SECTION 16

EEC and 4EAT—Pinpoint Tests—All Vehicles

Contents

Pinpoint Test Index

Pinpoint Tests Instructions

- **DO NOT** perform any of the following Pinpoint Tests unless instructed by Quick Test.
- Each Pinpoint Test **ASSUMES:** you are diagnosing causes for a specific symptom described in Diagnostic Routines and that every cause with a higher probability, (as outlined in Section 2), has been checked and verified to be operating properly.
- **Service Codes** retrieved in Quick Test Steps 6 or 7, implies that a hard fault is present and the associated Pinpoint Test should be performed to isolate the cause. If more than one service code is received, always start service with the first code received.
- **Probable** components listed in Diagnostic Routines should be diagnosed only when Quick Test Steps 1-11 have resulted in a Pass Code. With the knowledge of the symptom, a close observation can be made of each specified component, by performing the associated Pinpoint Test.
- Performing a complete **visual inspection** will often lead to the source of a problem without performing any Test Step. For example, when directed to a Pinpoint Test, look carefully at the electrical schematic and special notes. Check each component and the related wiring to the control module, for any evidence of damage. Loose connections, corrosion, overheating and physical damage are often the cause of failure.
- **Do not** replace any parts unless the test result indicates they should be replaced.
- **Do not** measure voltage or resistance at the control module or connect any test lamps to it, unless otherwise specified.
- **Do** disconnect solenoids and switches from the harness before measuring for continuity, resistance or energizing with a power source.
- **Do** start with the first Pinpoint Test Step and follow the appropriate result in order, until the cause of a fault is found.
- **Do** erase codes and perform Quick Test to insure any repairs made are effective.
- **An Open** is defined as any resistance reading greater than 10,000 ohms, unless otherwise specified.

Pinpoint Tests Instructions

- **A Short** is defined as any resistance reading less than 5 ohms, 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**	**V**	**Violet**
LG	**Light Green**	**Y**	**Yellow**

Where two colors are shown for a wire, the first color is the basic color of the wire. The second color is the stripe marking.

For example:

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

- For connector location refer to the vehicle's EVTM Manual.
- Use the following Breakout Box and 4EAT Tester and adapters.

ROTUNDA NO.	DESCRIPTION	ENGINE
007-00033	Breakout Box	All
007-00037	4EAT Tester	1.6L 4EAT
0095A	4EAT Adapter	1.6L 4EAT
007-00038	Breakout Box Adapter	1.6L Turbo 1.6L

Air Conditioning Control Switch	All Engines	ACCS

Note

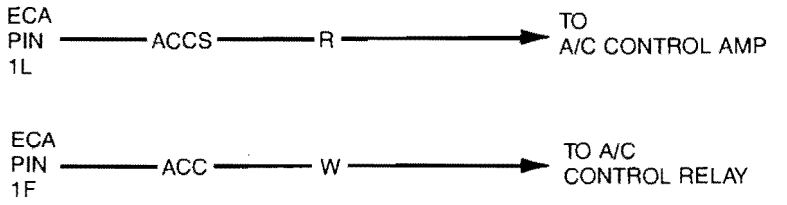
You should enter this Pinpoint Test only when directed by Quick Test Step QT10 or when directed here by QT12 .

Remember

This Pinpoint Test and wiring diagram are intended to diagnose only the following:

- Circuits: ACCS (Air Conditioning Control Switch)
  ACC (Air Conditioning Control Relay)

Pinpoint Test Schematic



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Air Conditioning Control Switch

All Engines

ACCS

TEST STEP	RESULT ▶	ACTION TO TAKE
ACC1 ACCS INPUT VOLTAGE • Connect breakout box (leave ECA connected). • Key on, engine running. • Blower on. • Measure the voltage between test pins ACCS and GND. • Compare voltage readings with table: A/C switch OFF — Greater Than 10V A/C switch ON — Less than 3V • **Are the voltage readings OK?**	Yes ▶ No ▶	GO to **ACC2**. SERVICE ACC input. REFER to the Shop Manual.
ACC2 A/C RELAY SIGNAL • Key on, engine off. • A/C switch off. • Measure the voltage between the A/C Relay test pin and GND. • **Is the voltage greater than 10V?**	Yes ▶ No ▶	GO to **ACC3**. SERVICE A/C Relay circuit. Refer to the Shop Manual.
ACC3 A/C CONTROL • Engine running. • A/C switch on. • Blower switch on. • Measure voltage between the A/C relay test pin and GND when the compressor is engaged. • **Is the voltage less than 3V?**	Yes ▶ No ▶	ACC system is OK. If A/C does not operate, refer to the Shop Manual. REPLACE ECA.

Barometric Pressure Sensor	All Engines	BP

Note

You should enter this Pinpoint Test only when a Service Code 14 is received in Quick Test Steps QT6 or QT7, or when Quick Test Step QT12 directs you here.

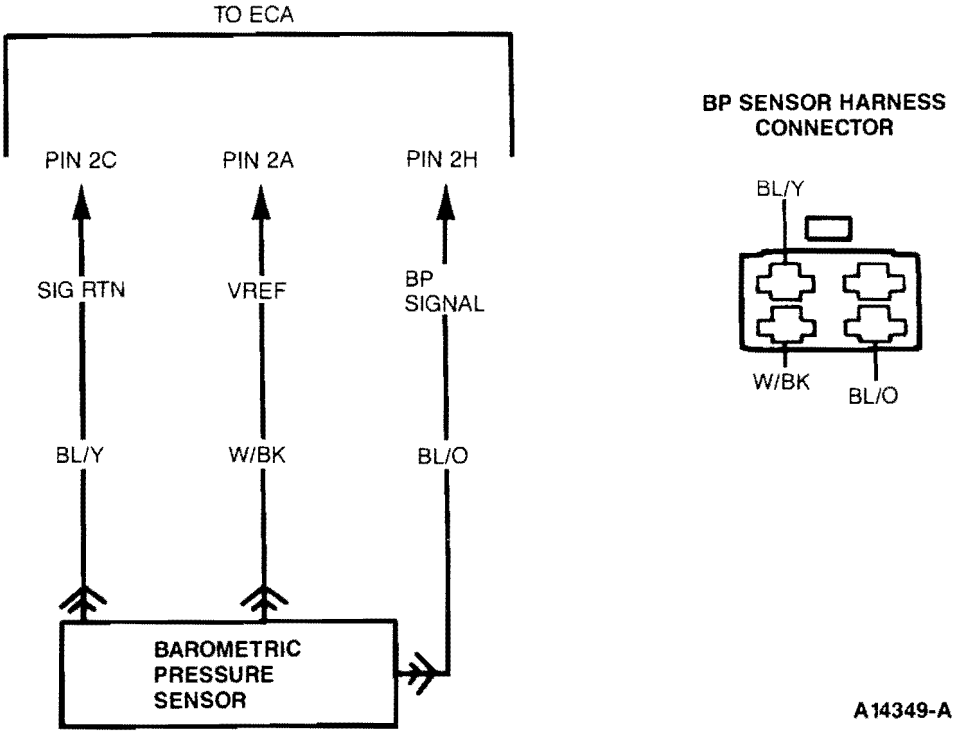
Remember

This Pinpoint Test and wiring diagram are intended to diagnose only the following:

- Circuit: (BP)

Pinpoint Test Schematic

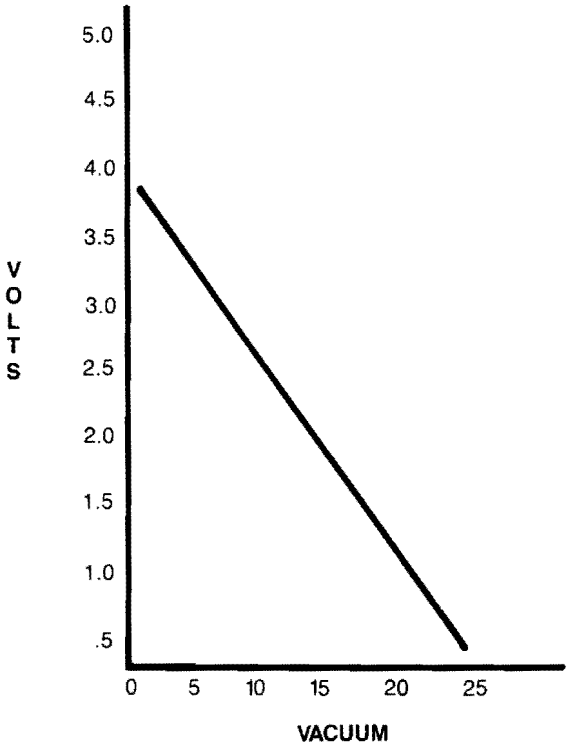
BAROMETRIC PRESSURE SENSOR



Barometric Pressure Sensor

All Engines

BP



VOLTS		VACUUM in-Hg	VACUUM kPa
3.84	±0.58	0	0
3.36	±0.50	5	16.7
2.66	±0.40	10	33.7
1.93	±0.29	15	50.7
1.26	±0.19	20	67.7
0.58	±0.09	25	84.7

A14348-A

Barometric Pressure Sensor

All Engines

BP

TEST STEP	RESULT ▶	ACTION TO TAKE
BP1 BP INPUT VOLTAGE • Install breakout box. • Key on, engine off. • Remove dust cover from BP sensor and connect vacuum pump. • Measure the voltage between pins BP and SIGRTN with vacuum applied as indicated on chart. • Compare voltage readings to data on chart. • **Are the voltage readings OK?**	Yes ▶ No ▶	BP sensor OK. If directed here from [QT12], RETURN to Quick Test, otherwise REPLACE ECA. GO to [BP2].
BP2 BP SIGNAL FROM BP SENSOR • Disconnect BP sensor. • Jumper BP sensor VREF and SIGRTN wires on BP connector. • Key on, engine off. • Measure voltage between SIGRTN and the BP signal terminal on the BP sensor with vacuum applied. • Compare voltage readings to the data sheet. • **Are the voltage readings OK?**	Yes ▶ No ▶	SERVICE BP sensor wire to ECA. GO to [BP3].
BP3 BP VOLTAGE REFERENCE • Disconnect BP sensor. • Key on, engine off. • Measure voltage between VREF and SIGRTN on BP connector. • **Is the voltage between 4.5 and 5.5V?**	Yes ▶ No ▶	REPLACE BP sensor. GO to [BP4].
BP4 VREF/SIGNAL RETURN • Disconnect BP sensor. • Key on, engine off. • Measure voltage between VREF and GROUND. • **Is the voltage between 4.5 and 5.5V?**	Yes ▶ No ▶	SERVICE Signal Return wire to ECA. GO to Pinpoint Test [VREF].

Brake On/Off Switch	All Engines	BOO

Note

You should enter this Pinpoint Test only when directed by Quick Test Step QT10 or when directed here by QT12 .

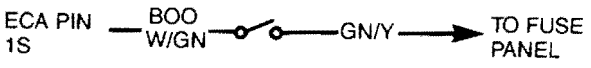
Remember

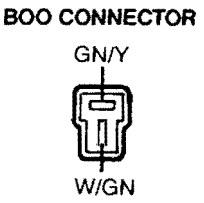
This Pinpoint Test and wiring diagram are intended to diagnose only the following:

- Circuit: BOO (Brake On/Off Switch Signal to the ECA)

Pinpoint Test Schematic

BRAKE ON/OFF SWITCH





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Brake On/Off Switch

All Engines

BOO

TEST STEP	RESULT ▶	ACTION TO TAKE
BOO1 BOO SWITCH SIGNAL • Connect breakout box (leave ECA connected). • Key on. • Measure the voltage at the BOO test pin. • Compare readings with the chart: **Brake Pedal / Voltage**: Depressed — Greater than 10V; Released — Less than 1.5V • **Are the voltage measurements OK?**	Yes ▶ No ▶	BOO Switch is functional. If sent here from QT12, RETURN to Quick Test, otherwise REPLACE ECA. GO to BOO2.
BOO2 BOO SWITCH OPERATION • Key on, engine off. • Measure voltage at the BOO signal terminal of the BOO Switch. • Compare readings with the chart: **Brake Pedal / Voltage**: Depressed — Greater than 10V; Released — Less than 1.5V • **Are the voltage measurements OK?**	Yes ▶ No ▶	SERVICE BOO signal wire to ECA. GO to BOO3.
BOO3 BOO SWITCH CHECK • Disconnect BOO connector. • Measure the resistance across the BOO Switch terminals. • Compare readings with the chart: **Brake Pedal / Resistance**: Depressed — Under 5 ohms; Released — Over 10,000 ohms • **Are the resistance measurements OK?**	Yes ▶ No ▶	GO to BOO4. SERVICE supply wire to BOO Switch.
BOO4 BOO SUPPLY CHECK • Disconnect BOO connector. • Key on, engine off. • Measure the voltage at the GN/Y wire at the BOO connector. • **Is the voltage greater than 10V?**	Yes ▶ No ▶	REPLACE ECA. SERVICE supply wire to BOO Switch.

Boost Pressure Switch	Turbo Engine	BPS

Note

You should enter this Pinpoint Test only when directed by Quick Test Step QT12 .

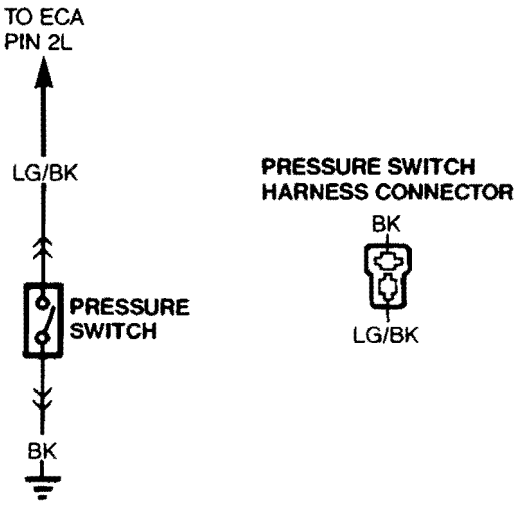
Remember

This Pinpoint Test and wiring diagram are intended to diagnose only the following:

- Circuit: (BPS)

Pinpoint Test Schematic

TURBO BOOST PRESSURE SWITCH



Boost Pressure Switch

Turbo Engine

BPS

TEST STEP	RESULT ▶	ACTION TO TAKE
BPS1 BPS SIGNAL		
• Connect breakout box (leave ECA disconnected). • Key off. • Connect a pressure tester to the BPS. • Measure the resistance from the BPS test pin and GROUND. • Compare readings with the chart: **BPS Pressure** / **Resistance** 0 kPa (0 psi) / Over 10,000 ohms 72-80 kPa (10-12 psi) / Under 5 ohms • **Are the measurements OK?**	Yes ▶ No ▶	BPS is functional. If sent here from **QT12**, RETURN to Quick Test, otherwise REPLACE ECA. GO to **BPS2**.
BPS2 BPS SWITCH FUNCTION		
• Disconnect BPS connector. • Key off. • Connect a pressure tester to the BPS. • Measure the resistance across the terminals of the BPS. • Compare readings with the chart: **BPS Pressure** / **Resistance** 0 kPa (0 psi) / Over 10,000 ohms 72-80 kPa (10-12 psi) / Under 5 ohms • **Are the measurements OK?**	Yes ▶ No ▶	GO to **BPS3**. REPLACE BPS.
BPS3 BPS GROUND		
• Disconnect BPS connector. • Key off. • Measure the resistance between GROUND and the GROUND pin on the BPS connector. • **Is the resistance under 5 ohms?**	Yes ▶ No ▶	GO to **BPS4**. SERVICE BPS ground wire.

Boost Pressure Switch

Turbo Engine

BPS

TEST STEP	RESULT ▶	ACTION TO TAKE
BPS4 BPS SIGNAL		
• Disconnect BPS connector. • Connect breakout box (leave ECA disconnected). • Key off. • Measure the resistance between the BPS test pin and the BPS signal wire on the BPS connector. • **Is the resistance under 5 ohms?**	Yes ▶ No ▶	REPLACE ECA. SERVICE BPS signal wire.

Canister Purge Solenoid	All Engines	CANP

Note

You should enter this Pinpoint Test only when a Service Code 26 is received in Quick Test Steps QT6, QT7 or when Quick Test Step QT12 directs you here.

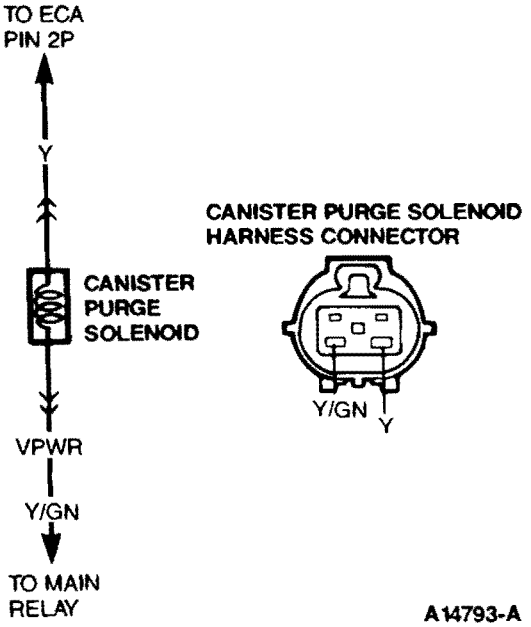
Remember

This Pinpoint Test and wiring diagram are intended to diagnose only the following:

- Circuit: (CANP)

Pinpoint Test Schematic

CANISTER PURGE SOLENOID



Canister Purge Solenoid

All Engines

CANP

TEST STEP	RESULT ▶	ACTION TO TAKE
CANP1 CANP VACUUM FUNCTION • Disconnect CANP connector. • Remove both vacuum hoses from the CANP valve. • Apply vacuum to the CANP valve. • **Does the CANP hold vacuum?**	Yes ▶ No ▶	GO to **CANP2** . REPLACE CANP and RETEST.
CANP2 CANP FUNCTION • Connect breakout box (leave ECA disconnected). • Reconnect the CANP connector. • Key on. • With vacuum applied to the CANP, jumper the CANP test pin on the breakout box to GROUND. • **Does the vacuum drop to 0 kPa?**	Yes ▶ No ▶	CANP function OK. If sent here by **QT12** , RETURN to Quick Test, otherwise REPLACE ECA. GO to **CANP3** .
CANP3 CANP POWER • Disconnect CANP connector. • Measure the voltage between the VPWR terminal of the CANP connector and GROUND. • Key on. • **Is the voltage reading above 10V?**	Yes ▶ No ▶	GO to **CANP4** . GO to Section **VPWR** .
CANP4 CANP SIGNAL CONTINUITY • Connect breakout box (leave ECA disconnected). • Disconnect CANP connector. • Measure resistance between the signal wire on the CANP connector and the CANP test pin. • **Is the resistance less than 5 ohms?**	Yes ▶ No ▶	GO to **CANP5** SERVICE CANP signal.
CANP5 CANP SIGNAL ISOLATION • Connect breakout box (leave ECA disconnected). • Key off. • Disconnect CANP connector. • Measure resistance between the CANP test pin and all other test pins. • **Is the resistance between CANP test pin and any other test pin less than 10,000 ohms?**	Yes ▶ No ▶	SERVICE CANP signal wire to ECA. REPLACE ECA.

Cylinder Identification	All Engines	CID

Note

You should enter this Pinpoint Test only when a Service Code 26 is received in Quick Test Steps QT6 or QT7 or when Quick Test Step QT12 directs you here.

Remember

This Pinpoint Test and wiring diagram are intended to diagnose only the following:

- Circuit: (CID)

Pinpoint Test Schematic

Cylinder Identification

All Engines

CID

TEST STEP	RESULT ▶	ACTION TO TAKE
CID1 CID SIGNAL WIRE • Connect breakout box (leave ECA disconnected). • Disconnect the CID connector at the distributor. • Key off. • Measure the resistance from the CID test pin and the CID terminal on the distributor connector. • **Is resistance greater than 5 ohms?**	Yes ▶ No ▶	SERVICE CID signal wire to ECA. GO to **CID2** .
CID2 CID SIGNAL ISOLATION • Connect breakout box (leave ECA disconnected). • Disconnect the CID connector at the distributor. • Key off. • Measure the resistance from the CID test pin and GROUND. • **Is resistance less than 10,000 ohms?**	Yes ▶ No ▶	SERVICE CID signal wire to ECA. GO to **CID3** .
CID3 CID SIGNAL VOLTAGES • Connect breakout box (ECA connected). • Reconnect the CID connector at the distributor. • Key on, engine off. • Measure the voltage at the CID test pin and compare with table: **Condition** / **Voltage** Key On, Engine Off — Less Than 1V or Greater Than 10V Engine at Idle — Between 3 and 5V • **Is the voltage OK?**	Yes ▶ No ▶	CID OK. If sent here from **QT12** RETURN to Quick Test, otherwise REPLACE ECA. REPLACE CID sensor.

Engine Coolant Temperature Sensor	All Engines	ECT

Note

You should enter this Pinpoint Test only when a Service Code 9 is received in Quick Test Steps QT6 or QT7 or when Quick Test Step QT12 directs you here.

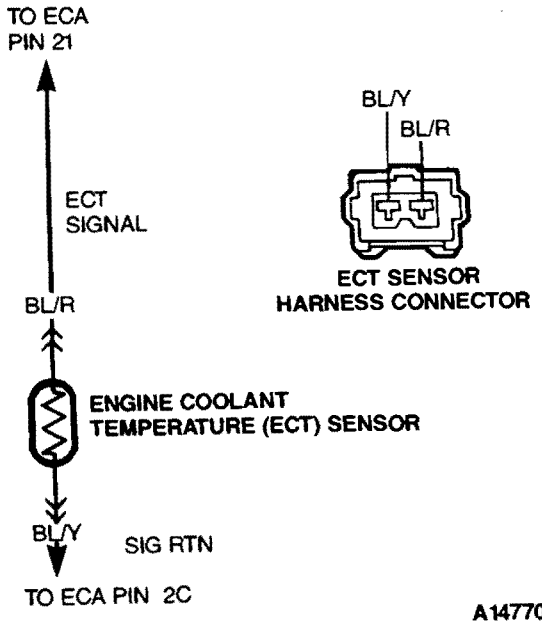
Remember

This Pinpoint Test and wiring diagram are intended to diagnose only the following:

- Circuit: (ECT)

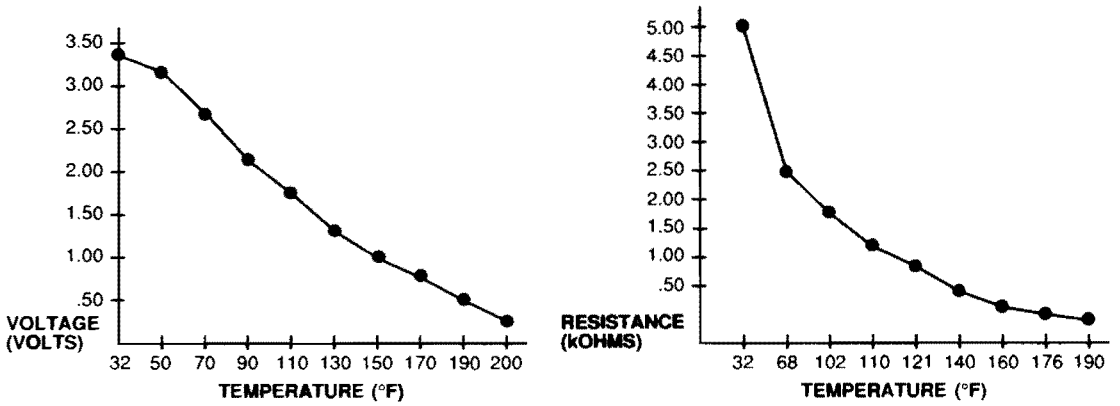
Pinpoint Test Schematic

ENGINE COOLANT TEMPERATURE SENSOR



Engine Coolant Temperature Sensor	All Engines	ECT

GRAPH



GRAPH DATA VALUES

°F	VOLTS
32	3.38
50	3.10
70	2.64
90	2.16
110	1.74
130	1.30
150	.93
170	.72
190	.54
200	.38

°F	kOHMS
32	5.2
68	2.5
102	1.3
110	1.2
121	.90
140	.60
160	.48
176	.36
190	.30

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Note: Values on Voltage and Resistance values may vary ± 15%.

Engine Coolant Temperature Sensor	All Engines	ECT

TEST STEP	RESULT ▶	ACTION TO TAKE
ECT1 ECT INPUT VOLTAGE • Install breakout box. • Engine at normal operating temperature. • Monitor the engine coolant temperature. • Key on, engine off. • Measure the voltage between pins ECT and SIGRTN. • Compare voltage readings to the data sheet. • **Are the voltage readings OK?**	Yes ▶ No ▶	ECT Sensor OK. If directed here from [QT12] then RETURN to Quick Test, otherwise REPLACE ECA. GO to [ECT2] .
ECT2 ECT SENSOR RESISTANCE • Disconnect ECT sensor. • Engine at normal operating temperature. • Monitor the engine coolant temperature. • Compare resistance readings to the data sheet. • **Are the resistance readings OK?**	Yes ▶ No ▶	GO to [ECT3] . REPLACE ECT sensor.
ECT3 ECT SIGNAL • Connect breakout box (leave ECA disconnected). • Disconnect ECT connector. • Measure resistance between ECT test pin and ECT signal wire at ECT connector. • **Is the resistance less than 5 ohms?**	Yes ▶ No ▶	GO to [ECT4] . SERVICE ECT signal wire to ECA.
ECT4 ECT SIGNAL RETURN • Connect breakout box (leave ECA disconnected). • Disconnect ECT connector. • Measure resistance between ECT test pin and ECT signal return wire at ECT connector. • **Is resistance less than 5 ohms?**	Yes ▶ No ▶	REPLACE ECA. SERVICE ECT SIGRTN wire to ECA.

Exhaust Gas Oxygen Sensor	All Engines	EGO

Note

You should enter this Pinpoint Test only when a Service Code 15 is received in Quick Test Steps QT6 or QT7 or when Quick Test Step QT12 directs you here.

Special Note

Code 15 indicates a continuously lean condition; Code 17 indicates a continuously rich condition.

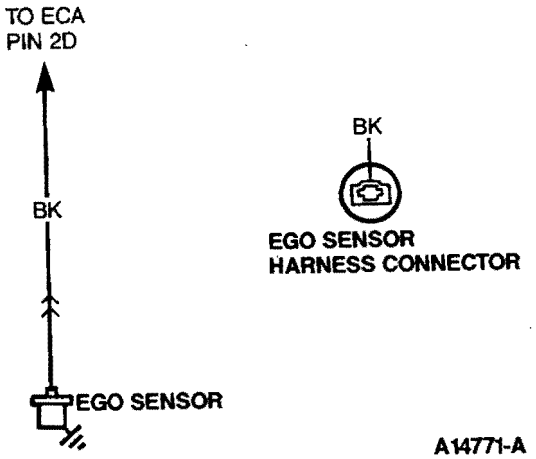
Remember

This Pinpoint Test and wiring diagram are intended to diagnose only the following:

- Circuit: (EGO)

Pinpoint Test Schematic

EXHAUST GAS OXYGEN SENSOR



Exhaust Gas Oxygen Sensor

All Engines

EGO

TEST STEP	RESULT ▶	ACTION TO TAKE
EGO1 EGO SENSOR VOLTAGE • Disconnect EGO connector. • Engine at normal operating temperature. • Key on, engine on. • Measure the voltage between EGO sensor wire and GROUND. Condition / Voltage: Increasing Engine Speed — Increases Decreasing Engine Speed — Decreases Engine at Idle — 0.2-0.8V **NOTE: Voltage that remains above 0.55V indicates a continuously rich condition while below 0.55V indicates a continuously lean condition.** • **Are the voltage readings OK?**	Yes ▶ No ▶	GO to **EGO2** . REPLACE EGO sensor. **NOTE: Rich or Lean conditions could be an indication of another problem.**
EGO2 EGO SIGNAL WIRE • Connect breakout box (leave ECA disconnected). • Disconnect EGO sensor connector. • Key off. • Measure resistance between the EGO test pin and the EGO connector. • **Is the resistance less than 5 ohms?**	Yes ▶ No ▶	GO to **EGO3** . SERVICE EGO signal wire.
EGO3 EGO CIRCUIT ISOLATION • Connect breakout box (leave ECA disconnected). • Disconnect EGO connector. • Key off. • Measure resistance between EGO and all other test points. • **Is the resistance between the EGO test pin and any other test pin less than 10,000 ohms?**	Yes ▶ No ▶	SERVICE EGO wire to ECA. REPLACE ECA.

Electrical Load Control Unit	All Engines	ELU

Note

You should enter this Pinpoint Test only when directed by Quick Test Step QT10 or when directed here by QT12 .

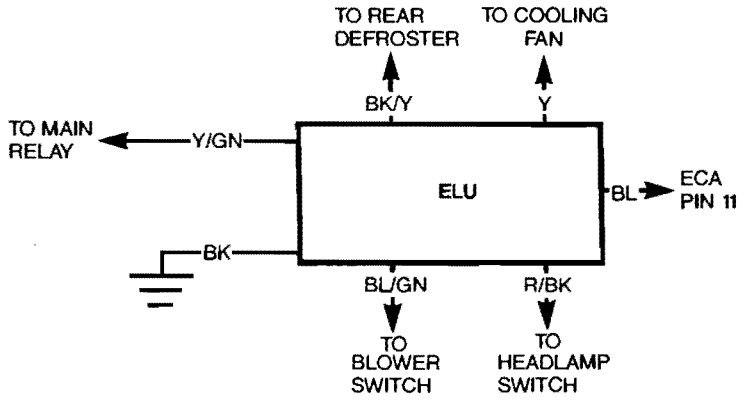
Remember

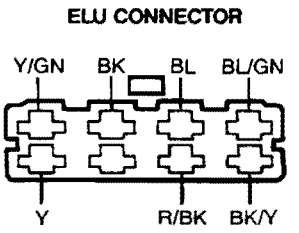
This Pinpoint Test and wiring diagram are intended to diagnose only the following:

- Circuit: (ELU)

Pinpoint Test Schematic

ELECTRICAL LOAD CONTROL UNIT





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Electrical Load Control Unit

All Engines

ELU

TEST STEP	RESULT ▶	ACTION TO TAKE
ELU1 ELU SIGNAL VOLTAGE • Connect breakout box (leave ECA connected). • Key on, engine off. • Measure the voltage between the ELU test pin and GROUND while exercising the below inputs. • Compare readings to the table: **Switch Position** / **Voltage** All Accessories Off — Greater than 10V Defroster On — Less than 1.5V Headlamps On — Less than 1.5V Blower Speed 2 to 4 — Less than 1.5V Cooling Fan On — Less than 1.5V • **Are the measurements OK?**	Yes ▶	ELU is functional if sent here from QT12, RETURN to Quick Test, otherwise REPLACE ECA.
	No ▶	GO to ELU2.
ELU2 ELU SIGNAL TO ECA • Connect breakout box (leave ECA disconnected). • Key on, engine off. • Measure the resistance between the ELU test pin and GROUND while exercising the below inputs. • Compare readings to the table: **Switch Position** / **Resistance** All Accessories Off — Greater than 10,000 Defroster On — Less than 5 Headlamps On — Less than 5 Blower Speed 2 to 4 — Less than 5 Cooling Fan On — Less than 5 • **Are the measurements OK?**	Yes ▶	REPLACE ECA.
	No ▶	GO to ELU3.
ELU3 ELU POWER • Disconnect ELU connector. • Key on. • Measure the voltage between the ELU power terminal and body GROUND. • **Is the voltage greater than 10V?**	Yes ▶	GO to ELU4.
	No ▶	SERVICE power feed to ELU.

Electrical Load Control Unit

All Engines

ELU

TEST STEP	RESULT ▶	ACTION TO TAKE
ELU4 ELU GROUND		
• Disconnect ELU connector. • Key off. • Measure resistance between the GND terminal on the ELU switch connector and body GROUND. • **Is the resistance less than 5 ohms?**	Yes ▶ No ▶	GO to **ELU5** . SERVICE GND wire to ELU.
ELU5 ELU INPUT SIGNALS		
• Disconnect ELU connector. • Take the following measurements on the ELU inputs. • All measurements are from the input wire on the ELU connector to body GROUND. **NOTE: Voltage measurements are made with the Key On. Resistance measurements are made with the Key Off.** • Compare readings to the table: • **Are the measurements OK?**	Yes ▶ No ▶	REPLACE ELU. REFER to the Shop Manual Section covering faulty input.

Switch and Position	Measurements
Defroster On	Greater than 10V
Defroster Off	Less than 5V
Headlamps On	Greater than 10V
Headlamps Off	Less than 5V
Cooling Fan On	Less than 1.5V
Cooling Fan Off	Greater than 10V
Blower Speed 2 to 4	Less than 5 ohms
Blower Speed 1 or Off	Greater than 10,000 ohms

Idle Switch	All Engines	IDL

Note

You should enter this Pinpoint Test only when directed by Quick Test Step QT10 or when directed here by QT12 .

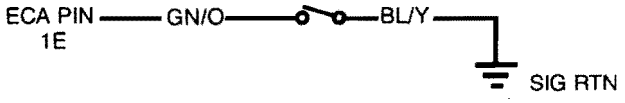
Remember

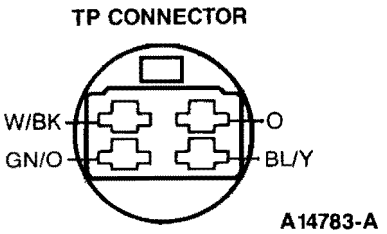
This Pinpoint Test and wiring diagram are intended to diagnose only the following:

- Circuit: (IDL)

Pinpoint Test Schematic

IDLE SWITCH (MOUNTED IN TP SENSOR)





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Idle Switch

All Engines

IDL

TEST STEP	RESULT ▶	ACTION TO TAKE
IDL1 IDL SWITCH SIGNAL		
• Connect breakout box (leave ECA connected). • Key on, engine off. • Measure the voltage between the IDL and SIGRTN test pins. • Compare readings with the table: **Throttle Pedal** / **Voltage** Released / Less than 1V Depressed / Greater than 10V • **Are the measurements OK?**	Yes ▶	IDL Switch is functional. If sent here from **QT12**, RETURN to Quick Test, otherwise REPLACE ECA.
	No ▶	GO to **IDL2**.
IDL2 IDL SWITCH OPERATION		
• Disconnect switch. • Key off. • Measure the resistance between the IDL signal and the SIGRTN terminals on the IDL Switch. • Compare readings to the chart: **Throttle Pedal** / **Resistance** Released / Under 5 ohms Depressed / Over 10,000 ohms • **Do the measurements compare with the chart?**	Yes ▶	GO to **IDL3**.
	No ▶	GO to **IDL4**.
IDL3 IDL CONTINUITY CHECK		
• Connect breakout box (leave ECA disconnected). • Disconnect 4EAT module (if equipped). • Key off. • Measure resistance between the IDL test pin and the IDL signal terminal on the IDL Switch connector. • **Is the resistance less than 5 ohms?**	Yes ▶	GO to **IDL5**.
	No ▶	SERVICE IDL signal wire.
IDL4 THROTTLE LINKAGE		
• Verify that throttle operates properly. • Check the following: • Throttle Cable. • Dashpot. • Throttle Plate.	Yes ▶	REPLACE IDL Switch.
	No ▶	REPAIR throttle linkage.

Idle Switch	All Engines	IDL

TEST STEP	RESULT ▶	ACTION TO TAKE
IDL5 IDL SIGNAL ISOLATION		
• Connect breakout box (leave ECA disconnected). • Disconnect 4EAT module (if equipped). • Disconnect IDL Switch connector. • Key off. • Check for resistance between the IDL test pin and all other test pins. • **Is the resistance between the IDL test pin and any other test pin less than 10,000 ohms?**	Yes ▶ No ▶	SERVICE IDL wire to ECA. GO to **IDL6** .
IDL6 IDL SIGNAL RETURN		
• Connect breakout box (leave ECA disconnected). • Disconnect 4EAT module (if equipped). • Disconnect IDL Switch connector. • Key off. • Measure resistance between the SIGRTN test pin and the SIGRTN terminal on the IDL Switch connector. • **Is the resistance less than 5 ohms?**	Yes ▶ No ▶	REPLACE ECA. SERVICE SIGRTN wire to ECA.

Ignition Diagnostic Monitor	All Engines	IDM

Note

You should enter this Pinpoint Test only when a Service Code 1 is received in Quick Test Steps QT6 or QT7 or when Quick Test Step QT12 directs you here.

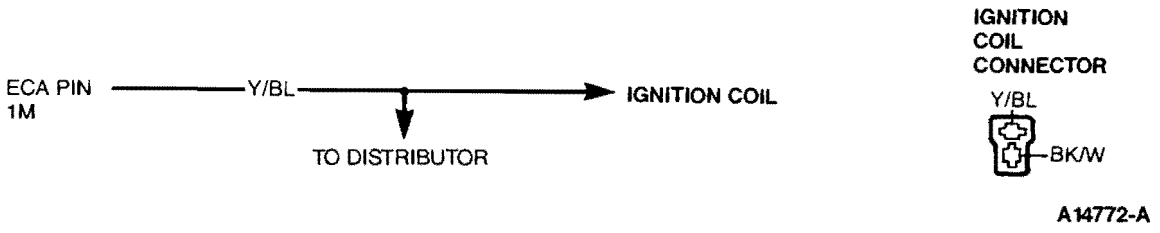
Remember

This Pinpoint Test and wiring diagram are intended to diagnose only the following:

- Circuit: (IDM)

Pinpoint Test Schematic

IGNITION DIAGNOSTIC MONITOR



Ignition Diagnostic Monitor

All Engines

IDM

TEST STEP	RESULT ▶	ACTION TO TAKE
IDM1 IDM SIGNAL VOLTAGE • Connect breakout box (leave ECA connected). • Key on. • Measure the voltage at the IDM test pin. • **Is the voltage greater than 10V?**	Yes ▶	If sent here from QT12, RETURN to Quick Test, otherwise REPLACE ECA.
	No ▶	GO to IDM2.
IDM2 IDM SIGNAL CONTINUITY • Connect breakout box (leave ECA disconnected). • Disconnect the IDM connectors at the distributor and ignition coil. • Key off. • Measure the resistance from IDM test pin to the IDM signal wire on the distributor connector and from IDM test pin to IDM signal wire on ignition coil connector. • **Is resistance greater than 5 ohms?**	Yes ▶	SERVICE wire in question.
	No ▶	GO to IDM3.
IDM3 IDM SIGNAL ISOLATION • Connect breakout box (leave ECA disconnected). • Disconnect the IDM connectors at the distributor and ignition coil. • Key off. • Measure the resistance from the IDM test pin and all other test pins. • **Is the resistance greater than 10,000 ohms?**	Yes ▶	SERVICE IDM signal wire in question.
	No ▶	GO to IDM4.
IDM4 IGNITION COIL CHECK • Disconnect IDM connector at the coil. • Measure the coil Primary and Secondary resistance. Primary: 0.8 to 1.6 ohms Secondary: 6K to 30K ohms • **Are the readings OK?**	Yes ▶	GO to IDM5.
	No. ▶	REPLACE coil and RETEST.

Ignition Diagnostic Monitor

All Engines | **IDM**

TEST STEP	RESULT ▶	ACTION TO TAKE
IDM5 COIL POWER CHECK		
• Disconnect IDM coil connector. • Key on. • Measure voltage on BK/W wire at IDM coil connector. • **Is the voltage greater than 10V?**	Yes ▶ No ▶	GO to **IDM6**. SERVICE BK/W wire.
IDM6 IGNITION MODULE CHECK		
• Disconnect IDM coil connector. • Reconnect IDM distributor connector. • Connect test lamp between the IDM signal wire at the coil connector and battery positive terminal. • Crank engine. • **Does test lamp blink on and off as engine cranks?**	Yes ▶ No ▶	REPLACE ECA. REPLACE Ignition Module.

Idle Speed Control	All Engine	ISC

Note

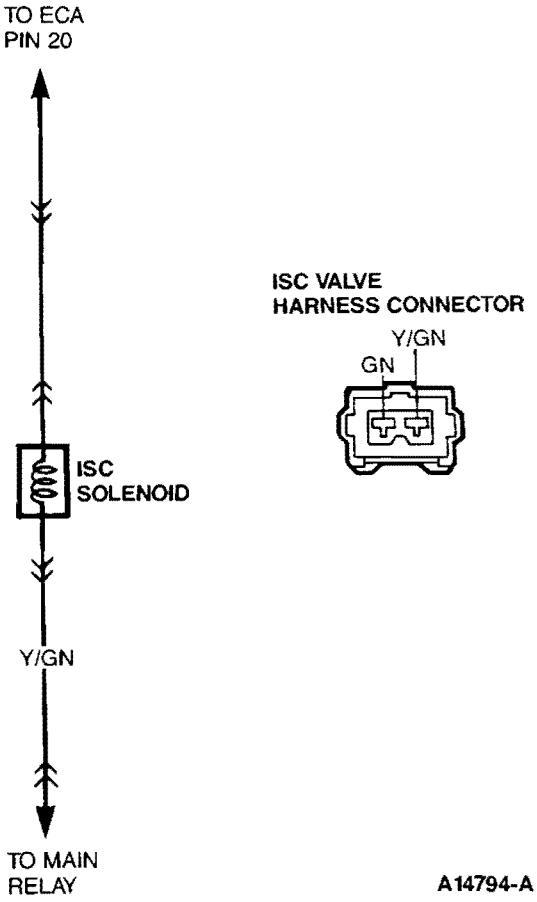
You should enter this Pinpoint Test only when a Service Code 34 is received in Quick Test Steps QT6, or QT7 or when Quick Test Step QT12 directs you here.

Remember

This Pinpoint Test and wiring diagram are intended to diagnose only the following:

- Circuit: (ISC)

Pinpoint Test Schematic



Idle Speed Control

All Engine

ISC

TEST STEP	RESULT ▶	ACTION TO TAKE
ISC1 ISC FUNCTION CHECK • Install breakout box (leave ECA disconnected). • Key on. • Ground the ISC test pin. • **Does the ISC solenoid click?**	Yes ▶ No ▶	ISC is functional. If sent here from **QT12**, RETURN to Quick Test, otherwise REPLACE ECA. GO to **ISC2**.
ISC2 ISC POWER CHECK • Disconnect ISC connector. • Key on. • Measure the voltage between the VPWR terminal on the ISC connector and GROUND. • **Is the voltage greater than 10V?**	Yes ▶ No ▶	GO to **ISC3**. SERVICE main relay VPWR wire.
ISC3 ISC SIGNAL CONTINUITY • Disconnect ISC connector. • Key off. • Measure the resistance between the ISC signal wire on the ISC connector and the ISC test pin. • **Is the resistance less than 5 ohms?**	Yes ▶ No ▶	GO to **ISC4**. SERVICE ISC signal wire.
ISC4 ISC SOLENOID CHECK • Disconnect ISC connector. • Key off. • Measure the resistance across the terminals on the ISC solenoid. • **Is the resistance 5 to 20 ohms?**	Yes ▶ No ▶	REPLACE ISC. REPLACE ECA.

Knock Controller/Knock Sensor	All Engines	KC/KS

Note

You should enter this Pinpoint Test only when referred here by Section 2, Diagnostic Routines.

Remember

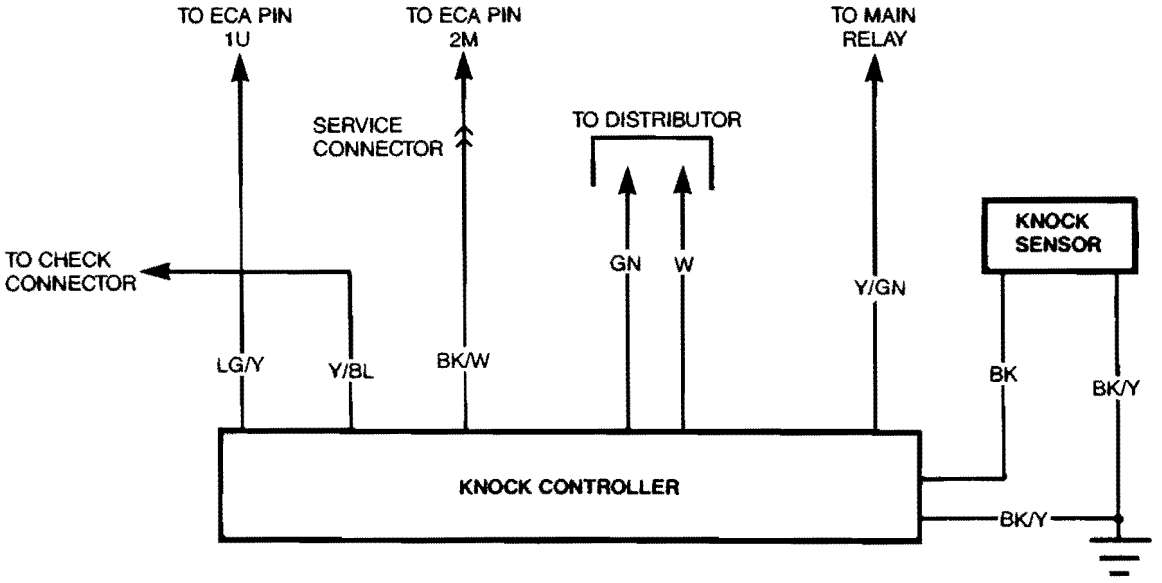
This Pinpoint Test and wiring diagram are intended to diagnose only the following:

- Circuits: (KS, KC)

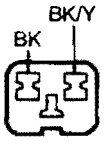
Knock Controller/Knock Sensor	All Engines	KC/KS

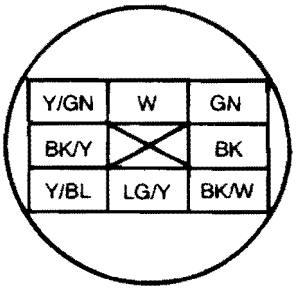
Pinpoint Test Schematic

KNOCK CONTROL



KNOCK SENSOR HARNESS CONNECTOR





KNOCK CONTROLLER

A14790-A

Knock Controller/Knock Sensor	All Engines	KC/KS

TEST STEP	RESULT ▶	ACTION TO TAKE
KS1 KC FAIL-SAFE • Disconnect and plug distributor vacuum hose. • Key on, engine running. • Connect timing lamp and record the timing measurement. • Disconnect the KC service connector (near ECA). • **Did the ignition timing retard?**	Yes ▶ No ▶	SERVICE open Knock Sensor and/or KS wires. GO to **KS2**.
KS2 KC FUNCTION • Disconnect distributor vacuum hose. • Key on, engine running. • Disconnect the KC service connector (near ECA). • Connect timing lamp and record the timing measurement. • Tap the intake plenum with a plastic hammer. • **Did the ignition timing retard?**	Yes ▶ No ▶	GO to **KS3**. GO to **KS4**.
KS3 KC RETEST • Reconnect the KS service connector (near ECA). • Key on, engine running. • Connect timing lamp and record the timing measurement. • Tap the intake plenum with a plastic hammer. • **Did the ignition timing retard?**	Yes ▶ No ▶	REPLACE Knock Controller. Knock Controller OK.
KS4 KS TEST • Disconnect and plug distributor vacuum hose. • Key on, engine running. • Disconnect the KC service connector (near ECA). • Connect a good KS to the vehicle and GROUND. • Connect timing lamp and record the timing measurement. • Tap the intake plenum with a plastic hammer. • **Did the ignition timing retard?**	Yes ▶ No ▶	REPLACE Knock Sensor. GO to **KS5**.
KS5 KC WIRING • Verify VPWR and GROUND to the Knock Controller. • Check all Knock Controller wiring for opens and shorts. • **Are all Knock Controller wires OK?**	Yes ▶ No ▶	REPLACE Knock Controller. SERVICE wire(s) in question.

Malfunction Indicator Lamp	All Engines	MIL

Note

You should enter this Pinpoint Test only when directed here by Capri Shop Manual Section 33-01.

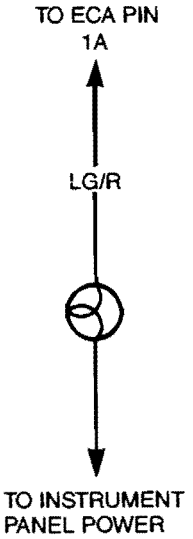
Remember

This Pinpoint Test and wiring diagram are intended to diagnose only the following:

- Circuit: (MIL)

Pinpoint Test Schematic

MALFUNCTION INDICATOR LAMP



A14797-A

Malfunction Indicator Lamp | All Engines | MIL

TEST STEP	RESULT ▶	ACTION TO TAKE
MIL1 MIL OPERATION • Connect breakout box (leave ECA disconnected). • Key on. • Ground the MIL test pin. • **Does the lamp go on?**	Yes ▶ No ▶	If sent here from [QT12], RETURN to Quick Test, otherwise REPLACE ECA. GO to [MIL2].
MIL2 MIL POWER CHECK • Key off. • While watching the instrument cluster, turn the key ON. • **Do the other lamps light?**	Yes ▶ No ▶	GO to [MIL3]. SERVICE power feed to instrument cluster.
MIL3 MIL INSPECTION • Remove MIL. • Connect the lamp to battery. • **Does the lamp go on?**	Yes ▶ No ▶	GO to [MIL4]. REPLACE lamp and RETEST.
MIL4 MIL SHORT CHECK • Connect breakout box (leave ECA disconnected). • Key off. • Measure the resistance from the MIL test pin to GROUND. • **Is resistance greater than 10,000 ohms?**	Yes ▶ No ▶	GO to [MIL5]. SERVICE MIL wire.
MIL5 MIL OPEN CHECK • Connect breakout box (leave ECA disconnected). • Disconnect 8 – pin connector from the instrument cluster. • Key off. • Measure the resistance from the MIL test pin to the MIL terminal on the 8 – pin connector. • **Is the resistance less than 5 ohms?**	Yes ▶ No ▶	**INSPECT instrument cluster for:** • Open traces. • Power to lamp. • Signal to lamp from connector. SERVICE MIL wire.

Manual Lever Position Switch | 4EAT | MLP

Note

You should only enter this Pinpoint Test only when directed here by Capri Shop Manual Section 17-27 or Quick Test Step QT12 .

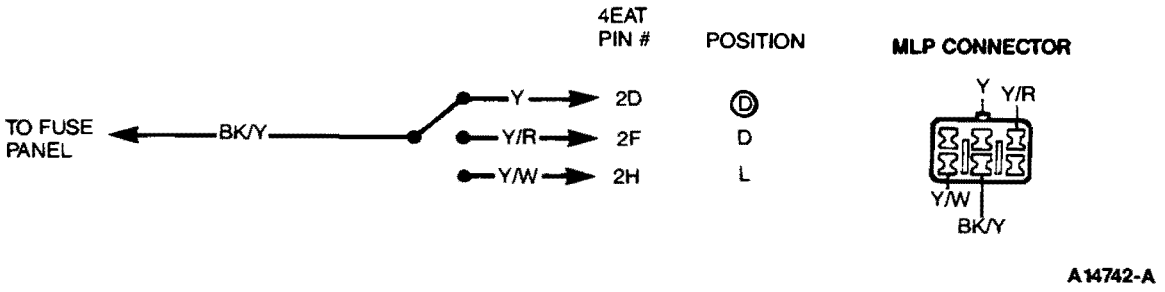
Remember

This Pinpoint Test and wiring diagram are intended to diagnose only the following:

- Circuit: (MLP)

Pinpoint Test Schematic

MANUAL LEVER POSITION SWITCH



A14742-A

Manual Lever Position Switch | 4EAT | MLP

TEST STEP	RESULT ▶	ACTION TO TAKE
MLP1 MLP SWITCH SIGNAL • Connect 4EAT tester (leave 4EAT module disconnected). • Key on, engine off. • Measure the voltage between GROUND and the MLP test pins while operating the switch. • Compare readings with the chart below: • **Are the measurements OK?**	Yes ▶ No ▶	MLP Switch is functional. If sent here from **QT12**, RETURN to Quick Test, otherwise REPLACE 4EAT module. If all measurements are less than 1.5V GO to **MLP2**, otherwise GO to **MLP3**.
MLP2 MLP POWER CHECK • Disconnect MLP connector (located on the transaxle housing). • Key on. • Measure the voltage between the VPWR terminal on the MLP connector and GROUND. • **Is the voltage greater than 10V?**	Yes ▶ No ▶	REPLACE MLP Switch. SERVICE VPWR circuit to MLP.
MLP3 MLP CONTINUITY CHECK • **NOTE: In this step "MLP" represents the test pin that failed step MLP1.** • Connect 4EAT tester (leave 4EAT module disconnected). • Key off. • Disconnect MLP connector. • Measure resistance between the MLP test pin and the MLP signal ternminal on the MLP Switch connector. • **Is the resistance less than 5 ohms?**	Yes ▶ No ▶	REPLACE MLP Switch. SERVICE MLP signal wire.

Test Pin	Lever Positions					
	P	R	N	OD	D	L
OD	–	–	–	*	–	–
D	–	–	–	–	*	–
L	–	–	–	–	–	*

– = Less than 1.5 Volts
* = Greater than 10 Volts

Manual Shift Lamp	4EAT	MSL

Note

You should only enter this Pinpoint Test only when directed here by Capri Shop Manual Section 17-27 or Quick Test Step QT12 .

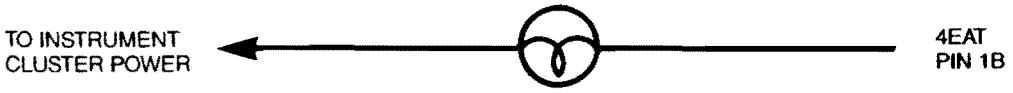
Remember

This Pinpoint Test and wiring diagram are intended to diagnose only the following:

- Circuit: (MSL)

Pinpoint Test Schematic

MANUAL SHIFT LAMP



A14798-A

Manual Shift Lamp	4EAT	MSL

NOTE: Before proceeding with the MSL Pinpoint Tests, Verify that the Manual Mode Switch is Functional.

TEST STEP	RESULT ▶	ACTION TO TAKE
MSL1 MSL OPERATION		
• Connect 4EAT tester (leave 4EAT module disconnected). • Key on. • GROUND the MSL test pin. • **Does the lamp go on?**	Yes ▶	If sent here from QT12, RETURN to Quick Test, otherwise REPLACE 4EAT module.
	No ▶	GO to MSL2.
MSL2 MSL POWER CHECK		
• Connect 4EAT tester (leave 4EAT module disconnected). • Key on. • Measure the voltage at the MSL test pin. • **Is the voltage greater than 10V?**	Yes ▶	REPLACE 4EAT module.
	No ▶	SERVICE MSL power circuit, wire, fuse, lamp.

Manual Mode Switch	4EAT	MMS

Note

You should enter this Pinpoint Test only when directed here by Capri Shop Manual Section 17-27 or Quick Test Step QT12 .

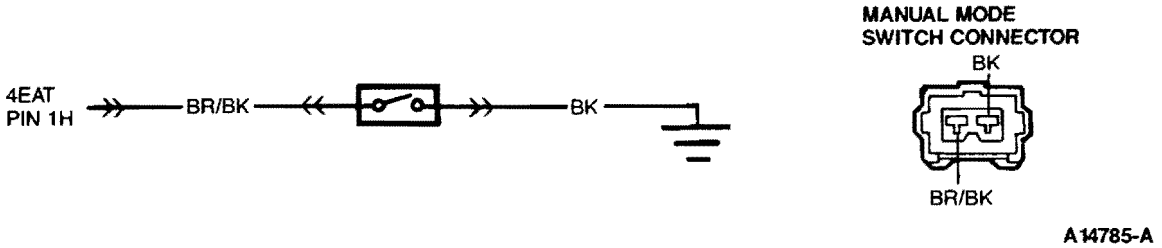
Remember

This Pinpoint Test and wiring diagram are intended to diagnose only the following:

- Circuit: (MMS)

Pinpoint Test Schematic

MANUAL MODE SWITCH



Manual Mode Switch | 4EAT | MMS

TEST STEP	RESULT ▶	ACTION TO TAKE
MMS1 MMS SWITCH SIGNAL • Connect 4EAT tester (leave 4EAT module connected). • Key on, engine off. • Measure the voltage between the MMS and GND test pins. • Compare readings to the table: • **Are the measurements OK?**	Yes ▶ No ▶	MMS is functional. If sent here from **QT12**, RETURN to Quick Test, otherwise REPLACE 4EAT module. GO to **MMS2**.
MMS2 MMS SWITCH OPERATION • Disconnect MMS connector (located on the gear selector lever). • Key off. • Measure the resistance between the MMS Signal and the GND terminals on the MMS Switch. • Compare readings to the table: • **Do the measurements compare with the chart?**	Yes ▶ No ▶	GO to **MMS3**. REPLACE Manual Mode Switch.
MMS3 MMS CONTINUITY CHECK • Connect 4EAT tester (leave 4EAT disconnected). • Key off. • Disconnect MMS connector. • Measure resistance between the MMS test pin and the MMS signal terminal on the MMS connector. • **Is the resistance less than 5 ohms?**	Yes ▶ No ▶	GO to **MMS4**. SERVICE MMS signal wire.

Manual Switch	Voltage
Released	Less than 1V
Depressed	Greater than 10V

Manual Switch	Resistance
Released	Under 5 ohms
Depressed	Over 10,000 ohms

Manual Mode Switch | 4EAT | MMS

TEST STEP	RESULT ▶	ACTION TO TAKE
MMS4 MMS SIGNAL ISOLATION • Connect 4EAT tester (leave 4EAT disconnected). • Disconnect MMS connector. • Key off. • Measure the resistance between the MMS test pin and all other test pins. • **Is the resistance less than 10,000 ohms?**	Yes ▶ No ▶	SERVICE MMS signal wire. GO to **MMS5** .
MMS5 MMS GROUND • Connect MMS. • Key off. • Measure resistance between the GND terminal on the MMS connector and body GROUND. • **Is the resistance less than 5 ohms?**	Yes ▶ No ▶	REPLACE ECA. SERVICE MMS GND wire.

Neutral Gear Switch/Clutch Engage Switch

MTX Vehicles

NGS/ CES

Note

You should enter this Pinpoint Test only when directed here by Quick Test Step QT10 or when directed here by QT12 .

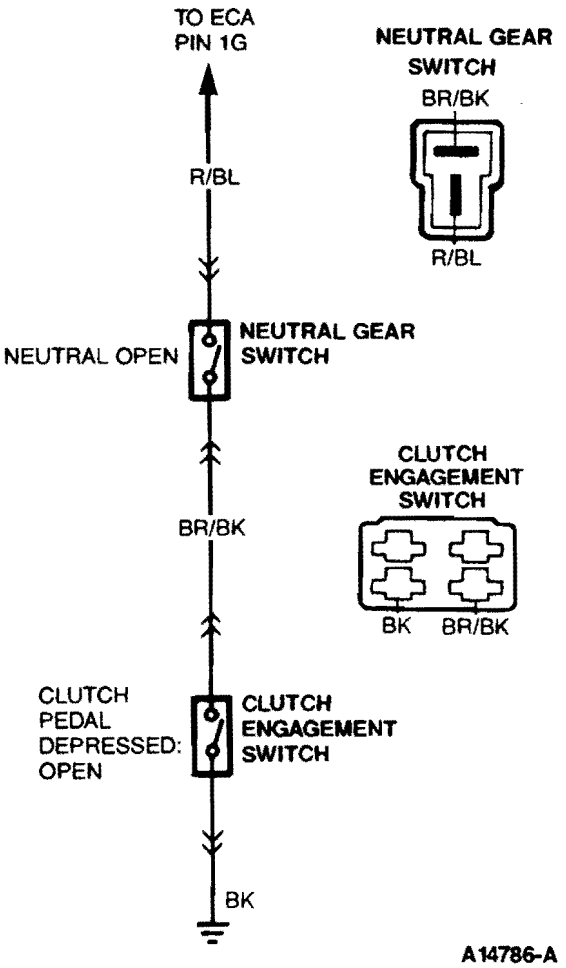
Remember

This Pinpoint Test and wiring diagram are intended to diagnose only the following:

- Circuits: (NGS/CES)

Pinpoint Test Schematic

NEUTRAL GEAR/CLUTCH ENGAGE SWITCH



Neutral Gear Switch/Clutch Engage Switch

MTX Vehicles

NGS/ CES

TEST STEP	RESULT ▶	ACTION TO TAKE
NGS/ CES1 NGS/CES SWITCH SIGNAL		
• Connect breakout box (leave ECA disconnected). • Measure the resistance between the NGS sensor terminal and GROUND and compare the readings with the table. **Trans / Clutch / Resistance** Neutral / Released / Over 10,000 Ohms Neutral / Pressed / Over 10,000 Ohms In Gear / Pressed / Over 10,000 Ohms In Gear / Released / Under 5 Ohms • **Are the measurements OK?**	Yes ▶ No ▶	NGS/CES switches OK. If sent here by **QT12**, RETURN to Quick Test, otherwise REPLACE ECA. GO to **NGS/CES2**.
NGS/ CES2 CES OPERATION		
• Disconnect CES connector. • Measure the resistance across the CES terminals. • Clutch pedal depressed (over 10,000 ohms). • Clutch pedal released (under 5 ohms). • **Are the resistance measurements OK?**	Yes ▶ No ▶	GO to **NGS/CES3**. REPLACE CES.
NGS/ CES3 NGS OPERATION		
• Disconnect NGS connector. • Measure the resistance across the NGS terminals. • In Neutral (over 10,000 ohms) In Gear (under 5 ohms) • **Are the resistance measurements OK?**	Yes ▶ No ▶	SERVICE NGS/CES wiring. REPLACE NGS.

Neutral Safety Switch	4EAT	NSS

Note

You should enter this Pinpoint Test only when directed here by Quick Test Step QT10 or when directed here by QT12 .

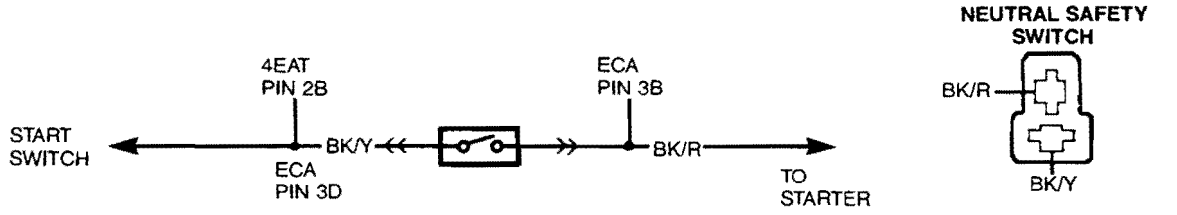
Remember

This Pinpoint Test and wiring diagram are intended to diagnose only the following:

- Circuit: (NSS)

Pinpoint Test Schematic

NEUTRAL SAFETY SWITCH



Neutral Safety Switch | 4EAT | NSS

NOTE: This procedure is used to diagnose both ECA and 4EAT systems. If replacement of a module is recommended, replace only the malfunctioning module (4EAT or ECA).

TEST STEP	RESULT ▶	ACTION TO TAKE
NSS1 NSS SWITCH SIGNAL		
• Connect 4EAT tester (leave 4EAT module disconnected). • Connect breakout box (leave ECA disconnected). • Key off. • Measure the resistance between the NSS test pins and ground. • Compare readings to the table: **Shift Lever Position** / **Resistance** P or N — Less than 5 ohms R OD D 1 — Greater than 10,000 • **Are the measurements OK?**	Yes ▶	NSS is functional. If sent here from **QT12**, RETURN to Quick Test, otherwise REPLACE 4EAT module.
	No ▶	Go to **NSS2**.
NSS2 NSS GROUND		
• NSS connected. • Key off. • Measure resistance between the GND terminal on the NSS switch connector and body GROUND. • **Is the resistance less than 5 ohms?**	Yes ▶	Go to **NSS3**.
	No ▶	SERVICE NSS GND wire.
NSS3 NSS SWITCH OPERATION		
• Disconnect NSS connector. • Key off. • Measure the resistance between the NSS signal and the GND terminals on the NSS. • Compare readings to the table: **Lever Position** / **Resistance** P or N — Less than 5 ohms R OD D 1 — Greater than 10,000 • **Do the measurements compare with the chart?**	Yes ▶	Go to **NSS4**.
	No ▶	REPLACE Neutral Safety Switch.

Neutral Safety Switch | 4EAT | NSS

TEST STEP	RESULT ▶	ACTION TO TAKE
NSS4 NSS CONTINUITY CHECK		
• Connect 4EAT tester (leave 4EAT module disconnected). • Connect breakout box (leave ECA disconnected). • Key off. • Disconnect NSS connector. • Measure resistance between the NSS test pin and the NSS signal terminal on the NSS connector. • **Is the resistance less than 5 ohms?**	Yes ▶ No ▶	REPLACE module. SERVICE NSS signal wire.

Pressure Regulator Control Valve Solenoid	All Engines	PRCV

Note

You should enter this Pinpoint Test only when a Service Code 25 is received in Quick Test Steps QT6 or QT7 or when Quick Test Step QT12 directs you here.

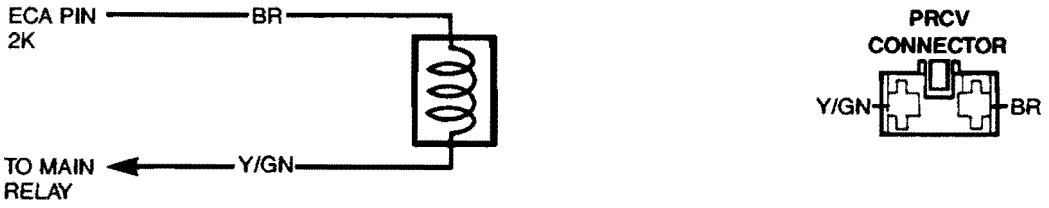
Remember

This Pinpoint Test and wiring diagram are intended to diagnose only the following:

- Circuit: (PRCV)

Pinpoint Test Schematic

PRESSURE REGULATOR CONTROL VALVE



A14795-A

Pressure Regulator Control Valve

All Engines

PRCV

TEST STEP	RESULT ▶	ACTION TO TAKE
PRCV1 PRCV VACUUM FUNCTION • Disconnect PRCV connector. • Remove both vacuum lines from PRCV, plug one port and apply vacuum to the other port. • **Does the PRCV hold vacuum?**	Yes ▶ No ▶	GO to **PRCV2**. REPLACE PRCV and RETEST.
PRCV2 PRCV FUNCTION • Connect breakout box (leave ECA disconnected). • Reconnect the PRCV connector. • Key on. • With vacuum applied to the PRCV, jumper the PRCV test pin on the breakout box to GROUND. • **Does the vacuum drop to 0?**	Yes ▶ No ▶	PRCV function OK. If sent here from **QT12**, RETURN to Quick Test, otherwise REPLACE ECA. GO to **PRCV3**.
PRCV3 PRCV POWER • Disconnect PRCV connector. • Key on. • Measure the voltage between the VPWR terminal of the PRCV connector and GROUND. • **Is the voltage reading above 10V?**	Yes ▶ No ▶	GO to **PRCV4**. GO to Section **VPWR**.
PRCV4 PRCV SIGNAL CONTINUITY • Connect breakout box (leave ECA disconnected). • Key off. • Disconnect PRCV connector. • Measure resistance between the signal wire on the PRCV connector and the PRCV test pin. • **Is the resistance less than 5 ohms?**	Yes ▶ No ▶	GO to **PRCV5**. SERVICE PRCV signal wire to ECA.
PRCV5 PRCV SIGNAL ISOLATION • Connect breakout box (leave ECA disconnected). • Key off. • Disconnect PRCV connector. • Measure resistance between the PRCV test pin and all other test pins. • **Is the resistance between the PRCV test pin and any other test pin less than 10,000 ohms?**	Yes ▶ No ▶	SERVICE PRCV signal wire to ECA. REPLACE ECA.

Power Steering Pressure Switch	All Vehicles	PSPS

NOTE

You should only enter this Pinpoint Test only when directed here by Capri Shop Manual Section 13-01 or Quick Test Step QT12 .

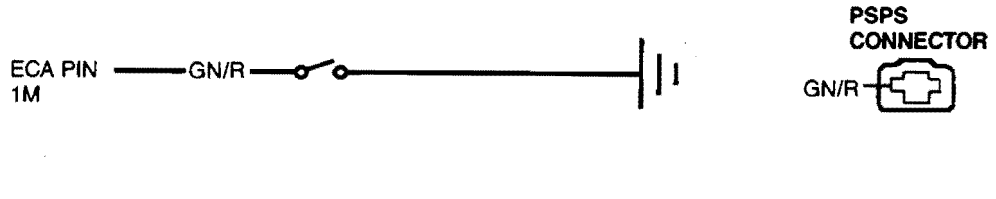
REMEMBER

This Pinpoint Test and wiring diagram are intended to diagnose only the following:

- Circuit: (PSPS)

Pinpoint Test Schematic

POWER STEERING PRESSURE SWITCH



A14788-A

Power Steering Pressure Switch

All Vehicles

PSPS

TEST STEP	RESULT ▶	ACTION TO TAKE
PSPS1 PSPS OPEN SIGNAL • Disconnect PSPS. • Key on, engine off. • Measure the resistance between the PSPS sensor terminal and GROUND. • **Is the resistance over 10,000 ohms?**	Yes ▶ No ▶	GO to **PSPS2** . REPLACE PSPS.
PSPS2 PSPS CLOSED SIGNAL • Disconnect PSPS. • Key on, engine running. • Turn steering to left or right as far as possible (may need to connect a gauge to ensure that the power steering pressure is greater than 2000 kPa 290 psi). • Measure the resistance between the PSPS sensor terminal and GROUND. • **Is the resistance under 5 ohms?**	Yes ▶ No ▶	GO to **PSPS3** . REPLACE PSPS.
PSPS3 PSPS CONTINUITY CHECK • Connect breakout box (leave ECA disconnected). • Key off. • Measure resistance between the PSPS test pin and the PSPS connector terminal. • **Is the resistance less than 5 ohms?**	Yes ▶ No ▶	If sent here by **QT12** , RETURN to Quick Test, otherwise REPLACE ECA. SERVICE PSPS signal wire.

Solenoid Controlled By Power	4EAT	SCP

Note

You should enter this Pinpoint Test only when a Service Code 60, 61, 62, or 63 is received in Quick Test Steps QT6 or QT7 or when Quick Test Step QT12 directs you here.

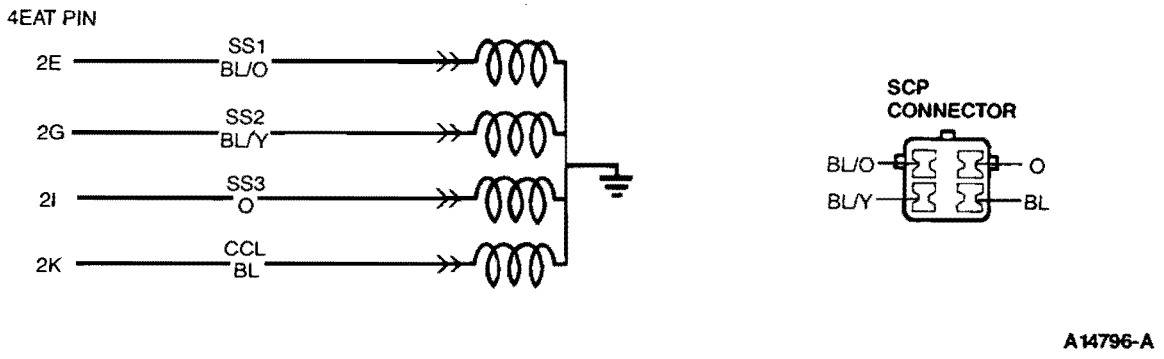
Remember

This Pinpoint Test and wiring diagram are intended to diagnose only the following:

- Circuits: (SS1, SS2, SS3, CCC)

Pinpoint Test Schematic

SOLENOID CONTROLLED BY POWER



A14796-A

Solenoid Controlled By Power | 4EAT | SCP

This Pinpoint Test is intended to diagnose the following 4EAT outputs:

Shift Solenoid #1	(SS1)
Shift Solenoid #2	(SS2)
Shift Solenoid #3	(SS3)
Converter Clutch Control	(CCC)

Signal "SIG"	4EAT Pin	Wire Color	Service Code
SS1	2E	BL/O	60
SS2	2G	BL/Y	61
SS3	2I	O	62
CCC	2K	EL	63

NOTE: In the Pinpoint Tests "SIG" refers to the circuit in question.

SOLENOID	4EAT SOLENOID ACTIVATED UNDER THESE CONDITIONS
SS1	• Driving in Reverse. • Coasting in Neutral above 11 MPH. • Driving in "OD" range, 3rd or 4th gear above 25 MPH.
SS2	• Driving in "D", "OD" or "L" range in 1st or 2nd gear. • Driving in Manual Mode, "D" range in 1st or 2nd gear.
SS3	• Engine idling in "P" range. • Manual mode in 2nd gear. • Normal mode in "D" range in 1st and 2nd gear.
CCC	• Driving above 25 MPH in "OD" range.

Solenoid Controlled By Power | 4EAT | SCP

TEST STEP	RESULT ▶	ACTION TO TAKE
SCP1 SCP CLICK TEST • Disconnect 4EAT module connectors. • Apply 12V to the SIG terminal of the 4EAT harness connector. • Listen for a CLICK at transaxle. • **Does the solenoid CLICK when 12V is applied?**	Yes ▶ No ▶	Solenoid function OK. If sent here by **QT12**, RETURN to Quick Test, otherwise REPLACE 4EAT module. GO to **SCP2**.
SCP2 SCP RESISTANCE • Connect 4EAT tester (leave 4EAT module disconnected). • Measure resistance between the SIG test pin and GROUND. • **Is the resistance between 13 - 17 ohms?**	Yes ▶ No ▶	REPLACE Solenoid. GO to **SCP3**.
SCP3 SCP SIGNAL CONTINUITY • Connect 4EAT tester (leave 4EAT module disconnected). • Disconnect Solenoid connector at the transaxle. • Measure resistance between the SIG wire on the solenoid connector and the SIG test pin. • **Is the resistance less than 5 ohms?**	Yes ▶ No ▶	GO to **SCP4**. SERVICE SIG wire to 4EAT.
SCP4 SCP SIGNAL ISOLATION • Connect 4EAT tester (leave 4EAT module disconnected). • Disconnect Solenoid connector at the transaxle. • Measure resistance between the SIG test pin and all other test pins. • **Is the resistance between the SIG test pin and any other test pin less than 10,000 ohms?**	Yes ▶ No ▶	SERVICE SIG wire to 4EAT. REPLACE ECA.

Switch Monitor Lamp	All Vehicles	SML

Note

You should enter this Pinpoint Test only when directed here by Quick Test Step QT11 .

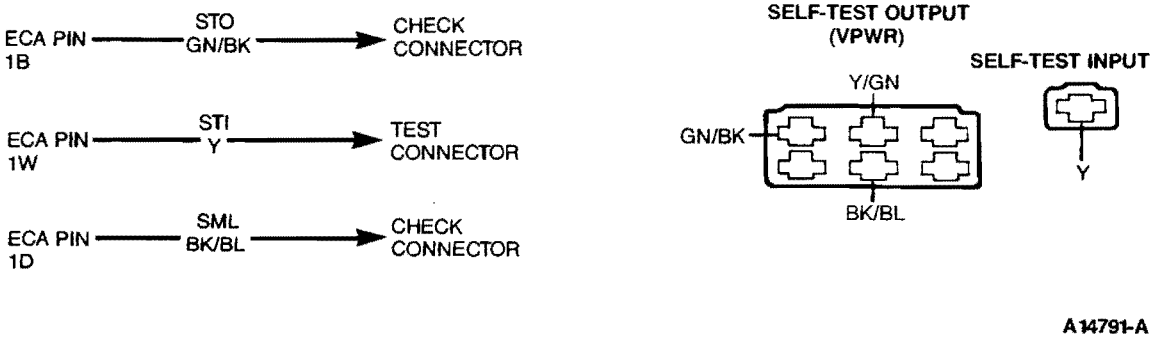
Remember

This Pinpoint Test and wiring diagram are intended to diagnose only the following:

- Circuit: (SML)

Pinpoint Test Schematic

SELF-TEST OUTPUT, SELF-TEST INPUT AND SWITCH-MONITOR LAMP



Switch Monitor Lamp

All Vehicles

SML

TEST STEP	RESULT ▶	ACTION TO TAKE
SML1 SML LINE CONTINUITY • Connect breakout box (leave ECA disconnected). • Key off. • Measure resistance between the SML test pin and the diagnostic check connector SML terminal. • **Is the resistance less than 5 ohms?**	Yes ▶ No ▶	GO to **SML2** SERVICE SML wire to ECA.
SML2 SML ISOLATION • Connect breakout box (leave ECA disconnected). • Key off. • Measure resistance between the SML test pin and all other test pins. • **Is the resistance between SML test pin and any other test pin less than 10,000 ohms?**	Yes ▶ No ▶	SERVICE SML wire to ECA. GO to **SML3**.
SML3 SML VPWR CHECK • Key on, engine off. • Measure the voltage between GROUND and the VPWR terminal on the diagnostic check connector. • **Is the voltage above 10V ohms?**	Yes ▶ No ▶	REPLACE ECA. GO to Section **VPWR**.

Self-Test Input	All Engines	STI

Note

You should enter this Pinpoint Test only when directed here by Quick Test Step QT5 .

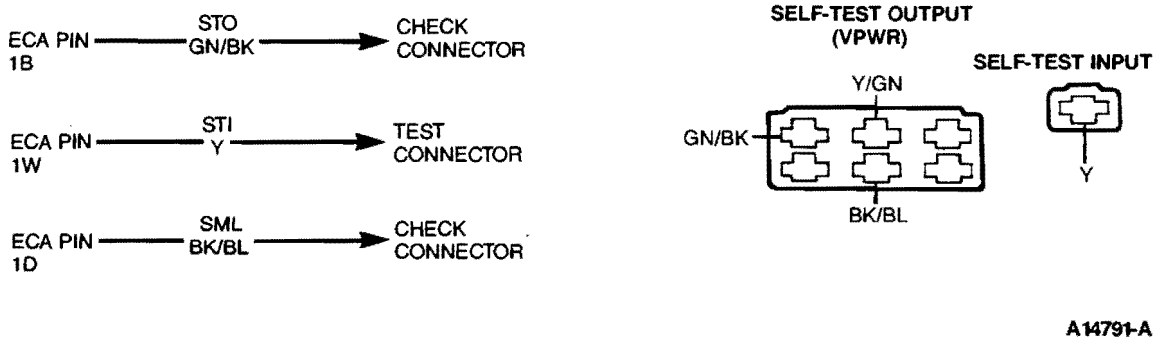
Remember

This Pinpoint Test and wiring diagram are intended to diagnose only the following:

- Circuit: (STI)

Pinpoint Test Schematic

SELF-TEST OUTPUT, SELF-TEST INPUT AND SWITCH-MONITOR LAMP



Self-Test Input

All Engines

STI

TEST STEP	RESULT ▶	ACTION TO TAKE
STI1 STI TO ECA		
• Connect breakout box (leave ECA disconnected). • Key off. • Connect a test lamp between the STI test pin and battery positive (+). • Observe the test lamp under the following conditions: CONDITION / LAMP STI connector not grounded — Off STI connector grounded — On • **Is the STI OK?**	Yes ▶	GO to Pinpoint Test **STO**
	No ▶	SERVICE STI wire to the ECA.

Self-Test Output	All Engines	STO

Note

You should enter this Pinpoint Test only when directed here by Quick Test Step AT11 or by Pinpoint Test STI .

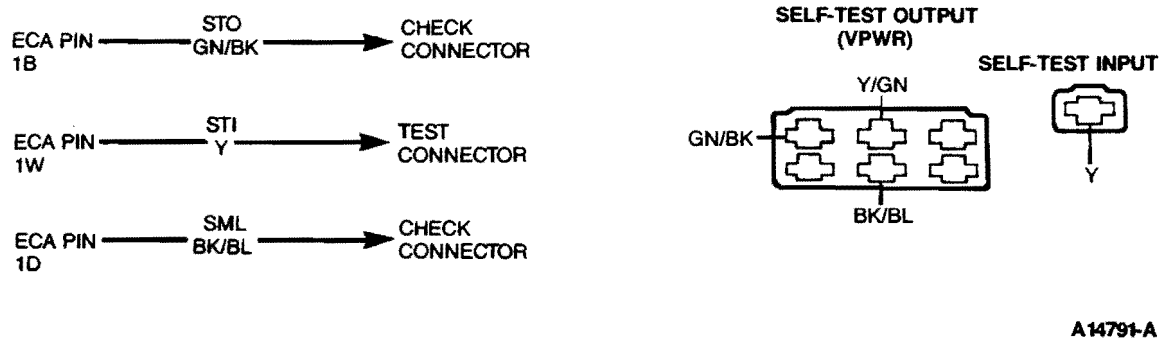
Remember

This Pinpoint Test and wiring diagram are intended to diagnose only the following:

- Circuit: (STO)

Pinpoint Test Schematic

SELF-TEST OUTPUT, SELF-TEST INPUT AND SWITCH-MONITOR LAMP



Self-Test Output	All Engines	STO

TEST STEP	RESULT ▶	ACTION TO TAKE
STO1 SML LINE CONTINUITY		
• Connect breakout box (leave ECA disconnected). • Key off. • Measure resistance between the STO test pin and the diagnostic check connector STO terminal. • **Is the resistance less than 5 ohms?**	Yes ▶ No ▶	GO to **STO2** . SERVICE STO wire.
STO2 STO ISOLATION		
• Connect breakout box (leave ECA disconnected). • Key off. • Measure resistance between the STO test pin and all other test pins. • **Is the resistance between the STO test pin and any other test pin less than 10,000 ohms?**	Yes ▶ No ▶	SERVICE STO wire to ECA. REPLACE ECA.

Torque Converter Speed	4EAT	TCS

Note

You should enter this Pinpoint Test only when a Service Code 55 is received in Quick Test Steps QT6 or QT7 or when Quick Test Step QT12 directs you here.

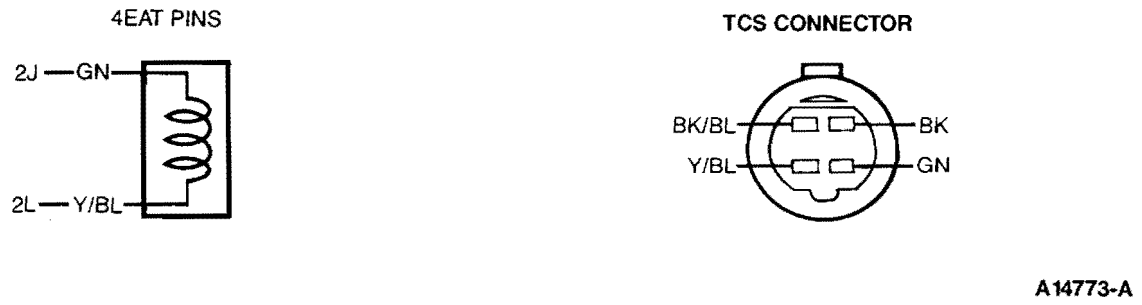
Remember

This Pinpoint Test and wiring diagram are intended to diagnose only the following:

- Circuit: (VAF)

Pinpoint Test Schematic

TORQUE CONVERTER SPEED



Torque Converter Speed | 4EAT | TCS

TEST STEP	RESULT ▶	ACTION TO TAKE
TCS1 TCS INPUT RESISTANCE		
• Connect 4EAT tester (leave 4EAT module disconnected). • Measure the resistance between the TCS and TCSRTN test pin terminals. • **Is resistance between 210-300 ohms?**	Yes ▶	TSC switch is functional. If sent here from **QT12** then RETURN, otherwise REPLACE 4EAT module.
	No ▶	GO to **TCS2** .
TSC2 TSC SENSOR RESISTANCE		
• Disconnect TCS connector on transaxle. • Measure resistance between the TCS and TCSRTN terminals of the TCS sensor. • **Is resistance between 210-300 ohms?**	Yes ▶	SERVICE wire(s) to 4EAT.
	No ▶	REPLACE TCS sensor.

Transaxle Oil Temperature Switch	4EAT	TOT

Note

You should enter this Pinpoint Test only when directed by Quick Test Step QT12 .

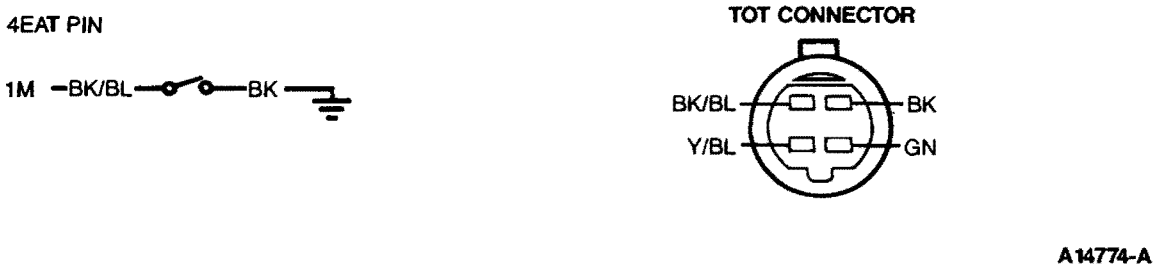
Remember

This Pinpoint Test and wiring diagram are intended to diagnose only the following:

- Circuit: (TOT)

Pinpoint Test Schematic

TRANSAXLE OIL TEMPERATURE SWITCH



Transaxle Oil Temperature Switch

4EAT | **TOT**

TEST STEP	RESULT ▶	ACTION TO TAKE
TOT1 TOT SWITCH SIGNAL		
• Drive vehicle to warm up transaxle. • Connect 4EAT tester. • Key on. • Measure voltage at the TOT test pin. • Allow the transaxle to cool • Measure voltage at the TOT test pin. • Compare voltage readings with the following chart: **Trans. Oil Temp.** / **Voltage** Warm (above 150°C 302°F) / Greater than 10V Cool (below 150°C 302°F) / Less than 1.5V • **Are the voltage readings OK?**	Yes ▶ No ▶	TOT Switch is OK. If directed here from QT12, RETURN to Quick Test, otherwise REPLACE 4EAT module. GO to TOT2.
TOT2 TOT SWITCH CHECK		
• Drive vehicle to warm up transaxle. • Disconnect TOT connector. • Measure the resistance across the TOT Switch terminals. • Allow the transaxle to cool. • Measure the resistance across the TOT Switch terminals. • Compare the resistance readings to the following chart: **Trans. Oil Temp.** / **Resistance** Warm (above 150°C 302°F) / Greater than 10,000 ohms Cool (below 150°C 302°F) / Less than 5 ohms • **Are the resistance readings OK?**	Yes ▶ No ▶	GO to TOT3. REPLACE TOT Switch.
TOT3 TOT GROUND CHECK		
• Disconnect TOT connector. • Measure the resistance between the GND terminal on the TOT connector and engine GROUND. • **Is the resistance less than 5 ohms?**	Yes ▶ No ▶	GO to TOT4. SERVICE wire.

Transaxle Oil Temperature Switch

4EAT | **TOT**

TEST STEP	RESULT ▶	ACTION TO TAKE
TOT4 TOT SIGNAL WIRE		
• Connect 4EAT tester (leave 4EAT disconnected). • Disconnect TOT connector. • Measure the resistance between the TOT terminal on the TOT connector and the TOT test pin. • **Is the resistance less than 5 ohms?**	Yes ▶ No ▶	REPLACE 4EAT module. SERVICE wire.

Throttle Position Sensor	All Engines	TPS

Note

You should enter this Pinpoint Test only when a Service Code 12 is received in Quick Test Steps QT6 or QT7 or when Quick Test Step QT12 directs you here.

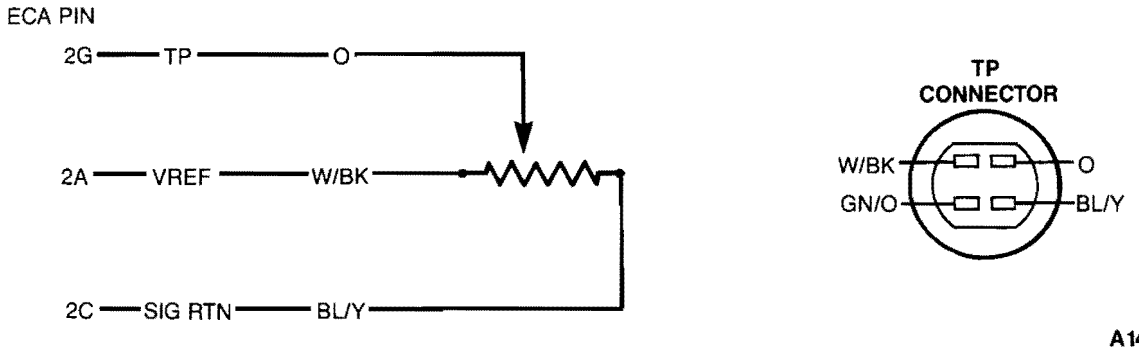
Remember

This Pinpoint Test and wiring diagram are intended to diagnose only the following:

- Circuit: (TP)

Pinpoint Test Schematic

THROTTLE POSITION SENSOR



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Throttle Position Sensor

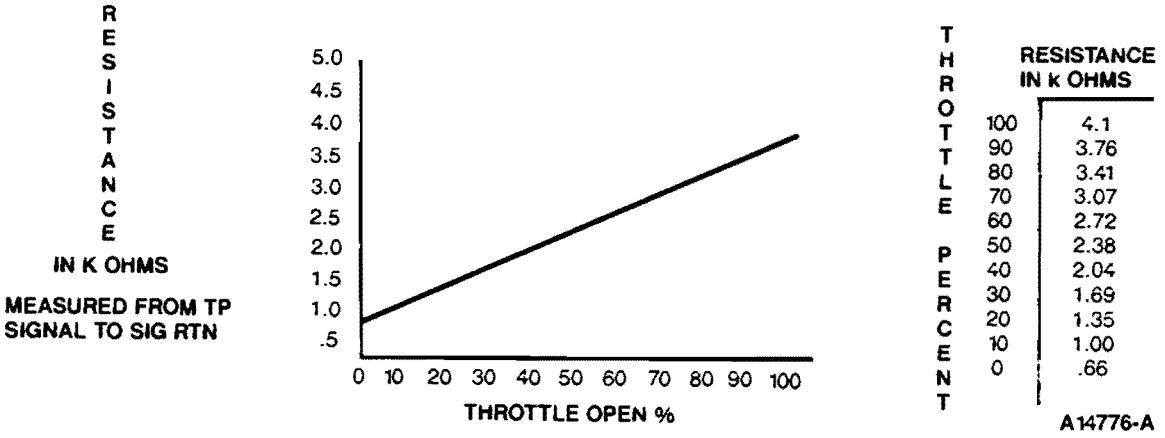
All Engines

TPS

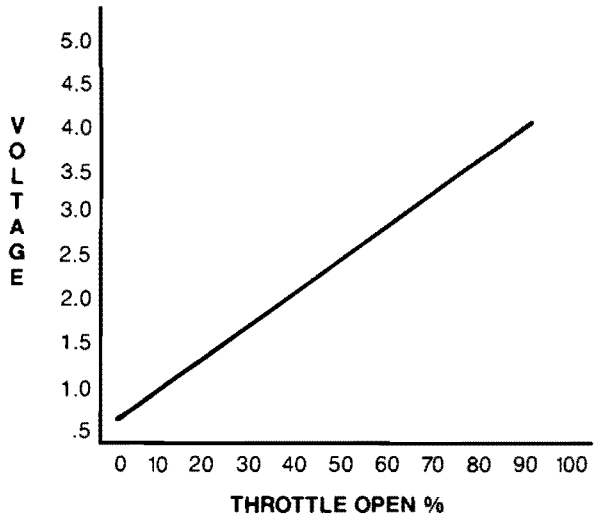
TEST STEP	RESULT ▶	ACTION TO TAKE
TP1 TP INPUT VOLTAGE • Install breakout box. • Key on, engine off. • Measure the voltage between pins TP and SIGRTN. • Compare voltage readings to the data sheet. • **Are the voltage readings OK?**	Yes ▶ No ▶	TP Sensor OK. If directed here from [QT12], RETURN to Quick Test, otherwise REPLACE ECA. GO to [TP2].
TP2 TP SIGNAL FROM TP SENSOR • Disconnect TP Sensor. • Jumper TP Sensor VREF and SIGRTN wires on TP connector. • Key on, engine off. • Measure voltage between SIGRTN and the TP Signal terminal on the TP Sensor. • Compare voltage readings to the data sheet. • **Are the voltage readings OK?**	Yes ▶ No ▶	SERVICE TP Sensor wire to ECA. GO to [TP3].
TP3 TP VOLTAGE REFERENCE • Disconnect TP Sensor. • Key on, engine off. • Measure voltage between VREF and SIGRTN on TP connector. • **Is the voltage between 4 and 5V?**	Yes ▶ No ▶	REPLACE TP Sensor. GO to [TP4].
TP4 VREF/SIGNAL RETURN • Disconnect TP Sensor. • Key on, engine off. • Measure voltage between VREF and GROUND. • **Is the voltage between 4 and 5V?**	Yes ▶ No ▶	SERVICE Signal Return wire to ECA. GO to Pinpoint Test [VREF].

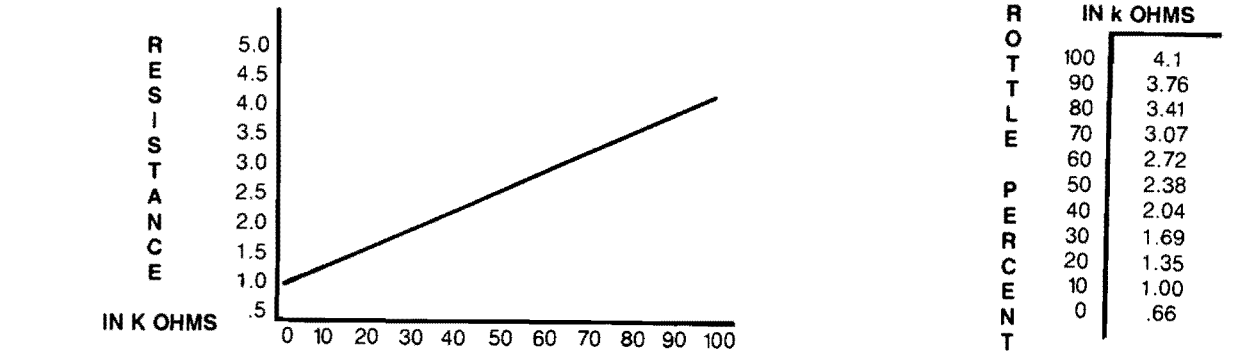
Throttle Position Sensor	All Engines	TPS

NATURALLY ASPIRATED AND TURBO SENSOR



4.8 K OHMS FROM SIG RTN TO VREF





Vane Air Flow Meter	All Engines	VAF

Note

You should enter this Pinpoint Test only when a Service Code 8 is received in Quick Test Steps QT6 or QT7 or when Quick Test Step QT12 directs you here.

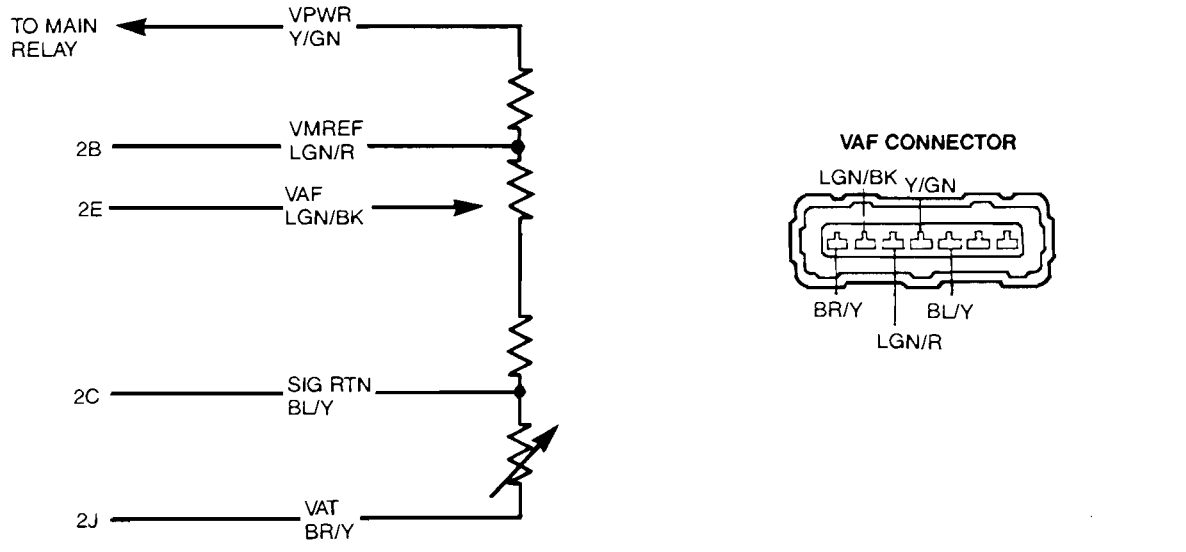
Remember

This Pinpoint Test and wiring diagram are intended to diagnose only the following:

- Circuit: (VAF)

Pinpoint Test Schematic

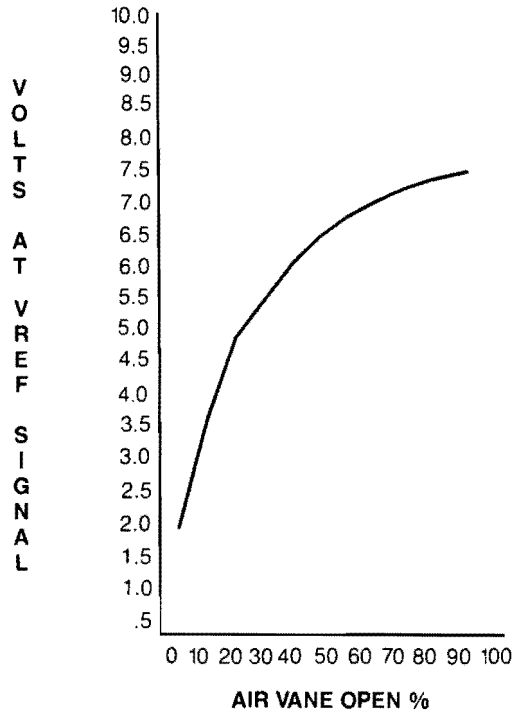
VANE AND FLOW METER AND VANE AIR TEMPERATURE SENSOR



Vane Air Flow Meter

All Engines

VAF



ALL MEASUREMENTS: KEY ON, ENGINE OFF

AIR VANE OPEN%	VOLTAGE
100	7.50
90	7.44
80	7.30
70	7.12
60	6.90
50	6.59
40	6.15
30	5.6
20	4.68
10	3.23
0	1.9

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Vane Air Flow Meter

All Engines

VAF

TEST STEP	RESULT ▶	ACTION TO TAKE
VAF1 VAF INPUT VOLTAGE • Install breakout box. • Key on, engine off. • Cycle the VAF meter air door from fully closed to fully opened. • Measure the voltage between pins VAF and SIGRTN. • Compare voltage readings to the data sheet. • **Are the voltage readings OK?**	Yes ▶ No ▶	GO to **VAF2** . GO to **VAF3** .
VAF2 VAF REFERENCE VOLTAGE • Key on, engine off. • Measure the voltage between pins VMREF and SIGRTN. • **Is the voltage between 7-9V?**	Yes ▶ No ▶	VAF OK. If directed here from **QT12** , RETURN to Quick Test, otherwise REPLACE ECA. GO to **VAF3** .
VAF3 VAF SIGNAL WIRE • Disconnect VAF meter connector. • Jumper the VPWR, VMREF and SIGRTN from the VAF connector to the VAF meter. • Key on, engine off. • Measure the voltage between the SIGRTN and the VAF terminal on the VAF meter. • Compare voltage readings to the data sheet. • **Are the voltage readings OK?**	Yes ▶ No ▶	REPAIR VAF Signal Wire to ECA. GO to **VAF4** .
VAF4 VAF SIGNAL WITHOUT VMREF • Disconnect VAF meter connector. • Jumper the VPWR, and the SIGRTN from the VAF connector to the VAF meter. • Key on, engine off. • Measure the voltage between the SIGRTN and the VAF terminal on the VAF meter. • Compare voltage readings to the data sheet. • **Are the voltage readings OK?**	Yes ▶ No ▶	REPAIR VMREF wire to ECA. GO to **VAF5** .

Vane Air Flow Meter

All Engines

VAF

TEST STEP	RESULT ▶	ACTION TO TAKE
VAF5 VPWR/SIGRTN AT VAF METER • Disconnect VAF meter connector. • Key on, engine off. • Measure the voltage between the SIGRTN and the VPWR wire. • **Is the voltage reading above 10V?**	Yes ▶ No ▶	REPLACE VAF meter. GO to **VAF6**.
VAF6 VPWR AT VAF METER • Disconnect VAF meter connector. • Key on, engine off. • Measure the voltage between GROUND and the VPWR wire. • **Is the voltage reading above 10V?**	Yes ▶ No ▶	REPAIR SIGRTN wire to ECA. GO to Pinpoint Test **VPWR**.

Vane Air Temperature Sensor	All Engines	VAT

Note

You should enter this Pinpoint Test only when a Service Code 10 is received in Quick Test Steps QT6 or QT7 or when Quick Test Step QT12 directs you here.

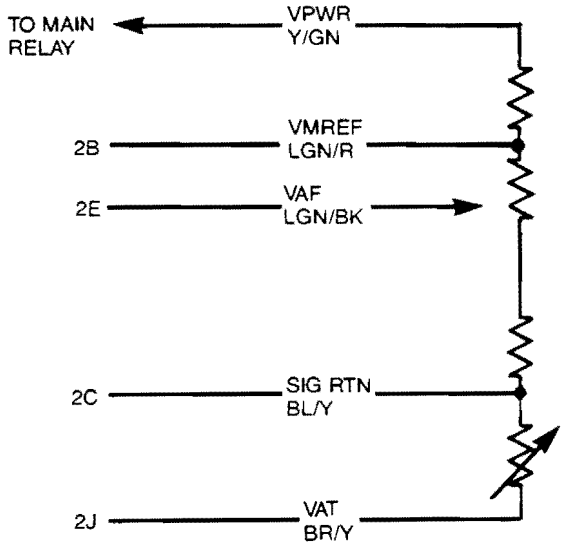
Remember

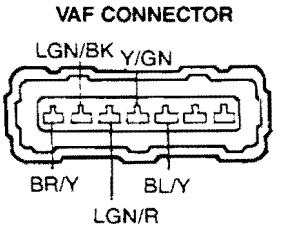
This Pinpoint Test and wiring diagram are intended to diagnose only the following:

- Circuit: (VAT)

Pinpoint Test Schematic

VANE AND FLOW METER AND VANE AIR TEMPERATURE SENSOR





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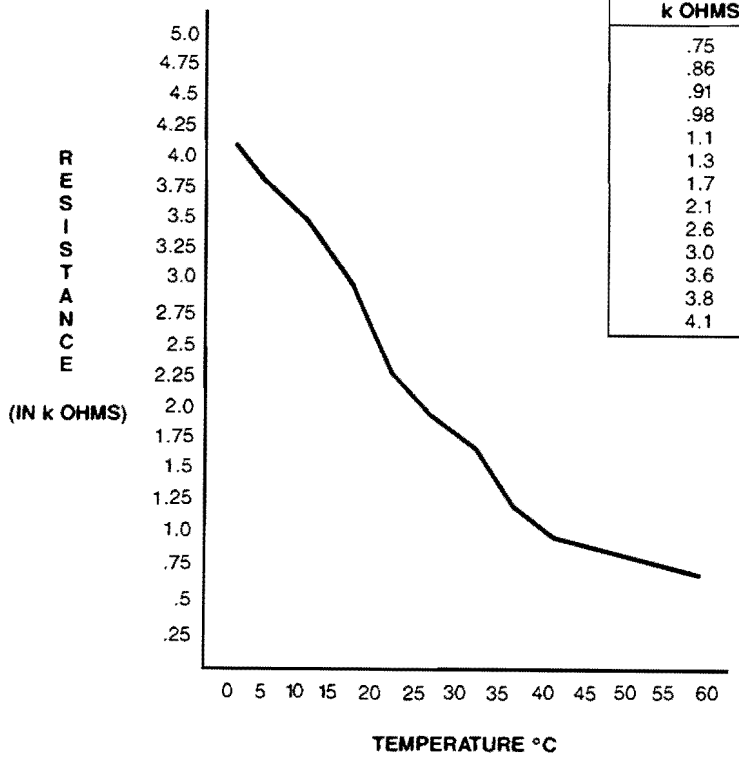
Vane Air Temperature Sensor

All Engines

VAT

VAT SENSOR

RESISTANCE k OHMS	TEMP °C	VOLTS
.75	60	.75
.86	55	.86
.91	50	.91
.98	45	.98
1.1	40	1.1
1.3	35	1.3
1.7	30	1.7
2.1	25	2.1
2.6	20	2.6
3.0	15	3.0
3.6	10	3.6
3.8	5	3.8
4.1	0	4.1



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Vane Air Temperature Sensor

All Engines

VAT

TEST STEP	RESULT ▶	ACTION TO TAKE
VAT1 VAT INPUT VOLTAGE • Install breakout box. • Key on, engine off. • Monitor the temperature near the VAF. • Measure the voltage between pins VAT and SIGRTN. • Compare voltage readings to the data sheet. • **Are the voltage readings OK?**	Yes ▶ No ▶	VAT Sensor OK. If directed here from QT12, RETURN to Quick Test, otherwise REPLACE ECA. GO to VAT2.
VAT2 VAT INPUT RESISTANCE • Disconnect ECA from breakout box. • Key on, engine off. • Monitor the temperature near the VAF. • Measure the resistance between pins VAF and SIGRTN. • Compare resistance readings to the data sheet. • **Are the resistance readings OK?**	Yes ▶ No ▶	VAT Sensor OK. GO to VAT3.
VAT3 VAT CIRCUIT • Disconnect VAF meter connector. • Disconnect ECA. • Key off. • Measure resistance between Pin 2J and VAT pin on VAF connector. • **Is the resistance greater than 5 ohms?**	Yes ▶ No ▶	REPAIR VAT signal wire. GO to VAT4.
VAT4 SIGNAL RETURN • Disconnect VAF meter connector. • Disconnect ECA. • Key off. • Measure resistance between Pin 2C and SIGRTN pin on VAF connector. • **Is the resistance greater than 5 ohms?**	Yes ▶ No ▶	REPAIR Signal Return wire. REPLACE VAF Meter.

Vehicle Power	All Engines	VPWR

Note

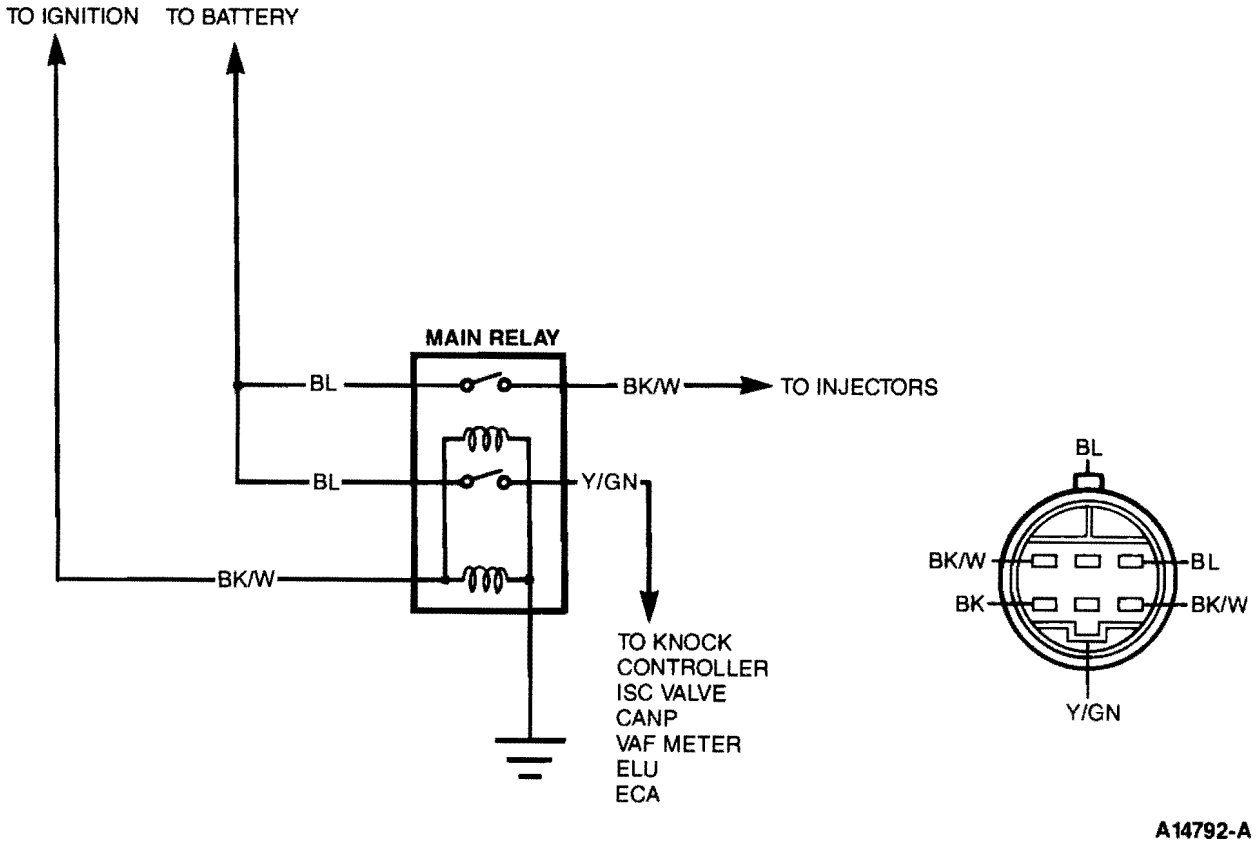
You should enter this Pinpoint Test only when directed here by Quick Test Step QT5 or other Pinpoint Tests.

Remember

This Pinpoint Test and wiring diagram are intended to diagnose only the following:

- Circuits: (VPWR and GND)

Pinpoint Test Schematic



Vehicle Power	All Engines	VPWR

TEST STEP	RESULT ▶	ACTION TO TAKE
VPWR1 VPWR TO ECA		
• Connect breakout box (leave ECA disconnected). • Key on. • Measure voltage between VPWR Test Pin 3I and GROUND. • **Is the voltage above 10V?**	Yes ▶	If directed here from the Quick TEST, GO to **VPWR2**, otherwise GO to **VPWR3**.
	No ▶	GO to **VPWR3**.
VPWR2 GROUND AT ECA		
• Connect breakout box (leave ECA disconnected). • Key on. • Measure voltage between the VPWR test pin and test pin GND. • Repeat for all GND Test Pins 2R, 3A, 3G. • **Is voltage above 10V for each circuit?**	Yes ▶	GO to Pinpoint Test **VREF**.
	No ▶	SERVICE ECA GND wires.
VPWR3 VPWR FROM MAIN RELAY		
• Disconnect Main Relay connector. • Jumper BATT, PWR and GND wires from the Main Relay connector to their respective terminals on the Main Relay. • Key on. • Measure the voltage at the Main Relay VPWR terminal. • **Is the voltage greater than 10V?**	Yes ▶	SERVICE Main Relay VPWR wire to ECA.
	No ▶	GO to **VPWR4**.
VPWR4 BATTERY TO MAIN RELAY		
• Disconnect Main Relay connector. • Measure the voltage between the BATT terminal on the connector and GROUND. • **Is the voltage above 10V?**	Yes ▶	GO to **VPWR5**.
	No ▶	SERVICE Main Relay BATT wire.
VPWR5 IGNITION POWER TO MAIN RELAY		
• Disconnect Main Relay connector. • Key on. • Measure the voltage between the PWR terminal on the connector and GROUND. • **Is the voltage above 10V?**	Yes ▶	GO to **VPWR6**.
	No ▶	SERVICE Main Relay PWR wire.

Vehicle Power	All Engines	VPWR

TEST STEP	RESULT ▶	ACTION TO TAKE
VPWR6 GROUND AT MAIN RELAY		
• Disconnect Main Relay connector. • Key on. • Measure the voltage between the BATT and GND wires on the connector. • **Is the voltage above 10V?**	Yes ▶ No ▶	REPLACE Main Relay. SERVICE Main Relay GND wire.

Reference Voltage	All Engines	VREF

Note

You should enter this Pinpoint Test only when directed here by Quick Test Step QT12 or by Diagnostic Routines.

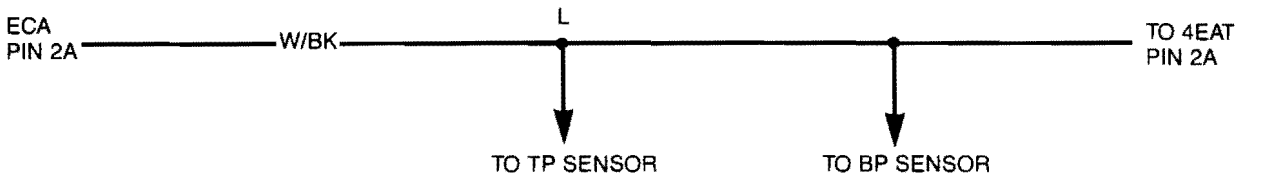
Remember

This Pinpoint Test and wiring diagram are intended to diagnose only the following:

- Circuits: (VREF, SIGRTN)

Pinpoint Test Schematic

REFERENCE VOLTAGE



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Reference Voltage

All Engines

VREF

TEST STEP	RESULT ▶	ACTION TO TAKE
VREF1 CHECK REFERENCE VOLTAGE • Connect breakout box (ECA connected). • Key on. • Measure voltage between VREF test pin and GROUND. • **Is voltage between 4 and 5V?**	Yes ▶	GO to **VREF4**. If 0V, GO to **VREF3**. If greater than 10V, GO to **VREF2**.
VREF2 VREF SHORT TO POWER • Connect breakout box (leave ECA disconnected). • Key on. • Measure voltage between the VREF test pin and GROUND. • **Is voltage above 10V?**	Yes ▶ No ▶	SERVICE VREF short to power. REPLACE ECA.
VREF3 VREF FROM SHORT TO GROUND • Connect breakout box (leave ECA disconnected). • Disconnect 4EAT module (if equipped). • Disconnect TP and BP sensors. • Key off. • Measure the resistance between the VREF test pin and GROUND. • **Is the resistance under 10,000 ohms?**	Yes ▶ No ▶	SERVICE VREF short to GROUND. REPLACE ECA.
VREF4 VREF CHECK AT SENSORS • Connect breakout box (ECA connected). • Disconnect TP and BP sensors. • Key on, engine off. • Measure the voltage between the VREF terminal on the TP connector and GROUND. • Repeat for the BP connector. • **Are both readings 4 to 5V?**	Yes ▶ No ▶	VREF OK. SERVICE wire in question.

Vehicle Speed Sensor	All Engines	VSS

Note

You should enter this Pinpoint Test only when a Service Code 6 is received in Quick Test Steps QT6 or QT7 or when Quick Test Step QT12 directs you here.

Remember

This Pinpoint Test and wiring diagram are intended to diagnose only the following:

- Circuit: (VSS)

Pinpoint Test Schematic

VEHICLE SPEED SENSOR

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Vehicle Speed Sensor

All Engines

VSS

TEST STEP	RESULT ▶	ACTION TO TAKE
VSS1 VSS INPUT SIGNAL		
NOTE: If the speedometer is not working, verify that the speedometer drive gear and cable are OK before proceeding with the VSS SIGNAL tests. • Install 4EAT tester (leave 4EAT disconnected). • Disconnect speedometer cable from transaxle. • Measure resistance between the VSS and GND test pins. • Rotate speedometer cable. • **Does resistance drop to less than 5 ohms four times per revolution of the speedometer cable?**	Yes ▶ No ▶	VSS circuit is functional. If sent here from QT12 then return, otherwise REPLACE 4EAT. GO to VSS2.
VSS2 VSS SIGNAL FROM SENSOR		
• Disconnect VSS connector at instrument cluster. • Disconnect speedometer cable from transaxle. • Measure resistance between the VSS and GND terminals on the instrument cluster. • Rotate the speedometer cable. • **Does resistance drop to less than 5 ohms four times per revolution of the speedometer cable?**	Yes ▶ No ▶	SERVICE VSS signal wire to 4EAT. REPLACE Speedometer/ Tachometer assembly.

Water Temperature Switch	4EAT	WTS

Note

You should enter this Pinpoint Test only when referred here by Section 2, Diagnostic Routines or Capri Shop Manual Section 17-01.

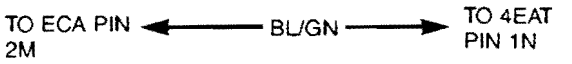
Remember

This Pinpoint Test and wiring diagram are intended to diagnose only the following:

- Circuit: (WTS)

Pinpoint Test Schematic

WATER TEMPERATURE SWITCH



A14800-A

Water Temperature Switch | 4EAT | WTS

TEST STEP	RESULT ▶	ACTION TO TAKE
WTS1 WTS SIGNAL CHECK • Connect breakout box (leave ECA connected). • Key on, engine running. • Measure the voltage between the WTS test pin and GND. • Compare measurements to the table below: **COOLANT TEMPERATURE** / **VOLTAGE** Greater than 17°C / Greater than 10V Less than 17°C / Less than 1.5V • **Are the measurements OK?**	Yes ▶ No ▶	WTS is functioning properly. GO to **WTS2**.
WTS2 WTS SIGNAL CONTINUITY • Connect breakout box (leave ECA disconnected). • Disconnect 4EAT. • Key off. • Measure the resistance between the WTS test pin and WTS signal wire in the 4EAT connector. • **Is the resistance less than 5 ohms?**	Yes ▶ No ▶	GO to **WTS3**. SERVICE WTS signal wire.
WTS3 WTS SHORT CHECK • Connect breakout box (leave ECA disconnected). • Disconnect 4EAT. • Key off. • Measure the resistance between the WTS test pin and GND. • **Is the resistance less than 5 ohms?**	Yes ▶ No ▶	SERVICE WTS signal wire. TEST the ECT circuit. If the ECT is OK, REPLACE THE ECA.