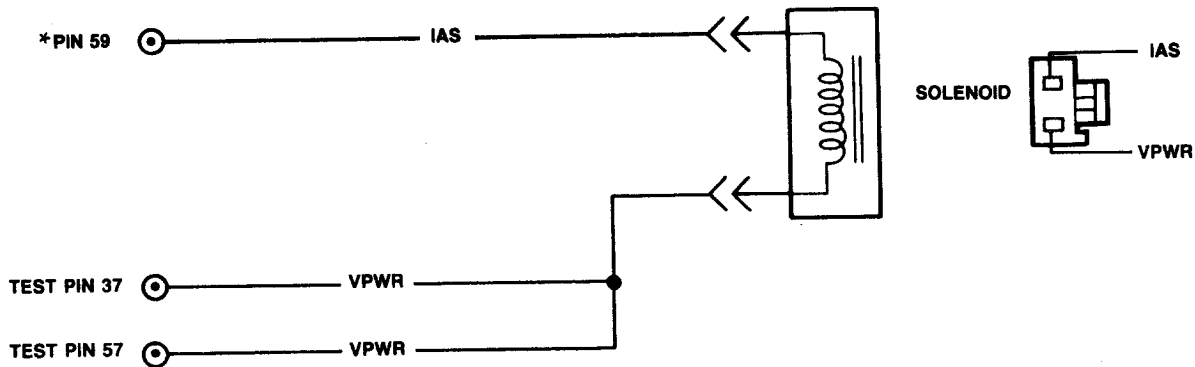


Inlet Air Solenoid (IAS)**Pinpoint
Test****KH****KH**

*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 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:

- Air or Vacuum Leaks
- Heat Riser and Stovepipe









This Pinpoint Test is intended to diagnose only the following:

- Circuits IAS and VPWR
- IAS Solenoid
- Presence of Manifold Vacuum
- Processor Assembly

Inlet Air Solenoid (IAS)**Pinpoint
Test****KH**

TEST STEP		RESULT	ACTION TO TAKE
KH1	SIMULATE SUB-ZERO AMBIENT TEMPERATURE		
<ul style="list-style-type: none"> ● Locate, then disconnect ACT sensor. ● Start vehicle. ● Does inlet air door close on air cleaner inlet air duct? 		Yes	IAS is functioning. GO to Diagnostic Routines, Section 2.
		No	GO to KH2 .
KH2	VACUUM CHECK		
<ul style="list-style-type: none"> ● Key Off. ● Disconnect both vacuum hoses from IAS. ● Connect both vacuum hoses. ● Key On, start vehicle. ● Does inlet air door close? 		Yes	RECONNECT source vacuum hose. GO to KH4 .
		No	GO to KH3 .
KH3	DUCT AND VALVE CHECK		
<ul style="list-style-type: none"> ● Key Off. ● Connect vacuum pump to inlet air valve vacuum hose. ● Apply vacuum. ● Does inlet air door close? 		Yes	VERIFY proper source vacuum.
		No	GO to inlet air duct and valve assembly, Section 8.
KH4	MEASURE IAS SOLENOID RESISTANCE		
<ul style="list-style-type: none"> ● Key Off, wait 10 seconds. ● DVOM on 200 ohm scale. ● Disconnect IAS solenoid connector. ● Measure solenoid resistance. 		Resistance is between 65 and 110 ohms	CONNECT IAS solenoid. GO to KH5 .
		Resistance is less than 65 ohms or greater than 110 ohms	REPLACE IAS solenoid. RERUN Quick Test.
KH5	CHECK VOLTAGE OF VPWR CIRCUIT		
<ul style="list-style-type: none"> ● Key On, Engine Off. ● DVOM on 20V scale. ● Measure voltage between VPWR circuit at IAS solenoid and battery ground. 		Voltage reading is less than 10.5V	SERVICE harness open circuit. RERUN Quick Test.
		Voltage reading is 10.5V or greater	GO to KH6 .

Inlet Air Solenoid (IAS)**Pinpoint
Test****KH**

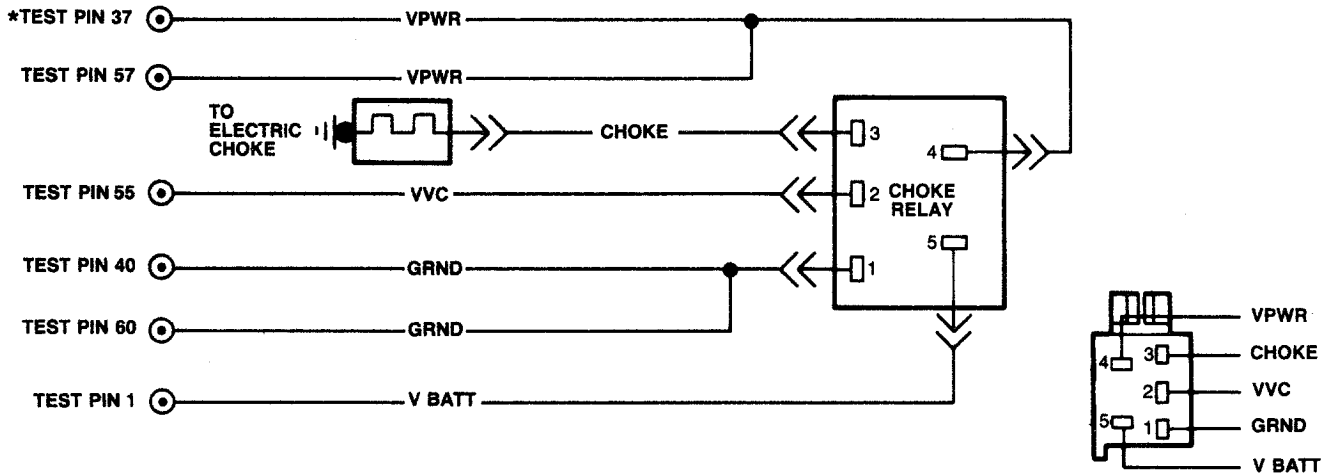
TEST STEP		RESULT	ACTION TO TAKE
KH6	CHECK CONTINUITY OF IAS CIRCUIT		
<ul style="list-style-type: none"> ● Key Off, wait 10 seconds. ● Disconnect processor 60 Pin connector and inspect for damaged pins, corrosion, loose wires. Service as necessary. ● Connect Breakout box to harness. Leave processor disconnected. ● DVOM on 200 ohm scale. ● Measure resistance between test Pin 59 at the Breakout box and IAS 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 KH7 .
KH7	CHECK FOR SHORT TO GROUND		
<ul style="list-style-type: none"> ● Key Off, wait 10 seconds. ● Leave Breakout box installed and processor disconnected. ● Disconnect IAS solenoid. ● DVOM on 200,000 ohm scale. ● Measure resistance between test Pin 59 and test Pins 40, 46 and 60 at the Breakout box. 		Any resistance reading is less than 10,000 ohms  All resistance readings are 10,000 ohms or greater 	SERVICE short to ground. RERUN Quick Test. GO to KH8 .
KH8	CHECK FOR SHORT TO POWER		
<ul style="list-style-type: none"> ● Key Off, wait 10 seconds. ● DVOM on 200,000 ohm scale. ● IAS solenoid disconnected. ● Leave Breakout box installed and processor disconnected. ● Measure resistance between test Pin 59 and test Pins 37 and 57 at the Breakout box. 		All resistance readings are 10,000 ohms or greater  Any resistance reading is less than 10,000 ohms 	GO to KH9 . SERVICE short to power. RERUN Quick Test.
KH9	PROCESSOR CHECK		
<ul style="list-style-type: none"> ● Key Off. ● Leave Breakout box installed and processor disconnected. ● Connect a jumper between test Pin 59 and test Pin 40 at the Breakout box. ● Key On, start vehicle. ● Does inlet air door close? 		Yes  No 	REPLACE processor. REPLACE IAS.

Variable Voltage Choke (VVC)

Pinpoint Test

KJ

KJ



*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 88 is received in Quick Test Step 3.0 or when directed here from Diagnostics by Symptom in the Engine Supplement Section.

This Pinpoint Test is intended to diagnose only the following:

- Harness circuits: VPWR, Choke, VVC, Grnd., and V Batt.
- Choke Relay

Variable Voltage Choke (VVC)

Pinpoint Test

KJ

TEST STEP		RESULT	ACTION TO TAKE
KJ1	ENTER OUTPUT STATE CHECK (REFER TO APPENDIX)		
<p>NOTE: Do not use STAR tester for this step, use VOM/DVOM.</p> <ul style="list-style-type: none"> ● 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 when test is complete. ● Depress and release the throttle. ● Did DVOM reading change to a high voltage reading? 		<p>Yes</p> <p>No</p>	<p>REMAIN in Output State Check. GO to KJ2.</p> <p>DEPRESS throttle to WOT and RELEASE. If STO voltage does not go high, GO to Pinpoint Test Step Q40.</p>
KJ2	CHECK VVC OUTPUT ELECTRICAL OPERATION		
<ul style="list-style-type: none"> ● Key On, Engine Off. ● DVOM on 20V scale. ● Connect DVOM positive test lead to choke circuit on choke cap and negative test lead to battery ground. ● While observing DVOM depress and release the throttle several times to cycle output On and Off. ● Choke output cycles On and Off? 		<p>Yes</p> <p>No</p>	<p>GO to Section 4.</p> <p>REMOVE jumper. GO to KJ3.</p>
KJ3	CHECK CONTINUITY OF GROUND CIRCUIT		
<ul style="list-style-type: none"> ● Key Off, wait 10 seconds. ● DVOM on 200 ohm scale. ● Measure resistance between battery negative terminal and Pin 1 at the VVC relay vehicle harness connector. 		<p>Resistance reading is 5 ohms or greater</p> <p>Resistance reading is less than 5 ohms</p>	<p>SERVICE harness circuit. RERUN Quick Test.</p> <p>GO to KJ4.</p>

Variable Voltage Choke (VVC)

Pinpoint Test

KJ

TEST STEP		RESULT	ACTION TO TAKE
KJ4	CONTINUITY OF CHOKE RELAY		
<ul style="list-style-type: none"> ● Key Off, wait 10 seconds. ● Disconnect VVC relay. ● DVOM on 200 ohm scale. ● Measure resistance between Pin 3 of the VVC relay connector and the choke connector at the choke cap. ● Is the reading greater than 5 ohms? 		Yes No	SERVICE open in choke circuit. GO to KJ5 .
KJ5	CHECK FOR VOLTAGE ON V BATT AND VPWR CIRCUITS		
<ul style="list-style-type: none"> ● Key On, Engine Off. ● DVOM on 20V scale. ● VVC relay disconnected. ● Measure voltage between Pin 1 and Pin 5 and between Pin 1 and between Pin 4 of VVC relay vehicle harness connector. 		Voltage is less than 10.5V Voltage is 10.5V or greater	SERVICE open in choke power circuit. RERUN Quick Test. REPLACE choke relay.
KJ6	CHOKE RELAY RESISTANCE		
<ul style="list-style-type: none"> ● Key Off. ● DVOM on 200,000 ohm scale. ● Disconnect VVC relay. ● Measure resistance at the VVC relay between Pin 2 and Pin 4. ● Is resistance reading 1,800 ohms ± 200 ohms? 		Yes No	GO to KJ7 . REPLACE choke relay.
KJ7	VPWR TO CHOKE RELAY		
<ul style="list-style-type: none"> ● Key Off. ● DVOM on 20V scale. ● VVC relay disconnected. ● Key On, engine Off. ● Measure voltage between Pin 4 at the VVC relay connector and engine block ground. ● Is voltage greater than 10V? 		Yes No	GO to KJ8 . SERVICE VPWR circuit and RERUN Quick Test.

Variable Voltage Choke (VVC)

Pinpoint Test

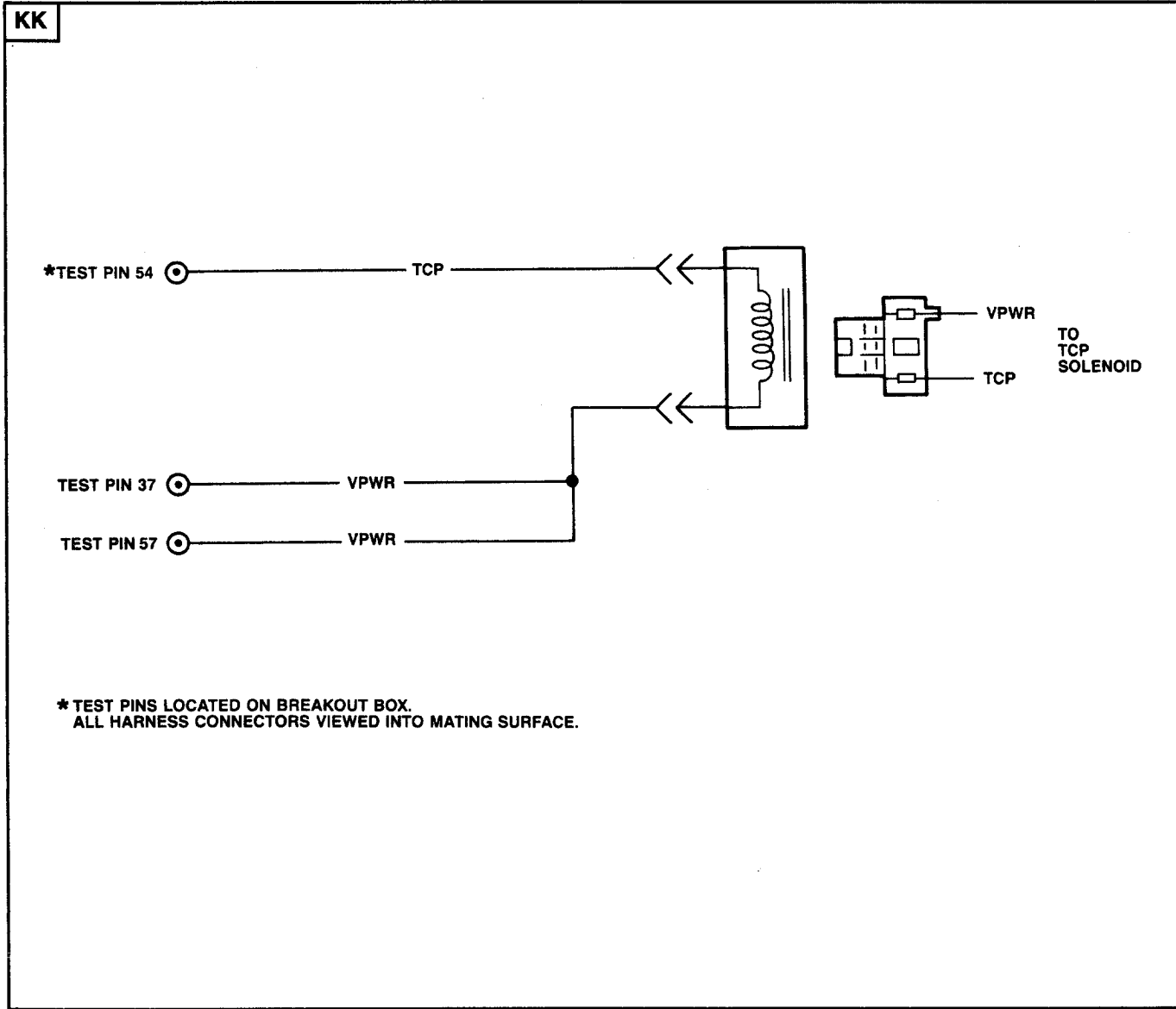
KJ

TEST STEP		RESULT	ACTION TO TAKE
KJ8	CHECK CONTINUITY OF VVC CIRCUIT		
<ul style="list-style-type: none"> ● 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. ● VVC relay disconnected. ● DVOM on 200 ohm scale. ● Measure resistance between test Pin 55 at the Breakout box and VVC circuit at the relay vehicle harness connector. 		Resistance is 5 ohms or greater	SERVICE harness circuit. RERUN Quick Test.
		Resistance is less than 5 ohms	GO to KJ9 .
KJ9	CHECK FOR SHORT TO GROUND ON VVC CIRCUIT		
<ul style="list-style-type: none"> ● Key Off, wait 10 seconds. ● DVOM on 200,000 ohm scale. ● VVC relay disconnected. ● Leave Breakout box installed and processor disconnected. ● Measure resistance between Pin 55 to test Pins 40, 46 and 60 at the Breakout box. 		All resistance readings are 10,000 ohms or greater	GO to KJ10 .
		Any resistance readings less than 10,000 ohms	SERVICE harness short(s). RERUN Quick Test.
KJ10	CHECK FOR SHORT TO POWER		
<ul style="list-style-type: none"> ● Key Off, wait 10 seconds. ● VVC relay disconnected. ● DVOM on 200,000 ohm scale. ● Leave Breakout box installed and processor disconnected. ● Measure resistance between test Pin 55 and test Pins 1, 37 and 57 at the Breakout box. 		All resistance readings are 10,000 ohms or greater	REPLACE processor. RERUN Quick Test.
		Any resistance reading is less than 10,000 ohms	SERVICE short to power. RERUN Quick Test. If code is repeated, REPLACE processor.

Temperature Compensated Pump (TCP)

Pinpoint Test

KK



STOP-WARNING

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

This Pinpoint Test is intended to diagnose only the following:

- Harness circuits: TCP and VPWR
- TCP Solenoid
- Processor Assembly

Temperature Compensated Pump (TCP)

Pinpoint Test

KK

TEST STEP		RESULT	ACTION TO TAKE
KK1	ENTER OUTPUT STATE CHECK (REFER TO APPENDIX)		
<p>NOTE: Do not use STAR tester for this Step, use VOM/DVOM.</p> <ul style="list-style-type: none"> ● 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 when test is complete. ● Depress and release the throttle. ● Did DVOM reading change to a high voltage reading? 		<p>Yes</p> <p>No</p>	<p>REMAIN in Output State Check. GO to KK2.</p> <p>DEPRESS throttle to WOT and release. If STO voltage does not go high, GO to Pinpoint Test Step Q40.</p> <p>Leave equipment hooked up.</p>
KK2	CHECK TCP SOLENOID ELECTRICAL OPERATION		
<ul style="list-style-type: none"> ● DVOM on 20V scale. ● Connect DVOM positive test lead to VPWR circuit on TCP solenoid and negative test lead to TCP circuit at the solenoid. ● While observing DVOM depress and release the throttle several times to cycle output On and Off. ● Does TCP output cycle On and Off? 		<p>Yes</p> <p>No</p>	<p>GO to KK3.</p> <p>REMOVE jumper to STI. GO to KK5.</p>
KK3	CHECK TCP SOLENOID FOR VACUUM CYCLING		
<ul style="list-style-type: none"> ● Install vacuum pump to the TCP 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. <p>NOTE: Maintain vacuum at source.</p>		<p>Vacuum output cycles On and Off</p> <p>Vacuum output does not cycle On and Off</p>	<p>GO to KK4.</p> <p>REPLACE solenoid. RERUN Quick Test.</p>

Temperature Compensated Pump (TCP)

Pinpoint Test

KK

TEST STEP		RESULT	ACTION TO TAKE
KK4	CHECK MANIFOLD VACUUM LINES FOR BLOCKAGE OR LEAKS		
<ul style="list-style-type: none"> • With vacuum lines disconnected at TCP solenoid, check for vacuum. • Start engine. • Check for vacuum. 		Vacuum present	EEC-IV system OK. REFER to Section 11 for TCP diagnostics.
		No vacuum present	SERVICE vacuum source blockage or leak. RERUN Quick Test.
KK5	MEASURE TCP SOLENOID RESISTANCE		
<ul style="list-style-type: none"> • Key Off, wait 10 seconds. • DVOM on 200 ohm scale. • Disconnect TCP solenoid connector and measure solenoid resistance. 		Resistance is between 50-100 ohms	CONNECT TCP solenoid. GO to KK6 .
		Resistance is less than 50 ohms or greater than 100 ohms	REPLACE TCP solenoid. RERUN Quick Test.
KK6	CHECK VOLTAGE OF VPWR CIRCUIT		
<ul style="list-style-type: none"> • Key On, Engine Off. • DVOM on 20V scale. • Measure voltage between VPWR circuit at the TCP solenoid vehicle harness connector and battery ground. 		Voltage reading is 10.5V or less	SERVICE harness open circuit. RERUN Quick Test.
		Voltage reading is 10.5V or greater	GO to KK7 .
KK7	CHECK CONTINUITY OF TCP CIRCUIT		
<ul style="list-style-type: none"> • Key Off, wait 10 seconds. • Disconnect processor and inspect both 60 Pin connectors. • Connect Breakout box to harness, leave processor disconnected. • DVOM on 200 ohm scale. • Measure resistance between test Pin 54 at the Breakout box and TCP circuit at TCP solenoid vehicle harness connector. 		Resistance reading is 5 ohms or greater	SERVICE harness open circuit. RERUN Quick Test.
		Resistance reading is less than 5 ohms	GO to KK8 .

Temperature Compensated Pump (TCP)

Pinpoint Test

KK

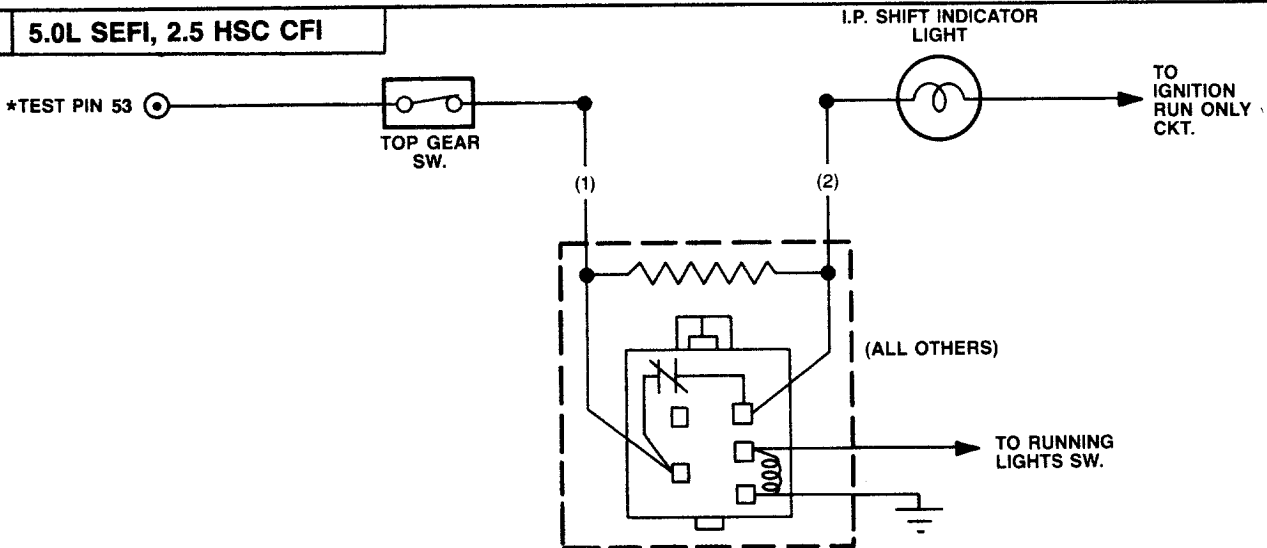
TEST STEP		RESULT	ACTION TO TAKE
KK8	CHECK FOR SHORT TO GROUND		
<ul style="list-style-type: none"> ● Key Off, wait 10 seconds. ● Leave Breakout box installed and processor disconnected. ● Disconnect TCP solenoid. ● DVOM on 200,000 ohm scale. ● Measure resistance between test Pin 54 and test Pin 40, 46 and 60 at the Breakout box. 		<p>Any resistance reading is less than 10,000 ohms</p> <p>All resistance readings are 10,000 ohms or greater</p>	<p>SERVICE short to ground. RERUN Quick Test.</p> <p>GO to KK9.</p>
KK9	CHECK FOR SHORT TO POWER		
<ul style="list-style-type: none"> ● Key Off, wait 10 seconds. ● DVOM on 200,000 ohm scale. ● Leave Breakout box installed and processor disconnected. ● TCP solenoid disconnected. ● Measure resistance between test Pin 54 and test Pins 37 and 57 at the Breakout box. 		<p>All resistance readings are 10,000 ohms or greater</p> <p>Any resistance reading is less than 10,000 ohms</p>	<p>REPLACE processor. RERUN Quick Test.</p> <p>SERVICE short to power. RERUN Quick Test. If code is repeated, REPLACE processor.</p>

Shift Indicator Light (SIL)

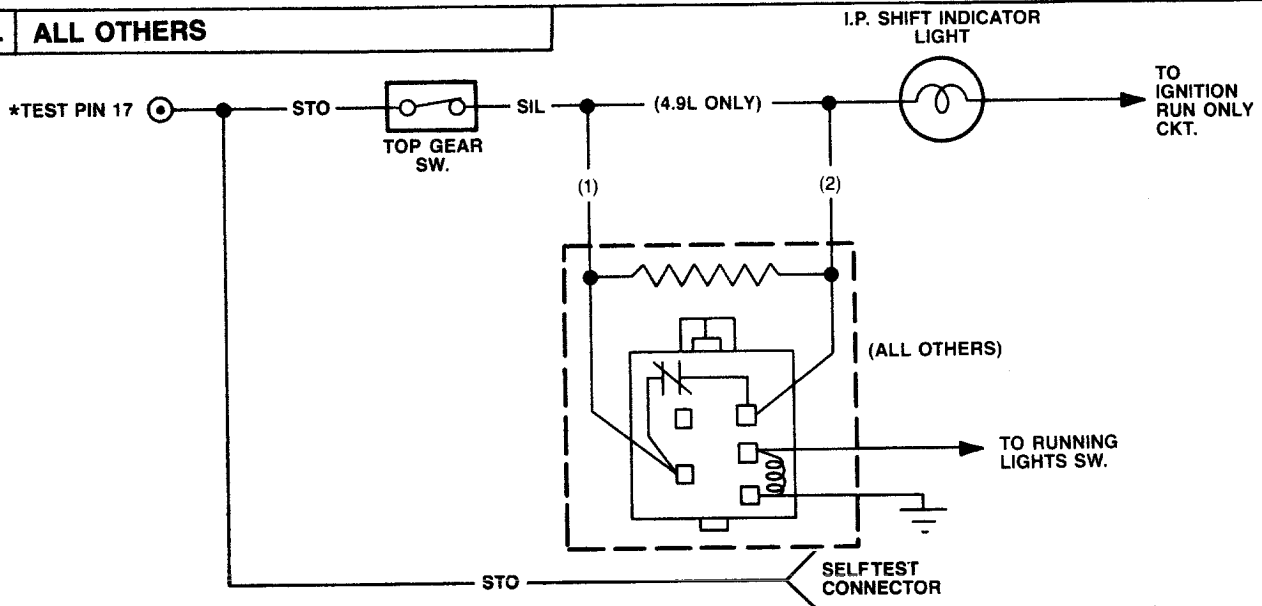
Pinpoint Test

KL

KL 5.0L SEFI, 2.5 HSC CFI



KL ALL OTHERS



*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 Diagnostics by Symptom in the Engine Supplement Section or from Pinpoint Test Step Q6.

This Pinpoint Test is intended to diagnose only the following:

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

Shift Indicator Light (SIL)

Pinpoint Test

KL

TEST STEP		RESULT	ACTION TO TAKE
KL1	ENTER OUTPUT STATE CHECK IN NEUTRAL (REFER TO APPENDIX)		
<p>NOTE: Do not use STAR tester for this Step, use VOM/DVOM.</p> <ul style="list-style-type: none"> ● Key Off, wait 10 seconds. ● Transmission in neutral. ● 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 when test is complete. ● Depress and release the throttle. ● Did DVOM reading change to a high voltage reading? 		<p>Yes</p> <p>No</p>	<p>REMAIN in output state check, Go to KL2.</p> <p>DEPRESS throttle to WOT and release. If STO voltage does not go high, GO to Pinpoint Test Step KL7.</p> <p>Leave equipment hooked up.</p>
KL2	CHECK FOR ELECTRICAL CYCLING AT DIMMER RELAY INPUT		
<ul style="list-style-type: none"> ● If 4.9L truck go to step KL5. ● DVOM on 20V scale. ● Connect DVOM positive test lead to battery positive terminal and negative test lead to Pin 1 on dimmer relay. ● While observing DVOM, depress and release the throttle several times to cycle Pin 1 On and Off. ● Does Pin 1 cycle On and Off? 		<p>Yes</p> <p>No</p>	<p>GO to KL3.</p> <p>GO to KL5.</p>
KL3	CHECK FOR ELECTRICAL CYCLING AT DIMMER RELAY OUTPUT		
<ul style="list-style-type: none"> ● DVOM on 20V scale. ● Connect DVOM positive test lead to battery positive terminal and negative test lead to Pin 2 on dimmer relay. ● While observing DVOM, depress and release the throttle several times to cycle Pin 2 On and Off. ● Does Pin 2 cycle On and Off? 		<p>Yes</p> <p>No</p>	<p>REMOVE jumper, GO to KL4.</p> <p>REMOVE jumper. REPLACE dimmer relay.</p>

Shift Indicator Light (SIL)

Pinpoint Test

KL

TEST STEP		RESULT	ACTION TO TAKE
KL4	CHECK CONTINUITY BETWEEN DIMMER RELAY OUTPUT AND SIL BULB		
<ul style="list-style-type: none"> ● Key Off, wait 10 seconds. ● DVOM on 200 ohm scale. ● Measure resistance between Pin 2 of dimmer relay connector and SIL bulb. 		Resistance reading is 5 ohms or greater	SERVICE harness open circuit. RERUN Quick Test.
		Resistance reading is less than 5 ohms	REPLACE SIL bulb.
KL5	CHECK FOR ELECTRICAL CYCLING AT SIL SIDE OF TOP GEAR SWITCH		
<ul style="list-style-type: none"> ● DVOM on 20V scale. ● Connect DVOM positive test lead to battery positive terminal and negative test lead to SIL circuit of top gear switch. ● While observing DVOM, depress and release the throttle several times to cycle SIL circuit On and Off. ● Does SIL circuit cycle On and Off? 		Yes	SERVICE harness open circuit. RERUN Quick Test. 4.9L only, change SIL bulb.
		No	GO to KL6 .
KL6	CHECK FOR ELECTRICAL CYCLING AT STO SIDE OF TOP GEAR SWITCH		
<ul style="list-style-type: none"> ● DVOM on 20V scale. ● Connect DVOM positive test lead to battery positive terminal and negative test lead to STO circuit of top gear switch. ● While observing DVOM, depress and release the throttle several times to cycle STO circuit On and Off. ● Does STO circuit cycle On and Off? 		Yes	CHANGE top gear switch.
		No	SERVICE harness open circuit. RERUN Quick Test.

Shift Indicator Light (SIL)

Pinpoint Test

KL

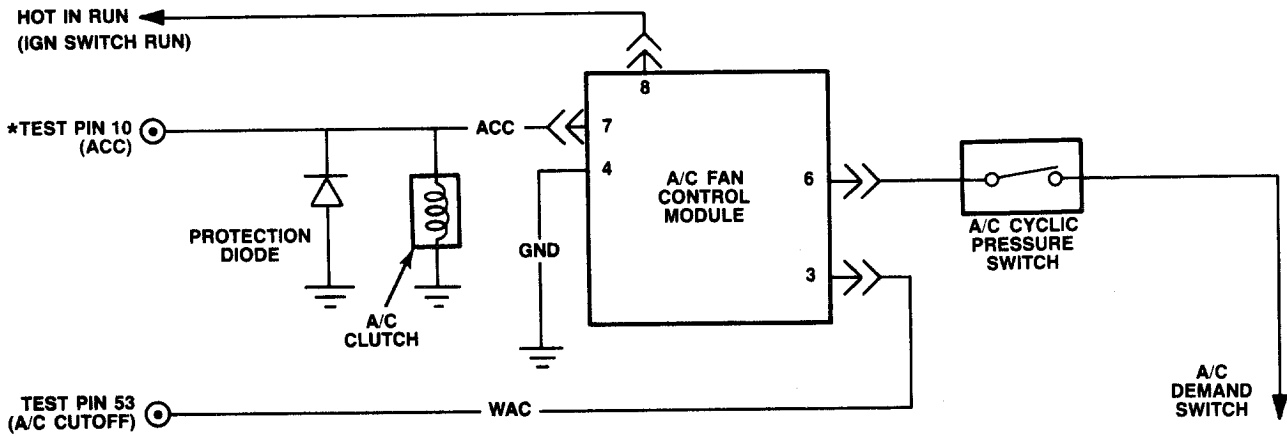
TEST STEP		RESULT	ACTION TO TAKE
KL7	ENTER OUTPUT STATE CHECK IN TOP GEAR (REFER TO APPENDIX)		
<p>NOTE: Do not use STAR tester for this Step, use VOM/DVOM.</p> <ul style="list-style-type: none"> ● Key Off, wait 10 seconds. ● Transmission in top gear. ● DVOM on 20V scale. ● Connect DVOM negative test 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 when test is complete. ● Depress and release the throttle. ● Did DVOM reading change to a high voltage reading? 		Yes	CHECK SIL bulb and fuse 15. If OK, SERVICE short to ground in SIL circuit.
		No	GO to Pinpoint Test Step Q40 .

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

Pinpoint Test

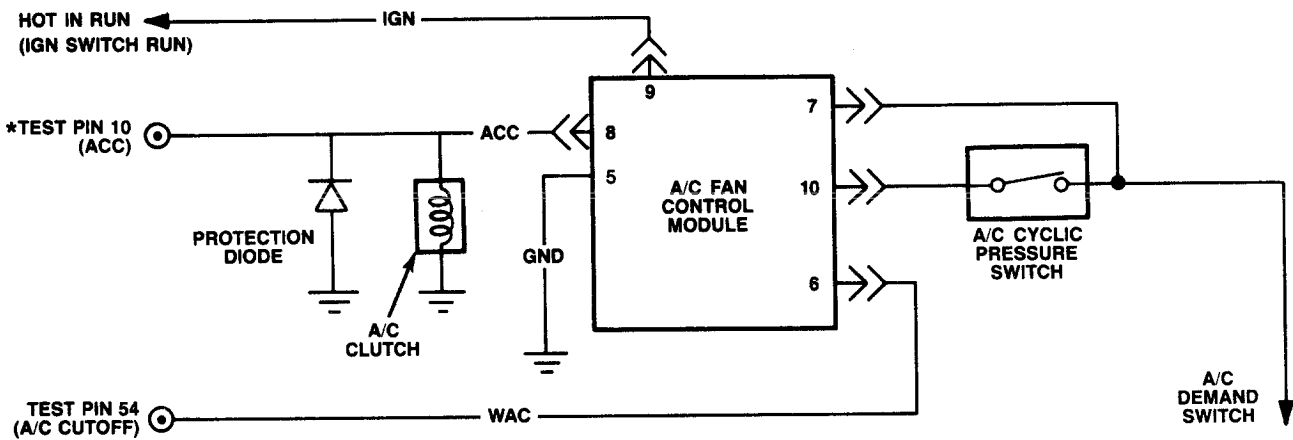
KM

KM 2.3L OHC, 2.3L EFI TC, 2.3L CFI ENGINES



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

KM 1.9L EFI ENGINE



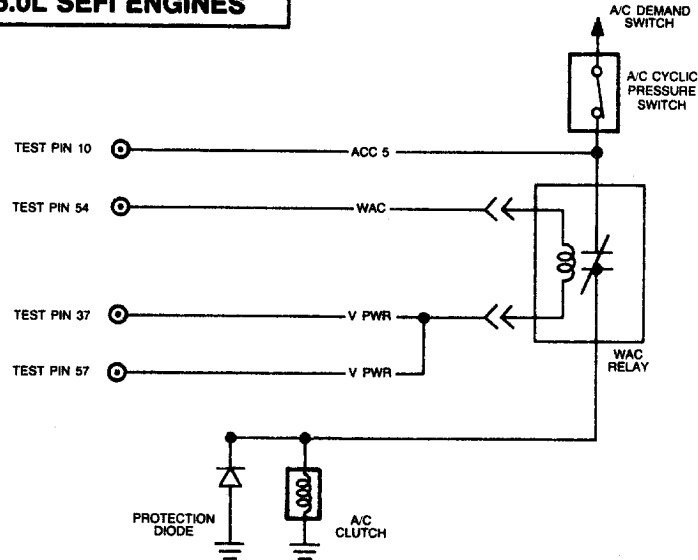
*TEST PINS LOCATED ON BREAKOUT BOX.
ALL HARNESS CONNECTORS VIEWED INTO MATING SURFACE.

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

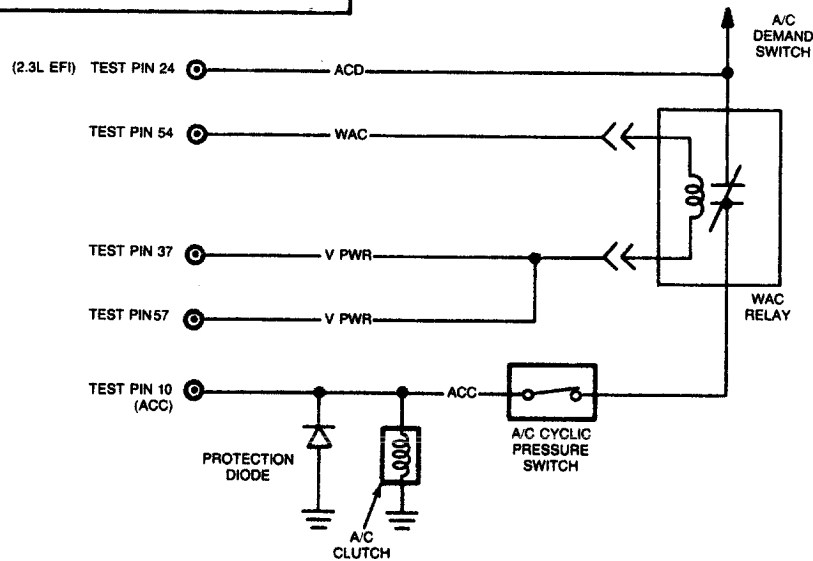
**Pinpoint
Test**

KM

KM 3.0L EFI TRUCK AND 5.0L SEFI ENGINES



KM 2.3L, 2.9L EFI TRUCK AND 3.8L CFI ENGINES



STOP-WARNING

You should enter this Pinpoint Test only when a Service Code 86 is received in Quick Test Step 3.0 or when directed here from Diagnostics by Symptom in the Engine Supplement Section.

This Pinpoint Test is intended to diagnose only the following:

- Harness Circuits: WAC and V PWR
- WOT A/C Cut-Off Relay
- Processor Assembly
- A/C Demand Switch

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

TEST STEP	RESULT	ACTION TO TAKE
KM1 ENTER OUTPUT STATE CHECK (REFER TO APPENDIX)		
<p>NOTE: Do not use STAR tester for this Step, use VOM/DVOM.</p> <ul style="list-style-type: none"> ● 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 when test complete. ● Depress and release the throttle. ● Did DVOM reading change to a high voltage reading? 	<p>Yes</p> <p>No</p>	<p>REMAIN in Output State Check. GO to KM2.</p> <p>DEPRESS throttle to WOT and RELEASE. If STO voltage does not go high, GO to Pinpoint Test Step Q40.</p> <p>Leave equipment hooked up.</p>
KM2 CHECK A/C CLUTCH ELECTRICAL OPERATION		
<ul style="list-style-type: none"> ● Key On, engine Off. ● Disconnect processor 60 Pin connector and inspect for damaged pins, corrosion, loose wires. Service as necessary. ● Connect Breakout box to harness. Reconnect processor. ● A/C switch to A/C. ● DVOM on 20V scale. ● Connect DVOM positive test lead to test Pin 37 and negative test lead to test Pin 54 at the Breakout box. ● While observing DVOM, depress and release the throttle several times (to cycle output On and Off). ● Does A/C clutch output cycle On and Off? 	<p>Yes</p> <p>No</p>	<p>EEC-IV system OK. Refer to Shop Manual, Group 36.</p> <p>REMOVE jumper. GO to KM3.</p>
KM3 FAN CONTROL MODULE OR WAC RELAY		
<ul style="list-style-type: none"> ● A/C fan/control module applications 2.3L EFI, TC CFI, 1.9L EFI, 2.3L OHC, 2.3L engines. ● All other systems with WAC relay. 	<p>A/C fan control</p> <p>WAC relay</p>	<p>GO to KM4.</p> <p>GO to KM10.</p>

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

Pinpoint Test

KM

TEST STEP		RESULT	ACTION TO TAKE
KM4	CHECK CONTINUITY OF GROUND CIRCUIT TO FAN CONTROL MODULE		
	<ul style="list-style-type: none"> ● Key Off, wait 10 seconds. ● DVOM on 200 ohm scale. ● Measure resistance of ground circuit between fan control module connector and battery ground. 	Resistance reading is 5 ohms or greater	SERVICE harness circuit. RERUN Quick Test.
		Resistance reading is less than 5 ohms	GO to KM5 .
KM5	CHECK FOR IGN. CIRCUIT VOLTAGE		
	<ul style="list-style-type: none"> ● Key On, engine Off. ● DVOM on 20V scale. ● Measure voltage between ignition circuit and ground circuit on the fan control module connector. 	Voltage is less than 10.5V	SERVICE open in ign. circuit. RERUN Quick Test.
		Voltage is 10.5V or greater	GO to KM6 .
KM6	CHECK CONTINUITY OF WAC CIRCUIT		
	<ul style="list-style-type: none"> ● 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 54 (test Pin 53 for 2.3L OHC engine) at the Breakout box and WAC circuit at fan control module connector. 	Resistance is 5 ohms or greater	SERVICE harness WAC circuit. RERUN Quick Test.
		Resistance is less than 5 ohms	GO to KM7 .
KM7	CHECK FOR SHORT TO GROUND ON WAC CIRCUIT		
	<ul style="list-style-type: none"> ● Key Off, wait 10 seconds. ● Leave Breakout box installed and processor disconnected. ● DVOM on 200,000 ohm scale. ● Measure resistance between test Pin 54 (test Pin 53 for 2.3L OHC engine) and test Pins 40, 46 and 60 at the Breakout box. 	Resistance reading is less than 10,000 ohms	GO to KM8 .
		Resistance reading is 10,000 ohms or greater	REPLACE processor. RERUN Quick Test.

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

Pinpoint Test

KM

TEST STEP		RESULT	ACTION TO TAKE
KM8	CHECK FOR SHORT TO GROUND WITH FAN CONTROL MODULE DISCONNECTED		
<ul style="list-style-type: none"> ● Key Off, wait 10 seconds. ● Leave Breakout box installed and processor disconnected. ● DVOM on 200,000 ohm scale. ● Disconnect fan control module. ● Measure resistance between test Pin 54 (test Pin 53 for 2.3L OHC engine) and test Pins 40, 46 and 60 at the Breakout box. 		<p>All resistance readings 10,000 ohms or greater</p> <p>Any resistance reading is less than 10,000 ohms</p>	<p>REPLACE fan control module. RERUN Quick Test.</p> <p>SERVICE harness short. RERUN Quick Test.</p>
KM10	MEASURE WAC RELAY RESISTANCE		
<ul style="list-style-type: none"> ● Key Off, wait 10 seconds. ● DVOM on 200 ohm scale. ● Disconnect WAC relay connector and measure relay resistance. 		<p>Resistance is between 50 and 70 ohms</p> <p>Resistance is less than 50 ohms or greater than 70 ohms</p>	<p>CONNECT WAC solenoid. GO to KM11.</p> <p>REPLACE WAC relay. RERUN Quick Test.</p>
KM11	CHECK VOLTAGE OF V PWR CIRCUIT		
<ul style="list-style-type: none"> ● Key On, Engine Off. ● DVOM on 20V scale. ● Connect DVOM positive test lead to V PWR circuit and negative test lead to ground. ● Measure voltage on WAC relay V PWR circuit. 		<p>Voltage reading is less than 10.5V</p> <p>Voltage reading is 10.5V or greater</p>	<p>SERVICE harness open circuit. RERUN Quick Test.</p> <p>GO to KM12.</p>
KM12	CHECK CONTINUITY OF WAC CIRCUIT		
<ul style="list-style-type: none"> ● 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 54 at the Breakout box and WAC circuit at harness connector. 		<p>Resistance readings are 5 ohms or greater</p> <p>Resistance reading is less than 5 ohms</p>	<p>SERVICE harness open circuit. RERUN Quick Test.</p> <p>GO to KM13.</p>

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

Pinpoint Test

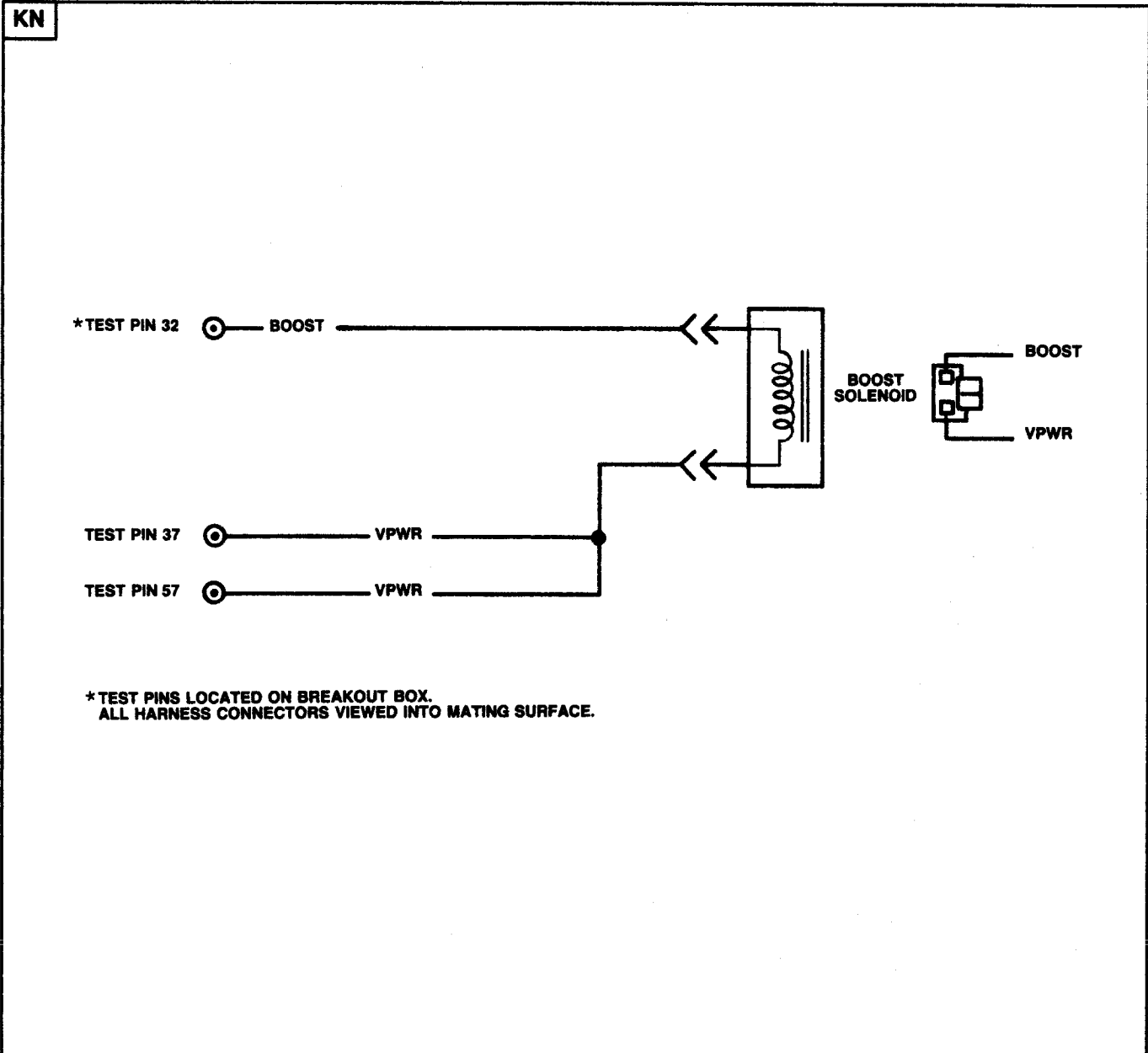
KM

TEST STEP		RESULT	ACTION TO TAKE
KM13	CHECK FOR SHORT TO GROUND		
<ul style="list-style-type: none"> ● Key Off, wait 10 seconds. ● Leave Breakout box installed and processor disconnected. ● DVOM on 200,000 ohm scale. ● Measure resistance between test Pin 54 and test Pins 40, 46 and 60 at Breakout box. 		Any resistance reading is less than 10,000 ohms All resistance readings are 10,000 ohms or greater	SERVICE short to ground. RERUN Quick Test. GO to KM14 .
KM14	CHECK FOR SHORT TO POWER		
<ul style="list-style-type: none"> ● Key Off, wait 10 seconds. ● DVOM on 200,000 ohm scale. ● Leave Breakout box installed and processor disconnected. ● WAC solenoid disconnected. ● Measure resistance between test Pin 54 and test Pins 37 and 57 at Breakout box. 		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.
KM20	CYCLE A/C DEMAND SWITCH		
<ul style="list-style-type: none"> ● 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 20V scale. ● Measure voltage between test Pin 10 (and Pin 24 for 2.3L EFI truck) and test Pin 40 at the Breakout box. ● Does output cycle 4.0-10.5V when A/C switch is cycled? 		Yes No	REPLACE processor. RERUN Quick Test. GO to KM21 .
KM21	CHECK CONTINUITY OF ACC/ACD CIRCUIT		
<ul style="list-style-type: none"> ● Key Off, wait 10 seconds. ● DVOM on 200 ohm scale. ● Measure resistance between ACC test Pin 10 at the Breakout box and A/C clutch. For 2.3L EFI truck, also measure resistance between ACD test Pin 24 at the Breakout box and A/C demand switch. 		Resistance reading is 5 ohms or greater Resistance reading is less than 5 ohms	SERVICE harness circuit. RERUN Quick Test. EEC-IV system OK. REFER to Shop Manual, Group 36.

Turbo Boost

Pinpoint Test

KN



STOP-WARNING

You should enter this Pinpoint Test only when directed here from Diagnostics by Symptom in the Engine Supplement Section.

This Pinpoint Test is intended to diagnose only the following:

- Harness circuits: VPWR, Boost

Turbo Boost

Pinpoint Test

KN

TEST STEP		RESULT	ACTION TO TAKE
KN1	ENTER OUPUT STATE CHECK (REFER TO APPENDIX)		
<p>NOTE: Do not use STAR tester for this Step, use VOM/DVOM.</p> <ul style="list-style-type: none"> ● 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 when test is complete. ● Depress and release the throttle. ● Did DVOM reading change to a high vottage reading? 		Yes	REMAIN in Output State Check. GO to KN2 .
		No	DEPRESS throttle to WOT and release. If STO voltage does not go high, GO to Pinpoint Test Step Q40 . Leave equipment hooked up.
KN2	CHECK BOOST OUTPUT ELECTRICAL OPERATION		
<ul style="list-style-type: none"> ● Key On, Engine Off. ● DVOM on 20V scale. ● Connect DVOM positive test lead to circuit VPWR on boost solenoid connector and negative test lead to boost output on boost solenoid connector. ● While observing DVOM, depress and release the throttle several times to cycle output On and Off. ● Does boost output solenoid cycle On and Off? 		Yes	GO to KN3 .
		No	REMOVE jumper. GO to KN4 .

<h1>Turbo Boost</h1>	<h1>Pinpoint Test</h1>	<h1>KN</h1>
----------------------	------------------------	-------------

TEST STEP	RESULT	ACTION TO TAKE
KN3 CHECK BOOST SOLENOID FUNCTION <ul style="list-style-type: none"> ● Remain in output state check. ● Disconnect black solenoid vacuum hose at the turbocharger end. (Not the black and yellow stripe hose.) ● Attach a vacuum pump to the hose. ● Depress the throttle once to cycle the solenoid closed. ● Apply vacuum to the solenoid. ● Depress the throttle once again to cycle the solenoid open and release trapped vacuum. ● Did the solenoid hold and then release vacuum? 	Yes No	EEC-IV system OK. REFER to Shop Manual for boost diagnostics. REPLACE solenoid. RERUN Quick Test.
KN4 MEASURE BOOST SOLENOID RESISTANCE <ul style="list-style-type: none"> ● Key Off, wait 10 seconds. ● DVOM on 200 ohm scale. ● Disconnect boost solenoid connector and measure the solenoid resistance. 	Resistance is between 65 and 110 ohms Resistance is less than 65 ohms or greater than 110 ohms	CONNECT BOOST solenoid. GO to KN5 . REPLACE BOOST solenoid. RERUN Quick Test.
KN5 CHECK VOLTAGE OF VPWR CIRCUIT <ul style="list-style-type: none"> ● Key On, Engine Off. ● DVOM on 20V scale. ● Measure voltage between VPWR circuit of boost 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 KN6 .
KN6 CHECK CONTINUITY OF BOOST CIRCUIT <ul style="list-style-type: none"> ● 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 32 at the Breakout box and boost 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 KN7 .

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

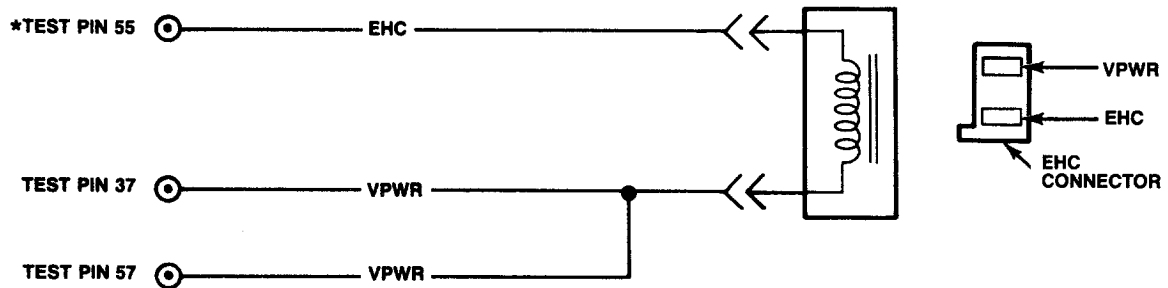
TEST STEP		RESULT	ACTION TO TAKE
KN7	CHECK FOR SHORT TO GROUND		
<ul style="list-style-type: none"> ● Key Off, wait 10 seconds. ● Leave Breakout box installed and processor disconnected. ● Disconnect boost solenoid. ● DVOM on 200,000 ohm scale. ● Measure resistance between test Pin 32 and test Pins 40, 46 and 60 at the Breakout box. 		<p>All readings 10,000 ohms or greater</p> <p>Any reading less than 10,000 ohms</p>	<p>Go to KN8.</p> <p>SERVICE short to ground, RERUN Quick Test.</p>
KN8	CHECK FOR SHORT TO POWER		
<ul style="list-style-type: none"> ● Key Off, wait 10 seconds. ● DVOM on 200,000 ohm scale. ● Leave Breakout box installed and processor disconnected. ● Boost solenoid disconnected. ● Measure resistance between Pin 32 and test Pins 37 and 57 at the Breakout box. 		<p>Any resistance reading less than 10,000 ohms</p> <p>All resistance readings are 10,000 ohms or greater</p>	<p>SERVICE short to power. RERUN Quick Test. If symptom is still present, REPLACE processor.</p> <p>REPLACE processor. RERUN Quick Test.</p>

Exhaust Heat Control (EHC)

Pinpoint Test

KP

KP



*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 89 is received in Quick Test Step 3.0 or when directed here from Diagnostics by Symptom in the Engine Supplement Section.

This Pinpoint Test is intended to diagnose only the following:

- Exhaust Heat Solenoid
- Vacuum Routing

Exhaust Heat Control (EHC)

Pinpoint Test

KP

TEST STEP		RESULT	ACTION TO TAKE
KP1	ENTER OUTPUT STATE CHECK (REFER TO APPENDIX)		
<p>NOTE: Do not use STAR tester for this Step, use VOM/DVOM.</p> <ul style="list-style-type: none"> ● 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 when test is complete. ● Depress and release the throttle. ● Did DVOM reading change to a high voltage reading? 		<p>Yes</p> <p>No</p>	<p>REMAIN in Output State Check. GO to KP2.</p> <p>DEPRESS throttle to WOT and release. If STO voltage does not go high, GO to Pinpoint Test Step Q40.</p> <p>Leave equipment hooked up.</p>
KP2	CHECK EHC SOLENOID ELECTRICAL OPERATION		
<ul style="list-style-type: none"> ● DVOM on 20V scale. ● Measure voltage between VPWR and EHC circuit at EHC solenoid. ● While observing DVOM, depress throttle several times to cycle output on and off. ● Does EHC output cycle on and off? 		<p>Yes</p> <p>No</p>	<p>GO to KP3.</p> <p>GO to KP5.</p>
KP3	CHECK EXHAUST HEAT SOLENOID FOR VACUUM CYCLING		
<ul style="list-style-type: none"> ● Install vacuum pump to the exhaust heat 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. <p>NOTE: Maintain vacuum at source.</p>		<p>Vacuum output cycles on and off</p> <p>Vacuum output does not cycle on and off</p>	<p>GO to KP4.</p> <p>REPLACE solenoid. RERUN Quick Test.</p>

Exhaust Heat Control (EHC)

Pinpoint Test

KP

TEST STEP		RESULT	ACTION TO TAKE
KP4	CHECK MANIFOLD VACUUM LINES FOR BLOCKAGE OR LEAKS		
<ul style="list-style-type: none"> • With vacuum lines disconnected at exhaust heat solenoid, check for vacuum. • Start engine. • Check for vacuum. 		Vacuum present	EEC-IV system OK. REFER to Section 3 for exhaust heat diagnostics.
		No vacuum present	SERVICE vacuum source blockage or leak. RERUN Quick Test.
KP5	MEASURE EHC SOLENOID RESISTANCE		
<ul style="list-style-type: none"> • Key Off, wait 10 seconds. • DVOM on 200 ohm scale. • Disconnect exhaust heat solenoid connector and measure solenoid resistance. 		Resistance is between 50 and 100 ohms	CONNECT exhaust heat solenoid. Go to KP6 .
		Resistance is less than 50 ohms or greater than 100 ohms	REPLACE exhaust heat solenoid. RERUN Quick Test.
KP6	CHECK VOLTAGE OF VPWR CIRCUIT		
<ul style="list-style-type: none"> • Key On, Engine Off. • DVOM on 20V scale. • Measure voltage between VPWR at the EHC solenoid vehicle harness connector circuit and ground. 		Voltage reading is less than 10.5V	SERVICE harness open circuit. RERUN Quick Test.
		Voltage reading is 10.5V or greater	GO to KP7 .
KP7	CHECK CONTINUITY OF EHC CIRCUIT		
<ul style="list-style-type: none"> • 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 55 at the Breakout box and EHC circuit at vehicle harness connector. 		Resistance readings are 5 ohms or greater	SERVICE harness open circuit. RERUN Quick Test.
		Resistance reading is less than 5 ohms	GO to KP8 .

Exhaust Heat Control (EHC)

Pinpoint Test

KP

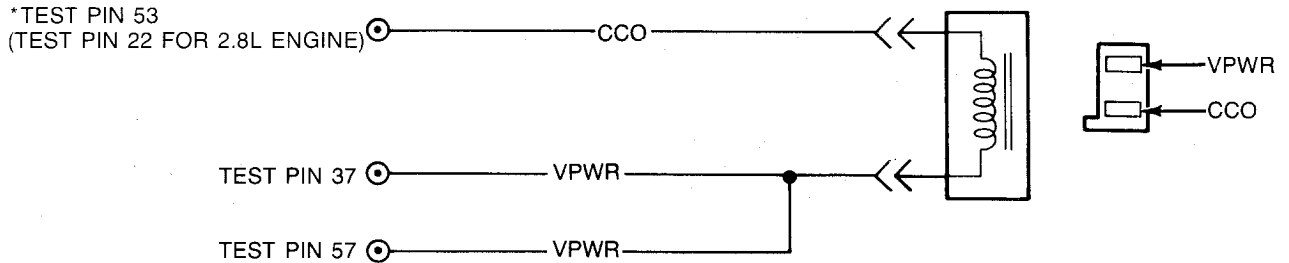
TEST STEP		RESULT	ACTION TO TAKE
KP8	CHECK FOR SHORT TO GROUND		
<ul style="list-style-type: none"> ● Key off, wait 10 seconds. ● Leave Breakout box installed and processor disconnected. ● Disconnect EHC solenoid. ● DVOM on 200,000 ohm scale. ● Measure resistance between test Pin 55 and test Pins 40, 46 and 60 at Breakout box. 		Resistance readings are less than 10,000 ohms	SERVICE short to ground. RERUN Quick Test.
		All resistance readings are 10,000 ohms or greater	GO to KP9 .
KP9	CHECK FOR SHORT TO POWER		
<ul style="list-style-type: none"> ● Key Off, wait 10 seconds. ● DVOM on 200,000 ohm scale. ● Leave Breakout box installed and processor disconnected. ● EHC solenoid disconnected. ● Measure resistance between test Pin 55 and test Pins 37 and 57 at Breakout box. 		Resistance reading is 10,000 ohms or greater	REPLACE processor. RERUN Quick Test.
		Resistance reading is less than 10,000 ohms	SERVICE short to power. RERUN Quick Test. If code is repeated, REPLACE processor.

Converter Clutch Override (CCO)

Pinpoint Test

KR

KR



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

A9688-B

STOP-WARNING

You should enter this Pinpoint Test only when a service code 89 is received in Quick Test Step 3.0.

This Pinpoint Test is intended to diagnose only the following:

- Harness Circuits: CCO and V PWR.
- CCO Solenoid.
- Processor Assembly.

TEST STEP	RESULT	ACTION TO TAKE
CODE 89 PRESENT		
KR1 MEASURE CCO SOLENOID RESISTANCE		
<ul style="list-style-type: none"> • Key Off, wait 10 seconds. • DVOM on 200 ohm scale. • Disconnect CCO solenoid connector and measure solenoid resistance. 	Resistance is between 26 and 40 ohms	CONNECT CCO solenoid. GO to KR2 .
	Resistance is less than 26 ohms or greater than 40 ohms	REPLACE CCO solenoid. RERUN Quick Test.

Converter Clutch Override (CCO)

Pinpoint Test

KR

TEST STEP		RESULT	ACTION TO TAKE
KR2	CHECK VOLTAGE OF VPWR CIRCUIT		
<ul style="list-style-type: none"> ● Key On, Engine Off. ● DVOM on 20V scale. ● Measure voltage at the CCO solenoid connector between VPWR circuit and battery ground. 		Voltage reading is less than 10.5V	SERVICE harness open circuit. RERUN Quick Test.
		Voltage reading is 10.5V or greater	GO to KR3 .
KR3	CHECK CONTINUITY OF CCO CIRCUIT		
<ul style="list-style-type: none"> ● 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 53 (test Pin 22 for 2.8L) at the Breakout box and CCO circuit at the solenoid vehicle harness connector. 		Resistance readings are 5 ohms or greater	SERVICE harness open circuit. RERUN Quick Test.
		Resistance reading is less than 5 ohms	GO to KR4 .
KR4	CHECK FOR SHORT TO GROUND		
<ul style="list-style-type: none"> ● Key Off, wait 10 seconds. ● Leave Breakout box installed and processor disconnected. ● Disconnect CCO solenoid. ● DVOM on 200,000 ohm scale. ● Measure resistance between test Pin 55 and test Pins 40, 46 and 60 at Breakout box. 		Any resistance readings less than 10,000 ohms	SERVICE short to ground. RERUN Quick Test.
		All resistance readings are 10,000 ohms or greater	GO to KR5 .
KR5	CHECK FOR SHORT TO POWER		
<ul style="list-style-type: none"> ● Key Off, wait 10 seconds. ● DVOM on 200,000 ohm scale. ● Leave Breakout box installed and processor disconnected. ● CCO solenoid disconnected. ● Measure resistance between test Pin 55 and test Pins 37 and 57 at Breakout box. 		All resistance readings are 10,000 ohms or greater	REPLACE processor. RERUN Quick Test.
		Any resistance reading is less than 10,000 ohms	SERVICE short to power. RERUN Quick Test. If code is still present, REPLACE processor.