| Fuel Pump Circuit — (Inertia Switch)	Pinpoint Test	J

J

TYPE I — VEHICLE APPLICATION: LINCOLN TOWN CAR, FORD CROWN VICTORIA/MERCURY GRAND MARQUIS, TEMPO/TOPAZ, ESCORT/LYNX AND EXP

★TEST PINS LOCATED ON BREAKOUT BOX.
ALL HARNESS CONNECTORS VIEWED INTO MATING SURFACE.
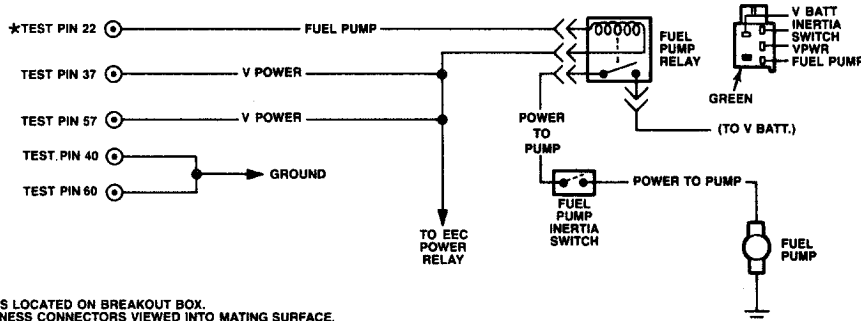
TYPE II — VEHICLE APPLICATION: MARK VII/CONTINENTAL, THUNDERBIRD/COUGAR, LTD/MARQUIS, MUSTANG/CAPRI, RANGER, E-SERIES AND F-SERIES

★ TEST PINS LOCATED ON BREAKOUT BOX.
ALL HARNESS CONNECTORS VIEWED INTO MATING SURFACE.
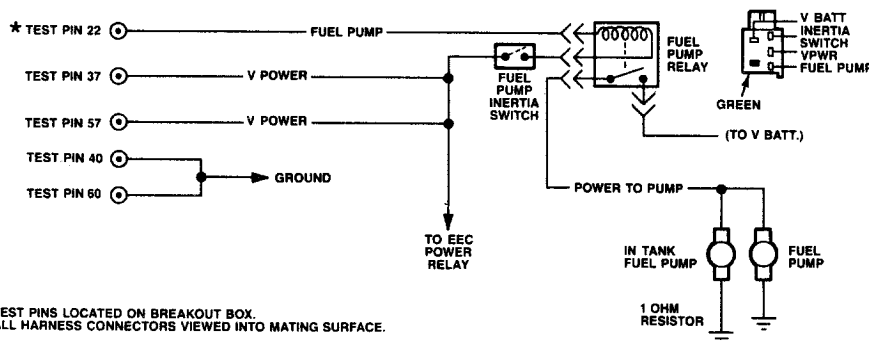
STOP-WARNING

You should enter this Pinpoint Test only when a service code 87 is received in Quick Test Step 3.0 or you are directed here from Pinpoint Test Step A22 or Diagnostics by Symptom in the Engine Supplement Section.

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

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

This Pinpoint Test is intended to diagnose only the following:

- Fuel Pump Relay
- Harness Circuits: V Batt., V Power, F.P., Ground and Power to Pump(s)
- Processor Assembly

Fuel Pump Circuit — (Inertia Switch)	Pinpoint Test	J

TEST STEP	RESULT ▶	ACTION TO TAKE
J1 NO FUEL PUMP PRESSURE ● Fuel pressure gauge installed. ● 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.	Yes ▶ No ▶	GO to Shop Manual, Group 24 electric fuel pump. GO to J2 .
J2 CHECK FOR V POWER TO PROCESSOR ● Key Off, wait 10 seconds. ● Disconnect processor 60 Pin connector and inspect for damaged pins, corrosion, loose wires. Service as necessary. ● Install Breakout box and reconnect processor. ● Key On, engine Off. ● DVOM on 20V scale. ● 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.	Either voltage reading ▶ is less than 10.5V Both voltage readings ▶ are 10.5V or greater	GO to B1 . GO to J3 .
J3 RESISTANCE CHECK OF FUEL PUMP INERTIA SWITCH ● Key Off, wait 10 seconds. ● Leave Breakout box installed and processor connected. ● Locate and disconnect fuel pump inertia switch. ● DVOM on 200 ohm scale. ● Measure the resistance of the fuel pump inertia switch.	Less than 5.0 ohms ▶ 5.0 ohms or greater ▶	GO to J4 . REPLACE or reset fuel pump inertia switch. RERUN Quick Test.
J4 POWER TO PUMP(S) CHECK ● Key On, engine Off. ● Leave Breakout box installed and processor connected. ● Locate fuel pump relay. ● DVOM on 20V scale. ● Measure voltage between chassis ground and power-to-pump(s) circuit at fuel pump relay during crank mode.	8.0V or greater during ▶ crank Less than 8.0V during ▶ crank	GO to J5 . GO to J6 .

Fuel Pump Circuit — (Inertia Switch)	Pinpoint Test	J

TEST STEP	RESULT ▶	ACTION TO TAKE
J5 POWER AT FUEL PUMP(S) CHECK ● Key On, engine Off. ● Leave Breakout box installed and processor connected. ● Locate fuel pump(s). ● DVOM on 20V scale. ● Measure voltage between chassis ground and power-to-pump(s) circuit at fuel pump during crank mode.	8.0V or greater during ▶ crank Less than 8.0V during ▶ crank	GO to Shop Manual, Group 24 electric fuel pump. SERVICE open in power to the pump(s) circuit. RERUN Quick Test.
J6 FUEL PUMP CIRCUIT CHECK TO V BATT. ● Key On, engine Off. ● Leave Breakout box installed and processor connected. ● Locate fuel pump relay. ● DVOM on 20V scale. ● Measure voltage between chassis ground and V Batt. at the fuel pump relay.	10.5V or greater ▶ Less than 10.5V ▶	GO to J7 . SERVICE open in V Batt. between fuel pump relay and vehicle battery positive post. RERUN Quick Test.
J7 V POWER TO FUEL PUMP RELAY CHECK ● Key On, engine Off. ● Leave Breakout box installed and processor connected. ● Locate fuel pump relay. ● DVOM on 20V scale. ● Measure voltage between chassis ground and V Power circuit at the fuel pump relay.	10.5V or greater ▶ Less than 10.5V ▶	GO to J8 . SERVICE open in V Power circuit between the processor and the fuel pump relay. RERUN Quick Test.
J8 FUEL PUMP CIRCUIT CHECK CONTINUITY ● Leave Breakout box installed and processor connected. ● Key Off, wait 10 seconds. ● DVOM on 200 ohm scale. ● Measure resistance between fuel pump circuit at the pump relay and test Pin 22 at the Breakout box.	Less than 5 ohms ▶ 5 ohms or greater ▶	GO to J9 . SERVICE open in fuel pump circuit and RERUN Quick Test.

Fuel Pump Circuit — (Inertia Switch)	Pinpoint Test	J

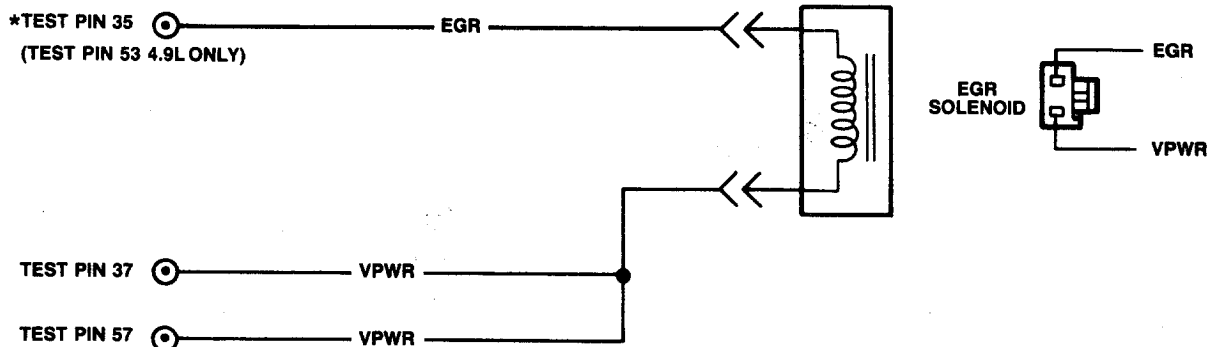| TEST STEP	RESULT ▶	ACTION TO TAKE
J9 CHECK FOR SHORT TO GROUND ● Key Off. ● Leave Breakout box installed and processor disconnected. ● Fuel pump relay disconnected. ● DVOM on 200,000 ohm scale. ● Measure resistance between test Pin 22 and test Pins 40 and 60 at the Breakout box.	10,000 ohms or greater ▶ Less than 10,000 ohms ▶	GO to J10 . SERVICE short in the fuel pump circuit. RERUN Quick Test.
J10 CHECK FOR SHORT TO POWER ● Key Off, wait 10 seconds. ● Leave Breakout box installed and disconnect processor. ● Fuel pump relay disconnected. ● DVOM on 200,000 ohm scale. ● Measure resistance between test Pin 22 and test Pins 37 and 57 at the Breakout box.	10,000 ohms or greater ▶ Less than 10,000 ohms ▶	RECONNECT fuel pump relay. GO to J11 . SERVICE short to power in the fuel pump circuit. RECONNECT processor, ATTEMPT to start vehicle. If vehicle fails to start, REPLACE processor. RERUN Quick Test.
J11 FINAL SYSTEM CHECK ● Leave Breakout box installed and processor disconnected. ● Connect jumper wire from test Pin 22 to test Pin 40 or 60 at the Breakout box. ● DVOM on 20V scale. ● Key On, engine Off. ● Measure voltage between chassis ground and power-to-pump(s) circuit at fuel pump relay.	10.5V or greater ▶ Less than 10.5V ▶	REPLACE processor. RERUN Quick Test. REPLACE fuel pump relay. RECONNECT processor and RERUN Quick Test.

Fuel Pump Circuit — (Inertia Switch)	Pinpoint Test	J

TEST STEP	RESULT ▶	ACTION TO TAKE
J15 FUEL PUMP RELAY CHECK • Key-Off. • Remove fuel pump relay. • Does fuel pump turn off?	Yes ▶ No ▶	REPLACE fuel pump relay. RERUN Quick Test. SERVICE short to power to pumps circuit.

J

EGR On/Off Control	Pinpoint Test	KA

KA

```
*TEST PIN 35  ⊙————————— EGR ——————⟨⟨
(TEST PIN 53 4.9L ONLY)
                                                              EGR
                                                    EGR       ┌─┐ ——— EGR
                                                  SOLENOID    │ │
                                                              └─┘ ——— VPWR
                                             ⟨⟨

TEST PIN 37  ⊙———————— VPWR ——————————●

TEST PIN 57  ⊙———————— VPWR ——————————
```

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

STOP-WARNING

You should enter this Pinpoint Test only when a service code 34 is received in Quick Test Step 5.0 or when directed here from Diagnostic by Symptom in the Engine Supplement Section.

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

● Air or Vacuum Leaks

● EGR Flow Restrictions

● EGR Value

NOTE: Code 34 may be the result of high volume exhaust vent system (reduces backpressure). 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

EGR On/Off Control	Pinpoint Test	KA

TEST STEP	RESULT ▶	ACTION TO TAKE
KA1 ENTER OUTPUT STATE CHECK (REFER TO APPENDIX) **NOTE: Do not use STAR tester for this step, use a VOM/DVOM.** • Key Off, wait 10 seconds. • DVOM on 20V scale. • Connect DVOM negative test lead to STO at the Self-Test connector and positive test lead to battery positive. • Jumper STI to signal return at the Self-Test connector. • Perform Key On, Engine Off Self-Test until the completion of the Continuous Test Codes. • DVOM will indicate zero volts. • Depress and release the throttle. • Did DVOM reading change to a high voltage reading?	Yes ▶ No ▶	REMAIN in Output State Check. GO to KA2 . DEPRESS throttle to WOT and release. If STO voltage does not go high, GO to Pinpoint Test Step Q40 . Leave equipment hooked up.
KA2 CHECK EGR ON/OFF CONTROL SOLENOID ELECTRICAL OPERATION • DVOM on 20V scale. • Connect DVOM positive test lead to VPWR circuit on EGR solenoid and negative test lead to EGR output circuit. • While observing DVOM, depress and release the throttle several times to cycle output On and Off. • EGR output cycles On and Off.	Yes ▶ No ▶	GO to KA3 . REMOVE jumper. GO to KA5 .
KA3 CHECK SOLENOID FOR VACUUM CYCLING • Install vacuum pump to the solenoid vacuum supply port and install a vacuum gauge to the output port. Apply 6 in. Hg minimum. • While cycling outputs On and Off (by depressing and releasing throttle) observe the vacuum gauge at the output. **NOTE: Maintain vacuum at source.**	Vacuum output cycles ▶ On and Off Vacuum output does ▶ not cycle On and Off	GO to KA4 . REPLACE solenoid. RERUN Quick Test.

EGR On/Off Control	Pinpoint Test	KA

TEST STEP	RESULT ▶	ACTION TO TAKE
KA4 CHECK MANIFOLD VACUUM LINES FOR BLOCKAGE OR LEAKS • Vacuum lines disconnected at solenoid. • Start engine. • Check for vacuum.	Vacuum present ▶ No vacuum present ▶	EEC-IV system OK. REFER to Section 6. SERVICE vacuum source blockage or leak. RERUN Quick Test.
KA5 MEASURE EGR SOLENOID RESISTANCE • Key Off, wait 10 seconds. • DVOM on 200 ohm scale. • Disconnect EGR solenoid connector and measure solenoid resistance.	Resistance is between ▶ 65 and 110 ohms Resistance is less ▶ than 65 ohms or greater than 110 ohms	CONNECT EGR solenoid. GO to KA6 . REPLACE EGR solenoid. RERUN Quick Test.
KA6 CHECK VOLTAGE OF VPWR CIRCUIT • Key On, Engine Off. • DVOM on 20V scale. • Measure voltage between VPWR circuit at the EGR solenoid vehicle harness connector and battery ground.	Voltage reading is ▶ less than 10.5V Voltage reading is ▶ 10.5V or greater	SERVICE harness open circuit. RERUN Quick Test. GO to KA7 .
KA7 CHECK CONTINUITY OF EGR CIRCUIT • Key Off, wait 10 seconds. • Disconnect processor 60 Pin connector and inspect for damaged pins, corrosion, loose wires. Service as necessary. • Connect Breakout box to harness. Leave processor disconnected. • DVOM on 200 ohm scale. • Measure resistance between test Pin 35* at the Breakout box and EGR circuit at vehicle harness connector. *Test Pin 53 for 4.9L engine, truck only.	Resistance reading is ▶ 5 ohms or greater Resistance reading is ▶ less than 5 ohms	SERVICE open circuit. RERUN Quick Test. GO to KA8 .

EGR On/Off Control	Pinpoint Test	KA

| TEST STEP	RESULT ▶	ACTION TO TAKE
KA8 CHECK FOR SHORT TO GROUND ● Key Off, wait 10 seconds. ● Leave Breakout box installed and processor disconnected. ● Disconnect EGR solenoid. ● DVOM on 200,000 ohm scale. ● Measure resistance between test Pin 35* and test Pins 40, 46 and 60 at the Breakout box. *Test Pin 53 for 4.9L engine, truck only.	Resistance reading is ▶ less than 10,000 ohms Resistance reading is ▶ 10,000 ohms or greater	SERVICE short to ground. RERUN Quick Test. GO to KA9 .
KA9 CHECK FOR SHORT TO POWER ● Key Off, wait 10 seconds. ● DVOM on 200,000 ohm scale. ● Leave Breakout box installed and processor disconnected. ● EGR solenoid disconnected. ● Measure resistance between test Pin 35* and test Pins 37 and 57 at the Breakout box. *Test Pin 53 for 4.9L engine, truck only.	Resistance reading is ▶ 10,000 ohms or greater Resistance reading is ▶ less than 10,000 ohms	REPLACE Processor. RERUN Quick Test. SERVICE short to power. RERUN Quick Test. If code is repeated, REPLACE processor.

Air Management System	Pinpoint Test	KC

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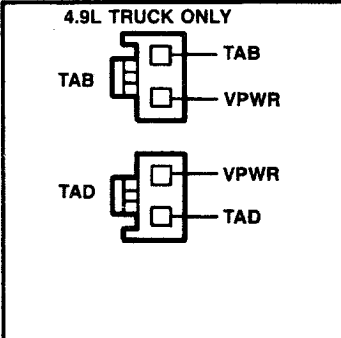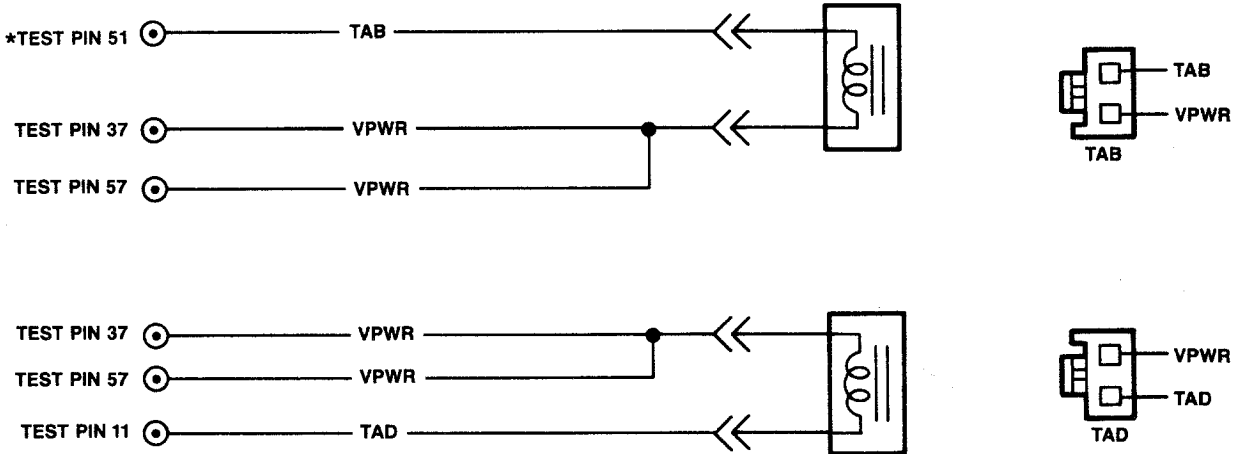
*TEST PINS LOCATED ON BREAKOUT BOX.
ALL HARNESS CONNECTORS VIEWED INTO MATING SURFACE.

4.9L TRUCK ONLY

STOP-WARNING

You should enter this Pinpoint Test only when a service code 44, 45, 46, 94, 95, 96, 81 or 82 is received in Quick Test Step 3.0 or 5.0.

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

● Thermactor System

   — Belt
   — Pump
   — Valve

This Pinpoint Test is intended to diagnose only the following:

● TAB and TAD Solenoid Valve Assemblies

● Harness Circuits: TAB, TAD and VPWR

● Vacuum Supply

● Processor Assembly

Air Management System	Pinpoint Test	KC

TEST STEP	RESULT ▶	ACTION TO TAKE
KC1 SERVICE CODES 44 (94), 45 (95) AND 46 (96): VERIFY VACUUM LINE ROUTING • Verify proper vacuum line routing to the TAB/TAD solenoids and to the bypass diverter valve. Refer to VECI decal. • Check for kinked or blocked vacuum lines. • Check for kinked or blocked air hoses. • Check for disconnected vacuum lines. • Are visual checks satisfactory?	No ▶ Yes ▶	SERVICE routing or faults. RERUN Quick Test. Service code 44 (94), GO to ▢ KC4 . Service code 45 (95), GO to ▢ KC2 . Service code 46 (96), GO to ▢ KC3 .
KC2 ATTEMPT TO ELIMINATE SERVICE CODE 45 (95) (TAD ONLY) • Disconnect vacuum line on diverter valve and cap vacuum line. • Key Off, wait 10 seconds. • Repeat Engine Running Self-Test and record service codes. • Is code 45 (95) present?	Yes ▶ No ▶	EEC-IV system OK. REFER to Section 3 for diverter valve or check valve diagnostics. GO to ▢ KC4 .
KC3 ATTEMPT TO ELIMINATE SERVICE CODE 46 (96) (TAB ONLY) • Disconnect vacuum line on bypass valve and cap vacuum line. • Key Off, wait 10 seconds. • Repeat Engine Running Self-Test and record codes. • Is code 46 (96) present?	Yes ▶ No ▶	EEC-IV system OK. REFER to Section 3 for bypass valve diagnostics. GO to ▢ KC4 .

Air Management System	Pinpoint Test	KC

TEST STEP	RESULT ▶	ACTION TO TAKE
KC4 ENTER OUTPUT STATE CHECK (REFER TO APPENDIX) **NOTE: Do not use STAR tester for this Step, use a VOM/DVOM.** ● Key Off, wait 10 seconds. ● DVOM on 20V scale. ● Connect DVOM negative test lead to STO circuit at the Self-Test connector and positive test lead to battery positive. ● Jumper STI circuit to signal return at the Self-Test connector. ● Perform Key On, Engine Off Self-Test until the completion of the Continuous Test Codes. ● DVOM will indicate zero volts when Test is complete. ● Depress and release the throttle. ● Did DVOM reading change to a high voltage reading?	Yes ▶ No ▶	REMAIN in Output State Check. GO to KC5 . DEPRESS throttle to WOT and RELEASE. If STO voltage does not go high, GO to Pinpoint Test Step Q40 . Leave equipment hooked up.
KC5 CHECK TAB/TAD SOLENOID ELECTRICAL OPERATION ● DVOM on 20V scale. ● Connect DVOM positive test lead to VPWR circuit on TAB solenoid and negative test lead to TAB circuit on TAB solenoid. ● While observing DVOM depress and release the throttle several times (to cycle output On and Off). ● Repeat for TAD solenoid. Connect positive test lead to VPWR circuit on TAD solenoid and negative test lead to TAD circuit on TAD solenoid. ● Solenoids cycle On and Off.	Both outputs cycle On and Off ▶ Either output does not cycle On and Off ▶	GO to KC6 . REMOVE jumper. GO to KC8 .
KC6 CHECK TAB/TAD SOLENOID FOR VACUUM CYCLING ● Install vacuum pump to the TAB solenoid vacuum supply port and install a vacuum gauge to the output port. ● While cycling outputs On and Off (by depressing and releasing throttle), observe the vacuum gauge at the output. **NOTE: Maintain vacuum at source.** ● Repeat for TAD solenoid. Connect vacuum pump to the TAD solenoid vacuum supply port and connect a vacuum gauge to the output port. ● Cycle output On and Off.	Both vacuum outputs cycle On and Off ▶ Either vacuum output does not cycle On and Off ▶	GO to KC7 . REPLACE solenoid assembly. RERUN Quick Test.

Air Management System	Pinpoint Test	KC

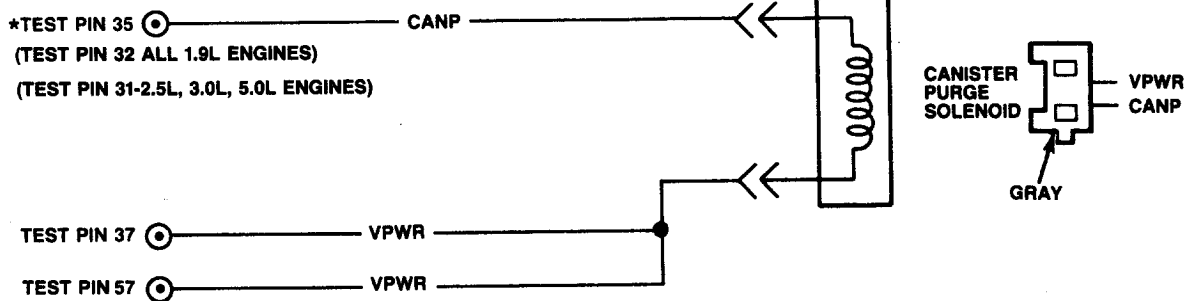| TEST STEP	RESULT ▶	ACTION TO TAKE
KC7 CHECK MANIFOLD VACUUM LINES FOR BLOCKAGE OR LEAKS • Vacuum lines disconnected at TAD/TAB solenoids. • Start engine. • Check for vacuum.	Vacuum present ▶ No vacuum present ▶	EEC-IV system OK. REFER to Section 3 for Thermactor valve and air pump diagnostics. SERVICE vacuum source blockage or leak. RERUN Quick Test.
KC8 MEASURE TAB/TAD SOLENOID RESISTANCE • Key Off, wait 10 seconds. • DVOM on 200 ohm scale. • Disconnect TAB solenoid connector and measure solenoid resistance. • Disconnect TAD solenoid connector and measure solenoid resistance.	Both resistances are ▶ between 50 and 100 ohms Either resistance is ▶ less than 50 ohms or greater than 100 ohms	CONNECT TAB/TAD solenoids. GO to KC9 . REPLACE TAB/TAD solenoid assembly. RERUN Quick Test.
KC9 CHECK VOLTAGE OF VPWR CIRCUIT • Key On, engine Off. • DVOM on 20V scale. • Measure voltage between TAB solenoid VPWR circuit and battery ground. • Repeat for TAD solenoid.	Both voltage readings ▶ are greater than 10.5V Either voltage reading ▶ is less than 10.5V	GO to KC10 . SERVICE harness circuit open. RERUN Quick Test.
KC10 CHECK CONTINUITY OF TAB AND TAD CIRCUITS • Key Off, wait 10 seconds. • Disconnect processor 60 Pin connector and inspect for damaged pins, corrosion, loose wires. Service as necessary. • Connect Breakout box to harness. Leave processor disconnected. • DVOM on 200 ohm scale. • Measure resistance between test Pin 51 at Breakout box and TAB circuit at vehicle harness connector. • Measure resistance between test Pin 11 at the Breakout box and TAD circuit at vehicle harness connector.	Both resistance ▶ readings are less than 5 ohms Either resistance ▶ reading is 5 ohms or greater	GO to KC11 . SERVICE harness open circuit. RERUN Quick Test.

Air Management System	Pinpoint Test	KC

TEST STEP	RESULT ▶	ACTION TO TAKE
KC11 CHECK FOR SHORT TO GROUND • Key Off, wait 10 seconds. • DVOM on 200,000 ohm. • Leave Breakout box installed and processor disconnected. • Disconnect TAB/TAD solenoids. • Measure resistance between test Pin 51 and test Pins 37 and 57, and between test Pin 11 and test Pins 37 and 57 at the Breakout box.	All resistance readings ▶ 10,000 ohms or greater Any resistance ▶ reading less than 10,000 ohms	GO to KC12 . SERVICE short to power. RERUN Quick Test.
KC12 CHECK FOR SHORT TO GROUND • Key Off, wait 10 seconds. • DVOM on 200,000 ohm scale. • Leave Breakout box installed and processor disconnected. • TAB/TAD solenoids disconnected. • Measure resistance between test Pins 51 and test Pins 40, 46, and 60 and between test Pin 11 and test Pins 40, 46, and 60 at the Breakout box.	All resistance readings ▶ less than 10,000 ohms Any resistance ▶ readings 10,000 ohms or greater	SERVICE short to ground. REMOVE Breakout box. RECONNECT harness to processor. RERUN Quick Test. If code is repeated, REPLACE processor. REPLACE processor. REMOVE Breakout box. RECONNECT harness to processor. RERUN Quick Test.

Canister Purge (CANP)	Pinpoint Test	KD

KD

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★TEST PIN 35 ⊙——————————— CANP ————————
(TEST PIN 32 ALL 1.9L ENGINES)
(TEST PIN 31-2.5L, 3.0L, 5.0L ENGINES)


                                                              CANISTER      VPWR
                                                              PURGE
                                                              SOLENOID      CANP


TEST PIN 37 ⊙——————————— VPWR ———————            GRAY
TEST PIN 57 ⊙——————————— VPWR ———————
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★TEST PINS LOCATED ON BREAKOUT BOX.
ALL HARNESS CONNECTORS VIEWED INTO MATING SURFACE.

STOP-WARNING

You should enter this Pinpoint Test only when a service code 85 is received in Quick Test Step 3.0 or when you are directed here from a fuel control Pinpoint Test and Diagnostics by Symptom in the Engine Supplement Section.

This Pinpoint Test is intended to diagnose only the following:

- Harness Circuits: CANP and VPWR
- Processor Assembly

Canister Purge (CANP)	Pinpoint Test	KD

TEST STEP	RESULT ▶	ACTION TO TAKE
KD1 ENTER OUTPUT STATE CHECK (REFER TO APPENDIX) **NOTE: Do not use STAR tester for this step, use VOM/DVOM.** ● Key Off, wait 10 seconds. ● DVOM on 20V scale. ● Connect DVOM negative test lead to STO circuit at Self-Test connector and positive test lead to battery positive. ● Jumper STI circuit to signal return at the Self-Test connector. ● Perform Key On, Engine Off Self-Test until the completion of the Continuous Test Codes. ● DVOM will indicate zero volts when test is completed. ● Depress and release the throttle. ● Did DVOM reading change to a high voltage reading?	Yes ▶ No ▶	REMAIN in Output State Check. GO to ⬚KD2⬚. DEPRESS throttle to WOT and release. If STO voltage does not go high, GO to Pinpoint Test Step ⬚Q40⬚. Leave equipment hooked up.
KD2 CHECK CANISTER PURGE (CANP) SOLENOID ELECTRICAL OPERATION ● DVOM on 20V scale. ● Connect DVOM positive test lead to VPWR on CANP solenoid and negative test lead to CANP output circuit on the solenoid. ● While observing DVOM depress and release the throttle several times (to cycle output On and Off). ● CANP solenoid cycles On and Off?	Yes ▶ No ▶	GO to ⬚KD3⬚. REMOVE jumper. GO to ⬚KD4⬚.
KD3 CHECK CANISTER PURGE SOLENOID FOR HOLDING VACUUM ● Key Off, wait 10 seconds. ● Remove jumper from STI to Signal Return. ● Disconnect vacuum hose at canister purge solenoid at PCV side. ● Apply 16 in. Hg to CANP solenoid. ● Does CANP solenoid hold vacuum for 20 seconds?	Yes ▶ No ▶	EEC-IV system OK. Refer to Shop Manual Group 24. REPLACE CANP solenoid. RERUN Quick Test. If code 42 is still present, GO to Section 3.

Canister Purge (CANP)	Pinpoint Test	KD

TEST STEP	RESULT ▶	ACTION TO TAKE
KD4 MEASURE CANP SOLENOID RESISTANCE • Key Off, wait 10 seconds. • DVOM on 200 ohm scale. • Disconnect CANP solenoid connector and measure solenoid resistance.	Resistance is between ▶ 40 and 90 ohms Resistance is less ▶ than 40 ohms or greater than 90 ohms	CONNECT CANP solenoid. GO to KD5. REPLACE CANP solenoid. RERUN Quick Test.
KD5 CHECK VOLTAGE OF VPWR CIRCUIT • Key On, engine Off. • DVOM on 20V scale. • Measure voltage between VPWR at the CANP solenoid vehicle harness connector and battery ground.	Voltage reading is ▶ less than 10.5V Voltage reading is ▶ 10.5V or greater	SERVICE harness open circuit. RERUN Quick Test. GO to KD6.
KD6 CHECK CONTINUITY OF CANP CIRCUIT • Key Off, wait 10 seconds. • Disconnect processor and inspect both 60 Pin connectors and inspect for damaged pins, corrosion, loose wires. Service as necessary. • Connect Breakout box to harness. Leave processor disconnected. • DVOM on 200 ohm scale. • Measure resistance between test Pin 35* at the Breakout box and CANP vehicle harness connector. *Test Pin 32 for 1.9L engine. *Test Pin 31 for 2.5L, 3.0L, 5.0L engines.	Resistance reading is ▶ 5 ohms or greater Resistance reading is ▶ less than 5 ohms	SERVICE open circuit. RERUN Quick Test. GO to KD7.

Canister Purge (CANP)	Pinpoint Test	KD

TEST STEP	RESULT ▶	ACTION TO TAKE
KD7 CHECK FOR SHORT TO GROUND • Key Off, wait 10 seconds. • Leave Breakout box to harness. Leave processor disconnected. • Disconnect CANP solenoid. • DVOM on 200,000 ohm scale. • Measure resistance between test Pin 35* and test Pins 40, 46 and 60 at the Breakout box. *Test Pin 32 for 1.9L engine. *Test Pin 31 for 2.5L, 3.0L, 5.0L engines.	All resistance readings ▶ are 10,000 ohms or greater Any resistance ▶ reading less than 10,000 ohms	GO to KD8 . SERVICE short to power. RERUN Quick Test.
KD8 CHECK FOR SHORT TO POWER • Key Off, wait 10 seconds. • DVOM on 200,000 ohm scale. • Leave Breakout box installed and processor disconnected. • CANP solenoid disconnected. • Measure resistance between test Pin 35* and test Pins 37 and 57 at the Breakout box. *Test Pin 32 for 1.9L engine. *Test Pin 31 for 2.5L, 3.0L, 5.0L engines.	All resistance readings ▶ are less than 10,000 ohms Any resistance ▶ reading is 10,000 ohms or greater	SERVICE short to ground. REPEAT Quick Test. If code is repeated, REPLACE processor. RERUN Quick Test. REMOVE Breakout box. REPLACE processor. RERUN Quick Test.

Idle Speed Control (By-Pass Air)	Pinpoint Test	KE

KE
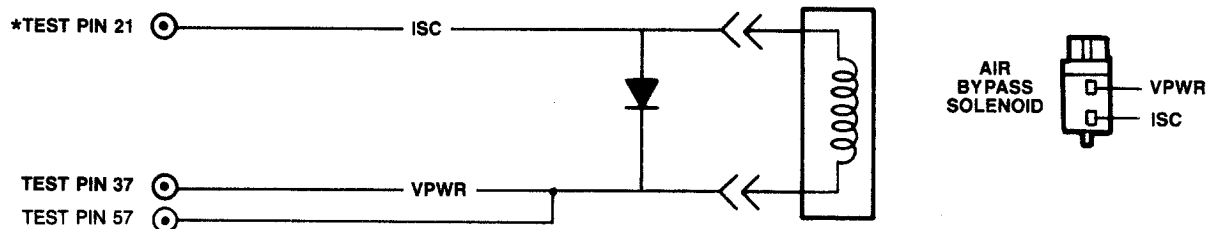
*TEST PIN 21 ⊙——————— ISC

TEST PIN 37 ⊙——————— VPWR
TEST PIN 57 ⊙

AIR BYPASS SOLENOID — VPWR / ISC

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

STOP-WARNING

You should enter this Pinpoint Test only when a service code 12 or 13 is received in Quick Test Step 5.0 or when directed here from Diagnostic by Symptom in the Engine Supplement Section.

CAUTION: If the engine exhibits rough running and/or idle, correct these conditions before diagnosing Idle Speed Control (ISC). Rough running/misses may be caused by:

- Ignition System
  Refer to Section 15

- Fuel System
  Refer to Pinpoint Test Steps HA1 through HA7
  Refer to Pinpoint Test Steps HE1 through HE7.
  Refer to Pinpoint Test Steps HG1 through HG6.
  Refer to Pinpoint Test Steps HL2 through HL7.

- EGR System, Section 6

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

This Pinpoint Test is intended to diagnose only the following:

- RPM in Self-Test only
- ISC Actuator
- Harness Circuits ISC and VPWR
- Processor Assembly

Idle Speed Control (By-Pass Air)	Pinpoint Test	KE

TEST STEP	RESULT ▶	ACTION TO TAKE
KE1 RPM DROP • Key Off. • Connect engine tachometer. • Start engine. • Disconnect ISC harness connector. • Does rpm drop or stall?	Yes ▶ No ▶	GO to KE2 . GO to KE3 .
KE2 CHECK FOR EGR CODES • Are service codes 31, 32, 33 or 34 present?	Yes ▶ No ▶	GO to Quick Test Step 5.0 for appropriate Pinpoint Test. SERVICE next code or if code 12 or 13 only, GO to KE3 .
KE3 MEASURE ISC SOLENOID RESISTANCE • Key Off. • DVOM on 200 ohm scale. • Disconnect ISC solenoid connector and measure solenoid resistance.	Resistance is between ▶ 7 and 13 ohms Resistance is less ▶ than 7 ohms or greater than 13 ohms	GO to KE4 . REPLACE ISC solenoid. RERUN Quick Test.
KE4 ISC SHORT TO CASE (GROUND) CHECK • Key Off. • DVOM on 200,000 ohm scale. • ISC solenoid disconnected. • Measure resistance from either ISC pin to ISC housing.	10,000 ohms or ▶ greater Less than 10,000 ▶ ohms	GO to KE5 . REPLACE ISC solenoid. RERUN Quick Test.
KE5 CHECK VOLTAGE OF VPWR CIRCUIT • Key On, Engine Off. • DVOM on 20V scale. • ISC solenoid disconnected. • Measure voltage between VPWR at the ISC solenoid harness connector and battery ground.	Voltage reading is ▶ less than 10.5V Voltage reading is ▶ 10.5V or greater	SERVICE harness open circuit. RERUN Quick Test. GO to KE6 .

Idle Speed Control (By-Pass Air)	Pinpoint Test	KE

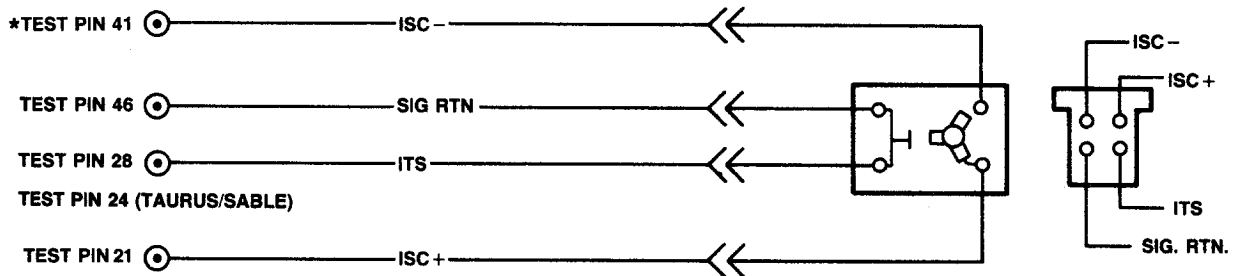| TEST STEP	RESULT ▶	ACTION TO TAKE
KE6 CHECK CONTINUITY OF ISC CIRCUIT • Key Off, wait 10 seconds. • ISC solenoid disconnected. • Disconnect processor and inspect both 60 Pin connectors for damaged pins, corrosion, loose wires. Service as necessary. • Connect Breakout box to harness. Leave processor disconnected. • DVOM on 200 ohm scale. • Measure resistance between test Pin 21 at the Breakout box and ISC circuit at vehicle harness connector.	Resistance reading is ▶ 5 ohms or greater Resistance reading is ▶ less than 5 ohms	SERVICE open circuit. RERUN Quick Test. GO to KE7.
KE7 CHECK FOR SHORT TO GROUND • Key Off, wait 10 seconds. • Leave Breakout box installed and processor disconnected. • ISC solenoid disconnected. • DVOM on 200,000 ohm scale. • Measure resistance between test Pin 21 and test Pins 40, 46 and 60 at the Breakout box.	All resistance readings ▶ are less than 10,000 ohms Any resistance ▶ reading is 10,000 ohms or greater	SERVICE short to ground. RERUN Quick Test. GO to KE8.
KE8 CHECK FOR SHORT TO POWER • Key Off, wait 10 seconds. • DVOM on 200,000 ohm scale. • ISC solenoid disconnected. • Leave Breakout box to connected harness. Leave processor disconnected. • Measure resistance between test Pin 21 and test Pin 37 at the Breakout box.	Resistance reading is ▶ 10,000 ohms or greater Resistance reading is ▶ less than 10,000 ohms	GO to KE9. SERVICE short to power. RERUN Quick Test.
KE9 CHECK FOR ISC SIGNAL AT THE PROCESSOR • Connect processor. • Connect ISC actuator. • Vehicle prepared for Quick Test. • DVOM on 20V scale. • Connect DVOM between test Pin 21 and test Pin 40. • Start engine and observe the DVOM during Engine Running Quick Test.	Meter reading varies ▶ during Quick Test Meter reading does ▶ not vary during Quick Test	REPLACE ISC actuator. RERUN Quick Test. GO to KE10.

Idle Speed Control (By-Pass Air)	Pinpoint Test	KE

TEST STEP	RESULT ▶	ACTION TO TAKE
KE10 **CODE 13:** RPM DOES NOT DROP TO LESS THAN 1500 AT END OF TEST • Disconnect ISC harness connector. • Connect engine tachometer. • Repeat Engine Running Quick Test. • At end of test, record service codes for future use. • Does rpm remain below 1500 rpm during test?	Yes ▶ No ▶	REPLACE processor. RERUN Quick Test. 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 actuator. RERUN Quick Test.
KE11 CURB IDLE CHECK • Key Off, wait 10 seconds. • Deactivate Self-Test. • Run engine at 2000 rpm for 2 minutes or until inlet radiator hose is hot and pressurized. • Key Off, wait 10 seconds. • Activate Self-Test. • Run Engine Running Self-Test. • Is code 17 still present?	No ▶ Yes ▶	SERVICE other codes as necessary. INSPECT throttle body and air inlet for contamination. SERVICE as necessary. If OK, ADJUST curb idle (REFER to Section 4 for procedure). RERUN Quick Test.

Idle Speed Control (DC Motor/Idle Tracking Switch Assembly)	Pinpoint Test	KF

KF

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*TEST PIN 41 ⊙————————ISC -————————《

TEST PIN 46 ⊙————————SIG RTN————————《

TEST PIN 28 ⊙————————ITS————————《
TEST PIN 24 (TAURUS/SABLE)

TEST PIN 21 ⊙————————ISC +————————《
```

```
                                                 ISC -
                                                 ISC +

                                                 ITS

                                                 SIG. RTN.
```

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

STOP-WARNING

You should enter this Pinpoint Test only when a Service Code 12, 13, 58 or 68 is received in Quick Test Step 3.0, 5.0 or 6.0 or when directed here from Diagnostics by Symptom in the Engine Supplement Section.

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

● Anti-Diesel Speed too High

● Basic Engine

● Vacuum Leaks
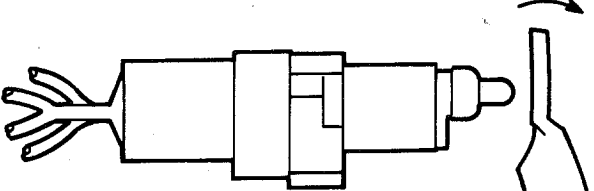
● Throttle Sticking or on High Cam

This Pinpoint Test is intended to diagnose only the following:

● DC Motor

● Idle Tracking Switch

● Harness circuits: ISC +, ISC −, Signal Return and ITS
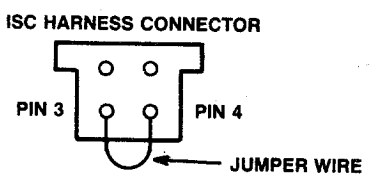
● Processor Assembly

Idle Speed Control (DC Motor/Idle Tracking Switch Assembly)

Pinpoint Test

KF

TEST STEP	RESULT ▶	ACTION TO TAKE
KF1 SERVICE CODE 68: SIMULATE NO THROTTLE CONTACT TO FORCE A CODE 11 IN KEY ON — ENGINE OFF TEST • Key Off, wait 10 seconds. • Move throttle away from ISC DC motor shaft. • Perform Key On, Engine Off Self-Test. • Is code 68 present? **NOTE: Ignore all other codes at this point.** MOVE THROTTLE AWAY FROM DC MOTOR SHAFT 	Yes ▶ No ▶	RELEASE throttle and GO to KF3. RELEASE throttle and GO to Pinpoint Test Step KF2.
KF2 RETRACT ISC DC MOTOR • Key Off, wait 10 seconds. • Leave Breakout box installed. Leave processor disconnected. • Jumper test Pin 41 to test Pin 1 at the Breakout box and test Pin 21 at the Breakout box to battery ground (to retract DC motor). • Observe DC motor. **NOTE: Do not leave jumper wire in test pins if the motor will not move; it will damage Breakout box wiring.**	Motor does not retract ▶ Motor retracts and still contacts throttle lever ▶ Motor retracts and does not contact throttle lever ▶	REMOVE jumper and GO to KF5. GO to ISC Adjustments, Section 4. REMOVE jumper and GO to KF26.

Idle Speed Control (DC Motor/Idle Tracking Switch Assembly)	Pinpoint Test	KF

TEST STEP	RESULT ▶	ACTION TO TAKE
KF3 SIMULATE A CLOSED CONTACT CONDITION IN KEY ON — ENGINE OFF TEST ● Key Off, wait 10 seconds. ● Disconnect harness from ISC. ● Connect jumper between ISC vehicle harness connector Pins 3 and 4. ● Install jumper as shown. ● Perform Key On, Engine Off Self-Test. ● Is code 68 present? ISC HARNESS CONNECTOR PIN 3 PIN 4 JUMPER WIRE **CAUTION: Do not short any other pins.**	Yes ▶ No ▶	GO to KF4. REPLACE ISC DC motor. RERUN Quick Test.
KF4 CHECK ITS AND SIGNAL RETURN CIRCUITS FOR CONTINUITY ● Key Off, wait 10 seconds. ● Disconnect processor 60 Pin connector and inspect for damaged pins, corrosion, loose wires. Service as necessary. ● Connect Breakout box to harness. Leave processor disconnected. ● DVOM on 200 ohm scale. ● Measure resistance between test Pin 46 at the Breakout box and Signal Return circuit at ISC vehicle harness connector and between test Pin 28* at the Breakout box and ITS circuit at ISC vehicle harness connector. *Test Pin 24 on Taurus/Sable vehicles.	Either resistance 5 ohms or greater ▶ Both resistances less than 5 ohms ▶	SERVICE faulty circuit. RERUN Quick Test. REPLACE processor. RERUN Quick Test.

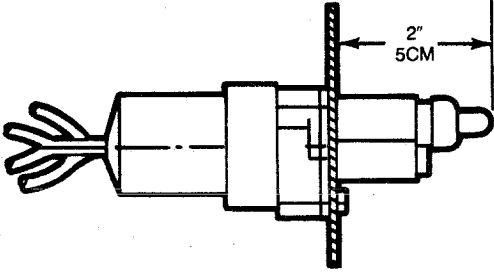| Idle Speed Control (DC Motor/Idle Tracking Switch Assembly)	Pinpoint Test	KF

TEST STEP	RESULT ▶	ACTION TO TAKE
KF5 CHECK TP AND ISC CIRCUITS FOR CONTINUITY • Key Off, wait 10 seconds. • Disconnect processor 60 Pin connector and inspect for damaged pins, corrosion, loose wires. Service as necessary. • Connect Breakout box. Leave processor disconnected. • Disconnect harness connector for ISC motor. • DVOM on 200 ohm scale. • Measure resistance between test Pin 41 at the Breakout box and ISC− circuit at vehicle harness connector and between test Pin 21 at the Breakout box and ISC+ circuit at vehicle harness connector.	Both resistance readings are less than 5 ohms ▶ Either resistance reading is 5 ohms or greater ▶	GO to KF6 . SERVICE faulty circuits. RERUN Quick Test.
KF6 CHECK ISC+ AND ISC− CIRCUITS FOR SHORTS TO POWER • Key On, Engine Off. • Leave Breakout box installed. Leave processor disconnected. • Harness disconnected from ISC motor. • DVOM on 20V scale. • Measure voltage between test Pin 41 and test Pins 40 and 60 at the Breakout box. Measure voltage between test Pin 21 and test Pins 40 and 60 at the Breakout box.	All voltage readings are less than 1V ▶ Any voltage reading is ▶ 1V or more	GO to KF7 . SERVICE circuit short to power. RERUN Quick Test. If code 12 is still present, REPLACE processor.
KF7 CHECK ISC+ AND ISC− CIRCUITS FOR SHORTS TO GROUND • Key Off, wait 10 seconds. • Leave Breakout box installed. Leave processor disconnected. • Harness disconnected from ISC motor. • DVOM on 200,000 ohm scale. • Measure resistance between test Pin 41 and test Pins 40, 46 and 60 at the Breakout box. Measure resistance between test Pin 21 and test Pins 40, 46 and 60 at the Breakout box.	All resistance readings ▶ greater than 10,000 ohms Any resistance reading is 10,000 ▶ ohms or less	GO to KF8 . SERVICE faulty circuit. RERUN Quick Test. If code 12 is still present, REPLACE processor.

Idle Speed Control (DC Motor/Idle Tracking Switch Assembly)	Pinpoint Test	KF

TEST STEP	RESULT ▶	ACTION TO TAKE
KF8 PREPARE IDLE SPEED CONTROL DC MOTOR FOR OPERATION • Key Off, wait 10 seconds. • Leave Breakout box installed. Leave processor disconnected. • Harness disconnected from ISC motor. • DVOM on 20V scale. • Connect DVOM positive test lead to test Pin 1 at the Breakout box and negative test lead to ground.	Voltage reading is 10.5V or greater ▶ Voltage reading is less than 10.5V ▶	GO to **KF9**. SERVICE open in KAPWR circuit. RERUN Quick Test. If code 12 is still present, GO to **KF9**.
KF9 ISC DC MOTOR OPERATION CHECK • Key Off, wait 10 seconds. • Leave Breakout box installed. Leave processor disconnected. • Connect ISC DC motor to harness connector. • Jumper test Pin 21 to test Pin 1 at the Breakout box and test Pin 41 at the Breakout box to ground (to extend DC motor). • Does DC motor shaft extend 5 cm (2 inches) or more? 	Yes ▶ No ▶	GO to **KF10**. REPLACE DC motor. RERUN Quick Test.
KF10 RETRACT ISC DC MOTOR • Key Off, wait 10 seconds. • Leave Breakout box installed. Leave processor disconnected. • Jumper test Pin 41 to test Pin 1 at the Breakout box and test Pin 21 at the Breakout box to ground (to retract DC motor). • Does ISC DC motor retract?	Yes ▶ No ▶	GO to **KF11**. REPLACE DC motor. RERUN Quick Test.

Idle Speed Control (DC Motor/Idle Tracking Switch Assembly)	Pinpoint Test	KF

TEST STEP	RESULT ▶	ACTION TO TAKE
KF11 EXTEND ISC DC MOTOR • Key Off, wait 10 seconds. • Leave Breakout box installed. Leave processor disconnected. • Jumper test Pin 21 to test Pin 1 at the Breakout box and test Pin 41 at the Breakout box to ground (to extend DC motor). • Does ISC DC motor extend?	No ▶ Yes ▶	REPLACE DC motor. RERUN Quick Test. REPLACE processor. RERUN Quick Test.
KF12 SERVICE CODE 58: SIMULATE THROTTLE CONTACT TO FORCE A SERVICE CODE 68 IN KEY ON — ENGINE OFF TEST • Key Off, wait 10 seconds. • Press on ISC DC motor shaft to simulate throttle contact. • With a force pushing on DC motor shaft, perform Key On, Engine Off Self-Test. **NOTE: Ignore all other codes at this point.** • Is code 68 present?	Yes ▶ No ▶	GO to Pinpoint Test Step **KF5**. GO to **KF13**.
KF13 RETRACT ISC DC MOTOR • Key Off, wait 10 seconds. • Leave Breakout box installed. Leave processor disconnected. • Jumper test Pin 41 to test Pin 1 at the Breakout box and test Pin 21 at the Breakout box to ground (to retract DC motor). • Does ISC DC motor retract?	Yes ▶ No ▶	GO to ISC Adjustments, Section 4. GO to **KF14**.
KF14 IDLE TRACKING SWITCH ALWAYS "NOT TRACKING" (CLOSED) • Key Off, wait 10 seconds. • Reconnect processor. • Disconnect vehicle harness from ISC. • Perform Key On, Engine Off Self-Test. **NOTE: Ignore all other codes at this point.** • Is code 68 present?	Yes ▶ No ▶	REPLACE DC motor. RERUN Quick Test. GO to **KF15**.

Idle Speed Control (DC Motor/Idle Tracking Switch Assembly)	Pinpoint Test	KF

TEST STEP	RESULT ▶	ACTION TO TAKE
KF15 CHECK ITS CIRCUIT FOR SHORT TO GROUND ● Key Off, wait 10 seconds. ● Disconnect processor 60 Pin connector and inspect for damaged pins, corrosion, loose wires. Service as necessary. ● Connect Breakout box. Disconnect processor. ● Harness disconnected at ISC. ● DVOM on 200,000 ohm scale. ● Measure resistance between test Pin 28* and test Pins 40, 46 and 60 at the Breakout box. *Test Pin 24 Taurus/Sable.	Any resistance less than 10,000 ohms ▶ All resistances 10,000 ohms or more ▶	SERVICE short to ground. RERUN Quick Test. REPLACE processor. RERUN Quick Test.
KF16 DC MOTOR CONTROL FAULT ISOLATION: SERVICE CODE 12 ● Are service codes 58, 68, 31 or 41 present?	Yes ▶ No ▶	GO to Quick Test Step 5.0 for appropriate Pinpoint Test. GO to KF17.
KF17 CHECK FOR THROTTLE STICKING ● Check throttle plates and linkages for binding. ● Check speed control for binding (if so equipped).	Yes ▶ No ▶	SERVICE as necessary. RERUN Quick Test. GO to KF18.
KF18 EXTEND ISC DC MOTOR ● Key Off, wait 10 seconds. ● Leave Breakout box installed. Leave processor disconnected. ● Jumper test Pin 21 to test Pin 1 at the Breakout box and test Pin 41 at the Breakout box to ground (to extend DC motor). ● Does ISC DC motor extend?	No ▶ Yes ▶	REPLACE DC motor. RERUN Quick Test. REPLACE processor. RERUN Quick Test.

Idle Speed Control (DC Motor/Idle Tracking Switch Assembly)	Pinpoint Test	KF

TEST STEP	RESULT ▶	ACTION TO TAKE
KF19 ENGINE RUNNING CODES 13 AND/OR 16 • Prepare system for normal engine operation. • Deactivate Self-Test. • Air conditioner Off. • Run engine. Alternate between 30 seconds at idle and 5 seconds at part throttle modes for 3 minutes. • Is idle speed erratic?	No ▶ Yes ▶	GO to KF20. CHECK for: • Vacuum leaks • Code 22 • Code 31 • Code 41 • Code 58 SERVICE above codes as necessary before continuing.
KF20 CHECK FOR THROTTLE STICKING OR CHOKE POSITION • Inspect throttle mechanisms (plate linkage) for sticking or binding. • Inspect choke for sticking or binding. • Inspect for throttle stuck on high cam. • Are above inspections satisfactory?	No ▶ Yes ▶	SERVICE fault. RERUN Quick Test. GO to KF21.
KF21 PERFORM KEY ON — ENGINE OFF TEST. OBSERVE ON DEMAND CODES • Perform Key On, Engine Off Test. Record On Demand codes. • Key On, Engine Off. • Is code 68 present?	Yes ▶ No ▶	GO to Pinpoint Test Step KF1. REFER to Section 4 for anti-diesel speed adjustment.
KF25 CHECK ISC+ AND ISC− CIRCUITS FOR SHORTS TO GROUND • Key Off, wait 10 seconds. • Leave Breakout box installed. Leave processor disconnected. • Harness disconnected from ISC motor. • DVOM on 200,000 ohm scale. • Measure resistance between test Pin 41 and test Pins 40, 46 and 60 at the Breakout box. Measure resistance between test Pin 21 and test Pins 40, 46 and 60 at the Breakout box.	All resistance readings ▶ greater than 10,000 ohms Any resistance ▶ reading is 10,000 ohms or less	GO to KF26. SERVICE faulty circuit. RERUN Quick Test. If code 12 is still present, REPLACE processor.

Idle Speed Control (DC Motor/Idle Tracking Switch Assembly)	**Pinpoint Test**	**KF**

TEST STEP	RESULT ▶	ACTION TO TAKE
KF26 CHECK ISC+ AND ISC− CIRCUITS FOR SHORTS TO POWER • Key On, Engine Off. • Leave Breakout box installed. Leave processor disconnected. • Harness disconnected from ISC motor. • DVOM on 20V scale. • Measure voltage between test Pin 41 and test Pins 40 and 60 at the Breakout box. Measure voltage between test Pin 21 and test Pins 40 and 60 at the Breakout box.	All voltage readings are less than 1V ▶ Any voltage reading is 1V or more ▶	GO to KF27 . SERVICE circuit short to power. RERUN Quick Test. If code 12 is still present, REPLACE processor.
KF27 EXTEND ISC DC MOTOR • Key Off, wait 10 seconds. • Leave Breakout box installed. Leave processor disconnected. • Jumper test Pin 21 to test Pin 1 at the Breakout box and test Pin 41 at the Breakout box to ground (to extend DC motor). • Does ISC DC motor extend?	No ▶ Yes ▶	REPLACE DC motor. RERUN Quick Test. REPLACE processor. RERUN Quick Test.