SECTION 21

EEC IV—Pinpoint Tests—All Vehicles

Contents

Pinpoint Tests

INSTRUCTIONS FOR USING THE PINPOINT TESTS

- Do not run any of the following Pinpoint Tests unless you are so instructed by the Quick Test. Each Pinpoint Test assumes that a fault has been detected in the system with direction to enter a specific repair routine. Doing any Pinpoint Test without direction from Quick Test may produce incorrect results and replacement of Non-Defective components.
- Correct test results for Quick Test are dependent on the proper operation of related non-EEC components/systems. It may be necessary to correct any defects in these areas before EEC will pass the Quick Test. Refer to the Diagnostic Routines, Section 2 for service.
- Do not replace any parts unless the test result indicates they should be replaced.
- When more than one service code is received, always start service with the first code received.
- Do not measure voltage or resistance at the processor or connect any test lights to it, unless otherwise specified.
- Isolate both ends of a circuit, and turn key Off whenever checking for shorts or continuity, unless specified.
- Disconnect solenoids and switches from the harness before measuring for continuity, resistance, or energizing by way of 12-volt source.
- In using the Pinpoint Tests, follow each Step in order, starting from the first Step in the appropriate test. Follow each Step until the fault is found.
- After completing any repairs to the EEC system, verify all components are properly reconnected and repeat the functional test (Retest).
- An open is defined as any resistance reading greater than 5 ohms unless otherwise specified.
- A short is defined as any resistance reading less than 10,000 ohms to ground, unless otherwise specified.

The standard Ford color abbreviations are:

BK	**Black**	**N**	**Natural**
BL	**Blue**	**O**	**Orange**
BR	**Brown**	**PK**	**Pink**
DB	**Dark Blue**	**P**	**Purple**
DG	**Dark Green**	**R**	**Red**
GY	**Gray**	**T**	**Tan**
GR	**Green**	**W**	**White**
LB	**Light Blue**	**Y**	**Yellow**
LG	**Light Green**		

Where two colors are shown for a wire, the first color is the basic color of the wire. The second color is the dot, hash, or stripe marking. If **D** or **H** is given, the second color is dots or hash marks. If there is no letter after the second color, the wire has a stripe.

For example:

BR/O is a brown wire with an orange stripe.

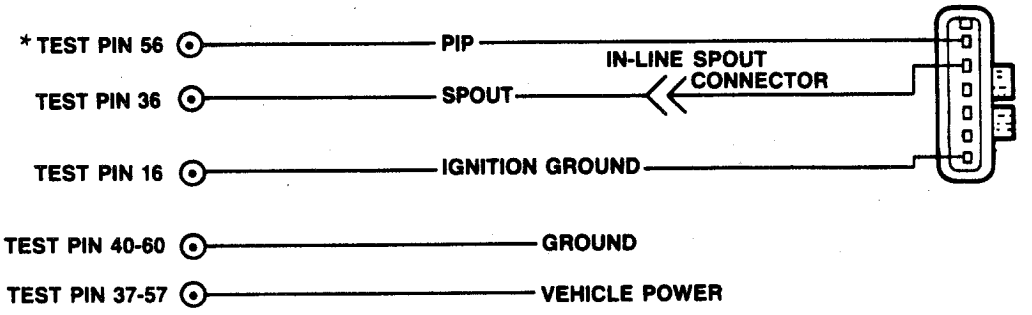
R/Y D is a red wire with yellow dots.

BK/W H is a black wire with white hash marks.

Pinpoint Test Index

EEC IV No Start	Pinpoint Test	A

A



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

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

STOP-WARNING

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. This Pinpoint Test will not diagnose ignition system problems.

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, vehicle power.

EEC IV No Start	Pinpoint Test	A

WARNING: Stop this test at the first sign of a fuel leak and service as required.
CAUTION: No open flame — No smoking during fuel delivery checks.

TEST STEP	RESULT ▶	ACTION TO TAKE
A1 ATTEMPT TO START ENGINE		
	Engine cranks, but does not start, or stalls out ▶	GO to **A2**.
	Engine does not crank ▶	REFER to Shop Manual, Group 28.
A2 CHECK FOR VREF AT THROTTLE POSITION SENSOR		
• Key Off, wait 10 seconds. • DVOM on 20V scale. • Disconnect TP sensor. • Key On, Engine Off. • Measure voltage at the TP vehicle harness connector between VREF and signal return. **NOTE: Refer to electrical schematic in appropriate engine supplement section for connector pin orientation.**	Less than 4.0V or greater than 6.0V ▶	GO to Pinpoint Test Step **C1**.
	4.0V to 6.0V ▶	RECONNECT TP sensor. GO to **A3**.
A3 CHECK FOR SPARK AT PLUGS		
• Disconnect the spark plug wire to any accessible cylinder. • Connect spark tester between spark plug wire and engine ground. • Crank engine and check for spark. • Reconnect the spark plug wire to the spark plug.	Spark ▶	GO to **A13**.
	No spark ▶	GO to **A4**.
A4 CHECK FOR SPARK AT COIL		
• Remove high tension coil wire from distributor and install spark tester. • Check for spark while cranking. • Reconnect high tension coil wire to distributor.	Spark ▶	REFER to Section 15, Part 2 for TFI Diagnosis for cap, rotor, wires.
	No spark ▶	GO to **A5**.

EEC IV No Start	Pinpoint Test	A

TEST STEP	RESULT ▶	ACTION TO TAKE
A5 HARNESS CHECK (IGNITION GROUND) • Key Off, wait 10 seconds. • Install Breakout box. Leave processor disconnected. • DVOM on 200 ohm scale. • Disconnect TFI. • Measure resistance between test Pin 16 at the Breakout box and TFI harness connector ignition ground.	Less than 5 ohms ▶ 5 ohms or greater ▶	GO to **A6**. SERVICE harness as necessary. RERUN Quick Test.
A6 ISOLATION OF PROBLEM TO SPOUT CIRCUIT • Breakout box installed. • Connect TFI. • Connect processor. • Timing switch to "Dist" position on Breakout box. • Attempt to start vehicle. • Does the vehicle start?	Yes ▶ No ▶	GO to **A10**. GO to **A7**.
A7 SPOUT SIGNAL CHECK • Breakout box installed. • Timing switch to "Computed" position on Breakout box. • DVOM on 20V scale. • Measure voltage between test Pin 36 at the Breakout box and chassis ground, during crank.	Less than 3.0V or greater than 6.0V ▶ Between 3.0V and 6.0V ▶	GO to **A8**. EEC OK, REFER to Section 15, for TFI diagnosis.
A8 CHECK SPOUT FOR SHORTS • Key Off, wait 10 seconds. • Breakout box installed. • Disconnect processor. • Disconnect TFI. • DVOM on 200,000 ohm scale. • 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.	All readings 10,000 ohms or greater ▶ Any reading less than 10,000 ohms ▶	GO to **A9**. SERVICE short in harness. RERUN Quick Test if vehicle does not start. GO to **A9**.

EEC IV No Start — Pinpoint Test A

TEST STEP	RESULT ▶	ACTION TO TAKE
A9 ISOLATE SHORT(S) IN PROCESSOR		
• Key Off, wait 10 seconds. • Breakout box installed. • Reconnect processor. • TFI disconnected. • DVOM on 200 ohm scale. • 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.	All readings 5.0 ohms or greater. ▶	Connect TFI. GO to **A10**.
	Any reading less than 5.0 ohms ▶	REPLACE processor. RERUN Quick Test.
A10 PIP SIGNAL CHECK		
• Breakout box installed. • DVOM to 20V scale. • Measure voltage between test Pin 56 and test Pin 16 at the Breakout box. • Crank engine, record reading.	Between 3.0V and 6.0V ▶	REMOVE Breakout box. REPLACE processor. RERUN Quick Test.
	Less than 3.0V or greater than 6.0V ▶	GO to **A11**.
A11 CONTINUITY OF PIP CIRCUIT CHECK		
• Breakout box installed. • Key Off, wait 10 seconds. • DVOM on 200 ohm scale. • Disconnect TFI. • Disconnect processor. • Measure resistance between test Pin 56 at the Breakout box and TFI harness connector PIP circuit.	Less than 5 ohms ▶	GO to **A12**.
	5 ohms or greater ▶	SERVICE open PIP circuit. RERUN Quick Test.

EEC IV No Start — Pinpoint Test A

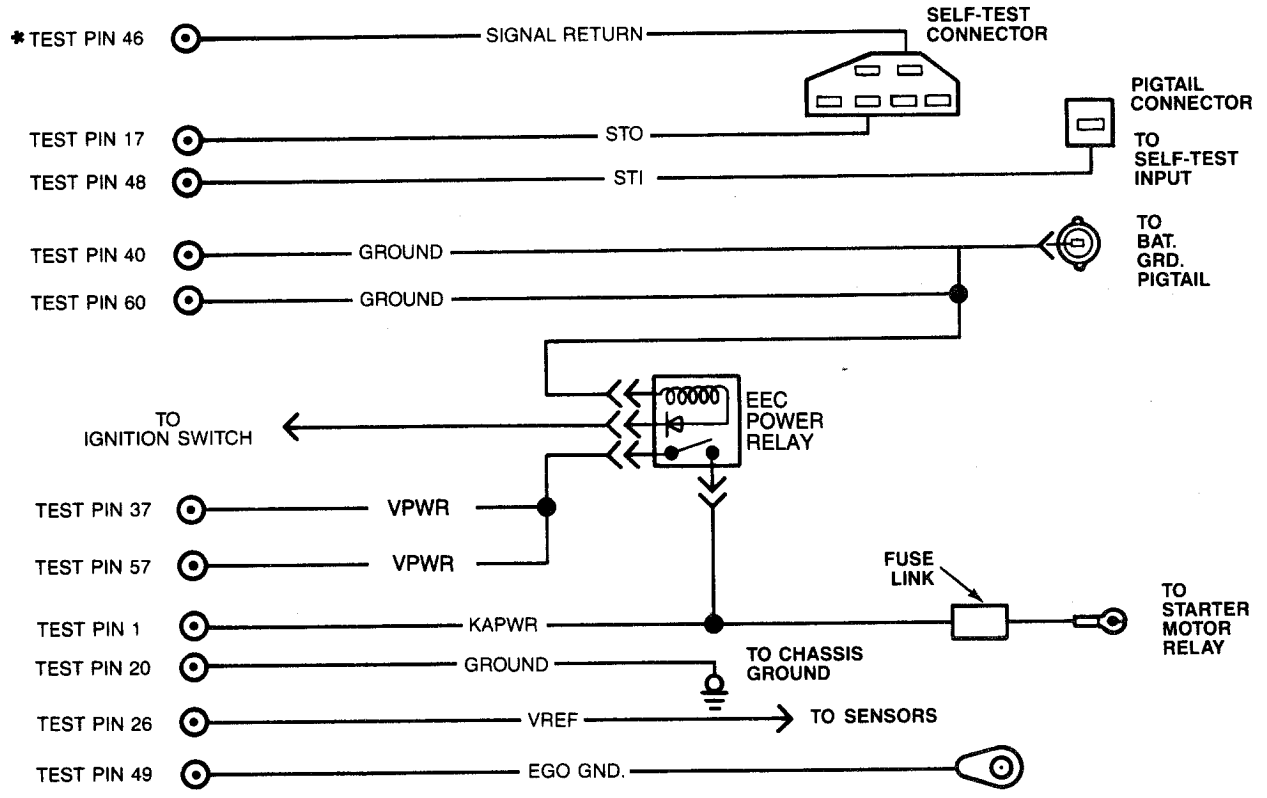
TEST STEP	RESULT ▶	ACTION TO TAKE
A12 CHECK PIP CIRCUIT FOR SHORTS • Breakout box installed. • Processor disconnected. • Key Off. • Disconnect TFI connector. • DVOM on 200,000 ohm scale. • Measure resistance between test Pin 56 and test Pins 16, 20, 26, 40, 60 (shorts to ground) and test Pins 37 and 57 (shorts to power) and test Pin 36 (short to spout) at the Breakout box.	Any resistance less than 10,000 ohms ▶ All resistance greater than 10,000 ohms ▶	SERVICE PIP circuit. RERUN Quick Test. REFER to Section 15 for TFI diagnosis.
A13 SPOUT SIGNAL VERIFICATION • Key Off, wait 10 seconds. • Disconnect processors 60 pin connector and inspect for damaged pins, corrosion, loose wires. Service as necessary. • Install Breakout box. • Processor connected. • DVOM on 20V scale. • Measure voltage between test Pin 36 at the Breakout box and chassis ground, during crank. • Ensure timing switch is in "Computed" position on Breakout box.	Between 3.0V and 6.0V ▶ Less than 3.0V or greater than 6.0V ▶	FBC vehicles. REFER to Shop Manual, Group 24. EFI and CFI GO to **A21**. GO to **A10**.

EEC IV No Start — Pinpoint Test A

TEST STEP	RESULT ▶	ACTION TO TAKE
A21 FUEL PUMP CHECK		
• **No smoking nearby.** • Disconnect all injector electrical connections at the injectors. • Connect pressure gauge. • Note initial pressure reading. • 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.) • Turn key Off. Wait 10 seconds. • Reconnect all injectors. **WARNING: If fuel starts leaking, turn key OFF immediately. No smoking.**	PRESSURE GAUGE READING: Increased ▶ Did not increase ▶	All EFI Go to Pinpoint Test Step **S1**. All CFI Go to Pinpoint Test Step **S2**. TURN key Off, and CONTINUE to **A22**.
A22 INERTIA SWITCH CHECK		
• Key Off. • Fuel pressure gauge installed. • Locate fuel pump inertia switch. Refer to Owner's Manual for location. • Push the button of inertia switch to reset to ON. **NOTE: If switch will not reset to ON, replace Inertia Switch and repeat Step A21. If switch button was on, GO to Step J1, except 2.5L HSC CFI and 3.0L EFI passenger car, GO to Step X-11.** • 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.	PRESSURE GAUGE READING: Increase ▶ No increase ▶	RERUN Quick Test. • 2.5L HSC-CFI and 3.0L EFI passenger car GO to **X-11**. • All others, GO to **J1**.

Vehicle Battery	Pinpoint Test	B

B



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

STOP-WARNING

You should enter this Pinpoint Test only when directed here from Pinpoint Tests C, J or P or when a continuous memory code 78 is received in Quick Test Step 6.0C.

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.

Vehicle Battery | Pinpoint Test | B

TEST STEP	RESULT ▶	ACTION TO TAKE
B1 BATTERY VOLTAGE CHECK • Key On, Engine Off. • DVOM on 20V scale. • Measure voltage across battery terminals.	10.5V or greater ▶	GO to **B2**.
	Less than 10.5V ▶	SERVICE discharged battery, REFER to Shop Manual, Group 31.
B2 BATTERY POWER GROUND CHECK • Key On, Engine Off. • Processor connected. • DVOM on 20V scale. • Measure voltage between battery negative post and Signal Return in the Self-Test connector.	Less than 0.5V ▶	GO to **B6**.
	0.5V or greater ▶	GO to **B3**.
B3 GROUND FAULT ISOLATION • Breakout box installed. • Key On, Engine Off. • Processor connected. • DVOM on 20V scale. • Measure voltage between battery negative post and test Pins 40 and 60 at the Breakout box.	Both readings less than 0.5V ▶	GO to **B4**.
	One or both readings 0.5V or greater ▶	Circuit(s) with greater than 0.5V has high resistance or open. CORRECT faulty ground circuit. RERUN Quick Test.
B4 PROCESSOR GROUND FAULT ISOLATION • Breakout box installed. • Key Off, wait 10 seconds. • Processor connected. • DVOM on 200 ohm scale. • Measure resistance between test Pin 46 and test Pin 40 and between test Pin 46 and test Pin 60 both at the Breakout box.	Both readings less than 5 ohms ▶	GO to **B5**.
	One or both readings 5 ohms or greater ▶	DISCONNECT processor connector and INSPECT for corrosion, damaged pins, etc. SERVICE as necessary and RETEST. If fault is still present, REPLACE processor. RERUN Quick Test.

Vehicle Battery | Pinpoint Test | B

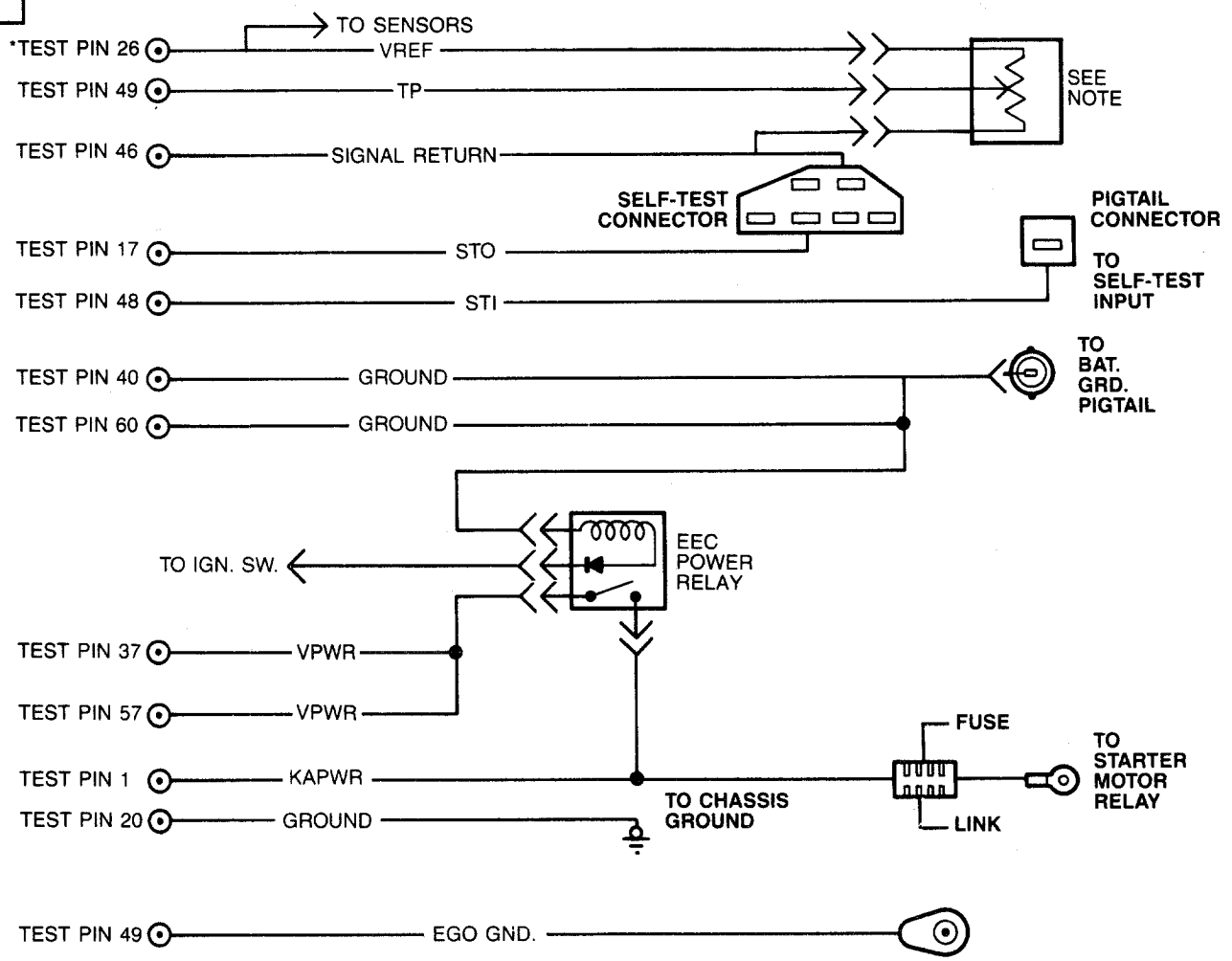
TEST STEP	RESULT ▶	ACTION TO TAKE
B5 HARNESS CHECK (SIGNAL RETURN) • Breakout box installed. • Key Off, wait 10 seconds. • Processor connected. • DVOM on 200 ohm scale. • Measure resistance between test Pin 46 at the Breakout box and Signal Return in the Self-Test connector.	Less than 5 ohms ▶ 5 ohms or greater ▶	System OK. RUN Quick Test. CORRECT cause of resistance in the harness Signal Return circuit. RERUN Quick Test.
B6 12 VOLT BATTERY POWER FAULT ISOLATION • Key On, Engine Off. • Processor connected. • DVOM on 20V scale. • Measure voltage between the battery negative post and KAPWR circuit at EEC power relay.	10.5V or greater ▶ Less than 10.5V ▶	GO to **B7**. CHECK KAPWR and VPWR circuits for shorts to ground and KAPWR circuit from power relay to battery positive post for opens. SERVICE as necessary. RERUN Quick Test.
B7 12 VOLT BATTERY POWER FAULT ISOLATION • Key On, Engine Off. • Processor connected. • DVOM on 20V scale. • Measure voltage between the battery negative post and Ignition circuit at EEC power relay.	10.5V or greater ▶ Less than 10.5V ▶	GO to **B8**. CHECK for open in ignition switch circuits. SERVICE as necessary. RERUN Quick Test.
B8 12 VOLT BATTERY POWER FAULT ISOLATION • Key On, Engine Off. • Processor connected. • DVOM on 20V scale. • Measure voltage between the battery negative post and ground circuit at EEC power relay.	Less than 0.5V ▶ 0.5V or greater ▶	If you entered this test for a code 78, GO to **B10**. All others, GO to **B9**. SERVICE open or ground in Ground Circuit. RERUN Quick Test.

Vehicle Battery | Pinpoint Test | B

TEST STEP	RESULT ▶	ACTION TO TAKE
B9 12 VOLT BATTERY POWER FAULT ISOLATION		
• Key On, Engine Off. • Processor connected. • DVOM on 20V scale. • Measure voltage between the battery negative post and VPWR circuit at EEC power relay.	10.5V or greater ▶	SERVICE short to ground or open in VPWR circuit from EEC power relay to processor connector test Pins 37 and 57. RERUN Quick Test.
	Less than 10.5V ▶	REPLACE power relay. RERUN Quick Test.
B10 WIGGLE TEST VPWR CIRCUITS		
• Key On, Engine Off. • STAR tester or VOM hooked up to Self-Test connector. • Self-Test deactivated. • Observe STAR/VOM for fault indication as explained in Quick Test Step 6.0D. • Shake, bend and twist the EEC-IV harness from the EEC time delay power relay to the processor. • Is a fault indicated or does code 78 reappear in continuous memory if Quick Test is rerun?	Yes ▶	SERVICE intermittent VPWR circuit. RERUN Quick Test.
	No ▶	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. RERUN Quick Test.

Reference Voltage	Pinpoint Test	C

C



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

NOTE: Refer to the electrical schematic in the appropriate engine supplement section for proper connector and pin orientation.

STOP-WARNING

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.

This pinpoint test is intended to diagnose only the following:

- Processor.
- Sensor harness circuits: Signal Return, STO, STI, Ground, VPWR, KAPWR, VREF, Ignition.

Reference Voltage — Pinpoint Test C

TEST STEP	RESULT ▶	ACTION TO TAKE
C1 VEHICLE BATTERY POWER CIRCUIT CHECK • Breakout box installed. • Key On, Engine Off. • Processor connected. • DVOM on 20V scale. • Measure voltage between test Pin 37 at the Breakout box and Signal Return in Self-Test connector.	10.5V or greater ▶ Less than 10.5V ▶	GO to C2. 2.5L HSC CFI and 3.0L EFI passenger car GO to X-1. All others, GO to B1.
C2 VREF VOLTAGE CHECK • Breakout box installed. • Key On, Engine Off. • Processor connected. • DVOM on 20V scale. • Measure voltage between test Pin 26 and test Pin 46 at the Breakout box.	6.0V or greater ▶ 4.0V or less ▶ Greater than 4.0V, less than 6.0V ▶	GO to C4. GO to C5. GO to C3.
C3 CHECK VREF AND SIGNAL RETURN FOR CONTINUITY • Breakout box installed. • Disconnect 60 Pin connector. Inspect for damaged pins, corrosion, loose wires, etc. Service as necessary. • Processor disconnected. • Key Off. • DVOM on 200 ohm scale. • Measure resistance from test Pin 26 at Breakout box to VREF at vehicle harness connector of the sensor that sent you here. • Measure resistance from test Pin 46 at Breakout box to signal return at vehicle harness connector of the sensor that sent you here.	Less than 5 ohms on all readings ▶ 5 ohms or greater on any reading ▶	RECONNECT sensors. Reference voltage OK. RERUN Quick Test. SERVICE open in VREF or Signal Return. RERUN Quick Test.
C4 CHECK FOR SHORT FROM VREF TO VPWR • Key Off, wait 10 seconds. • Breakout box installed. • Disconnect processor. • Key On, Engine Off. • DVOM on 20V scale. • Measure voltage between test Pin 26 at the Breakout box and battery ground.	Less than 0.5V ▶ 0.5V or greater ▶	REPLACE processor. RERUN Quick Test. SERVICE short to battery power in EEC harness. RERUN Quick Test. If condition persists, REPLACE processor.

Reference Voltage — Pinpoint Test C

TEST STEP	RESULT ▶	ACTION TO TAKE
C5 CHECK FOR SHORTED THROTTLE POSITION SENSOR		
• Key Off, wait 10 seconds. • Breakout box installed. • Processor connected. • Disconnect Throttle Position (TP) sensor from vehicle harness. • Key On, Engine Off. • DVOM on 20V scale. • Measure voltage between test Pin 26 and test Pin 46 at the Breakout box.	Less than 4.0V ▶ 4.0V or greater ▶	Vehicles equipped with EVP sensor, GO to **C6**. All other vehicles, GO to **C7**. REPLACE TP sensor. RERUN Quick Test.
C6 CHECK FOR SHORTED EGR VALVE POSITION (EVP) SENSOR		
• Key Off, wait 10 seconds. • Breakout box installed. • Processor connected. • Disconnect EGR valve position (EVP) sensor. • Key On, Engine Off. • DVOM on 20V scale. • Measure voltage between test Pin 26 and test Pin 46 at the Breakout box.	Less than 4.0V ▶ 4.0V or greater ▶	GO to **C7**. REPLACE EVP sensor. RERUN Quick Test.
C7 CHECK FOR SHORTED MAP/BP SENSOR		
• Key Off, wait 10 seconds. • Breakout box installed. • Processor connected. • Disconnect MAP/BP sensor. • Key On, Engine Off. • DVOM on 20V scale. • Measure voltage between test Pin 26 and test Pin 46 at the Breakout box.	Less than 4.0V ▶ 4.0V or greater ▶	Vehicles equipped with VAF sensor, GO to **C8**. All other vehicles, GO to **C9**. REPLACE MAP/BP sensor. RERUN Quick Test.

Reference Voltage | Pinpoint Test | C

TEST STEP	RESULT ▶	ACTION TO TAKE
C8 CHECK FOR SHORTED VANE AIR METER (VAF) SENSOR		
• Key Off, wait 10 seconds. • Breakout box installed. • Processor connected. • Disconnect vane air meter (VAF) sensor. • Key On, Engine Off. • DVOM on 20V scale. • Measure voltage between test Pin 26 and test Pin 46 at the Breakout box.	Less than 4.0V ▶ 4.0V or greater ▶	GO to C9. REPLACE VAF sensor and RERUN Quick Test.
C9 SHORT TO GROUND IN VREF		
• Breakout box installed. • Processor disconnected. • Key Off, wait 10 seconds. • Disconnect TP and MAP/BP, EVP and VAF, if so equipped. • DVOM on 200 ohm scale. • Measure resistance between test Pin 26 and test Pins 20, 40, 46 and 60 at the Breakout box.	Less than 5 ohms ▶ 5 ohms or greater ▶	SERVICE short to ground. CONNECT all sensors. RERUN Quick Test. If original condition still exists, REPLACE processor. RECONNECT sensors. REPLACE processor. RERUN Quick Test.