JD: Crankshaft Position (CKP) Sensor

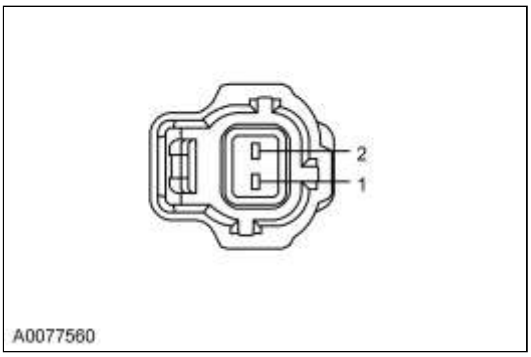
WARNING: Crown Victoria Police Interceptor vehicles equipped with fire suppression system, refer to Section 419-03 for Important Safety Warnings. Failure to follow these instructions may result in personal injury.

This pinpoint test is intended to diagnose the following:

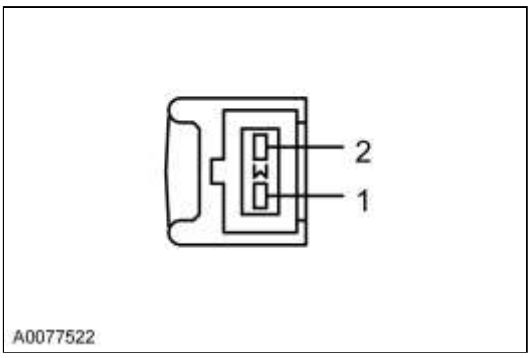
- Crankshaft Position (CKP) Sensor (6C135).
- Harness Circuits: CKP(+) and CKP(-)
- Powertrain control module (PCM) (12A650)

Crankshaft Position (CKP) Sensor Connector

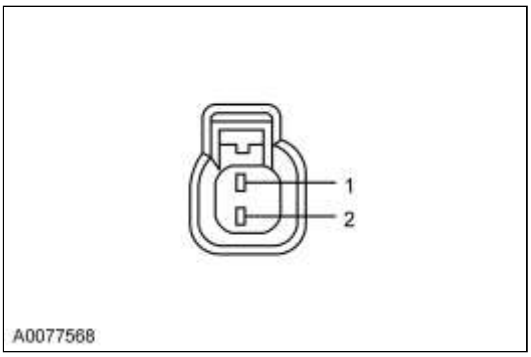
A



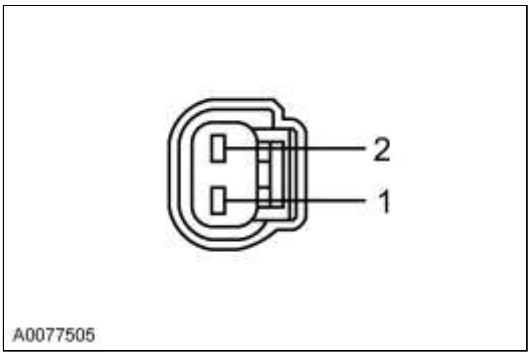
B



C



D



Vehicle	Connector	Pin	Circuit
Escape, Mariner	A	2 1	CKP- CKP+
Explorer 4.0L, Mountaineer 4.0L, Mustang 4.0L, Ranger 4.0L	B	2 1	CKP- CKP+
LS 3.9L, Thunderbird	C	1 2	CKP- CKP+
All other vehicles	D	2 1	CKP- CKP+

Powertrain Control Module (PCM) Connector

For PCM connector views or reference values, refer to Section 6.

Vehicle	Connector	Pin	Circuit
Aviator, LS, Thunderbird	150 (60-32-58) Pin	E55 E56	CKP+ CKP-
E-Series, F-Super Duty, Mustang	170 Pin	E47 E46	CKP+ CKP-
Excursion, Explorer Sport Trac, Freestar/Monterey, Ford GT, Ranger, Sable, Taurus	104 Pin	21 22	CKP+ CKP-
Expedition, F-150, Navigator	190 Pin	E47 E46	CKP+ CKP-
All other vehicles	150 (50-50-50) Pin	E34 E45	CKP+ CKP-

JD1 CHECK THE CRANKSHAFT POSITION (CKP) SENSOR SIGNAL SENT TO THE PCM

Note: *On certain applications with electronic throttle control (ETC), erroneous ignition and ETC-related DTCs may be set due to salt water intrusion into the crankshaft position (CKP) sensor harness connector. These DTCs are set in the following combinations:*

- *P0320, P0351, and P2106*
- *P0320, P0356, and P2106*

Thoroughly clean the connector, pack with di-electric grease and retest. If the problem returns, continue the CKP sensor diagnosis.

- Battery fully charged and starting system functioning properly.
- Diagnostic tool connector connected.
- Disable the inertia switch.
- Key ON, engine OFF.
- Access the PCM and monitor the RPM PID.
- Crank the engine.

Is the RPM greater than 150 RPM?

Yes	For DTC P1336 with no start, GO to Pinpoint Test A. For DTC P1336, GO to HD30. For all others, the CKP, PCM, and harness are working properly. RETURN to Section 3, Symptom Charts for further direction.
No	GO to JD2.

JD2 CHECK THE TIMING COVER, CKP SENSOR AND EXTERNAL TRIGGER WHEEL (OUTSIDE THE TIMING COVER) FOR OBVIOUS PHYSICAL DAMAGE

- Key in OFF position.
- Visually CHECK the timing cover, CKP sensor and external trigger wheel (outside the timing cover) for obvious physical damage.

Do any parts appear physically damaged?

Yes	REPAIR as necessary. RESET the keep alive memory (KAM). REFER to Section 2, Resetting The Keep Alive Memory (KAM). REPEAT the self-test.
No	GO to JD3.

JD3 CHECK FOR PROPER CKP BIAS VOLTAGES IN THE PCM

- CKP Sensor connector disconnected.
- Key ON, engine OFF.
- Measure the voltage between:

(+) CKP Sensor Connector, Harness Side	(-) Vehicle Battery
CKP+	Negative terminal
CKP-	Negative terminal

Are the voltages between 1 - 3 V?

Yes	GO to JD4.
No	GO to JD6.

JD4 CHECK THE CKP SENSOR RESISTANCE

- Key in OFF position.
- Measure the resistance between:

(+) CKP Sensor Connector, Component Side	(-) CKP Sensor Connector, Component Side
CKP+	CKP-

- Note: The CKP sensor resistance values change significantly with temperature rise.

Is the resistance between 250 - 1K ohms?

Yes	GO to JD5.
No	INSTALL a new CKP sensor. REFER to the Workshop Manual Section 303-14, Electronic Engine Controls. RESET the keep alive memory (KAM). REFER to Section 2, Resetting The Keep Alive Memory (KAM).

JD5 CHECK THE CKP HARNESS SHIELD GROUND

Note: *The harness shield protects the CKP signal from electrical noise and is grounded at one end, typically near the PCM.*

Note: *Carry out the following resistance measurement between the CKP shield and the chassis ground.*

- Measure the resistance between:

(+) CKP_SHLD Assembly Connector, Harness Side	(-)
CKP_SHLD	Ground

Is the resistance less than 5 ohms?

Yes	GO to JD6.
No	REPAIR the open circuit. CHECK for a poor ground connection.

JD6 CHECK FOR SHORT BETWEEN CKP(+) AND CKP(-) IN THE HARNESS

- Key in OFF position.
- PCM connector disconnected.
- Measure the resistance between:

(+) CKP Sensor Connector, Harness Side	(-) CKP Sensor Connector, Harness Side
CKP+	CKP-

Is the resistance greater than 10K ohms?

Yes	GO to JD7.
No	REPAIR the short circuit.

JD7 CHECK THE CKP CIRCUIT(S) FOR AN OPEN IN THE HARNESS

- Measure the resistance between:

(+) CKP Sensor Connector, Harness Side	(-) PCM Connector, Harness Side
CKP-	CKP-
CKP+	CKP+

Are the resistances less than 5 ohms?

Yes	GO to JD8.
No	REPAIR the open circuit.

JD8 CHECK THE CKP CIRCUIT(S) FOR A SHORT TO GROUND IN THE HARNESS

- Measure the resistance between:

(+) CKP Sensor Connector, Harness Side	(-) Vehicle Battery
CKP+	Negative terminal
CKP-	Negative terminal

Are the resistances greater than 10K ohms?

Yes	GO to JD9.
No	REPAIR the short circuit to GND.

JD9 CHECK THE CKP CIRCUIT FOR A SHORT TO VOLTAGE IN THE HARNESS

- Key ON, engine OFF.
- Measure the voltage between:

(+) PCM Connector, Harness Side	(-) Vehicle Battery
CKP+	Negative terminal
CKP-	Negative terminal

Is any voltage present?

Yes	REPAIR the short circuit to PWR.
No	INSTALL a new PCM. REFER to Section 2, Flash Electrically Erasable Programmable Read Only Memory (EEPROM).