# Computers and Control Systems: Pinpoint Tests
# Test DR: Camshaft Position (CMP) Sensor

| Camshaft Position (CMP) Sensor | DR |
|---|---|

## Note

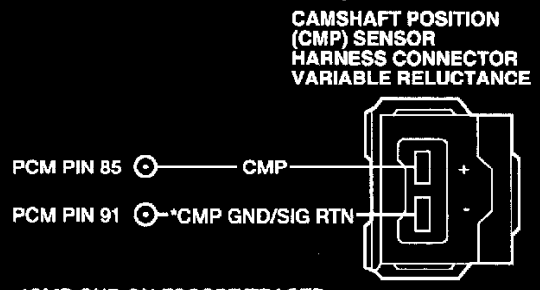
This Pinpoint Test is intended to diagnose the following:

- Camshaft Position (CMP) Sensor (6B288) (12A112)
- Harness Circuits: CMP, VPWR, SIG RTN, PWR GND, CMP/TSS GND
- Powertrain Control Module (PCM) (12A650)

## Pinpoint Test Schematics and Connectors

Camshaft Position (CMP) Sensor Connectors

**2.0L (2V) Escort, 4.0L SOHC Explorer**

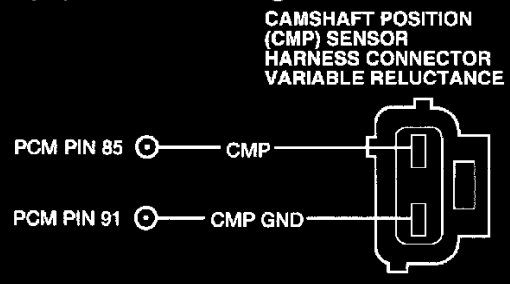



*CMP GND ON ESCORT/TRACER,
SIG RTN ON EXPLORER

NOTE: ALL HARNESS CONNECTORS ARE
VIEWED INTO MATING SURFACE

A0041633

**2.0L (4V) Escort, 2.5L Cougar**




NOTE: ALL HARNESS CONNECTORS ARE
VIEWED INTO MATING SURFACE

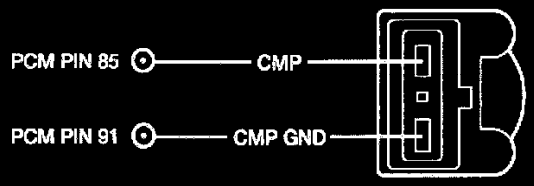
A0041634

Note, Schematics and Connectors

# Camshaft Position (CMP) Sensor

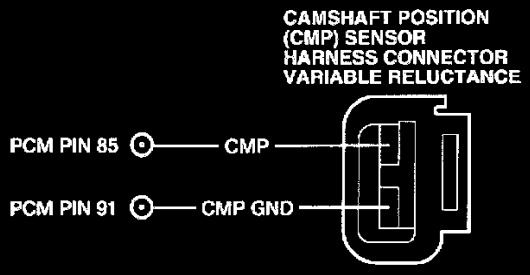
DR

## 2.0L (2V) Focus



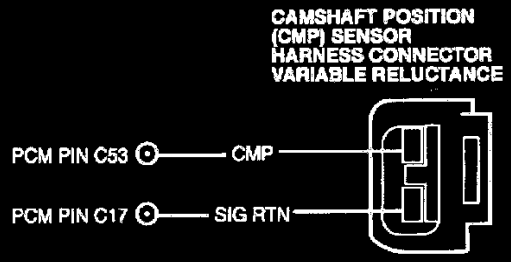

A0041635

## 2.0L (4V) Focus, Escape




A0041636

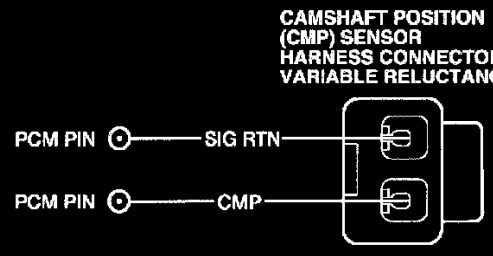
## LS6




NOTE: ALL HARNESS CONNECTORS ARE VIEWED INTO MATING SURFACE

AA4384-B

## LS8, Expedition/Navigator, Explorer/Mountaineer, Thunderbird




NOTE: ALL HARNESS CONNECTORS ARE VIEWED INTO MATING SURFACE

A0041637

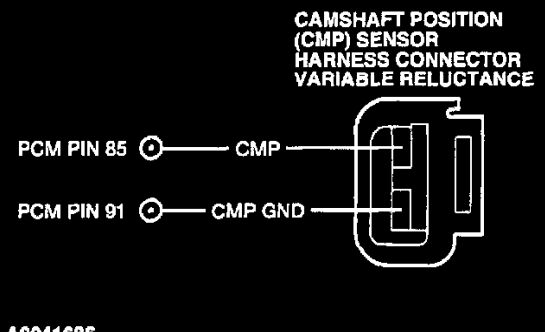
### PCM CONNECTOR PIN NUMBERS

| PCM TYPE | CMP | SIG RTN |
|---|---|---|
| Expedition Navigator | B31 | B25 |
| LS8, Thunderbird, Explorer Mountaineer | C53 | C17 |

**Test Schematic**

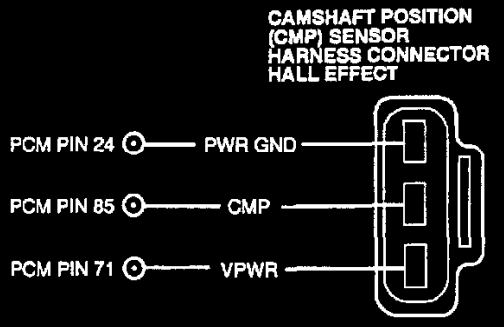
# Camshaft Position (CMP) Sensor — DR

### 3.0L (4V) Escape




A0041636

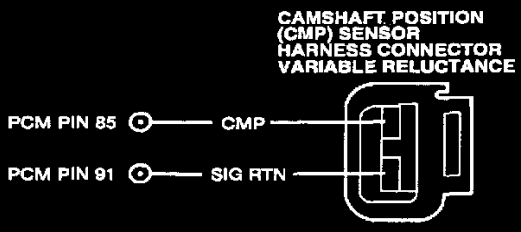
### 4.2L F-Series, 4.2L Econoline




NOTE: ALL HARNESS CONNECTORS ARE VIEWED INTO MATING SURFACE

AA4378-B

### All Others




NOTE: ALL HARNESS CONNECTORS ARE VIEWED INTO MATING SURFACE

A0041638

| Test Steps | | Results → | Action to Take |
|---|---|---|---|
| DR1 | DTC P0340: CHECK IF ENGINE WILL START | | |
| | Note: Refer to the Pinpoint Test Schematic to determine the type of CMP sensor.<br>• Start engine.<br>• **Will the engine start?** | Yes →<br>No → | GO to **DR2.**<br>DTC P0340 is not the cause of the No Start. GO to Symptom Charts to diagnose the No Start symptom. |
| DR2 | CLEAR AND ATTEMPT TO RE-GENERATE DTC P0340 | | |
| | • Complete PCM Reset to clear DTCs.<br>• Increase rpm to greater than 1500 rpm for 10 seconds. Repeat two times.<br>• Retrieve all Continuous Memory DTCs.<br>• **Is DTC P0340 present?** | Yes →<br><br><br><br>No → | **For VR type CMP:** KEY OFF. GO to **DR5**<br>**For Hall Effect type CMP:** KEY OFF. GO to **DR3**<br>The fault that produced DTC P0340 is intermittent. GO to **Z1**. |

**Schematic, Test DR1 - DR2**

# Camshaft Position (CMP) Sensor — DR

| Test Steps | | Results → | Action to Take |
|---|---|---|---|
| DR3 | CHECK VPWR VOLTAGE TO CMP SENSOR | | |
| | • Disconnect CMP sensor.<br>• Key on, engine off.<br>• Measure VPWR circuit voltage between CMP sensor harness connector and battery negative post.<br>• **Is voltage greater than 10.5 volts?** | Yes →<br>No → | KEY OFF. GO to **DR4**.<br>REPAIR open circuit. |
| DR4 | CHECK PWR GND TO CMP SENSOR | | |
| | • Measure resistance of PWR GND circuit between CMP sensor harness connector and battery negative post.<br>• **Is resistance less than 5.0 ohms?** | Yes →<br>No → | GO to **DR5**.<br>REPAIR open circuit. |
| DR5 | CHECK FOR OPEN CMP, SIG RTN/CMP GND AND PWR GND CIRCUITS BETWEEN PCM AND CMP SENSOR | | |
| | Note: Refer to the PCM connector pin numbers in the beginning of this pinpoint test.<br>• Disconnect PCM and CMP sensor.<br>• If VR type CMP: Measure resistance of CMP, CMP GND/SIG RTN circuits between PCM harness connector pin and CMP sensor harness connector.<br>• If Hall type CMP: Measure resistance of CMP, VPWR and PWR GND circuits between PCM harness connector and CMP sensor harness connector.<br>• **Are resistance measurements less than 5.0 ohms?** | Yes →<br>No → | GO to **DR6**.<br>REPAIR open circuit. |
| DR6 | CHECK CMP CIRCUIT FOR SHORT TO POWER IN HARNESS | | |
| | • Key on, engine off.<br>• If Hall type CMP: Measure voltage between CMP and VPWR circuits at the PCM harness connector.<br>• If VR type CMP: Measure voltage between CMP and CMP GND/SIG RTN circuits at the PCM connector.<br>• **Is voltage less than 1.0 volt?** | Yes →<br>No → | KEY OFF. GO to **DR7**.<br>REPAIR short circuit. |
| DR7 | CHECK CMP CIRCUIT FOR SHORT TO GND AND SIG RTN IN HARNESS | | |
| | • If VR type CMP: Measure resistance between CMP and CMP GND/SIG RTN at the PCM harness connector.<br>• If Hall type CMP: Measure resistance between CMP and PWR GND at the PCM harness connector.<br>• **Is each resistance greater than 10,000 ohms?** | Yes →<br>No → | GO to **DR8**.<br>REPAIR short circuit. |

# Camshaft Position (CMP) Sensor — DR

| Test Steps | Results → | Action to Take |
|---|---|---|
| **DR8** CHECK FOR SHORTS IN PCM | | |
| • Reconnect PCM.<br>• For VR type CMP: Measure resistance between CMP and CMP GND/SIG RTN circuits at the CMP harness connector.<br>• For Hall Effect type CMP: Measure resistance between CMP and VPWR and CMP and PWR GND circuits at the CMP harness connector.<br>• **Is each resistance greater than 500 ohms?** | Yes →<br><br><br><br>No → | **For VR type CMP:** GO to **DR9**.<br>**For Hall Effect type CMP:** GO to **DR10**.<br>REPLACE PCM (refer to Diagnostic Methods, Flash Electrically Erasable Programmable Read Only Memory (EEPROM)). |
| **DR9** CHECK CMP SENSOR OUTPUT | | |
| • Reconnect CMP sensor.<br>• Digital multimeter on ac scale (to monitor less than 5.0 volts).<br>• Measure voltage between CMP and CMP GND/SIG RTN circuits while running engine at varying rpm.<br>• **Does AC voltage vary greater than 0.2 volt AC?** | Yes →<br><br><br><br>No → | REPLACE PCM (refer to Diagnostic Methods, Flash Electrically Erasable Programmable Read Only Memory (EEPROM)).<br>REPLACE CMP sensor. |
| **DR10** CHECK CMP SENSOR OUTPUT DURING CRANK MODE | | |
| • Disconnect PCM.<br>• Reconnect CMP sensor.<br>• Connect digital multimeter between CMP and the CMP sensor GND circuit.<br>• Bump engine in short bursts with the starter without starting engine for at least 10 engine revolutions.<br>• **Does voltage reading switch between low (less than 2.0 volts dc) and high (greater than 8.0 volts dc)?** | Yes →<br><br><br><br><br><br><br><br>No → | A CMP sensor that is installed out of synchronization will produce a DTC. VERIFY the correct installation. If CMP is installed properly, REPLACE PCM (refer to Diagnostic Methods, Flash Electrically Erasable Programmable Read Only Memory (EEPROM).<br>Note: If vehicle has a miss with the P0340 code, ignition/ alternator noise, RFI, and CKP concerns should be considered.<br>REPLACE CMP sensor. |