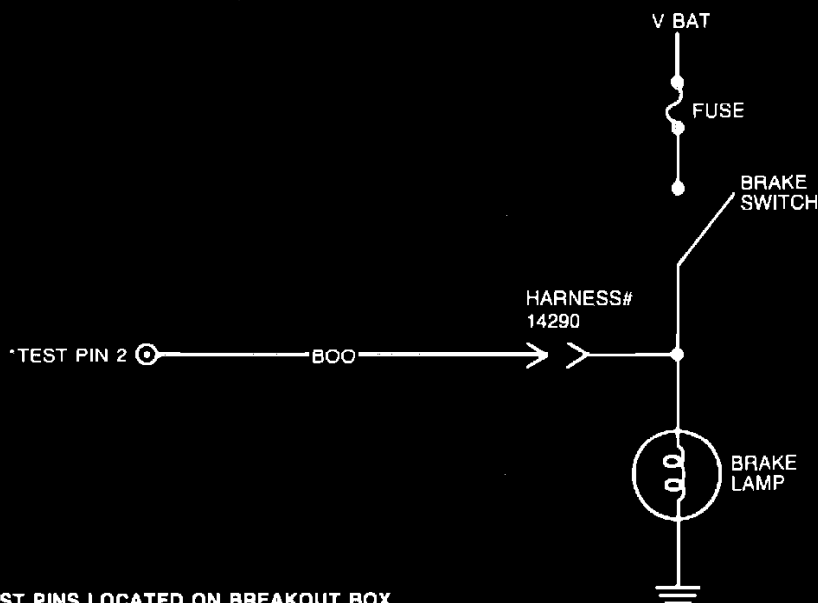
**Remember**

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

- Brake lamp, Brake switch, and fuse.

This Pinpoint Test is intended to diagnose only the following:

- BOO circuit.
- Processor assembly.

**Pinpoint Test Schematic**

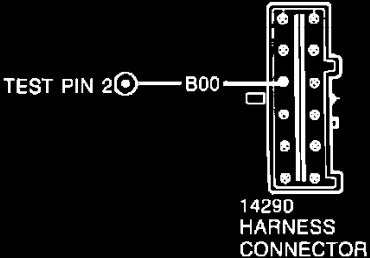
\*TEST PINS LOCATED ON BREAKOUT BOX.  
ALL HARNESS CONNECTORS VIEWED INTO MATING SURFACE.

Pinpoint Test FD - Brake On/Off (BOO)

Brake On/Off (BOO)		Pinpoint Test	FD
TEST STEP	RESULT	ACTION TO TAKE	
<b>FD1</b>   SERVICE CODE 74			
<ul style="list-style-type: none"> <li>• Did you press brake during the Engine Running Self-Test?</li> </ul> <p><b>NOTE: On some vehicles it is necessary to depress and release the brake after the dynamic response code 1(0) but before the brief WOT.</b></p>	Yes No	▶ ▶	GO to <b>FD2</b> .  RERUN Engine Running Self-Test. PRESS brake once during test.
<b>FD2</b>   CYCLE BOO CIRCUIT			
<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, leave processor disconnected.</li> <li>• DVOM on 20 volt scale.</li> <li>• Measure voltage between Test Pin 2 and Test Pin 40 at the breakout box while depressing and releasing brake.</li> <li>• Does the voltage cycle?</li> </ul>	Yes No	▶ ▶	REMOVE breakout box. REPLACE processor. RERUN Quick Test.  GO to <b>FD3</b> .
<b>FD3</b>   CHECK BOO CIRCUIT FOR SHORT TO GROUND			
<ul style="list-style-type: none"> <li>• Key off.</li> <li>• Breakout box installed.</li> <li>• Processor disconnected.</li> <li>• DVOM on 200,000 Ohm scale.</li> <li>• Disconnect BOO circuit from 14290 harness (12 pin connector).</li> <li>• Measure resistance between Test Pin 2 and Test Pin 40 at the breakout box.</li> <li>• Is resistance greater than 10,000 ohms?</li> </ul>	Yes No	▶ ▶	GO to <b>FD4</b> .  REMOVE breakout box. SERVICE short circuit. RERUN Engine Running Self-Test.

Pinpoint Test FD1 Thru FD3 - Brake On/Off (BOO)

**Brake On/Off (BOO)****Pinpoint  
Test****FD**

TEST STEP	RESULT	ACTION TO TAKE
<p><b>FD4</b> CHECK CONTINUITY OF BOO CIRCUIT</p> <ul style="list-style-type: none"> <li>• Key off.</li> <li>• Breakout box installed.</li> <li>• Processor disconnected.</li> <li>• DVOM on 200 ohm scale.</li> <li>• Disconnect BOO circuit from 14290 harness (12 pin connector).</li> <li>• Measure resistance between Test Pin 2 at the breakout box and BOO circuit at the 14290 harness connector.</li> <li>• Is resistance greater than 5 ohms?</li> </ul> <div style="text-align: center;">  <p>14290 HARNESS CONNECTOR</p> </div>	<p>Yes</p>	<p>REMOVE breakout box. RECONNECT processor. SERVICE open circuit. RERUN Engine Running Self-Test.</p>
<p><b>FD5</b> SERVICE CODE 75: CYCLE BOO CIRCUIT</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, leave processor disconnected.</li> <li>• DVOM on 20 volt scale.</li> <li>• Measure voltage between Test Pin 2 and Test Pin 40 at the breakout box while depressing and releasing the brake.</li> <li>• Does the voltage cycle?</li> </ul>	<p>Yes</p> <p>No</p>	<p>REMOVE breakout box. REPLACE processor. RERUN Quick Test.</p> <p>GO to <b>FD6</b>.</p>

**Pinpoint Test FD4 & FD5 - Brake On/Off (BOO)**

<b>Brake On/Off (BOO)</b>		<b>Pinpoint Test</b>	<b>FD</b>
<b>TEST STEP</b>		<b>RESULT</b>	<b>ACTION TO TAKE</b>
<b>FD6</b>	<b>CHECK BOO CIRCUIT FOR SHORT TO POWER</b>		
<ul style="list-style-type: none"> <li>• Key off.</li> <li>• Breakout box installed.</li> <li>• Processor disconnected.</li> <li>• DVOM on 20 volt scale.</li> <li>• Disconnect BOO circuit from 14290 harness (12 pin connector).</li> <li>• Measure voltage between Test Pin 2 at the breakout box and engine block ground.</li> <li>• Is voltage greater than 10.5 volts?</li> </ul>		<p>Yes</p> <p>No</p>	<p>REMOVE breakout box. RECONNECT processor. SERVICE short circuit. RERUN Engine Running Self-Test.</p> <p>BOO circuit OK.</p> <p>SERVICE stoplamp circuit.</p>

Pinpoint Test FD6 - Brake On/Off (BOO)

## Power Steering Pressure Switch (PSPS)

## Pinpoint Test

## FF

### Note

You should enter this Pinpoint Test only when a Service Code 52 is received in Quick Test Steps 3.0, 5.0 or if you are directed here from Diagnostic By Symptom in the Engine Supplement Section.

### Remember

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

- Idle speeds/throttle stop adjustment.
- Binding throttle shaft/linkage or speed control linkage.

This Pinpoint Test is intended to diagnose only the following:

- Power steering pressure switch.
- Switch harness circuits: PSPS SIGNAL, and SIGNAL RETURN.
- Processor assembly.

### Pinpoint Test Schematic

(TEST PIN 23 FOR 2.5L CFI)

\*TEST PIN 24 

TEST PIN 46 

— PSPS CKT. —







— SIG. RTN. —



POWER STEERING  
PRESSURE SWITCH  
VEHICLE HARNESS  
CONNECTOR

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

Pinpoint Test FF - Power Steering Pressure Switch (PSPS)

<b>Power Steering Pressure Switch (PSPS)</b>		<b>Pinpoint Test</b>	<b>FF</b>
<b>TEST STEP</b>		<b>RESULT</b>	<b>ACTION TO TAKE</b>
<b>FF1</b>	<b>ATTEMPT TO ELIMINATE CODE 52</b>		
<ul style="list-style-type: none"> <li>• Key off, wait 10 seconds.</li> <li>• Disconnect PSPS.</li> <li>• Jumper PSPS circuit to SIGNAL RETURN at vehicle harness connector.</li> <li>• Rerun Key On Engine Off Self-Test.</li> <li>• Is Code 52 still present?</li> </ul>		Yes  No 	GO to <b>FF2</b> .  REPLACE PSPS. RERUN Quick Test.
<b>FF2</b>	<b>PSPS HARNESS CHECK</b>		
<ul style="list-style-type: none"> <li>• Key off, wait 10 seconds.</li> <li>• PSPS disconnected.</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 Test Pin 46 at the breakout box and SIGNAL RETURN at the PSPS vehicle harness connector.</li> <li>• Measure resistance between Test Pin 24 (Test Pin 23 for 2.5L CFI) at the breakout box and PSPS circuit at the PSPS vehicle harness connector.</li> <li>• Are both readings less than 5 ohms?</li> </ul>		Yes  No 	REMOVE breakout box. RECONNECT all components. REPLACE processor. RERUN Quick Test.  REMOVE breakout box. RECONNECT all components. SERVICE open circuit. RERUN Quick Test.
<b>FF3</b>	<b>SWITCH INTEGRITY</b>		
<ul style="list-style-type: none"> <li>• Install tachometer.</li> <li>• Start engine, allow to idle in NEUTRAL/PARK.</li> <li>• Disconnect PSPS at switch.</li> <li>• Does rpm increase?</li> </ul>		Yes  No 	REPLACE PSPS.  GO to <b>FF4</b> .

Pinpoint Test FF1 Thru FF3 - Power Steering Pressure Switch (PSPS)

Power Steering Pressure Switch (PSPS)		Pinpoint Test	FF
TEST STEP		RESULT	ACTION TO TAKE
<b>FF4</b>	<b>PSPS HARNESS CHECK</b>		
<ul style="list-style-type: none"> <li>• Key off, wait 10 seconds.</li> <li>• PSPS disconnected.</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 24 (Test Pin 23 for 2.5L CFI) and Test Pin 46 at the breakout box.</li> <li>• Is resistance less than 10,000 ohms?</li> </ul>		Yes	REMOVE breakout box. RECONNECT all components. SERVICE short in harness. RERUN Quick Test.
		No	REMOVE breakout box. RECONNECT all components. REPLACE processor. RERUN Quick Test.
<b>FF5</b>	<b>SERVICE CODE 52 ENGINE RUNNING SELF-TEST</b>		
<ul style="list-style-type: none"> <li>• Did you turn the steering wheel at least one-half turn within 1 to 2 seconds after engine ID code?</li> </ul> <p><b>NOTE: Make sure the front wheels are centered (no load condition).</b></p>		Yes	GO to <b>FF6</b> .
		No	RERUN Quick Test.
<b>FF6</b>	<b>DETERMINE WHETHER THE PROCESSOR CAN IDENTIFY AN OPEN CIRCUIT</b>		
<ul style="list-style-type: none"> <li>• Key off, wait 10 seconds.</li> <li>• Disconnect PSPS.</li> <li>• Run Key On Engine Off Self-Test.</li> <li>• Is Code 52 present?</li> </ul>		Yes	GO to <b>FF8</b> .
		No	GO to <b>FF7</b> .
<b>FF7</b>	<b>PSPS HARNESS CHECK</b>		
<ul style="list-style-type: none"> <li>• Key off, wait 10 seconds.</li> <li>• PSPS disconnected.</li> <li>• Disconnect processor 60 pin connector. Inspect for damaged pins, corrosion or 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 46 and Test Pin 24 (Test Pin 23 for 2.5L CFI) at the breakout box.</li> <li>• Is resistance 10,000 ohms or less?</li> </ul>		Yes	REMOVE breakout box. RECONNECT all components. SERVICE short circuit. RERUN Quick Test.
		No	REMOVE breakout box. RECONNECT all components. REPLACE processor. RERUN Quick Test.

Pinpoint Test FF4 Thru FF7 - Power Steering Pressure Switch (PSPS)

## Power Steering Pressure Switch (PSPS)

## Pinpoint Test

## FF

TEST STEP		RESULT	ACTION TO TAKE
<b>FF8</b>	PSPS POSITION KEY ON ENGINE OFF VS. RUNNING		
<ul style="list-style-type: none"> <li>• Key off, wait 10 seconds.</li> <li>• Connect PSPS.</li> <li>• Disconnect processor 60 pin connector. Inspect for damaged pins, corrosion, loose wires, etc. Service as necessary.</li> <li>• Processor connected.</li> <li>• Install breakout box, connect processor to breakout box.</li> <li>• DVOM on 200 ohm scale.</li> <li>• Key on.</li> <li>• Measure resistance between Test Pin 24 (Test Pin 23 for 2.5L CFI) and Test Pin 46 at the breakout box.</li> <li>• Start engine.</li> <li>• Does resistance remain less than 10 ohms between key on, engine off and engine running?</li> </ul>		Yes ▶  No ▶	GO to <b>FF9</b> .  GO to <b>FF11</b> .
<b>FF9</b>	PSPS POSITION ENGINE RUNNING NO LOAD VS. LOAD		
<ul style="list-style-type: none"> <li>• Engine idling.</li> <li>• Breakout box installed.</li> <li>• Processor connected.</li> <li>• PSPS connected.</li> <li>• DVOM on 200 ohm scale.</li> <li>• Measure the resistance between Test Pin 24 (Test Pin 23 for 2.5L CFI) and Test Pin 46 at the breakout box.</li> <li>• Turn the steering wheel at least one-half turn then return.</li> <li>• Does resistance change from less than 10 ohms to infinity (indicating PSPS opening), then returning to 10 ohms or less when steering wheel is returned to center position?</li> </ul>		Yes ▶  No ▶	PSPS system OK, REMOVE breakout box and RETURN to Quick Test Step 5.0 to continue Diagnostics.  GO to <b>FF10</b> .

### Pinpoint Test FF8 & FF9 - Power Steering Pressure Switch (PSPS)

<b>Power Steering Pressure Switch (PSPS)</b>		<b>Pinpoint Test</b>	<b>FF</b>
<b>TEST STEP</b>		<b>RESULT</b>	<b>ACTION TO TAKE</b>
<b>FF10</b>	<b>PSPS ALWAYS CLOSED VS. POWER STEERING HYDRAULIC PRESSURE WITH ENGINE RUNNING</b>		
<ul style="list-style-type: none"> <li>• At this point in the Diagnostics there are only two possible causes for the original Code 52 Engine Running:               <ul style="list-style-type: none"> <li>— PSPS (switch) that will not open.</li> <li>— Low available hydraulic pressure.</li> </ul> </li> <li>• Key off, wait 10 seconds.</li> <li>• Substitute original PSPS with a known good PSPS.</li> <li>• Run Engine Running Self-Test. (Turn steering wheel at least one-half turn after engine ID code.)</li> <li>• Is Code 52 still present?</li> </ul>		<p>Yes ▶</p> <p>No ▶</p>	<p>GO to Power Steering Pressure Diagnostics</p> <p>Original Code 52 Engine Running was a result of a bad PSPS (switch). REMOVE all equipment and continue, if necessary, with any other Diagnostics.</p>
<b>FF11</b>	<b>PSPS ALWAYS OPEN VS. POWER STEERING HYDRAULIC PRESSURE WITH ENGINE RUNNING</b>		
<ul style="list-style-type: none"> <li>• At this point in the Diagnostics there are two possible causes for the original Code 52 Engine Running:               <ul style="list-style-type: none"> <li>— PSPS (switch) that always remains open during Engine Running.</li> <li>— Excessively high hydraulic pressure.</li> </ul> </li> <li>• Key Off, wait 10 seconds.</li> <li>• Substitute original PSPS with a known good PSPS.</li> <li>• Run Engine Running Self Test. (Turn steering wheel at least one-half turn after engine ID code.)</li> <li>• Is Code 52 still present?</li> </ul>		<p>Yes ▶</p> <p>No ▶</p>	<p>GO to Power Steering Pressure Diagnostics</p> <p>Original Code 52 Engine Running was a result of a bad PSPS (switch). REMOVE all equipment and continue, if necessary, with any other Diagnostics.</p>

Pinpoint Test FF10 &amp; FF11 - Power Steering Pressure Switch (PSPS)

**H - Fuel Pressure Specification Table**

**Fuel Control****Pinpoint  
Test****H****FUEL PRESSURE  
SPECIFICATION TABLE**

		<b>PASSENGER CAR ENGINES</b>										
		1.9L EFI	1.9L CFI	2.3L OHC EFI	2.3L TC EFI	2.3L HSC EFI	2.5L CFI	3.0L EFI	3.8L FWD EFI	3.8L RWD EFI	5.0L SEFI	5.0L MA SEFI
<b>ENGINE RUNNING</b>		30-45 PSI 210- 310 kPa	13-17 PSI 90- 120 kPa	30-45 PSI 210- 310 kPa	30-55 PSI 210- 345 kPa	45-60 PSI 310- 415 kPa	13-17 PSI 90- 120 kPa	30-45 PSI 210- 310 kPa	30-45 PSI 210- 310 kPa	30-45 PSI 210- 310 kPa	30-45 PSI 210- 310 kPa	30-45 PSI 210- 310 kPa
	<b>KEY ON ENGINE OFF</b>	35-45 PSI 240- 310 kPa	13-17 PSI 90- 120 kPa	35-45 PSI 240- 310 kPa	35-45 PSI 240- 310 kPa	50-60 PSI 345- 415 kPa	13-16 PSI 90- 110 kPa	35-45 PSI 240- 310 kPa	35-45 PSI 240- 310 kPa	35-45 PSI 240- 310 kPa	35-45 PSI 240- 310 kPa	35-45 PSI 240- 310 kPa
		<b>LIGHT TRUCK ENGINES</b>										
		2.3L EFI	2.9L EFI	3.0L EFI	4.9L EFI	5.0L EFI	5.8L EFI	7.5L EFI				
<b>ENGINE RUNNING</b>		30-45 PSI 210-310 kPa	30-45 PSI 210-310 kPa	30-45 PSI 210-310 kPa	45-60 PSI 310-415 kPa	30-45 PSI 210-310 kPa	30-45 PSI 210-310 kPa	30-45 PSI 210-310 kPa				
	<b>KEY ON ENGINE OFF</b>	35-45 PSI 240-310 kPa	35-45 PSI 240-310 kPa	35-45 PSI 240-310 kPa	50-60 PSI 345-415 kPa	35-45 PSI 240-310 kPa	35-45 PSI 240-310 kPa	35-45 PSI 240-310 kPa	35-45 PSI 240-310 kPa			

**Pinpoint Test H - Fuel Control**

**Fuel Control****Pinpoint  
Test****H****INJECTOR BANK RESISTANCE  
SPECIFICATION TABLE # 1**

<b>PASSENGER CAR ENGINES</b>										
<b>VALUES ARE IN OHMS</b>										
<b>1.9L EFI</b>	<b>1.9L CFI</b>	<b>2.3L OHC EFI</b>	<b>2.3L TC EFI</b>	<b>2.3L HSC EFI</b>	<b>2.5L CFI</b>	<b>3.0L EFI</b>	<b>3.8L FWD EFI</b>	<b>3.8L RWD EFI</b>	<b>5.0L SEFI</b>	<b>5.0L MA SEFI</b>
1.2 TO 1.8	1.0 TO 2.0	7.0 TO 9.5	1.2 TO 1.8	7.0 TO 9.5	1.0 TO 2.0	5.0 TO 6.5	4.0 TO 6.0	4.0 TO 6.0	13.5 TO 19.0	1.5 TO 19.0

<b>LIGHT TRUCK ENGINES</b>						
<b>VALUES ARE IN OHMS</b>						
<b>2.3L EFI</b>	<b>2.9L EFI</b>	<b>3.0L EFI</b>	<b>4.9L EFI</b>	<b>5.0L EFI</b>	<b>5.8L EFI</b>	<b>7.5L EFI</b>
7.0 TO 9.5	5.0 TO 6.5	5.0 TO 6.5	5.0 TO 6.5	3.5 TO 5.0	2.5 TO 5.0	2.5 TO 5.0

**Pinpoint Test H - Fuel Control**

**Fuel Control****Pinpoint  
Test****H****Note**

You should enter this Pinpoint Test only when a Service Code 41, 91 or 42, 92 or 43, 65, 85, 86 is received in Quick Test Step 5.0 or 6.0 or when directed here from Pinpoint Test S or Diagnostic By Symptom in the Engine Supplement Section.

**Remember**

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

- Ignition Coil
- Distributor Cap
- Distributor Rotor
- Fouled Spark Plugs
- Spark Plug Wires
- CANP Problems
- PCV Valves (see note below)
- EGR Valve and Gasket
- Air Filter
- Fuel Contamination, Engine Oil
- Poor Power Ground
- Fuel Pressure
- Manifold Leaks, Intake/Exhaust
- Engine Not at Normal Operating Temperatures

This Pinpoint Test is intended to diagnose only the following:

- HEGO Sensor
- HEGO Signal and Ground Circuit
- HEGO Sensor Connection
- Vacuum Systems
- Fuel Injector
- Processor Assembly
- Harness Circuits HEGO GRD, HEGO, INJ. 1-B, and VPWR

**NOTE:** Fuel contaminated engine oil may affect 41, 91 and 42, 92 Service Codes, so if it is suspected, remove the PCV from the valve cover, and rerun Quick Test. If the problem is corrected, then change the engine oil and filter.

**Pinpoint Test H - Fuel Control**

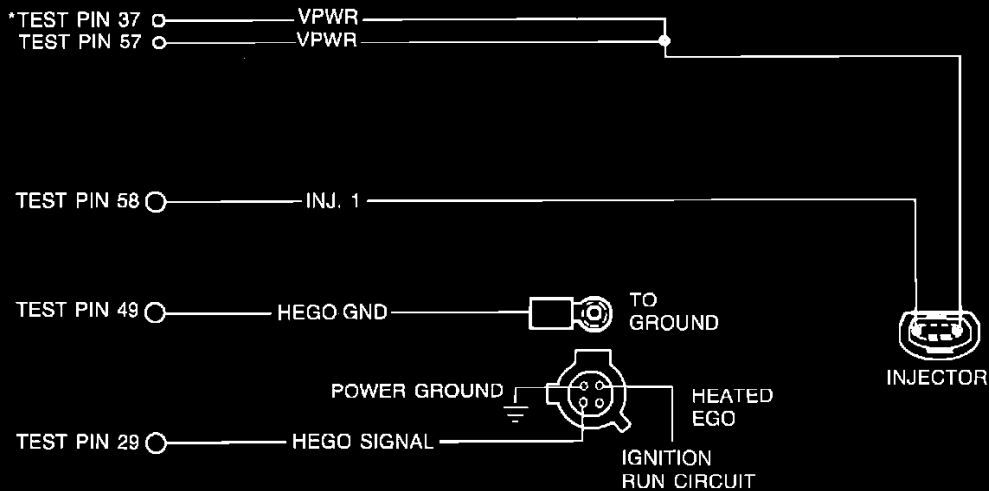
**Fuel Control**

**Pinpoint Test**

**H**

**Pinpoint Test Schematic**

All CFI



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

Pinpoint Test H - Fuel Control

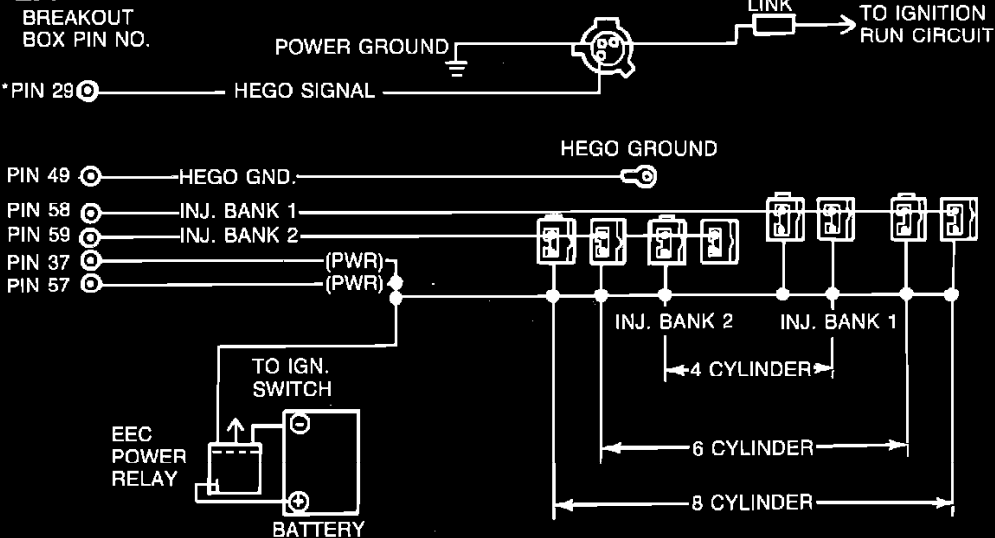
# Fuel Control

# Pinpoint Test

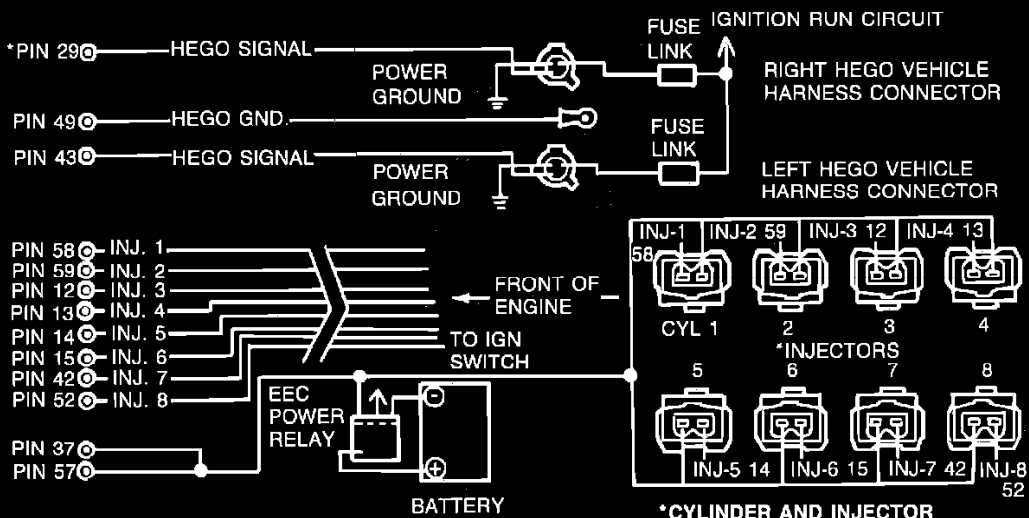
# H

## Pinpoint Test Schematic

### All EFI



### 5.0L SEFI and 5.0 SEFI Mass Air



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

\*CYLINDER AND INJECTOR LOCATIONS ARE THE SAME  
IE CYL. = INJ. = ETC

Fuel Control		Pinpoint Test	H
TEST STEP		RESULT	ACTION TO TAKE
<b>H1</b>	<b>CHECK FUEL PRESSURE</b>		
<ul style="list-style-type: none"> <li>• Key off, wait 10 seconds.</li> <li>• Install fuel pressure gauge.</li> <li>• Verify that manifold vacuum is connected to the fuel pressure regulator if applicable.</li> <li>• Start and run engine at idle.</li> <li>• Refer to Fuel Pressure Specification Table.</li> <li>• Is fuel pressure within specification for the engine being tested?</li> </ul> <p><b>FOR NO STARTS:</b></p> <ul style="list-style-type: none"> <li>• If engine will not run, cycle the key off to on several times.</li> <li>• Refer to Fuel Pressure Specification Table.</li> <li>• Is fuel pressure within specification for the engine being tested?</li> </ul>		Yes ▶ No ▶	GO to <b>H2</b> . REMOVE fuel pressure gauge.
<b>H2</b>	<b>CHECK SYSTEM'S ABILITY TO HOLD FUEL PRESSURE</b>		
<ul style="list-style-type: none"> <li>• Key on, engine off.</li> <li>• Does fuel pressure remain at specification for 60 seconds?</li> </ul>		Yes ▶ No ▶	GO to <b>H3</b> . For 5.0L SEFI GO to <b>H9</b> . All others GO to <b>H6</b> .
<b>H3</b>	<b>FUEL DELIVERY TEST</b>		
<p><b>NOTE: Verify fuel quality; air and/or water will also pressurize and look like acceptable fuel delivery.</b></p> <ul style="list-style-type: none"> <li>• Key off.</li> <li>• Fuel pressure gauge installed.</li> <li>• Pressurize fuel system per step <b>H1</b> .</li> <li>• Locate and disconnect the inertia switch.</li> <li>• Crank engine for 5 seconds.</li> <li>• Does pressure drop greater than 5 psi. (34 kPa.) by the end of the 5 second crank cycle?</li> </ul>		Yes ▶ No ▶	The EEC-IV system is not the cause of the No Start. REMOVE the fuel pressure gauge. RECONNECT the inertia switch. If the complaint was runs rough, misses or a fuel service code GO to <b>H4</b> . For 5.0L SEFI GO to <b>H9</b> . REMOVE fuel pressure gauge. RECONNECT inertia switch. GO to <b>H4</b> .

Pinpoint Test H1 Thru H3 - Fuel Control

Fuel Control		Pinpoint Test	H
TEST STEP		RESULT	ACTION TO TAKE
<b>H4</b>	CHECK RESISTANCE OF INJECTOR(S) AND HARNESS		
<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, leave processor disconnected.</li> <li>• DVOM on 200 ohm scale.</li> </ul> <p><b>For EFI:</b></p> <ul style="list-style-type: none"> <li>— Measure resistance of INJECTOR BANK 1 between Test Pin 37 and Test Pin 58 at the breakout box. Record resistance.</li> <li>— Measure resistance of INJECTOR BANK 2 between Test Pin 37 and Test Pin 59 at the breakout box. Record resistance.</li> </ul> <p><b>For SEFI:</b></p> <ul style="list-style-type: none"> <li>— From cylinder balance test: Measure resistance between the suspect INJECTOR circuit Test Pin and Test Pin 37 at the breakout box. Record resistance.</li> <li>— For No Starts: Pick any injector and measure resistance between that INJECTOR circuit's Test Pin and Test Pin 37 at the breakout box. Record resistance.</li> </ul> <p><b>For CFI:</b></p> <ul style="list-style-type: none"> <li>— Measure resistance of INJECTOR circuit between Test Pin 37 and Test Pin 58 at the breakout box. Record resistance.</li> </ul> <ul style="list-style-type: none"> <li>• Refer to Injector Resistance Specification Table #1.</li> <li>• Is/are resistance(s) within specification for the appropriate engine?</li> </ul>		<p>Yes</p> <p>No</p>	<p>GO to <b>H6</b> .</p> <p><b>For EFI</b> GO to <b>H5</b> .</p> <p><b>For SEFI:</b> REMOVE breakout box. RECONNECT processor. SERVICE open or short in harness/connector of suspect injector. If OK, REPLACE injector RERUN Quick Test and Cylinder Balance Test.</p> <p>For No Start: SERVICE open in VPWR circuit.</p> <p><b>For CFI:</b> REMOVE breakout box. RECONNECT processor. SERVICE open or short in harness/connector If OK, REPLACE injector RERUN Quick Test.</p>

## Pinpoint Test H4 - Fuel Control

**Fuel Control****Pinpoint  
Test****H****SINGLE INJECTOR RESISTANCE  
SPECIFICATION TABLE #2**

PASSENGER CAR ENGINES								
VALUES ARE IN OHMS								
1.9L EFI	1.9L CFI	2.3L OHC EFI	2.3L TC EFI	2.3L HSC EFI	2.5L CFI	3.0L EFI	3.8L FWD EFI	3.8L RWD EFI
2.0 TO 2.7	1.0 TO 2.0	15.0 TO 19.0	2.0 TO 3.0	13.5 TO 16.0	1.0 TO 2.0	15.0 TO 18.0	13.5 TO 16.0	13.5 TO 16.0

LIGHT TRUCK ENGINES						
VALUES ARE IN OHMS						
2.3L EFI	2.9L EFI	3.0L EFI	4.9L EFI	5.0L EFI	5.8L EFI	7.5L EFI
13.5 TO 18.0	13.5 TO 18.0	15.0 TO 18.0	13.5 TO 18.0	13.5 TO 18.0	13.5 TO 18.0	13.5 TO 19.0

TEST STEP	RESULT	ACTION TO TAKE
<b>H5</b> ISOLATE FAULTY INJECTOR CIRCUIT		
<ul style="list-style-type: none"> <li>• Key off.</li> <li>• Breakout box installed, processor disconnected.</li> <li>• Disconnect all injectors on suspect bank.</li> <li>• DVOM on 200 ohm scale.</li> <li>• Connect one injector and measure resistance between Test Pin 37 and either Test Pin 58 or 59 as appropriate.</li> <li>• Disconnect that injector and repeat process for each of the remaining injectors.</li> <li>• Refer to Injector Resistance Specification Table #2.</li> <li>• Is/are resistance(s) within specification for the appropriate engine?</li> </ul>	<p>Yes</p> <p>No</p>	<p>▶ GO to <b>H6</b> .</p> <p>▶ REMOVE breakout box. RECONNECT processor and injectors. SERVICE open/short circuit in injector harness. If OK REPLACE injector. RERUN Quick Test.</p>

**Pinpoint Test H5 - Fuel Control**

Fuel Control		Pinpoint Test	H
TEST STEP		RESULT	ACTION TO TAKE
<b>H6</b>	<b>CHECK INJECTOR DRIVER SIGNAL</b>		
<p>Requires standard non-powered 12 volt test lamp.</p> <ul style="list-style-type: none"> <li>• Key off.</li> <li>• Breakout box installed.</li> <li>• Connect processor to breakout box.</li> </ul> <p><b>For EFI:</b></p> <ul style="list-style-type: none"> <li>— Connect test lamp between Test Pin 37 and Test Pin 58 at the breakout box.</li> <li>— Connect test lamp between Test Pin 37 and 59 at the breakout box.</li> </ul> <p><b>For SEFI:</b></p> <ul style="list-style-type: none"> <li>— Connect test lamp between Test Pin 37 and the suspect injectors Test Pin at the breakout box.</li> </ul> <p><b>For CFI:</b></p> <ul style="list-style-type: none"> <li>— Connect test lamp between Test Pin 37 and Test Pin 58 at the breakout box.</li> </ul> <ul style="list-style-type: none"> <li>• Crank or start engine.</li> <li>• Is glow on lamp dim?</li> </ul> <p><b>NOTE: Properly operating systems will show a dim glow on the lamp.</b></p>		<p><b>Yes</b></p> <p>▶</p> <p><b>No</b></p> <p>▶</p>	<p><b>For 5.0L SEFI:</b> REMOVE breakout box. RECONNECT processor.</p> <p>After any servicing, RERUN Quick Test and Cylinder Balance Test.</p> <p>For all other engines: GO To <b>[H7]</b>.</p> <p><b>NO LIGHT:</b></p> <p>VERIFY 12 volt battery at Test Pins 37 and 57.</p> <p><b>BRIGHT LIGHT:</b></p> <p>CHECK injector circuit for shorts to ground.</p> <p>If OK, REMOVE breakout box. REPLACE processor RERUN Quick Test.</p>

Pinpoint Test H6 - Fuel Control

**Fuel Control****Pinpoint  
Test****H**

TEST STEP		RESULT	ACTION TO TAKE
<b>H7</b>	<b>CHECK EXTERNAL SOURCE FOR FUEL PRESSURE PROBLEM</b>		
<ul style="list-style-type: none"> <li>• Key off.</li> <li>• Pressurize fuel system per Test Step <b>H1</b>.</li> <li><b>For EFI:</b> <ul style="list-style-type: none"> <li>— Visually look for fuel leaking at fuel injector O-rings, fuel pressure regulator, and fuel rails.</li> </ul> </li> <li><b>For CFI:</b> <ul style="list-style-type: none"> <li>— Remove air inlet tube at the fuel charging assembly.</li> <li>— Visually look for fuel leaking at the air horn inlet, fuel injector O-ring, fuel pressure regulator and fuel line to fuel charging assembly.</li> </ul> </li> <li>• Is there a visible leak?</li> </ul>		<p>Yes</p> <p>▶</p>	<p>REMOVE pressure gauge. SERVICE as necessary.</p> <p>After servicing leak, RERUN Quick Test.</p>
		<p>No</p> <p>▶</p>	<p><b>For EFI:</b> GO to <b>H8</b>.</p> <p><b>For CFI:</b> REMOVE pressure gauge. Fuel delivery system is OK. Problem is in an area common to all cylinders, i.e. air/vacuum leak, fuel contamination, EGR, etc.</p>
<b>H8</b>	<b>INJECTOR BALANCE TEST</b>		
<ul style="list-style-type: none"> <li>• Connect tachometer to engine. Run engine at idle.</li> <li>• Disconnect and reconnect the injectors one at a time: Note rpm drop for each injector.</li> <li>• Does each injector produce at least a 100 rpm momentary drop?</li> </ul> <p><b>NOTE: ISC will attempt to re-establish rpm.</b></p>		<p>Yes</p> <p>▶</p>	<p>Fuel delivery OK. Problem is in an area common to all cylinders i.e. air/vacuum leak, fuel contamination, EGR etc.</p>
		<p>No</p> <p>▶</p>	<p>GO to injector testing and cleaning instructions. After any servicing, RERUN Quick Test.</p>

**Pinpoint Test H7 & H8 - Fuel Control**

**Fuel Control****Pinpoint  
Test****H**

TEST STEP		RESULT	ACTION TO TAKE
<b>H9</b>	CYLINDER BALANCE TEST: SEFI ENGINES ONLY		
<ul style="list-style-type: none"> <li>• Run the Engine Running Self-Test.</li> <li>• After the last repeated code, wait 5-10 seconds.</li> <li>• "Goose" throttle very lightly (not wide-open-throttle).</li> <li>• Time of test is approximately 90 seconds.</li> <li>• Use table below to interpret codes received from cylinder balance test.</li> <li>• Is Code 90 present?</li> </ul> <p>Refer to appendix in the Quick Test Section for detailed information about cylinder balance test.</p>		Yes	GO to <b>H10</b> .
		No	GO to <b>H4</b> .

The Cylinder Balance Test switches each injector OFF and ON one at a time. Service codes correspond to the cylinder number, e.g. Service Code 30 indicates a problem with cylinder No. 3. The Cylinder Balance Test is designed to aid in the detection of a non-contributing cylinder. The cylinder balance Pinpoint Test Steps H9 and H10 are designed to isolate only EEC-IV related problems.

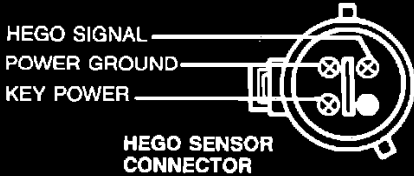
SERVICE CODE	90	10	20	30	40	50	60	70	80	77*
CYLINDER/INJECTOR NUMBER	PASS	1	2	3	4	5	6	7	8	RERUN TEST
BREAKOUT BOX PIN NUMBER		58	59	12	13	14	15	42	52	

\* If throttle is touched (moved) during Cylinder Balance Test, Service Code 77 will appear, indicating test was not completed.

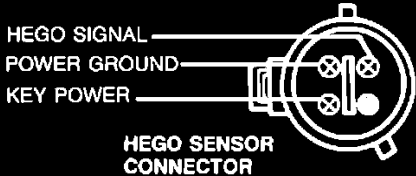
**Pinpoint Test H9 - Fuel Control**

Fuel Control		Pinpoint Test	H
TEST STEP		RESULT	ACTION TO TAKE
H10	PERFORM 2ND/3RD LEVEL CYLINDER BALANCE TEST		
<p><b>NOTE: A Cylinder Balance Test Service Code 90 received in the first test level indicates that the injector harness is not open or shorted and the processor is sending a drive signal to all injectors. The 2nd/3rd level Cylinder Balance Test is intended to aid in the detection of any partially contributing injectors.</b></p> <ul style="list-style-type: none"> <li>• Within 2 minutes after the previous Cylinder Balance Test, lightly depress and release the throttle to enter 2nd/3rd level Cylinder Balance Test.</li> <li>• Is Code 90 present in all levels?</li> </ul>		Yes	<p>For 5.0L SEFI Mass Air vehicles with Service Code 41/91 GO to <b>H11</b> . For Service Code 42/92 GO to <b>H23</b> .</p> <p>For all other SEFI vehicles GO to Diagnostic by Symptom</p>
		No	GO to <b>H4</b> .
H11	SERVICE CODE 41/91: FUEL CONTROL ALWAYS LEAN		
<p><b>NOTE: For 5.0L SEFI and 5.0L SEFI Mass Air Code 41 refers to right HEGO; Code 91 refers to left HEGO.</b></p> <ul style="list-style-type: none"> <li>• Run engine at 2000 rpm for 2 minutes.</li> <li>• Key off, wait 10 seconds.</li> <li>• Rerun Engine Running Self-Test.</li> <li>• Is Code 41/91 present?</li> </ul>		Yes	<p><b>For engines with:</b></p> <ul style="list-style-type: none"> <li>— MAP sensors GO to <b>H12</b> .</li> <li>— Vane Air Meters GO to <b>H13</b> .</li> <li>— Mass Air Meters GO to <b>H14</b> .</li> </ul>
		No	GO to <b>H20</b> .

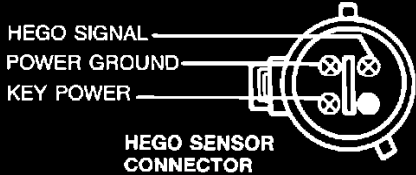
## Pinpoint Test H10 &amp; H11 - Fuel Control

Fuel Control		Pinpoint Test	H
TEST STEP		RESULT	ACTION TO TAKE
<b>H12</b>	CHECK HEGO SENSOR ON ENGINES WITH MAP SENSORS		
<p><b>NOTE:</b> Vacuum/air leaks in non-EEC-IV areas could also cause Code 41/91. Check for:</p> <ul style="list-style-type: none"> <li>— Leaking vacuum actuator (e.g. A/C control motor)</li> <li>— Engine sealing</li> <li>— EGR system</li> <li>— PCV system</li> <li>— Lead contaminated HEGO sensor</li> </ul> <ul style="list-style-type: none"> <li>• Key off.</li> <li>• Disconnect appropriate HEGO sensor from vehicle harness.</li> <li>• Connect DVOM to HEGO SIGNAL at the sensor and battery negative post.</li> <li>• Disconnect and plug vacuum line at MAP sensor.</li> <li>• DVOM on 20 volt scale.</li> <li>• Apply 10-14 in. Hg. (33-46 kPa) to MAP sensor.</li> <li>• Start engine.</li> <li>• Does the DVOM indicate greater than 0.5 volts within 1 minute?</li> </ul>		<p>Yes</p> <p>No</p>	<p>GO to <b>H15</b>.</p> <p>RECONNECT MAP sensor vacuum line. REPLACE HEGO sensor. RERUN Quick Test.</p>
 <p>HEGO SIGNAL</p> <p>POWER GROUND</p> <p>KEY POWER</p> <p>HEGO SENSOR CONNECTOR</p>			

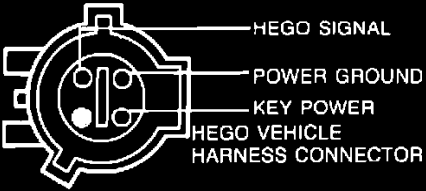
Pinpoint Test H12 - Fuel Control

Fuel Control		Pinpoint Test	H
TEST STEP		RESULT	ACTION TO TAKE
<b>H13</b>	CHECK HEGO SENSOR ON ENGINES WITH VANE AIR METER		
<p><b>NOTE:</b> Vacuum/air leaks in non-EEC-IV areas could also cause Code 41. Check for:</p> <ul style="list-style-type: none"> <li>— Leaking vacuum actuator (e.g. A/C control motor)</li> <li>— Engine sealing</li> <li>— EGR system</li> <li>— PCV system</li> <li>— Lead contaminated HEGO sensor</li> <li>— Unmetered air leak between Air Meter and throttle body</li> </ul> <ul style="list-style-type: none"> <li>• Key off.</li> <li>• Disconnect HEGO sensor from vehicle harness</li> <li>• Remove air cleaner to gain access to air meter inlet. Using a standard wood lead pencil, prop the air meter door partway open.</li> <li>• Connect DVOM to HEGO SIGNAL at the sensor and battery negative post.</li> <li>• DVOM on 20 volt scale.</li> <li>• Start the engine and run at approximately 2000 rpm for 2 minutes.</li> <li>• Does the DVOM indicate greater than 0.5 volts within 1 minute?</li> </ul>		<p>Yes</p> <p>No</p>	<p>GO to <b>H15</b>.</p> <p>REMOVE pencil from Air Meter. REINSTALL air cleaner. REPLACE HEGO sensor. RERUN Quick Test.</p>
 <p>HEGO SIGNAL</p> <p>POWER GROUND</p> <p>KEY POWER</p> <p>HEGO SENSOR CONNECTOR</p>			

Pinpoint Test H13 - Fuel Control

Fuel Control		Pinpoint Test	H
TEST STEP		RESULT	ACTION TO TAKE
<b>H14</b>	CHECK HEGO SENSOR ON ENGINES WITH MASS AIR SENSOR		
<p><b>NOTE:</b> Vacuum/air leaks in non-EEC-IV areas could also cause Code 41/91. Check for:</p> <ul style="list-style-type: none"> <li>— Leaking vacuum actuator (e.g. A/C control motor)</li> <li>— Engine sealing</li> <li>— EGR system</li> <li>— PCV system</li> <li>— Unmetered air leak between Mass Air Flow sensor and throttle body</li> <li>— Lead contaminated HEGO sensor</li> </ul> <ul style="list-style-type: none"> <li>• Key off.</li> <li>• Disconnect appropriate HEGO sensor from vehicle harness.</li> <li>• Connect DVOM to HEGO SIGNAL at the sensor and battery negative post.</li> <li>• DVOM on 20 volt scale.</li> <li>• Rerun Engine Running Self-Test and monitor HEGO sensor voltage.</li> </ul> <p><b>NOTE:</b> The purpose of this test is to verify the HEGO sensor can generate greater than 0.5 volts during Engine Running Self-Test.</p> <ul style="list-style-type: none"> <li>• Is the voltage greater than 0.5 volts at the end of Self-Test?</li> </ul>		<p>Yes</p> <p>No</p>	<p>GO to <b>H15</b>.</p> <p>REPLACE HEGO sensor. RERUN Quick Test.</p>
 <p>HEGO SIGNAL</p> <p>POWER GROUND</p> <p>KEY POWER</p> <p>HEGO SENSOR CONNECTOR</p>			

CPinpoint Test H14 - Fuel Control

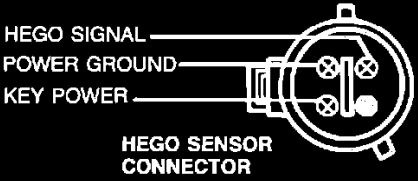
Fuel Control		Pinpoint Test	H
TEST STEP		RESULT	ACTION TO TAKE
<b>H15</b>	<b>CHECK CONTINUITY OF HEGO SIGNAL AND HEGO GROUND CIRCUITS</b>		
<ul style="list-style-type: none"> <li>• Key off.</li> <li>• Disconnect processor 60 pin connector. Inspect for damaged pins, corrosion, loose wires, etc. Service as necessary.</li> <li>• Install breakout box, leave processor disconnected.</li> <li>• HEGO disconnected.</li> <li>• DVOM on 200 ohm scale.</li> <li>• Measure resistance between Test Pin 49 at the breakout box and battery negative post.</li> <li>• Measure resistance between Test Pin 29 at the breakout box and HEGO SIGNAL at the vehicle harness connector.</li> <li>• For vehicles with dual HEGO, also measure resistance between Test Pin 43 at the breakout box and HEGO SIGNAL at the vehicle harness connector.</li> <li>• Are all resistances less than 5.0 ohms?</li> </ul>		<p>Yes</p> <p>No</p>	<p>GO to <b>H16</b> .</p> <p>REMOVE breakout box. RECONNECT processor, HEGO sensor, and any other components that are disconnected or removed. SERVICE open circuit. RERUN Quick Test.</p>
			
<b>H16</b>	<b>CHECK HEGO CIRCUIT FOR SHORT TO GROUND</b>		
<ul style="list-style-type: none"> <li>• Key off.</li> <li>• Breakout box installed, processor disconnected.</li> <li>• HEGO disconnected.</li> <li>• DVOM on 200,000 ohm scale.</li> <li>• Measure resistance between Test Pin 29 and Test Pin 40 at the breakout box.</li> <li>• For vehicles with dual HEGO also measure resistance between Test Pin 43 and Test Pin 40 at the breakout box.</li> <li>• Is resistance greater than 10,000 ohms?</li> </ul>		<p>Yes</p> <p>No</p>	<p>GO to <b>H17</b> .</p> <p>REMOVE breakout box. RECONNECT processor and HEGO sensor. SERVICE short circuit. RERUN Quick Test.</p>

Pinpoint Test H15 &amp; H16 - Fuel Control

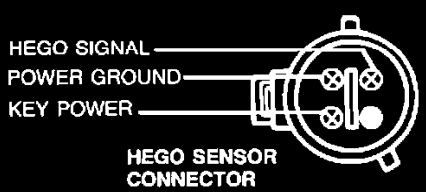
# Fuel Control

## Pinpoint Test

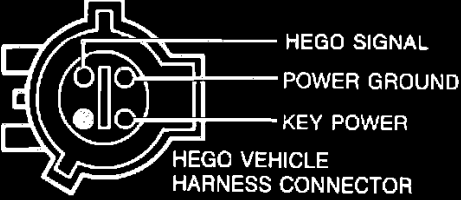
## H

TEST STEP		RESULT	ACTION TO TAKE
<b>H17</b>	<b>CHECK HEGO SENSOR FOR SHORT TO GROUND</b>		
<ul style="list-style-type: none"> <li>• Key off.</li> <li>• Breakout box installed, processor disconnected.</li> <li>• HEGO disconnected.</li> <li>• DVOM on 200,000 ohm scale.</li> <li>• Measure resistance between HEGO PWR GND and HEGO SIGNAL at the HEGO sensor connector.</li> <li>• Is resistance greater than 10,000 ohms?</li> </ul>  <p style="text-align: center;"><b>HEGO SENSOR CONNECTOR</b></p>		<p>Yes</p> <p>No</p>	<p><b>For engines with:</b></p> <ul style="list-style-type: none"> <li>— MAP sensor GO to <b>H18</b>.</li> <li>— Vane Air Meter GO to <b>H19</b>.</li> <li>— Mass Air Meter REMOVE breakout box. RECONNECT HEGO sensor. REPLACE processor. RERUN Quick Test.</li> </ul> <p>REMOVE breakout box. RECONNECT processor. REPLACE HEGO sensor. RERUN Quick Test.</p>
<b>H18</b>	<b>ATTEMPT TO ELIMINATE CODE 41 ON ENGINES WITH MAP SENSOR</b>		
<ul style="list-style-type: none"> <li>• Key off.</li> <li>• Breakout box installed.</li> <li>• MAP vacuum line disconnected and plugged.</li> <li>• Connect processor to breakout box.</li> <li>• Reconnect HEGO sensor.</li> <li>• Apply 10-14 in. Hg. (3-46 kPa) vacuum to MAP sensor.</li> <li>• Start engine and run at approximately 2000 rpm for 2 minutes. Allow engine to return to idle.</li> <li>• Rerun Engine Running Self-Test.</li> <li>• Is Code 41 still present?</li> </ul> <p><b>NOTE: Disregard other codes received at this time.</b></p>		<p>Yes</p> <p>No</p>	<p>REMOVE breakout box. RECONNECT MAP sensor vacuum line. REPLACE processor. RERUN Quick Test.</p> <p>REMOVE breakout box. RECONNECT processor and MAP sensor vacuum line. HEGO sensor input OK. GO to <b>H1</b>.</p>

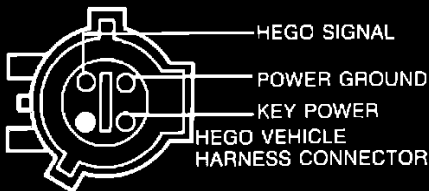
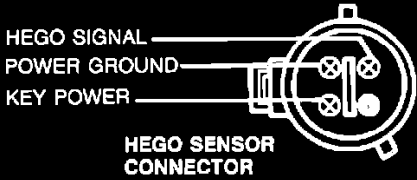
### Pinpoint Test H17 & H18 - Fuel Control

Fuel Control		Pinpoint Test	H
TEST STEP		RESULT	ACTION TO TAKE
<b>H19</b>	ATTEMPT TO ELIMINATE CODE 41 ON ENGINES WITH VANE AIR METER		
<ul style="list-style-type: none"> <li>• Key off.</li> <li>• Breakout box installed.</li> <li>• Connect processor to breakout box.</li> <li>• Reconnect HEGO sensor.</li> <li>• Air cleaner removed, pencil inserted in vane meter inlet.</li> <li>• Start engine and run at approximately 2000 rpm for 2 minutes.</li> <li>• Rerun Engine Running Self-Test.</li> <li>• Is Code 41 present?</li> </ul>		Yes	<ul style="list-style-type: none"> <li>▶ REMOVE breakout box.</li> <li>▶ REMOVE pencil from vane meter.</li> <li>▶ REINSTALL air cleaner.</li> <li>▶ REPLACE processor.</li> <li>▶ RERUN Quick Test.</li> </ul>
		No	<ul style="list-style-type: none"> <li>▶ REMOVE breakout box.</li> <li>▶ RECONNECT processor. HEGO input circuit OK. GO to <b>H1</b>.</li> </ul>
<b>H20</b>	CHECK RESISTANCE OF HEATER ELEMENT ON HEGO		
<ul style="list-style-type: none"> <li>• Key off.</li> <li>• Disconnect HEGO.</li> <li>• DVOM on 200 ohm scale.</li> <li>• Measure resistance between IGNITION RUN circuit and PWR GND circuit at HEGO sensor connector.</li> <li>• Hot to warm resistance specification is 5.0 to 20.0 ohms.</li> <li>• Is resistance within specification?</li> </ul> <p><b>NOTE: Room temperature resistance specification is 2.0 to 5.0 ohms.</b></p>		Yes	<ul style="list-style-type: none"> <li>▶ GO to <b>H21</b>.</li> </ul>
		No	<ul style="list-style-type: none"> <li>▶ REPLACE HEGO sensor. RERUN Quick Test.</li> </ul>
 <p>HEGO SIGNAL —</p> <p>POWER GROUND —</p> <p>KEY POWER —</p> <p><b>HEGO SENSOR CONNECTOR</b></p>			

Pinpoint Test H19 &amp; H20 - Fuel Control

Fuel Control		Pinpoint Test	H
TEST STEP		RESULT	ACTION TO TAKE
<b>H21</b>	CHECK FOR POWER AT HEGO HARNESS CONNECTOR		
<ul style="list-style-type: none"> <li>• Key on, engine off.</li> <li>• HEGO disconnected.</li> <li>• DVOM on 20 volt scale.</li> <li>• Measure voltage between IGNITION RUN circuit and PWR GND circuit at the HEGO vehicle harness connector.</li> <li>• Is voltage greater than 10.5 volts?</li> </ul>  <p>HEGO SIGNAL POWER GROUND KEY POWER HEGO VEHICLE HARNESS CONNECTOR</p>		<p>Yes</p> <p>No</p>	<p>RECONNECT HEGO sensor. HEGO sensor system OK. GO to <b>H1</b>.</p> <p>GO to <b>H22</b>.</p>
<b>H22</b>	CHECK CONTINUITY OF POWER GROUND CIRCUIT		
<ul style="list-style-type: none"> <li>• Key off, wait 10 seconds.</li> <li>• HEGO disconnected.</li> <li>• DVOM on 200 ohm scale.</li> <li>• Measure resistance between PWR GND circuit at the HEGO vehicle harness connector and battery negative post.</li> <li>• Is resistance less than 5.0 ohms?</li> </ul>		<p>Yes</p> <p>No</p>	<p>RECONNECT HEGO sensor. SERVICE open in IGNITION RUN circuit. RERUN Quick Test.</p> <p>RECONNECT HEGO sensor. SERVICE open in PWR GND circuit. RERUN Quick Test.</p>

Pinpoint Test H21 &amp; H22 - Fuel Control

Fuel Control		Pinpoint Test	H
TEST STEP		RESULT	ACTION TO TAKE
<b>H23</b>	<b>SERVICE CODE 42/92: FUEL CONTROL ALWAYS RICH: CHECK HEGO SIGNAL FOR SHORT TO POWER</b>		
<p><b>NOTE: For 5.0L SEFI and 5.0L SEFI Mass Air Code 42 refers to Right HEGO; Code 92 refers to Left HEGO.</b></p> <ul style="list-style-type: none"> <li>• Key off, wait 10 seconds.</li> <li>• Disconnect the appropriate HEGO sensor for Code 42/92.</li> <li>• DVOM on 20 volt scale.</li> <li>• Key on, engine off.</li> <li>• Measure voltage between HEGO SIGNAL and PWR GND at the HEGO vehicle harness connector.</li> <li>• Is voltage less than 0.5 volts?</li> </ul> 		<p>Yes</p> <p>No</p>	<p>GO to <b>H24</b>.</p> <p>RECONNECT HEGO sensor. SERVICE HEGO circuit short to power. RERUN Quick Test.</p>
<b>H24</b>	<b>CHECK HEGO SENSOR FOR SHORT TO IGNITION RUN CIRCUIT</b>		
<ul style="list-style-type: none"> <li>• Key off.</li> <li>• HEGO disconnected.</li> <li>• DVOM on 200,000 ohm scale.</li> <li>• Measure resistance between IGNITION RUN circuit and HEGO SIGNAL circuit at the HEGO sensor connector.</li> <li>• Is resistance greater than 10,000 ohms?</li> </ul> 		<p>Yes</p> <p>No</p>	<p>GO to <b>H25</b>.</p> <p>REPLACE HEGO sensor. RERUN Quick Test.</p>

Pinpoint Test H23 &amp; H24 - Fuel Control

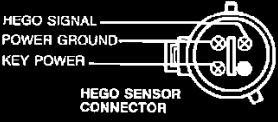
Fuel Control		Pinpoint Test	H
TEST STEP		RESULT	ACTION TO TAKE
<b>H25</b>	ATTEMPT TO GENERATE CODE 41/91		
<ul style="list-style-type: none"> <li>• Key off, wait 10 seconds.</li> </ul> <p><b>NOTE: Non-EEC areas could cause a Service Code 42/92. Check for:</b></p> <ul style="list-style-type: none"> <li>— Fuel contaminated engine oil</li> <li>— Ignition caused misfire (fouled spark plug)</li> <li>— CANP problems</li> </ul> <ul style="list-style-type: none"> <li>• HEGO disconnected.</li> <li>• Jumper HEGO SIGNAL circuit at the HEGO vehicle harness connector to battery negative post.</li> <li>• Rerun Engine Running Self-Test.</li> <li>• Is Code 41/91 present?</li> </ul>		<p>Yes</p> <p>No</p>	<p>REMOVE jumper. For engines with MAP sensor GO to <b>H26</b>. All others GO to <b>H28</b>.</p> <p>REMOVE jumper. RECONNECT HEGO sensor. DISCONNECT processor 60 pin connector. Inspect for damaged pins, corrosion, loose wires, etc. SERVICE as necessary. If OK REPLACE processor. RERUN Quick Test.</p>
<b>H26</b>	CHECK MAP SENSOR FOR VACUUM LEAK		
<p><b>NOTE: Due to the MAP sensor's large influence on fuel control, there is a possibility that a Code 42/92 could be a result of a MAP problem, even though a Code 22 is not present. Therefore the next two Test Steps will verify proper vacuum to the MAP sensor and its ability to hold vacuum.</b></p> <ul style="list-style-type: none"> <li>• Key off, wait 10 seconds.</li> <li>• Disconnect vacuum line from MAP sensor.</li> <li>• Connect a vacuum pump to the MAP sensor and apply 18 in. Hg. (60 kPa) 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>H27</b>.</p> <p>REMOVE vacuum pump. RECONNECT HEGO sensor. REPLACE MAP sensor. RERUN Quick Test.</p>

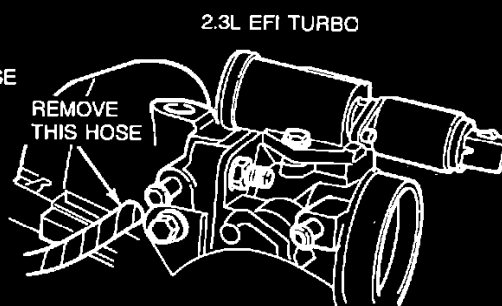
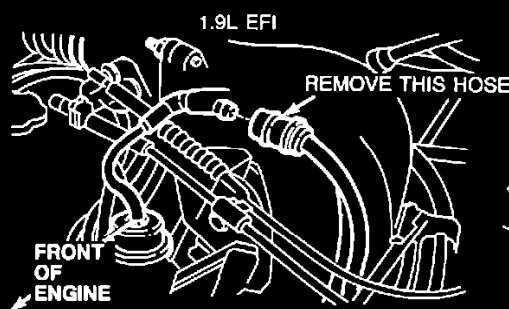
Pinpoint Test H25 &amp; H26 - Fuel Control

<b>Fuel Control</b>		<b>Pinpoint Test</b>	<b>H</b>
<b>TEST STEP</b>		<b>RESULT</b>	<b>ACTION TO TAKE</b>
<b>H27</b>	<b>CHECK FOR LOSS OF VACUUM TO MAP SENSOR</b>		
<ul style="list-style-type: none"> <li>• Tee a vacuum gauge into the manifold vacuum line at the MAP sensor.</li> <li>• Start the engine and let rpm stabilize. Note vacuum level.</li> <li>• Key off, wait 10 seconds.</li> <li>• REMOVE vacuum gauge and tee and reconnect vacuum line to MAP sensor.</li> <li>• Tee in vacuum gauge at a different source of intake manifold vacuum and restart the engine. Note vacuum level.</li> <li>• Does the vacuum level differ greater than 1 in. Hg.?</li> </ul>		<p>Yes ▶</p> <p>No ▶</p>	<p>REMOVE vacuum gauge and tee. RECONNECT HEGO sensor. INSPECT vacuum lines for leaks, holes, disconnections, kinks, blockages, and proper routing. SERVICE as necessary. RERUN Quick Test.</p> <p>GO to <b>H28</b> .</p>

## Pinpoint Test H27 - Fuel Control

**Fuel Control****Pinpoint  
Test****H**

TEST STEP		RESULT	ACTION TO TAKE
<b>H28</b>	<b>HEGO SENSOR CHECK</b>		
<ul style="list-style-type: none"> <li>• Key off, wait 10 seconds.</li> <li>• HEGO sensor disconnected.</li> <li>• Connect DVOM to HEGO SIGNAL at the HEGO sensor connector and to battery negative post.</li> <li>• DVOM on 20 volt scale.</li> <li>• Create a vacuum leak to cause HEGO sensor to go lean.</li> </ul> <p><b>For 1.9L EFI and 2.3L EFI TC:</b></p> <ul style="list-style-type: none"> <li>— Disconnect the manifold vacuum hose illustrated below.</li> </ul> <p><b>For 5.0L SEFI MASS AIR:</b></p> <ul style="list-style-type: none"> <li>— Disconnect any vacuum hose from the manifold vacuum tree.</li> </ul> <p><b>For all other applications:</b></p> <ul style="list-style-type: none"> <li>— Disconnect the PCV valve hose from the PCV valve.</li> </ul> <ul style="list-style-type: none"> <li>• Start engine and run at approximately 2000 rpm.</li> <li>• Does the DVOM indicate less than 0.4 volts within 30 seconds?</li> </ul>		<p>Yes</p> <p>No</p>	<p>▶ RECONNECT HEGO sensor and vacuum lines. HEGO sensor is OK. GO to <b>H1</b>.</p> <p>▶ RECONNECT vacuum hoses. REPLACE HEGO sensor. RERUN Quick Test.</p> 



Pinpoint Test H28 - Fuel Control

**Fuel Control****Pinpoint  
Test****H****H29** CONTINUOUS TESTING: CODE 41, OR 91

CODE 41/91 — Indicates that a HEGO circuit has not switched during closed loop fuel control.

**NOTE:** In this situation, Code 41/91 does not necessarily indicate a lean condition.

Before attempting to service a Continuous Memory Service Code 41 or 91, DIAGNOSE all other driveability complaints first. E.g., rough idle, misses, etc. in the EEC-IV Diagnostic By Symptom in the appropriate Engine Supplement Section.

**NOTE:** The Fuel Service Code may help to isolate the cause of the fuel control problem.

Some areas to check are:

- Unmetered Air (vacuum leaks/intake air leaks):
  - Canister purge system
  - PCV system
  - Engine sealing
  - Crimped fuel lines
  - Plugged fuel filter
  - Fouled fuel injectors
  - Air leaks between mass air flow sensor and air outlet tube to throttle body

- HEGO Fuel Fouled:

Whenever an over-rich fuel condition has been experienced (fuel fouled spark plugs), make a thorough check of the ignition system. If a HEGO sensor is suspected of being fuel fouled (low output or slow response), run the vehicle at sustained high speed (within legal limits) followed by a few hard accels. This will burn off the HEGO contamination and restore proper HEGO operation.

- Ignition System:

If engine is always in DEFAULT spark (base timing) refer to Quick Test Step **4.0**.

- Improper Fueling:

Lead fouled HEGO sensor.

- Fuel Pressure:

Perform Pinpoint Test Steps **H1** and **H2**.

- TP Sensor:

Turn key to RUN position. While moving throttle slowly toward wide-open position, measure voltage between Test Pins 47 and 46 at the breakout box. If the voltage does not increase with the increase of throttle opening, replace TP sensor or linkage as necessary.

- If at this point the driveability concern is still present, perform Pinpoint Test Steps **H3** through **H6**.

**Pinpoint Test H29 - Fuel Control**

**Fuel Control****Pinpoint  
Test****H****H30** | CONTINUOUS TESTING: CODE 41, 42, 43, 65, 85, OR 86

CODE 41 — HEGO indicated the fuel system was lean for more than 15 seconds when the fuel system should have been in closed loop fuel control.

CODE 42 — HEGO indicated the fuel system was rich for more than 15 seconds when the fuel system should have been in closed loop fuel control.

CODE 43 — HEGO indicated the fuel system was lean at WOT for more than 3 seconds.

CODE 65 — Never went to closed loop fuel control on HEGO switching.

CODE 85 — Adaptive fuel has corrected an excessive rich condition. (Adaptive fuel made the fuel system leaner.)

CODE 86 — Adaptive fuel has corrected an excessive lean condition. (Adaptive fuel made the fuel system richer.)

- Before attempting to service a Continuous Memory Service Code 41, 42, 43, 65, 85, or 86, DIAGNOSE all other drivability complaints first. Examples: rough idle, misses, etc. in the EEC-IV Diagnostic By Symptom in appropriate Engine Supplement Section.
- Whenever an over-rich fuel condition has been experienced (fuel fouled spark plugs), make a thorough check of the ignition system. If a HEGO sensor is suspected of being fuel fouled (low output or slow response), after the vehicle service, run the vehicle at sustained high speed (within legal limits) followed by a few hard accels. This will burn off the HEGO contamination and restore proper HEGO operation.
- The fuel Service Code may help to isolate the cause of the fuel control problem. Some areas to check are:

**Code 41:**

- Intermittant HEGO circuit (SIGNAL or GROUND).
- If Code 65 is also present, service faulty HEGO circuit (SIGNAL or GROUND).
- If Code 43 is also present, service Code 43 first.
- Airflow meter indicates low air flow. Check for vacuum leaks, intake air leaks, or a sticking air meter vane caused by contamination or frost.
- Low fuel pressure at WOT.
  - Low-pressure fuel pump.
  - Restricted fuel supply (crimped fuel lines or plugged fuel filter).
- Low fuel flow at WOT with correct fuel pressure.
  - Clogged fuel injectors.
  - Low battery (fuel injector voltage less than 11 volts).

**Pinpoint Test H30 - Fuel Control**

**Fuel Control****Pinpoint  
Test****H****H30** (CONTINUED)**CODE 42:**

- Intermittant HEGO circuit (SIGNAL or GROUND).
- Airflow indicated by the air meter is greater than the actual airflow (causing more fuel to be delivered than necessary). Check for high air meter voltage output due to a sticking air meter vane caused by contamination.
- Excessive fuel pressure. Check for fuel pressure regulator vacuum line disconnected or kinked fuel return line.
- Excessive fuel flow. Check for damaged or stuck open fuel injector(s).

**BOTH CODES 41 and 42:**

- Intermittant HEGO circuit (SIGNAL or GROUND).
- Sticking air meter vane due to contamination.
- Contaminated HEGO sensor (lead or silicone fouled).

**CODE 43:**

- Low fuel pressure at WOT.
  - Low pressure fuel pump.
  - Restricted fuel supply (crimped fuel lines or plugged filter).
- Low fuel flow at WOT with correct fuel pressure.
  - Clogged fuel injectors.
  - Low battery (fuel injector voltage less than 11 volts).

**CODE 65:**

- Check for faulty HEGO circuit (SIGNAL or GROUND).

**CODE 85:**

- If Code 42 is also present, service Code 42 first.
- Excessive fuel pressure. Check for fuel pressure regulator vacuum line disconnected or kinked fuel return line.
- Excessive fuel flow. Check for damaged fuel injector pintle or injectors stuck open.

**CODE 86:**

- If Code 41 is also present, service Code 41 first.
- Low fuel pressure
  - Low pressure fuel pump.
  - Restricted fuel supply (crimped fuel lines or plugged filter).
- Low fuel flow with correct fuel pressure
  - Clogged fuel injectors.
  - Low battery (fuel injector voltage less than 11 volts).

**Pinpoint Test H30 - Fuel Control**

**Fuel Pump Circuit****Pinpoint  
Test****J****Note**

You should enter this Pinpoint Test only when a Service Code 87, 95 or 96 is received in Quick Test Step 3.0 or 6.0 or you are directed here from Pinpoint Test Step A or Diagnostic By Symptom

**Remember**

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

- Fuel Lines
- Fuel Filters
- Throttle Body
- Contaminated Fuel
- Fuel Pump

This Pinpoint Test is intended to diagnose only the following:

- Fuel Pump Relay
- Inertia Switch
- Harness Circuits: V BATT., VPWR, F.P., GROUND and POWER-TO-PUMP(s)
- Processor Assembly

**Pinpoint Test J - Fuel Pump Circuit**

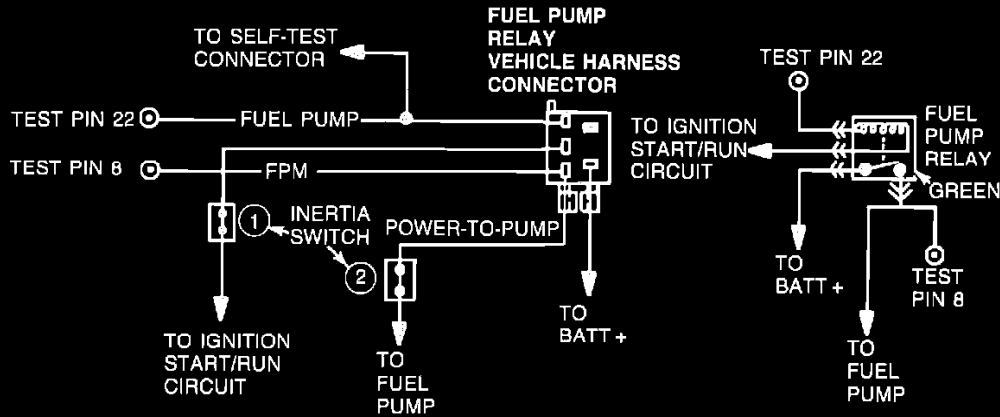
# Fuel Pump Circuit

# Pinpoint Test

# J

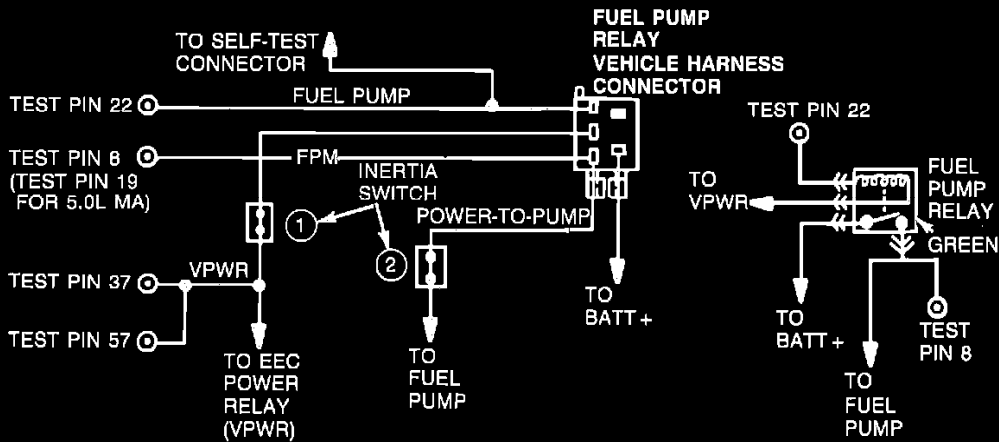
## Pinpoint Test Schematic

1.9L CFI, 1.9L EFI, 2.3L HSC



- ① INERTIA SWITCH LOCATION — PASSIVE RESTRAINT VEHICLES
- ② INERTIA SWITCH LOCATION — ACTIVE RESTRAINT VEHICLES

3.8L EFI RWD, 5.0L SEFI MA, 2.3L EFI TRUCK, 2.9L EFI TRUCK, 3.0L EFI TRUCK



- ① INERTIA SWITCH LOCATION — 3.8L EFI RWD, 5.0L SEFI MA
- ② INERTIA SWITCH LOCATION — ALL OTHERS

Pinpoint Test J - Fuel Pump Circuit

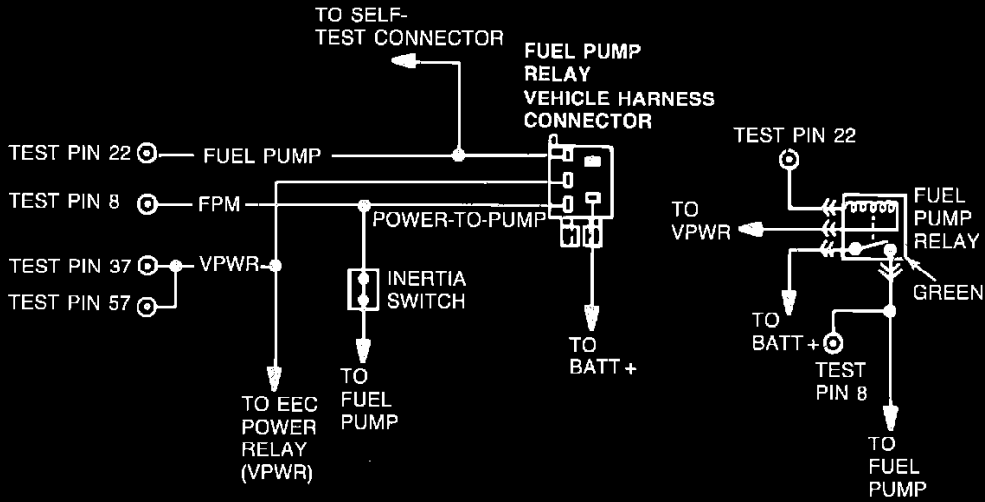
# Fuel Pump Circuit

# Pinpoint Test

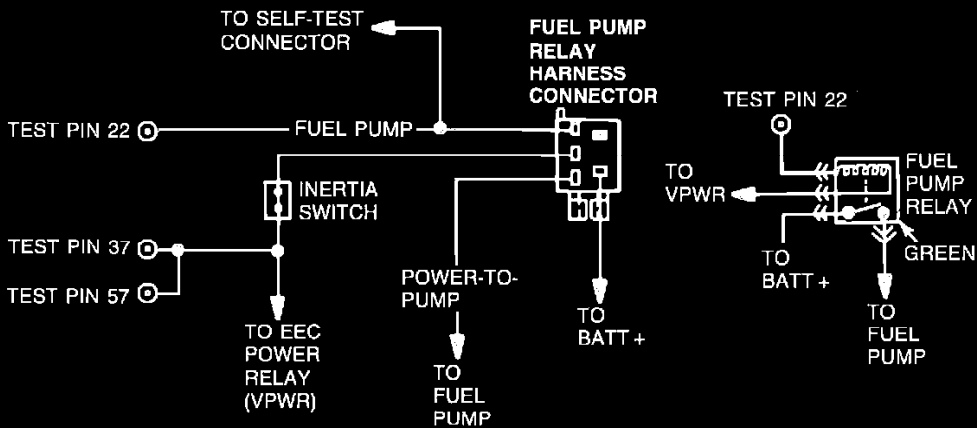
# J

## Pinpoint Test Schematic

4.9L EFI, 5.0L EFI, 5.8L EFI, 7.5L EFI, TRUCKS



2.3L OHC EFI CAR, 5.0L SEFI



Pinpoint Test J - Fuel Pump Circuit

<b>Fuel Pump Circuit</b>		<b>Pinpoint Test</b>	<b>J</b>
<b>TEST STEP</b>		<b>RESULT</b>	<b>ACTION TO TAKE</b>
<b>J1</b>	<b>NO FUEL PUMP PRESSURE: CHECK FOR FUEL PUMP ELECTRICAL OPERATION</b>		
<ul style="list-style-type: none"> <li>Fuel pressure gauge installed.</li> <li>To check if fuel pump runs, cycle key from Off to Run, repeat several times, (Do not enter start mode.) Fuel pump should run briefly each time the key enters Run.</li> </ul>		Yes ▶  No ▶	<b>Electric Fuel Pump</b>  GO to <b>J2</b> .
<b>J2</b>	<b>CHECK FOR VPWR TO PROCESSOR</b>		
<ul style="list-style-type: none"> <li>Key off, wait 10 seconds.</li> <li>Disconnect processor 60 pin connector. Inspect for damaged pins, corrosion, loose wires, etc. Service as necessary.</li> <li>Install breakout box and reconnect processor.</li> <li>Key on, engine off.</li> <li>DVOM on 20 volt scale.</li> <li>Measure voltage between Test Pin 37 and Test Pin 40 at the breakout box and between Test Pin 57 and Test Pin 60 at the breakout box.</li> <li>Are both voltages greater than 10.5 volts?</li> </ul>		Yes ▶  No ▶	GO to <b>J3</b> .  GO to <b>B1</b> .
<b>J3</b>	<b>CHECK RESISTANCE OF FUEL PUMP INERTIA SWITCH</b>		
<ul style="list-style-type: none"> <li>Key off, wait 10 seconds.</li> <li>Leave breakout box installed and processor connected.</li> <li>Locate and disconnect fuel pump inertia switch.</li> <li>DVOM on 200 ohm scale.</li> <li>Measure the resistance of the fuel pump inertia switch.</li> <li>Is resistance less than 5.0 ohms?</li> </ul>		Yes ▶  No ▶	RECONNECT inertia switch and GO to <b>J4</b> .  REPLACE or reset fuel pump inertia switch. RERUN Quick Test.

Pinpoint Test J1 Thru J3 - Fuel Pump Circuit

Fuel Pump Circuit		Pinpoint Test	J
TEST STEP		RESULT	ACTION TO TAKE
<b>J4</b>	CHECK FOR VOLTAGE TO POWER-TO-PUMP(S) CIRCUIT		
<ul style="list-style-type: none"> <li>• Key on, engine off.</li> <li>• Leave breakout box installed and processor connected.</li> <li>• Locate fuel pump relay.</li> <li>• DVOM on 20 volt scale.</li> <li>• Measure voltage between chassis ground and POWER-TO-PUMP(s) circuit at fuel pump relay during crank mode.</li> <li>• Is voltage greater than 8.0 volts during crank?</li> </ul>		Yes	Open in power-to-pump circuit, PWR fuel pump GND, open in pump, etc.
		No	GO to <b>J6</b> .
<b>J6</b>	CHECK FOR V BATT TO FUEL PUMP RELAY		
<ul style="list-style-type: none"> <li>• Key on, engine off.</li> <li>• Leave breakout box installed and processor connected.</li> <li>• Locate fuel pump relay.</li> <li>• DVOM on 20 volt scale.</li> <li>• Measure voltage between chassis ground and V Batt. at the fuel pump relay.</li> <li>• Is voltage greater than 10.5 volts?</li> </ul>		Yes	GO to <b>J7</b> .
		No	SERVICE open in V Batt. between fuel pump relay and vehicle battery positive post. RERUN Quick Test.
<b>J7</b>	CHECK FOR VPWR TO FUEL PUMP RELAY		
<ul style="list-style-type: none"> <li>• Key on, engine off.</li> <li>• Leave breakout box installed and processor connected.</li> <li>• Locate fuel pump relay.</li> <li>• DVOM on 20 volt scale.</li> <li>• Measure voltage between chassis ground and VPWR circuit (Ignition start/run circuit for 1.9L EFI, 1.9L CFI and 2.3L HSC) at the fuel pump relay.</li> <li>• Is voltage greater than 10.5 volts?</li> </ul>		Yes	GO to <b>J8</b> .
		No	VERIFY inertia switch is reset to On. If switch will not reset, REPLACE switch. If OK. <ul style="list-style-type: none"> <li>— 1.9L EFI, 1.9L CFI and 2.3L HSC, SERVICE open between ignition switch start/run circuit and fuel pump relay.</li> <li>— All others, SERVICE open in VPWR circuit between the EEC power relay and the fuel pump relay. RERUN Quick Test.</li> </ul>

## Pinpoint Test J4 Thru J7 - Fuel Pump Circuit

Fuel Pump Circuit		Pinpoint Test	J
TEST STEP		RESULT	ACTION TO TAKE
<b>J8</b>	CHECK CONTINUITY OF FUEL PUMP CIRCUIT		
	<ul style="list-style-type: none"> <li>• Key off, wait 10 seconds.</li> <li>• Leave breakout box installed and processor connected.</li> <li>• DVOM on 200 ohm scale.</li> <li>• Measure resistance between fuel pump circuit at the pump relay and Test Pin 22 at the breakout box.</li> <li>• Is resistance less than 5.0 ohms?</li> </ul>	<p>Yes ▶</p> <p>No ▶</p>	<p>GO to <b>J9</b> .</p> <p>SERVICE open circuit. RERUN Quick Test.</p>
<b>J9</b>	CHECK FOR SHORT TO POWER		
	<ul style="list-style-type: none"> <li>• Key on.</li> <li>• Breakout box installed.</li> <li>• Disconnect processor.</li> <li>• Disconnect fuel pump relay.</li> <li>• DVOM on 20 volt scale.</li> <li>• Measure voltage between Test Pin 22 and battery negative post.</li> <li>• Is voltage less than 1.0 volt?</li> </ul>	<p>Yes ▶</p> <p>No ▶</p>	<p>GO to <b>J10</b> .</p> <p>SERVICE short circuit. RECONNECT processor, ATTEMPT to start vehicle. If vehicle fails to start, REPLACE processor. RERUN Quick Test.</p>
<b>J10</b>	CHECK FOR SHORT TO GROUND		
	<ul style="list-style-type: none"> <li>• Key off, wait 10 seconds.</li> <li>• Leave breakout box installed and processor disconnected.</li> <li>• Fuel pump relay disconnected.</li> <li>• DVOM on 200,000 ohm scale.</li> <li>• Measure resistance between Test Pin 22 and Test Pins 40 and 60 at the breakout box.</li> <li>• Is resistance greater than 10,000 ohms?</li> </ul>	<p>Yes ▶</p> <p>No ▶</p>	<p>RECONNECT fuel pump relay. GO to <b>J11</b> .</p> <p>SERVICE short circuit. RERUN Quick Test.</p>
<b>J11</b>	CHECK FOR VOLTAGE AT POWER-TO-PUMP(S) CIRCUIT		
	<ul style="list-style-type: none"> <li>• Leave breakout box installed and processor disconnected.</li> <li>• Connect jumper wire from Test Pin 22 to Test Pin 40 or 60 at the breakout box.</li> <li>• DVOM on 20 volt scale.</li> <li>• Key on, engine off.</li> <li>• Measure voltage between chassis ground and POWER-TO-PUMP(s) circuit at fuel pump relay.</li> <li>• Is voltage greater than 10.5 volts?</li> </ul>	<p>Yes ▶</p> <p>No ▶</p>	<p>REPLACE processor. RERUN Quick Test.</p> <p>REPLACE fuel pump relay. RECONNECT processor and RERUN Quick Test.</p>

Pinpoint Test J8 Thru J11 - Fuel Pump Circuit

Fuel Pump Circuit		Pinpoint Test	J
TEST STEP		RESULT	ACTION TO TAKE
<b>J20</b>	SERVICE CODE 95: CHECK INERTIA SWITCH		
<p><b>NOTE: Key On Engine Off Service Code 95 indicates that one of the following has occurred:</b></p> <ul style="list-style-type: none"> <li>— Open circuit in or between fuel pump and FPM circuit at the processor</li> <li>— Poor fuel pump ground</li> <li>— Fuel pump circuit short to power</li> <li>— Fuel pump relay contacts always closed.</li> </ul> <ul style="list-style-type: none"> <li>• Key off, wait 10 seconds.</li> <li>• Locate and disconnect fuel pump inertia switch (verify that switch is reset).</li> <li>• DVOM on 200 ohm scale.</li> <li>• Measure resistance of the fuel pump inertia switch.</li> <li>• Is resistance less than 5.0 ohms?</li> </ul>		<p>Yes ▶</p> <p>No ▶</p>	<p>RECONNECT inertia switch. GO to <b>J21</b> .</p> <p>REPLACE or RESET inertia switch. RERUN Quick Test.</p>
<b>J21</b>	VERIFY THAT FUEL PUMP IS OFF		
<ul style="list-style-type: none"> <li>• Key off.</li> <li>• Listen for motor noise from fuel pump.</li> <li>• Is fuel pump off?</li> </ul>		<p>Yes ▶</p> <p>No ▶</p>	<p>GO to <b>J23</b> .</p> <p>GO to <b>J22</b> .</p>
<b>J22</b>	CHECK FOR FUEL PUMP RELAY ALWAYS CLOSED		
<ul style="list-style-type: none"> <li>• Key off.</li> <li>• Locate and disconnect fuel pump relay.</li> <li>• Does fuel pump shut off when relay is disconnected?</li> </ul>		<p>Yes ▶</p> <p>No ▶</p>	<p>REPLACE fuel pump relay. RERUN Quick Test.</p> <p>SERVICE short to power in POWER-TO-PUMP/FPM circuit. RERUN Quick Test.</p>

Pinpoint Test J20 Thru J22 - Fuel Pump Circuit

Fuel Pump Circuit		Pinpoint Test	J
TEST STEP		RESULT	ACTION TO TAKE
<b>J23</b>	<b>CHECK CONTINUITY OF FPM CIRCUIT</b>		
<ul style="list-style-type: none"> <li>• Key off.</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>• Disconnect fuel pump relay.</li> <li>• DVOM on 200 ohm scale.</li> <li>• Measure resistance between Test Pin 8 (Test Pin 19 for 5.0L Mass Air engines) at the breakout box and POWER-TO-PUMP circuit at the fuel pump relay vehicle harness connector.</li> <li>• Is resistance less than 5.0 ohms?</li> </ul>		<p>Yes ▶</p> <p>No ▶</p>	<p>GO to <b>J24</b> .</p> <p>REMOVE breakout box. RECONNECT processor and fuel pump relay. SERVICE open circuit. RERUN Quick Test.</p>
<b>J24</b>	<b>CHECK FOR CONTINUITY BETWEEN FPM CIRCUIT AND GROUND</b>		
<ul style="list-style-type: none"> <li>• Key off.</li> <li>• Breakout box installed, processor disconnected.</li> <li>• Fuel pump relay disconnected.</li> <li>• DVOM on 200 ohm scale.</li> <li>• Measure resistance between Test Pin 8 (Test Pin 19 for 5.0L Mass Air engines) at the breakout box and battery negative post.</li> <li>• Is resistance less than 10.0 ohms?</li> </ul>		<p>Yes ▶</p> <p>No ▶</p>	<p>For 1.9L EFI, RECONNECT fuel pump relay and GO to <b>J25</b> . All others, REMOVE breakout box. RECONNECT fuel pump relay. REPLACE processor. RERUN Quick Test.</p> <p>REMOVE breakout box. RECONNECT fuel pump relay and processor.</p> <p>Electric Fuel Pump for open in POWER-TO-PUMP circuit, poor fuel pump GROUND, open in fuel pump, etc.</p>

Pinpoint Test J23 &amp; J24 - Fuel Pump Circuit

**Fuel Pump Circuit****Pinpoint  
Test****J**

TEST STEP		RESULT	ACTION TO TAKE
<b>J25</b>	CHECK FUEL PUMP PRIMARY 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>• Fuel pump relay disconnected.</li> <li>• DVOM on 200,000 ohm scale.</li> <li>• Measure resistance between Test Pin 22 and Test Pin 40 at the breakout box.</li> <li>• Is resistance greater than 10,000 ohms?</li> </ul>	<p>Yes</p> <p>No</p>	<p>REMOVE breakout box. RECONNECT fuel pump relay. REPLACE processor RERUN Quick Test.</p> <p>REMOVE breakout box. RECONNECT processor and fuel pump relay. SERVICE short circuit. RERUN Quick Test.</p>
<b>J30</b>	SERVICE CODE 96: CHECK FOR VBATT TO FUEL PUMP RELAY		
	<p><b>NOTE: Service Code 96 indicates that when the fuel pump is being activated, power is not being supplied to the pump.</b></p> <ul style="list-style-type: none"> <li>• Key off, wait 10 seconds.</li> <li>• Locate fuel pump relay.</li> <li>• DVOM on 20 volt scale.</li> <li>• Measure voltage between VBATT circuit at the fuel pump relay and battery negative post.</li> <li>• Is voltage greater than 10.5 volts?</li> </ul>	<p>Yes</p> <p>No</p>	<p>GO to <b>J31</b>.</p> <p>SERVICE open in VBATT circuit. RERUN Quick Test.</p>
<b>J31</b>	CHECK FOR VOLTAGE AT POWER-TO-PUMP CIRCUIT VERIFY FUEL PUMP OPERATION		
	<ul style="list-style-type: none"> <li>• Key off.</li> <li>• DVOM on 20 volt scale.</li> <li>• Connect DVOM between POWER-TO-PUMP circuit at the fuel pump relay and battery negative post.</li> <li>• Observe DVOM as you activate fuel pump relay (turn key to run for 1 second, then to off for 10 seconds. Repeat 5 times.</li> <li>• Does voltage measure greater than 10.5 volts for about 1 second after key is turned to ON position during test?</li> </ul>	<p>Yes</p> <p>No</p>	<p>4.9L EFI, 5.0L EFI, 5.8L EFI and 7.5L EFI Trucks GO to <b>J32</b>. All others REPLACE processor. RERUN Quick Test.</p> <p>DISCONNECT fuel pump relay. INSPECT for damaged pins, corrosion, loose wires, etc. If OK REPLACE fuel pump relay. RERUN Quick Test.</p>

Pinpoint Test J25 Thru J31 - Fuel Pump Circuit

<b>Fuel Pump Circuit</b>		<b>Pinpoint Test</b>	<b>J</b>
<b>TEST STEP</b>		<b>RESULT</b>	<b>ACTION TO TAKE</b>
<b>J32</b>	<b>CHECK CONTINUITY OF POWER-TO-PUMP CIRCUIT</b>		
<ul style="list-style-type: none"> <li>• Key off.</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>• Disconnect Fuel Pump Relay.</li> <li>• DVOM on 200 ohm scale.</li> <li>• Measure resistance between Test Pin 8 at the breakout box and POWER-TO-PUMP circuit at the fuel pump relay vehicle harness connector.</li> <li>• Is resistance less than 5.0 ohms?</li> </ul>	<p>Yes ▶</p> <p>No ▶</p>	<p>REMOVE breakout box. RECONNECT fuel pump relay. REPLACE processor. RERUN Quick Test.</p> <p>SERVICE open in POWER-TO-PUMP circuit between FPM splice and fuel pump relay. REFER to schematic. RERUN Quick Test.</p>	
<b>J90</b>	<b>CONTINUOUS MEMORY CODE 95: CHECK EEC-IV HARNESS</b>		
<p>A Continuous Memory Code 95 indicates that one of the following intermittent conditions has occurred:</p> <ul style="list-style-type: none"> <li>— Open circuit in or between the fuel pump and pin 8 (pin 19 on 5.0L MA) in the processor (see schematic).</li> <li>— Poor fuel pump ground.</li> </ul> <ul style="list-style-type: none"> <li>• Start engine.</li> <li>• Check for engine stall/stumble while performing the following (also, if possible, listen for fuel pump turning off.) <ul style="list-style-type: none"> <li>— Shake, wiggle, bend the POWER-TO-PUMP circuit between the POWER-TO-PUMP pin at the fuel pump relay and the fuel pump.</li> <li>— Shake, wiggle, bend the fuel pump ground circuit from the fuel pump to ground.</li> <li>— Lightly tap the fuel pump to simulate road shock.</li> <li>— For vehicles with the inertia switch in the POWER-TO-PUMP circuit (refer to schematic), lightly tap inertia switch to simulate road shock.</li> </ul> </li> <li>• Key off.</li> <li>• Inspect the fuel pump harness connector and the fuel pump ground for corrosion, damaged pins, etc.</li> <li>• Is fault indicated/found?</li> </ul>	<p>Yes ▶</p> <p>No ▶</p>	<p>ISOLATE fault and SERVICE as necessary. CLEAR Continuous Memory Code 95.</p> <p>RERUN Quick Test.</p> <p>GO to <b>J91</b>.</p>	

Pinpoint Test J32 &amp; J90 - Fuel Pump Circuit

Fuel Pump Circuit		Pinpoint Test	J
TEST STEP		RESULT	ACTION TO TAKE
<b>J91</b>	CHECK FPM CIRCUIT		
<ul style="list-style-type: none"> <li>• Key off.</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>• Key on, engine off.</li> <li>• Connect a TEST LAMP between Test Pin 8 (Test Pin 19 for 5.0L MA.) and Test Pin 37.</li> <li>• Observe test lamp for an indication of a fault while performing the following (The light will go out when a fault is found, indicating an open): <ul style="list-style-type: none"> <li>— Shake, wiggle, bend the fuel pump monitor circuit between the fuel pump relay (or splice if applicable, see schematic) and the processor.</li> </ul> </li> <li>• Is fault indicated?</li> </ul>		<p>Yes</p> <p>No</p>	<p>ISOLATE fault and SERVICE as necessary. REMOVE breakout box. CLEAR Continuous Memory Code 95.</p> <p>RERUN Quick Test.</p> <p>Unable to duplicate fault at this time. REMOVE breakout box. CLEAR Continuous Memory Code 95.</p>
<b>J92</b>	CONTINUOUS MEMORY CODE 96 CHECK FOR CONTINUOUS MEMORY CODE 87		
<ul style="list-style-type: none"> <li>• Is Continuous Memory Code 87 also present?</li> </ul>		<p>Yes</p> <p>No</p>	<p>GO to <b>J95</b>.</p> <p>GO to <b>J93</b>.</p>

Pinpoint Test J91 &amp; J92 - Fuel Pump Circuit

Fuel Pump Circuit		Pinpoint Test	J
TEST STEP		RESULT	ACTION TO TAKE
<b>J93</b>	CHECK EEC-IV HARNESS		
<p>A Continuous Memory Code 96, without the presence of a Continuous Memory Code 87, indicates that during vehicle operation, one of the following has occurred:</p> <ul style="list-style-type: none"> <li>— Open in the VBATT circuit between BATT+ and the fuel pump relay.</li> <li>— Fuel pump relay contacts opened.</li> <li>— Open in the POWER-TO-PUMP circuit from the fuel pump relay to the FPM splice, if applicable (see schematic).</li> </ul> <ul style="list-style-type: none"> <li>• Start engine.</li> <li>• Check for engine stall/stumble while performing the following (also, if possible, listen for fuel pump turning off): <ul style="list-style-type: none"> <li>— Shake, wiggle, bend the VBATT(+) circuit from BATT(+) to the fuel pump relay.</li> <li>— Lightly tap the fuel pump relay (to simulate road shock).</li> <li>— Shake, wiggle, bend the POWER-TO-PUMP circuit from the fuel pump relay to the FPM splice, if applicable (See schematic).</li> </ul> </li> <li>• Key off.</li> <li>• Inspect the fuel pump relay connectors and BATT+ connector terminal for corrosion, damaged pins, etc.</li> <li>• Is fault indicated/found?</li> </ul>		<p>Yes</p> <p>No</p>	<p>ISOLATE fault and SERVICE as necessary. CLEAR Continuous Memory Code 96.</p> <p>RERUN Quick Test.</p> <p>1.9L EFI: GO to <b>J95</b>.</p> <p>ALL OTHERS:</p> <p>Unable to duplicate fault at this time. CLEAR Continuous Memory Code 96.</p> <p>Continuous Memory Code 96 testing complete.</p>

Pinpoint Test J93 - Fuel Pump Circuit

Fuel Pump Circuit		Pinpoint Test	J
TEST STEP		RESULT	ACTION TO TAKE
<b>J95</b>	CONTINUOUS MEMORY SERVICE CODE 87 CHECK EEC-IV HARNESS		
<p>A Continuous Memory Code 87 indicates that one of the following intermittent conditions has occurred:</p> <ul style="list-style-type: none"> <li>— Open in VPWR circuit between the EEC power relay and the fuel pump relay.</li> <li>— Open coil in fuel pump relay.</li> <li>— Open in fuel pump circuit (pin 22).</li> </ul> <ul style="list-style-type: none"> <li>• Start engine.</li> <li>• Check for engine stall/stumble while performing the following (also, if possible, listen for fuel pump turning off): <ul style="list-style-type: none"> <li>— Shake, wiggle, bend the VPWR circuit between the EEC power relay and the fuel pump relay. For vehicles with the inertia switch in the VPWR circuit (refer to schematic), lightly tap the inertia switch to simulate road shock.</li> <li>— Shake, wiggle, bend the EEC-IV harness fuel pump circuit (Test Pin 22) between the processor and the fuel pump relay.</li> <li>— Lightly tap the fuel pump relay to simulate road shock.</li> </ul> </li> <li>• Key off.</li> <li>• Inspect the processor 60 pin connector and them fuel pump relay connectors for corrosion, damaged pins, etc.</li> <li>• Is fault indicated/found?</li> </ul>		<p>Yes</p> <p>No</p>	<p>ISOLATE fault and SERVICE as necessary. CLEAR Continuous Memory Code(s).</p> <p>RERUN Quick Test.</p> <p>Unable to duplicate fault at this time. CLEAR Continuous Memory Code(s).</p>

Pinpoint Test J95 - Fuel Pump Circuit

**EGR On/Off Control****Pinpoint  
Test****KA****Note**

You should enter this Pinpoint Test only when a Service Code 34 or 84 is received in Quick Test Step 3.0, 5.0 or when directed here from Diagnostic By Symptom

**Remember**

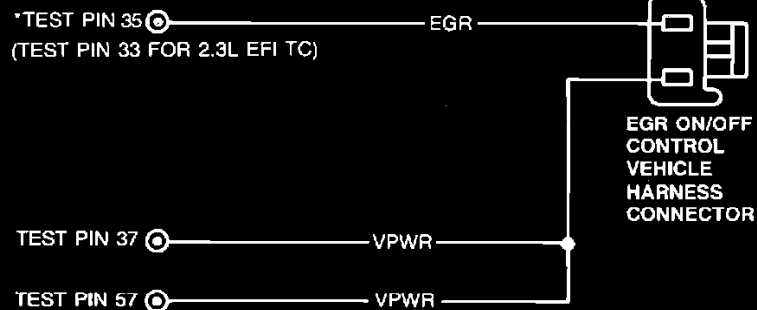
To prevent the replacement of good components, be aware that the following non-EEC areas may be at fault:

- Air or Vacuum Leaks
- EGR Flow Restrictions
- EGR Value

**NOTE:** Code 34 may be the result of high volume exhaust vent system (reduces back pressure). If this is suspected, perform the test in a well-ventilated area without exhaust vent connected.

This Pinpoint Test is intended to diagnose only the following:

- Circuits: EGR and VPWR
- EGR Solenoid
- Presence of Manifold Vacuum
- Processor Assembly

**Pinpoint Test Schematic**

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

**Pinpoint Test KA - EGR On/Off Control**

EGR On/Off Control		Pinpoint Test	KA
TEST STEP		RESULT	ACTION TO TAKE
<b>KA1</b>	ENTER OUTPUT STATE CHECK (REFER TO APPENDIX)		
<p><b>NOTE: Do not use STAR tester for this step, use a VOM/DVOM.</b></p> <ul style="list-style-type: none"> <li>• Key off, wait 10 seconds.</li> <li>• DVOM on 20 volt scale.</li> <li>• Connect DVOM negative test lead to STO at the Self-Test connector and positive test lead to battery positive.</li> <li>• Jumper STI to SIGNAL RETURN at the Self-Test connector.</li> <li>• Rerun Key On Engine Off Self-Test until the completion of the Continuous Test Codes.</li> <li>• DVOM will indicate less than 1.0 volts.</li> <li>• Depress and release the throttle.</li> <li>• Did DVOM reading change to a high voltage reading?</li> </ul>		<p>Yes</p> <p>No</p>	<p>REMAIN in Output State Check. GO to <b>KA2</b>.</p> <p>DEPRESS throttle to WOT and release. If STO voltage does not go high, GO to Pinpoint Test Step <b>QC1</b>. Leave equipment hooked up.</p>
<b>KA2</b>	CHECK EGR ON/OFF CONTROL SOLENOID ELECTRICAL OPERATION		
<ul style="list-style-type: none"> <li>• DVOM on 20 volt scale.</li> <li>• Connect DVOM positive test lead to VPWR circuit on EGR solenoid and negative test lead to EGR output circuit.</li> <li>• While observing DVOM, depress and release the throttle several times to cycle output On and Off.</li> <li>• Does EGR output cycle On and Off?</li> </ul>		<p>Yes</p> <p>No</p>	<p>GO to <b>KA3</b>.</p> <p>REMOVE STI jumper. GO to <b>KA5</b>.</p>
<b>KA3</b>	CHECK SOLENOID FOR VACUUM CYCLING		
<ul style="list-style-type: none"> <li>• Install vacuum pump to the solenoid vacuum supply port and install a vacuum gauge to the output port. Apply 6 in. Hg minimum.</li> <li>• While cycling outputs On and Off (by depressing and releasing throttle) observe the vacuum gauge at the output.</li> </ul> <p><b>NOTE: Maintain vacuum at source.</b></p> <ul style="list-style-type: none"> <li>• Does output port vacuum cycle On and Off?</li> </ul>		<p>Yes</p> <p>No</p>	<p>GO to <b>KA4</b>.</p> <p>REPLACE solenoid. RERUN Quick Test.</p>

Pinpoint Test KA1 Thru KA3 - EGR On/Off Control

<b>EGR On/Off Control</b>		<b>Pinpoint Test</b>	<b>KA</b>
<b>TEST STEP</b>		<b>RESULT</b>	<b>ACTION TO TAKE</b>
<b>KA1</b>	<b>ENTER OUTPUT STATE CHECK (REFER TO APPENDIX)</b>		
<p><b>NOTE: Do not use STAR tester for this step, use a VOM/DVOM.</b></p> <ul style="list-style-type: none"> <li>• Key off, wait 10 seconds.</li> <li>• DVOM on 20 volt scale.</li> <li>• Connect DVOM negative test lead to STO at the Self-Test connector and positive test lead to battery positive.</li> <li>• Jumper STI to SIGNAL RETURN at the Self-Test connector.</li> <li>• Rerun Key On Engine Off Self-Test until the completion of the Continuous Test Codes.</li> <li>• DVOM will indicate less than 1.0 volts.</li> <li>• Depress and release the throttle.</li> <li>• Did DVOM reading change to a high voltage reading?</li> </ul>		<p>Yes</p> <p>No</p>	<p>REMAIN in Output State Check. GO to <b>KA2</b>.</p> <p>DEPRESS throttle to WOT and release. If STO voltage does not go high, GO to Pinpoint Test Step <b>QC1</b>. Leave equipment hooked up.</p>
<b>KA2</b>	<b>CHECK EGR ON/OFF CONTROL SOLENOID ELECTRICAL OPERATION</b>		
<ul style="list-style-type: none"> <li>• DVOM on 20 volt scale.</li> <li>• Connect DVOM positive test lead to VPWR circuit on EGR solenoid and negative test lead to EGR output circuit.</li> <li>• While observing DVOM, depress and release the throttle several times to cycle output On and Off.</li> <li>• Does EGR output cycle On and Off?</li> </ul>		<p>Yes</p> <p>No</p>	<p>GO to <b>KA3</b>.</p> <p>REMOVE STI jumper. GO to <b>KA5</b>.</p>
<b>KA3</b>	<b>CHECK SOLENOID FOR VACUUM CYCLING</b>		
<ul style="list-style-type: none"> <li>• Install vacuum pump to the solenoid vacuum supply port and install a vacuum gauge to the output port. Apply 6 in. Hg minimum.</li> <li>• While cycling outputs On and Off (by depressing and releasing throttle) observe the vacuum gauge at the output.</li> </ul> <p><b>NOTE: Maintain vacuum at source.</b></p> <ul style="list-style-type: none"> <li>• Does output port vacuum cycle On and Off?</li> </ul>		<p>Yes</p> <p>No</p>	<p>GO to <b>KA4</b>.</p> <p>REPLACE solenoid. RERUN Quick Test.</p>

Pinpoint Test KA1 Thru KA3 - EGR On/Off Control

<b>EGR On/Off Control</b>		<b>Pinpoint Test</b>	<b>KA</b>
<b>TEST STEP</b>		<b>RESULT</b>	<b>ACTION TO TAKE</b>
<b>KA4</b>	<b>CHECK MANIFOLD VACUUM LINES FOR BLOCKAGE OR LEAKS</b>		
<ul style="list-style-type: none"> <li>• Vacuum lines disconnected at solenoid.</li> <li>• Start engine.</li> <li>• Check for vacuum.</li> <li>• Is vacuum present?</li> </ul>		<p>Yes ▶</p> <p>No ▶</p>	<p>EEC-IV system OK.</p> <p>SERVICE vacuum source blockage or leak. RERUN Quick Test.</p>
<b>KA5</b>	<b>MEASURE EGR SOLENOID RESISTANCE</b>		
<ul style="list-style-type: none"> <li>• Key off, wait 10 seconds.</li> <li>• DVOM on 200 ohm scale.</li> <li>• Disconnect EGR solenoid.</li> <li>• Measure solenoid resistance.</li> <li>• Is resistance between 65 and 110 ohms?</li> </ul>		<p>Yes ▶</p> <p>No ▶</p>	<p>GO to <b>KA6</b> .</p> <p>REPLACE EGR solenoid. RERUN Quick Test.</p>
<b>KA6</b>	<b>CHECK VOLTAGE OF VPWR CIRCUIT</b>		
<ul style="list-style-type: none"> <li>• Key on, engine off.</li> <li>• EGR solenoid disconnected.</li> <li>• DVOM on 20 volt scale.</li> <li>• Measure voltage between VPWR circuit at the EGR solenoid vehicle harness connector and battery ground.</li> <li>• Is voltage greater than 10.5 volts?</li> </ul>		<p>Yes ▶</p> <p>No ▶</p>	<p>GO to <b>KA7</b> .</p> <p>RECONNECT EGR solenoid. SERVICE open circuit. RERUN Quick Test.</p>
<b>KA7</b>	<b>CHECK CONTINUITY OF EGR CIRCUIT</b>		
<ul style="list-style-type: none"> <li>• Key off, wait 10 seconds.</li> <li>• EGR solenoid disconnected.</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 Test Pin 35 (Test Pin 33 for 2.3L EFI TC) at the breakout box and EGR circuit at vehicle harness connector.</li> <li>• Is resistance less than 5 ohms?</li> </ul>		<p>Yes ▶</p> <p>No ▶</p>	<p>GO to <b>KA8</b> .</p> <p>REMOVE breakout box. RECONNECT all components. SERVICE open circuit. RERUN Quick Test.</p>

Pinpoint Test KA4 Thru KA7 - EGR On/Off Control

<b>EGR On/Off Control</b>		<b>Pinpoint Test</b>	<b>KA</b>
<b>TEST STEP</b>		<b>RESULT</b>	<b>ACTION TO TAKE</b>
<b>KA8</b>	<b>CHECK FOR SHORT TO GROUND</b>		
<ul style="list-style-type: none"> <li>• Key off, wait 10 seconds.</li> <li>• Breakout box installed, processor disconnected.</li> <li>• EGR solenoid disconnected.</li> <li>• DVOM on 200,000 ohm scale.</li> <li>• Measure resistance between Test Pin 35 (Test Pin 33 for 2.3L EFI TC) and Test Pins 40, 46 and 60 at the breakout box.</li> <li>• Is resistance greater than 10,000 ohms?</li> </ul>	<p>Yes ▶</p> <p>No ▶</p>	<p>GO to <b>KA9</b> .</p> <p>REMOVE breakout box. RECONNECT all components. SERVICE short circuit. RERUN Quick Test.</p>	
<b>KA9</b>	<b>CHECK FOR SHORT TO POWER</b>		
<ul style="list-style-type: none"> <li>• Key off, wait 10 seconds.</li> <li>• DVOM on 200,000 ohm scale.</li> <li>• Breakout box installed, processor disconnected.</li> <li>• EGR solenoid disconnected.</li> <li>• Measure resistance between Test Pin 35 (Test Pin 33 for 2.3L EFI TC) and Test Pins 37 and 57 at the breakout box.</li> <li>• Is resistance greater than 10,000 ohms?</li> </ul>	<p>Yes ▶</p> <p>No ▶</p>	<p>REMOVE breakout box. RECONNECT all components. REPLACE Processor. RERUN Quick Test.</p> <p>REMOVE breakout box. RECONNECT all components. SERVICE short to power. RERUN Quick Test. If code is repeated, REPLACE processor.</p>	

Pinpoint Test KA8 &amp; KA9 - EGR On/Off Control

**Air Management System****Pinpoint  
Test****KC****Note**

You should enter this Pinpoint Test only when a Service Code 44, 45, 46, 81, 82 or 94 is received in Quick Test Step 3.0 or 5.0.

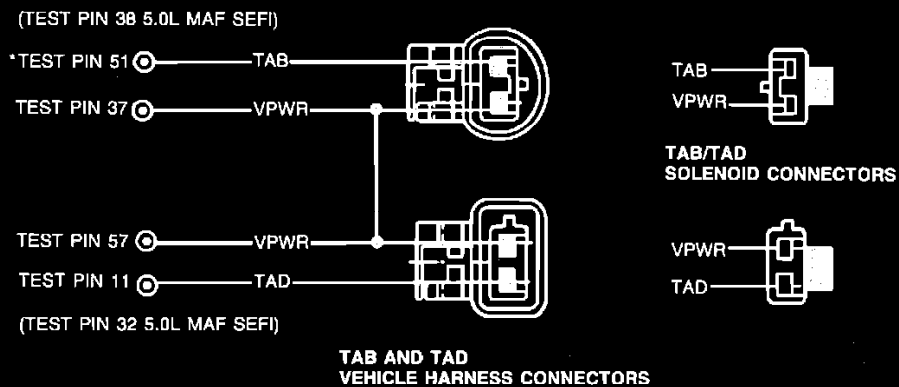
**Remember**

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

- Thermoactor System
  - Belt
  - Pump
  - Valve

This Pinpoint Test is intended to diagnose only the following:

- TAB and TAD Solenoid Valve Assemblies
- Vacuum Supply
- Harness Circuits: TAB, TAD and VPWR
- Processor Assembly

**Pinpoint Test Schematic****Pinpoint Test KC - Air Management System**

Air Management System		Pinpoint Test	KC
TEST STEP		RESULT	ACTION TO TAKE
<b>KC1</b>	SERVICE CODES 44 (94), 45 AND 46: VERIFY VACUUM LINE ROUTING		
<ul style="list-style-type: none"> <li>• Verify proper vacuum line routing to the TAB/TAD solenoids and to the bypass diverter valve. Refer to VECI decal.</li> <li>• Check for kinked or blocked vacuum lines.</li> <li>• Check for kinked or blocked air hoses.</li> <li>• Check for disconnected or cracked vacuum lines.</li> <li>• Are visual checks satisfactory?</li> </ul>		No	SERVICE routing or faults. RERUN Quick Test.
		Yes	Service Code 44 (94), GO to <b>KC4</b> . Service Code 45, GO to <b>KC2</b> . Service Code 46, GO to <b>KC3</b> .
<b>KC2</b>	ATTEMPT TO ELIMINATE SERVICE CODE 45 (TAD ONLY)		
<ul style="list-style-type: none"> <li>• Disconnect vacuum line on diverter valve and cap vacuum line.</li> <li>• Key off, wait 10 seconds.</li> <li>• Repeat Engine Running Self-Test and record service codes.</li> <li>• Is Code 45 present?</li> </ul>		Yes	EEC-IV system OK.
		No	GO to <b>KC4</b> .
<b>KC3</b>	ATTEMPT TO ELIMINATE SERVICE CODE 46 (TAB ONLY)		
<ul style="list-style-type: none"> <li>• Disconnect vacuum line on bypass valve and cap vacuum line.</li> <li>• Key off, wait 10 seconds.</li> <li>• Repeat Engine Running Self-Test and record codes.</li> <li>• Is Code 46 present?</li> </ul>		Yes	EEC-IV system OK.
		No	GO to <b>KC4</b> .

Pinpoint Test KC1 Thru KC3 - Air Management System

Air Management System		Pinpoint Test	KC
TEST STEP	RESULT	ACTION TO TAKE	
<b>KC4</b> ENTER OUTPUT STATE CHECK (REFER TO APPENDIX IN QUICK TEST)			
<p><b>NOTE: Do not use STAR tester for this Step, use a VOM/DVOM.</b></p> <ul style="list-style-type: none"> <li>• Key off, wait 10 seconds.</li> <li>• DVOM on 20 volt scale.</li> <li>• Connect DVOM negative test lead to STO circuit at the Self-Test connector and positive test lead to battery positive.</li> <li>• Jumper STI circuit to SIGNAL RETURN at the Self-Test connector.</li> <li>• Perform Key On, Engine Off Self-Test until the completion of the Continuous Memory Test Codes.</li> <li>• DVOM will indicate zero volts when Test is complete.</li> <li>• Depress and release the throttle.</li> <li>• Did DVOM change to a high voltage?</li> </ul>	<p>Yes</p> <p>No</p>	<p>▶ REMAIN in Output State Check. GO to <b>KC5</b>.</p> <p>▶ DEPRESS throttle to WOT and RELEASE. If STO voltage does not go high, GO to Pinpoint Test Step <b>QC1</b>. Leave equipment hooked up.</p>	
<b>KC5</b> CHECK TAB/TAD SOLENOID ELECTRICAL OPERATION			
<ul style="list-style-type: none"> <li>• DVOM on 20 volt scale.</li> <li>• Disconnect TAB and TAD solenoids.</li> <li>• Connect DVOM positive test lead to VPWR circuit and negative test lead to TAB circuit on TAB solenoid vehicle harness connector.</li> <li>• While observing DVOM depress and release the throttle several times (to cycle output On and Off).</li> <li>• Repeat for TAD solenoid. Connect positive test lead to VPWR circuit and negative test lead to TAD circuit on TAD solenoid vehicle harness connector.</li> <li>• Do both solenoids cycle On and Off?</li> </ul>	<p>Yes</p> <p>No</p>	<p>▶ GO to <b>KC6</b>.</p> <p>▶ REMOVE jumper. GO to <b>KC9</b>.</p>	

Pinpoint Test KC4 &amp; KC5 - Air Management System

# Air Management System

## Pinpoint Test

## KC

TEST STEP		RESULT	ACTION TO TAKE
<b>KC6</b>	CHECK TAB/TAD SOLENOID FOR VACUUM CYCLING		
<ul style="list-style-type: none"> <li>• Install vacuum pump to the TAB solenoid vacuum supply port and install a vacuum gauge to the output port.</li> <li>• While cycling outputs On and Off (by depressing and releasing throttle), observe the vacuum gauge at the output.</li> </ul> <p><b>NOTE: Maintain vacuum at source.</b></p> <ul style="list-style-type: none"> <li>• Repeat for TAD solenoid. Connect vacuum pump to the TAD solenoid vacuum supply port and connect a vacuum gauge to the output port.</li> <li>• Cycle output On and Off.</li> <li>• Do both vacuum outputs cycle On and Off?</li> </ul>		Yes  No	GO to <b>KC7</b> .  REPLACE solenoid assembly. RERUN Quick Test.
<b>KC7</b>	CHECK MANIFOLD VACUUM LINES FOR BLOCKAGE OR LEAKS		
<ul style="list-style-type: none"> <li>• Vacuum lines disconnected at TAD/TAB solenoids.</li> <li>• Start engine.</li> <li>• Check for vacuum.</li> <li>• Is vacuum present at the solenoids?</li> </ul>		Yes  No	EEC-IV system OK.  SERVICE vacuum source blockage or leak. RERUN Quick Test.
<b>KC8</b>	CHECK VOLTAGE OF VPWR CIRCUIT		
<ul style="list-style-type: none"> <li>• Key on, engine off.</li> <li>• DVOM on 20 volt scale.</li> <li>• Measure voltage between TAB solenoid VPWR circuit and battery ground.</li> <li>• Repeat for TAD solenoid.</li> <li>• Are both voltage greater than 10.5 volts?</li> </ul>		Yes  No	GO to <b>KC9</b> .  RECONNECT TAB/TAD solenoids. SERVICE harness circuit open. RERUN Quick Test.

### Pinpoint Test KC6 Thru KC8 - Air Management System

Air Management System		Pinpoint Test	KC
TEST STEP		RESULT	ACTION TO TAKE
<b>KC9</b>	MEASURE TAB/TAD SOLENOID RESISTANCE		
<ul style="list-style-type: none"> <li>• Key off, wait 10 seconds.</li> <li>• DVOM on 200 ohm scale.</li> <li>• Disconnect TAB solenoid connector and measure solenoid resistance.</li> <li>• Disconnect TAD solenoid connector and measure solenoid resistance.</li> <li>• Are both solenoid resistances between 50 and 100 ohms?</li> </ul>		Yes ▶  No ▶	GO to <b>KC10</b> .  REPLACE TAB/TAD solenoid assembly. RERUN Quick Test.
<b>KC10</b>	CHECK CONTINUITY OF TAB AND TAD CIRCUITS		
<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>• Connect breakout box to harness. Leave processor disconnected.</li> <li>• DVOM on 200 ohm scale.</li> <li>• Measure resistance between Test Pin 51 (Test Pin 38 for 5.0L MAF SEFI) at breakout box and TAB circuit at vehicle harness connector.</li> <li>• Measure resistance between Test Pin 11 (Test Pin 32 for 5.0L MAF SEFI) at the breakout box and TAD circuit at vehicle harness connector.</li> <li>• Are both solenoid resistances less than 5.0 ohms?</li> </ul>		Yes ▶  No ▶	GO to <b>KC11</b> .  REMOVE breakout box. RECONNECT processor and TAB/TAD solenoids. SERVICE harness open circuit. RERUN Quick Test.

Pinpoint Test KC9 &amp; KC10 - Air Management System

Air Management System		Pinpoint Test	KC
TEST STEP	RESULT	ACTION TO TAKE	
<b>KC11</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.</li> <li>• Leave breakout box installed and processor disconnected.</li> <li>• Disconnect TAB/TAD solenoids.</li> <li>• Measure resistance between Test Pin 51 (Test Pin 38 for 5.0L MAF SEFI) and Test Pins 40, 46 and 60 and between Test Pin 11 (Test Pin 32 for 5.0L MAF SEFI) and Test Pins 40, 46 and 60 at the breakout box.</li> <li>• Are all resistances greater than 10,000 ohms?</li> </ul>	<p>Yes</p> <p>No</p>	<p>▶ GO to <b>KC12</b> .</p> <p>▶ SERVICE short to ground. REMOVE breakout box. RECONNECT processor and TAB/TAD solenoids. RERUN Quick Test.</p>	
<b>KC12</b>   CHECK FOR SHORT TO POWER			
<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>• TAB/TAD solenoids disconnected.</li> <li>• Measure resistance between Test Pin 51 (Test Pin 38 for 5.0L MAF SEFI) and Test Pins 37 and 57, and between Test Pin 11 (Test Pin 32 for 5.0L MAF SEFI) and Test Pins 37 and 57 at the breakout box.</li> <li>• Are all resistances greater than 10,000 ohms?</li> </ul>	<p>Yes</p> <p>No</p>	<p>▶ REMOVE breakout box. RECONNECT TAB/TAD solenoid. REPLACE processor. RERUN Quick Test.</p> <p>▶ REMOVE breakout box. RECONNECT processor and TAB/TAD solenoids. SERVICE short to power. RERUN Quick Test. If code is present, REPLACE processor.</p>	

Pinpoint Test KC11 &amp; KC12 - Air Management System

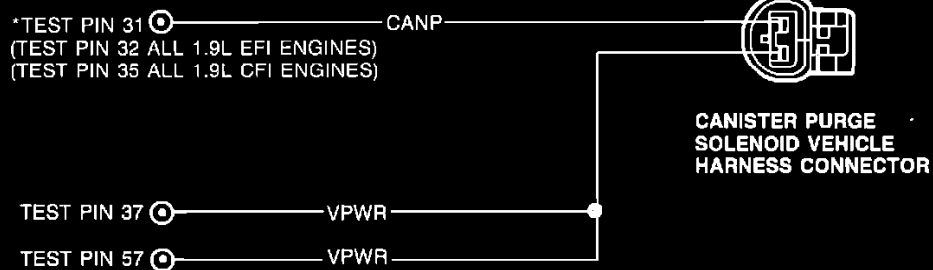
**Canister Purge (CANP)****Pinpoint  
Test****KD****Note**

You should enter this Pinpoint Test only when a Service Code 85 is received in Quick Test Step 3.0 or when you are directed here from a fuel control Pinpoint Test and Diagnostic By Symptom

**Remember**

This Pinpoint Test is intended to diagnose only the following:

- Harness Circuits: CANP and VPWR
- Processor Assembly

**Pinpoint Test Schematic**

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

**Pinpoint Test KD - Canister Purge (CANP)**







**Canister Purge (CANP)****Pinpoint  
Test****KD**

TEST STEP		RESULT	ACTION TO TAKE
<b>KD1</b>	ENTER OUTPUT STATE CHECK (REFER TO APPENDIX)		
<p><b>NOTE: Do not use STAR tester for this step, use VOM/DVOM.</b></p> <ul style="list-style-type: none"> <li>• Key off, wait 10 seconds.</li> <li>• DVOM on 20 volt scale.</li> <li>• Connect DVOM negative test lead to STO circuit at Self-Test connector and positive test lead to battery positive.</li> <li>• Jumper STI circuit to SIGNAL RETURN at the Self-Test connector.</li> <li>• Perform Key On Engine Off Self-Test until the completion of the Continuous Test Codes.</li> <li>• DVOM will indicate less than 1.0 volt when test is completed.</li> <li>• Depress and release the throttle.</li> <li>• Does voltage increase?</li> </ul>		<p>Yes</p> <p>No</p>	<p>REMAIN in Output State Check. GO to <b>KD2</b>.</p> <p>DEPRESS throttle to WOT and release. If STO voltage does not go high, GO to Pinpoint Test Step <b>QC1</b>. Leave equipment hooked up.</p>
<b>KD2</b>	CHECK CANISTER PURGE (CANP) SOLENOID ELECTRICAL OPERATION		
<ul style="list-style-type: none"> <li>• Key on engine off.</li> <li>• Disconnect CANP solenoid.</li> <li>• Connect DVOM positive test lead to VPWR circuit and negative test lead to CANP output circuit on the vehicle harness connector.</li> <li>• DVOM on 20 volt scale.</li> <li>• While observing DVOM depress and release the throttle several times to cycle output On and Off.</li> <li>• Does CANP circuit cycle On and Off?</li> </ul>		<p>Yes</p> <p>No</p>	<p>GO to <b>KD3</b>.</p> <p>REMOVE jumper. GO to <b>KD6</b>.</p>
<b>KD3</b>	CHECK CANISTER PURGE SOLENOID FOR VACUUM LEAKS		
<ul style="list-style-type: none"> <li>• Key on.</li> <li>• CANP solenoid disconnected.</li> <li>• Disconnect vacuum hose at canister purge solenoid on PCV side.</li> <li>• Apply 16 in. Hg. (53 kPa) of vacuum to PCV side of CANP solenoid.</li> <li>• Does CANP solenoid hold vacuum for 20 seconds?</li> </ul>		<p>Yes</p> <p>No</p>	<p>REMAIN in output state check. Leave vacuum pump setup in place. GO to <b>KD4</b>.</p> <p>REPLACE CANP solenoid. RERUN Quick Test.</p>

**Pinpoint Test KD1 Thru KD3 - Canister Purge (CANP)**

<b>Canister Purge (CANP)</b>		<b>Pinpoint Test</b>	<b>KD</b>
<b>TEST STEP</b>		<b>RESULT</b>	<b>ACTION TO TAKE</b>
<b>KD4</b>	<b>CHECK CANISTER PURGE SOLENOID FOR MECHANICAL OPERATION</b>		
<ul style="list-style-type: none"> <li>• Key on, engine off.</li> <li>• CANP circuit Off (no voltage).</li> <li>• Reconnect CANP solenoid connector.</li> <li>• Apply 16 in.-Hg. (53 kPa) of vacuum to PCV side of CANP solenoid.</li> <li>• Depress and release throttle.</li> <li>• Is vacuum released?</li> </ul>	<p>Yes</p> <p>No</p>	<p>CHECK hose from solenoid to canister for cracks, leaks, etc. If OK, REMOVE Jumper from STI to SIGNAL RETURN. GO to <b>KD5</b>.</p> <p>CHECK hose from solenoid to canister for blockage or kinks. If OK, REPLACE CANP solenoid. RERUN Quick Test.</p>	
<b>KD5</b>	<b>CHECK FOR VACUUM TO CANISTER PURGE SOLENOID</b>		
<ul style="list-style-type: none"> <li>• Disconnect vacuum hose at canister purge solenoid at PCV side.</li> <li>• Start engine.</li> <li>• Is vacuum present at engine vacuum hose?</li> </ul>	<p>Yes</p> <p>No</p>	<p>EEC-IV system OK.</p> <p>CHECK vacuum line for proper routing, kinks or blockage.</p>	
<b>KD6</b>	<b>MEASURE CANP SOLENOID RESISTANCE</b>		
<ul style="list-style-type: none"> <li>• Key off, wait 10 seconds.</li> <li>• DVOM on 200 ohm scale.</li> <li>• Disconnect CANP solenoid.</li> <li>• Measure solenoid resistance.</li> <li>• Is resistance between 40 and 90 ohms?</li> </ul>	<p>Yes</p> <p>No</p>	<p>GO to <b>KD7</b>.</p> <p>REPLACE CANP solenoid. RERUN Quick Test.</p>	
<b>KD7</b>	<b>CHECK VOLTAGE OF VPWR CIRCUIT</b>		
<ul style="list-style-type: none"> <li>• Key on, engine off.</li> <li>• CANP solenoid disconnected.</li> <li>• DVOM on 20 volt scale.</li> <li>• Measure voltage between VPWR at the CANP solenoid vehicle harness connector and battery ground.</li> <li>• Is voltage greater than 10.5 volts?</li> </ul>	<p>Yes</p> <p>No</p>	<p>GO to <b>KD8</b>.</p> <p>RECONNECT CANP solenoid. SERVICE harness open circuit. RERUN Quick Test.</p>	

Pinpoint Test KD4 Thru KD7 - Canister Purge (CANP)

<b>Canister Purge (CANP)</b>		<b>Pinpoint Test</b>	<b>KD</b>
<b>TEST STEP</b>		<b>RESULT</b>	<b>ACTION TO TAKE</b>
<b>KD8</b>	<b>CHECK CONTINUITY OF CANP CIRCUIT</b>		
<ul style="list-style-type: none"> <li>• Key off, wait 10 seconds.</li> <li>• CANP solenoid disconnected.</li> <li>• Disconnect processor 60 pin connectors. 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 Test Pin 31 (Test Pin 35 for 1.9L CFI engines, Test Pin 32 for 1.9L EFI engines) at the breakout box and CANP on the vehicle harness connector.</li> <li>• Is resistance less than 5 ohms?</li> </ul>		Yes  No 	GO to <b>KD9</b> .  REMOVE breakout box. RECONNECT processor and CANP solenoid. SERVICE open circuit. RERUN Quick Test.
<b>KD9</b>	<b>CHECK FOR SHORT TO GROUND</b>		
<ul style="list-style-type: none"> <li>• Key off, wait 10 seconds.</li> <li>• Breakout box installed, processor disconnected.</li> <li>• CANP solenoid disconnected.</li> <li>• DVOM on 200,000 ohm scale.</li> <li>• Measure resistance between Test Pin 31 (Test Pin 35 for 1.9L CFI engines, Test Pin 32 for 1.9L EFI engines) and Test Pins 40, 46 and 60 at the breakout box.</li> <li>• Are all resistances greater than 10,000 ohms?</li> </ul>		Yes  No 	GO to <b>KD10</b> .  REMOVE breakout box. RECONNECT processor and CANP solenoid. SERVICE short to ground. RERUN Quick Test.
<b>KD10</b>	<b>CHECK FOR SHORT TO POWER</b>		
<ul style="list-style-type: none"> <li>• Key off, wait 10 seconds.</li> <li>• CANP solenoid disconnected.</li> <li>• Breakout box installed, processor disconnected.</li> <li>• DVOM on 200,000 ohm scale.</li> <li>• Measure resistance between Test Pin 31 (Test Pin 35 for 1.9L CFI engines, Test Pin 32 for 1.9L EFI engines) and Test Pins 37 and 57 at the breakout box.</li> <li>• Are both resistances greater than 10,000 ohms?</li> </ul>		Yes  No 	RECONNECT CANP solenoid. REMOVE breakout box. REPLACE processor. RERUN Quick Test.  REMOVE breakout box. RECONNECT processor and CANP solenoid. SERVICE short to power. REPEAT Quick Test. If code is repeated, REPLACE processor. RERUN Quick Test.

Pinpoint Test KD8 Thru KD10 - Canister Purge (CANP)

## Idle Speed Control (Bypass Air)

## Pinpoint Test

**KE**

### Note

You should enter this Pinpoint Test only when a Service Code 12, 13, 16, 17, 47 or 48 is received in Quick Test Step 5.0 or when directed here from Diagnostic By Symptom

### Remember

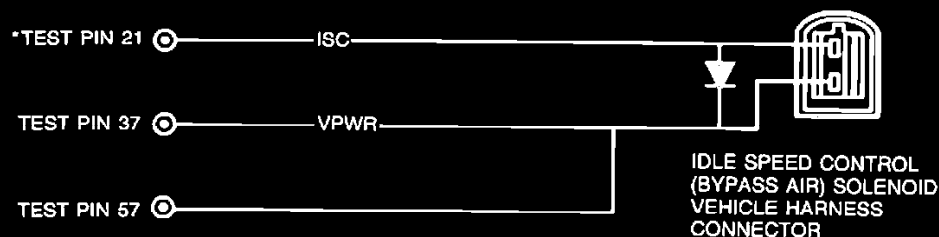
To prevent the replacement of good components, be aware that the following non-EEC areas may be at fault:

- Engine not up to operating temperature
- Engine over operating temperature
- Improper Idle Speed Throttle Stop Adjustment
- A/C input (electrical problem)
- Throttle Speed Control Linkage
- Throttle Sticking or Linkage Binding.

This Pinpoint Test is intended to diagnose only the following:

- Rpm in Self-Test only
- ISC Solenoid
- Harness Circuits ISC and VPWR
- Processor Assembly

### Pinpoint Test Schematic













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

Pinpoint Test KE - Idle Speed Control (Bypass Air)

## Idle Speed Control (Bypass Air)

## Pinpoint Test

## KE

TEST STEP		RESULT	ACTION TO TAKE
<b>KE1</b>	<b>CHECK FOR RPM DROP</b>		
	<ul style="list-style-type: none"> <li>• Key off.</li> <li>• Connect engine tachometer.</li> <li>• Start engine.</li> <li>• Disconnect ISC harness connector.</li> <li>• Does rpm drop or stall?</li> </ul>	Yes  No 	GO to <b>KE2</b> . GO to <b>KE3</b> .
<b>KE2</b>	<b>CHECK FOR EGR CODES</b>		
	<ul style="list-style-type: none"> <li>• Are Service Codes 31, 32, 33 or 34 present?</li> </ul>	Yes  No 	RECONNECT ISC solenoid. GO to Quick Test Step 5.0 for appropriate Pinpoint Test. GO to <b>KE3</b> .
<b>KE3</b>	<b>CHECK FOR OTHER EEC CODES</b>		
	<ul style="list-style-type: none"> <li>• Are Service Codes 22, 41, 42, 91 or 92 present?</li> </ul>	Yes  No 	RECONNECT ISC solenoid. For 1.9L EFI with Code 42 present, GO to <b>KE4</b> . All others GO to Quick Test Step 5.0 for appropriate Pinpoint Test. GO to <b>KE4</b> .
<b>KE4</b>	<b>MEASURE ISC SOLENOID RESISTANCE</b>		
	<ul style="list-style-type: none"> <li>• Key off.</li> <li>• ISC solenoid disconnected.</li> <li>• DVOM on 200 ohm scale.</li> <li>• Measure solenoid resistance.</li> <li>• Is resistance between 7.0 and 13.0 ohms?</li> </ul>	Yes  No 	GO to <b>KE5</b> . REPLACE ISC solenoid. RERUN Quick Test.
<b>KE5</b>	<b>CHECK FOR INTERNAL SHORT TO ISC SOLENOID CASE</b>		
	<ul style="list-style-type: none"> <li>• Key off.</li> <li>• ISC solenoid disconnected.</li> <li>• DVOM on 200,00 ohm scale.</li> <li>• Measure resistance from either ISC solenoid pin to ISC housing.</li> <li>• Is resistance greater than 10,000 ohms?</li> </ul>	Yes  No 	GO to <b>KE6</b> . REPLACE ISC solenoid. RERUN Quick Test.

Pinpoint Test KE1 Thru KE5 - Idle Speed Control (Bypass Air)

## Idle Speed Control (Bypass Air)

## Pinpoint Test

## KE

TEST STEP		RESULT	ACTION TO TAKE
<b>KE6</b>	CHECK VOLTAGE OF VPWR CIRCUIT		
<ul style="list-style-type: none"> <li>• Key on, engine off.</li> <li>• ISC solenoid disconnected.</li> <li>• DVOM on 20 volt scale.</li> <li>• Measure voltage between VPWR at the ISC solenoid harness connector and battery ground.</li> <li>• Is voltage less than 10.5 volts?</li> </ul>		Yes	SERVICE open circuit. RERUN Quick Test.
		No	GO to <b>KE7</b> .
<b>KE7</b>	CHECK CONTINUITY OF ISC CIRCUIT		
<ul style="list-style-type: none"> <li>• Key off, wait 10 seconds.</li> <li>• ISC solenoid disconnected.</li> <li>• Disconnect processor and inspect both 60 pin connectors 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 Test Pin 21 at the breakout box and ISC circuit at vehicle harness connector.</li> <li>• Is resistance greater than 5 ohms?</li> </ul>		Yes	SERVICE open circuit. REMOVE breakout box. RECONNECT processor and ISC solenoid. RERUN Quick Test.
		No	GO to <b>KE8</b> .
<b>KE8</b>	CHECK ISC CIRCUIT FOR SHORT TO GROUND		
<ul style="list-style-type: none"> <li>• Key off, wait 10 seconds.</li> <li>• Breakout box installed and processor disconnected.</li> <li>• ISC solenoid disconnected.</li> <li>• DVOM on 200,000 ohm scale.</li> <li>• Measure resistance between Test Pin 21 and Test Pins 40, 46 and 60 at the breakout box.</li> <li>• Is any resistance less than 10,000 ohms?</li> </ul> <p><b>NOTE: Placement of probes for DVOM D.</b></p>		Yes	SERVICE short circuit. REMOVE breakout box. RECONNECT processor and ISC solenoid. RERUN Quick Test.
		No	GO to <b>KE9</b> .

### Pinpoint Test KE6 Thru KE8 - Idle Speed Control (Bypass Air)

Idle Speed Control (Bypass Air)		Pinpoint Test	KE
TEST STEP		RESULT	ACTION TO TAKE
<b>KE9</b>	<b>CHECK FOR SHORT TO POWER</b>		
<ul style="list-style-type: none"> <li>• Key off, wait 10 seconds.</li> <li>• ISC solenoid disconnected.</li> <li>• Breakout box installed and processor disconnected.</li> <li>• DVOM on 200,000 ohm scale.</li> <li>• Measure resistance between Test Pin 37 and Test Pin 21 at the breakout box.</li> <li>• Is resistance greater than 10,000 ohms?</li> </ul>		Yes ▶  No ▶	GO to <b>KE10</b> .  SERVICE short circuit. REMOVE breakout box. RECONNECT processor and ISC solenoid. RERUN Quick Test. If code or symptom is present, REPLACE processor.
<b>KE10</b>	<b>CHECK FOR ISC SIGNAL FROM THE PROCESSOR</b>		
<ul style="list-style-type: none"> <li>• Key off.</li> <li>• Reconnect ISC solenoid.</li> <li>• Breakout box installed.</li> <li>• Connect processor to breakout box.</li> <li>• DVOM on a 20 volt scale.</li> <li>• Connect DVOM between Test-Pin 21 and Test Pin 40.</li> <li>• Start engine.</li> <li>• Slowly increase and decrease rpm.</li> <li>• Does DVOM voltage vary?</li> </ul>		Yes ▶  No ▶	GO to <b>KE11</b> .  REMOVE breakout box. REPLACE processor. RERUN Quick Test.
<b>KE11</b>	<b>CHECK CURB IDLE</b>		
<ul style="list-style-type: none"> <li>• Is curb idle within specification?</li> <li>• Refer to Section 4 for curb idle set procedure.</li> </ul>		Yes ▶  No ▶	REMOVE breakout box. RECONNECT processor. REPLACE ISC solenoid. RERUN Quick Test.  REMOVE breakout box. RECONNECT processor. CHECK engine vacuum hoses. REFER to VECI decal. CHECK that throttle plates are fully closed, CHECK throttle linkage and/or speed control linkage for binding. If OK, REPLACE ISC solenoid. RERUN Quick Test.

Pinpoint Test KE9 Thru KE11 - Idle Speed Control (Bypass Air)

Idle Speed Control (Bypass Air)		Pinpoint Test	KE
TEST STEP		RESULT	ACTION TO TAKE
<b>KE12</b>	CODE 19: LOW ISC RPM		
<ul style="list-style-type: none"> <li>• Key off, wait 10 seconds.</li> <li>• Deactivate Self-Test.</li> <li>• Run engine at 2000 rpm for 2 minutes or until inlet radiator hose is hot and pressurized.</li> <li>• Key off, wait 10 seconds.</li> <li>• Rerun Engine Running Self-Test.</li> <li>• Does engine stumble and/or is code 19 still present?</li> </ul>		Yes	INSPECT throttle body and air inlet for contamination. SERVICE as necessary. If OK, ADJUST curb idle  RERUN Quick Test.
		No	SERVICE other codes as necessary.
<b>KE13</b>	CODE 17: LOW ISC RPM		
<p><b>NOTE: Check and correct excessive engine load problems like cooling fan running, lights on, etc.</b></p> <ul style="list-style-type: none"> <li>• Run engine at 2000 rpm for 2 minutes or until inlet radiator hose is hot and pressurized.</li> <li>• Key off, wait 10 seconds.</li> <li>• Rerun Engine Running Self-Test.</li> <li>• Is Code 17 still present?</li> </ul>		Yes	INSPECT throttle body and air inlet for contamination. SERVICE as necessary. If OK ADJUST curb idle  RERUN Quick Test.
		No	SERVICE other codes as necessary.
<b>KE15</b>	CODE 13: HIGH ISC RPM		
<ul style="list-style-type: none"> <li>• Key off.</li> <li>• Connect tachometer.</li> <li>• Start engine.</li> <li>• Disconnect ISC harness connector.</li> <li>• Does rpm drop or engine stall?</li> </ul>		Yes	INSPECT throttle body and air inlet for contamination. SERVICE as necessary. If OK, REPLACE processor. RERUN Quick Test.
		No	CHECK engine vacuum hoses. REFER to VECI decal. VERIFY curb idle. CHECK that throttle plates are fully closed, CHECK throttle linkage and/or speed control linkage for binding. If OK, REPLACE ISC solenoid. RERUN Quick Test.

Pinpoint Test KE12 Thru KE15 - Idle Speed Control (Bypass Air)

Idle Speed Control (Bypass Air)		Pinpoint Test	KE
TEST STEP		RESULT	ACTION TO TAKE
<b>KE20</b>	<b>CODE 47: CHECK FOR LOW FLOW UNMETERED AIR</b>		
<ul style="list-style-type: none"> <li>• Check for holes, cracks, and/or disconnections in fuel charging assembly (manifold gaskets, vacuum lines, vacuum tree, etc).</li> <li>• Check for stuck-open purge solenoid and/or injector O-rings.</li> <li>• Are any faults present?</li> </ul>		Yes	SERVICE as necessary. RERUN Quick Test.
		No	EEC system OK for metered air. GO to Quick Test Step <b>5.0B</b> to service other code if necessary.
<b>KE21</b>	<b>CODE 48: CHECK FOR HIGH FLOW UNMETERED AIR</b>		
<ul style="list-style-type: none"> <li>• Check for holes, cracks, and/or disconnections in air cleaner outlet tube (between vane airflow meter and fuel charging assembly).</li> <li>• Check for loss of ignition or fuel on one or more cylinder(s).</li> </ul>		Yes	SERVICE as necessary. RERUN Quick Test.
		No	EEC system OK for metered air. GO to Quick Test Step <b>5.0B</b> to SERVICE other code if necessary.
<b>KE22</b>	<b>CODE 16: HIGH ISC RPM</b>		
<ul style="list-style-type: none"> <li>• Is Code 48 present?</li> </ul>		Yes	RESET throttle plate. REFER to VECL decal for curb idle set procedure. RERUN Quick Test. If Code 48 is still present, GO to <b>KE21</b> .
		No	CHECK for vacuum leaks at injector O-rings, purge solenoid, vacuum lines/fittings, excessive PCV, or inlet pin leak between air meter and throttle body. SERVICE as necessary. RERUN Quick Test.

Pinpoint Test KE20 Thru KE22 - Idle Speed Control (Bypass Air)

## Shift Indicator Light (SIL)

## Pinpoint Test

## KL

### Note

You should enter this Pinpoint Test only when directed here from Diagnostic By Symptom or from Pinpoint Test Step QA9.

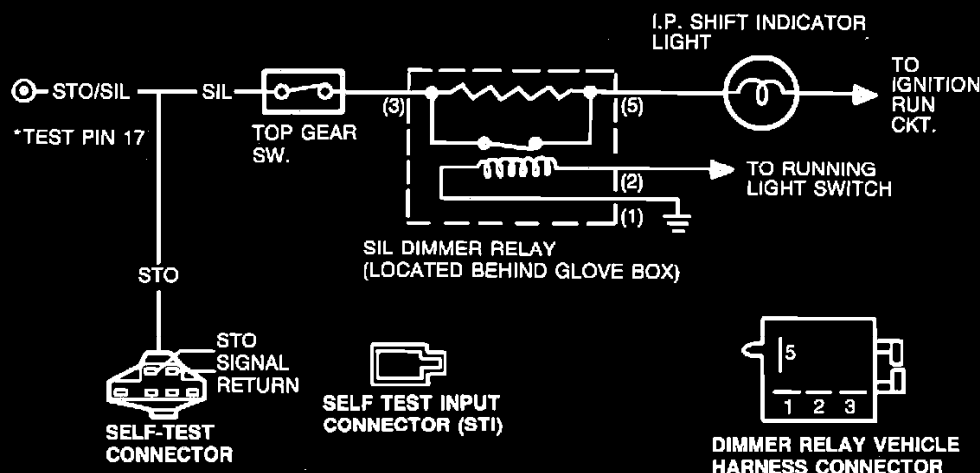
### Remember

This Pinpoint Test is intended to diagnose only the following:

- Harness Circuits: SIL and STO
- Top Gear Switch
- SIL Dimmer Relay
- Shift Indicator Light Bulb and Fuse

### Pinpoint Test Schematic

1.9L EFI



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

Pinpoint Test KL - Shift Indicator Light (SIL)

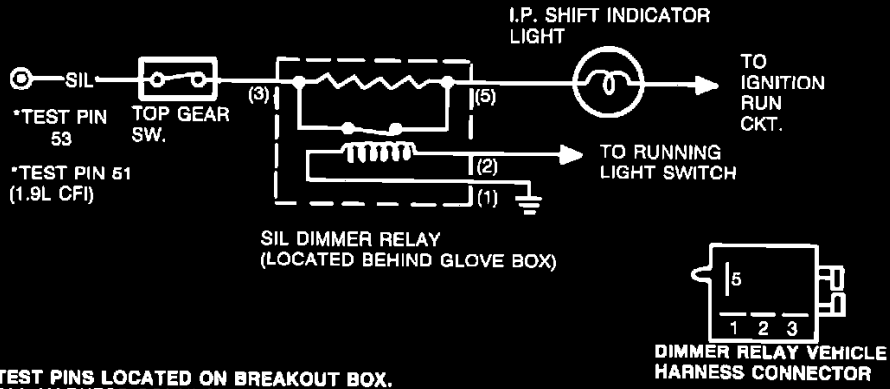
# Shift Indicator Light (SIL)

# Pinpoint Test

**KL**

## Pinpoint Test Schematic

ALL OTHERS



Pinpoint Test KL - Shift Indicator Light (SIL)

## Shift Indicator Light (SIL)

## Pinpoint Test

## KL

TEST STEP		RESULT	ACTION TO TAKE
<b>KL1</b>	CHECK SIL OPERATION		
<p><b>NOTE:</b> To verify SIL operation, inspect the SIL while driving the vehicle. The SIL should turn on when the optimum shift speed is reached in each gear and remain off while in the highest gear.</p> <p>If the SIL is always on, look for a short to ground in the SIL circuit. If the SIL is always off, look for an open in the SIL circuit.</p> <ul style="list-style-type: none"> <li>• Is SIL on all the time?</li> </ul>		<p>Yes</p> <p>No</p>	<p>GO to <b>KL6</b>.</p> <p>GO to <b>KL2</b>.</p>
<b>KL2</b>	CHECK SIL CIRCUIT FUSE		
<ul style="list-style-type: none"> <li>• Key off, wait 10 seconds.</li> <li>• Remove SIL circuit fuse (#18) and inspect.</li> <li>• Is fuse OK?</li> </ul>		<p>Yes</p> <p>No</p>	<p>GO to <b>KL3</b>.</p> <p>SERVICE short to ground between fuse and SIL bulb. REPLACE SIL fuse. VERIFY SIL operation.</p>
<b>KL3</b>	CHECK SIL BULB		
<ul style="list-style-type: none"> <li>• Key off.</li> <li>• Remove SIL bulb and inspect.</li> <li>• Is bulb OK?</li> </ul>		<p>Yes</p> <p>No</p>	<p>GO to <b>KL4</b>.</p> <p>REPLACE SIL bulb. VERIFY SIL operation.</p>
<b>KL4</b>	CHECK SIL DIMMER RELAY CONTINUITY		
<ul style="list-style-type: none"> <li>• Key off.</li> <li>• Disconnect SIL dimmer relay.</li> <li>• DVOM on 200 ohm scale.</li> <li>• Measure resistance between Pins 3 and 5 on SIL dimmer relay.</li> <li>• Is resistance less than 5 ohms?</li> </ul>		<p>Yes</p> <p>No</p>	<p>GO to <b>KL5</b>.</p> <p>REPLACE SIL dimmer relay. VERIFY SIL operation.</p>

Pinpoint Test KL1 Thru KL4 - Shift Indicator Light (SIL)

## Shift Indicator Light (SIL)

## Pinpoint Test

## KL

TEST STEP		RESULT	ACTION TO TAKE
<b>KL5</b>	<b>CHECK SIL DIMMER RELAY FUNCTION</b>		
	<ul style="list-style-type: none"> <li>• Key off.</li> <li>• SIL dimmer relay disconnected.</li> <li>• Apply 12 volts across Pins 1 and 2 on the SIL dimmer relay.</li> <li>• DVOM on 200 ohm scale.</li> <li>• Measure resistance between Pins 3 and 5 on SIL dimmer relay.</li> <li>• Is resistance between 40 ohms and 55 ohms?</li> </ul>	Yes ▶  No ▶	GO to <b>KL6</b> .  REPLACE SIL dimmer relay. VERIFY SIL operation.
<b>KL6</b>	<b>CHECK VOLTAGE AT SIL DIMMER RELAY</b>		
	<ul style="list-style-type: none"> <li>• Key on, engine off.</li> <li>• Disconnect SIL dimmer relay.</li> <li>• DVOM on 20 volt scale.</li> <li>• Measure voltage between Test Pin 5 on the SIL dimmer relay vehicle harness connector and the battery negative post.</li> <li>• Is voltage greater than 5 volts?</li> </ul>	Yes ▶  No ▶	RECONNECT SIL dimmer relay. GO to <b>KL7</b> .  SERVICE circuit between SIL dimmer relay and SIL fuse. VERIFY SIL operation.
<b>KL7</b>	<b>CHECK VOLTAGE AT TOP GEAR SWITCH</b>		
	<ul style="list-style-type: none"> <li>• Key on, engine off.</li> <li>• Disconnect top gear switch.</li> <li>• DVOM on 20 volt scale.</li> <li>• Measure voltage between the SIL dimmer relay side of the top gear switch vehicle harness connector and the battery negative post.</li> <li>• Is voltage greater than 5 volts?</li> </ul>	Yes ▶  No ▶	GO to <b>KL8</b> .  SERVICE circuit between top gear switch and SIL dimmer relay. VERIFY SIL operation.
<b>KL8</b>	<b>CHECK OPERATION OF TOP GEAR SWITCH</b>		
	<ul style="list-style-type: none"> <li>• Key off, wait 10 seconds.</li> <li>• Top gear switch disconnected.</li> <li>• DVOM on 200 ohm scale.</li> <li>• Measure resistance of top gear switch while shifting the transmission from the highest gear to the next lower gear.</li> <li>• Does circuit open and close?</li> </ul>	Yes ▶  No ▶	GO to <b>KL9</b> .  REPLACE top gear switch. VERIFY SIL operation.

Pinpoint Test KL5 Thru KL8 - Shift Indicator Light (SIL)

Shift Indicator Light (SIL)		Pinpoint Test	KL
TEST STEP		RESULT	ACTION TO TAKE
<b>KL9</b>	CHECK CONTINUITY OF SIL CIRCUIT		
<ul style="list-style-type: none"> <li>• Key off.</li> <li>• Top gear switch disconnected.</li> <li>• Install breakout box, leave processor disconnected.</li> <li>• DVOM on 200 ohm scale.</li> <li>• Measure resistance between Test Pin 53 (Test Pin 51 on 1.9L CFI or Test Pin 17 on 1.9L EFI) and the processor side of the top gear switch vehicle harness connector.</li> <li>• Is resistance less than 5 ohms?</li> </ul>		Yes	RECONNECT top gear switch. Shift transmission into highest gear. GO to <b>KL10</b> .
		No	SERVICE open circuit between the top gear switch and the processor. VERIFY SIL operation.
<b>KL10</b>	CHECK SIL CIRCUIT FOR SHORT TO GROUND		
<ul style="list-style-type: none"> <li>• Key off.</li> <li>• Transmission in highest gear.</li> <li>• Breakout box installed and processor disconnected.</li> <li>• DVOM on 200 ohm scale.</li> <li>• Measure resistance between Test Pin 53 (Test Pin 51 on 1.9L CFI or Test Pin 17 on 1.9L EFI) and Test Pin 60.</li> <li>• Is resistance greater than 100,000 ohms?</li> </ul>		Yes	RERUN Quick Test and CHECK ECT and map circuits for influence on SIL system. If OK, REPLACE processor.
		No	SERVICE short to ground between top gear switch and processor (on 1.9L EFI, also CHECK STO circuit for short to ground). VERIFY SIL operation.

Pinpoint Test KL9 &amp; KL10 - Shift Indicator Light (SIL)

## WOT A/C Cutoff (WAC) A/C Demand

## Pinpoint Test

## KM

### Note

You should enter this Pinpoint Test only when directed here from Diagnostic By Symptom

### Remember

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

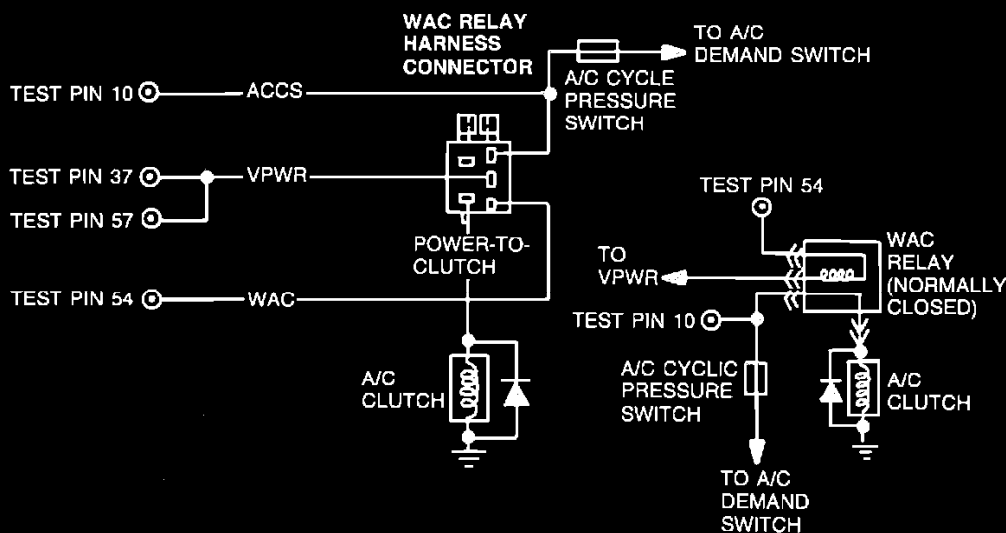
- Fuse
- Non-Electrical A/C components
- Refrigerant charge

This Pinpoint Test is intended to diagnose only the following:

- Harness Circuits: WAC, VPWR, GROUND, POWER-TO-CLUTCH, ACD
- WAC Relay or A/C fan controller
- Processor assembly

### Pinpoint Test Schematic

APPLICATIONS: 3.8L EFI RWD, 5.0L SEFI, 5.0L SEFI MA, 2.9L EFI TRUCK, 3.0L EFI TRUCK



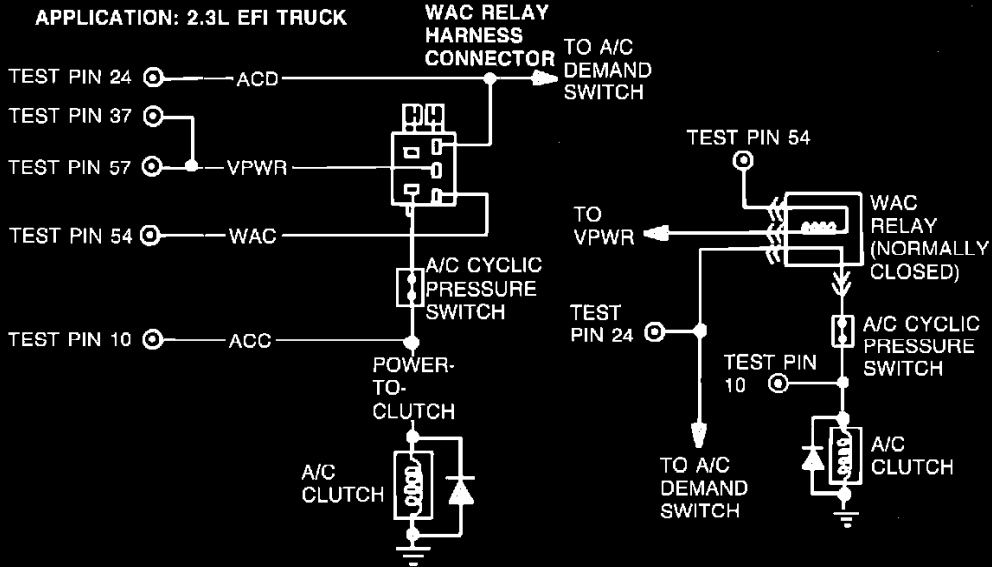
Pinpoint Test KM - WOT A/C Cutoff (WAC) A/C Demand

# WOT A/C Cutoff (WAC) A/C Demand

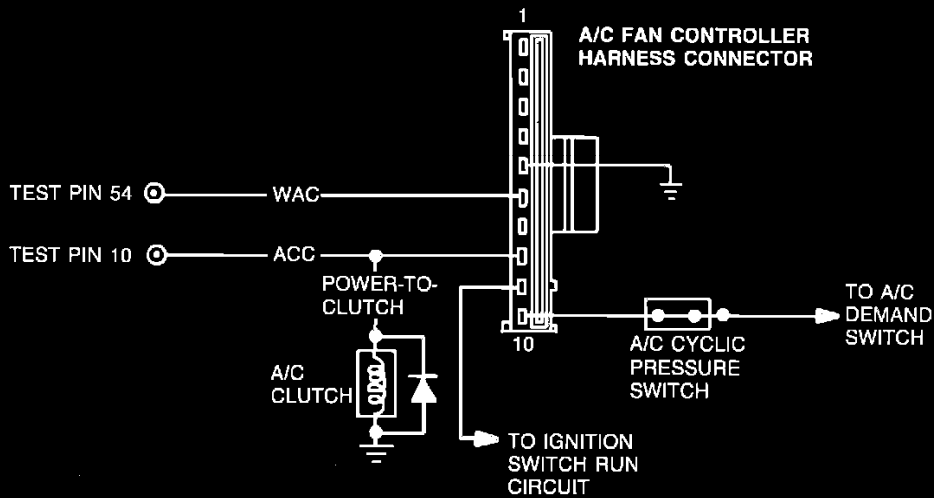
## Pinpoint Test

KM

### Pinpoint Test Schematic



**APPLICATIONS: 1.9L CFI, 1.9L EFI**



Pinpoint Test KM - WOT A/C Cutoff (WAC) A/C Demand

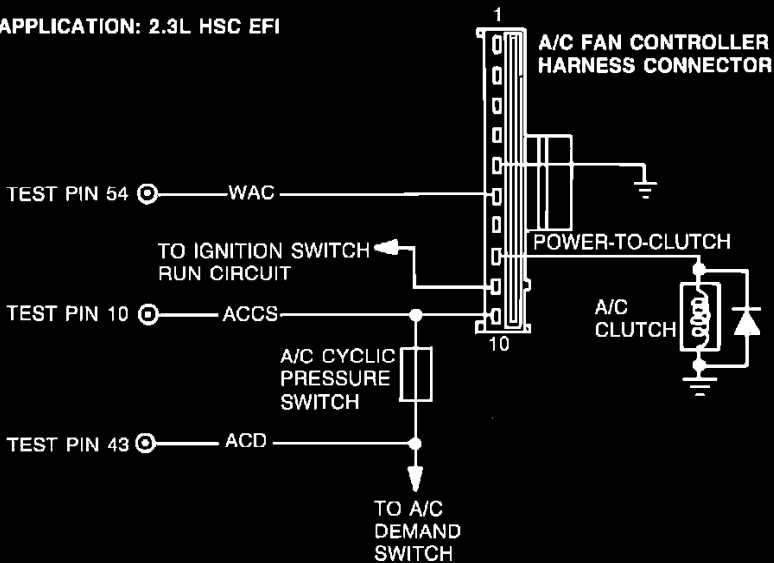
# WOT A/C Cutoff (WAC) A/C Demand

# Pinpoint Test

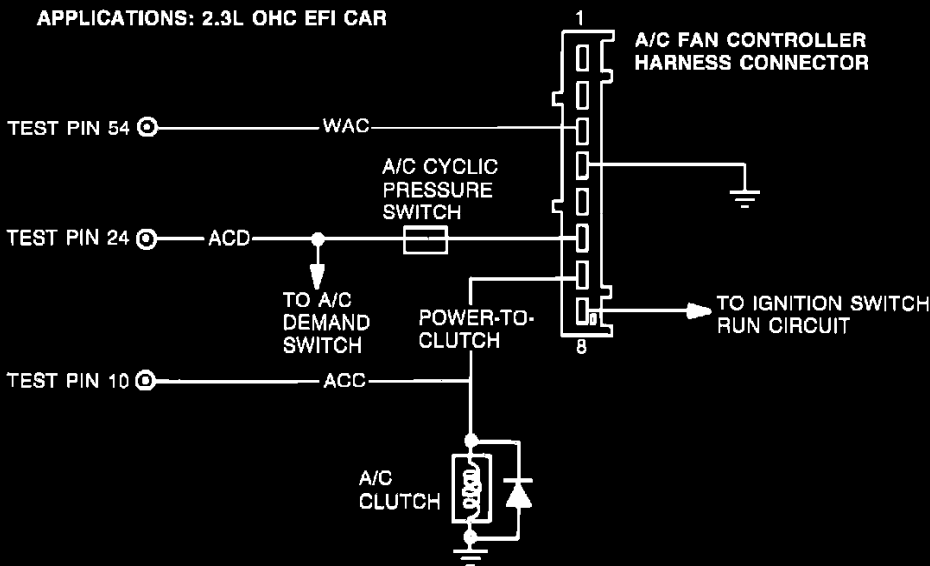
# KM

## Pinpoint Test Schematic

APPLICATION: 2.3L HSC EFI



APPLICATIONS: 2.3L OHC EFI CAR



Pinpoint Test KM - WOT A/C Cutoff (WAC) A/C Demand

<b>WOT A/C Cutoff (WAC) A/C Demand</b>		<b>Pinpoint Test</b>	<b>KM</b>
<b>TEST STEP</b>		<b>RESULT</b>	<b>ACTION TO TAKE</b>
<b>KM1</b>	<b>NO A/C: CHECK FOR VOLTAGE AT A/C CLUTCH</b>		
<p><b>NOTE: Before proceeding with "NO A/C" diagnostics, verify integrity of related fuses in fuse panel.</b></p> <ul style="list-style-type: none"> <li>• Key on, engine off.</li> <li>• Disconnect harness from A/C clutch.</li> <li>• A/C switch to A/C.</li> <li>• DVOM on 20 volt scale.</li> <li>• Measure voltage between the power side of the A/C clutch harness connector and battery negative post.</li> <li>• Is voltage greater than 10.5 volts?</li> </ul>		<p>Yes</p> <p>No</p>	<p>EEC-IV system OK.</p> <p>GO to <b>KM2</b>.</p>
<b>KM2</b>	<b>CHECK CONTINUITY OF POWER-TO-CLUTCH CIRCUIT</b>		
<p><b>NOTE: Applications with WAC relay: 3.8L EFI RWD, 5.0L SEFI, 5.0L SEFI MA, 2.3L EFI TRK, 2.9L EFI TRK, 3.0L EFI TRK.</b></p> <p><b>Applications with A/C fan controller: 1.9L CFI, 1.9L EFI, 2.3L HSC, 2.3L EFI OHC car.</b></p> <ul style="list-style-type: none"> <li>• Key off.</li> <li>• A/C clutch harness disconnected.</li> <li>• Disconnect harness from WAC relay or A/C FAN controller.</li> <li>• DVOM on 200 ohm scale.</li> <li>• Measure resistance between power side of the A/C clutch harness connector and POWER-TO-CLUTCH pin at the WAC relay or A/C fan controller harness connector.</li> <li>• Is resistance less than 5.0 ohms?</li> </ul>		<p>Yes</p> <p>No</p>	<p>RECONNECT A/C clutch. GO to <b>KM3</b>.</p> <p>2.3L EFI TRK: VERIFY operation of A/C cyclic pressure switch.</p> <p>If OK, SERVICE open circuit.</p> <p>All others: SERVICE open circuit.</p> <p>RECONNECT A/C clutch and WAC relay or A/C fan controller. RE-EVALUATE symptom.</p>

Pinpoint Test KM1 &amp; KM2 - WOT A/C Cutoff (WAC) A/C Demand

<b>WOT A/C Cutoff (WAC) A/C Demand</b>		<b>Pinpoint Test</b>	<b>KM</b>
<b>TEST STEP</b>		<b>RESULT</b>	<b>ACTION TO TAKE</b>
<b>KM3</b>	<b>CHECK FOR POWER ON A/C DEMAND CIRCUIT</b>		
<ul style="list-style-type: none"> <li>• Key on, engine off.</li> <li>• WAC relay or A/C fan controller disconnected.</li> <li>• A/C switch to A/C.</li> <li>• DVOM on 20 volt scale.</li> <li>• Measure voltage between A/C demand input pin at WAC relay or A/C fan controller harness connector and chassis ground.</li> <li>• Is voltage greater than 10.5 volts?</li> </ul>		<p>Yes ▶</p> <p>No ▶</p>	<p>GO to <b>KM4</b> .</p> <p>2.3L EFI TRK: VERIFY operation of A/C demand switch. If OK, SERVICE open circuit.</p> <p>All others: VERIFY operation of A/C cyclic pressure switch and A/C demand switch.</p> <p>If OK, SERVICE open circuit.</p> <p>RECONNECT WAC relay or A/C fan controller. RE-EVALUATE symptom.</p>
<b>KM4</b>	<b>CHECK FOR WAC CIRCUIT SHORT TO GROUND</b>		
<ul style="list-style-type: none"> <li>• Key off.</li> <li>• WAC relay or A/C fan controller disconnected.</li> <li>• Disconnect processor 60 pin connector. Inspect for damaged pins, corrosion, loose wires, etc. Service as necessary. Leave processor disconnected.</li> <li>• DVOM on 200,000 ohm scale.</li> <li>• Measure resistance between WAC circuit at the WAC relay or A/C fan controller harness connector and chassis ground.</li> <li>• Is resistance greater than 10,000 ohms?</li> </ul>		<p>Yes ▶</p> <p>No ▶</p>	<p>A/C fan controller applications: GO to <b>KM5</b> .</p> <p>WAC relay applications: GO to <b>KM7</b> .</p> <p>SERVICE short circuit. RECONNECT processor and WAC relay or A/C fan controller. RE-EVALUATE symptom.</p>

Pinpoint Test KM3 &amp; KM4 - WOT A/C Cutoff (WAC) A/C Demand

<b>WOT A/C Cutoff (WAC) A/C Demand</b>		<b>Pinpoint Test</b>	<b>KM</b>
<b>TEST STEP</b>		<b>RESULT</b>	<b>ACTION TO TAKE</b>
<b>KM5</b>	<b>CHECK FOR GROUND TO A/C FAN CONTROLLER</b>		
<ul style="list-style-type: none"> <li>• Key off.</li> <li>• A/C fan controller disconnected.</li> <li>• Processor disconnected.</li> <li>• DVOM on 200 ohm scale.</li> <li>• Measure resistance between ground circuit at A/C fan controller harness connector and chassis ground.</li> <li>• Is resistance less than 5.0 ohms?</li> </ul>		Yes ▶  No ▶	GO to <b>KM6</b> .  SERVICE open circuit. RECONNECT processor and A/C fan controller. RE-EVALUATE symptom.
<b>KM6</b>	<b>CHECK FOR VOLTAGE TO A/C FAN CONTROLLER</b>		
<ul style="list-style-type: none"> <li>• Key on.</li> <li>• A/C fan controller disconnected.</li> <li>• Processor disconnected.</li> <li>• DVOM on 20 volt scale.</li> <li>• Measure voltage between Ignition Switch run circuit at the A/C fan controller harness connector and chassis ground.</li> <li>• Is voltage greater than 10.5 volts?</li> </ul>		Yes ▶  No ▶	GO to <b>KM7</b> .  SERVICE open circuit. RECONNECT processor A/C fan controller. RE-EVALUATE symptom.
<b>KM7</b>	<b>CHECK WAC RELAY, A/C FAN CONTROLLER</b>		
<ul style="list-style-type: none"> <li>• Key off.</li> <li>• Processor disconnected.</li> <li>• Reconnect WAC relay or A/C fan controller.</li> <li>• Disconnect harness from A/C clutch.</li> <li>• DVOM on 20 volt scale.</li> <li>• Key on, engine off.</li> <li>• A/C switch to A/C.</li> <li>• Measure voltage between the power side of the A/C clutch harness connector and the battery negative post.</li> <li>• Is voltage greater than 10.5 volts?</li> </ul>		Yes ▶  No ▶	REPLACE processor. RECONNECT A/C clutch. RE-EVALUATE symptom.  REPLACE WAC relay or A/C fan controller. RECONNECT processor and A/C clutch. RE-EVALUATE symptom.

Pinpoint Test KM5 Thru KM7 - WOT A/C Cutoff (WAC) A/C Demand

## WOT A/C Cutoff (WAC) A/C Demand

## Pinpoint Test

## KM

TEST STEP	RESULT	ACTION TO TAKE
<b>KM17</b> CHECK FOR WAC CYCLING		
<ul style="list-style-type: none"> <li>• Still in output state check.</li> <li>• Disconnect A/C fan controller.</li> <li>• DVOM on 20 volt scale.</li> <li>• Connect DVOM positive test lead to the Ignition Run circuit and the negative test lead to the WAC circuit at the A/C fan controller harness connector.</li> <li>• While observing DVOM, depress and release throttle several times (to cycle output on and off).</li> <li>• Does voltage cycle high and low?</li> </ul>	<p>Yes</p> <p>No</p>	<p>REPLACE A/C fan controller. REMOVE jumper. RE-EVALUATE symptom.</p> <p>REMOVE jumper. GO to <b>KM18</b>.</p>
<b>KM18</b> CHECK CONTINUITY OF WAC CIRCUIT		
<ul style="list-style-type: none"> <li>• Key off.</li> <li>• Disconnect processor 60 pin connector. Inspect for damaged pins, corrosion, loose wires, etc. Service as necessary.</li> <li>• Connect breakout box to harness, leave processor disconnected.</li> <li>• A/C fan controller disconnected.</li> <li>• Measure resistance between Test Pin 54 at the breakout box and WAC circuit at the WAC relay harness connector.</li> <li>• Is resistance less than 5.0 ohms?</li> </ul>	<p>Yes</p> <p>No</p>	<p>GO to <b>KM19</b>.</p> <p>SERVICE open circuit. REMOVE breakout box. RECONNECT processor and A/C fan controller. RE-EVALUATE symptom.</p>
<b>KM19</b> CHECK FOR SHORT TO POWER		
<ul style="list-style-type: none"> <li>• Key off.</li> <li>• Breakout box installed, processor disconnected.</li> <li>• A/C fan controller disconnected.</li> <li>• DVOM on 200,000 ohm scale.</li> <li>• Measure resistance between Test Pin 54 and Test Pins 37 and 57 at the breakout box.</li> <li>• Are both resistances greater than 10,000 ohms?</li> </ul>	<p>Yes</p> <p>No</p>	<p>REPLACE processor. RECONNECT A/C fan controller. RE-EVALUATE symptom.</p> <p>SERVICE short circuit. REMOVE breakout box. RECONNECT processor and A/C fan controller. RE-EVALUATE symptom. If symptom is still present, REPLACE processor.</p>

### Pinpoint Test KM17 Thru KM19 - WOT A/C Cutoff (WAC) A/C Demand

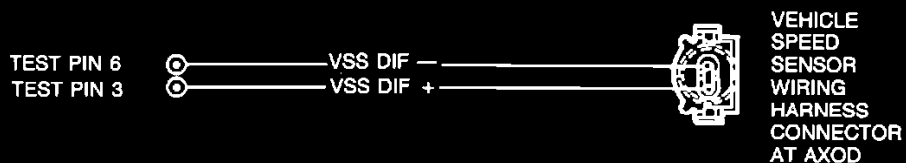
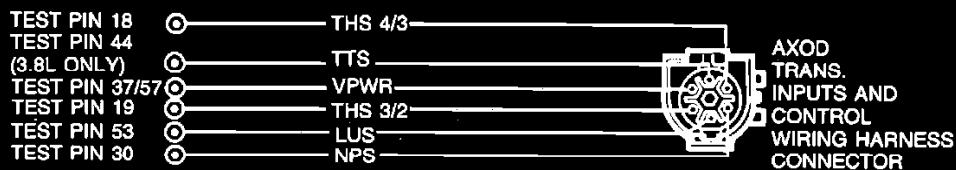
# Transmission — AXOD

# Pinpoint Test

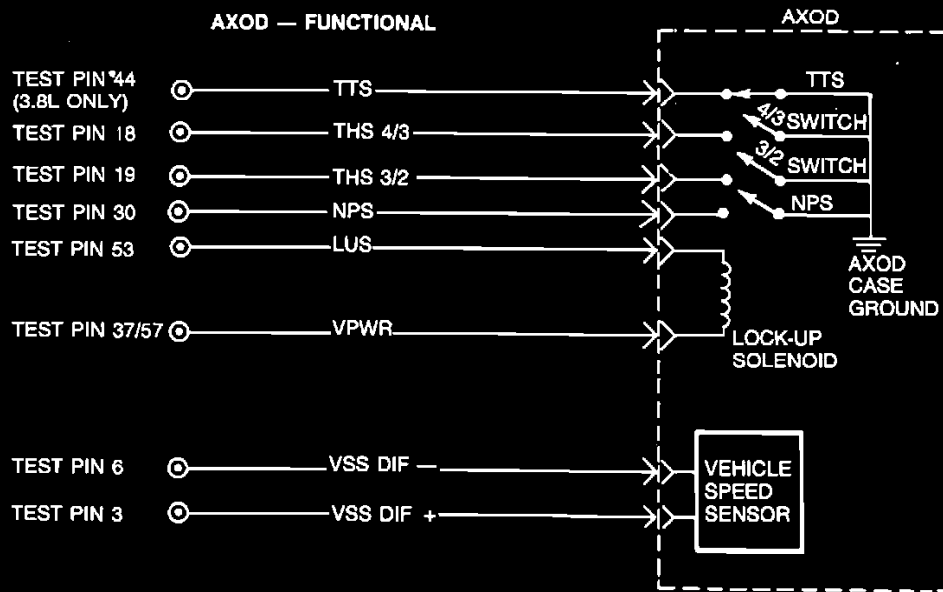
T

## Pinpoint Test Schematic

### AXOD — HARNESS CONNECTIONS



### AXOD — FUNCTIONAL



Pinpoint Test KM10 Thru KM12 - WOT A/C Cutoff (WAC) A/C Demand

<b>WOT A/C Cutoff (WAC) A/C Demand</b>		<b>Pinpoint Test</b>	<b>KM</b>
<b>TEST STEP</b>		<b>RESULT</b>	<b>ACTION TO TAKE</b>
<b>KM13</b>	<b>CHECK FOR WAC CYCLING</b>		
<ul style="list-style-type: none"> <li>• Still in output state check.</li> <li>• WAC relay disconnected.</li> <li>• DVOM on 20 volt scale.</li> <li>• Connect DVOM positive test lead to the VPWR circuit and the negative test lead to the WAC circuit at the WAC relay harness connector.</li> <li>• While observing DVOM, depress and release throttle several times (to cycle output on and off).</li> <li>• Does voltage cycle high and low?</li> </ul>		<p>Yes</p> <p>No</p>	<p>REPLACE WAC relay. REMOVE jumper. RE-EVALUATE symptom.</p> <p>REMOVE jumper. GO to <b>KM14</b>.</p>
<b>KM14</b>	<b>CHECK CONTINUITY OF WAC CIRCUIT</b>		
<ul style="list-style-type: none"> <li>• Key off.</li> <li>• Disconnect processor 60 pin connector. Inspect for damaged pins, corrosion, loose wires, etc. Service as necessary.</li> <li>• Connect breakout box to harness, leave processor disconnected.</li> <li>• WAC relay disconnected.</li> <li>• Measure resistance between Test Pin 54 at the breakout box and WAC circuit at the WAC relay harness connector.</li> <li>• Is resistance less than 5.0 ohms?</li> </ul>		<p>Yes</p> <p>No</p>	<p>GO to <b>KM15</b>.</p> <p>SERVICE open circuit. REMOVE breakout box. RECONNECT processor and WAC relay. RE-EVALUATE symptom.</p>
<b>KM15</b>	<b>CHECK FOR SHORT TO POWER</b>		
<ul style="list-style-type: none"> <li>• Key off.</li> <li>• Breakout box installed, processor disconnected.</li> <li>• WAC relay disconnected.</li> <li>• DVOM on 200,000 ohm scale.</li> <li>• Measure resistance between Test Pin 54 and Test Pins 37 and 57 at the breakout box.</li> <li>• Are both resistances greater than 10,000 ohms?</li> </ul>		<p>Yes</p> <p>No</p>	<p>REPLACE processor. RECONNECT WAC relay. RE-EVALUATE symptom.</p> <p>SERVICE short circuit. REMOVE breakout box. RECONNECT processor and WAC relay. RE-EVALUATE symptom. IF symptom is still present, REPLACE processor.</p>

Pinpoint Test KM13 Thru KM15 - WOT A/C Cutoff (WAC) A/C Demand

<b>WOT A/C Cutoff (WAC) A/C Demand</b>		<b>Pinpoint Test</b>	<b>KM</b>
<b>TEST STEP</b>		<b>RESULT</b>	<b>ACTION TO TAKE</b>
<b>KM20</b>	<b>CYCLE A/C DEMAND SWITCH</b>		
<ul style="list-style-type: none"> <li>• Key off, wait 10 seconds.</li> <li>• Disconnect processor 60 pin connector. Inspect for damaged pins, corrosion, loose wires, etc. Service as necessary.</li> <li>• Connect breakout box to harness, leave processor disconnected.</li> <li>• DVOM on 20 volt scale.</li> <li>• Key on, engine off.</li> <li>• Connect DVOM positive test lead to Test Pin 24 (Test Pin 43 for 2.3L HSC EFI) and negative test lead to Test Pin 40.</li> <li>• Does voltage cycle high and low when A/C switch is cycled?</li> </ul>		<p>Yes ▶</p> <p>No ▶</p>	<p>REMOVE breakout box. REPLACE processor. RERUN Quick Test.</p> <p>GO to <b>KM21</b>.</p>
<b>KM21</b>	<b>CHECK CONTINUITY OF ACD CIRCUIT</b>		
<ul style="list-style-type: none"> <li>• Key off, wait 10 seconds.</li> <li>• DVOM on 200 ohm scale.</li> <li>• Measure resistance between Test Pin 24 (Test Pin 43 for 2.3L HSC EFI) at the breakout box and A/C demand switch.</li> <li>• Is resistance greater than 5 ohms?</li> </ul>		<p>Yes ▶</p> <p>No ▶</p>	<p>SERVICE open in ACD circuit. RERUN Quick Test.</p> <p>EEC-IV system OK.</p>
<b>KM25</b>	<b>CHECK ACD CIRCUIT FOR SHORT TO POWER</b>		
<ul style="list-style-type: none"> <li>• Key off.</li> <li>• Disconnect processor 60 pin connector. Inspect for damaged pins, corrosion, loose wires, etc. Service as necessary.</li> <li>• Connect breakout box to harness, leave processor disconnected.</li> <li>• Disconnect WAC relay (TRK) or A/C fan controller (CAR).</li> <li>• A/C demand switch "OFF".</li> <li>• DVOM on 20 volt scale.</li> <li>• Key on.</li> <li>• Measure voltage between Test Pin 24 at the breakout box and chassis ground.</li> <li>• Is voltage less than 1.0 volt?</li> </ul>		<p>Yes ▶</p> <p>No ▶</p>	<p>EEC-IV system OK.</p> <p>VERIFY operation of A/C demand switch. IF OK, SERVICE short circuit. REMOVE breakout box. RECONNECT processor and WAC relay or A/C fan controller. RE-EVALUATE symptom.</p>

Pinpoint Test KM20 Thru KM25 - WOT A/C Cutoff (WAC) A/C Demand

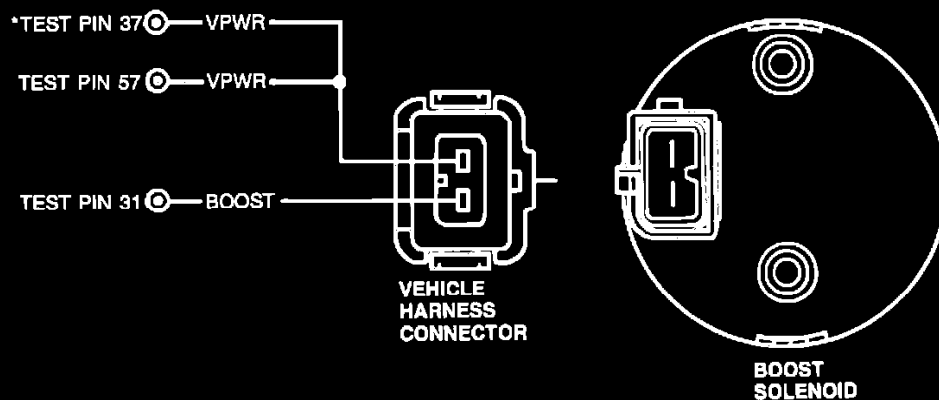
**Turbo Boost****Pinpoint  
Test****KN****Note**

You should enter this Pinpoint Test only when a Service Code 81 is received in Quick Test Step 3.0 or when directed here from Diagnostic By Symptom  
ment Section...

**Remember**

This Pinpoint Test is intended to diagnose only the following:

- Harness circuits: VPWR, Boost
- Octane switch

**Pinpoint Test Schematic**

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

Pinpoint Test KN - Turbo Boost

Turbo Boost		Pinpoint Test	KN
TEST STEP		RESULT	ACTION TO TAKE
<b>KN1</b>	ENTER OUTPUT STATE CHECK (REFER TO APPENDIX)		
<p><b>NOTE: Do not use STAR tester for this Step, use VOM/DVOM.</b></p> <ul style="list-style-type: none"> <li>• Key off, wait 10 seconds.</li> <li>• DVOM on 20 volt scale.</li> <li>• Connect DVOM negative test lead to STO at the Self-Test connector and positive test lead to battery positive.</li> <li>• Jumper STI to SIGNAL RETURN at the Self-Test connector.</li> <li>• Perform Key On Engine Off Self-Test through the completion of the Continuous Test Codes.</li> <li>• DVOM will indicate less than 1.0 volts when test is complete.</li> <li>• Depress and release the throttle.</li> <li>• Did DVOM change to a high voltage?</li> </ul>		<p>Yes</p> <p>No</p>	<p>▶ REMAIN in Output State Check. GO to <b>KN2</b>.</p> <p>▶ DEPRESS throttle to WOT and release. If STO voltage does not go high, GO to Pinpoint Test Step <b>QC1</b>. Leave equipment hooked up.</p>
<b>KN2</b>	CHECK BOOST OUTPUT ELECTRICAL OPERATION		
<ul style="list-style-type: none"> <li>• Key on, engine off.</li> <li>• Disconnect boost solenoid.</li> <li>• DVOM on 20 volt scale.</li> <li>• Connect DVOM positive test lead to VPWR circuit on boost solenoid connector and negative test lead to boost output on boost solenoid connector.</li> <li>• While observing DVOM, depress and release the throttle several times to cycle output On and Off.</li> <li>• Does boost output solenoid cycle On and Off?</li> </ul>		<p>Yes</p> <p>No</p>	<p>▶ RECONNECT boost solenoid. GO to <b>KN3</b>.</p> <p>▶ REMOVE jumper. GO to <b>KN4</b>.</p>


Pinpoint Test KN1 &amp; KN2 - Turbo Boost

Turbo Boost		Pinpoint Test	KN
TEST STEP	RESULT	ACTION TO TAKE	
<b>KN3</b> CHECK BOOST SOLENOID FUNCTION <ul style="list-style-type: none"> <li>• Remain in output state check.</li> <li>• Disconnect turbo boost control solenoid vacuum hose at the turbocharger inlet end.</li> <li>• Attach a vacuum pump to the hose.</li> <li>• Depress the throttle once to cycle the solenoid closed.</li> <li>• Apply vacuum to the solenoid.</li> <li>• Depress the throttle once again to cycle the solenoid open and release trapped vacuum.</li> <li>• Did the solenoid hold and then release vacuum?</li> </ul> <div style="text-align: center;"> <p>TURBO BOOST CONTROL SOLENOID</p> <p>The diagram shows a circular solenoid with a rectangular coil symbol at the top. Two ports are shown: 'TO WASTE GATE' on the left and 'TO TURBO INLET' on the right. An arrow labeled 'FLOW' points from the waste gate port towards the turbo inlet port.</p> </div>	Yes  No	EEC-IV system OK.  REPLACE solenoid. RERUN Quick Test.	
<b>KN4</b> CHECK VOLTAGE OF VPWR CIRCUIT <ul style="list-style-type: none"> <li>• Key on, engine off.</li> <li>• Boost solenoid disconnected.</li> <li>• DVOM on 20 volt scale.</li> <li>• Measure voltage between VPWR circuit of boost solenoid vehicle harness connector and battery negative post.</li> <li>• Is voltage greater than 10.5 volts?</li> </ul>	Yes  No	GO to <b>KN5</b> .  RECONNECT boost solenoid. SERVICE harness open circuit. RERUN Quick Test.	
<b>KN5</b> MEASURE BOOST SOLENOID RESISTANCE <ul style="list-style-type: none"> <li>• Key off, wait 10 seconds.</li> <li>• Boost solenoid disconnected.</li> <li>• DVOM on 200 ohm scale.</li> <li>• Measure the solenoid resistance.</li> <li>• Is resistance between 65 and 110 ohms?</li> </ul>	Yes  No	GO to <b>KN6</b> .  REPLACE BOOST solenoid. RERUN Quick Test.	

Pinpoint Test KN3 Thru KN5 - Turbo Boost

<b>Turbo Boost</b>		<b>Pinpoint Test</b>	<b>KN</b>
<b>TEST STEP</b>		<b>RESULT</b>	<b>ACTION TO TAKE</b>
<b>KN6</b>	<b>CHECK CONTINUITY OF BOOST CIRCUIT</b>		
<ul style="list-style-type: none"> <li>• Key off, wait 10 seconds.</li> <li>• Boost solenoid disconnected.</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 Test Pin 31 at the breakout box and BOOST circuit at vehicle harness connector.</li> <li>• Is resistance less than 5 ohms?</li> </ul>		Yes ▶  No ▶	GO to <b>KN7</b> .  REMOVE breakout box. RECONNECT all components. SERVICE open circuit. RERUN Quick Test.
<b>KN7</b>	<b>CHECK FOR SHORT TO GROUND</b>		
<ul style="list-style-type: none"> <li>• Key off, wait 10 seconds.</li> <li>• Breakout box installed, processor disconnected.</li> <li>• Boost solenoid disconnected.</li> <li>• DVOM on 200,000 ohm scale.</li> <li>• Measure resistance between Test Pin 31 and Test Pins 40, 46 and 60 at the breakout box.</li> <li>• Is resistance greater than 10,000 ohms?</li> </ul>		Yes ▶  No ▶	GO to <b>KN8</b> .  REMOVE breakout box. RECONNECT all components. SERVICE short circuit. RERUN Quick Test.
<b>KN8</b>	<b>CHECK FOR SHORT TO POWER</b>		
<ul style="list-style-type: none"> <li>• Key off, wait 10 seconds.</li> <li>• DVOM on 200,000 ohm scale.</li> <li>• Breakout box installed, processor disconnected.</li> <li>• Boost solenoid disconnected.</li> <li>• Measure resistance between Test Pin 31 and Test Pins 37 and 57 at the breakout box.</li> <li>• Is resistance greater than 10,000 ohms?</li> </ul>		Yes ▶  No ▶	REMOVE breakout box. RECONNECT all components. REPLACE processor. RERUN Quick Test.  REMOVE breakout box. RECONNECT all components. SERVICE short circuit. RERUN Quick Test. If symptom is still present, REPLACE processor.

Pinpoint Test KN6 Thru KN8 - Turbo Boost

Turbo Boost		Pinpoint Test	KN
TEST STEP		RESULT	ACTION TO TAKE
<b>KN10</b>	CHECK OCTANE SWITCH INPUT FOR INPUT CHANGE		
<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. Reconnect processor.</li> <li>• DVOM to 20 volt scale.</li> <li>• Connect positive test lead to Test Pin 24 and negative test lead to Test Pin 46 at the breakout box.</li> <li>• Key on, engine off.</li> <li>• Cycle octane switch several times while observing DVOM.</li> <li>• Does voltage change from less than 1.0 octane switch volts to 5 volts?</li> </ul>  <p>TEST PIN 24 ○ ———— / ————</p> <p>TEST PIN 46 ○ — SIGNAL RETURN ————</p>		<p>Yes</p> <p>No</p>	<p>REMOVE breakout box. RECONNECT processor. REPLACE processor. RERUN Quick Test.</p> <p>REMOVE breakout box. RECONNECT processor. EEC-IV system OK.</p>

Pinpoint Test KN10 - Turbo Boost

## Converter Clutch Override (CCO) and Shift Solenoid 3/4-4/3 (SS 3/4-4/3)

## Pinpoint Test

## KR

### Note

You should enter this Pinpoint Test only when a Service Code 85, 86, 88 or 89 are received in Quick Test Step 3.0.

### Remember

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

- Hydraulic brakes
- Emergency brakes
- Internal transmission
- Transmission linkage

This Pinpoint Test is intended to diagnose only the following:

- Harness Circuits: CCO SS 3/4-4/3 and VPWR.
- CCO Solenoid.
- Shift Solenoid 3/4-4/3.
- Processor Assembly.

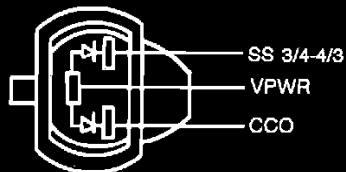
### Pinpoint Test Schematic

\*(TEST PIN 52 FOR 2.5L & 3.0L TRUCK)

TEST PIN 42  
PIN 37  
PIN 57  
PIN 53



CCO AND SS 3/4-4/3  
VEHICLE HARNESS  
CONNECTOR











CCO AND SS 3/4-4/3  
TRANSMISSION  
BULKHEAD CONNECTOR

NOTE: TEST PIN 42 (52 ON 2.9L & 3.0L TRUCK) IS NOT USED ON APPLICATIONS EQUIPPED WITH CCO ONLY.

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

Pinpoint Test KR - Converter Clutch Override (CCO)/Shift Solenoid 3/4-4/3 (SS 3/4-4/3)

<b>Converter Clutch Override (CCO) and Shift Solenoid 3/4-4/3 (SS 3/4-4/3)</b>		<b>Pinpoint Test</b>	<b>KR</b>
<b>TEST STEP</b>	<b>RESULT</b>	<b>ACTION TO TAKE</b>	
<b>CODE 88 or 89 PRESENT</b>			
<b>KR1</b>   MEASURE CCO SOLENOID RESISTANCE			
<ul style="list-style-type: none"> <li>• Key off, wait 10 seconds.</li> <li>• DVOM on 200 ohm scale.</li> <li>• Disconnect CCO solenoid.</li> <li>• Measure resistance of solenoid between CCO and VPWR at the transmission bulkhead connector.</li> <li>• Is resistance reading between 26 and 40 ohms?</li> </ul>	Yes  No 	GO to <b>KR2</b> .  A4LD transmission diagnosis.	
<b>KR2</b>   CHECK VOLTAGE OF VPWR CIRCUIT			
<ul style="list-style-type: none"> <li>• Key on, engine off.</li> <li>• CCO solenoid disconnected.</li> <li>• DVOM on 20 volt scale.</li> <li>• Measure voltage between the VPWR circuit and battery ground at the CCO solenoid vehicle harness connector.</li> <li>• Is voltage greater than 10.5 volts?</li> </ul>	Yes  No 	GO to <b>KR3</b> .  RECONNECT CCO/shift solenoid. SERVICE open circuit. RERUN Quick Test.	
<b>KR3</b>   CHECK CONTINUITY OF CCO CIRCUIT			
<ul style="list-style-type: none"> <li>• Key off, wait 10 seconds.</li> <li>• CCO solenoid disconnected.</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 Test Pin 53 at the breakout box and CCO circuit at the solenoid vehicle harness connector.</li> <li>• Is resistance reading less than 5 ohms?</li> </ul>	Yes  No 	GO to <b>KR4</b> .  REMOVE breakout box. RECONNECT all components. SERVICE open circuit. RERUN Quick Test.	
<b>KR4</b>   CHECK CCO CIRCUIT FOR SHORT TO GROUND			
<ul style="list-style-type: none"> <li>• Key off, wait 10 seconds.</li> <li>• Breakout box installed, processor disconnected.</li> <li>• CCO solenoid disconnected.</li> <li>• DVOM on 200,000 ohm scale.</li> <li>• Measure resistance between Test Pin 53 and Test Pins 40, 46 and 60 at breakout box.</li> <li>• Is resistance greater than 100,000 ohms?</li> </ul>	Yes  No 	GO to <b>KR5</b> .  REMOVE breakout box. RECONNECT all components. SERVICE short circuit. RERUN Quick Test.	

**Pinpoint Test KR1 Thru KR4 - Converter Clutch Override (CCO)/Shift Solenoid 3/4-4/3 (SS 3/4-4/3)**

## Converter Clutch Override (CCO) and Shift Solenoid 3/4-4/3 (SS 3/4-4/3)

## Pinpoint Test

## KR

TEST STEP		RESULT	ACTION TO TAKE
<b>KR5</b>	CHECK CCO CIRCUIT FOR SHORT TO POWER		
<ul style="list-style-type: none"> <li>• Key off, wait 10 seconds.</li> <li>• DVOM on 200,000 ohm scale.</li> <li>• Breakout box installed, processor disconnected.</li> <li>• CCO solenoid disconnected.</li> <li>• Measure resistance between Test Pin 53 and Test Pins 37 and 57 at breakout box.</li> <li>• Are all resistance readings 10,000 ohms?</li> </ul>		Yes	REMOVE breakout box. RECONNECT all components. REPLACE processor. RERUN Quick Test.
		No	REMOVE breakout box. RECONNECT all components. SERVICE short circuit. RERUN Quick Test. If code is still present, REPLACE processor.
<b>CODE 85 OR 86 PRESENT</b>			
<b>KR10</b>	MEASURE SS 3/4-4/3 RESISTANCE		
<ul style="list-style-type: none"> <li>• Key off, wait 10 seconds.</li> <li>• Disconnect CCO/shift solenoid.</li> <li>• DVOM on 200 ohm scale.</li> <li>• Measure resistance of solenoid between SS and VPWR at the transmission bulkhead connector.</li> <li>• Is resistance between 26 and 40 ohms?</li> </ul>		Yes	TO to <b>KR11</b> .
		No	A4LD transmission diagnosis.
<b>KR11</b>	CHECK VOLTAGE OF VPWR CIRCUIT		
<ul style="list-style-type: none"> <li>• Key on, engine off.</li> <li>• CCO/shift solenoid disconnected.</li> <li>• DVOM on 20 volt scale.</li> <li>• Measure voltage at the SS 3/4-4/3 solenoid vehicle harness connector between VPWR circuit and battery ground.</li> <li>• Is voltage greater than 10.5 volts?</li> </ul>		Yes	GO to <b>KR12</b> .
		No	RECONNECT CCO/Shift solenoid. SERVICE open circuit. RERUN Quick Test.

Pinpoint Test KR5 Thru KR11 - Converter Clutch Override (CCO)/Shift Solenoid 3/4-4/3 (SS 3/4-4/3)

<b>Converter Clutch Override (CCO) and Shift Solenoid 3/4-4/3 (SS 3/4-4/3)</b>		<b>Pinpoint Test</b>	<b>KR</b>
<b>TEST STEP</b>	<b>RESULT</b>	<b>ACTION TO TAKE</b>	
<b>KR12</b> CHECK CONTINUITY OF SS 3/4-4/3 CIRCUIT			
<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, leave processor disconnected.</li> <li>• CCO/shift solenoid disconnected.</li> <li>• DVOM on 200 ohm scale.</li> <li>• Measure resistance between Test Pin 42 (Test Pin 52 for 2.9L and 3.0L truck) at the breakout box and SS 3/4-4/3 circuit at the solenoid vehicle harness connector.</li> <li>• Is resistance less than 5 ohms?</li> </ul>	<p>Yes</p> <p>No</p>	<p>▶ GO to <b>KR13</b> .</p> <p>▶ REMOVE breakout box. RECONNECT all components. SERVICE open circuit. RERUN Quick Test.</p>	
<b>KR13</b> CHECK FOR SHORT TO GROUND			
<ul style="list-style-type: none"> <li>• Key off, wait 10 seconds.</li> <li>• Breakout box installed, processor disconnected.</li> <li>• CCO/shift solenoid disconnected.</li> <li>• DVOM on 200,000 ohm scale.</li> <li>• Measure resistance between Test Pin 42 (Test Pin 52 for 2.9L and 3.0L truck) and Test Pins 40, 46 and 60 at breakout box.</li> <li>• Is resistance greater than 100,000 ohms?</li> </ul>	<p>Yes</p> <p>No</p>	<p>▶ GO to <b>KR14</b> .</p> <p>▶ REMOVE breakout box. RECONNECT all components. SERVICE short circuit. RERUN Quick Test.</p>	
<b>KR14</b> CHECK FOR SHORT TO POWER			
<ul style="list-style-type: none"> <li>• Key off, wait 10 seconds.</li> <li>• Breakout box installed, processor disconnected.</li> <li>• CCO/shift solenoid disconnected.</li> <li>• DVOM on 200,000 ohm scale.</li> <li>• Measure resistance between Test Pin 42 (Test Pin 52 for 2.9L and 3.0L truck) and Test Pins 37 and 57 at breakout box.</li> <li>• Are all resistances greater than 10,000 ohms?</li> </ul>	<p>Yes</p> <p>No</p>	<p>▶ REMOVE breakout box. RECONNECT all components. REPLACE processor. RERUN Quick Test.</p> <p>▶ REMOVE breakout box. RECONNECT all components. SERVICE short circuit. RERUN Quick Test. If code is still present, REPLACE processor.</p>	

Pinpoint Test KR12 Thru KR14 - Converter Clutch Override (CCO)/Shift Solenoid 3/4-4/3 (SS 3/4-4/3)

**Dynamic Response Test****Pinpoint  
Test****M****Note**

You should enter this Pinpoint Test only when a Service Code 77 is received in Quick Test Step 5.0.

**Remember**

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

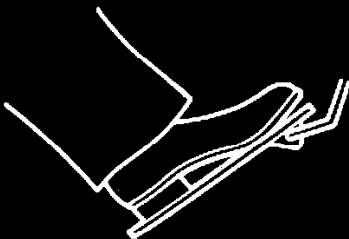
- Operator did not perform a brief WOT after dynamic response code.
- Mechanical engine problems; engine did not achieve greater than 2000 rpm.

This Pinpoint Test is intended to diagnose only the following:

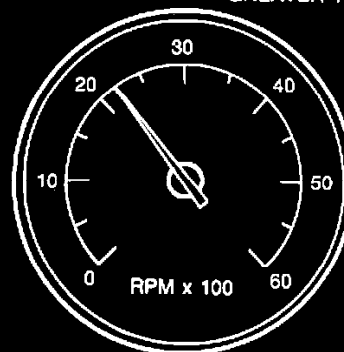
- Throttle movement (greater than 3/4 throttle).
- Vane Airflow (greater than 50% open).
- Rpm increase (greater than 2000 rpm).

**Pinpoint Test Schematic**

OPERATOR PERFORMS BRIEF WOT



RPM INCREASE  
GREATER THAN 2000 RPM



Pinpoint Test M - Dynamic Response Test

Dynamic Response Test		Pinpoint Test	M
TEST STEP		RESULT	ACTION TO TAKE
M1	SERVICE CODE 77; SYSTEM FAILED TO RECOGNIZE BRIEF WOT		
<p><b>NOTE: A brief snap of the throttle may not be sufficient to pass this test. Be sure to go to WOT and return.</b></p> <ul style="list-style-type: none"> <li>• Rerun Engine Running Self-Test. Be sure operator is familiar with the engine running format which proceeds as follows: <ul style="list-style-type: none"> <li>— With Self-Test activated restart the engine.</li> <li>— ID Code 2 (0) start of test.</li> <li>— Dynamic response Code 1 (0) perform brief WOT.</li> <li>— Testing over.</li> <li>— Service code output begins.</li> </ul> </li> <li>• Is Code 77 still present?</li> </ul>		<p>Yes</p> <p>No</p>	<p>REPLACE processor. RERUN Quick Test.</p> <p>Dynamic Response Test passed. SERVICE any other service code(s) received as necessary.</p>

Pinpoint Test M1 - Dynamic Response Test

**"CHECK ENGINE" Light/Message  
"CHECK ENGINE"/"CHECK DCL" Message**

**Pinpoint  
Test**

**ML**

**Note**

You should enter this Pinpoint Test only when directed here from Pinpoint Test QA or Diagnostic By Symptom

**Remember**

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

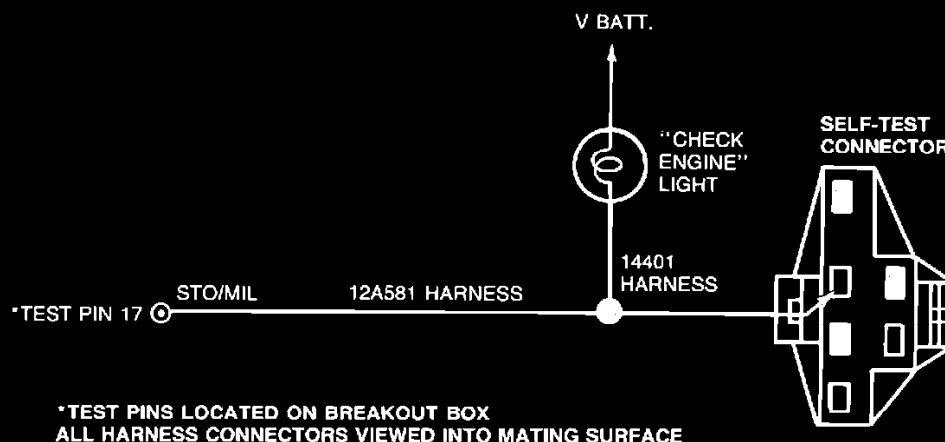
- Fuse, bulb or socket.

This Pinpoint Test is intended to diagnose only the following:

- STO/MIL circuit. (All except 1.9L EFI and 3.8L EFI Continental)
- MIL circuit (1.9L EFI only)
- Processor assembly.
- Data Communications Link (DCL) (3.8L EFI Continental only)

**Pinpoint Test Schematic**

ALL EXCEPT 1.9L EFI AND 3.8L EFI CONTINENTAL



Pinpoint Test ML - "CHECK ENGINE" Light/Message/"CHECK DCL" Message

**"CHECK ENGINE" Light/Message**  
**"CHECK ENGINE"/"CHECK DCL" Message**

**Pinpoint**  
**Test**

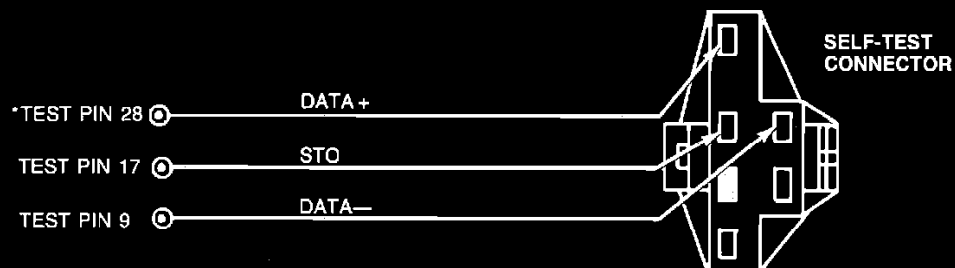
**ML**

### Pinpoint Test Schematic

1.9L EFI



3.8L EFI CONTINENTAL



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

Pinpoint Test ML - "CHECK ENGINE" Light/Message/"CHECK DCL" Message

<b>"CHECK ENGINE" Light/Message "CHECK ENGINE"/"CHECK DCL" Message</b>		<b>Pinpoint Test</b>	<b>ML</b>
<b>TEST STEP</b>		<b>RESULT</b>	<b>ACTION TO TAKE</b>
<b>ML1</b>	<b>"CHECK ENGINE" LIGHT ALWAYS ON: CHECK FOR SHORT TO GROUND</b>		
<p><b>NOTE: If vehicle will not start go to Pinpoint Test Step <b>A1</b>.</b></p> <ul style="list-style-type: none"> <li>• If any Key On Engine Off service codes are present, service before proceeding. If no codes are outputted, continue with this Test Step.</li> <li>• Key off.</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 17 (Test Pin 53 on 1.9L EFI) and Test Pin 40 at the breakout box.</li> <li>• Is resistance less than 10,000 ohms?</li> </ul>		<p>Yes</p> <p>No</p>	<p>REMOVE breakout box. RECONNECT processor. SERVICE short circuit between Test Pin 17/53 and "Check Engine" Light, or between Test Pin 17 and the Self-Test Connector. RERUN Quick Test.</p> <p>REMOVE breakout box. REPLACE processor. RERUN Quick Test.</p>
<b>ML5</b>	<b>"CHECK ENGINE" LIGHT NEVER ON: CHECK CONTINUITY OF STO/MIL CIRCUIT</b>		
<p><b>NOTE: If vehicle will not start go to Pinpoint Test Step <b>A1</b>.</b></p> <ul style="list-style-type: none"> <li>• Key off.</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 Test Pin 17 (Test Pin 53 on 1.9L EFI) and the "CHECK ENGINE" light.</li> <li>• Is resistance less than 5 ohms?</li> </ul>		<p>Yes</p> <p>No</p>	<p>GO to <b>ML6</b>.</p> <p>REMOVE breakout box. RECONNECT processor. SERVICE OPEN circuit. RERUN Quick Test.</p>
<b>ML6</b>	<b>CHECK FOR POWER TO BULB</b>		
<ul style="list-style-type: none"> <li>• Check for power to "CHECK ENGINE" light bulb.</li> <li>• Is there power at the light bulb?</li> </ul>		<p>Yes</p> <p>No</p>	<p>REPLACE bulb or socket. GO to <b>ML7</b>.</p> <p>CHECK fuse and VBATT input circuit. GO to <b>ML7</b>.</p>

Pinpoint Test ML1 Thru ML6 - "CHECK ENGINE" Light/Message/"CHECK DCL" Message

<b>"CHECK ENGINE" Light/Message "CHECK ENGINE"/"CHECK DCL" Message</b>		<b>Pinpoint Test</b>	<b>ML</b>
<b>TEST STEP</b>		<b>RESULT</b>	<b>ACTION TO TAKE</b>
<b>ML7</b>	<b>CONFIRM CIRCUIT REPAIR</b>		
	<ul style="list-style-type: none"> <li>• Reconnect processor.</li> <li>• Turn key to run.</li> <li>• Is "CHECK ENGINE" Light ON?</li> </ul>	<p>Yes</p> <p>No</p>	<p>System OK.</p> <p>REPLACE processor.</p>
<b>ML10</b>	<b>"CHECK ENGINE" MESSAGE DISPLAYED</b>		
	<p><b>NOTE: If vehicle is a no start, go to Pinpoint Test Step <b>A1</b>.</b></p> <ul style="list-style-type: none"> <li>• Run Key On Engine Off Self-Test.</li> <li>• Is result 11-10-11 (Pass Codes)?</li> </ul>	<p>Yes</p> <p>No</p>	<p>System OK</p> <p>GO to Quick Test Step 3.0B. PROCEED as directed.</p>
<b>ML15</b>	<b>"CHECK ENGINE"/"CHECK DCL" MESSAGE DISPLAYED</b>		
	<p><b>NOTE: If vehicle is a no start, go to Pinpoint Test Step <b>A1</b>.</b></p> <ul style="list-style-type: none"> <li>• Run Key On Engine Off Self-Test with a STAR tester or volt/ohmmeter.</li> <li>• Is result 11-10-11 (Pass Codes)?</li> </ul>	<p>Yes</p> <p>No</p>	<p>Go to DCL diagnosis</p> <p>GO to Quick Test Step 3.0B. PROCEED as directed.</p>

Pinpoint Test ML7 Thru ML15 - "CHECK ENGINE" Light/Message/"CHECK DCL" Message

## Ignition Diagnostic Monitor (IDM)

## Pinpoint Test

# N

### Note

You should enter this Pinpoint Test only when a Service Code 18 is received in Quick Test Step 6.0.

### Remember

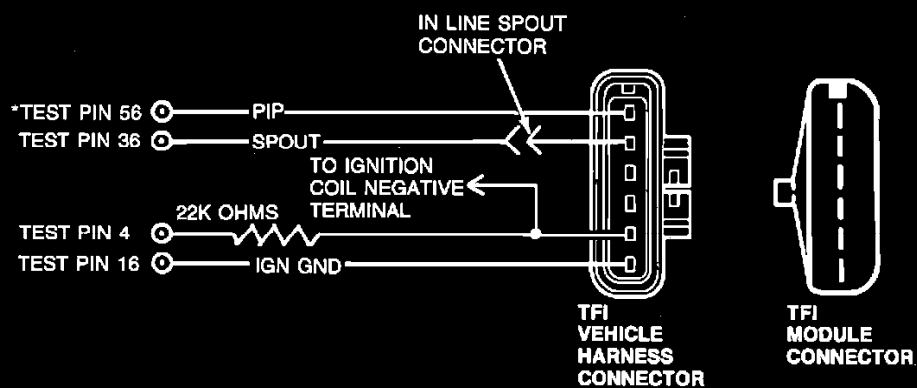
To prevent the replacement of good components, be aware that the following non-EEC areas may be at fault:

- Ignition module
- Ignition coil
- Spark plugs and high tension cables
- Distributor and PIP sensor

This Pinpoint Test is intended to diagnose only the following:

- Harness circuits: IGNITION GROUND, SPOUT, PIP, IDM.

### Pinpoint Test Schematic



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

Pinpoint Test N - Ignition Diagnostic Monitor (IDM)

Ignition Diagnostic Monitor (IDM)		Pinpoint Test	N
TEST STEP		RESULT	ACTION TO TAKE
<b>N1</b>	<b>CHECK CONTINUITY OF IDM CIRCUIT</b>		
<p><b>NOTE: It is important to know that the IDM circuit has a 20,000 ohm resistor between Test Pin 4 and the Ignition Coil Negative Terminal.</b></p> <ul style="list-style-type: none"> <li>• Key off, wait 10 seconds.</li> <li>• Disconnect E-core ignition coil.</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 4 at the breakout box and ignition coil harness connector negative terminal.</li> <li>• Is resistance between 20,000 and 24,000 ohms?</li> </ul>		<p>Yes</p> <p>No</p>	<p>GO to <b>N2</b>.</p> <p>REMOVE breakout box. RECONNECT processor. SERVICE open circuit. RERUN Quick Test. RECONNECT E-core ignition coil.</p>
<b>N2</b>	<b>CHECK FOR SHORT TO GROUND</b>		
<ul style="list-style-type: none"> <li>• Key off, wait 10 seconds.</li> <li>• Breakout box installed, processor disconnected.</li> <li>• DVOM on 200,000 ohm scale.</li> <li>• Measure resistance between Test Pin 4 and Test Pins 40, 46 and 60 at the breakout box.</li> <li>• Are all resistances above 10,000 ohms?</li> </ul>		<p>Yes</p> <p>No</p>	<p>REMOVE breakout box. RECONNECT E-core ignition coil and processor. GO to <b>N3</b>.</p> <p>REMOVE breakout box. SERVICE short to ground in IDM circuit. RECONNECT E-core ignition coil and processor. RERUN Quick Test.</p>

Pinpoint Test N1 &amp; N2 - Ignition Diagnostic Monitor (IDM)

Ignition Diagnostic Monitor (IDM)		Pinpoint Test	N									
TEST STEP		RESULT	ACTION TO TAKE									
<b>N3</b>	<b>CHECK TFI MODULE</b>											
<ul style="list-style-type: none"> <li>• Key off, wait 10 seconds.</li> <li>• Deactivate Self-Test.</li> <li>• Connect VOM or STAR per Quick Test Step 2.0.</li> <li>• Enter Engine Running Continuous Monitor Test (as instructed in Quick Test Step 6.0B).</li> <li>• Observe VOM or STAR LED for indication of a fault while performing the following: <ul style="list-style-type: none"> <li>• Lightly tap on TFI module (simulate road shock).</li> <li>• Wiggle TFI connector.</li> <li>• Is a fault indicated?</li> </ul> </li> </ul>		<p>Yes ▶ DISCONNECT and INSPECT connectors.</p> <p>No ▶ GO to <b>N4</b>.</p>										
<b>N4</b>	<b>CHECK EEC-IV HARNESS</b>											
<ul style="list-style-type: none"> <li>• While still in continuous monitor test from Step N3, observe VOM or STAR LED for a fault indication while performing the following:</li> <li>• While looking for faults listed in the table below, grasp the harness close to the TFI 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. Do this test on the circuits listed one at a time if needed to locate a faulty circuit.</li> </ul> <table border="1"> <thead> <tr> <th>FAULT</th> <th>BREAKOUT BOX NO.</th> </tr> </thead> <tbody> <tr> <td>PIP shorted to ground or open</td> <td>Test Pin 56</td> </tr> <tr> <td>Spout shorted to ground</td> <td>Test Pin 36</td> </tr> <tr> <td>Ign. ground open</td> <td>Test Pin 16</td> </tr> <tr> <td>IDM open or shorted to ground, power</td> <td>Test Pin 4</td> </tr> </tbody> </table> <ul style="list-style-type: none"> <li>• Is a fault indicated?</li> </ul>		FAULT	BREAKOUT BOX NO.	PIP shorted to ground or open	Test Pin 56	Spout shorted to ground	Test Pin 36	Ign. ground open	Test Pin 16	IDM open or shorted to ground, power	Test Pin 4	<p>Yes ▶ ISOLATE fault and make necessary repairs. RERUN Quick Test.</p> <p>No ▶ GO to <b>N5</b>.</p>
FAULT	BREAKOUT BOX NO.											
PIP shorted to ground or open	Test Pin 56											
Spout shorted to ground	Test Pin 36											
Ign. ground open	Test Pin 16											
IDM open or shorted to ground, power	Test Pin 4											

Pinpoint Test N3 &amp; N4 - Ignition Diagnostic Monitor (IDM)

<b>Ignition Diagnostic Monitor (IDM)</b>		<b>Pinpoint Test</b>	<b>N</b>
<b>TEST STEP</b>		<b>RESULT</b>	<b>ACTION TO TAKE</b>
<b>N5</b>	<b>CHECK PROCESSOR AND HARNESS CONNECTORS</b>		
<ul style="list-style-type: none"> <li>• Key off, wait 10 seconds.</li> <li>• Disconnect processor 60 pin connector. Inspect for damaged pins, corrosion, loose wires, etc.</li> <li>• Are connectors and terminals OK?</li> </ul>		<p>Yes ▶</p> <p>No ▶</p>	<p>REPLACE processor. Start engine and run for about one minute. RERUN Key On Engine Off Self-Test observing continuous codes.</p> <p>SERVICE as necessary. RECONNECT processor. RERUN Quick Test.</p>

**Pinpoint Test N5 - Ignition Diagnostic Monitor (IDM)**

## Spark Timing Check

## Pinpoint Test

## P

### Note

You should enter this Pinpoint Test only when directed here from Quick Test Step 4.0 or when a Service Code 18 is received in Quick Test Step 5.0.

### Remember

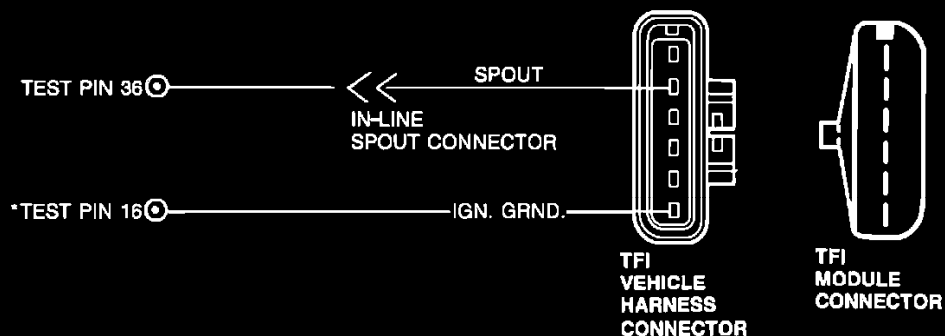
To prevent the replacement of good components, be aware that the following non-EEC areas may be at fault:

- Base Engine
- PIP Sensor
- TFI Module

This Pinpoint Test is intended to diagnose only the following:

- Harness Spout Circuit
- Base Timing
- Processor Assembly

### Pinpoint Test Schematic

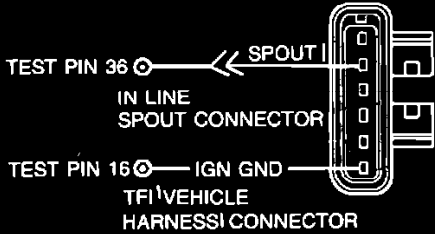


\*TEST PINS LOCATED ON BREAKOUT BOX.  
ALL HARNESS CONNECTORS VIEWED INTO MATING SURFACE.

### Pinpoint Test P - Spark Timing Check

Spark Timing Check		Pinpoint Test	P
TEST STEP	RESULT	ACTION TO TAKE	
<b>P1</b>   CHECK SPARK TIMING			
<p><b>NOTE:</b> Self-Test locks the timing at 20 degrees plus base during code output and for two minutes after the last service code is outputted. Timing check must be made during this time period. Self-Test timing is base +20 degrees (<math>\pm 3</math> degrees) BTDC. (See VECI decal for base value.)</p> <ul style="list-style-type: none"> <li>• Check timing. Record value.</li> <li>• Is timing equal to base plus 20 degrees (<math>\pm 3</math> degrees)?</li> </ul>	<p>Yes</p> <p>No</p>	<p>▶ GO to Quick Test Step <b>5.0</b>.</p> <p>▶ GO to <b>P2</b>.</p>	
<b>P2</b>   CHECK SPARK OUTPUT (SPOUT) CIRCUIT TO THE TFI MODULE			
<ul style="list-style-type: none"> <li>• Locate spout connector and open this connection.</li> <li>• Start engine.</li> <li>• Check base timing.</li> <li>• Is base timing within <math>\pm 3</math> degrees of value on VECI decal?</li> </ul>	<p>Yes</p> <p>No</p>	<p>▶ RECONNECT spout connector. GO to <b>P3</b>.</p> <p>▶ Adjust base timing if necessary.</p> <p>After timing is reset, RECONNECT spout and PERFORM Quick Test Step <b>4.0</b>.</p>	
<b>P3</b>   CHECK FOR POWER TO PROCESSOR			
<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. Service as necessary.</li> <li>• Install breakout box.</li> <li>• Key on, engine off.</li> <li>• DVOM on 20 volt scale.</li> <li>• Measure voltage between Test Pin 37 and Test Pin 40 and between Test Pin 57 and Test Pin 60 at the breakout box.</li> <li>• Is voltage less than 10.5 volts?</li> </ul>	<p>Yes</p> <p>No</p>	<p>▶ GO to Pinpoint Test Step <b>B1</b> except 2.3L EFI TC, 2.5L HSC CFI, 3.0L EFI, and 3.8L FWD EFI passenger car; GO to Pinpoint Test Step <b>X1</b>.</p> <p>▶ GO to <b>P4</b>.</p>	

Pinpoint Test P1 Thru P3 - Spark Timing Check

Spark Timing Check		Pinpoint Test	P
TEST STEP	RESULT	ACTION TO TAKE	
<b>P4</b>   CHECK HARNESS FOR CONTINUITY <ul style="list-style-type: none"> <li>• Key off, wait 10 seconds.</li> <li>• Breakout box installed.</li> <li>• Processor disconnected.</li> <li>• Disconnect TFI module.</li> <li>• DVOM on 200 ohm scale.</li> <li>• Measure resistance between Test Pin 36 at the breakout box and the spout pin at the TFI vehicle harness connector.</li> <li>• Is resistance less than 5 ohms?</li> </ul> 	Yes  No	▶ GO to <b>P5</b> .  ▶ SERVICE open circuit. CHECK timing per <b>P1</b> .	
<b>P5</b>   HARNESS CHECK — IGNITION GROUND <ul style="list-style-type: none"> <li>• Key off, wait 10 seconds.</li> <li>• Breakout box installed.</li> <li>• Connect processor to breakout box.</li> <li>• Reconnect TFI module.</li> <li>• Timing switch to "computed" position on breakout box.</li> <li>• DVOM on 20 volt scale.</li> <li>• Measure voltage between Test Pin 36 at the breakout box and battery negative post during Engine Running Self-Test.</li> <li>• Is voltage between 4.0 and 8.0 volts?</li> </ul>	Yes  No	▶ EEC system OK.  ▶ REMOVE breakout box. REPLACE processor. RERUN Quick Test.	

Pinpoint Test P4 &amp; P5 - Spark Timing Check

## No Codes/Codes Not Listed

## Pinpoint Test

## QA

### Note

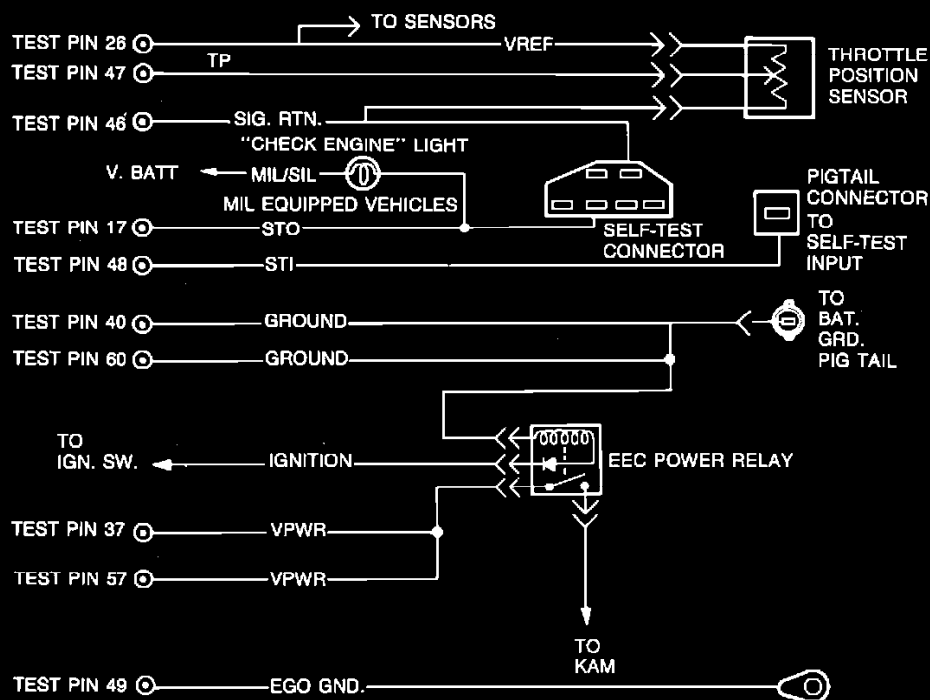
You should enter this Pinpoint Test only when directed here from Quick Test Step 3.0, 5.0 or 6.0 or when directed here from Diagnostic By Symptom

### Remember

This Pinpoint Test is intended to diagnose only the following:

- Processor.
- EEC Power Relay.
- Harness Circuits: SIGNAL RETURN, STO, STI, GROUND, VPWR, VREF, NDS.

### Pinpoint Test Schematic



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

Pinpoint Test QA - No Codes/Codes Not Listed

No Codes/Codes Not Listed		Pinpoint Test	QA
TEST STEP	RESULT	ACTION TO TAKE	
<b>QA1</b>   CHECK FOR VREF  Refer to schematic in Pinpoint Test QA. <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.</li> <li>• DVOM on 20 volt scale.</li> <li>• Key on, engine off.</li> <li>• Measure voltage between Test Pin 26 and Test Pin 46 at the breakout box.</li> <li>• Is voltage between 4.0 and 6.0 volts?</li> </ul>	Yes  No	▶ RECONNECT TP Sensor. GO to <b>QA2</b> .  ▶ GO to Pinpoint Test Step <b>C1</b> .	
<b>QA2</b>   CHECK SELF-TEST INPUT CONTINUITY  Refer to schematic in Pinpoint Test QA. <ul style="list-style-type: none"> <li>• Key off, wait 10 seconds.</li> <li>• Breakout box installed, processor disconnected.</li> <li>• Set DVOM to 200 ohm scale.</li> <li>• Measure resistance between SELF-TEST INPUT at the Self-Test single pin connector and Test Pin 48 at the breakout box.</li> <li>• Is resistance less than 5 ohms?</li> </ul>	Yes  No	▶ GO to <b>QA3</b> .  ▶ SERVICE open circuit. REMOVE breakout box. RECONNECT processor. RERUN Quick Test.	
<b>QA3</b>   CHECK SELF-TEST OUTPUT CIRCUIT CONTINUITY  Refer to schematic in Pinpoint Test QA. <ul style="list-style-type: none"> <li>• Breakout box installed, processor disconnected.</li> <li>• DVOM to 200 ohm scale.</li> <li>• Measure resistance between SELF-TEST OUTPUT at the Self-Test connector and Test Pin 17 at the breakout box.</li> <li>• Is resistance less than 5 ohms?</li> </ul>	Yes  No	▶ GO to <b>QA4</b> .  ▶ SERVICE open circuit. REMOVE breakout box. RECONNECT processor. RERUN Quick Test.	

Pinpoint Test QA1 Thru QA3 - No Codes/Codes Not Listed

No Codes/Codes Not Listed		Pinpoint Test	QA
TEST STEP		RESULT	ACTION TO TAKE
<b>QA4</b>	CHECK EGO SENSOR GROUND CONTINUITY		
Refer to schematic in Pinpoint Test QA. <ul style="list-style-type: none"> <li>• Key off.</li> <li>• Breakout box installed, processor disconnected.</li> <li>• DVOM on 200 ohm scale.</li> <li>• Measure resistance between EGO GROUND on engine and Test Pin 49 at the breakout box.</li> <li>• Is resistance less than 5 ohms?</li> </ul>		Yes No	GO to <b>QA5</b> . SERVICE open circuit. REMOVE breakout box. RECONNECT processor. RERUN Quick Test.
<b>QA5</b>	STO SHORT TO GROUND		
<ul style="list-style-type: none"> <li>• Key off.</li> <li>• Breakout box installed, processor disconnected.</li> <li>• DVOM on 200 ohm scale.</li> <li>• Measure resistance between SELF-TEST OUTPUT at Self-Test connector and engine block ground.</li> <li>• Is resistance greater than 5 ohms?</li> </ul>		No Yes	REMOVE breakout box. RECONNECT processor. SERVICE STO or MIL/SIL circuit for short to ground. RERUN Quick Test. 3.0L EFI passenger car GO to <b>QA7</b> . All others GO to <b>QA6</b> .
<b>QA6</b>	INTERMITTENT NDS		
<ul style="list-style-type: none"> <li>• Key off.</li> <li>• Breakout box installed.</li> <li>• Connect processor.</li> <li>• Connect DVOM between Test Pin 30 and Test Pin 40 or 60 at the breakout box.</li> <li>• Run Engine Running Self-Test.</li> <li>• Is voltage greater than 1 volt?</li> </ul> <b>NOTE: Refer to proper illustration in Pinpoint-Test <b>FA</b> for connector orientation.</b>		Yes No	SERVICE intermittent open in NDS harness, connector or switch. If OK, REMOVE breakout box. RECONNECT processor. GO to Quick Test Step <b>5.0</b> for appropriate service codes. GO to <b>QA7</b> .

Pinpoint Test QA4 Thru QA6 - No Codes/Codes Not Listed

No Codes/Codes Not Listed		Pinpoint Test	QA
TEST STEP	RESULT	ACTION TO TAKE	
<b>QA7</b>   POWER RELAY ALWAYS ON			
<ul style="list-style-type: none"> <li>• Key off.</li> <li>• Breakout box installed.</li> <li>• Connect DVOM to Test Pin 37 or 57 and to Test Pin 40 or 60 at the breakout box.</li> <li>• Turn key ON and OFF. Wait 10 seconds.</li> <li>• Does voltage change from greater than 10.5 volts to zero volts?</li> </ul>	<p>Yes</p> <p>No</p>	<p>If vehicle is equipped with MIL (malfunction indicator light displayed as "CHECK ENGINE" light) or SIL (shift indicator light) GO to <b>QA9</b>. If not, REPLACE the processor. RERUN Quick Test.</p> <p>GO to <b>QA8</b>.</p>	
<b>QA8</b>   VPWR HARNESS SHORT TO POWER			
<ul style="list-style-type: none"> <li>• Key off.</li> <li>• Breakout box installed.</li> <li>• EEC Power Relay or Integrated Relay Controller disconnected.</li> <li>• Connect DVOM to Test Pin 37 or 57 and to Test Pin 40 or 60 at the breakout box.</li> <li>• Is voltage greater than 10.5 volts?</li> </ul>	<p>Yes</p> <p>No</p>	<p>SERVICE VPWR harness short to power. RERUN Quick Test.</p> <p>REPLACE EEC Power Relay or Integrated Relay Controller. RERUN Quick Test.</p>	
<b>QA9</b>   MIL AND/OR SIL EQUIPPED VEHICLES			
<ul style="list-style-type: none"> <li>• Are any of these conditions present?</li> <li>• Shift indicator light: <ul style="list-style-type: none"> <li>— Always ON _____ →</li> <li>— Always OFF _____ →</li> </ul> </li> <li>• Malfunction indicator light: <ul style="list-style-type: none"> <li>— Always ON _____ →</li> <li>— Always OFF _____ →</li> </ul> </li> <li>• Shift and malfunction indicator lights functioning normally. _____ →</li> </ul>		<p>GO to <b>KL1</b>.</p> <p>GO to <b>KL1</b>.</p> <p>GO to <b>ML1</b>.</p> <p>GO to <b>ML5</b>.</p> <p>REPLACE the processor. RERUN Quick Test.</p>	

Pinpoint Test QA7 Thru QA9 - No Codes/Codes Not Listed

## Key On Engine Off and/or Continuous Memory Service Code 15

## Pinpoint Test

## QB

### Note

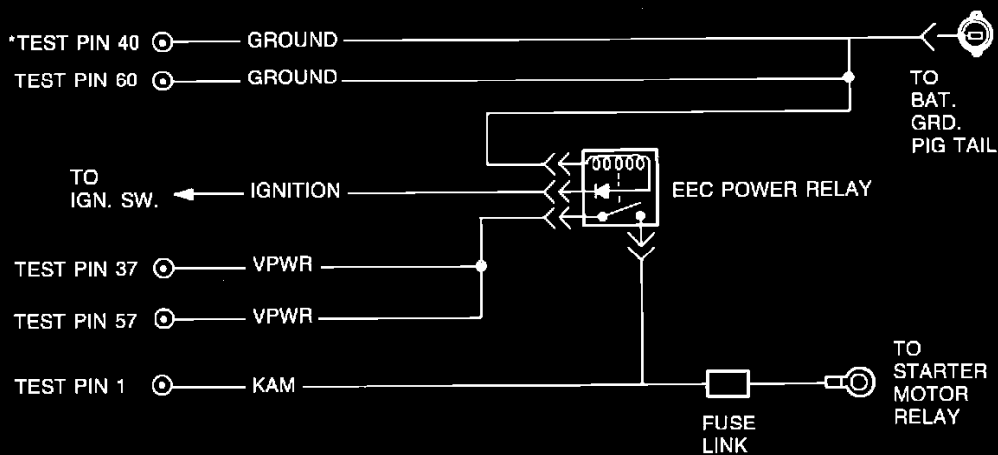
You should enter this Pinpoint Test only when directed here from Quick Test Step 3.0.

### Remember

This Pinpoint Test is intended to diagnose only the following:

- Processor.
- Harness Circuits: GROUND, VPWR, KAM, IGNITION.

### Pinpoint Test Schematic



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

Pinpoint Test QB - Key On Engine Off and/or Continuous Memory Code 15

Key On Engine Off and/or Continuous Memory Service Code 15		Pinpoint Test	QB
TEST STEP		RESULT	ACTION TO TAKE
<b>QB1</b>	CONDITIONS FOR CONTINUOUS CODE 15		
<ul style="list-style-type: none"> <li>• Power interruption to Keep Alive Memory (KAM) Pin 1 may result in a service code being stored in Continuous Memory.*</li> <li>• Clear continuous memory codes (use procedure described in Quick Test Step 6.0A).</li> <li>• Rerun Quick Test Step 3.0 through Continuous memory code output.</li> <li>• Code 15 present on retest?</li> </ul> <p><b>*NOTE: Anytime power is interrupted to the processor, for example when installing a breakout box, a Code 15 may be outputted the first time Key On Engine Off Self-Test is run after restoration of power. Rerun Self-Test to ensure correct diagnosis.</b></p>		Yes ▶ No ▶	GO to <b>QB2</b> . Test complete.
<b>QB2</b>	INSPECT ENGINE COMPARTMENT WIRING FOR PROPER ROUTING		
<ul style="list-style-type: none"> <li>• Are any EEC components or EEC wiring close to ignition components or wires (High Electrical Energy Sources)? If EEC wiring close, reroute and rerun Step 3.0.</li> <li>• Is Code 15 still present in Continuous Memory?</li> </ul>		Yes ▶ No ▶	GO to <b>QB3</b> . Test complete.
<b>QB3</b>	CHECK POWER CIRCUIT TO KEEP ALIVE MEMORY		
<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, leave processor disconnected.</li> <li>• DVOM on 20 volt scale.</li> <li>• Connect positive test lead to Test Pin 1 and negative test lead to Test Pin 40 or 60 at the breakout box.</li> <li>• Key on.</li> <li>• Is voltage less than 10.5 volts?</li> </ul> <p><b>NOTE: If on initial Key On Engine Off Self-Test, no voltage to the processor is observed, a Code 15 will be generated.</b></p>		Yes ▶ No ▶	SERVICE open circuit. REMOVE breakout box. RECONNECT processor. RERUN Quick Test. REMOVE breakout box. REPLACE processor. RERUN Quick Test.

Pinpoint Test QB1 Thru QB3 - Key On Engine Off and/or Continuous Memory Code 15

## Output State Check Not Functioning

## Pinpoint Test

## QC

### Note

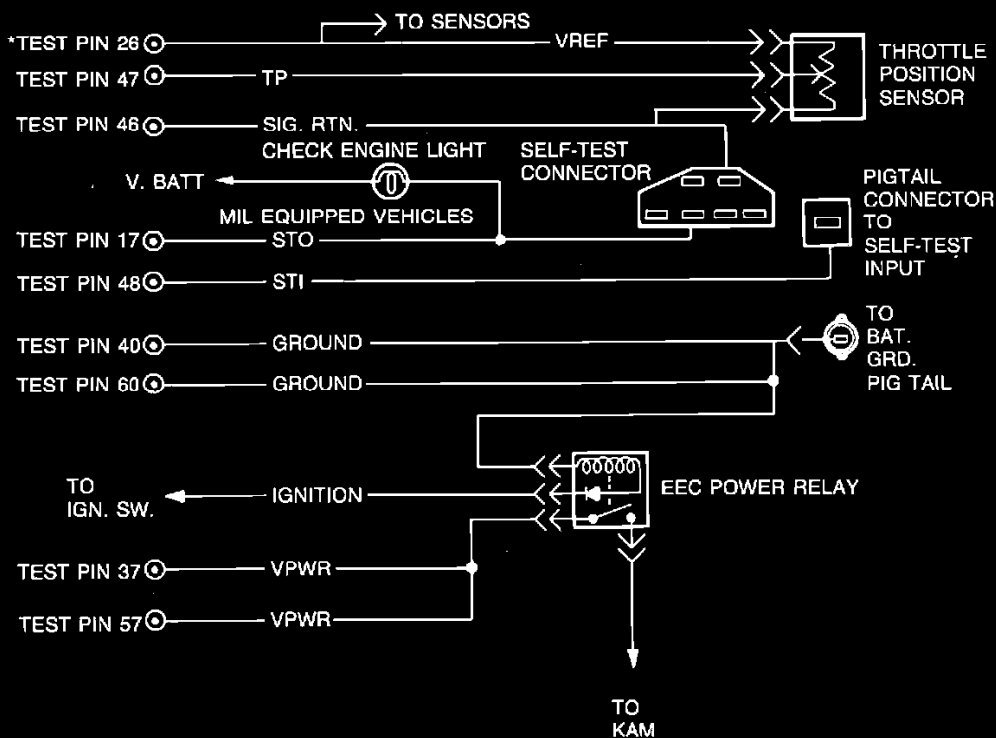
You should enter this Pinpoint Test only when directed here.

### Remember

This Pinpoint Test is intended to diagnose only the following:

- Processor
- Harness Circuits: SIGNAL RETURN, STO, STI, GROUND, VPWR, VREF

### Pinpoint Test Schematic



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

Pinpoint Test QC - Output State Check Not Functioning

<b>Output State Check Not Functioning</b>		<b>Pinpoint Test</b>	<b>QC</b>
<b>TEST STEP</b>		<b>RESULT</b>	<b>ACTION TO TAKE</b>
<b>QC1</b>	<b>CHECK FOR CODES 23, 53, 63 OR 68</b>		
<ul style="list-style-type: none"> <li>• Key off, wait 10 seconds.</li> <li>• Perform Key On Engine Off Self-Test.</li> <li>• Leave Key On to enter Output State Check.</li> <li>• Key on engine off.</li> <li>• Are any of these codes 23, 53, 63 or 68 present?</li> </ul>		Yes ▶  Code 11 ▶  No Codes ▶	GO to Quick Test Step <b>3.0B</b> and SERVICE appropriate code as instructed.  GO to <b>QC2</b> .  GO to <b>QA1</b> .
<b>QC2</b>	<b>CHECK THROTTLE LINKAGE</b>		
<ul style="list-style-type: none"> <li>• Check throttle and throttle linkages for sticking and binding.</li> <li>• Is throttle OK?</li> </ul>		Yes ▶  No ▶	REPLACE TP sensor. RERUN Quick Test.  SERVICE as necessary. RERUN Quick Test.

Pinpoint Test QC1 &amp; QC2 - Output State Check Not Functioning

## Processor Power Check

## Pinpoint Test

## QD

### Note

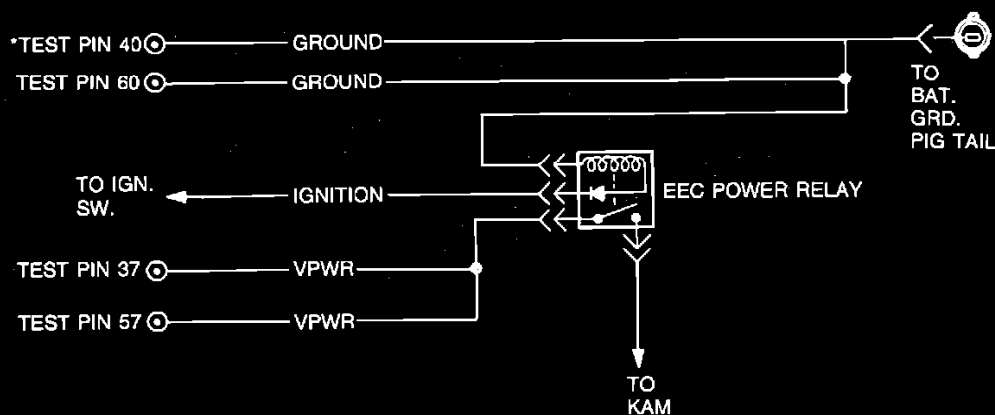
You should enter this Pinpoint Test only when directed here from Quick Test Step 3.0 or 6.0 or when directed here from Diagnostic By Symptom in the Engine Supplement Section or from a Pinpoint Test Step.

### Remember

This Pinpoint Test is intended to diagnose only the following:

- Processor.
- Harness Circuits: GROUND, VPWR.

### Pinpoint Test Schematic



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

Pinpoint Test QD - Processor Power Check

<b>Processor Power Check</b>		<b>Pinpoint Test</b>	<b>QD</b>
<b>TEST STEP</b>		<b>RESULT</b>	<b>ACTION TO TAKE</b>
<b>QD1</b>	<b>CHECK FOR POWER TO PROCESSOR</b>		
<ul style="list-style-type: none"> <li>• Key off, wait 10 seconds.</li> <li>• Disconnect processor 60 pin connector. Inspect for damaged pins, corrosion, loose wires, etc. Service as necessary.</li> <li>• Install breakout box.</li> <li>• Key on, engine off.</li> <li>• DVOM on 20 volt scale.</li> <li>• Measure voltage between Test Pin 37 and Test Pin 40 at the breakout box and between Test Pin 57 and Test Pin 60 at the breakout box.</li> <li>• Is either voltage less than 10.5 volts?</li> </ul>		<p>Yes</p> <p>No</p>	<p>2.3L EFI TC, 2.5L CFI and 3.0L EFI passenger car GO to Pinpoint Test <b>X1</b>. All others GO to Pinpoint Test <b>B1</b>.</p> <p>REMOVE breakout box. REPLACE processor. RERUN Quick Test.</p>

Pinpoint Test QD1 - Processor Power Check

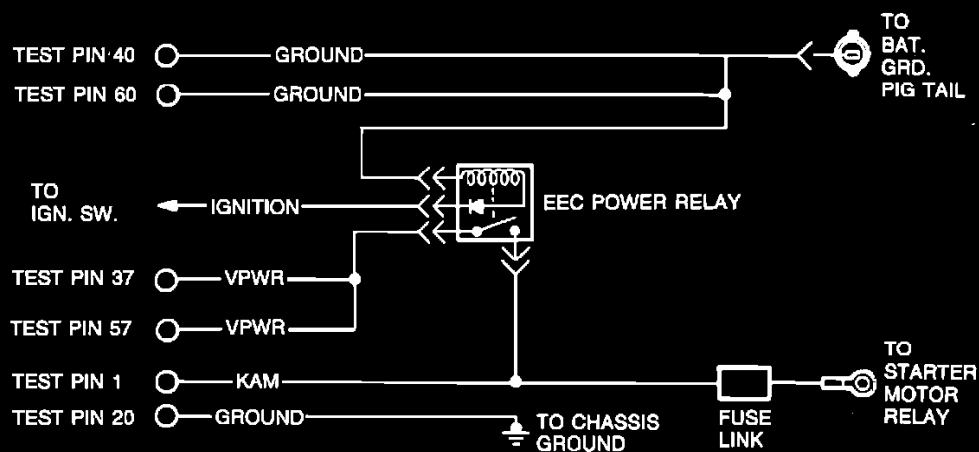
**Re-Initialization Check****Pinpoint  
Test****QE****Note**

You should enter this Pinpoint Test only when directed here from Quick Test Step 3.0, 5.0 or 6.0 or when directed here from Diagnostic By Symptom

**Remember**

This Pinpoint Test is intended to diagnose only the following:

- Processor, EEC Power Relay.
- Harness Circuits: GROUND, VPWR, IGNITION.

**Pinpoint Test Schematic**

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

Pinpoint Test QE - Re-Initialization Check

Re-Initialization Check		Pinpoint Test	QE
TEST STEP		RESULT	ACTION TO TAKE
<b>QE1</b>	CHECK FOR SOURCES OF ELECTRICAL NOISE		
<p><b>NOTE:</b> Be aware that after-market installed electrical components may influence the driveability of the vehicle.</p> <ul style="list-style-type: none"> <li>• Key off.</li> <li>• Check that the EEC IV wiring and components are greater than 2 inches from secondary ignition wires and ignition coil.</li> <li>• Check that the EEC IV wiring and components are greater than 4 inches from distributor, coil tower, starter motor and its wiring.</li> <li>• Are all above conditions satisfied?</li> </ul>		<p>Yes ▶</p> <p>No ▶</p>	<p>GO to <b>QE2</b>.</p> <p>SERVICE as necessary, RERUN Quick Test.</p>
<b>QE2</b>	HARNESS CHECK — CASE GROUND		
<ul style="list-style-type: none"> <li>• Key off.</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 Test Pin 20 at the breakout box and chassis ground.</li> <li>• Is the resistance less than 5 ohms?</li> </ul>		<p>Yes ▶</p> <p>No ▶</p>	<p>GO to <b>QE3</b>.</p> <p>REMOVE breakout box. RECONNECT processor. SERVICE open circuit. RERUN Quick Test.</p>
<b>QE3</b>	DISCONNECT HARNESS — CASE GROUND CHECK		
<ul style="list-style-type: none"> <li>• Key off.</li> <li>• Reconnect processor to breakout box, but disconnect harness from breakout box.</li> <li>• DVOM on 200 ohm scale.</li> <li>• Measure resistance between Test Pin 20 at the breakout box and metal case of processor.</li> <li>• Is the resistance less than 5 ohms?</li> </ul>		<p>Yes ▶</p> <p>No ▶</p>	<p>For 1.9L EFI GO to <b>QE4</b>. For 2.3L EFI TC and 2.5L CFI GO to <b>X10</b>.</p> <p>REMOVE breakout box. REPLACE processor. RERUN Quick Test.</p>

Pinpoint Test QE1 Thru QE3 - Re-Initialization Check

Re-Initialization Check		Pinpoint Test	QE
TEST STEP		RESULT	ACTION TO TAKE
<b>QE4</b>	<b>WIGGLE TEST OF VPWR CIRCUIT</b>		
<ul style="list-style-type: none"> <li>• Key on, engine off.</li> <li>• Connect STAR or VOM to Self-Test connector.</li> <li>• Self-Test deactivated.</li> <li>• Using Continuous Monitor Mode (Engine Running) per Quick Test Step 6.0B. Observe STAR/VOM for indication of a fault while doing the following:               <ul style="list-style-type: none"> <li>— Shake, bend, and twist the EEC-IV harness from the EEC-IV power relay to the processor.</li> </ul> </li> <li>• Is a fault indicated or does Code 72 reappear in continuous memory if the Key On Engine Off Self-Test is rerun?</li> </ul>		<p>Yes</p> <p>No</p>	<p>SERVICE intermittent in the VPWR circuit. RERUN Quick Test.</p> <p>INSPECT EEC-IV power relay and harness connectors for damaged pins, loose wires, corrosion, etc. SERVICE as necessary. If OK, REPLACE EEC-IV power relay. RERUN Quick Test.</p>

## Pinpoint Test QE4 - Re-Initialization Check

**Key Power Check****Pinpoint  
Test****QF****Note**

You should enter this Pinpoint Test only when a Service Code 55 is received in Quick Test Step 5.0.

**Remember**

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

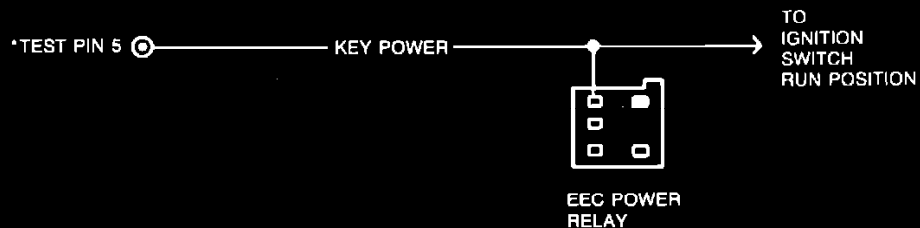
- Charging system under voltage
- Battery charger connected with engine running
- Jump starting

This Pinpoint Test is intended to diagnose only the following:

- Harness Circuit: KEY POWER
- Processor

**Pinpoint Test Schematic**

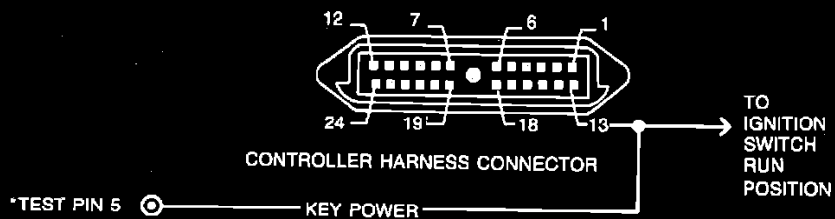
1.9L CFI



Pinpoint Test QF - Key Power Check

**Key Power Check****Pinpoint  
Test****QF****Pinpoint Test Schematic**

2.5L CFI WITH INTEGRATED CONTROLLER



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

**Pinpoint Test QF - Key Power Check**

<b>Key Power Check</b>		<b>Pinpoint Test</b>	<b>QF</b>
<b>TEST STEP</b>		<b>RESULT</b>	<b>ACTION TO TAKE</b>
<b>QF1</b>	<b>CHECK CONTINUITY OF KEY POWER CIRCUIT</b>		
<ul style="list-style-type: none"> <li>• Key off, wait 10 seconds.</li> <li>• Disconnect processor 60 pin connector. Inspect for damaged pins, corrosion, loose wires, etc. Service as necessary.</li> <li>• Install breakout box, leave processor disconnected.</li> <li>• Disconnect the EEC-IV power relay or integrated controller as appropriate.</li> <li>• DVOM on 200 ohm scale.</li> <li>• Measure resistance between Test Pin 5 at the breakout box and KEY POWER at the EEC power relay or Test Pin 13 at the Integrated Controller vehicle harness connector.</li> <li>• Is resistance less than 5.0 ohms?</li> </ul>		<p>Yes ▶</p> <p>No ▶</p>	<p>GO to <b>QF2</b>.</p> <p>REMOVE breakout box. RECONNECT processor and EEC power relay or integrated controller. SERVICE open circuit. RERUN Quick Test.</p>
<b>QF2</b>	<b>CHECK KEY POWER CIRCUIT FOR SHORT TO GROUND</b>		
<ul style="list-style-type: none"> <li>• Key off.</li> <li>• Breakout box installed, processor disconnected.</li> <li>• EEC power relay or integrated controller disconnected.</li> <li>• DVOM on 200,000 ohm scale.</li> <li>• Measure resistance between Test Pin 5 and Test Pins 40, 46, and 60 at the breakout box.</li> <li>• Is resistance greater than 10,000 ohms?</li> </ul>		<p>Yes ▶</p> <p>No ▶</p>	<p>REMOVE breakout box. RECONNECT EEC power relay or integrated controller. REPLACE processor. RERUN Quick Test.</p> <p>REMOVE breakout box. RECONNECT processor and EEC power relay or integrated controller. SERVICE short circuit. RERUN Quick Test.</p>

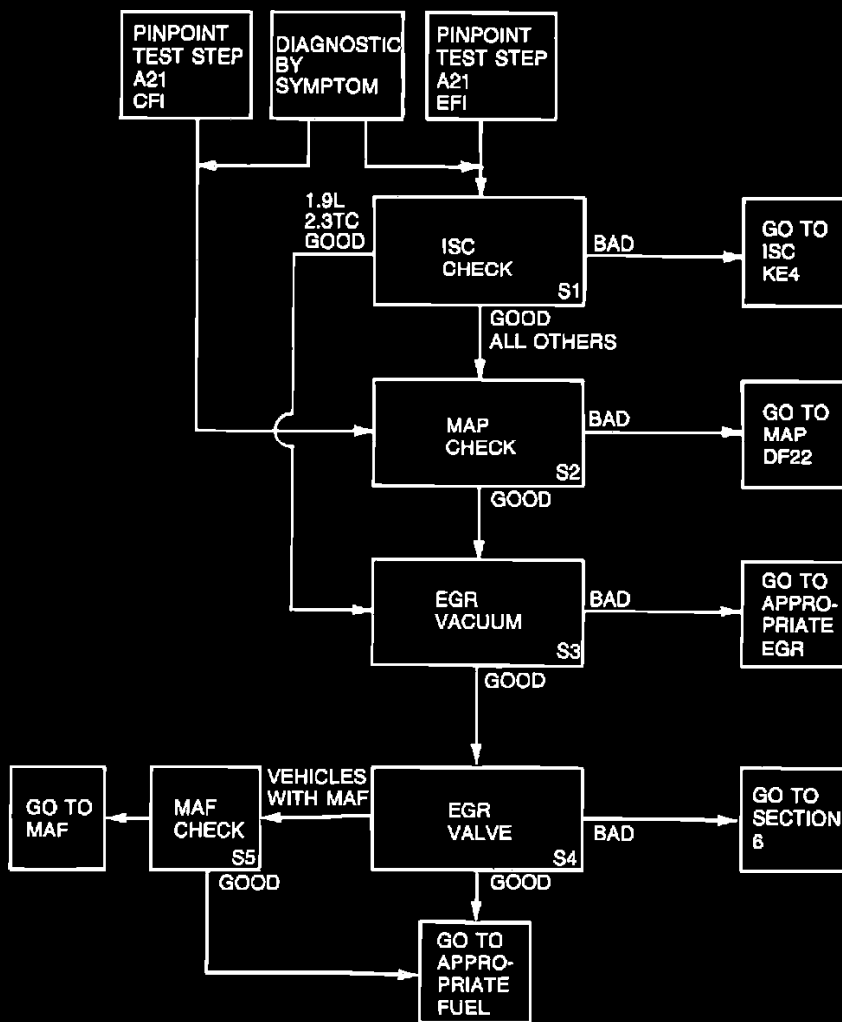
Pinpoint Test QF1 &amp; QF2 - Key Power Check

**System Check**

**Pinpoint Test**

**S**

**Pinpoint Test Flow Chart**



Pinpoint Test S - System Check

**System Check****Pinpoint  
Test****S****Note**

You should enter this Pinpoint Test only after a Code 11 is received in Quick Test Step 3.0, and you have been directed here from EEC-IV No-Start Pinpoint Test Step **A21** or Diagnostic By Symptom.

**Remember**

This Pinpoint Test is intended only as a Quick Check for the basic functioning of the following:

- ISC Bypass Air System
- MAP System
- EGR System
- MAF System

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

- Poor power/ground connections
- Ignition system distributor cap, rotor, wires, coil, plugs
- Base engine valves, cam timing, compression, etc.

**Pinpoint Test S - System Check**

System Check		Pinpoint Test	S
TEST STEP		RESULT	ACTION TO TAKE
<b>S1</b>	ISC-BPA CHECK		
<p><b>NOTE:</b> For 1.9L and 2.5L CFI go directly to <b>S2</b>.</p> <ul style="list-style-type: none"> <li>If you are here for any reason other than stalls or a no start, go to <b>S2</b>. Except 1.9L EFI and 2.3L EFI TC, go to <b>S3</b>.</li> <li>Attempt to start engine at part throttle.</li> <li>Will engine run at part throttle?</li> </ul>		<p>Yes, but runs rough ▶</p> <p>Yes, and runs smooth ▶</p> <p>No ▶</p>	<p>GO to <b>S2</b>.</p> <p>GO to <b>KE4</b>.</p> <p>1.9 EFI and 2.3L EFI TC and 5.0L MA Mustang, GO to <b>S3</b>.</p> <p>All others GO to <b>S2</b>.</p>
<b>S2</b>	MAP CHECK		
<ul style="list-style-type: none"> <li>Key off.</li> <li>Disconnect the MAP sensor from the vehicle harness.</li> <li>Connect the MAP tester between the vehicle harness and the MAP sensor.</li> <li>Plug MAP tester banana plugs into DVOM.</li> <li>Set DVOM to 20 volt scale.</li> <li>Key on.</li> <li>Observe DVOM.           <ul style="list-style-type: none"> <li><u>Approximate Altitude (Ft.)</u>    <u>Voltage Output (+/- .04V)</u></li> <li>0    1.59</li> <li>1000                                        1.56</li> <li>2000                                        1.53</li> <li>3000                                        1.50</li> <li>4000                                        1.47</li> <li>5000                                        1.44</li> <li>6000                                        1.41</li> <li>7000                                        1.39</li> </ul> </li> <li>If MAP sensor is out of limits (voltage output for altitude) GO to DF21.</li> <li>Crank engine.</li> <li>While cranking, does DVOM reading decrease from the appropriate reading for your altitude listed above?</li> </ul>		<p>Yes ▶</p> <p>No ▶</p>	<p>2.9L EFI and 3.0L EFI Truck, GO to Pinpoint Test Step <b>H1</b>, all others, GO to <b>S3</b>.</p> <p>GO to <b>DF22</b>.</p>

Pinpoint Test S1 &amp; S2 - System Check

System Check		Pinpoint Test	S
TEST STEP	RESULT	ACTION TO TAKE	
<b>S3</b>   CHECK EGR VACUUM			
<p><b>NOTE:</b> The next two Test Steps will attempt to determine if the EGR system is the cause of the current symptom and/or no start.</p> <ul style="list-style-type: none"> <li>• Disconnect vacuum line at EGR valve. Do not plug the vacuum line.</li> <li>• Start engine.</li> <li>• For Drive Symptom: Is symptom eliminated?</li> <li>• For No Start: Does engine start?</li> </ul>	Yes	<p>For 1.9L EFI and 2.3L EFI TC, GO to <b>KA1</b>.</p> <p>For 2.3L OHC EFI Car and Truck GO to <b>DD11</b>.</p> <p>For 2.5L HSC CFI, 5.0L SEFI Car and 4.9L EFI, 5.0L EFI, 5.8L EFI, 7.5L EFI Truck GO to <b>DN42</b>.</p> <p>For 1.9L CFI, 2.3L HSC, EFI, 3.0L EFI and 3.8L EFI Car GO to <b>DL23</b>.</p>	
	No	GO to <b>S4</b> .	
<b>S4</b>   CHECK EGR VALVE			
<ul style="list-style-type: none"> <li>• Inspect EGR valve to ensure proper seating.</li> <li>• Is valve fully seated (closed)?</li> </ul>	Yes	Vehicles with MAF sensor GO to <b>S5</b> . All others GO to <b>H1</b> .	
	No	GO to EGR valve diagnosis.	
<b>S5</b>   CHECK MAF SENSOR OUTPUT			
<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.</li> <li>• Connect processor to breakout box.</li> <li>• Key on, engine off.</li> <li>• DVOM on 20 volt scale.</li> <li>• Measure voltage between Test Pin 50 at the breakout box and battery negative post.</li> <li>• Is voltage between 0.5 and 1.5 volts?</li> </ul>	Yes	If vehicle stalls GO to Pinpoint Test Step <b>DC6</b> . All others GO to <b>H1</b> .	
	No	Vehicles with Continuous Memory Code 56 GO to <b>DC10</b> . Vehicles with Continuous Memory Code 66 GO to <b>DC6</b> .	

Pinpoint Test S3 Thru S5 - System Check

**Transmission — AXOD****Pinpoint  
Test****T****Note**

You should enter this Pinpoint Test only when Service Codes 59, 62, 67, 69 and 89 are received in Quick Test Step 3.0, and/or Service Codes 29, 39, 57, 59 and 69 received in Quick Test Step 6.0 or when directed here from Diagnostic By Symptom

**Remember**

This Pinpoint Test is intended to diagnose only the following:

- Harness Circuits: THS 4/3, THS 3/2, TTS, LUS, NPS, VSS+, VSS- and VPWR
- Vehicle Speed Sensor
- Processor Assembly

**Pinpoint Test T - Transmission-AXOD**

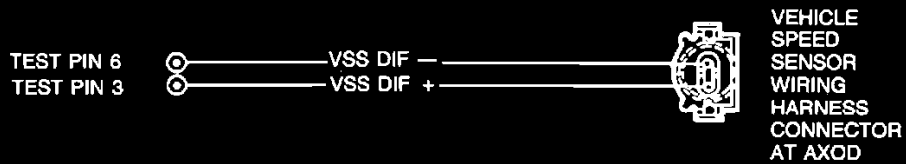
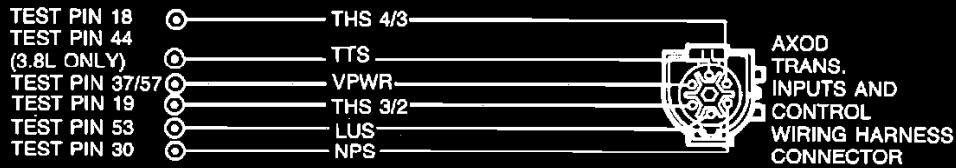
# Transmission — AXOD

# Pinpoint Test

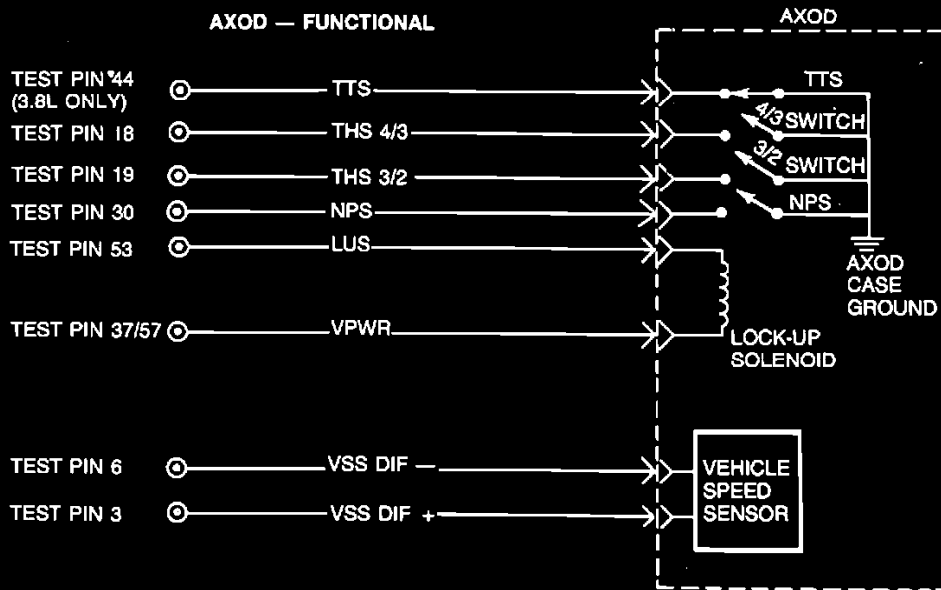
T

## Pinpoint Test Schematic



### AXOD — HARNESS CONNECTIONS



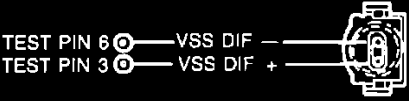
### AXOD — FUNCTIONAL



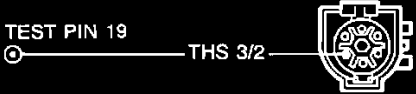
Pinpoint Test T - Transmission-AXOD

Transmission — AXOD		Pinpoint Test	T
<b>T1</b>	<b>DRIVE CYCLE FOR CHECKING AXOD CONTINUOUS CODES</b>		
<ol style="list-style-type: none"> <li>Record and clear Continuous Memory Self-Test codes.</li> <li>Warm engine to operating temperature.</li> <li>With transmission in D range, lightly accelerate from a stop to 40 mph to achieve third gear. Hold speed and throttle opening (not closed throttle) steady for 15 seconds minimum (30 seconds above 4000 feet altitude).</li> <li>Shift gear selector to OD range and accelerate lightly from 40 to 50 mph to achieve fourth gear. Hold speed and throttle opening (not closed throttle) steady for 15 seconds minimum in fourth gear.</li> <li>With transmission in fourth gear and steady speed and throttle opening (not closed throttle) lightly apply and release brakes (to light brake lamps) and then hold speed and throttle opening steady for an additional 15 seconds minimum.</li> <li>Brake to a stop and remain stopped for 20 seconds minimum with transmission in OD range.</li> <li>Turn engine off. Run Key On Engine Off Self-Test and record Continuous Memory Codes.</li> </ol> <p><b>NOTE: All components must be connected when performing this test.</b></p>			
TEST STEP		RESULT	ACTION TO TAKE
<b>T2</b>	<b>ATTEMPT TO GENERATE CONTINUOUS MEMORY CODE 29</b>		
<ul style="list-style-type: none"> <li>Perform Drive Cycle outlined in Test Step <b>T1</b>, then return to this Step.</li> <li>Did Continuous Memory Code 29 repeat?</li> </ul>		Yes  No 	GO to <b>T3</b> . Unable to duplicate Continuous Memory Code 29 at this time. SERVICE other codes as necessary. If none, test is completed.

Pinpoint Test T1 &amp; T2 - Transmission-AXOD

Transmission — AXOD		Pinpoint Test	T
TEST STEP		RESULT	ACTION TO TAKE
<b>T3</b>	<b>CHECK CONTINUITY OF VEHICLE SPEED SENSOR (VSS) HARNESS</b>		
<ul style="list-style-type: none"> <li>• Key off, wait 10 seconds.</li> <li>• Disconnect VSS.</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 Test Pin 3 at the breakout box and the VSS vehicle harness connector as shown below.</li> <li>• Measure resistance between Test Pin 6 at the breakout box and the VSS vehicle harness connector, as shown below.</li> </ul>		Yes  No	GO to <b>T4</b> .  REMOVE breakout box. RECONNECT all components. SERVICE open circuit(s). REPEAT Test Step <b>T2</b> .
 <p>TEST PIN 6 — VSS DIF - TEST PIN 3 — VSS DIF +</p>			
<ul style="list-style-type: none"> <li>• Are both resistances less than 5 ohms?</li> </ul>			
<b>T4</b>	<b>CHECK VSS HARNESS FOR SHORTS TO POWER OR GROUND</b>		
<ul style="list-style-type: none"> <li>• Key off.</li> <li>• Processor disconnected.</li> <li>• VSS disconnected.</li> <li>• DVOM on 200,000 ohm scale.</li> <li>• Measure resistance between Test Pin 3 and Test Pins 37, 40 and 6 at the breakout box.</li> <li>• Measure resistance between Test Pin 6 and Test Pin 37 at the breakout box.</li> <li>• Are all resistances greater than 10,000 ohms?</li> </ul>		Yes  No	REMOVE breakout box. RECONNECT all components. GO to <b>T5</b> .  REMOVE breakout box. RECONNECT all components. SERVICE short circuit(s). REPEAT Test Step <b>T2</b> .
<b>T5</b>	<b>REPEAT DRIVE CYCLE WITH A KNOWN GOOD VSS INSTALLED</b>		
<ul style="list-style-type: none"> <li>• Substitute VSS with known good sensor.</li> <li>• Processor and VSS connected.</li> <li>• Perform Drive Cycle outlined in Test Step <b>T1</b> , then return to this Step.</li> <li>• Did Continuous Memory Code 29 repeat?</li> </ul>		Yes  No	REPLACE processor. REPEAT Test Step <b>T2</b> .  REPLACE VSS. RERUN Quick Test.




Pinpoint Test T3 Thru T5 - Transmission-AXOD

Transmission — AXOD		Pinpoint Test	T
TEST STEP		RESULT	ACTION TO TAKE
<b>T11</b>	ATTEMPT TO GENERATE CONTINUOUS MEMORY CODE 69		
<ul style="list-style-type: none"> <li>Perform Drive Cycle outlined in Test Step <b>T1</b>, then return to this Step.</li> <li>Did Continuous Memory Code 69 repeat?</li> </ul>		Yes  No	GO to <b>T12</b> .  Unable to duplicate Continuous Memory Code 69 at this time. SERVICE other codes as necessary. If none, test is completed.
<b>T12</b>	CHECK CONTINUITY OF THS 3/2 CIRCUIT		
<ul style="list-style-type: none"> <li>Key off, wait 10 seconds.</li> <li>Disconnect AXOD harness.</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 Test Pin 19 at the breakout box and the AXOD vehicle harness connector, as shown below.</li> <li>Is resistance less than 5 ohms?</li> </ul> <div style="text-align: center;">  <p>TEST PIN 19 — THS 3/2</p> </div>		Yes  No	GO to <b>T13</b> .  REMOVE breakout box. RECONNECT all components. SERVICE open in THS 3/2 circuit. REPEAT Test Step <b>T11</b> .
<b>T13</b>	CHECK THS 3/2 CIRCUIT FOR SHORT TO POWER		
<ul style="list-style-type: none"> <li>Key off.</li> <li>Breakout box installed.</li> <li>Processor disconnected.</li> <li>AXOD harness disconnected.</li> <li>DVOM on 200,000 ohm scale.</li> <li>Measure resistance between Test Pin 19 and Test Pin 37 at the breakout box.</li> <li>Is resistance greater than 10,000 ohms?</li> </ul>		Yes  No	GO to <b>T14</b> .  REMOVE breakout box. RECONNECT all components. SERVICE short to power in THS 3/2 circuit. REPEAT Test Step <b>T11</b> .

Pinpoint Test T11 Thru T13 - Transmission-AXOD

Transmission — AXOD		Pinpoint Test	T
TEST STEP		RESULT	ACTION TO TAKE
<b>T14</b>	PROCESSOR VERIFICATION		
<ul style="list-style-type: none"> <li>• Key off.</li> <li>• Breakout box installed.</li> <li>• Reconnect processor and AXOD harness.</li> <li>• Jumper Test Pin 19 to Test Pin 40 at the breakout box.</li> <li>• Run Key On Engine Off Self-Test.</li> <li>• Is Code 62 or 69 present?</li> </ul>		<p>Yes</p> <p>▶</p>	<p>REMOVE breakout box. REMOVE jumper wire.</p> <p>AXOD Transmission Electrical Component Diagnostics.</p>
		<p>No</p> <p>▶</p>	<p>REMOVE breakout box. REMOVE jumper wire. REPLACE processor. REPEAT Test Step <b>T11</b>.</p>
<b>T21</b>	ATTEMPT TO GENERATE CONTINUOUS MEMORY CODE 59		
<ul style="list-style-type: none"> <li>• Perform Drive Cycle outlined in Test Step <b>T1</b>, then return to this Step.</li> <li>• Did Continuous Memory Code 59 repeat?</li> </ul>		<p>Yes</p> <p>▶</p>	<p>GO to <b>T22</b>.</p>
		<p>No</p> <p>▶</p>	<p>Unable to duplicate Continuous Memory Code 59 at this time. SERVICE other codes as necessary. If none, test is completed.</p>


Pinpoint Test T14 &amp; T21 - Transmission-AXOD

Transmission — AXOD		Pinpoint Test	T
TEST STEP		RESULT	ACTION TO TAKE
<b>T22</b>	CHECK CONTINUITY OF THS 4/3 CIRCUIT		
<ul style="list-style-type: none"> <li>• Key off, wait 10 seconds.</li> <li>• Disconnect AXOD harness.</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 Test Pin 18 at the breakout box and the AXOD vehicle harness connector, as shown below.</li> </ul> <p>TEST PIN 18 </p> <ul style="list-style-type: none"> <li>• Is resistance less than 5 ohms?</li> </ul>		<p>Yes </p> <p>No </p>	<p>GO to <b>T23</b> .</p> <p>REMOVE breakout box. RECONNECT all components. SERVICE open in THS 4/3 circuit. REPEAT Test Step <b>T21</b> .</p>



Pinpoint Test T22 - Transmission-AXOD

Transmission — AXOD		Pinpoint Test	T
TEST STEP		RESULT	ACTION TO TAKE
<b>T23</b>	CHECK THS 4/3 CIRCUIT FOR SHORT TO POWER		
	<ul style="list-style-type: none"> <li>• Key off.</li> <li>• Breakout box installed.</li> <li>• Processor disconnected.</li> <li>• AXOD harness disconnected.</li> <li>• DVOM on 200,000 ohm scale.</li> <li>• Measure resistance between Test Pin 18 and Test Pin 37 at the breakout box.</li> <li>• Is resistance greater than 10,000 ohms?</li> </ul>	<p>Yes ▶</p> <p>No ▶</p>	<p>GO to <b>T24</b> .</p> <p>REMOVE breakout box. RECONNECT all components. SERVICE short to power in THS 4/3 circuit. REPEAT Test Step <b>T21</b> .</p>
<b>T24</b>	PROCESSOR VERIFICATION		
	<ul style="list-style-type: none"> <li>• Key Off.</li> <li>• Breakout box installed.</li> <li>• Reconnect processor and AXOD harness.</li> <li>• Jumper Test Pin 18 to Test Pin 40 at the breakout box.</li> <li>• Run Key On Engine Off Self-Test.</li> <li>• Is Code 62 or 59 present?</li> </ul>	<p>Yes ▶</p> <p>No ▶</p>	<p>REMOVE breakout box. REMOVE jumper wire.</p> <p>AXOD Transmission Electrical Component Diagnostics.</p> <p>REMOVE breakout box. REMOVE jumper wire. REPLACE processor. REPEAT TEST Step <b>T21</b> .</p>
<b>T31</b>	ATTEMPT TO GENERATE CONTINUOUS MEMORY CODE 39		
	<p><b>NOTE: If Continuous Memory Code 59 is also present, go directly to <b>T21</b> .</b></p> <ul style="list-style-type: none"> <li>• Perform Drive Cycle outlined in Test Step <b>T1</b> , then return to this Step.</li> <li>• Did Continuous Memory Code 39 repeat?</li> </ul>	<p>Yes ▶</p> <p>No ▶</p>	<p>AXOD Transmission Electrical Component Diagnostics.</p> <p>Unable to duplicate Continuous Memory Code 39 at this time. SERVICE other codes as necessary. If none, test is completed.</p>







Pinpoint Test T23 Thru T31 - Transmission-AXOD

Transmission — AXOD		Pinpoint Test	T
TEST STEP		RESULT	ACTION TO TAKE
<b>T41</b>	ATTEMPT TO GENERATE CONTINUOUS MEMORY CODE 57		
<ul style="list-style-type: none"> <li>• Perform Drive Cycle outlined in Test Step <b>T1</b> then return to this Step.</li> <li>• Did Continuous Memory Code 57 repeat?</li> </ul>		Yes No	GO to <b>T42</b> . Unable to duplicate Continuous Memory Code 57 at this time. SERVICE other codes as necessary. If none, test is completed.
<b>T42</b>	CHECK CONTINUITY OF NPS HARNESS CIRCUIT		
<ul style="list-style-type: none"> <li>• Key off, wait 10 seconds.</li> <li>• Disconnect AXOD harness.</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 Test Pin 30 at the breakout box and the AXOD vehicle harness connector, as shown below.</li> </ul> <div style="text-align: center;">  <p>TEST PIN 30 — NPS</p> </div> <ul style="list-style-type: none"> <li>• Is resistance less than 5 ohms?</li> </ul>		Yes No	REMOVE breakout box. RECONNECT all components. REMOVE breakout box. RECONNECT all components. SERVICE open in NPS circuit. REPEAT Test Step <b>T41</b> .

Pinpoint Test T41 &amp; T42 - Transmission-AXOD

Transmission — AXOD		Pinpoint Test	T
TEST STEP		RESULT	ACTION TO TAKE
<b>T51</b>	<b>SERVICE CODE 89: CHECK CONTINUITY OF VPWR CIRCUIT</b>		
<ul style="list-style-type: none"> <li>• Key off, wait 10 seconds.</li> <li>• Disconnect AXOD harness.</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 Test Pin 37 at the breakout box and the AXOD vehicle harness connector, as shown.</li> </ul> <div style="text-align: center;">  <p>TEST PIN 37 ⊙ — VPWR —</p> </div> <ul style="list-style-type: none"> <li>• Is resistance less than 5 ohms?</li> </ul>		<p>Yes</p> <p>No</p>	<p>▶ GO to <b>T52</b>.</p> <p>▶ REMOVE breakout box. RECONNECT all components. SERVICE open in VPWR circuit to AXOD. RERUN Quick Test.</p>
<b>T52</b>	<b>CHECK CONTINUITY OF LUS CIRCUIT</b>		
<ul style="list-style-type: none"> <li>• Key off.</li> <li>• Breakout box installed.</li> <li>• Processor disconnected.</li> <li>• AXOD harness disconnected.</li> <li>• DVOM on 200 ohm scale.</li> <li>• Measure resistance between Test Pin 53 at the breakout box and the AXOD vehicle harness connector, as shown.</li> </ul> <div style="text-align: center;">  <p>TEST PIN 53 ⊙ — LUS —</p> </div> <ul style="list-style-type: none"> <li>• Is resistance less than 5 ohms?</li> </ul>		<p>Yes</p> <p>No</p>	<p>▶ GO to <b>T53</b>.</p> <p>▶ REMOVE breakout box. RECONNECT all components. SERVICE open in LUS circuit to AXOD. RERUN Quick Test.</p>





Pinpoint Test T51 &amp; T52 - Transmission-AXOD

<b>Transmission — AXOD</b>		<b>Pinpoint Test</b>	<b>T</b>
<b>TEST STEP</b>		<b>RESULT</b>	<b>ACTION TO TAKE</b>
<b>T53</b>	<b>CHECK LUS CIRCUIT FOR SHORT TO POWER OR GROUND</b>		
<ul style="list-style-type: none"> <li>• Key off.</li> <li>• Breakout box installed.</li> <li>• Processor disconnected.</li> <li>• AXOD harness disconnected.</li> <li>• DVOM on 200,000 ohm scale.</li> <li>• Measure resistance between Test Pin 53 and Test Pins 37 and 40 at the breakout box.</li> <li>• Are both resistances greater than 10,000 ohms?</li> </ul>		Yes  No 	GO to <b>T54</b> .  REMOVE breakout box. RECONNECT all components. SERVICE short(s) in LUS circuit. RERUN Quick Test. If code 89 is still present, REPLACE processor. RERUN Quick Test.
<b>T54</b>	<b>CHECK TOTAL CIRCUIT RESISTANCE</b>		
<ul style="list-style-type: none"> <li>• Key off.</li> <li>• Breakout box installed.</li> <li>• Processor disconnected.</li> <li>• Reconnect AXOD harness.</li> <li>• DVOM on 200 ohm scale.</li> <li>• Measure the resistance between Test Pin 53 and Test Pin 57 at the breakout box.</li> <li>• Is resistance between 20 ohms and 40 ohms?</li> </ul>		Yes  No 	REMOVE breakout box. REPLACE processor. RERUN Quick Test.  REMOVE breakout box. RECONNECT processor.
<b>T61</b>	<b>SERVICE CODE 62: AXOD HARNESS VERIFICATION</b>		
<ul style="list-style-type: none"> <li>• Key off.</li> <li>• Disconnect AXOD harness.</li> <li>• Run Key On Engine Off Self-Test.</li> <li>• Is Code 62 still present?</li> </ul>		Yes  No 	GO to <b>T62</b> .  RECONNECT AXOD harness.

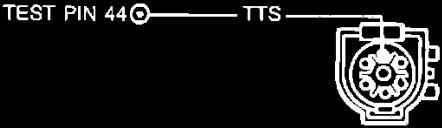
Pinpoint Test T53 Thru T61 - Transmission-AXOD

Transmission — AXOD		Pinpoint Test	T
TEST STEP		RESULT	ACTION TO TAKE
<b>T62</b>	CHECK THS 3/2 AND 4/3 CIRCUITS FOR SHORT TO GROUND		
<ul style="list-style-type: none"> <li>• Key off.</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>• AXOD harness disconnected.</li> <li>• DVOM on 200,000 ohm scale.</li> <li>• Measure resistance between Test Pin 18 and Test Pins 40 and 60 at the breakout box.</li> <li>• Measure resistance between Test Pin 19 and Test Pins 40 and 60 at the breakout box.</li> <li>• Are all resistances greater than 10,000 ohms?</li> </ul>		Yes	▶ REMOVE breakout box. RECONNECT all components. REPLACE processor. RERUN Quick Test.
		No	▶ REMOVE breakout box. RECONNECT all components. SERVICE short(s) to ground. RERUN Quick Test.
<b>T71</b>	SERVICE CODE 59: AXOD HARNESS VERIFICATION		
<ul style="list-style-type: none"> <li>• Key off.</li> <li>• Disconnect AXOD harness.</li> <li>• Run Key On Engine Off Self-Test.</li> <li>• Is Code 59 still present?</li> </ul>		Yes	▶ GO to <b>T72</b> .
		No	▶ RECONNECT AXOD harness.
<b>T72</b>	CHECK THS 4/3 HARNESS CIRCUIT FOR SHORT TO GROUND		
<ul style="list-style-type: none"> <li>• Key Off.</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>• AXOD harness disconnected.</li> <li>• DVOM on 200,000 ohm scale.</li> <li>• Measure resistance between Test Pin 18 and Test Pins 40 and 60 at the breakout box.</li> <li>• Are resistances greater than 10,000 ohms?</li> </ul>		Yes	▶ REMOVE breakout box. RECONNECT AXOD harness. REPLACE processor. RERUN Quick Test.
		No	▶ REMOVE breakout box. RECONNECT AXOD harness and processor. SERVICE short to ground. RERUN Quick Test.

Pinpoint Test T62 Thru T72 - Transmission-AXOD

<b>Transmission — AXOD</b>		<b>Pinpoint Test</b>	<b>T</b>
<b>TEST STEP</b>		<b>RESULT</b>	<b>ACTION TO TAKE</b>
<b>T73</b>	<b>SERVICE CODE 69: AXOD HARNESS VERIFICATION</b>		
<ul style="list-style-type: none"> <li>• Key off.</li> <li>• Disconnect AXOD harness.</li> <li>• Run Key On Engine Off Self-Test.</li> <li>• Is Code 69 still present?</li> </ul>		Yes  No 	GO to <b>T74</b> . RECONNECT AXOD harness.
<b>T74</b>	<b>CHECK THS 3/2 HARNESS CIRCUIT FOR SHORT TO GROUND</b>		
<ul style="list-style-type: none"> <li>• Key Off.</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>• AXOD harness disconnected.</li> <li>• DVOM on 200,000 ohm scale.</li> <li>• Measure resistance between Test Pin 19 and Test Pins 40 and 60 at the breakout box.</li> <li>• Are resistances greater than 10,000 ohms?</li> </ul>		Yes  No 	REMOVE breakout box. RECONNECT AXOD harness. REPLACE processor. RERUN Quick Test. . REMOVE breakout box. RECONNECT AXOD harness and processor. SERVICE short to ground. RERUN Quick Test.

Pinpoint Test T73 &amp; T74 - Transmission-AXOD

Transmission — AXOD		Pinpoint Test	T
TEST STEP		RESULT	ACTION TO TAKE
<b>T75</b>	CHECK CONTINUITY OF TTS HARNESS CIRCUIT		
<ul style="list-style-type: none"> <li>• Key off, wait 10 seconds.</li> <li>• Disconnect AXOD harness.</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 Test Pin 44 at the breakout box and the AXOD vehicle harness connector, as shown below.</li> <li>• Is resistance less than 5 ohms?</li> </ul>		<p>Yes</p> <p>No</p>	<p>▶ GO to <b>T76</b>.</p> <p>▶ SERVICE open in TTS circuit. REMOVE breakout box. RECONNECT all components. DRIVE vehicle to verify drive complaint was eliminated.</p>
<p>TEST PIN 44 </p>			
<b>T76</b>	CHECK TTS HARNESS CIRCUIT FOR SHORT TO POWER OR GROUND		
<ul style="list-style-type: none"> <li>• Key off.</li> <li>• Breakout box installed.</li> <li>• Processor disconnected.</li> <li>• AXOD harness disconnected.</li> <li>• DVOM on 200,000 ohm scale.</li> <li>• Measure resistance between Test Pin 44 and Test Pin 37 at the breakout box.</li> <li>• Measure resistance between Test Pin 44 and Test Pin 40 at the breakout box.</li> <li>• Are resistances greater than 10,000 ohms?</li> </ul>		<p>Yes</p> <p>No</p>	<p>▶ GO to <b>T77</b>.</p> <p>▶ SERVICE short(s) in TTS circuit. REMOVE breakout box. RECONNECT all components. DRIVE vehicle to verify drive complaint was eliminated.</p>

Pinpoint Test T75 &amp; T76 - Transmission-AXOD

Transmission — AXOD		Pinpoint Test	T
TEST STEP		RESULT	ACTION TO TAKE
<b>T77</b>	<b>PROCESSOR VERIFICATION</b>		
<ul style="list-style-type: none"> <li>• Key off.</li> <li>• Breakout box installed.</li> <li>• Reconnect processor and AXOD harness.</li> <li>• Jumper Test Pin 44 to Test Pin 40 at the breakout box.</li> <li>• Drive vehicle to verify drive complaint.</li> <li>• Was drive complaint eliminated?</li> </ul>		<p>Yes</p> <p>No</p>	<p>REMOVE breakout box. REMOVE jumper wire.</p> <p>AXOD Transmission Electrical Component Diagnostics.</p> <p><b>NOTE: To prevent the replacement of good components, be aware that non-EEC areas may cause similar drive symptoms (e.g. driveline, engine running rich).</b> REMOVE breakout box. REMOVE jumper wire. REPLACE processor.</p>
<b>T81</b>	<b>SERVICE CODE 67: CHECK VOLTAGE AT NPS INPUT TO PROCESSOR</b>		
<ul style="list-style-type: none"> <li>• Key on, engine off.</li> <li>• Disconnect processor 60 pin connector. Inspect for damaged pins, corrosion, loose wires etc. Service as necessary.</li> <li>• Install breakout box and reconnect processor.</li> <li>• DVOM on 20 volt scale.</li> <li>• Measure voltage between Test Pin 30 and Test Pin 46 at the breakout box.</li> <li>• Is voltage less than 4 volts?</li> </ul>		<p>Yes</p> <p>No</p>	<p>GO to <b>T82</b>.</p> <p>GO to Pinpoint Test <b>FA9</b>.</p>

Pinpoint Test T77 &amp; T81 - Transmission-AXOD

<b>Transmission — AXOD</b>		<b>Pinpoint Test</b>	<b>T</b>
<b>TEST STEP</b>		<b>RESULT</b>	<b>ACTION TO TAKE</b>
<b>T82</b>	<b>CHECK NPS HARNESS CIRCUIT FOR SHORT TO GROUND</b>		
<ul style="list-style-type: none"> <li>• Key off.</li> <li>• Breakout box installed.</li> <li>• Disconnect processor.</li> <li>• Disconnect AXOD harness.</li> <li>• DVOM on 200,000 ohm scale.</li> <li>• Measure resistance between Test Pin 30 and Test Pins 40 and 60 at the breakout box.</li> <li>• Are all resistances greater than 10,000 ohms?</li> </ul>		<p>Yes ▶</p> <p>No ▶</p>	<p>GO to <b>T83</b>.</p> <p>REMOVE breakout box. RECONNECT all components. SERVICE short to ground in NPS circuit. RERUN Quick Test.</p>
<b>T83</b>	<b>PROCESSOR VERIFICATION</b>		
<ul style="list-style-type: none"> <li>• Key off.</li> <li>• Breakout box installed.</li> <li>• Reconnect processor.</li> <li>• AXOD harness disconnected.</li> <li>• Run Key On Engine Off Self-Test.</li> <li>• Is Code 67 present?</li> </ul>		<p>Yes ▶</p> <p>No ▶</p>	<p>REMOVE breakout box. RECONNECT all components. REPLACE processor. RERUN Quick Test.</p> <p>REMOVE breakout box. RECONNECT all components.</p>

Pinpoint Test T82 &amp; T83 - Transmission-AXOD

Transmission — VSS		Pinpoint Test	T
TEST STEP		RESULT	ACTION TO TAKE
<b>T90</b>	<b>CHECK VEHICLE SPEED SENSOR</b>		
<ul style="list-style-type: none"> <li>• Key off, wait 10 seconds.</li> <li>• Locate and disconnect Vehicle Speed Sensor.</li> <li>• DVOM on 200,000 ohm scale.</li> <li>• Measure resistance across Vehicle Speed Sensor.</li> <li>• Is resistance between 190 and 230 ohms?</li> </ul>		Yes No	GO to <b>T91</b> . REPLACE sensor. DRIVE vehicle to verify drive complaint was eliminated.
<b>T91</b>	<b>CHECK CONTINUITY OF VEHICLE SPEED SENSOR (VSS) HARNESS</b>		
<ul style="list-style-type: none"> <li>• Key off, wait 10 seconds.</li> <li>• Disconnect processor 60 pin connector. Inspect for damaged pins, corrosion, loose wires etc. Service as necessary.</li> <li>• Install breakout box, leave processor disconnected.</li> <li>• VSS disconnected.</li> <li>• DVOM on 200 ohm scale.</li> <li>• Measure resistance between Test Pin 3 at the breakout box and the VSS vehicle harness connector as shown below.</li> <li>• Measure resistance between Test Pin 6 at the breakout box and the VSS vehicle harness connector, as shown below.</li> </ul> <div style="text-align: center;"> <p>TEST PIN 6 — VSS DIF -                      TEST PIN 3 — VSS DIF +</p> </div> <ul style="list-style-type: none"> <li>• Are both resistances less than 5 ohms?</li> </ul>		Yes No	GO to <b>T92</b> . REMOVE breakout box. RECONNECT all components. SERVICE open circuit(s) in VSS harness. DRIVE vehicle to verify drive complaint was eliminated.

Pinpoint Test T90 & T91 - Transmission-VSS

<b>Transmission — VSS</b>		<b>Pinpoint Test</b>	<b>T</b>
<b>TEST STEP</b>		<b>RESULT</b>	<b>ACTION TO TAKE</b>
<b>T92</b>	<b>CHECK VSS HARNESS FOR SHORTS TO POWER OR GROUND</b>		
<ul style="list-style-type: none"> <li>• Key off.</li> <li>• Breakout box installed.</li> <li>• Processor disconnected.</li> <li>• VSS disconnected.</li> <li>• DVOM on 200,000 ohm scale.</li> <li>• Measure resistance between Test Pin 3 and Test Pins 37, 40 and 6 at the breakout box.</li> <li>• Measure resistance between Test Pin 6 and Test Pin 37 at the breakout box.</li> <li>• Are all resistances greater than 10,000 ohms?</li> </ul>		<p>Yes ▶</p> <p>No ▶</p>	<p>REMOVE breakout box. RECONNECT all components. GO to <b>T93</b>.</p> <p>REMOVE breakout box. RECONNECT all components. SERVICE short circuit(s) in VSS harness. DRIVE vehicle to verify drive complaint was eliminated.</p>
<b>T93</b>	<b>SUBSTITUTE VEHICLE SPEED SENSOR (VSS)</b>		
<ul style="list-style-type: none"> <li>• Substitute VSS with known good sensor.</li> <li>• Processor and VSS connected.</li> <li>• Drive vehicle to verify drive complaint.</li> <li>• Was drive complaint eliminated?</li> </ul>		<p>Yes ▶</p> <p>No ▶</p>	<p>REPLACE VSS.</p> <p>REPLACE processor.</p>

Pinpoint Test T92 &amp; T93 - Transmission-VSS

**Integrated Controller****Pinpoint  
Test****X****Note**

You should enter this Pinpoint Test only when service code 72, 78, 82, 83, 87, 88, 95 and 96 are received in Quick Test Steps 3.0 or 6.0, or you are directed here from Pinpoint Test A, Pinpoint Test C, or Diagnostic By Symptom.

**Remember**

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

- Fuel Lines
- Fuel Filters
- Contaminated Fuel
- Fuel Pump
- Ignition Switch
- Battery Cables
- Alternator
- Voltage Regulator
- Ground Straps
- A/C Clutch
- A/C Demand
- Cooling Fan Motor

This Pinpoint Test is intended to diagnose only the following:

- Integrated Relay Controller Module (within this Pinpoint Named Integrated Controller)
- Battery Voltage
- Power Relay
- EDF Relay
- HEDF Relay
- WAC Relay
- Fuel Pump Relay
- Harness Circuits: V Batt., VPWR, F.P., GROUND and POWER to Fuel Pump(s), WAC, ACC, ACCS, COOLING FAN POWER, A/C CLUTCH, KEY POWER, POWERS To Integrated Controller
- Processor Assembly
- A/C Demand Switch Input

**Pinpoint Test X - Integrated Controller**

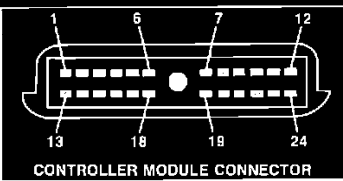
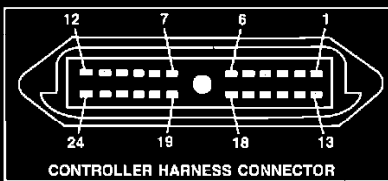
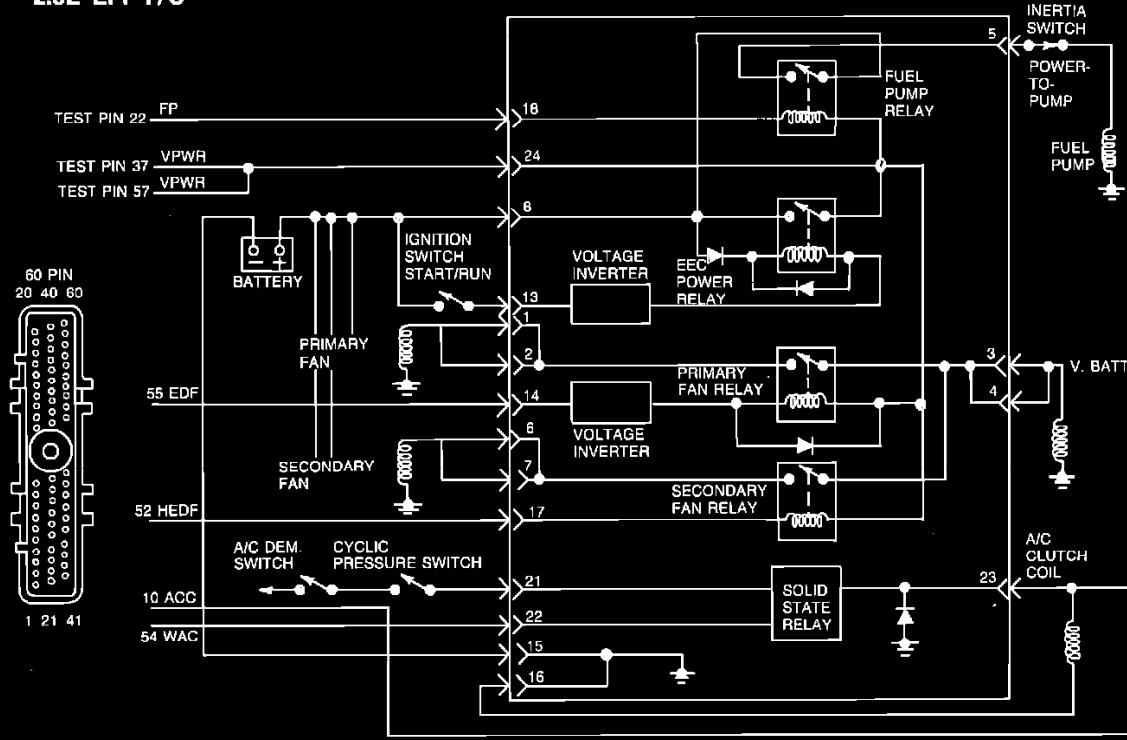
# Integrated Controller

# Pinpoint Test

# X

## Pinpoint Test Schematic

### 2.3L EFI T/C



Pinpoint Test X - Integrated Controller



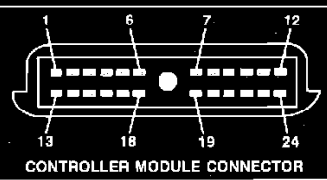
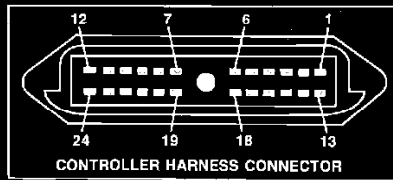
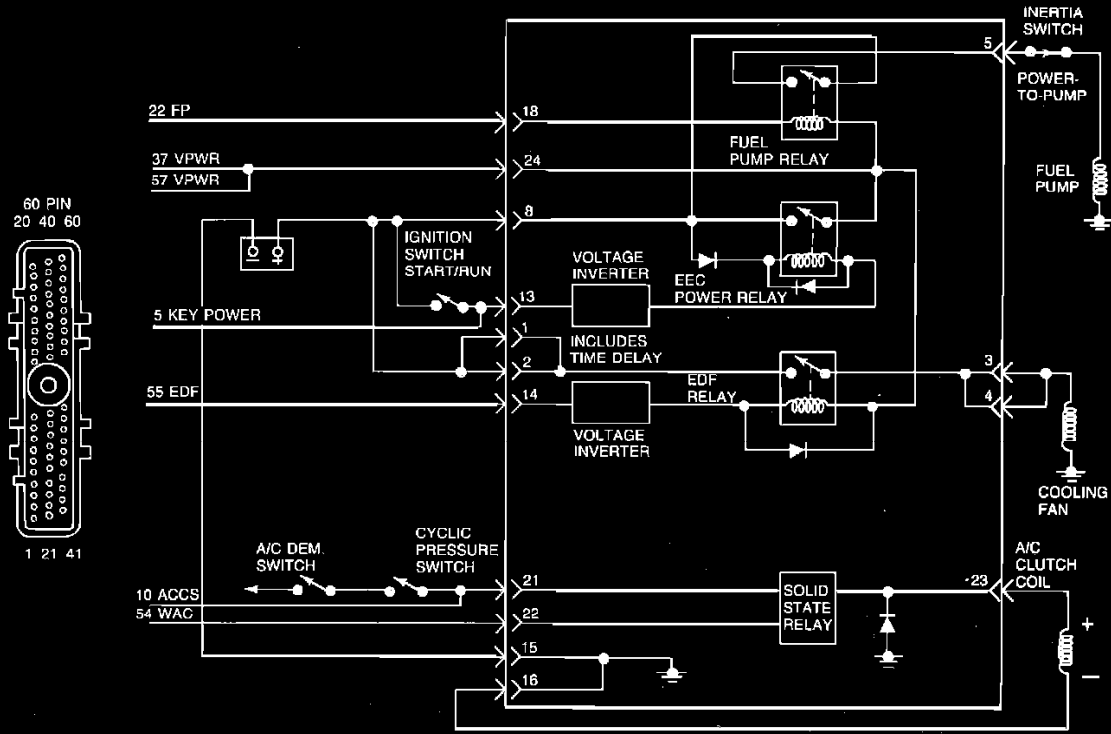
# Integrated Controller

# Pinpoint Test









# X

## Pinpoint Test Schematic

2.5L CFI MTX ONLY



Pinpoint Test X Schematic - Integrated Controller

<b>Integrated Controller</b>		<b>Pinpoint Test</b>	<b>X</b>
<b>TEST STEP</b>		<b>RESULT</b>	<b>ACTION TO TAKE</b>
<b>VEHICLE BATTERY</b>			
<b>X1</b>	<b>CHECK BATTERY VOLTAGE</b>		
<ul style="list-style-type: none"> <li>• Key on, engine off.</li> <li>• DVOM on 20 volt scale.</li> <li>• Measure voltage across battery terminals.</li> <li>• Is voltage greater than 10.5 volts?</li> </ul>		Yes  No 	GO to <b>X2</b> .  SERVICE discharged battery
<b>X2</b>	<b>CHECK BATTERY GROUND</b>		
<ul style="list-style-type: none"> <li>• Key on, engine off.</li> <li>• Processor connected.</li> <li>• DVOM on 20 volt range.</li> <li>• Measure voltage between battery negative post and SIGNAL RETURN circuit in the Self-Test connector.</li> <li>• Is voltage greater than 0.5 volts?</li> </ul>		Yes  No 	GO to <b>X3</b> .  GO to <b>X6</b> .
<b>X3</b>	<b>GROUND FAULT ISOLATION</b>		
<ul style="list-style-type: none"> <li>• Key off.</li> <li>• Disconnect processor 60 pin connector. Inspect for damaged pins, corrosion, loose wires etc. Service as necessary.</li> <li>• Install breakout box.</li> <li>• Key on, engine off.</li> <li>• Processor connected.</li> <li>• DVOM on 20 volt scale.</li> <li>• Measure voltage between battery negative post and Test Pins 40 and 60 at the breakout box.</li> <li>• Are both voltages less than 0.5 volts?</li> </ul>		Yes  No 	GO to <b>X4</b> .  Circuit(s) with greater than 0.5 volts has high resistance or open. SERVICE open ground circuit. RERUN Quick Test.
<b>X4</b>	<b>PROCESSOR GROUND FAULT ISOLATION</b>		
<ul style="list-style-type: none"> <li>• Breakout box installed.</li> <li>• Key off, wait 10 seconds.</li> <li>• Processor connected.</li> <li>• DVOM on 200 ohm scale.</li> <li>• Measure resistance between Test Pin 46 and Test Pin 40 and between Test Pin 46 and Test Pin 60 at the breakout box.</li> <li>• Are both resistances less than 5 ohms?</li> </ul>		Yes  No 	GO to <b>X5</b> .  REMOVE breakout box. REPLACE processor. RERUN Quick Test.

Pinpoint Test X1 Thru X4 - Integrated Controller

Integrated Controller		Pinpoint Test	X
TEST STEP		RESULT	ACTION TO TAKE
<b>X5</b>	CHECK CONTINUITY OF SIGNAL RETURN CIRCUIT		
<ul style="list-style-type: none"> <li>• Breakout box installed.</li> <li>• Key off, wait 10 seconds.</li> <li>• Processor connected.</li> <li>• DVOM on 200 ohm scale.</li> <li>• Measure resistance between Test Pin 46 at the breakout box and SIGNAL RETURN circuit at Self-Test connector.</li> <li>• Is resistance less than 5.0 ohms?</li> </ul>		Yes No	System OK. RUN Quick Test. REMOVE breakout box. RECONNECT processor. SERVICE open circuit. RERUN Quick Test.
<b>X6</b>	MEASURE VOLTAGE AND GROUND TO INTEGRATED CONTROLLER		
<ul style="list-style-type: none"> <li>• Key off.</li> <li>• Disconnect Integrated Controller Module.</li> <li>• DVOM on 20 volt scale.</li> <li>• Measure voltage between Test Pin 8 and Test Pin 15 at the Integrated Controller vehicle harness connector.</li> <li>• Is voltage greater than 10.5 volts?</li> </ul>		Yes No	GO to <b>X7</b> . GO to <b>X9</b> .
<b>X7</b>	KEY POWER TO INTEGRATED CONTROLLER		
<ul style="list-style-type: none"> <li>• Integrated Controller disconnected.</li> <li>• DVOM on 20 volt scale.</li> <li>• Key on.</li> <li>• Measure voltage between Pin 13 and Pin 15 at the Integrated Controller vehicle harness connector.</li> <li>• Refer to schematic in Pinpoint Test X.</li> <li>• Is voltage greater than 10.5 volts?</li> </ul>		Yes No	GO to <b>X8</b> . SERVICE open between Pin 13 and ignition switch. RECONNECT Integrated Controller. RERUN Quick Test.

Pinpoint Test X5 Thru X7 - Integrated Controller

<b>Integrated Controller</b>		<b>Pinpoint Test</b>	<b>X</b>
<b>TEST STEP</b>		<b>RESULT</b>	<b>ACTION TO TAKE</b>
<b>X8</b>	<b>MEASURE CONTINUITY OF VPWR</b>		
<ul style="list-style-type: none"> <li>• Key off.</li> <li>• Integrated Controller disconnected.</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 Test Pin 37 and 57 at the breakout box and Test Pin 24 at the Integrated Controller harness.</li> <li>• Is resistance greater than 5.0 ohms?</li> </ul>		<p>Yes</p> <p>No</p>	<p>REMOVE breakout box. RECONNECT processor. SERVICE open in VPWR circuit. RECONNECT Integrated Controller. RERUN Quick Test.</p> <p>REMOVE breakout box. RECONNECT processor. REPLACE Integrated Controller. RERUN Quick Test.</p>
<b>X9</b>	<b>MEASURE CONTINUITY OF POWER GROUND TO INTEGRATED CONTROLLER</b>		
<ul style="list-style-type: none"> <li>• Key off.</li> <li>• Integrated Controller disconnected.</li> <li>• DVOM on 200 ohm scale.</li> <li>• Measure resistance between battery negative post and at Test Pin 15 at the Integrated Controller connector.</li> <li>• Is resistance greater than 5.0 ohms?</li> </ul>		<p>Yes</p> <p>No</p>	<p>RECONNECT Integrated Controller. SERVICE open in battery ground to Pin 15 (Integrated Controller harness connector). RERUN Quick Test.</p> <p>RECONNECT Integrated Controller. SERVICE open in battery positive to Pin 8 (Integrated Controller harness connector). RERUN Quick Test.</p>

Pinpoint Test X8 &amp; X9 - Integrated Controller

Integrated Controller		Pinpoint Test	X
TEST STEP		RESULT	ACTION TO TAKE
<b>X10</b>	<b>CODE 72 OR 78: INTERMITTENT OPEN IN VPWR CIRCUIT</b>		
<p><b>NOTE:</b> Code 72 or 78 indicates that while key power was present, VPWR had an interrupt, or interference from electrical noises caused the processor to reset, resulting in possible stalls, high idle rpm, lack of power on acceleration or other drive symptoms.</p> <p>Possible Causes:</p> <ul style="list-style-type: none"> <li>• Intermittent open in VPWR circuit from integrated controller to processor.</li> <li>• EEC power relay intermittent malfunction.</li> <li>• Intermittent open in VBATT circuit to integrated controller.</li> <li>• Intermittent open in KEY POWER circuit to integrated controller.</li> <li>• EEC harness too close to the distributor spark plug wires and other vehicle harnesses.</li> <li>• Using Continuous Monitor Mode (Engine Running) per Appendix in Section 16. Observe VOM or STAR LED for indication of a fault while performing the following: <ul style="list-style-type: none"> <li>• Shake, bend and twist harness from integrated controller to the processor, to the ignition switch and to battery positive.</li> <li>• Is a fault indicated or does Code 72 or 78 reappear in continuous memory if Quick Test is rerun?</li> </ul> </li> </ul>		<p>Yes</p> <p>No</p>	<p>CHECK for proper routing of EEC harness. SERVICE as necessary. If OK SERVICE intermittent VPWR circuit. RERUN Quick Test.</p> <p>INSPECT component and harness connectors of integrated controller and processor, for loose or damaged pins, corrosion, etc. SERVICE as necessary. If OK, ROAD TEST vehicle through a variety of drive modes to verify if symptom exists. REPLACE integrated controller, otherwise testing complete. RERUN Quick Test.</p>
<b>X11</b>	<b>CHECK POWER-TO-PUMP(S) CIRCUIT</b>		
<ul style="list-style-type: none"> <li>• Key on, engine off.</li> <li>• Locate and disconnect fuel pump(s).</li> <li>• DVOM on 20 volt scale.</li> <li>• Measure voltage between CHASSIS GROUND and POWER-TO-PUMP(S) circuit at fuel pump during crank mode.</li> <li>• Is voltage greater than 8.0 volts during crank?</li> </ul>		<p>Yes</p> <p>No</p>	<p>Electric Fuel Pump Diagnosis.</p> <p>GO to <b>X12</b>.</p>

Pinpoint Test X10 &amp; X11 - Integrated Controller

Integrated Controller		Pinpoint Test	X
TEST STEP		RESULT	ACTION TO TAKE
<b>X12</b>	CHECK RESISTANCE OF FUEL PUMP INERTIA SWITCH		
<ul style="list-style-type: none"> <li>• Key off, wait 10 seconds.</li> <li>• Fuel pump(s) disconnected.</li> <li>• Locate and disconnect fuel pump inertia switch.</li> <li>• DVOM on 200 ohm scale.</li> <li>• Measure the resistance of the fuel pump inertia switch.</li> <li>• Is resistance less than 5.0 ohms?</li> </ul>		Yes	▶ GO to <b>X13</b> .
		No	▶ REPLACE fuel pump inertia switch. RERUN Quick Test.
<b>X13</b>	POWER-TO-PUMP CIRCUIT CONTINUITY CHECK		
<ul style="list-style-type: none"> <li>• Key off.</li> <li>• DVOM on 200 ohm scale.</li> <li>• Disconnect Integrated Controller.</li> <li>• Fuel pump(s) disconnected.</li> <li>• Measure resistance between Pin 5 at the integrated controller vehicle harness connector and POWER-TO-PUMP(S) circuit at the fuel pump vehicle harness connector.</li> <li>• Is resistance less than 5.0 ohms?</li> </ul>		Yes	▶ REPLACE Integrated Controller. RECONNECT all components. RERUN Quick Test.
		No	▶ SERVICE open in POWER-TO-PUMP(S) circuit. RECONNECT Integrated Controller. RERUN Quick Test.
<b>X14</b>	CHECK POWER-TO-PUMP(S) FOR SHORTS TO POWER		
<ul style="list-style-type: none"> <li>• Key off.</li> <li>• Disconnect Integrated Controller.</li> <li>• Disconnect fuel pumps.</li> <li>• DVOM on 200,000 ohm scale.</li> <li>• Measure resistance between Pin 5 and Pin 24 at the Integrated Controller vehicle harness connector.</li> <li>• Measure resistance between Pin 5 at the Integrated Controller vehicle harness connector and battery positive post.</li> <li>• Is either resistance less than 10,000 ohms?</li> </ul>		Yes	▶ SERVICE short circuit. RECONNECT all components. ATTEMPT to start vehicle. If vehicle runs, RERUN Quick Test. If vehicle will not run, REPLACE Integrated Controller. RERUN Quick Test.
		No	▶ RECONNECT fuel pump. REPLACE Integrated Controller. RERUN Quick Test.

Pinpoint Test X12 Thru X14 - Integrated Controller

Integrated Controller		Pinpoint Test	X
TEST STEP	RESULT	ACTION TO TAKE	
<b>SERVICE CODE: 87</b>			
<b>X15</b>	<b>CHECK CONTINUITY OF FUEL PUMP CIRCUIT</b>		
<ul style="list-style-type: none"> <li>• Key off.</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>• Disconnect Integrated Controller.</li> <li>• DVOM on 200 ohm scale.</li> <li>• Measure resistance between Test Pin 22 at the breakout box and Pin 18 at the Integrated Controller vehicle harness connector.</li> <li>• Is resistance less than 5.0 ohms?</li> </ul>	<p>Yes ▶</p> <p>No ▶</p>	<p>GO to <b>X16</b> .</p> <p>SERVICE open in fuel pump circuit. REMOVE breakout box. RECONNECT processor and controller. RERUN Quick Test.</p>	

Pinpoint Test X15 - Integrated Controller

Integrated Controller		Pinpoint Test	X
TEST STEP		RESULT	ACTION TO TAKE
<b>X16</b>	CHECK FUEL PUMP CIRCUIT FOR SHORTS TO POWER AND GROUND		
<ul style="list-style-type: none"> <li>• Key off.</li> <li>• Breakout box installed.</li> <li>• Processor disconnected.</li> <li>• Integrated Controller disconnected.</li> <li>• DVOM on 200,000 ohm scale.</li> <li>• Measure resistance between Test Pin 22 and Test Pins 37, 57 and battery positive post and between Test Pin 22 and Test Pins 40, 60 and battery negative.</li> <li>• Are all resistances greater than 10,000 ohms?</li> </ul>		Yes	▶ GO to <b>X17</b> .
		No	▶ REMOVE breakout box. SERVICE fuel pump circuit shorts to power or ground. RECONNECT all components. RERUN Quick Test. If code 87 is still present, GO to <b>X17</b> .
<b>X17</b>	CHECK RESISTANCE OF FUEL PUMP RELAY COIL		
<ul style="list-style-type: none"> <li>• Key off.</li> <li>• Breakout box installed.</li> <li>• Processor disconnected.</li> <li>• Integrated Controller disconnected.</li> <li>• DVOM on 200 ohm scale.</li> <li>• Measure resistance of Integrated Controller from Pin 18 to 24.</li> <li>• Is resistance between 65 and 100 ohms?</li> </ul>		Yes	▶ REMOVE breakout box. REPLACE processor. RECONNECT Integrated Controller. RERUN Quick Test.
		No	▶ REMOVE breakout box. RECONNECT processor. REPLACE Integrated Controller. RERUN Quick Test.
<b>X20</b>	NO FAN, HIGH OR LOW WITH NO CODE 83		
<ul style="list-style-type: none"> <li>• Key off.</li> <li>• Disconnect Integrated Controller.</li> <li>• DVOM on 20 volt scale.</li> <li>• Measure voltage between battery negative post and Pins 1, 2, 6 and 7, respectively at the Integrated Controller vehicle harness connector.</li> <li>• Is voltage greater than 10.5 volts?</li> </ul>		Yes	▶ GO to <b>X21</b> .
		No	▶ RECONNECT Integrated Controller. SERVICE open in battery power circuit. RE-EVALUATE symptom.
<b>X21</b>	CHECK FAN MOTOR		
<ul style="list-style-type: none"> <li>• Key off.</li> <li>• Integrated Controller disconnected.</li> <li>• Jumper Pin 3 to Pin 6 at Integrated Controller harness.</li> <li>• Does fan run?</li> </ul>		Yes	▶ GO to <b>X22</b> .
		No	▶ GO to <b>X23</b> .

Pinpoint Test X16 Thru X21 - Integrated Controller

<b>Integrated Controller</b>		<b>Pinpoint Test</b>	<b>X</b>
<b>TEST STEP</b>		<b>RESULT</b>	<b>ACTION TO TAKE</b>
<b>X22</b>	<b>CHECK FAN RUNNING MODE (LOW)</b>		
<ul style="list-style-type: none"> <li>• Key off.</li> <li>• Disconnect processor.</li> <li>• Reconnect Integrated Controller.</li> <li>• Key on.</li> <li>• Does fan run at low speed?</li> </ul>		Yes  No	GO to <b>X25</b> .  CHANGE Integrated Controller. RECONNECT processor and controller. RE-EVALUATE symptom.
<b>X23</b>	<b>MEASURE BATTERY VOLTAGE SUPPLY AT FAN — BYPASSING INTEGRATED CONTROLLER</b>		
<ul style="list-style-type: none"> <li>• Key Off.</li> <li>• Disconnect cooling fan.</li> <li>• Integrated Controller disconnected.</li> <li>• Jumper Pin 3 to Pin 6 at Integrated Controller vehicle harness connector.</li> <li>• DVOM on 20 volt scale.</li> <li>• Measure voltage at cooling fan vehicle harness connector.</li> <li>• Is voltage greater than 8.0 volts?</li> </ul>		Yes  No	RECONNECT Integrated Controller. CHANGE fan motor. RE-EVALUATE symptom.  GO to <b>X24</b> .
<b>X24</b>	<b>COOLING FAN GROUND VERIFICATION</b>		
<ul style="list-style-type: none"> <li>• Key off.</li> <li>• Cooling fan disconnected.</li> <li>• Integrated Controller disconnected.</li> <li>• Jumper Pin 3 to Pin 6 at Integrated Controller vehicle harness connector.</li> <li>• DVOM on 20 volt scale.</li> <li>• Measure voltage between voltage positive at cooling fan harness connector and negative battery post.</li> <li>• Is voltage greater than 8.0 volts?</li> </ul>		Yes  No	SERVICE Open in ground circuit to fan. RECONNECT Integrated Controller and cooling fan. RE-EVALUATE symptom.  SERVICE open in power-to-fan circuit from 3 and 4 of Integrated Controller harness connector to cooling fan connector. RECONNECT cooling fan and controller, RE-EVALUATE symptom.

Pinpoint Test X22 Thru X24 - Integrated Controller

<b>Integrated Controller</b>		<b>Pinpoint Test</b>	<b>X</b>
<b>TEST STEP</b>		<b>RESULT</b>	<b>ACTION TO TAKE</b>
<b>X25</b>	<b>JUMPER HIGH ELECTRIC-DRIVE SIGNAL (HEDF) TO GROUND</b>		
<ul style="list-style-type: none"> <li>• Key off.</li> <li>• Inspect processor 60 pin connector for damaged pins, corrosion, loose wires, etc. Service as necessary.</li> <li>• Install breakout box, leave processor disconnected.</li> <li>• Integrated Controller connected.</li> <li>• Key on.</li> <li>• Jumper Test Pin 52 to Test Pin 40 at breakout box.</li> <li>• Does fan speed change from low to high?</li> </ul>		<p>Yes ▶</p> <p>No ▶</p>	<p>GO to <b>X26</b> .</p> <p>REMOVE breakout box. REPLACE Integrated Controller. RECONNECT processor. RE-EVALUATE symptom.</p>
<b>X26</b>	<b>CHECK ECT SENSOR</b>		
<ul style="list-style-type: none"> <li>• Key off, wait 10 seconds.</li> <li>• Connect processor to breakout box.</li> <li>• Check engine coolant level.</li> <li>• Warm engine to operating temperature before taking ECT resistance measurement.</li> <li>• Key off, wait 10 seconds.</li> <li>• Disconnect harness from ECT sensor.</li> <li>• DVOM on 200,000 ohm scale.</li> <li>• Measure resistance of the ECT sensor.</li> <li>• Is the resistance between 1500 ohms and 2000 ohms?</li> </ul>		<p>Yes ▶</p> <p>No ▶</p>	<p>REMOVE breakout box. REPLACE processor. RECONNECT harness to ECT sensor. RECONNECT Integrated Controllers. RE-EVALUATE symptom.</p> <p>REMOVE breakout box. REPLACE ECT sensor. RECONNECT all components. RE-EVALUATE symptom.</p>
<b>X30</b>	<b>SERVICE CODE 83: CHECK RESISTANCE OF HEDF CONTROLLER CIRCUIT</b>		
<ul style="list-style-type: none"> <li>• Key off.</li> <li>• Disconnect Integrated Controller.</li> <li>• DVOM on 200 ohm scale.</li> <li>• Measure resistance between Pin 17 and Pin 24 at the Integrated Controller.</li> <li>• Is the resistance reading between 50 ohms and 100 ohms?</li> </ul>		<p>Yes ▶</p> <p>No ▶</p>	<p>GO to <b>X31</b> .</p> <p>REPLACE controller. RERUN Quick Test.</p>









Pinpoint Test X25 Thru X30 - Integrated Controller

Integrated Controller		Pinpoint Test	X
TEST STEP		RESULT	ACTION TO TAKE
<b>X31</b>	CHECK HEDF PROCESSOR SIGNAL TO INTEGRATED CONTROLLER FOR OPEN		
<ul style="list-style-type: none"> <li>• Key off.</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>• Integrated Controller disconnected.</li> <li>• DVOM On 200 ohms scale.</li> <li>• Measure resistance between Test Pin 52 at breakout box and Pin 17 of Integrated Controller vehicle harness connector.</li> <li>• Is resistance less than 5 ohms?</li> </ul>		Yes ▶  No ▶	GO to <b>X32</b> .  REMOVE breakout box. SERVICE open in HEDF circuit. RECONNECT all components. RERUN Quick Test.
<b>X32</b>	CHECK FOR SHORTS TO GROUND IN THE HEDF CIRCUIT		
<ul style="list-style-type: none"> <li>• Key off.</li> <li>• Breakout box installed.</li> <li>• Processor and Integrated Controller disconnected.</li> <li>• DVOM on 200,000 ohm scale.</li> <li>• Measure resistance between Test Pin 52 and Test Pin 40.</li> <li>• Is resistance less than 10,000 ohms?</li> </ul>		No ▶  Yes ▶	GO to <b>X33</b> .  REMOVE breakout box. RECONNECT processor and Integrated Controller. SERVICE short to ground in HEDF circuit. RERUN Quick Test.
<b>X33</b>	CHECK FOR SHORTS TO POWER IN THE HEDF CIRCUIT		
<ul style="list-style-type: none"> <li>• Key off.</li> <li>• Breakout box installed.</li> <li>• Processor and Integrated Controller disconnected.</li> <li>• DVOM on 200,000 ohms scale.</li> <li>• Measure resistance between Test Pin 52 and Test Pin 37.</li> <li>• Is resistance less than 10,000 ohms?</li> </ul>		No ▶  Yes ▶	REMOVE breakout box. REPLACE Processor. RECONNECT all components. RERUN Quick Test.  REMOVE breakout box. SERVICE short to power. RECONNECT all components. RERUN Quick Test. If code 83 is still present, REPLACE processor. RERUN Quick Test.

Pinpoint Test X31 Thru X33 - Integrated Controller

<b>Integrated Controller</b>		<b>Pinpoint Test</b>	<b>X</b>
<b>TEST STEP</b>		<b>RESULT</b>	<b>ACTION TO TAKE</b>
<b>X35</b>	<b>LOW SPEED OR HIGH SPEED FAN ALWAYS "ON", NO SERVICE CODE 83 OR 67</b>		
<ul style="list-style-type: none"> <li>• Key off.</li> <li>• Disconnect processor 60 pin connector. Inspect for damaged pins, corrosion, loose wires. Service as necessary.</li> <li>• Install breakout box, leave processor disconnected.</li> <li>• Disconnect the Integrated Controller.</li> <li>• DVOM on 200 ohm scale.</li> <li>• Measure the resistance between Test Pin 55 and controller vehicle harness Pin 14.</li> <li>• Is resistance less than 5 ohms?</li> </ul>		<p>Yes ▶</p> <p>No ▶</p>	<p>GO to <b>X36</b> .</p> <p>REMOVE breakout box. SERVICE open in EDF circuit. RECONNECT all components. RE-EVALUATE symptom.</p>
<b>X36</b>	<b>CHECK EDF CIRCUIT FOR SHORTS TO POWER</b>		
<ul style="list-style-type: none"> <li>• Key off.</li> <li>• Breakout box installed.</li> <li>• Processor and Integrated Controller disconnected.</li> <li>• DVOM on 200,000 ohm scale.</li> <li>• Measure resistance between Test Pin 55 and Test Pin 37 and between Test Pin 55 and battery positive post.</li> <li>• Is resistance less than 10,000 ohms?</li> </ul>		<p>Yes ▶</p> <p>No ▶</p>	<p>SERVICE short to power in EDF circuit. GO to <b>X37</b> .</p> <p>GO to <b>X37</b> .</p>
<b>X37</b>	<b>CHECK EDF FOR SHORT TO GROUND</b>		
<ul style="list-style-type: none"> <li>• Key on.</li> <li>• Breakout box installed.</li> <li>• Processor disconnected.</li> <li>• Connect Integrated Controller.</li> <li>• Jumper Test Pin 55 to Test Pin 40 or 60.</li> <li>• Does fan continue to run?</li> </ul>		<p>Yes ▶</p> <p>No ▶</p>	<p>REMOVE breakout box. RECONNECT processor. REPLACE controller. RE-EVALUATE symptom.</p> <p>REMOVE breakout box. RECONNECT controller. REPLACE processor. RE-EVALUATE symptom.</p>

Pinpoint Test X35 Thru X37 - Integrated Controller

<b>Integrated Controller</b>		<b>Pinpoint Test</b>	<b>X</b>
<b>TEST STEP</b>		<b>RESULT</b>	<b>ACTION TO TAKE</b>
<b>X40</b>	<b>NO FAN</b>		
<ul style="list-style-type: none"> <li>• Key off.</li> <li>• Disconnect Integrated Controller.</li> <li>• DVOM on 20 volt scale.</li> <li>• Measure voltage between battery negative post and Pin 1 and Pin 2, respectively at the Integrated Controller vehicle harness connector.</li> <li>• Is voltage greater than 10.5 volts?</li> </ul>		Yes  No 	GO to <b>X41</b> .  RECONNECT controller. SERVICE open in battery power circuit. RE-EVALUATE symptom.
<b>X41</b>	<b>CHECK FAN MOTOR</b>		
<ul style="list-style-type: none"> <li>• Key off.</li> <li>• Integrated Controller disconnected.</li> <li>• Jumper Pin 1 to Pin 3 at Integrated Controller harness.</li> <li>• Does fan run?</li> </ul>		Yes  No 	GO to <b>X42</b> .  GO to <b>X43</b> .
<b>X42</b>	<b>CHECK FAN RUNNING MODE</b>		
<ul style="list-style-type: none"> <li>• Key off.</li> <li>• Disconnect processor.</li> <li>• Connect Integrated Controller.</li> <li>• Key on.</li> <li>• Does fan run?</li> </ul>		Yes  No 	GO to <b>X46</b> .  GO to <b>X44</b> .
<b>X43</b>	<b>MEASURE BATTERY VOLTAGE SUPPLY AT FAN — BYPASSING INTEGRATED CONTROLLER</b>		
<ul style="list-style-type: none"> <li>• Key off.</li> <li>• Disconnect cooling fan.</li> <li>• Integrated Controller disconnected.</li> <li>• Jumper Pin 1 to Pin 3 at Integrated Controller vehicle harness connector.</li> <li>• DVOM on 20 volt scale.</li> <li>• Measure voltage at cooling fan vehicle harness connector.</li> <li>• Is voltage greater than 8.0 volts?</li> </ul>		Yes  No 	RECONNECT all components. CHANGE fan. RE-EVALUATE symptom.  GO to <b>X45</b> .

Pinpoint Test X40 Thru X43 - Integrated Controller

<b>Integrated Controller</b>		<b>Pinpoint Test</b>	<b>X</b>
<b>TEST STEP</b>		<b>RESULT</b>	<b>ACTION TO TAKE</b>
<b>X44</b>	<b>CHECK EDF CIRCUIT FOR SHORT TO GROUND</b>		
<ul style="list-style-type: none"> <li>• Key off.</li> <li>• Processor and controller disconnected.</li> <li>• DVOM on 200,000 ohm scale.</li> <li>• Measure resistance from Pin 14 to Pin 15 at Integrated Controller vehicle harness connector.</li> <li>• Is resistance greater than 10,000 ohms?</li> </ul>		<p>Yes ▶</p> <p>No ▶</p>	<p>REPLACE Integrated Controller. RECONNECT processor and controller. RE-EVALUATE symptom.</p> <p>SERVICE short to ground in EDF circuit. RECONNECT processor and Integrated Controller. RE-EVALUATE symptom.</p>
<b>X45</b>	<b>COOLING FAN GROUND VERIFICATION</b>		
<ul style="list-style-type: none"> <li>• Key off.</li> <li>• Cooling fan disconnected.</li> <li>• Integrated Controller disconnected.</li> <li>• Jumper Pin 1 to Pin 3 at Integrated Controller vehicle harness connector.</li> <li>• DVOM on 20 volt scale.</li> <li>• Measure voltage between voltage positive at cooling fan harness connector and negative battery post.</li> <li>• Is voltage greater than 8.0 volts?</li> </ul>		<p>Yes ▶</p> <p>No ▶</p>	<p>SERVICE open in ground circuit to fan. RECONNECT Integrated Controller, RE-EVALUATE symptom.</p> <p>SERVICE open in power-to-fan circuit from 3 and 4 of Integrated Controller harness connector to cooling fan connector. RECONNECT controller. RE-EVALUATE symptom.</p>
<b>X46</b>	<b>ECT SENSOR CHECK</b>		
<ul style="list-style-type: none"> <li>• Reconnect processor.</li> <li>• Check engine coolant level.</li> <li>• Warm engine to operating temperature before taking ECT resistance measurement.</li> <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 between 1500 ohms and 2000 ohms?</li> </ul>		<p>Yes ▶</p> <p>No ▶</p>	<p>REPLACE processor. RECONNECT harness to ECT sensor. RECONNECT Integrated Controller. RE-EVALUATE symptom.</p> <p>REPLACE ECT sensor. RECONNECT all components. RE-EVALUATE symptom.</p>

Pinpoint Test X44 Thru X46 - Integrated Controller

Integrated Controller		Pinpoint Test	X
TEST STEP		RESULT	ACTION TO TAKE
<b>X50</b>	<b>CHECK FOR VOLTAGE AT A/C CLUTCH</b>		
<ul style="list-style-type: none"> <li>• Key on, engine off.</li> <li>• A/C demand switch to A/C ON position.</li> <li>• DVOM on 20 volt scale.</li> <li>• Check voltage at A/C clutch harness connector.</li> <li>• Is voltage greater than 10.5 volts?</li> </ul>		Yes	▶ GO to A/C Diagnosis.
		No	▶ GO to <b>X51</b> .
<b>X51</b>	<b>CHECK FOR CONTINUITY FROM INTEGRATED CONTROLLER TO A/C CLUTCH</b>		
<ul style="list-style-type: none"> <li>• Key off.</li> <li>• Disconnect Integrated Controller.</li> <li>• DVOM on 200 ohm scale.</li> <li>• Measure resistance between Pin 23 of the controller harness and power side of the A/C clutch harness connector and between Pin 16 of the controller harness and ground side of the A/C clutch harness connector.</li> <li>• Are both resistances less than 5 ohms?</li> </ul>		Yes	▶ GO to <b>X61</b> .
		No	▶ SERVICE open in power to A/C clutch or ground to A/C clutch. RE-EVALUATE symptom.
<b>X52</b>	<b>ENTER OUTPUT STATE CHECK (REFER TO APPENDIX)</b>		
<p><b>NOTE: Do not use STAR tester for this Step, use VOM/DVOM.</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.</li> <li>• DVOM on 20 volt 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>		Yes	▶ REMAIN in Output State Check. GO to <b>X53</b> .
		No	▶ DEPRESS throttle to WOT and RELEASE. If STO voltage does not go high, GO to Pinpoint Test Step <b>QC1</b> . LEAVE equipment hooked up.

## Pinpoint Test X50 Thru X52 - Integrated Controller

<b>Integrated Controller</b>		<b>Pinpoint Test</b>	<b>X</b>
<b>TEST STEP</b>		<b>RESULT</b>	<b>ACTION TO TAKE</b>
<b>X53</b>	<b>CHECK WAC OUTPUT FOR PROPER ELECTRICAL OPERATION</b>		
<ul style="list-style-type: none"> <li>• Key on, engine off.</li> <li>• A/C demand switch to A/C on position.</li> <li>• Breakout box installed, processor connected.</li> <li>• DVOM on 20 volt scale.</li> <li>• Connect DVOM positive test lead to Test Pin 37 and negative test lead to Test Pin 54.</li> <li>• While observing DVOM, depress and release the throttle several times (to cycle output on and off).</li> <li>• Does voltage output cycle high and low?</li> </ul>		<p>Yes ▶</p> <p>No ▶</p>	<p>2.3L EFI T/C only, GO to <b>X61</b>. All others, GO to <b>X54</b>.</p> <p>GO to <b>X57</b>.</p>
<b>X54</b>	<b>CHECK FOR VOLTAGE AT A/C CLUTCH SWITCH</b>		
<ul style="list-style-type: none"> <li>• Key on, engine off.</li> <li>• A/C demand switch to A/C on position.</li> <li>• DVOM on 20 volt scale.</li> <li>• Breakout box installed.</li> <li>• Processor and Integrated Controller connected.</li> <li>• Measure voltage between Test Pin 10 and Test Pin 40 at breakout box.</li> <li>• Is voltage greater than 10.5 volts?</li> </ul>		<p>Yes ▶</p> <p>No ▶</p>	<p>GO to <b>X55</b>.</p> <p>GO to <b>X56</b>.</p>
<b>X55</b>	<b>CHECK CONTINUITY OF ACCS TO INTEGRATED CONTROLLER</b>		
<ul style="list-style-type: none"> <li>• Key off, wait 10 seconds.</li> <li>• Breakout box installed.</li> <li>• Processor disconnected.</li> <li>• Integrated Controller disconnected.</li> <li>• DVOM on 200 ohm scale.</li> <li>• Measure resistance between Test Pin 10 at breakout box and Pin 21 at controller harness connector.</li> <li>• Is resistance less than 5 ohms?</li> </ul>		<p>Yes ▶</p> <p>No ▶</p>	<p>REMOVE breakout box. RECONNECT processor. REPLACE Integrated Controller. RE-EVALUATE symptom.</p> <p>REMOVE breakout box. RECONNECT all components. SERVICE open in ACCS circuit. RE-EVALUATE symptom.</p>









Pinpoint Test X53 Thru X55 - Integrated Controller

Integrated Controller		Pinpoint Test	X
TEST STEP		RESULT	ACTION TO TAKE
<b>X56</b>	<b>CHECK CONTINUITY OF ACCS CIRCUIT</b>		
<ul style="list-style-type: none"> <li>• Key off, wait 10 seconds.</li> <li>• Breakout box installed.</li> <li>• A/C demand switch to A/C ON position.</li> <li>• Processor and Integrated Controller connected.</li> <li>• DVOM on 200 ohm scale.</li> <li>• Measure resistance between Test Pin 10 and A/C demand switch.</li> <li>• Is resistance less than 5 ohms?</li> </ul>		No	SERVICE open in circuit. RERUN Quick Test. REMOVE breakout box. RECONNECT all components.
		Yes	EEC-IV system OK.  REMOVE breakout box. RECONNECT all components.
<b>X57</b>	<b>CHECK CONTINUITY IN WAC TO INTEGRATED CONTROLLER CIRCUIT</b>		
<ul style="list-style-type: none"> <li>• Key off, wait 10 seconds.</li> <li>• Breakout box installed.</li> <li>• Disconnect processor and Integrated Controller.</li> <li>• DVOM on 200 ohm scale.</li> <li>• Measure resistance between Test Pin 54 and Pin 22 at Integrated Controller harness.</li> <li>• Is resistance less than 50 ohms?</li> </ul>		No	REMOVE breakout box. RECONNECT all components. SERVICE open in WAC circuit. RE-EVALUATE symptom.
		Yes	GO to <b>X58</b> .
<b>X58</b>	<b>CHECK WAC CIRCUIT FOR SHORTS TO GROUND</b>		
<ul style="list-style-type: none"> <li>• Key off, wait 10 seconds.</li> <li>• Leave breakout box installed and processor disconnected.</li> <li>• Integrated Controller disconnected.</li> <li>• DVOM on 200,000 ohm scale.</li> <li>• Measure resistance between Test Pin 54 and Test Pin 40 and between Test Pin 54 and Test Pin 46 and between Test Pin 54 and battery negative post.</li> <li>• Are all resistances greater than 10,000 ohms?</li> </ul>		Yes	GO to <b>X59</b> .
		No	REMOVE breakout box. RECONNECT all components. SERVICE shorts to ground in WAC circuit. RE-EVALUATE symptom.

Pinpoint Test X56 Thru X58 - Integrated Controller

<b>Integrated Controller</b>		<b>Pinpoint Test</b>	<b>X</b>
<b>TEST STEP</b>		<b>RESULT</b>	<b>ACTION TO TAKE</b>
<b>X59</b>	<b>CHECK WAC CIRCUIT FOR SHORTS TO POWER</b>		
<ul style="list-style-type: none"> <li>• Key off, wait 10 seconds.</li> <li>• Leave Breakout box installed and processor disconnected.</li> <li>• Integrated Controller disconnected.</li> <li>• DVOM on 200,000 ohm scale.</li> <li>• Measure resistance between Test Pin 54 and Test Pin 37 and between Test Pin 54 and battery positive.</li> <li>• Are both resistances greater than 10,000 ohms?</li> </ul>		<p>Yes ▶</p> <p>No ▶</p>	<p>GO to <b>X60</b> .</p> <p>REMOVE breakout box. RECONNECT all components. SERVICE short to power in WAC circuit. GO to <b>X60</b> .</p>
<b>X60</b>	<b>CHECK FOR VOLTAGE AT A/C CLUTCH</b>		
<ul style="list-style-type: none"> <li>• Key off, wait 10 seconds.</li> <li>• Leave breakout box installed.</li> <li>• Processor disconnected.</li> <li>• Connect Integrated Controller.</li> <li>• A/C clutch disconnected.</li> <li>• A/C demand switch to A/C ON position.</li> <li>• Key on, engine off.</li> <li>• DVOM on 20 volt scale.</li> <li>• Measure voltage at A/C clutch harness connection.</li> <li>• Is voltage greater than 10.5 volts?</li> </ul>		<p>Yes ▶</p> <p>No ▶</p>	<p>REMOVE breakout box. RECONNECT all components. REPLACE processor. RE-EVALUATE symptom.</p> <p>REMOVE breakout box. RECONNECT all components. REPLACE Integrated Controller. RE-EVALUATE symptom.</p>
<b>X61</b>	<b>CHECK FOR VOLTAGE AT A/C INPUT TO CONTROLLER</b>		
<ul style="list-style-type: none"> <li>• Key off, wait 10 seconds.</li> <li>• Leave breakout box installed.</li> <li>• Processor connected.</li> <li>• Integrated controller disconnected.</li> <li>• Key on, engine off.</li> <li>• A/C demand switch to A/C ON position.</li> <li>• DVOM on 20 volt scale.</li> <li>• Measure voltage between Pin 21 at controller harness connector and test Pin 40.</li> <li>• Is voltage greater than 10.5 volts?</li> </ul>		<p>Yes ▶</p> <p>No ▶</p>	<p>REMOVE breakout box. RECONNECT all components. REPLACE Integrated Controller. RE-EVALUATE symptom.</p> <p>REMOVE breakout box. RECONNECT all components. SERVICE open in A/C input circuit to controller. RE-EVALUATE symptom.</p>

Pinpoint Test X59 Thru X61 - Integrated Controller

<b>Integrated Controller</b>		<b>Pinpoint Test</b>	<b>X</b>
<b>TEST STEP</b>		<b>RESULT</b>	<b>ACTION TO TAKE</b>
<b>X70</b>	<b>NO FAN PRIMARY OR SECONDARY WITH NO CODE 82 OR 88</b>		
<ul style="list-style-type: none"> <li>• Key off, wait 10 seconds.</li> <li>• Disconnect Integrated controller.</li> <li>• DVOM on 20 volt scale.</li> <li>• Measure voltage between battery negative post and Pins 3 and 4 respectively at controller harness connector.</li> <li>• Are all voltages greater than 10.5 volts?</li> </ul>		Yes  No 	GO to <b>X71</b> .  <b>RECONNECT</b> Integrated Controller. <b>SERVICE</b> open in battery power circuit. <b>RE-EVALUATE</b> symptom.
<b>X71</b>	<b>FAN MOTORS CHECK</b>		
<ul style="list-style-type: none"> <li>• Key off.</li> <li>• Integrated controller disconnected.</li> <li>• Jumper Pin 3 to Pin 1 (for primary fan) and Pin 3 to Pin 6 (for secondary fan) at integrated controller harness connector.</li> <li>• Do both fans run?</li> </ul>		Yes  No 	GO to <b>X72</b> .  GO to <b>X73</b> .
<b>X72</b>	<b>CHECK FAN RUNNING MODE (LOW)</b>		
<ul style="list-style-type: none"> <li>• Key off.</li> <li>• Disconnect processor.</li> <li>• Connect Integrated controller.</li> <li>• Key on, engine off.</li> <li>• Does primary fan run?</li> </ul>		Yes  No 	GO to <b>X75</b> .  <b>REPLACE</b> Integrated Controller. <b>RECONNECT</b> all components. <b>RE-EVALUATE</b> symptom.
<b>X73</b>	<b>MEASURE BATTERY VOLTAGE SUPPLY AT FANS — BYPASSING INTEGRATED CONTROLLER</b>		
<ul style="list-style-type: none"> <li>• Key off.</li> <li>• Disconnect cooling fans.</li> <li>• Integrated controller disconnected.</li> <li>• Jumper Pin 3 to Pin 1 (for primary fan) and Pin 3 to Pin 6 if equipped (for secondary fan) at integrated controller harness connector.</li> <li>• DVOM on 20 volt scale.</li> <li>• Measure voltage at one or both cooling fan harness connectors as equipped.</li> <li>• Is either voltage greater than 8.0 volts?</li> </ul>		Yes  No 	<b>CHANGE</b> fan(s). <b>RE-EVALUATE</b> symptom.  GO to <b>X74</b> .

Pinpoint Test X70 Thru X73 - Integrated Controller

<b>Integrated Controller</b>		<b>Pinpoint Test</b>	<b>X</b>
<b>TEST STEP</b>		<b>RESULT</b>	<b>ACTION TO TAKE</b>
<b>X74</b>	<b>COOLING FAN GROUND VERIFICATION</b>		
<ul style="list-style-type: none"> <li>• Key off.</li> <li>• Cooling fan disconnected.</li> <li>• Integrated controller disconnected.</li> <li>• Jumper Pin 3 to Pin 1 (for primary fan) and Pin 3 to Pin 6 if equipped (for secondary fan) at integrated controller harness connector.</li> <li>• DVOM on 20 volt scale.</li> <li>• Measure voltage between voltage positive at one or both cooling fan harness connectors and negative battery post as equipped.</li> <li>• Is voltage greater than 8.0 volts?</li> </ul>		<p>Yes ▶</p> <p>No ▶</p>	<p>SERVICE open in ground circuit to fan(s). RECONNECT all components. RE-EVALUATE symptom.</p> <p>SERVICE open in power circuit to fan(s). RECONNECT all components. RE-EVALUATE symptom.</p>
<b>X75</b>	<b>JUMPER SECONDARY ELECTRIC DRIVE SIGNAL (HEDF) TO GROUND</b>		
<ul style="list-style-type: none"> <li>• Key off.</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>• Integrated controller connected.</li> <li>• Jumper Test Pin 52 to Test Pin 40 at breakout box.</li> <li>• Key on.</li> <li>• Does secondary fan run?</li> </ul>		<p>Yes ▶</p> <p>No ▶</p>	<p>GO to <b>X76</b> .</p> <p>REMOVE breakout box. REPLACE Integrated Controller. RECONNECT processor. RE-EVALUATE symptom.</p>
<b>X76</b>	<b>ECT SENSOR CHECK</b>		
<ul style="list-style-type: none"> <li>• Connect processor.</li> <li>• Check engine coolant level.</li> <li>• Warm engine to operating temperature before taking ECT resistance measurement.</li> <li>• Key off, wait 10 seconds.</li> <li>• Disconnect harness from ECT sensor.</li> <li>• DVOM on 200,000 ohm scale.</li> <li>• Measure resistance of ECT sensor.</li> <li>• Is resistance between 1500 and 2000 ohms?</li> </ul>		<p>Yes ▶</p> <p>No ▶</p>	<p>REMOVE breakout box. REPLACE processor. RECONNECT all components. RE-EVALUATE symptom.</p> <p>REMOVE breakout box. REPLACE ECT sensor. RECONNECT all components. RE-EVALUATE symptom.</p>

Pinpoint Test X74 Thru X76 - Integrated Controller

Integrated Controller		Pinpoint Test	X
TEST STEP		RESULT	ACTION TO TAKE
<b>X80</b>	SERVICE CODE 82 OR 88: CHECK EDF PROCESSOR SIGNAL TO INTEGRATED CONTROLLER FOR SHORTS TO GROUND		
<p><b>NOTE: If fan is always on with Code 82 or 88, GO to X82.</b></p> <ul style="list-style-type: none"> <li>• Key off.</li> <li>• Disconnect processor 60 pin connector. Inspect for damaged pins, corrosion, and loose wires, etc. Service as necessary.</li> <li>• Install breakout box, leave processor disconnected.</li> <li>• Disconnect Integrated controller.</li> <li>• DVOM on 200,000 ohm scale.</li> <li>• Measure resistance between Test Pin 55 and Test Pin 40.</li> <li>• Is resistance less than 10,000 ohms?</li> </ul>		<p>Yes</p> <p>No</p>	<p>SERVICE short to ground in EDF circuit. RECONNECT all components. RERUN Quick Test.</p> <p>GO to <b>X81</b>.</p>
<b>X81</b>	CHECK FAN RUNNING MODE		
<ul style="list-style-type: none"> <li>• Key off.</li> <li>• Breakout box installed.</li> <li>• Processor disconnected.</li> <li>• Connect integrated controller.</li> <li>• Key on, engine off.</li> </ul> <p>For 2.5L MTX &gt; Does fan run?</p> <p>For 2.5L, 3.0L and 3.8L AXOD &gt; Does fan run at low speed?</p> <p>For 2.3L EFI TC &gt; Does primary fan run?</p>		<p>Yes</p> <p>No</p>	<p>REMOVE breakout box. REPLACE processor. RECONNECT all components. RERUN Quick Test.</p> <p>REMOVE breakout box. REPLACE Integrated Controller. RECONNECT all components. RERUN Quick Test.</p>

Pinpoint Test X80 &amp; X81 - Integrated Controller

<b>Integrated Controller</b>		<b>Pinpoint Test</b>	<b>X</b>
<b>TEST STEP</b>		<b>RESULT</b>	<b>ACTION TO TAKE</b>
<b>X82</b>	FAN ALWAYS ON WITH CODE 82 OR 88: CHECK EDF PROCESSOR SIGNAL TO INTEGRATED CONTROLLER FOR OPEN CIRCUIT		
<ul style="list-style-type: none"> <li>• Key off.</li> <li>• Disconnect processor 60 pin connector. Inspect for damaged pins, corrosion, and loose wires, etc. Service as necessary.</li> <li>• Install breakout box.</li> <li>• Processor and integrated controller disconnected.</li> <li>• DVOM on 200 ohm scale.</li> <li>• Measure resistance between Test Pin 55 and Integrated Controller harness Pin 14.</li> <li>• Is resistance less than 5 ohms?</li> </ul>		<p>Yes ▶</p> <p>No ▶</p>	<p>GO to <b>X83</b> .</p> <p>REMOVE breakout box. SERVICE open in EDF circuit. RECONNECT all components. RERUN Quick Test.</p>
<b>X83</b>	CHECK EDF CIRCUIT FOR SHORTS TO POWER		
<ul style="list-style-type: none"> <li>• Key off.</li> <li>• Breakout box installed.</li> <li>• Processor and integrated controller disconnected.</li> <li>• DVOM on 200,000 ohm scale.</li> <li>• Measure resistance between Test Pin 55 and Test Pin 37, and between Test Pin 55 and battery positive.</li> <li>• Is resistance less than 10,000 ohms?</li> </ul>		<p>Yes ▶</p> <p>No ▶</p>	<p>REMOVE breakout box. RECONNECT all components. SERVICE short to power in EDF circuit. GO to <b>X84</b> .</p> <p>GO to <b>X84</b> .</p>
<b>X84</b>	CHECK EDF SHORT TO GROUND		
<ul style="list-style-type: none"> <li>• Key off.</li> <li>• Breakout box installed.</li> <li>• Processor disconnected.</li> <li>• Integrated controller connected.</li> <li>• Key on, engine off.</li> <li>• Jumper test Pin 55 to Test Pin 40 or 60.</li> <li>• Does fan continue to run?</li> </ul>		<p>Yes ▶</p> <p>No ▶</p>	<p>REMOVE breakout box. REPLACE Integrated Controller. RECONNECT all components. RERUN Quick Test.</p> <p>REMOVE breakout box. REPLACE processor. RECONNECT all components. RERUN Quick Test.</p>

Pinpoint Test X82 Thru X84 - Integrated Controller

<b>Integrated Controller</b>		<b>Pinpoint Test</b>	<b>X</b>
<b>TEST STEP</b>		<b>RESULT</b>	<b>ACTION TO TAKE</b>
<b>X90</b>	<b>SERVICE CODE 95: CHECK INERTIA SWITCH</b>		
<p><b>NOTE: Key On Engine Off Service Code 95 indicates that one of the following has occurred:</b></p> <ul style="list-style-type: none"> <li>— Open circuit in/or between the fuel pump and Test Pin 8 (see schematic)</li> <li>— Poor fuel pump ground</li> <li>— FUEL PUMP circuit short to power</li> <li>— Fuel pump relay contacts always closed</li> </ul> <ul style="list-style-type: none"> <li>• Key off, wait 10 seconds.</li> <li>• Locate and disconnect fuel pump inertia switch.</li> <li>• DVOM on 200 ohm scale.</li> <li>• Measure resistance of the fuel pump inertia switch.</li> <li>• Is resistance less than 5.0 ohms?</li> </ul>		<p>Yes</p> <p>No</p>	<p>▶ RECONNECT inertia switch. GO to <b>X91</b> .</p> <p>▶ REPLACE or RESET inertia switch. RERUN Quick Test.</p>
<b>X91</b>	<b>VERIFY THAT FUEL PUMP IS OFF</b>		
<ul style="list-style-type: none"> <li>• Key off.</li> <li>• Listen for motor noise from fuel pump.</li> <li>• Is fuel pump off?</li> </ul>		<p>Yes</p> <p>No</p>	<p>▶ GO to <b>X93</b> .</p> <p>▶ GO to <b>X92</b> .</p>
<b>X92</b>	<b>CHECK FOR FUEL PUMP RELAY ALWAYS CLOSED</b>		
<ul style="list-style-type: none"> <li>• Key off.</li> <li>• Locate and disconnect integrated controller.</li> <li>• Does fuel pump shut off when controller is disconnected?</li> </ul>		<p>Yes</p> <p>No</p>	<p>▶ REPLACE Integrated Controller. RERUN Quick Test</p> <p>▶ SERVICE short to power in POWER-TO-PUMP/FPM circuit. RECONNECT integrated controller. RERUN Quick Test.</p>

## Pinpoint Test X90 Thru X92 - Integrated Controller

<b>Integrated Controller</b>		<b>Pinpoint Test</b>	<b>X</b>
<b>TEST STEP</b>		<b>RESULT</b>	<b>ACTION TO TAKE</b>
<b>X93</b>	<b>CHECK CONTINUITY OF FPM CIRCUIT</b>		
<ul style="list-style-type: none"> <li>• Key off.</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>• Disconnect integrated controller.</li> <li>• DVOM on 200 ohm scale.</li> <li>• Measure resistance between Test Pin 8 at the breakout box and integrated controller harness connector pin 5.</li> <li>• Is resistance less than 5.0 ohms?</li> </ul>		<p>Yes ▶</p> <p>No ▶</p>	<p>GO to <b>X94</b> .</p> <p>REMOVE breakout box. RECONNECT processor and integrated controller. SERVICE open circuit. RERUN Quick Test.</p>
<b>X94</b>	<b>CHECK FOR CONTINUITY BETWEEN FPM CIRCUIT AND GROUND</b>		
<ul style="list-style-type: none"> <li>• Key off.</li> <li>• Breakout box installed, processor disconnected.</li> <li>• Integrated controller disconnected.</li> <li>• DVOM on 200 ohm scale.</li> <li>• Measure resistance between Test Pin 8 at the breakout box and battery negative post.</li> <li>• Is resistance less than 5.0 ohms?</li> </ul>		<p>Yes ▶</p> <p>No ▶</p>	<p>REMOVE breakout box. RECONNECT integrated controller. REPLACE processor. RERUN Quick Test.</p> <p>REMOVE breakout box. RECONNECT processor and integrated controller.</p> <p>Electric Fuel Pump for open in POWER-TO-PUMP circuit, poor fuel pump ground, open in fuel pump, etc.</p>

Pinpoint Test X93 &amp; X94 - Integrated Controller

Integrated Controller		Pinpoint Test	X
TEST STEP		RESULT	ACTION TO TAKE
<b>X95</b>	<b>SERVICE CODE 96: CHECK CONTINUITY OF POWER-TO-PUMP CIRCUIT</b>		
<p><b>NOTE: Service Code 96 indicates that when the fuel pump is being activated, power is not being supplied to the fuel pump.</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, leave processor disconnected.</li> <li>• Disconnect integrated relay controller.</li> <li>• DVOM on 200 ohm scale.</li> <li>• Measure resistance between Test Pin 8 at the breakout box and integrated controller harness connector pin 5.</li> <li>• Is resistance less than 5.0 ohms?</li> </ul>		<p>Yes ▶</p> <p>No ▶</p>	<p>GO to <b>X96</b> .</p> <p>REMOVE breakout box. RECONNECT processor and integrated controller. SERVICE open in POWER-TO-PUMP circuit between FPM splice and the integrated controller. RERUN Quick Test.</p>
<b>X96</b>	<b>VERIFY FUEL PUMP OPERATION</b>		
<ul style="list-style-type: none"> <li>• Key off.</li> <li>• Breakout box installed.</li> <li>• Reconnect processor and integrated controller.</li> <li>• DVOM on 20 volt scale.</li> <li>• Connect DVOM between Test Pin 8 and Test Pin 40 at the breakout box.</li> <li>• While observing DVOM, turn key to on.</li> <li>• Does voltage increase to greater than 10.5 volts for about 1 second after key is turned to on?</li> </ul>		<p>Yes ▶</p> <p>No ▶</p>	<p>REMOVE breakout box. REPLACE processor. RERUN Quick Test.</p> <p>REMOVE breakout box. RECONNECT processor. REPLACE integrated controller. RERUN Quick Test.</p>

Pinpoint Test X95 &amp; X96 - Integrated Controller

Integrated Controller		Pinpoint Test	X
TEST STEP		RESULT	ACTION TO TAKE
<b>X100</b>	<b>CONTINUOUS MEMORY CODE 95: CHECK EEC-IV HARNESS</b>		
<p>A Continuous Memory Code 95 indicates that one of the following intermittent conditions has occurred:</p> <ul style="list-style-type: none"> <li>— Open circuit in or between the fuel pump and Pin 8 in the processor (see schematic <b>X</b>).</li> <li>— Poor fuel pump ground.</li> </ul> <ul style="list-style-type: none"> <li>• Start engine.</li> <li>• Check for engine stall/stumble while performing the following (also, if possible, listen for fuel pump turning off). <ul style="list-style-type: none"> <li>— Shake, wiggle, bend the power-to-pump circuit between the Integrated Controller pin 5 and the fuel pump.</li> <li>— Shake, wiggle, bend the fuel pump ground circuit from the fuel pump to ground.</li> <li>— Lightly tap the inertia switch and the fuel pump to simulate road shock.</li> </ul> </li> <li>• Key off.</li> <li>• Inspect the fuel pump electrical connector and the fuel pump ground for corrosion, damaged pins, etc.</li> <li>• Is fault indicated/found?</li> </ul>		<p>Yes</p> <p>No</p>	<p>ISOLATE fault and SERVICE as necessary. CLEAR Continuous Memory Code 95.</p> <p>RERUN Quick Test.</p> <p>GO to <b>X101</b>.</p>
<b>X101</b>	<b>CHECK FPM CIRCUIT</b>		
<ul style="list-style-type: none"> <li>• Key off.</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>• Key on, engine off.</li> <li>• Connect a test lamp between Test Pin 8 and Test Pin 37.</li> <li>• Observe test lamp for an indication of a fault while performing the following (The light will go out when a fault is found indicating an open): <ul style="list-style-type: none"> <li>— Shake, wiggle, bend the fuel pump monitor circuit (Pin 8) between the processor and splice into the POWER-TO-PUMP circuit.</li> </ul> </li> <li>• Is fault found/indicated?</li> </ul>		<p>Yes</p> <p>No</p>	<p>ISOLATE fault and SERVICE as necessary. REMOVE breakout box. CLEAR Continuous Memory Code 95.</p> <p>RERUN Quick Test.</p> <p>Unable to duplicate fault at this time. CLEAR Continuous Memory Code 95.</p>

Pinpoint Test X100 &amp; X101 - Integrated Controller

Integrated Controller		Pinpoint Test	X
TEST STEP		RESULT	ACTION TO TAKE
<b>X102</b>	CONTINUOUS MEMORY CODE 96 CHECK FOR CONTINUOUS MEMORY CODE 87		
<ul style="list-style-type: none"> <li>Is Continuous Memory Code 87 also present?</li> </ul>		Yes	▶ GO to <b>X104</b> .
		No	▶ GO to <b>X103</b> .
<b>X103</b>	CHECK EEC-IV HARNESS		
<p>A Continuous Memory Code 96, without the presence of a Continuous Memory Code 87, indicates that during vehicle operation, one of the following has occurred:</p> <ul style="list-style-type: none"> <li>Fuel pump relay contacts opened.</li> <li>Open in the POWER-TO-PUMP circuit from the integrated relay controller pin 5 to the FPM splice. (See schematic <b>X</b> ).</li> </ul> <ul style="list-style-type: none"> <li>Start engine.</li> <li>Check for engine stall/stumble while performing the following (also, if possible, listen for fuel pump turning off): <ul style="list-style-type: none"> <li>Shake, wiggle, bend the POWER-TO-PUMP circuit from the integrated relay controller to the FPM splice.</li> <li>Lightly tap the integrated relay controller (to simulate road shock).</li> </ul> </li> <li>Key off.</li> <li>Inspect the integrated relay controller 24 pin connectors for corrosion, damaged pins, etc.</li> <li>Is fault indicated/found?</li> </ul>		Yes	▶ ISOLATE fault and SERVICE as necessary. CLEAR Continuous
		No	▶ Unable to duplicate fault at this time. CLEAR Continuous Memory Code 96.
			RERUN Quick Test.
			Continuous Memory Code 96 testing complete.

Pinpoint Test X102 &amp; X103 - Integrated Controller

<b>Integrated Controller</b>		<b>Pinpoint Test</b>	<b>X</b>
<b>TEST STEP</b>		<b>RESULT</b>	<b>ACTION TO TAKE</b>
<b>X104</b>	<b>CONTINUOUS MEMORY SERVICE CODE 87: CHECK EEC-IV HARNESS</b>		
<p>A Continuous Memory Code 87 indicates that one of the following intermittent conditions has occurred:</p> <ul style="list-style-type: none"> <li>— Open VPWP circuit in the integrated relay controller.</li> <li>— Open coil in fuel pump relay.</li> <li>— Open in fuel pump primary circuit.</li> </ul> <ul style="list-style-type: none"> <li>• Start engine.</li> <li>• Check for engine stall/stumble while performing the following (also, if possible, listen for fuel pump turning off):               <ul style="list-style-type: none"> <li>— Shake, wiggle, bend the EEC-IV Harness fuel pump circuit (pin 22) between the processor and the Integrated Controller (pin 18).</li> <li>— Lightly tap the Integrated Controller (to simulate road shock).</li> </ul> </li> <li>• Key off.</li> <li>• Inspect the processor 60 pin connectors and the integrated relay controller 24 pin connectors for corrosion, damaged pins, etc.</li> <li>• Is fault indicated/found?</li> </ul>		<p>Yes</p> <p>No</p>	<p>ISOLATE fault and SERVICE as necessary. CLEAR Continuous Memory Service Code(s).</p> <p>RERUN Quick Test.</p> <p>Unable to duplicate fault at this time. CLEAR Continuous Memory Code(s).</p>

Pinpoint Test X104 - Integrated Controller

**Erratic Ignition****Pinpoint  
Test****Y****Note**

You should enter this Pinpoint Test only when a service code 14 is received in Quick Test Step 6.0.

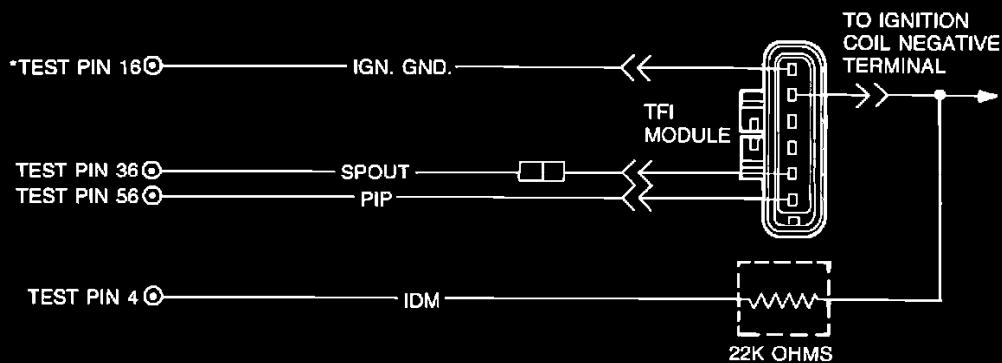
**Remember**

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

- TFI module.
- Arcing secondary ignition components.
  - Ignition coil.
  - Spark plugs and high tension cables.
- Distributor and PIP sensor.

This Pinpoint Test is intended to diagnose only the following:

- Harness circuits: IGNITION GROUND, SPOUT, PIP, IDM.

**Pinpoint Test Schematic**

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

**Pinpoint Test Y - Erratic Ignition**

Erratic Ignition		Pinpoint Test	Y
TEST STEP		RESULT	ACTION TO TAKE
<b>Y1</b>	<b>SERVICE CODE 14: ERRATIC IGNITION</b>		
<p><b>NOTE: Code 14 indicates two successive erratic profile ignition pickup (PIP) pulses occurred, resulting in a possible engine miss or stall.</b></p> <ul style="list-style-type: none"> <li>• Check EEC-IV and ignition systems harnesses for: <ul style="list-style-type: none"> <li>— Loose wires/connectors.</li> <li>— Arcing secondary ignition components (coil, cap, rotor, wires, plugs, etc.).</li> <li>— On-board transmitter (2-way radio).*</li> </ul> </li> <li>• Are any of the above present?</li> </ul> <p>*Verify all 2-way radio installations. Carefully follow manufacturer's installation instructions regarding the routing of antenna and power leads.</p>		<p>Yes</p> <p>No</p>	<p>SERVICE as necessary. CLEAR Continuous Memory Code 14.</p> <p>RERUN Quick Test.</p> <p>GO to <b>Y2</b>.</p>
<b>Y2</b>	<b>CHECK DISTRIBUTOR</b>		
<ul style="list-style-type: none"> <li>• Key off, wait 10 seconds.</li> <li>• Enter Engine Running Continuous Monitor mode. Refer to Appendix in Section 16.</li> <li>• Observe VOM or STAR LED for indication of a fault while performing the following: <ul style="list-style-type: none"> <li>• Lightly tap on TFI module and distributor.</li> <li>• Wiggle TFI connector.</li> </ul> </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 Ignition System Diagnostics.</p> <p>GO to <b>Y3</b>.</p>

Pinpoint Test Y1 &amp; Y2 - Erratic Ignition

<b>Erratic Ignition</b>		<b>Pinpoint Test</b>	<b>Y</b>
<b>TEST STEP</b>		<b>RESULT</b>	<b>ACTION TO TAKE</b>
<b>Y3</b>	<b>CHECK EEC-IV HARNESS</b>		
<ul style="list-style-type: none"> <li>• While still in Continuous Monitor mode from Step Y2 observe VOM or STAR LED for a fault indication while performing the following:</li> <li>• While looking for faults grasp the harness close to the TFI connector. Wiggle, shake or bend a small section of the ignition and EEC-IV systems harness while working your way to the other components and dash panel. Also wiggle, shake or bend the EEC-IV harness from the dash panel to the processor. Isolate the PIP circuit if needed for this test.</li> <li>• Is a fault indicated?</li> </ul>		<p>Yes</p> <p>No</p>	<p>ISOLATE fault and SERVICE as necessary. CLEAR Continuous Memory Code 14.</p> <p>RERUN Quick Test.</p> <p>GO to <b>Y4</b>.</p>
<b>Y4</b>	<b>CHECK PROCESSOR AND HARNESS CONNECTORS</b>		
<ul style="list-style-type: none"> <li>• Key off, wait 10 seconds.</li> <li>• Disconnect processor 60 pin connector. Inspect for damaged pins, corrosion, loose wires, etc. Service as necessary.</li> <li>• Are connectors and terminals OK?</li> <li>• Reconnect processor when this Step is completed.</li> </ul>		<p>Yes</p> <p>No</p>	<p>Unable to duplicate an erratic ignition fault in the EEC-IV System. For further diagnosis, Ignition System Diagnostics.</p> <p>SERVICE as necessary. CLEAR Continuous Memory Code 14.</p> <p>RERUN Quick Test.</p>

Pinpoint Test Y3 &amp; Y4 - Erratic Ignition