

# SECTION 5B

## EEC Quick Test Procedures and Appendix (Includes 4EAT Quick Test Procedures)

### Contents

EEC Quick Test.....	5B-1
Description.....	5B-1
EEC Quick Test Summary Flowchart.....	5B-2
Diagnostic Trouble Code Chart .....	5B-10
Switch Monitor Test Chart .....	5B-11
4EAT Quick Test .....	5B-13
Description.....	5B-13
4EAT Quick Test Summary Flowchart .....	5B-14
Diagnostic Trouble Code Chart .....	5B-22
Switch Monitor Test Chart .....	5B-23
Appendix .....	5B-25
EEC Quick Test Equipment Hookup.....	5B-25
4EAT Quick Test Equipment Hookup .....	5B-28
Diagnostic Test Mode Description.....	5B-30
Code Output Format .....	5B-30
Reading EEC and 4EAT Codes With New Generation Star (NGS) Scan Tool .....	5B-32

# SECTION 5B

## EEC Quick Test Procedures and Appendix (Includes 4EAT Quick Test Procedures)

### Contents (continued)

Reading EEC and 4EAT Codes With Super STAR II Tester .....	5B-38
Reading EEC and 4EAT Codes With Analog Voltmeter .....	5B-38
Reading EEC Codes With Malfunction Indicator Lamp (MIL) .....	5B-39
Reading 4EAT Codes With Overdrive Off Lamp (ODL) — 1.6L 4EAT and 2.5L 4EAT Only .....	5B-40
Reading 4EAT Codes With Malfunction Indicator Lamp (MIL) — 1.8L 4EAT .....	5B-40
Erasing Diagnostic Trouble Codes .....	5B-40
Specifications / Special Service Tools .....	5B-41
Special Service Tools / Equipment .....	5B-41

# EEC Quick Test

# QT

## Description

For a detailed description on PCM Diagnostic Test Mode and equipment operation, refer to the Appendix.

This diagnostic procedure is used on the following vehicle systems:

- 1.3L
- 1.6L
- 1.8L
- 2.5L

NOTE: 1.9L and 2.0L vehicles are covered in the "A" portions of this manual.

## Definition

Quick Test is a check of system electronics which utilizes the control module of each system to perform diagnostics on itself and its circuitry. This module capability is referred to as Diagnostic Test Mode. Since little effort is required to initiate Diagnostic Test Mode, but in return vital information is retrieved quickly, this procedure is referred to as Quick Test.

### CAUTION

Although Quick Test appears to be a fast and powerful diagnostic aid, it unfortunately cannot detect all possible failures that can occur within the EEC systems. Therefore, the Quick Test procedures in this manual have been carefully constructed to guide and refer you to Pinpoint Tests that inspect components and circuitry associated with particular symptoms.

Keep in mind that all things that went wrong with cars before the age of electronics reached the automobile, can still go wrong and are still the cause of the majority of the driveability problems. That's why the best diagnosis starts with a list of symptoms and possible causes, followed by a careful checking of those causes in the most probable order.

## Directions

When the Diagnostic Routines direct you to a Quick Test, perform all of the Quick Test step-by-step, following directions in the "Action To Take" column. If all phases of the Quick Test give no indication of a problem, it is likely that the problem is non-electronic and will be found elsewhere. You should return to Section 2B, Diagnostic Routines for the next possible fault for that particular symptom.

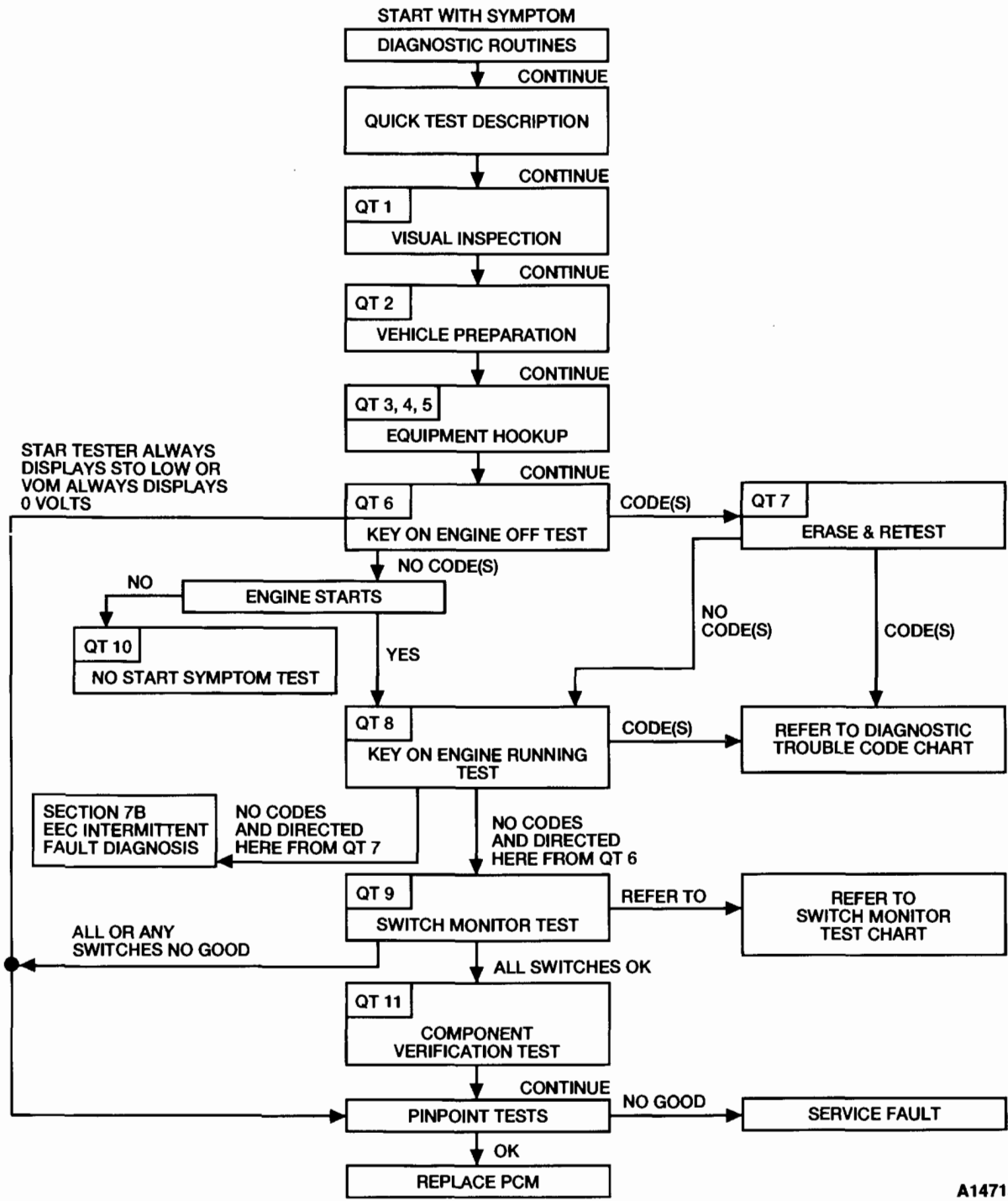
When directed to a Pinpoint Test, always read the cover page(s) for special notes and look carefully at the Pinpoint Test schematic. When a repair has been made, erase codes and rerun the Quick Test to confirm the repair was effective.

## Diagnostic Aids

The following flowchart can be used as a guide for better understanding of the Quick Test flow path. It is not intended as a diagnostic procedure on its own, nor does it contain the detailed information required to run Quick Test.

<h1>EEC Quick Test</h1>	<h1>QT</h1>
-------------------------	-------------

EEC Quick Test Summary Flowchart



A14715-D

## EEC Quick Test

QT

TEST STEP		RESULT	ACTION TO TAKE
QT1	PERFORM VISUAL INSPECTION		
	<ul style="list-style-type: none"> <li>● Inspect the air cleaner and inlet ducting, tubes, and clamps.</li> <li>● Check all engine vacuum hoses for damage, leaks, cracks, blockage, improper routing, etc.</li> <li>● Check the PCM wiring harness for improper connections, bent or broken pins, corrosion, loose wires, improper routing, blown fuses, etc.</li> <li>● Check the processor, sensors, and actuators for physical damage.</li> <li>● Check the engine coolant for proper level.</li> <li>● Check the engine oil level and quality.</li> <li>● Check the battery voltage. Refer to Service Manual Section 14-01 for checking and charging procedures.</li> <li>● <b>Do all components and fluids appear OK?</b></li> </ul>	<p>Yes</p> <p>No</p>	<ul style="list-style-type: none"> <li>▶ GO to <b>QT2</b>, Vehicle Preparation.</li> <li>▶ <b>SERVICE</b> the fault(s) in the system as required and <b>REEVALUATE</b> the symptom(s).</li> </ul>
QT2	PERFORM VEHICLE PREPARATION		
	<ul style="list-style-type: none"> <li>● Perform all the following safety steps required to start and run vehicle tests: <ul style="list-style-type: none"> <li>— Apply the parking brake.</li> <li>— Place the selector lever firmly into the PARK position (NEUTRAL on manual transaxle).</li> <li>— Block the drive wheels.</li> </ul> </li> <li>● Turn off all electrical loads: <ul style="list-style-type: none"> <li>— Radios</li> <li>— Lights</li> <li>— A/C</li> <li>— Rear window defroster</li> <li>— Heater, blower fans, etc.</li> </ul> </li> <li>● <b>Have all the safety steps been performed and all electrical loads been turned off?</b></li> </ul>	<p>Yes (Using New Generation Star [NGS] Scan Tool)</p> <p>Yes (Using Super STAR II Tester)</p> <p>Yes (Using Analog VOM or Malfunction Indicator Lamp [MIL])</p> <p>No</p>	<ul style="list-style-type: none"> <li>▶ GO to <b>QT3</b>, Equipment Hookup.</li> <li>▶ GO to <b>QT4</b>, Equipment Hookup.</li> <li>▶ GO to <b>QT5</b>, Equipment Hookup.</li> <li>▶ Personal safety and correct diagnostic results are dependent on test step <b>QT2</b>. <b>MAKE</b> all the necessary repairs to perform vehicle preparation.</li> </ul>

## EEC Quick Test

QT

TEST STEP		RESULT	ACTION TO TAKE
<b>QT3</b>	PERFORM EQUIPMENT HOOKUP (NEW GENERATION STAR [NGS] SCAN TOOL ONLY)		
	NOTE: Refer to Figure 2 and Figure 3 in Appendix for proper hookup.	Yes	▶ GO to <b>QT6</b> , Key ON, Engine Off Test.
	<ul style="list-style-type: none"> <li>● Key OFF.</li> <li>● Connect the DLC Adapter to the Diagnostic Data Link (DDL) connector on the Rotunda NGS Scan Tool 007-00500.</li> <li>● Connect Rotunda Super MECS Adapter 007-00052 to the DLC Adapter.</li> <li>● Connect the adapter cable leads to the STO and STI connectors on the 1.6L engine or to the Data Link Connector (DLC) on the 1.3L, 1.8L, and 2.5L engines.</li> <li>● Connect the adapter cable ground clip to the negative (-) battery terminal for the 1.6L engine.</li> <li>● Slide the adapter switch on the Super MECS Adapter to the PCM position for the 1.3L, 1.8L, and 2.5L engines.</li> <li>● Connect the NGS Power Cable to the battery with the battery adapter.</li> <li>● <b>Is equipment hooked up properly?</b></li> </ul>	No	▶ SERVICE the fault(s) as necessary and REPEAT <b>QT3</b> .
<b>QT4</b>	PERFORM EQUIPMENT HOOKUP (SUPER STAR II TESTER ONLY)		
	NOTE: Refer to Figure 2 and Figure 3 in Appendix for proper hookup.	Yes	▶ GO to <b>QT6</b> , Key ON, Engine Off Test.
	<ul style="list-style-type: none"> <li>● Key OFF.</li> <li>● Connect Rotunda Super MECS Adapter 007-00052 to the Rotunda Super STAR II Tester 007-0041B. The previously issued Rotunda Adapter 007-00036 may still be used on the 1.6L engine while Rotunda Adapter 007-00049 may be used on the 1.3L, 1.8L, and 2.5L engines.</li> <li>● Connect the adapter cable leads to the STO and STI connectors on the 1.6L engine or to the Data Link Connector (DLC) on the 1.3L, 1.8L, and 2.5L engines.</li> <li>● Connect the adapter cable ground clip to the negative (-) battery terminal for the 1.6L engine.</li> <li>● Slide the adapter switch on the Super MECS adapter to the PCM position for the 1.3L, 1.8L, and 2.5L engines.</li> <li>● Slide the Super STAR II Tester switch to the MECS position.</li> <li>● <b>Is equipment hooked up properly?</b></li> </ul>	No	▶ SERVICE the fault(s) as necessary and REPEAT <b>QT4</b> .

<h1>EEC Quick Test</h1>	<h1>QT</h1>
-------------------------	-------------

	TEST STEP	RESULT	ACTION TO TAKE
<b>QT5</b>	<p>PERFORM EQUIPMENT HOOKUP (ANALOG VOM OR MALFUNCTION INDICATOR LAMP [MIL] ONLY)</p> <p>NOTE: Refer to Figure 2 and Figure 3 in Appendix for proper hookup.</p> <ul style="list-style-type: none"> <li>● <b>If using Analog VOM</b> <ul style="list-style-type: none"> <li>— Key OFF.</li> <li>— Connect the VOM positive (+) lead to the PCM STO line and the negative (-) lead to engine ground.</li> <li>— Jumper the PCM STI to engine ground.</li> <li>— Set the VOM on a DC voltage range to read from 0 to 20 volts.</li> </ul> </li> <li>● <b>If using Malfunction Indicator Lamp (MIL)</b> <p>NOTE: If the MIL flashes continuously prior to equipment hookup, go to Section 6B, EEC Pinpoint Test STI.</p> <ul style="list-style-type: none"> <li>— To use the MIL, jumper the PCM STI line to engine ground.</li> </ul> </li> <li>● <b>Is equipment hooked up properly?</b></li> </ul>	<p>Yes</p> <p>No</p>	<ul style="list-style-type: none"> <li>▶ GO to <b>QT6</b>, Key ON, Engine Off Test.</li> <li>▶ SERVICE the fault(s) as necessary and REPEAT <b>QT5</b>.</li> </ul>

<h1>EEC Quick Test</h1>	<h1>QT</h1>
-------------------------	-------------

	TEST STEP	RESULT	ACTION TO TAKE
<b>QT6</b>	<p><b>PERFORM KEY ON ENGINE OFF TEST</b></p> <ul style="list-style-type: none"> <li>● Follow one of the test procedures based on the type of equipment used:</li> </ul> <p>NOTE: When performing the Diagnostic Test Mode on the 1.8L 4EAT either engine or transaxle codes can be received. Refer to the 4EAT Quick Test in this section for a list of transaxle related codes.</p> <ul style="list-style-type: none"> <li>● <b>If using New Generation Star (NGS) Scan Tool</b> <ul style="list-style-type: none"> <li>— Follow the procedure in the Appendix to activate and deactivate the Diagnostic Test Mode.</li> </ul> </li> <li>● <b>Are any diagnostic codes present?</b></li> <li>● <b>If using Super STAR II Tester</b> <ul style="list-style-type: none"> <li>— Latch the center button to the TEST position.</li> <li>— Turn the Super STAR II Tester ON (the tester will sound and "888" will be displayed for two seconds).</li> <li>— Key ON.</li> <li>— Unlatch and relatch the center test button.</li> <li>— After all codes are received, unlatch the center button to review all codes retained in tester memory.</li> </ul> </li> </ul> <p>NOTE: The "STI LO" indicator will flash as the codes are received by the Super STAR II Tester. If the "STI LO" indicator goes out and does not come back on, no codes exist.</p> <ul style="list-style-type: none"> <li>● <b>Are any diagnostic trouble codes present?</b></li> <li>● <b>If using Analog VOM</b> <ul style="list-style-type: none"> <li>— Key ON.</li> <li>— Turn the VOM ON.</li> <li>— Observe the VOM needle for any code indications. Refer to appendix to interpret observed codes.</li> </ul> </li> <li>● <b>Are any diagnostic trouble codes present?</b></li> <li>● <b>If using Malfunction Indicator Lamp (MIL)</b> <ul style="list-style-type: none"> <li>— Key ON.</li> <li>— Observe the MIL. Refer to appendix to interpret observed codes.</li> </ul> </li> <li>● <b>Are any diagnostic trouble codes present?</b></li> </ul>	<p>Yes Code(s)</p> <p>No codes present and STAR Tester always displays STO LO, or VOM always displays 0 volts</p> <p>No codes and engine starts</p> <p>No codes and no start</p>	<ul style="list-style-type: none"> <li>▶ GO to <b>QT7</b>, Erase and Retest.</li> <li>▶ GO to EEC Pinpoint Test <b>STI</b>, Section 6B.</li> <li>▶ GO to <b>QT8</b>, Key ON Engine Running Test.</li> <li>▶ GO to <b>QT10</b>, Check For Spark.</li> </ul>



<h1>EEC Quick Test</h1>	<h1>QT</h1>
-------------------------	-------------

	TEST STEP	RESULT	ACTION TO TAKE
<b>QT7</b>	<p><b>ERASE AND RETEST</b></p> <p>NOTE: Erasing diagnostic trouble codes and retesting will give an indication whether diagnostic trouble codes received in test step QT6 represent hard or intermittent faults. Hard fault codes will repeat immediately and will be displayed during retest.</p> <ul style="list-style-type: none"> <li>● Confirm code(s) were received in test step QT6.</li> <li>● Turn the Super STAR II Tester or VOM OFF, or disconnect the NGS Scan Tool.</li> <li>● Disconnect the negative battery cable and depress the brake pedal for 5- 10 seconds to erase codes in memory.</li> <li>● Reconnect the negative battery cable.</li> <li>● Perform the Key ON Engine Off Test as instructed in test step QT6.</li> </ul> <p>NOTE: If codes retrieved the first time cannot be re-created, it may be necessary to tap suspect sensors, shake and wiggle harness, or drive the vehicle in order to induce a failure. Repeat step QT6 each time.</p> <ul style="list-style-type: none"> <li>● <b>Are any diagnostic trouble codes present?</b></li> </ul>	<p>Yes code(s)</p> <p>No codes</p> <p>No codes and no start</p>	<p>▶ REFER to the Diagnostic Trouble Code Chart after Quick Test for Pinpoint Test direction.</p> <p>▶ GO to <b>QT8</b>, Key ON Engine Running Test.</p> <p>▶ GO to <b>QT10</b>, Check For Spark.</p>
<b>QT8</b>	<p><b>PERFORM KEY ON ENGINE RUNNING TEST</b></p> <p>NOTE: If using the New Generation Star (NGS) Scan Tool, follow the procedure in the Appendix to activate and deactivate the Diagnostic Test Mode.</p> <ul style="list-style-type: none"> <li>● Deactivate the Diagnostic Test Mode by unlatching the center button on the Super STAR II Tester and turning the tester OFF, or disconnect the jumper connecting PCM STI to ground if using VOM or MIL.</li> <li>● Connect a Rotunda 88 Digital Multimeter 105-00053, or equivalent as a tachometer.</li> <li>● Run the engine at 2000 rpm for three minutes.</li> <li>● If using Super STAR II Tester, turn the Super STAR II Tester ON.</li> <li>● Latch the center button on the Super STAR II Tester, or jumper the PCM STI to ground if using VOM or MIL.</li> <li>● Turn the engine off.</li> <li>● Start the engine and run the engine at idle.</li> <li>● Activate the Diagnostic Test Mode by unlatching then relatching the Super STAR II Tester.</li> <li>● <b>Are any diagnostic trouble codes present?</b></li> </ul>	<p>Yes Code(s)</p> <p>No Codes and sent here by QT6</p> <p>No codes and sent here by QT7</p>	<p>▶ REFER to the Diagnostic Trouble Code Chart after Quick Test for Pinpoint Test direction.</p> <p>▶ GO to <b>QT9</b>, Switch Monitor Test.</p> <p>▶ GO to Section 7B, EEC Intermittent Fault Diagnosis.</p>

## EEC Quick Test

QT

TEST STEP		RESULT	ACTION TO TAKE
<b>QT9</b>	<b>PERFORM SWITCH MONITOR TEST</b>		
	<p>NOTE: If using the New Generation Star (NGS) Scan Tool, follow the procedure in the Appendix to activate and deactivate the Switch Monitor Test.</p> <p>NOTE: A list of switches to be tested is found in the Switch Monitor Test Charts located after EEC Quick Test.</p> <ul style="list-style-type: none"> <li>● The Switch Monitor Test checks input signals from the individual input switches to the PCM.</li> <li>● Test all switches individually - leaving a switch ON while testing another will lead to a false test result.</li> <li>● Turn engine off and allow to cool before starting Switch Monitor Test.</li> <li>● If using Super STAR II Tester, deactivate Diagnostic Test Mode by unlatching the center button of the Super STAR II Tester and turning the tester OFF.</li> <li>● Turn all accessories off.</li> <li>● Apply the parking brake.</li> <li>● Place transaxle in NEUTRAL or PARK.</li> <li>● Key ON.</li> <li>● If using Super STAR II Tester, leave tester connected, turn tester ON, latch center button, and watch the output of the LED on the adapter cable as each switch is exercised.</li> <li>● If using VOM, jumper PCM STI to ground, connect VOM(+) lead to SML line and (-) lead to engine ground. (See illustration in Appendix).</li> <li>● <b>Do all the switches listed in the switch monitor test charts test OK?</b></li> </ul>	<p>Yes All switches OK</p> <p>No All switches fail</p> <p>One or more switches fail</p>	<p>▶ GO to <b>QT11</b>, Component Verification Test.</p> <p>▶ GO to EEC Pinpoint Test <b>SML</b> in Section 6B.</p> <p>▶ GO to Section 6B, EEC Pinpoint Test(s), for all switches that fail. REFER to the Switch Monitor Test Charts found after Quick Test for the list of Pinpoint Tests.</p>
<b>QT10</b>	<b>CHECK FOR SPARK</b>		
	<ul style="list-style-type: none"> <li>● Key OFF.</li> <li>● Connect a Rotunda Air Gap Spark Tester D81P-6666-A, or equivalent, between the # 1 spark plug wire (plug end) and ground.</li> <li>● Crank engine using ignition switch.</li> <li>● Repeat for all spark plug wires.</li> <li>● <b>Were sparks present at all wires?</b></li> </ul>	<p>Yes</p> <p>No</p>	<p>▶ GO to Section 9B, Fuel Delivery / Turbocharger System.</p> <p>▶ GO to Section 8B, Ignition Systems.</p>



## EEC Quick Test

QT

## Diagnostic Trouble Code Chart

Diagnostic Trouble Code	Component	Pinpoint Test Step Direction (Refer to Section 6B)			
		1.3L	1.6L	1.8L	2.5L
01	Ignition Diagnostic Monitor	—	IDM	—	—
02	CKP Sensor	—	—	CKP	CKP2
03	CID Sensor	CID	CID	CID	CID
04	CKP Sensor	CKP	—	—	CKP1
05	Knock Sensor	—	—	—	KS
06	Vehicle Speed Sensor	VSS	—	—	—
08	Air Flow Meter	MAF	VAF	VAF	MC-VAF
09	ECT Sensor	ECT	ECT	ECT	ECT
10	IAT Sensor	IAT	IAT	IAT	IAT
12	TP Sensor	TP	TP	TP	TP
14	BARO Sensor	BARO	BARO	BARO	BARO
15	(Heated) Oxygen Sensor	O2S	O2S	O2S	HO2S
16	EGRT Sensor / EVP Sensor	EVP	—	—	EVP
17	(Heated) Oxygen Sensor	O2S	O2S	O2S	HO2S
23	Heated Oxygen Sensor	—	—	—	HO2S
24	Heated Oxygen Sensor	—	—	—	HO2S
25	FPRC Solenoid	—	SCG	SCG	SCG
26	CANP Solenoid	—	SCG	SCG	SCG
28	EGRC Solenoid	—	—	—	SCG
29	EGRV Solenoid	—	—	—	SCG
34	IAC Solenoid	—	SCG	SCG	SCG
41	HSIA Solenoid / VRIS1 Solenoid	—	—	SCG	SCG
46	VRIS2 Solenoid	—	—	—	SCG
67	LFAN Relay	—	—	—	ROC
Codes Not Listed	—	PGC	PGC	PGC	PGC

\* NOTE: Both engine and transaxle codes may be received during the self test on 1.8L 4EAT engines.

## EEC Quick Test

QT

## Switch Monitor Test Chart

Switch/Relay	1.3L	1.6L Non-Turbo	1.6L Turbo	1.8L	2.5L	Condition	Super STAR II Tester / NGS Scan Tool LED, or Analog VOM Indication	EEC Pinpoint Test
A/C Selector (ACS) Switch	X	X	X	X	X	A/C selector switch on (blower switch on 1st position for 1.3L, 1.6L, and 1.8L)	LED on, or less than 1.5 volts	STG
Blower Motor (BLMT) Switch	X	X	X	X	X	Blower switch on 2nd or above position for 1.3L, 1.6L, 1.8L, and 3rd or Hi position with mode switch on for 2.5L	LED on, or less than 1.5 volts	STG (ELU for 1.6L)
Brake ON/OFF (BOO) Switch	X	X	X	X MTX	X	Brake pedal depressed	LED on, or less than 1.5 volts	STP
Coolant Temperature Switch (CTS)		X	X	X		Cooling fan on low speed (ground fan if necessary)	LED on, or less than 1.5 volts	STP (ELU for 1.6L)
Daytime Running Lamp (DRL) Relay (Canada Only)					X	Parking brake released	LED on, or less than 1.5 volts	DRL
Headlamp (HDLP) Switch	X	X	X	X	X	Headlamp switch on	LED on, or less than 1.5 volts	STP (ELU for 1.6L)
High Cooling Fan (HFAN) Relay					X	Accelerator pedal depressed (fan should operate at high speed)	LED on, or less than 1.5 volts	ROC
Idle (IDL) Switch	X	X	X	X	X	Accelerator pedal depressed	LED on, or less than 1.5 volts	STG
Knock Control (KC)			X			Tap on engine lift bracket while engine running	LED on, or less than 1.5 volts	KC
Cooling Fan Relay (CFR)	X					Accelerator pedal depressed (fan should operate)	LED on, or less than 1.5 volts	ROC
Manual Lever Position (MLP) Switch (ATX)	X	X		X	X	Selector lever in R, $\odot$ , D, L for 1.8L or R, D, 2, 1 for 1.3L, 1.6L, and 2.5L	LED on, or less than 1.5 volts	STP

(Continued)

## EEC Quick Test

QT

Switch / Relay	1.3L	1.6L Non- Turbo	1.6L Turbo	1.8L	2.5L	Condition	Super STAR II Tester / NGS Scan Tool LED, or Analog VOM Indication	EEC Pinpoint Test
Park/Neutral Position (PNP) Switch / Clutch Pedal Position (CPP) Switch (MTX)	X	X	X	X	X	Transaxle in gear and clutch pedal released	LED on, or less than 1.5 volts	STG
Rear Defroster (DEF) Switch	X	X	X	X	X	Rear defroster switch on	LED on, or less than 1.5 volts	STP (ELU for 1.6L)
Wide-Open Throttle (WOT) Switch			X	X MTX		Accelerator pedal fully depressed	LED off, or 12 volts	STG

## 4EAT Quick Test

**QT**

### Description

This diagnostic procedure is used on the following vehicle systems:

- 1.6L 4EAT
- 1.8L 4EAT
- 2.5L 4EAT

### Definition

Quick Test is a check of system electronics which utilizes the control module of each system to perform diagnostics on itself and its circuitry. This module capability is referred to as Diagnostic Test Mode. Since little effort is required to initiate Diagnostic Test Mode, but in return vital information is retrieved quickly, this procedure is referred to as Quick Test.

#### CAUTION

**Although Quick Test appears to be a fast and powerful diagnostic aid, it unfortunately cannot detect all possible failures that can occur within the Transaxle Control Module (TCM) system. Therefore, the Quick Test procedures in this manual have been carefully constructed to guide and refer you to Pinpoint Tests that inspect components and circuitry associated with particular symptoms.**

**Keep in mind that all things that went wrong with cars before the age of electronics reached the automobile can still go wrong, and are still the cause of the majority of the driveability problems. That's why the best diagnosis starts with a list of symptoms and possible causes, followed by a careful checking of those causes in the most probable order. Refer to Section 2B, Diagnostic Routines and the Group 07 Transaxle Symptom Chart of the appropriate Service Manual for a list of symptoms and probable causes.**

### Directions

When the Symptom Charts or Diagnostic Routines direct you to Quick Test, perform all of Quick Test step by step, following directions in the "Action To Take" column. If all phases of Quick Test give no indication of a problem, it is likely that the problem is non-electronic and will be found elsewhere. You should return to Section 2B, Diagnostic Routines and the Group 07 Transaxle Symptom Chart of the appropriate Service Manual for the next possible fault for that particular symptom.

When directed to a Pinpoint Test always read the cover page(s) for special notes and look carefully at the Pinpoint Test schematic. When a repair has been made, erase codes and rerun Quick Test to confirm the repair was effective.

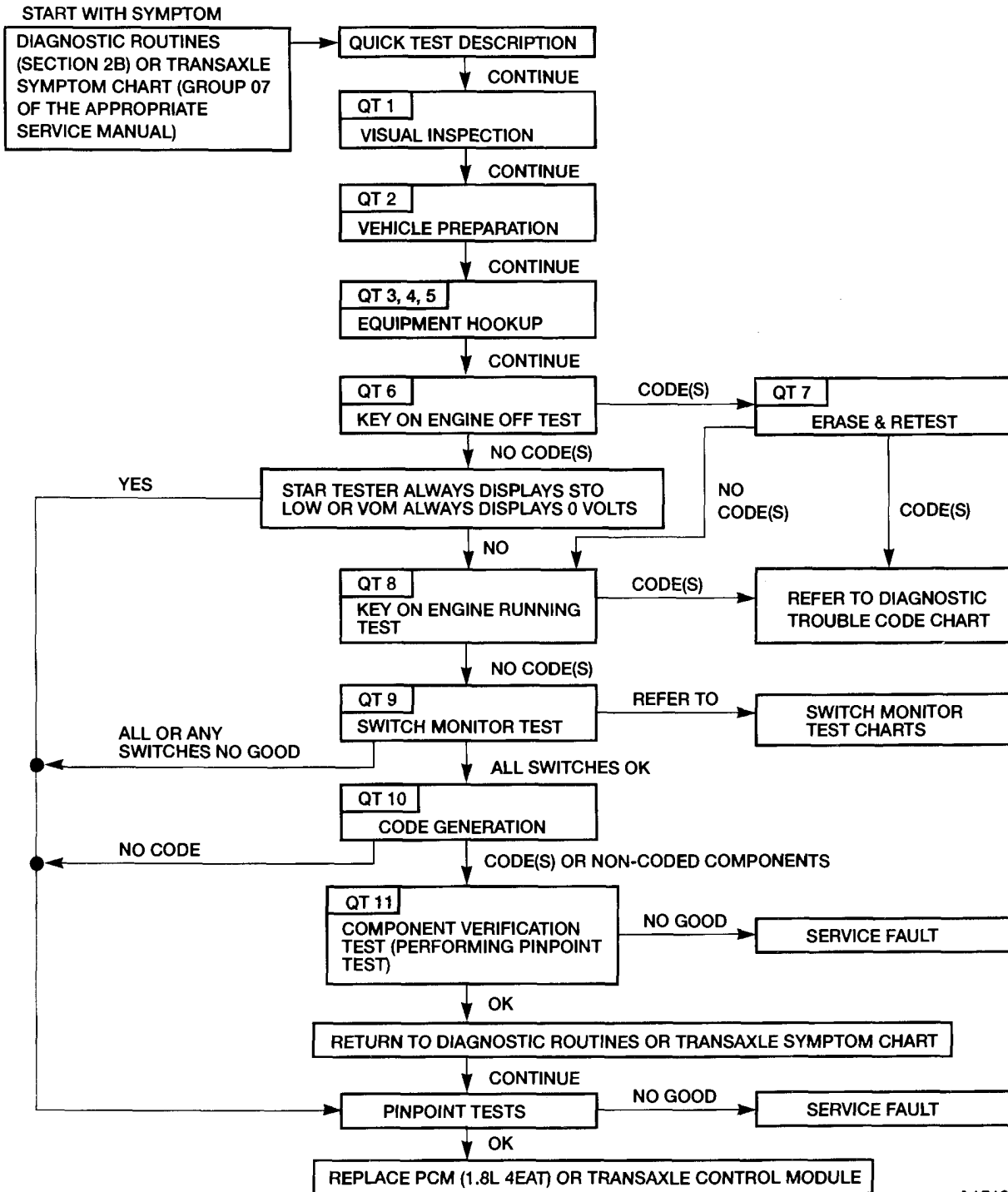
### Diagnostic Aids

The following flowchart can be used as a guide for better understanding of the Quick Test flow path. It is not intended as a diagnostic procedure on its own, nor does it contain the detailed information required to run Quick Test.

# 4EAT Quick Test

QT

## 4EAT Quick Test Summary Flowchart



A15138-F



<h1>4EAT Quick Test</h1>	<h1>QT</h1>
--------------------------	-------------

	TEST STEP	RESULT	ACTION TO TAKE
<b>QT1</b>	<b>PERFORM VISUAL INSPECTION</b> <ul style="list-style-type: none"> <li>● Check the engine coolant for proper level.</li> <li>● Check the transaxle fluid level and quality.</li> <li>● Check engine oil level and quality.</li> <li>● Check the shift linkage for excessive wear or damage.</li> <li>● Check the TCM wiring harness (PCM wiring harness for 1.8L) for improper connections, bent or broken pins, corrosion, loose wires, improper routing, blown fuses, etc.</li> <li>● Check the TCM (PCM for 1.8L) sensors and solenoids for physical damage.</li> <li>● Check the battery voltage. Refer to Service Manual Section 14-01 for checking and charging procedures.</li> <li>● <b>Do all components and fluids appear OK?</b></li> </ul>	<p>Yes</p> <p>No</p>	<ul style="list-style-type: none"> <li>▶ GO to <b>QT2</b>, Vehicle Preparation.</li> <li>▶ <b>SERVICE</b> the fault(s) in the system as required and <b>REEVALUATE</b> the symptom(s).</li> </ul>
<b>QT2</b>	<b>PERFORM VEHICLE PREPARATION</b> <ul style="list-style-type: none"> <li>● Perform all the following safety steps required to start and run vehicle tests:                             <ul style="list-style-type: none"> <li>— Apply the parking brake.</li> <li>— Place the selector lever firmly into the PARK position.</li> <li>— Block the drive wheels.</li> </ul> </li> <li>● Turn off all electrical loads:                             <ul style="list-style-type: none"> <li>— Radios</li> <li>— Lights</li> <li>— A/C</li> <li>— Rear window defroster</li> <li>— Heater, blower fans, etc.</li> </ul> </li> <li>● Start the engine and run until at normal operating temperature.</li> <li>● <b>Have all the safety steps been performed, electrical loads been turned off, and is engine at operating temperature?</b></li> </ul>	<p>Yes (Using New Generation Star [NGS] Scan Tool)</p> <p>Yes (Using Super STAR II Tester)</p> <p>Yes (Using Analog VOM, Malfunction Indicator Lamp [MIL] or Overdrive Off Lamp [ODL])</p> <p>No</p>	<ul style="list-style-type: none"> <li>▶ GO to <b>QT3</b>, Equipment Hookup.</li> <li>▶ GO to <b>QT4</b>, Equipment Hookup.</li> <li>▶ GO to <b>QT5</b>, Equipment Hookup.</li> <li>▶ Personal safety and correct diagnostic results are dependent on test step <b>QT2</b>. <b>MAKE</b> all the necessary repairs to perform vehicle preparation.</li> </ul>

## 4EAT Quick Test

QT

TEST STEP		RESULT	ACTION TO TAKE
<b>QT3</b>	<b>PERFORM EQUIPMENT HOOKUP (NEW GENERATION STAR [NGS] SCAN TOOL ONLY)</b>  NOTE: Refer to Figure 4 and Figure 5 in Appendix for proper hookup. <ul style="list-style-type: none"> <li>● Key OFF.</li> <li>● Connect the DLC Adapter to the Diagnostic Data Link (DDL) connector on the Rotunda NGS Scan Tool 007-00500.</li> <li>● Connect Rotunda Super MECS Adapter 007-00052 to the DLC Adapter.</li> <li>● Connect the adapter cable leads to the STO and STI connectors on the 1.6L 4EAT or to the Data Link Connector (DLC) on the 1.8L 4EAT and 2.5L 4EAT.</li> <li>● Connect the adapter cable ground clip to the negative (-) battery terminal on the 1.6L 4EAT.</li> <li>● Slide the adapter switch on the Super MECS Adapter to the TCM position for 2.5L 4EAT.</li> <li>● Slide the adapter switch on the Super MECS Adapter to the PCM position for 1.8L 4EAT.</li> <li>● Connect the NGS Power Cable to the battery with the battery adapter.</li> <li>● <b>Is equipment hooked up properly?</b></li> </ul>	Yes  No	► GO to <b>QT6</b> , Key ON Engine Off Test.  ► <b>SERVICE</b> the fault(s) as necessary and <b>REPEAT QT3</b> .
<b>QT4</b>	<b>PERFORM EQUIPMENT HOOKUP (SUPER STAR II TESTER ONLY)</b>  NOTE: Refer to Figure 4 and Figure 5 in Appendix for proper hookup. <ul style="list-style-type: none"> <li>● Key OFF.</li> <li>● Connect Rotunda Super MECS Adapter 007-00052 to the Rotunda Super STAR II Tester 007-0041B. The previously issued Rotunda Adapter 007-00036 may still be used on the 1.6L 4EAT while Rotunda Adapter 007-00049 may be used on the 1.8L 4EAT (ECA position) and the 2.5L 4EAT (4EAT position).</li> <li>● Connect the adapter cable leads to the STO and STI connectors on 1.6L 4EAT or to the Data Link Connector (DLC) on the 1.8L 4EAT and the 2.5L 4EAT.</li> <li>● Connect the adapter cable ground clip to the negative (-) battery terminal for 1.6L 4EAT.</li> <li>● Slide the adapter switch on the Super MECS adapter to the PCM position for 1.8L 4EAT or to the TCM position for the 2.5L 4EAT.</li> <li>● Slide the Super STAR II Tester switch to the MECS position.</li> <li>● <b>Is equipment hooked up properly?</b></li> </ul>	Yes  No	► GO to <b>QT6</b> , Key ON Engine Off Test.  ► <b>SERVICE</b> the fault(s) as necessary and <b>REPEAT QT4</b> .

# 4EAT Quick Test

QT

TEST STEP		RESULT	ACTION TO TAKE
QT5	PERFORM EQUIPMENT HOOKUP (ANALOG VOM, MALFUNCTION INDICATOR LAMP [MIL] OR OVERDRIVE OFF LAMP [ODL] ONLY)		
<p>NOTE: Refer to Figure 4 and Figure 5 in Appendix for proper hookup.</p> <ul style="list-style-type: none"> <li>● <b>If using Analog VOM</b> <ul style="list-style-type: none"> <li>— Key OFF.</li> <li>— Connect the VOM positive (+) lead to the TCM STO line (PCM STO line on 1.8L 4EAT) and the negative (-) lead to engine ground.</li> <li>— Jumper the TCM STI (PCM STI on 1.8L 4EAT) to engine ground.</li> <li>— Set the VOM on a DC voltage range to read from 0 to 20 volts.</li> </ul> </li> <li>● <b>If using Malfunction Indicator Lamp (MIL) (1.8L 4EAT Only)</b> <ul style="list-style-type: none"> <li>— To use the MIL, jumper the PCM STI line to engine ground.</li> </ul> </li> <li>● <b>If using Overdrive Off Lamp (ODL) (1.6L 4EAT and 2.5L 4EAT Only)</b> <ul style="list-style-type: none"> <li>— To use the ODL, jumper the TCM STI line to engine ground.</li> </ul> </li> <li>● <b>Is equipment hooked up properly?</b></li> </ul>		<p>Yes</p> <p>No</p>	<ul style="list-style-type: none"> <li>▶ GO to <b>QT6</b>, Key ON Engine Off Test.</li> <li>▶ <b>SERVICE</b> the fault(s) as necessary and <b>REPEAT QT5</b>.</li> </ul>

<h1>4EAT Quick Test</h1>	<h1>QT</h1>
--------------------------	-------------

	TEST STEP	RESULT	ACTION TO TAKE
<b>QT6</b>	<p><b>PERFORM KEY ON ENGINE OFF TEST</b></p> <ul style="list-style-type: none"> <li>● Follow one of the test procedures based on the type of equipment used:</li> </ul> <p>NOTE: When performing the Diagnostic Test Mode on the 1.8L 4EAT either engine or transaxle codes can be received. Refer to the EEC Quick Test in this section for a list of engine related codes.</p> <ul style="list-style-type: none"> <li>● <b>If using New Generation Star (NGS) Scan Tool</b> <ul style="list-style-type: none"> <li>— Follow the procedure in the Appendix to activate and deactivate the Diagnostic Test Mode.</li> </ul> </li> <li>● <b>If using Super STAR II Tester</b> <ul style="list-style-type: none"> <li>— Latch the center button to the TEST position.</li> <li>— Turn the Super STAR II Tester ON. (The tester will sound and "888" will be displayed for two seconds).</li> <li>— Key ON.</li> <li>— Unlatch and relatch the center button.</li> <li>— After all codes are received, unlatch the center button to review all codes retained in tester memory.</li> </ul> </li> </ul> <p>NOTE: The "STILO" indicator will flash as the codes are received by the Super STAR II Tester. If the "STILO" indicator goes out and does not come back on, no codes exist.</p> <ul style="list-style-type: none"> <li>— <b>Are any diagnostic trouble codes present?</b></li> </ul> <ul style="list-style-type: none"> <li>● <b>If using Analog VOM</b> <ul style="list-style-type: none"> <li>— Key ON.</li> <li>— Turn the VOM ON.</li> <li>— Observe the VOM needle for any code indications.</li> <li>— <b>Are any diagnostic trouble codes present?</b></li> </ul> </li> <li>● <b>If using Malfunction Indicator Lamp (MIL) (1.8L 4EAT Only)</b> <ul style="list-style-type: none"> <li>— Key ON.</li> <li>— Observe the MIL.</li> <li>— <b>Are any diagnostic trouble codes present?</b></li> </ul> </li> <li>● <b>If using Overdrive Off Lamp (ODL) (1.6L 4EAT and 2.5L 4EAT Only)</b> <ul style="list-style-type: none"> <li>— Key ON.</li> <li>— Observe the ODL.</li> <li>— <b>Are any diagnostic trouble codes present?</b></li> </ul> </li> </ul>	<p>Yes Code(s)</p> <p>No STAR Tester always displays STO LO or VOM always displays 0 volts</p> <p>No codes</p>	<p>▶ GO to <b>QT7</b>, Erase and Retest.</p> <p>▶ GO to 4EAT Pinpoint Test <b>STI</b> in Section 6B, EEC Pinpoint Tests.</p> <p>▶ GO to <b>QT8</b>, Key ON Engine Running Test.</p>

## 4EAT Quick Test

QT

TEST STEP		RESULT	ACTION TO TAKE
QT7	ERASE AND RETEST		
	<p>NOTE: Erasing diagnostic trouble codes and retesting will give an indication whether diagnostic trouble codes received in test step QT6 represent hard or intermittent faults. Hard faults will repeat immediately and codes will be displayed during retest.</p> <ul style="list-style-type: none"> <li>Confirm code(s) were received in test step QT6.</li> <li>Turn the Super STAR II Tester or VOM OFF, or disconnect the NGS Scan Tool.</li> <li>Disconnect the negative battery cable and depress the brake pedal for 5- 10 seconds to erase codes in memory.</li> <li>Reconnect the negative battery cable.</li> <li>Perform the Key ON Engine Off Test as instructed in test step QT6.</li> </ul> <p>NOTE: If codes retrieved the first time cannot be re-created, it may be necessary to tap suspect sensors, shake and wiggle harness, or drive the vehicle in order to induce a failure. Repeat test step QT6 each time.</p> <ul style="list-style-type: none"> <li><b>Are any diagnostic trouble codes present?</b></li> </ul>	<p>Yes Code(s)</p> <p>No code(s)</p>	<p>▶ REFER to the Diagnostic Trouble Code Chart after Quick Test for Pinpoint Test direction.</p> <p>▶ GO to <b>QT8</b>, Key ON Engine Running Test.</p>
QT8	PERFORM KEY ON ENGINE RUNNING TEST		
	<p>NOTE: If using the New Generation Star (NGS) Scan Tool, follow the procedure in the Appendix to activate and deactivate the Diagnostic Test Mode.</p> <ul style="list-style-type: none"> <li>Deactivate the Diagnostic Test Mode by unlatching the center button on the Super STAR II Tester and turning the tester OFF, or disconnect the jumper connecting the STI to ground if using VOM, ODL (1.6L 4EAT and 2.5L 4EAT), or MIL (1.8L 4EAT only).</li> <li>Drive the vehicle at 50 km/h (31 mph) and depress the accelerator pedal fully to activate kickdown. Stop the vehicle gradually.</li> <li>If using Super STAR II Tester, turn the Super STAR II Tester ON.</li> <li>Latch the center button on the Super STAR II Tester, or jumper the STI to ground if using VOM, ODL (1.6L 4EAT and 2.5L 4EAT only), or MIL (1.8L 4EAT only).</li> <li>Turn the engine off.</li> <li>Start the engine and run the engine at idle.</li> <li>Activate the Diagnostic Test Mode by unlatching and then relatching the Super STAR II Tester.</li> <li><b>Are any diagnostic trouble codes present?</b></li> </ul>	<p>Yes Code(s)</p> <p>No Codes</p>	<p>▶ REFER to the Diagnostic Trouble Code Chart after Quick Test for Pinpoint Test direction.</p> <p>▶ GO to <b>QT9</b>, Switch Monitor Test.</p>

# 4EAT Quick Test

QT

TEST STEP		RESULT	ACTION TO TAKE												
QT9	PERFORM SWITCH MONITOR TEST														
<ul style="list-style-type: none"> <li>Refer to illustration after Switch Monitor Test Chart for proper hookup.</li> <li>Connect Rotunda 4EAT Tester 007-0037B, or equivalent to the Powertrain Control Module (PCM) for vehicles with integrated processors (1.8L 4EAT), or to the Transaxle Control Module (TCM) for vehicles with separate processors (1.6L 4EAT and 2.5L 4EAT). Use the appropriate adapter and overlay as listed below.</li> </ul> <table border="1"> <thead> <tr> <th>Vehicle</th> <th>Adapter</th> <th>Overlay</th> </tr> </thead> <tbody> <tr> <td>1.6L</td> <td>007-00095A</td> <td>3122-694</td> </tr> <tr> <td>1.8L</td> <td>007-00100B</td> <td>3122-731</td> </tr> <tr> <td>2.5L</td> <td>007-00100A</td> <td>3122-696</td> </tr> </tbody> </table> <ul style="list-style-type: none"> <li>Key ON.</li> <li>Turn the 4EAT Tester ON.</li> </ul> <p>NOTE: Make sure Battery test pin LED lights up when tester is turned on. This will verify that tester is working.</p> <ul style="list-style-type: none"> <li>Check the switches listed in the Switch Monitor Test Charts found after Quick Test, under the conditions specified.</li> </ul> <p>NOTE: Switches can also be checked, instead of using the LEDs, by connecting a voltmeter (VOM) between the pin indicated in the Switch Monitor Test Charts found after Quick Test, and the ground pin on the 4EAT Tester.</p> <ul style="list-style-type: none"> <li><b>Do the 4EAT Tester lights (LEDs) indicate that all of the switches are functioning properly?</b></li> </ul>		Vehicle	Adapter	Overlay	1.6L	007-00095A	3122-694	1.8L	007-00100B	3122-731	2.5L	007-00100A	3122-696	<p>Yes</p> <p>No</p>	<ul style="list-style-type: none"> <li>GO to <b>QT10</b>, Code Generation.</li> <li>GO to the appropriate Pinpoint Test in Section 6B, 4EAT Pinpoint Tests for the switch(es) in question.</li> </ul>
Vehicle	Adapter	Overlay													
1.6L	007-00095A	3122-694													
1.8L	007-00100B	3122-731													
2.5L	007-00100A	3122-696													

<h1>4EAT Quick Test</h1>	<h1>QT</h1>
--------------------------	-------------

	TEST STEP	RESULT	ACTION TO TAKE
<b>QT10</b>	<p><b>PERFORM CODE GENERATION</b></p> <ul style="list-style-type: none"> <li>● Refer to the Diagnostic Trouble Code Chart located after the Quick Test and look at the components listed that could cause the symptoms.</li> <li>● Disconnect each component from the harness, one at a time, beginning with the first coded component.</li> <li>● Hook up the test equipment as in test step QT3, QT4, or QT5.</li> <li>● Perform the Key ON Engine Running Test as in test step QT8 to confirm that the PCM (1.8L 4EAT) or TCM (1.6L 4EAT or 2.5L 4EAT) recognizes the open circuit to each coded component and generates the diagnostic trouble codes.</li> </ul> <p>NOTE: Record and erase codes after generation.</p> <p>NOTE: If diagnostic trouble codes are not generated immediately, it may be necessary to drive vehicle with component disconnected. If engine will not start with component disconnected, perform Key ON Engine Off test instead.</p> <ul style="list-style-type: none"> <li>● <b>Are any diagnostic trouble codes recorded?</b></li> </ul>	<p>Yes Code(s)</p> <p>No code(s) for any or all components</p>	<ul style="list-style-type: none"> <li>▶ REPEAT test step <b>QT10</b> until all coded components have been checked, then GO to <b>QT11</b>, Component Verification Test.</li> <li>▶ GO to 4EAT Pinpoint Test <b>STO</b> in Section 6B, EEC Pinpoint Tests.</li> </ul>
<b>QT11</b>	<p><b>PERFORM COMPONENT VERIFICATION TEST</b></p> <p>NOTE: Refer to Section 3B, EEC Engine Supplement — Car to aid in determining possible causes of the symptom.</p> <ul style="list-style-type: none"> <li>● Refer to Section 6B, EEC Pinpoint Tests, and perform the 4EAT Pinpoint Test for each component that could cause the symptom.</li> <li>● <b>Does each Pinpoint Test check out OK?</b></li> </ul>	<p>Yes</p> <p>No</p>	<ul style="list-style-type: none"> <li>▶ REPEAT test step <b>QT11</b> until all possible components have been checked. If all components check out OK, RETURN to Section 2B, Diagnostic Routines.</li> <li>▶ SERVICE the fault(s) as indicated in Pinpoint Test and RECHECK the symptom(s).</li> </ul>

**4EAT Quick Test****QT****Diagnostic Trouble Code Chart**

Diagnostic Trouble Code	Component	Pinpoint Test Step Direction (Refer to Section 6B)		
		1.6L 4EAT	1.8L 4EAT	2.5L 4EAT
01	CKP Sensor	—	—	CKP1
06	VSS Sensor	VSS	VSS	VSS
12	TP Sensor	TP	TP	TP
14	BARO Sensor	—	—	BARO
55	Pulse Signal Generator	PSG	PSG	PSG
56	TOT Sensor	—	—	TOT
57	Reduce Torque Signal No. 1	—	—	RTS1
58	Reduce Torque Signal No. 2	—	—	RTS2
59	Torque Reduce / Engine Coolant Temperature Signal	—	—	TRS
60	SS1 (1-2 Shift Solenoid)	SCP	SCP	SCP
61	SS2 (2-3 Shift Solenoid)	SCP	SCP	SCP
62	SS3 (3-4 Shift Solenoid)	SCP	SCP	SCP
63	Torque Converter Clutch Control Solenoid	SCP	SCP	SCP
64	Downshift Solenoid	—	—	SCP
65	Torque Converter Clutch Solenoid	—	—	DCS
66	Line Pressure Solenoid	—	—	DCS
Codes Not Listed	—	PGC	PGC	PGC

\* NOTE: Both engine and transaxle codes may be received during the self test on 1.8L 4EAT engines.



**4EAT Quick Test****QT****Switch Monitor Test Chart**

Switch	1.6L Pin #	1.8L Pin #	2.5L Pin #	Condition	4EAT Tester Light (LED)	Voltmeter (VOM) Reading	Pinpoint Test
Brake On/Off (BOO)	1F	1Q	1F	Brake Pedal Depressed Brake Pedal Released	ON OFF	Above 10V Below 1.5V	STP
Manual Lever Position 1 Range (MLP1)	2H		2H	Selector Lever in 1 Range Other Positions	ON OFF	Above 10V Below 1.5V	STP
Manual Lever Position 2 Range (MLP2)	2F		2F	Selector Lever in 2 Range Other Positions	ON OFF	Above 10V Below 1.5V	STP
Manual Lever Position D Range (MLPD)	2D	3H	2D	Selector Lever in D Range Other Positions	ON OFF	Above 10V Below 1.5V	STP
Manual Lever Position R Range (MLPR)			1I	Selector Lever in R Range Other Positions	ON OFF	Above 10V Below 1.5V	STP
Manual Lever Position L Range (MLPL)		3G		Selector Lever in L Range Other Positions	ON OFF	Above 10V Below 1.5V	STP
Manual Lever Position O/D Range (MLPO/D)		3E		Selector Lever in O/D Range Other Positions	ON OFF	Above 10V Below 1.5V	STP
Manual Lever Position (MLP)	2B	1R	2B	Selector Lever in N or P Other Positions	ON OFF	Below 1.5V Above 10V	STP
Throttle Position (TP) Sensor	2T			Accelerator Fully Depressed Accelerator Released Every 1/8 Position Change	— — —	4.0-4.5V 0.5V Changes 0.5V	TP
Overdrive Off Switch (ODS)	1H		1H	O/D OFF Switch Depressed O/D OFF Switch Released	OFF ON	Below 1.5V Above 10V	STG
Overdrive Off Light (ODL)	1B		1B	O/D OFF Light On O/D OFF Light Off	ON OFF	Below 1.5V Above 10V	ODL
Idle (IDL) Switch	1O	1T	1O	Accelerator Depressed Accelerator Released	ON OFF	Above 10V Below 1.5V	STG

**4EAT Quick Test**

**QT**

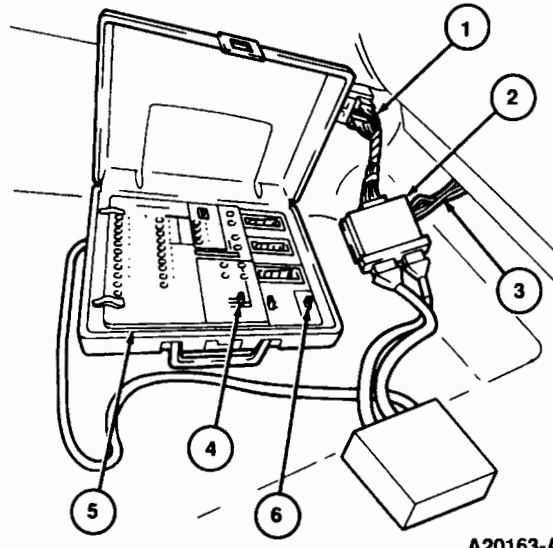


Figure 1.

Item	Description
1	TCM or PCM Harness
2	Adapter
3	To TCM or PCM
4	Throttle Sensor Switch
5	4EAT Tester
6	ON / OFF Switch

# Appendix

## EEC Quick Test Equipment Hookup

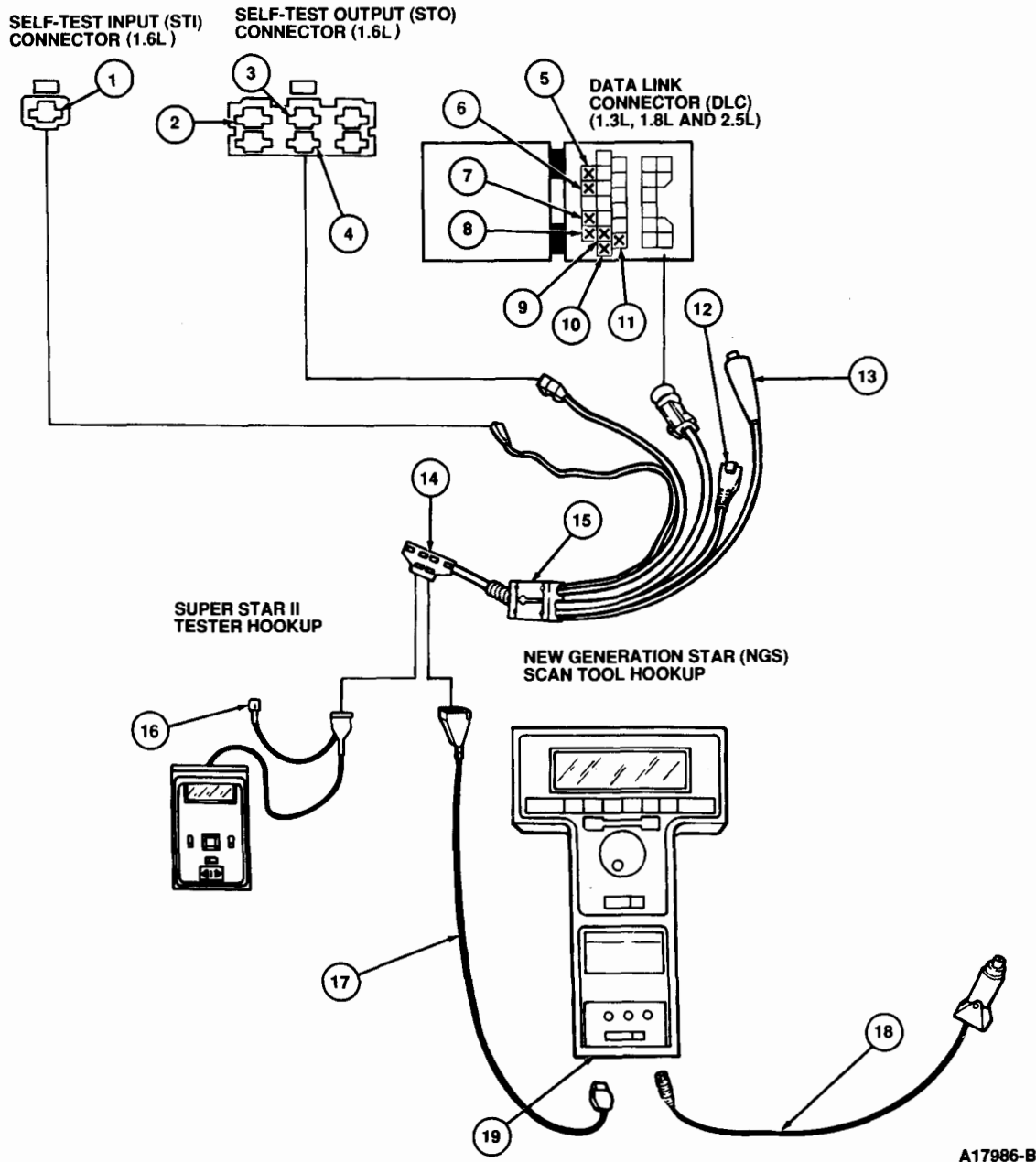


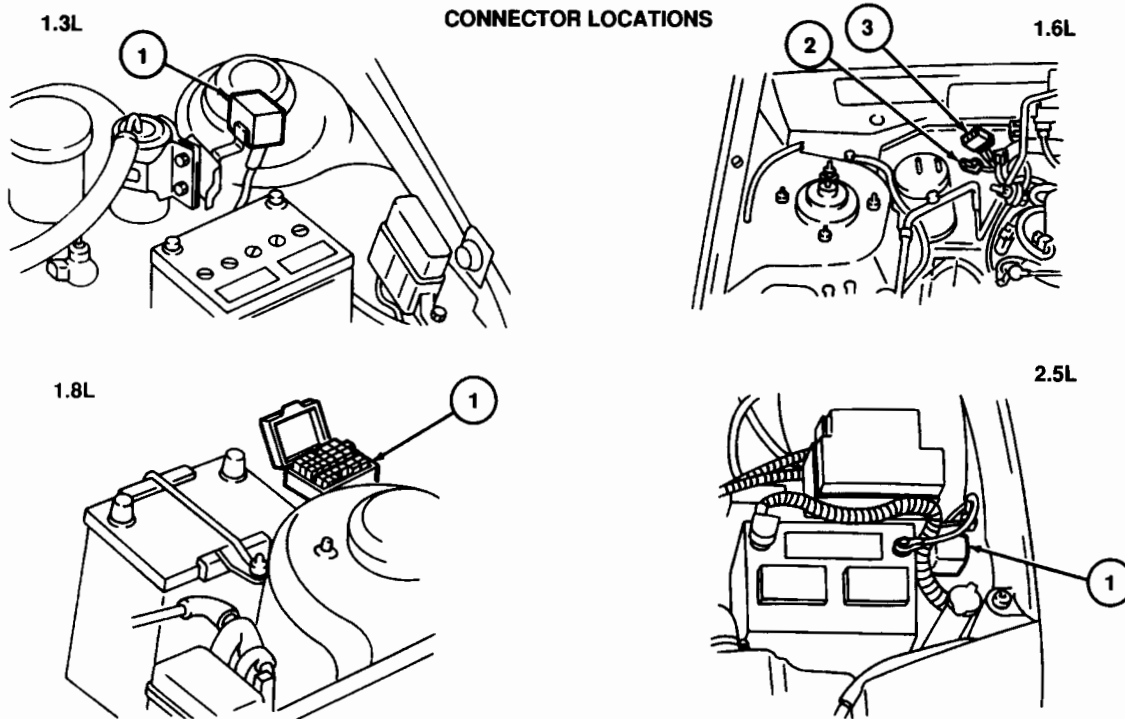
Figure 2.

Item	Description
1	PCM STI
2	PCM STO

(Continued)

# Appendix

Item	Description
3	VPWR
4	SML
5	VPWR
6	PCM STI
7	SML
8	PCM STO
9	TCM STO (2.5L)
10	GND
11	TCM STI (2.5L)
12	NOT USED
13	To Negative (-) Battery Terminal (1.6L)
14	Adapter Cable Connector
15	Super MECS Adapter 007-00052
16	NOT USED
17	DLC Adapter
18	Power Cable (To Battery With Adapter)
19	Diagnostic Data Link (DDL) Connector



A17987-D

Figure 3.

Item	Description
1	Data Link Connector (DLC)
2	STI Connector
3	STO Connector

## Appendix

### CONNECTOR INFORMATION CHART

Engine	Connector	Connector Location	Pin	Wire Color
1.3L	DLC	LH Rear Corner of Engine Compartment Near Battery	PCM STO SML PCM STI	W/BK BL/BK BL
1.6L	STO	RH Rear Corner of Engine Compartment	PCM STO SML	GN/BK BK/BL
1.6L	STI	RH Rear Corner of Engine Compartment	PCM STI	Y
1.8L	DLC	LH Rear Corner of Engine Compartment Near Battery	PCM STO SML PCM STI	W/BK W/Y LG/Y
2.5L	DLC	LH Front Corner of Engine Compartment Near Battery	PCM STO SML PCM STI	LG/R W/R R/W

# Appendix

## 4EAT Quick Test Equipment Hookup

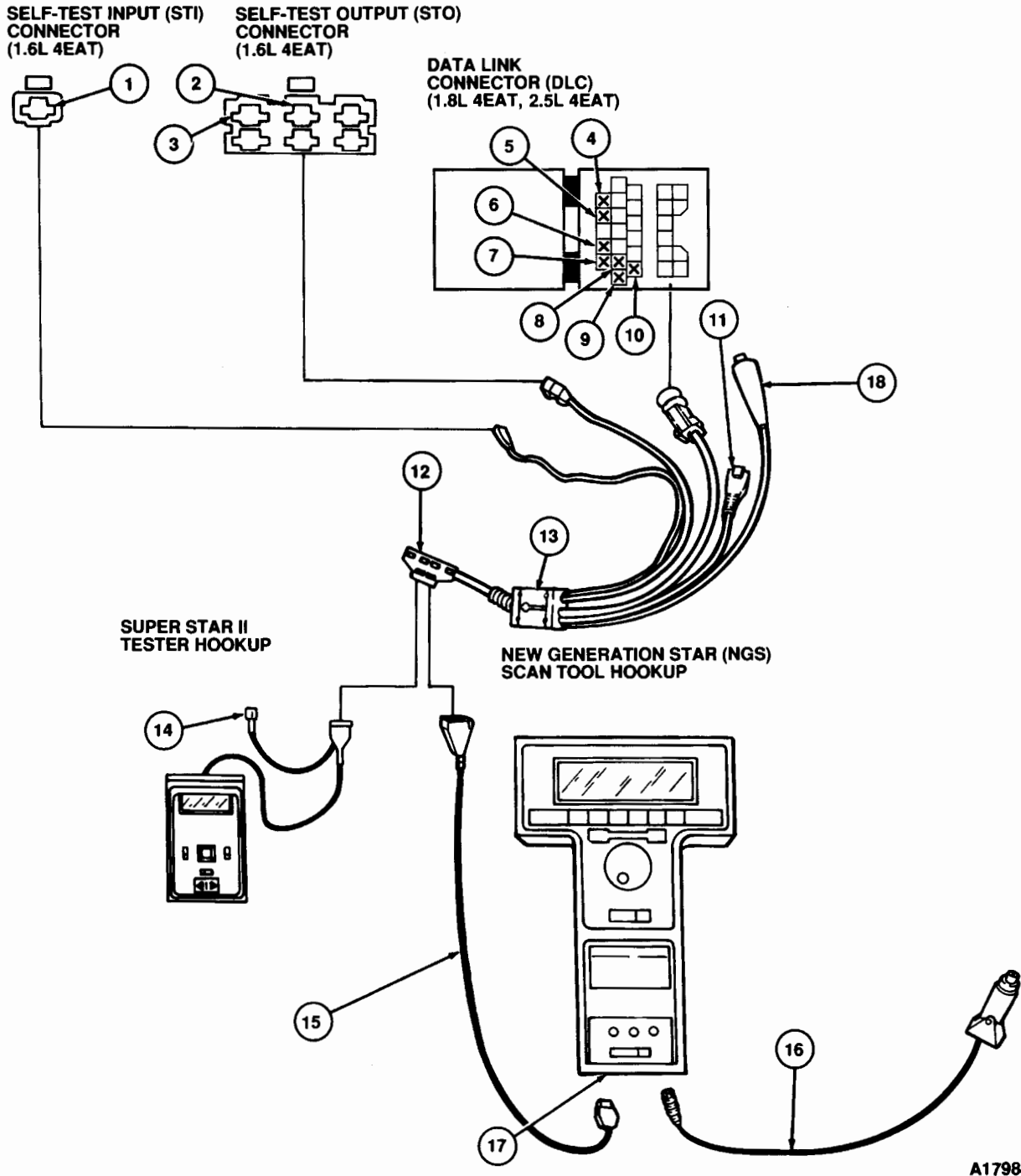
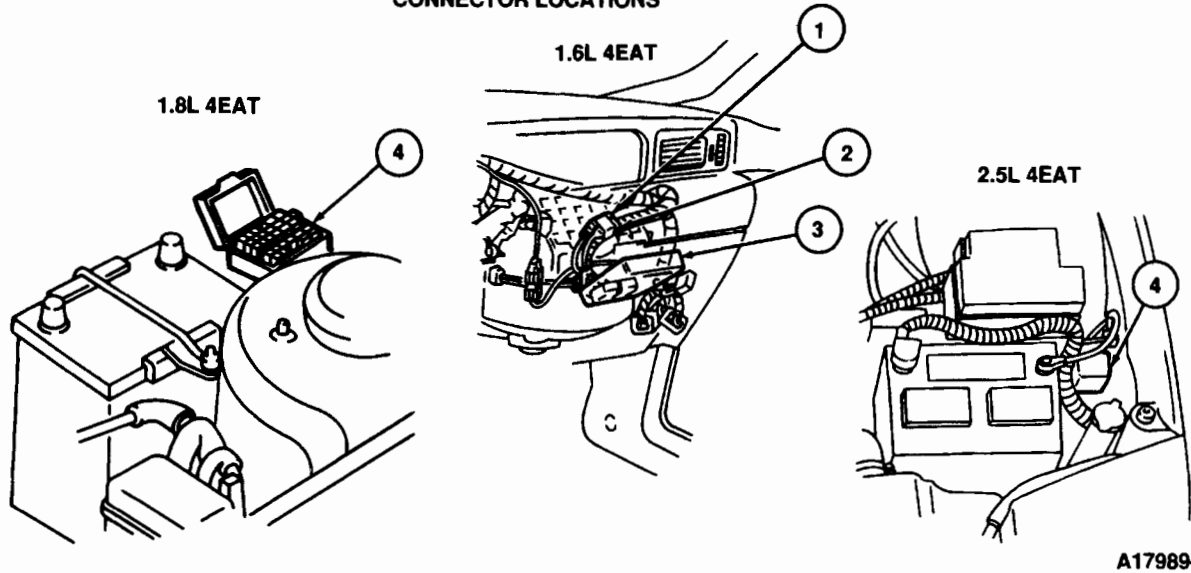


Figure 4.

# Appendix

Item	Description
1	TCM STI
2	VPWR
3	TCM STO
4	VPWR
5	PCM STI
6	SML
7	PCM STO
8	TCM STO (2.5L)
9	GND
10	TCM STI (2.5L)
11	NOT USED
12	Adapter Cable Connector
13	Super MECS Adapter 007-00052
14	NOT USED
15	DLC Adapter
16	Power Cable (To Battery With Adapter)
17	Diagnostic Data Link (DDL) Connector
18	To Negative (-) Battery Terminal (1.6L 4EAT)

### CONNECTOR LOCATIONS



A17989-D

Figure 5.

Item	Description
1	STO Connector
2	STI Connector
3	Transaxle Control Module (TCM)
4	Data Link Connector (DLC)

## Appendix

### CONNECTOR INFORMATION CHART

Engine	Connector	Connector Location	Pin	Wire Color
1.6L 4EAT	STO	RH Side of Passenger Compartment Behind Glove Compartment	TCM STO	R
1.6L 4EAT	STI	RH Side of Passenger Compartment Behind Glove Compartment	TCM STI	R/BK
1.8L 4EAT	DLC	LH Rear Corner of Engine Compartment Near Battery	PCM STO PCM STI	W/BK LG/Y
2.5L 4EAT	DLC	LH Front Corner of Engine Compartment Near Battery	TCM STO TCM STI	R R/BK

### Diagnostic Test Mode Description

The Diagnostic Test Mode for EEC Quick Test is divided into three specialized tests: Key ON Engine Off (KOEO) Test, Key ON Engine Running (KOER) Test, and Switch Monitor Test.

The Diagnostic Test Mode for 4EAT Quick Test is also divided into three specialized tests: Key ON Engine Off (KOEO) Test, Key ON Engine Running (KOER) Test, and Switch Monitor Test.

The Diagnostic Test Mode is not a conclusive test by itself, but is used as a part of the functional Quick Test diagnostic procedures. The Diagnostic Test program is stored in the processor's permanent memory. When activated, it checks the module by testing its memory integrity and processing capability, and verifying that various sensors and actuators are connected and operating properly.

**Unlike EEC-IV, no sensors or switches are exercised during Diagnostic Test Mode except in the Switch Monitor Test. Also, intermittent codes are not erased if the fault is removed after 40 vehicle cycles. Therefore, any intermittent code will be stored in permanent memory until erased.**

### Key ON Engine Off Test

A test of the system is conducted with power applied and engine off.

### Key ON Engine Running Test

A test of the system is conducted with the engine running. The sensors are checked under actual operating conditions and at normal operating temperatures.

### Switch Monitor Test

A test of the input switches is made with the engine off and cool.

### Code Output Format

### Diagnostic Trouble Codes

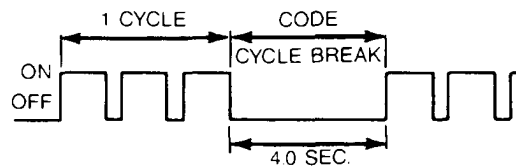
**The system communicates service information by way of the diagnostic trouble codes. These diagnostic trouble codes are two-digit numbers representing the Diagnostic Test Mode results.**



## Appendix

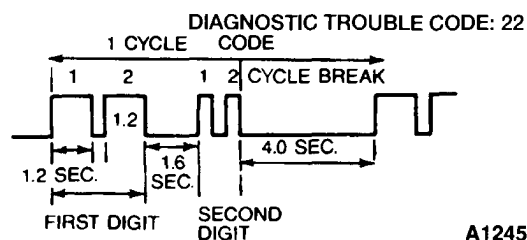
The diagnostic trouble codes are transmitted on the Self-Test Output (STO) line found in the vehicle Self Test Output (STO) connector or Data Link Connector (DLC). They are in the form of timed pulses, and read by the technician on a voltmeter, the Super STAR II Tester, the NGS Scan Tool, the Overdrive Off (O/D OFF) Lamp (1.6L 4EAT and 2.5L 4EAT only), or the Malfunction Indicator Lamp (MIL). On the voltmeter each pulse corresponds to a needle sweep.

1. Code cycle break is a 4.0 second delay between transmission of codes.



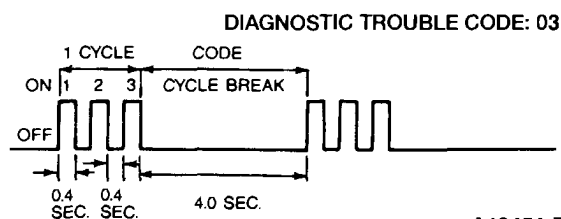
A12452-A

2. The first digit of a diagnostic trouble code (tens position) during one cycle consists of 1.2 second pulses, followed by a 1.6 second delay before the second digit is transmitted.



A12453-B

3. The second digit of a diagnostic trouble code (ones position) during one cycle consists of 0.4 second pulses, followed by a 4.0 second delay before a new code is transmitted.



A12454-B

### WARNING

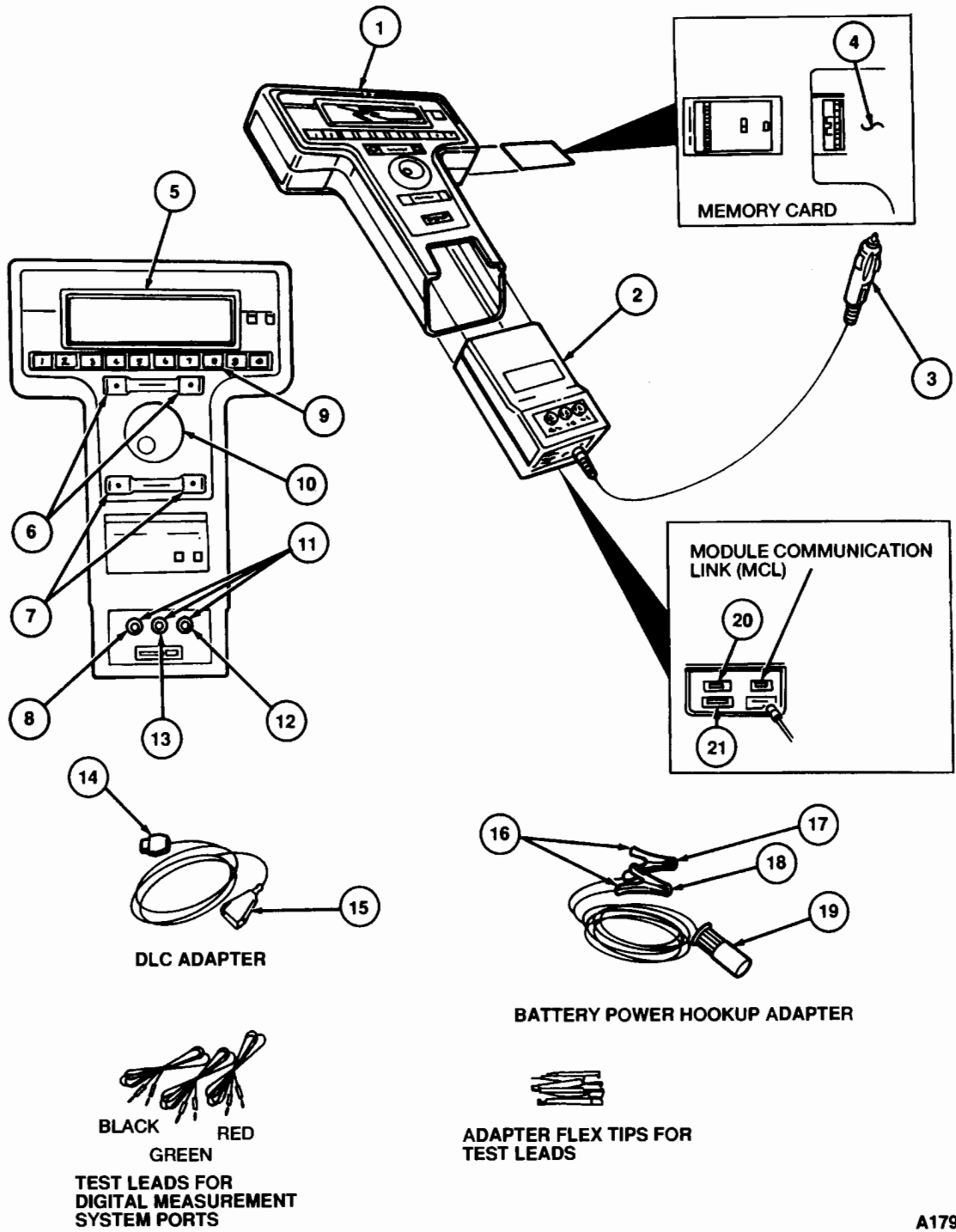
**ANYONE WHO DEPARTS FROM THE INSTRUCTIONS PROVIDED IN THIS PUBLICATION MUST FIRST ESTABLISH THAT THEY COMPROMISE NEITHER THEIR PERSONAL SAFETY NOR THE VEHICLE INTEGRITY BY THEIR CHOICE OF METHODS, TOOLS, OR PARTS.**

## Appendix

### Reading EEC and 4EAT Codes With New Generation Star (NGS) Scan Tool

As an option to using the Super STAR II Tester, the Rotunda New Generation Star (NGS) Scan Tool is available for use. The NGS is a user friendly, hand-held scan tool which can be used to perform a variety of diagnostic testing functions, including Diagnostic Test Mode. Similar to the Super STAR II Tester, the NGS has the capability to detect, receive, and display diagnostic trouble codes. Some of the features of the NGS are shown in the following illustrations.

# Appendix



A17948-B

Figure 6.

## Appendix

Item	Description
1	Control Unit
2	Vehicle Interface Module (VIM)
3	Power Cable Connector
4	Back of Tester
5	LCD Screen
6	Cancel Keys
7	Trigger Keys
8	Common (-)
9	Number Keys
10	Menu Dial
11	Digital Measurement Ports
12	Auxiliary
13	Signal (+)
14	To NGS Diagnostic Data Link (DDL)
15	To Vehicle Data Link Connector (DLC)
16	To Battery
17	Black Clip (-)
18	Red Clip (+)
19	To NGS Power Cable Connector
20	Printer RS-232 Link
21	Diagnostic Data Link (DDL)

The NGS is user friendly and will display messages to direct you through diagnostic testing functions. The following features are used to perform Diagnostic Test Mode:

1. **Menu Dial.** The menu dial highlights the item you select on the screen display. Turn the menu dial clockwise to move the highlighter down or right and counterclockwise to move the highlighter up or left. An up or down arrow on the right side of the screen display indicates that there are more menu items on that screen display. Turn the menu dial clockwise to move to the next screen display and counterclockwise to move to the previous screen display.
2. **TRIGGER.** The TRIGGER keys are used to select an item on the screen display. At times, it is also used to start, perform, or continue a function.
3. **CANCEL.** The CANCEL keys are used to end a function, as well as back up to a previous function. It also returns you to the main menu.
4. **Number Keys.** The number keys are used to enter numerical values. Numbers three through eight (the dark gray keys) are sometimes also used to control functions that are shown on the screen display.
5. **Main Menu.** The main menu is the first screen display that you encounter. The main menu provides six selections:
  - \* VEHICLE & ENGINE SELECTION
  - \* DIAGNOSTIC DATA LINK
  - \* DIGITAL MEASUREMENT SYSTEM

## Appendix

- \* DIAGNOSTIC TEST MODE
- \* NEW GENERATION STAR SETUP
- \* INTERNAL SYSTEM TESTS

Connect the NGS Scan Tool to the vehicle as shown in Quick Test Step QT3. Connect the power cable connector to the battery with the adapter. The NGS Scan Tool will perform an initialization and brief internal system memory check. The NGS has 24 hour memory storage. During initialization a message of M\*\*\*\* indicates that the vehicle selection and recorded data from the last testing session are stored in memory. A message of B\*\*\*\* indicates that memory time has been exceeded and no data is stored from the last testing session. Following initialization, the main menu will be displayed.

1. **Screen Display # 1 (Main Menu).** Key ON. Turn the menu dial to move the highlighter to VEHICLE & ENGINE SELECTION. Press TRIGGER. Screen Display #2 will appear.

### Screen Display # 1 (Main Menu)

VEHICLE & ENGINE SELECTION DIAGNOSTIC DATA LINK VIEW LINK RECORDER AREA DIGITAL MEASUREMENT SYSTEM OBDII FUNCTION
SELECT ITEM AND PRESS TRIGGER TO START

2. **Screen Display # 2.** Turn the menu dial to move the highlighter to SELECT NEW VEHICLE YEAR & MODEL. Press TRIGGER. Screen Display #3 will appear.

### Screen Display # 2

NO VEHICLE SELECTED (1994) SELECT NEW VEHICLE YEAR & MODEL DESELECT CURRENT MODEL
SELECT ITEM AND PRESS TRIGGER TO START

3. **Screen Display #3.** Turn the menu dial to move the highlighter to the proper model year. For an example, select 1994 - VIN # 10 : R. Press TRIGGER. Screen Display #4 will appear.

### Screen Display # 3

1994 - VIN # 10 : R 1993 - VIN # 10 : P 1992 - VIN # 10 : N 1991 - VIN # 10 : M 1990 - VIN # 10 : L
SELECT ITEM AND PRESS TRIGGER TO START

4. **Screen Display #4.** Turn the menu dial to move the highlighter to the proper engine / vehicle. For example, select 94 1.8L ESCORT/ TRACER. Press TRIGGER. Screen Display #5 will appear.

### Screen Display # 4

94 1.3L	ASPIRE
94 1.6L	CAPRI
94 1.6L TURBO	CAPRI
94 1.8L	ESCORT/ TRACER
94 1.9L CVH	ESCORT/ TRACER
SELECT ITEM AND PRESS TRIGGER TO START	

## Appendix

5. **Screen Display #5.** Turn the menu dial to move the highlighter to 94 1.8L ESCORT/TRACER. Press TRIGGER. Screen Display #6 will appear.

### Screen Display #5

94 1.8L	ESCORT/TRACER
SELECT NEW VEHICLE YEAR & MODEL	
DESELECT CURRENT MODEL	

SELECT ITEM AND PRESS TRIGGER TO START
--

6. **Screen Display #6.** Turn the menu dial to move the highlighter to DIAGNOSTIC DATA LINK. Press TRIGGER. Screen Display #7 will appear.

### Screen Display #6

VEHICLE AND ENGINE SELECTION
DIAGNOSTIC DATA LINK
VIEW LINK RECORDER AREA
DIGITAL MEASUREMENT SYSTEM
OBDII FUNCTIONS

SELECT ITEM AND PRESS TRIGGER TO START
--

7. **Screen Display #7.** Turn the menu dial to move the highlighter to PCM - POWERTRAIN CONTROL MODULE. Press TRIGGER. Screen Display #8 will appear.

### Screen Display #7

PCM - POWERTRAIN CONTROL MODULE
ABS - ANTI LOCK BRAKE MODULE
TCM - TRANSMISSION CTRL MODULE

SELECT ITEM AND PRESS TRIGGER TO START
--

8. **Screen Display #8.** Turn the menu dial to move the highlighter to DIAGNOSTIC TEST MODE. Press TRIGGER. Screen Display #9 will appear.

### Screen Display #8

DIAGNOSTIC TEST MODE
DIAGNOSTIC TROUBLE CODE LIBRARY

SELECT ITEM AND PRESS TRIGGER TO START
--

9. **Screen Display #9.** Turn the menu dial to move the highlighter to MECS SELF TEST. Press TRIGGER. Screen Display #10 will appear.

### Screen Display #9

MECS SELF TEST
SWITCH MONITOR SELF TEST

SELECT ITEM AND PRESS TRIGGER TO START
--

## Appendix

10. **Screen Display # 10.** Press the START key (number 3), turn the ignition OFF, press the TRIGGER key, then turn the ignition ON or start the engine. This will short STI to ground and start MECS Self Test (Diagnostic trouble code detection / retrieval). As an example, Screen Display # 11 will appear if codes 10 and 12 are present. The Switch Monitor Test may be performed at this time if no diagnostic trouble codes appear on the screen. The LED indicator for the Switch Monitor Test is located on the Super MECS Adapter. Press the STOP key (number 3) to end Diagnostic Test Mode.

### Screen Display # 10

TURN IGNITION OFF, PRESS TRIGGER, THEN TURN IGNITION ON OR START ENGINE					
MECS DIAGNOSTIC TEST MODE					
START					

11. **Screen Display # 11.** Diagnostic trouble codes (if any) will appear on the screen display. After all codes are received, they will start repeating. Press the STOP key (number 3). This will remove the STI short from ground and stop Diagnostic Test Mode. Screen Display # 12 will appear.

### Screen Display # 11

10	12	10	12		
MECS DIAGNOSTIC TEST MODE					
STOP					

12. **Screen Display # 12.** The first diagnostic trouble code received will be highlighted. The definition of this highlighted code will appear on the lower box of the display screen. Turn the menu dial to see the definitions of the other displayed diagnostic trouble codes.

### Screen Display # 12

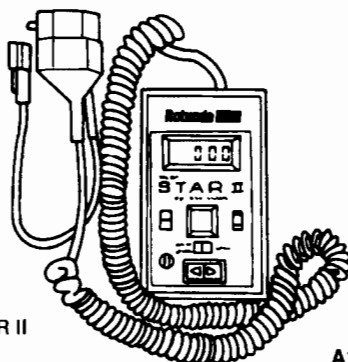
10	12	10	12		
IAT > OR < EXPECTED					
START		PRINT			

13. Press CANCEL to terminate MECS Self Test and to return to the diagnostic test mode selection menu (Screen Display #7). Press CANCEL again to return to the main menu (Screen Display # 1).

## Appendix

### Reading EEC and 4EAT Codes With Super STAR II Tester

After hooking up the Super STAR II Tester and turning on the power switch, the tester will run a display check and the numerals "888" will begin to flash in the display window. A steady "000" will then appear when the center button is unlatched, to signify that the Super STAR II Tester is ready to start the Diagnostic Test Mode and receive the diagnostic trouble codes.



SUPER STAR II  
007-0041B

A12793-B

**NOTE:** During Diagnostic Test Mode, a PASS code is not transmitted. A blank screen will appear continuously.

To receive input and/or output diagnostic trouble codes, latch the center button in the TEST position at the front of the Super STAR II Tester, turn the ignition ON, turn the Super STAR II Tester ON, and unlatch, and then relatch the center button.

To clear the display window during the Diagnostic Test Mode, turn the ignition OFF, and unlatch and relatch the tester's push button. Every time the Super STAR II Tester is turned OFF, the low battery indicator (LO BAT) should show briefly at the upper left corner of the tester's display window. If the LO BAT indicator shows continuously at any other time during the operation of the Super STAR II Tester with any Diagnostic Trouble code, turn its power switch to OFF and replace the 9 volt battery in the tester.

The Super STAR II Tester will display the last diagnostic trouble code received, even after disconnecting it from the vehicle. It will hold the diagnostic trouble code on the display until the power is turned OFF or the push button is unlatched and relatched.

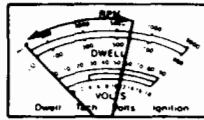
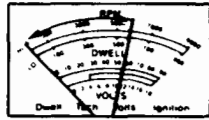
### Reading EEC and 4EAT Codes With Analog Voltmeter

When a diagnostic trouble code is reported on the analog voltmeter for a function test, it will represent itself as a pulsing or sweeping movement of the voltmeter's needle across the dial face. Therefore, a single-digit number of three will be reported by three needle pulses (sweeps). However, as previously stated, a diagnostic trouble code is sometimes represented by a two-digit number, such as 23. As a result, the diagnostic trouble code of 23 will appear on the voltmeter as two needle pulses (sweeps) then, after a 1.6-second pause, the needle will pulse (sweep) three times.



# Appendix

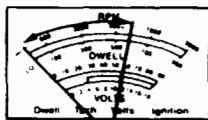
The continuous memory codes are not separated from the Key ON Engine Off codes. They are produced on the voltmeter in the same manner as the Key ON Engine Off codes.



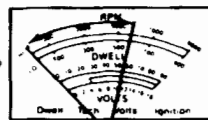
1 NEEDLE PULSE (SWEEP) + 1 NEEDLE PULSE (SWEEP) = 2 NEEDLE PULSES (SWEEPS) FOR 1ST DIGIT

1.6-SECOND PULSE BETWEEN DIGITS

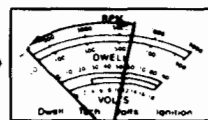
**: 23** DIAGNOSTIC TROUBLE CODE



1/2 SECOND PAUSE



1/2 SECOND PAUSE



1 NEEDLE PULSE (SWEEP) FOR 1/2 SECOND

+

1 NEEDLE PULSE (SWEEP) FOR 1/2 SECOND

+

1 NEEDLE PULSE (SWEEP) FOR 1/2 SECOND

3 NEEDLE PULSES (SWEEPS) FOR 2ND DIGIT

4-SECOND PAUSE BETWEEN DIAGNOSTIC TROUBLE CODES, WHEN MORE THAN ONE CODE IS INDICATED.

A12455-B

## Reading EEC Codes With Malfunction Indicator Lamp (MIL)

The Malfunction Indicator Lamp is intended to alert the driver to certain malfunctions in the engine control system.

If an engine control system fault occurs, the system processor will substitute a value or values and continue operating. This process is called Limited Operating Strategy (LOS). In some cases this action may result in a slight change in driveability.

### System OK

The Malfunction Indicator Lamp will remain on while the key is in the ON position, and go off once the vehicle has started.

### System Not OK

If the Malfunction Indicator Lamp remains on after the vehicle has started, perform Key ON Engine Off Test to completion. If the lamp remains on, go to EEC Pinpoint Test PGC. If the Malfunction Indicator Lamp never comes on, go to EEC Pinpoint Test MIL in Section 6B, EEC Pinpoint Tests. If the lamp comes on for a short period then goes off, and a diagnostic trouble code is present, the fault is intermittent.

**NOTE:** When the PCM is in Diagnostic Test Mode, the Malfunction Indicator Lamp will also flash diagnostic trouble codes.

## Appendix

### Reading 4EAT Codes With Overdrive Off Lamp (ODL) — 1.6L 4EAT and 2.5L 4EAT Only

The Overdrive Off (O/D OFF) Lamp is intended to alert the driver of certain malfunctions in the 4EAT system.

If such a fault occurs, the system processor will substitute a value or values and continue operating. This process is called Limited Operating Strategy (LOS). In some cases this action may result in a slight change in driveability.

#### System OK

The O/D OFF Lamp is activated by the switch on the shift lever. If switched on, it should remain ON whether or not the engine is running.

#### System Not OK

If the O/D OFF Lamp should begin to flash while the vehicle is being driven, perform Key ON Engine Off Test to completion. If the lamp continues to remain on, go to 4EAT Pinpoint Test PGC. If the O/D OFF Lamp never comes on, go to 4EAT Pinpoint Test ODL in Section 6B, EEC Pinpoint Tests.

NOTE: When the TCM is in Diagnostic Test Mode, the O/D OFF Lamp will also flash diagnostic trouble codes.

### Reading 4EAT Codes With Malfunction Indicator Lamp (MIL) — 1.8L 4EAT

To retrieve 4EAT codes, the 1.8L 4EAT uses the Malfunction Indicator Lamp (MIL).

If a fault occurs, the PCM processor will substitute a value or values and continue operating. This process is called Limited Operating Strategy (LOS). In some cases this action may result in a slight change in driveability.

#### System OK

The MIL will remain off as long as the system is OK.

#### System Not OK

If the MIL illuminates while the vehicle is being driven, perform Key ON Engine Off Test to completion.

### Erasing Diagnostic Trouble Codes

1. Disconnect the negative battery cable and depress the brake pedal for 5-10 seconds.
2. Reconnect the negative battery cable.
3. Rerun Quick Test to verify diagnostic trouble code(s) have been erased.

## Specifications/Special Service Tools

### Special Service Tools/Equipment

#### SPECIAL SERVICE TOOLS

Tool Number	Description
D81P-6666-A	Air Gap Spark Tester

#### ROTUNDA EQUIPMENT

Model	Description
007-00500	NGS Scan Tool
007-0041B	Super STAR II Tester
007-00052	Super MECS Adapter
059-00010	Analog Volt-Ohmmeter
007-00036	1.6L Super STAR II Tester
007-00049	1.3L, 1.8L and 2.5L Super STAR II Tester Adapter
007-0037B	4EAT Tester
105-00053	88 Digital Multimeter
007-00095A	1.6L 4EAT Adapter
007-00100B	1.8L 4EAT Adapter
007-00100A	2.5L 4EAT Adapter
3122-694	1.6L 4EAT Overlay
3122-731	1.8L 4EAT Overlay
3122-696	2.5L 4EAT Overlay