

**Step 3: No DTC(s) Present Symptom Charts**

**Chart 1**

- Starting Concerns: Stalls After Start
- Stalls/Quits: Idle, Acceleration, Cruise
- Runs Rough
- Misses
- Buck/Jerk
- Hesitation/Stumble
- Surge
- Unique Idle concerns: Rolling Idle

**Note:** For stalls on passenger car applications, engine may stall if left running while refueling. Advise customer to turn engine off while refueling to avoid contamination or damage to the EVAP system.

SYSTEM/COMPONENT	REFERENCE (Section 5 Pinpoint Test unless noted)
<p>Check The Following PIDs:</p> <ul style="list-style-type: none"> <li>▪ DPFEGR (if equipped) (hot idle value within 0.15V of KOEO value)</li> <li>▪ LONGFT1 / LONGFT2 (value between -20 and +20)</li> <li>▪ VPWR (value between 10.5 and 17.0 volts, and within 0.5 volts of battery voltage)</li> </ul>	<p><b>DPFEGR PID value not within 0.15V of KOEO value:</b></p> <ul style="list-style-type: none"> <li>• For vehicles equipped with <b>ESM EGR</b>: GO to <a href="#">HH34</a></li> <li>• <b>All others</b>: GO to <a href="#">HE57</a></li> </ul> <p><b>LONGFT1 / LONGFT2 value low (-):</b> Continue diagnosis. Concentrate checks in areas that would cause the engine to run rich.</p> <p><b>LONGFT1 / LONGFT2 value high (+):</b> Continue diagnosis. Concentrate checks in areas that would cause the engine to run lean.</p> <p><b>VPWR not between 10.5 and 17.0 volts:</b> Go to the Workshop Manual, Charging System Section 414.</p> <p><b>VPWR between 10.5 and 17.0 volts, but not within 0.5 of battery voltage:</b> CHECK B(+) supply to PCM power relay (or CCRM). CHECK VPWR circuit between PCM and PCM power relay or CCRM. CHECK PWR GND circuits.</p>
<p><b>For vehicles that run rough at idle:</b></p>	<p><b>INJxF PID(s) indicate a fault (an injector circuit fault is indicated):</b></p>

SYSTEM/COMPONENT	REFERENCE (Section 5 Pinpoint Test unless noted)
<p>With the key on, engine off, check the INJxF PIDs (the "x" indicates the injector number, there will be one INJxF PID for each engine cylinder). All INJxF PIDs must indicate no fault (or NO).</p>	<p><b>Natural Gas applications:</b> GO to <a href="#">HA27</a> <b>All others:</b> GO to <a href="#">H52</a></p>
<p>Mass Air Flow (MAF) Sensor</p>	<p>GO to <a href="#">DC25</a></p>
<p>Secondary Ignition System</p>	<p>For vehicles equipped with a coil pack ignition system, <a href="#">GO to Pinpoint Test JC</a>. For all others, <a href="#">GO to Pinpoint Test JB</a>.</p>
<p>Fuel Delivery System</p>	<p><b>Natural Gas Applications:</b> GO to <a href="#">HB1</a> <b>All Others:</b> GO to <a href="#">HC1</a></p>
<p>Exhaust System</p>	<p>GO to <a href="#">HF5</a></p>
<p>PCV System</p>	<p>GO to <a href="#">HG1</a></p>
<p><b>Natural Gas applications with rough idle:</b> Injector circuits between NG module and injectors.</p>	<p>GO to <a href="#">HA27</a></p>
<p>EVAP System</p>	<p>GO to <a href="#">HX14</a></p>
<p>Automatic Transmission</p>	<p>Automatic Transaxle/Transmission - Section 307 of the Workshop Manual</p>
<p>Base Engine</p>	<p>Engine System - Section 303 of the Workshop Manual</p>
<p>Intake Air System</p>	<p>For vehicles with electronic throttle control (ETC), GO to <a href="#">HU67</a> For all others, GO to <a href="#">HU1</a></p>

SYSTEM/COMPONENT	REFERENCE (Section 5 Pinpoint Test unless noted)
<b>Applications with A/C Pressure Sensor (3 wire sensor):</b> A/C pressure (ACP) sensor input to PCM	GO to <a href="#">DS18</a>
Additional Testing	GO to <a href="#">Z1</a>
<p>Additional Checks:</p> <p><b>Note:</b> <i>Some applications have a PID that will indicate whether the PCM is reducing torque (TQ_CNTL) (#095E b0), and if so, why the torque is being reduced (#095Eb1-13) (0 = No torque reduction requested; 1 = Torque Truncation. Cuts fuel to protect when line pressure fails to minimum limit; 2 = Traction Control Event. Cuts fuel and/or spark for traction control; 3 = Vehicle Speed Limit - Cuts fuel).</i></p> <ul style="list-style-type: none"> <li>▪ Correct PCM vehicle identification (VID) block information (refer to Section 2, <a href="#">Flash Electrically Erasable Programmable Read Only Memory (EEPROM)</a>)</li> <li>▪ Be aware of engine RPM/speed limiting functions of the PCM (look for incorrect high vehicle speed signal from ABS, VSS or OSS)</li> <li>▪ Verify fuel cap is properly tightened, and not physically damaged.</li> <li>▪ Drivelines</li> <li>▪ Manual transmission/clutch</li> <li>▪ Charging System</li> <li>▪ Traction control system (if equipped)</li> <li>▪ A/C system (for surge with A/C on)</li> <li>▪ Speed control system (for surge with speed control on)</li> <li>▪ A/C compressor diode, if equipped (for rolling idle)</li> </ul>	Applicable section in Workshop Manual

### Chart 2

- Starting Concerns:
- Hard Start/Long Crank
  - Erratic Start/Erratic Crank

SYSTEM/COMPONENT	REFERENCE (Section 5 Pinpoint Test unless noted)
Battery Condition and Current Draw	Visual, Charging System - Section 414 of the Workshop Manual
Secondary Ignition System	For vehicles equipped with a coil pack ignition system, <a href="#">GO to Pinpoint Test JC.</a>

SYSTEM/COMPONENT	REFERENCE (Section 5 Pinpoint Test unless noted)
	For all others, <a href="#">GO to Pinpoint Test JB</a> .
Fuel Delivery System	<b>Natural Gas Applications:</b> GO to <a href="#">HB1</a> <b>All Others:</b> GO to <a href="#">HC1</a>
Exhaust System	GO to <a href="#">HF5</a>
PCV System	GO to <a href="#">HG1</a>
EVAP System	GO to <a href="#">HX14</a>
Intake Air System	For vehicles with electronic throttle control (ETC), GO to <a href="#">HU67</a> For all others, GO to <a href="#">HU1</a>
Starting System	Starting System, Section 303 of the Workshop Manual
Mass Air Flow (MAF) Sensor	GO to <a href="#">DC25</a>
<b>5.4L SC F-Series only:</b> Check high speed fuel pump secondary circuits.	GO to <a href="#">KA52</a>
Additional Testing	GO to <a href="#">Z1</a>
Additional Checks: <ul style="list-style-type: none"> <li>▪ For applications with two Camshaft Position (CMP) sensors, verify CMP1 and CMP2 circuits are not shorted together.</li> </ul>	Visual

**Chart 3**

Starting Concerns:

- No Start (engine cranks)

**Note:** *Extended cranking because of a no start can load the exhaust system with raw fuel, damaging the catalytic converter after the engine starts. For applications with Secondary Air Injection (AIR) Systems, perform the following after the no start has been repaired: Disconnect the electric secondary air injection (AIR) solid state relay, run the engine until the surplus fuel is used up, and reconnect the relay (disconnecting the relay may set a Continuous Memory PCM DTC that will need to be cleared).*

SYSTEM/COMPONENT	REFERENCE (Section 5 Pinpoint Test unless noted)
Add-on Anti-Theft Devices	Visual, check with customer.
Fuel/Ignition	<b>Thunderbird and LS6/LS8:</b> GO to <a href="#">KB56</a> . <b>All others:</b> GO to <a href="#">A1</a> .
<b>If engine will not start now:</b> If engine will not start at closed throttle, but will start and run normally at part throttle, check Idle Air Control (IAC) System.	<b>Engine will now start and run normally at part throttle:</b> GO to <a href="#">KE2</a>
Exhaust System (restrictions)	GO to <a href="#">HF5</a>
Base Engine	Engine System - Section 303 of the Workshop Manual
Additional Testing	GO to <a href="#">Z1</a>

#### Chart 4

Unique Idle Concerns:

- Slow Return To Idle

SYSTEM/COMPONENT	REFERENCE (Section 5 Pinpoint Test unless noted)
Vacuum Leaks, Throttle Body	Visual

SYSTEM/COMPONENT	REFERENCE (Section 5 Pinpoint Test unless noted)
PCV System	GO to <a href="#">HG1</a>
Intake Air System (air leaks)	GO to <a href="#">HU1</a>

### Chart 5

Unique Idle Concerns:

- Fast Idle

Additional Driveability Concerns:

- Diesels/Runs On

**Note:** If vehicle runs normally after the ignition key is turned OFF, check for damaged ignition switch, IGN RUN circuit short to power, VPWR circuit short to power, etc. Refer to applicable Wiring Diagram and/or Workshop Manual

SYSTEM/COMPONENT	REFERENCE (Section 5 Pinpoint Test unless noted)
Base engine air leaks, including proper sealing of intake manifold and components/vacuum lines attached to intake air (such as the PCV, EGR or IAC valve/vacuum lines).	Visual, Engine System - Section 303 of the Workshop Manual
Verify engine operates at normal temperature.	Visual (refer to Symptom Index, or Engine Cooling Section 303 of Workshop Manual, to diagnose any cooling system concerns that are present).
<p><b>Fast idle concerns:</b> Key on, engine off, monitor TP MODE PID while wiggling TP sensor circuits. TP MODE PID can also be monitored during vehicle drive. With throttle closed, TP MODE PID must be C/T (closed throttle).</p>	<p><b>TP Mode PID is not C/T with throttle closed:</b></p> <p><b>Note:</b> At vehicle start, the TPREL will begin at about 1.25 volts, and count down to the lowest TP V value seen since engine start. If the TP V value goes below the "normal" range, then increases again, TPREL will set to the lower voltage. If TP V is about 0.04 volts greater than the TPREL value at closed throttle, the PCM will go into part throttle mode.</p> <p>Monitor TP V and TPREL PIDs for sudden changes while checking for intermittent TP circuit/connector concerns. Also check for loose/worn throttle plates. If no concern is found, GO to <a href="#">Z1</a> in Section 5.</p>
Intake Air System (air leaks)	GO to <a href="#">HU1</a>

SYSTEM/COMPONENT	REFERENCE (Section 5 Pinpoint Test unless noted)
Additional Testing	GO to <a href="#">Z1</a>

**Chart 6**

- Unique Idle Concerns:
- Low/Slow Idle
- Stalls/Quits
- Deceleration

SYSTEM/COMPONENT	REFERENCE (Section 5 Pinpoint Test unless noted)
Verify fuel filler cap is properly tightened	Visual
<b>For A/T with Stalls/Quits on deceleration:</b> Transmission	Automatic Transaxle/Transmission, Section 307 of the Workshop Manual (Diagnosis By Symptom: Torque Converter Concerns)
<b>For Low idle with A/C on (4.6/5.4L/6.8L E-Series):</b> Check ACCS PID with A/C on and engine running (PID should indicate ON when A/C clutch is engaged). (On applications where the PCM cannot control the A/C clutch on and off, the PCM uses the ACCS circuit to determine additional load on the engine.)	<b>ACCS PID does not indicate ON with A/C clutch engaged:</b> GO to <a href="#">KM7</a>
Fuel Delivery System	<b>Natural Gas Applications:</b> GO to <a href="#">HB1</a> <b>All Others:</b> GO to <a href="#">HC1</a>
Intake Air System	For vehicles with electronic throttle control (ETC), GO to <a href="#">HU67</a> For all others, GO to <a href="#">HU1</a>
Base Engine	Engine System - Section 303-00 of the Workshop Manual
Additional Checks:	Visual

SYSTEM/COMPONENT	REFERENCE (Section 5 Pinpoint Test unless noted)
<ul style="list-style-type: none"> <li>Check if the operation of certain SYSTEM/COMPONENT is correct at the low idle.</li> </ul>	
Additional Testing	GO to <a href="#">Z1</a>

## Chart 7

Backfires

SYSTEM/COMPONENT	REFERENCE (Section 5 Pinpoint Test unless noted)
Secondary Ignition	For vehicles equipped with a coil pack ignition system, <a href="#">GO to Pinpoint Test JC</a> . For all others, <a href="#">GO to Pinpoint Test JB</a> .
Fuel Delivery System	<b>Natural Gas Applications:</b> GO to <a href="#">HB1</a> <b>All Others:</b> GO to <a href="#">HC1</a>
Base Engine	Engine System - Section 303 of the Workshop Manual
Exhaust System	GO to <a href="#">HF5</a>
Additional Testing	GO to <a href="#">Z1</a>

## Chart 8

Lack/Loss of Power

**Note:** Verify symptom is reported under normal driving conditions without excessive engine/vehicle load. Also, be aware of the engine rpm/speed limiting functions of the PCM.

**Note:** For applications with knock sensor, a lack of power may result when the vehicle is operated with a breakout box installed at the PCM. The KS circuits are not shielded in the breakout box, and KS signal noise may be noticed by the PCM. If this happens, spark timing will be retarded and a lack of power may result.



**Note:** For applications with a knock sensor, a lack of power may result if the engine has developed an abnormal noise. The knock sensors may interpret some abnormal noise as detonation and retard spark timing.

SYSTEM/COMPONENT	REFERENCE (Section 5 Pinpoint Test unless noted)
<ul style="list-style-type: none"> <li>▪ Automatic Transmission Fluid</li> <li>▪ Throttle Linkage</li> <li>▪ Air cleaner element</li> </ul>	Visual
<p>Check the Following PIDS:</p> <ul style="list-style-type: none"> <li>▪ DPFEGR (if equipped) (hot idle value within 0.15V of KOEO value)</li> <li>▪ LONGFT1 / LONGFT2 (value between -20 and +20)</li> <li>▪ <b>For 4.6L E/F Series:</b> IMTVF with both Key On Engine Off, and with transmission in PARK/NEUTRAL and engine rpm greater than 3000 rpm (PID should indicate no fault (or NO) in both situations).</li> </ul>	<p><b>DPFEGR PID value not within 0.15V of KOEO value:</b></p> <ul style="list-style-type: none"> <li>• For vehicles equipped with ESM EGR: GO to <a href="#">HH34</a></li> <li>• All others: GO to <a href="#">HE57</a></li> </ul> <p><b>LONGFT1 / LONGFT2 value low (-):</b> Continue diagnosis. Concentrate checks in areas that would cause the engine to run rich.</p> <p><b>LONGFT1 / LONGFT2 value high (+):</b> Continue diagnosis. Concentrate checks in areas that would cause the engine to run lean.</p> <p><b>IMTVF PID indicates a fault:</b> GO to <a href="#">HU42</a></p>
Fuel Delivery System	<p><b>Natural Gas Applications:</b> GO to <a href="#">HB1</a></p> <p><b>All others:</b> GO to <a href="#">HC1</a></p>
Secondary Ignition	<p>For vehicles equipped with a coil pack ignition system, <a href="#">GO to Pinpoint Test JC</a>.</p> <p>For all others, <a href="#">GO to Pinpoint Test JB</a>.</p>
Mass Air Flow (MAF) Sensor	GO to <a href="#">DC25</a>
Exhaust System	GO to <a href="#">HF5</a>
Base Engine	Engine System - Section 303 of the Workshop Manual
Automatic Transmission	Automatic Transaxle/Transmission, Section 307 of the Workshop Manual

SYSTEM/COMPONENT	REFERENCE (Section 5 Pinpoint Test unless noted)
	(Diagnosis by Symptom - Poor Performance)
Brake System (brake drag or binding)	Brake System Section 206 of the Workshop Manual
<p><b>Mustang only:</b> Check for lack of A/C cutoff under wide open throttle conditions.</p>	Audible (listen for A/C clutch to disengage during a brief wide open throttle, then re-engage a few seconds after returning to idle). Follow Symptom Chart 21 if A/C does not cutoff.
<p><b>Supercharged applications:</b> Supercharger bypass system</p>	GO to <a href="#">KJ13</a>
<p><b>5.4L SC F-Series:</b> Check high speed fuel pump secondary circuits</p>	GO to <a href="#">KA52</a>
Additional Testing	GO to <a href="#">Z1</a>
<p>Additional Checks:</p> <p><b>Note:</b> <i>Some applications have a PID that will indicate whether the PCM is reducing torque (095E b0), and if so, why the torque is being reduced (095E b1-13).</i></p> <ul style="list-style-type: none"> <li>▪ Customer driving habits</li> <li>▪ Correct PCM vehicle identification (VID) block information (refer to Section 2, <a href="#">Flash Electrically Erasable Programmable Read Only Memory (EEPROM)</a>)</li> <li>▪ IMRC linkage (if equipped)</li> <li>▪ Clutch (M/T)</li> <li>▪ Charging System</li> <li>▪ Engine RPM/speed limiting functions of the PCM (look for incorrect high vehicle speed signal from ABS, VSS or OSS)</li> </ul>	Visual. Appropriate Group of the Workshop Manual

**Chart 9**

Spark Knock

SYSTEM/COMPONENT	REFERENCE (Section 5 Pinpoint Test unless noted)
Verify engine operates at normal temperature	Visual (refer to Symptom Index, or Engine Cooling Section 303 of the Workshop Manual, to diagnose any cooling system concerns that are present).
Verify correct coolant level and coolant concentration	Refer to Engine Cooling Section 303-03 for proper fill concentrations and fill procedures.
Mass Air Flow (MAF) Sensor	GO to <a href="#">DC25</a>
Base Engine	Engine System - Section 303 of the Workshop Manual
Fuel Delivery System	<p><b>Natural Gas Applications:</b> GO to <a href="#">HB1</a></p> <p><b>All Others:</b> GO to <a href="#">HC1</a></p>
Secondary Ignition System	<p>For vehicles equipped with a coil pack ignition system, <a href="#">GO to Pinpoint Test JC</a>.</p> <p>For all others, <a href="#">GO to Pinpoint Test JB</a>.</p>
PCV System	GO to <a href="#">HG1</a>
Engine Oil Quality	Visual
Additional Testing	GO to <a href="#">Z1</a>

**Chart 10**

Poor Fuel Economy

**Note:** Since driving styles can have a significant influence on fuel economy, verify the concern before starting an in-depth diagnosis. Also, the following external factors could contribute to "poor fuel economy" conditions:

- Stop/go driving
- Improper tire pressure/size
- Vehicle loads (such as trailer towing)
- Extended winter warm-up conditions

- High speed driving
- Improper axle ratio
- Road/weather conditions
- Aftermarket add-ons
- Short run operations
- Customer expectations

SYSTEM/COMPONENT	REFERENCE (Section 5 Pinpoint Test unless noted)
Transmission Fluid Level	Visual
<p>Check The Following PIDs:</p> <ul style="list-style-type: none"> <li>▪ DPFEGR (if equipped) (hot idle value within 0.15V of KOEO value)</li> <li>▪ LONGFT1 / LONGFT2 (value between -20 and +20)</li> <li>▪ VPWR (value between 10.5 and 17.0 volts, and within 0.5 volts of battery voltage)</li> </ul>	<p><b>DPFEGR PID value not within 0.15V of KOEO value:</b></p> <ul style="list-style-type: none"> <li>• For vehicles equipped with ESM EGR: GO to <a href="#">HH34</a></li> <li>• All others: GO to <a href="#">HE57</a></li> </ul> <p><b>LONGFT1 / LONGFT2 value low (-):</b> Continue diagnosis. Concentrate checks in areas that would cause the engine to run rich.</p> <p><b>LONGFT1 / LONGFT2 value high (+):</b> Continue diagnosis. Concentrate checks in areas that would cause the engine to run lean.</p> <p><b>VPWR not between 10.5 and 17.0 volts:</b> Go to the Charging System - Section 414 of the Workshop Manual</p> <p><b>VPWR between 10.5 and 17.0 volts, but not within 0.5 of battery voltage:</b> CHECK B(+) supply to PCM power relay (or CCRM). CHECK VPWR circuit between PCM and PCM power relay or CCRM. CHECK PWR GND circuits.</p>
Verify engine operates at normal temperature	Visual (refer to Symptom Index, or Engine Cooling Section 303 of the Workshop Manual, to diagnose any cooling system concerns that are present).
Secondary Ignition System	For vehicles equipped with a coil pack ignition system, <a href="#">GO to Pinpoint Test JC</a> . For all others, <a href="#">GO to Pinpoint Test JB</a> .
Fuel System	<p><b>Natural Gas Applications:</b> GO to <a href="#">HB1</a></p> <p><b>All Others:</b> GO to <a href="#">HC1</a></p>
Exhaust System	GO to <a href="#">HF5</a>

SYSTEM/COMPONENT	REFERENCE (Section 5 Pinpoint Test unless noted)
Automatic Transmission	Automatic Transaxle/Transmission Section 307 of the Workshop Manual (Diagnosis by Symptom - Poor Performance)
PCV System	GO to <a href="#">HG1</a>
Additional Checks: <ul style="list-style-type: none"> <li>▪ Correct PCM vehicle identification (VID) block information (refer to Section 2, <a href="#">Flash Electrically Erasable Programmable Read Only Memory (EEPROM)</a>)</li> <li>▪ Brake drag</li> <li>▪ Base engine concerns</li> <li>▪ Incorrect PCV valve</li> <li>▪ Contaminated MAF sensor</li> <li>▪ Intake air system</li> </ul>	Appropriate section in Workshop Manual
Additional Testing	GO to <a href="#">Z1</a>

**Chart 11**

Emissions Compliance

SYSTEM/COMPONENT	REFERENCE (Section 5 Pinpoint Test unless noted)
Emissions Related Systems	GO to <a href="#">EM1</a>

**Chart 12**

- Warning Indicators:
- MIL
  - TCIL
  - Temperature Warning Indicator Lamp or Gauge (applications with CHT sensor)
  - Check Fuel Cap Indicator Lamp

**Note:**

- If the symptom is both "MIL on" AND "exhaust emission test failure", GO directly to Chart 11.
- If engine is a no start, GO directly to Chart 3.
- If engine runs rough at idle, GO directly to Chart 1.

SYSTEM/COMPONENT	REFERENCE (Section 5 Pinpoint Test unless noted)
Verify fuel filler cap is properly tightened	Visual
<b>Trucks with Power Takeoff (PTO) and MIL concern:</b> PTO input to PCM	GO to <a href="#">FB1</a>
<b>MIL always on when engine is running (no DTCs):</b> MIL circuits	<b>Crown Victoria, Grand Marquis, Marauder, Explorer Sport Trac, Ranger:</b> GO to <a href="#">NB1</a> <b>All Others:</b> Instrument Cluster, Section 413 of the Workshop Manual
<b>TCIL always on when engine is running (no DTCs):</b> TCIL circuits	<b>Focus, Mustang, Town Car, Thunderbird, LS6/LS8, Freestar/Monterey , Expedition, Aviator and Navigator:</b> Instrument Cluster, Section 413 of the Workshop Manual <b>All Others:</b> GO to <a href="#">TB7</a>
<b>MIL never on</b> (including the bulb check when the engine is first started): MIL circuits	<b>Crown Victoria, Grand Marquis, Marauder, Explorer Sport Trac, Ranger:</b> GO to <a href="#">NB3</a> <b>All others:</b> Instrument Cluster, Section 413 of the Workshop Manual
<b>TCIL never on:</b> TCIL circuits	<b>Focus, Mustang, Town Car, Thunderbird, LS6/LS8, Freestar/Monterey, Expedition, Aviator and Navigator:</b> Instrument Cluster, Section 413 of the Workshop Manual <b>All others:</b> GO to <a href="#">TB9</a>
<b>Temperature Warning Indicator Lamp or Gauge concerns (applications with CHT sensor only):</b> Engine cooling system or lamp circuits	<b>If engine is overheating:</b> Engine Cooling, Section 303 of the Workshop Manual. Be aware that since a PCM DTC was not received, the PCM has not attempted to turn the lamp on. <b>If engine operates at normal temperature:</b> GO to <a href="#">DL35</a>

SYSTEM/COMPONENT	REFERENCE (Section 5 Pinpoint Test unless noted)
<p><b>Check Fuel Cap Indicator Lamp Always on or off:</b> Check fuel indicator lamp circuits</p>	<p><b>Focus (2.0L), Crown Victoria/Grand Marquis/Marauder, Ranger, Explorer Sport Trac, E-Series, and F-150 (4.2L and 4.6L):</b> Indicator Lamp Always On: GO to <a href="#">HX49</a> Indicator Lamp Always Off: GO to <a href="#">HX50</a> <b>All others:</b> Instrument Cluster, Section 413 of the Workshop Manual</p>
<p>Additional Testing</p>	<p>GO to <a href="#">Z1</a></p>

**Chart 13**

Automatic Transmission Concerns:

- Upshift
- Downshift
- Engagement

SYSTEM/COMPONENT	REFERENCE (Section 5 Pinpoint Test unless noted)
<p>Transmission</p>	<p>Automatic Transaxle/Transmission Section 307 of the Workshop Manual</p>
<p>Additional Tests</p>	<p>GO to <a href="#">Z1</a></p>

**Chart 14**

Instrumentation:

- Tachometer Inoperative
- Speedometer Inoperative
- Boost Gauge indicates higher than normal boost (supercharger applications)
- Fuel Gauge Inoperative

SYSTEM/COMPONENT	REFERENCE (Section 5 Pinpoint Test unless noted)
<p><b>Tachometer Inoperative</b> Applications with CTO circuit from PCM pin 48: CTO circuit from PCM</p>	<p>GO to <a href="#">JH1</a></p>
<p><b>Speedometer/odometer Inoperative</b></p>	<p><b>Applications with Manual Shift On The Fly (MSOF) transfer case using a Transfer Case Speed Sensor (TCSS):</b> GO to <a href="#">DP9</a> <b>Applications with manual transmissions using a Vehicle Speed Sensor (VSS):</b> GO to <a href="#">DP1</a> <b>Applications with manual transmissions using an Output Shaft Speed (OSS) Sensor:</b> GO to <a href="#">TJ1</a></p>
<p><b>Boost Gauge indicates higher than normal boost</b> Supercharger bypass control Intercooler system</p>	<p><b>Supercharger bypass control:</b> GO to <a href="#">KJ1</a> <b>Intercooler system:</b> GO to <a href="#">KP8</a></p>
<p><b>Fuel Gauge Inoperative</b> Fuel Gauge always indicates full or empty</p>	<p><b>For vehicles with hardwire circuit input to PCM (E-Series, Explorer Sport Trac, Ranger, Crown Victoria, Grand Marquis, Marauder):</b> GO to <a href="#">HX40</a> <b>All others:</b> REFER to Section 413, fuel level indicator or Rear Electronic Module diagnosis of the Workshop Manual</p>
<p>Instrumentation</p>	<p>Instrument Cluster, Section 413 of the Workshop Manual</p>

**Chart 15**

- Oil System Concerns:
- High Oil Consumption
  - Leaks

SYSTEM/COMPONENT	REFERENCE (Section 5 Pinpoint Test unless noted)
<p>PCV System</p>	<p>GO to <a href="#">HG1</a></p>



SYSTEM/COMPONENT	REFERENCE (Section 5 Pinpoint Test unless noted)
Base Engine	Engine System - Section 303 of the Workshop Manual
Additional Checks <ul style="list-style-type: none"> <li>▪ External leaks</li> <li>▪ Proper dipstick</li> <li>▪ Proper oil viscosity</li> </ul>	Visual

**Chart 16**

- Cooling System Concerns:
- Electric Cooling Fan(s) Does Not Operate (Low, Medium, High or Variable speed))

SYSTEM/COMPONENT	REFERENCE (Section 5 Pinpoint Test unless noted)
Electric Cooling Fan Components	<b>Mustang:</b> GO to <a href="#">X21</a> <b>Crown Victoria/Grand Marquis, LS6/LS8, Thunderbird and Town Car:</b> GO to <a href="#">KN9</a> <b>All Others:</b> GO to <a href="#">KF56</a>
Cooling System	Engine Cooling, Section 303 of the Workshop Manual

**Chart 17**

- Cooling System Concerns:
- Electric Cooling Fan(s) Always Runs

**Note:** This chart is intended to only diagnose an electric cooling fan that always runs with a "cool" engine and the A/C and defroster off.

SYSTEM/COMPONENT	REFERENCE (Section 5 Pinpoint Test unless noted)
Cooling fan circuits and ACPSW or ACP circuits	<p><b>Crown Victoria/Grand Marquis, Thunderbird, LS6/LS8 and Town Car:</b> VERIFY results of Quick Test. Visually inspect cooling fan for concerns.</p> <p><b>Freestar/Monterey, Aviator:</b> Go to Cooling System check below (also check for overpressurized A/C system)</p> <p><b>3.8/3.9L Mustang:</b> GO to <a href="#">X39</a></p> <p><b>4.6L Mustang:</b> GO to <a href="#">X37</a></p> <p><b>All others:</b> GO to <a href="#">KF55</a></p>
Cooling System	Engine Cooling, Section 303 of the Workshop Manual

**Chart 18**

Exhaust System Concerns:

- Smoke

**Note:** *Black smoke indicates a rich fuel mixture, blue smoke indicates burning oil, and white smoke indicates water in the combustion chamber.*

SYSTEM/COMPONENT	REFERENCE (Section 5 Pinpoint Test unless noted)
Base Engine	Engine System - Section 303 of the Workshop Manual
<p><b>Black Smoke:</b> Fuel Delivery System</p>	<p><b>Natural Gas Applications:</b> GO to <a href="#">HB1</a></p> <p><b>All Others:</b> GO to <a href="#">HC1</a></p>
<p><b>Black Smoke:</b> Ignition System</p>	<p>For vehicles equipped with a coil pack ignition system, <a href="#">GO to Pinpoint Test JC</a>.</p> <p>For all others, <a href="#">GO to Pinpoint Test JB</a>.</p>
<p><b>Blue Smoke:</b> PCV System</p>	REFER to Engine System (Oil Consumption Test), Section 303 of the Workshop Manual

### Chart 19

Fuel System Concerns:

- Odor, Engine Compartment

SYSTEM/COMPONENT	REFERENCE (Section 5 Pinpoint Test unless noted)
<b>Natural Gas Applications:</b> Fuel Delivery System	GO to <a href="#">HB28</a>
EVAP System	GO to <a href="#">HX14</a>
Fuel System	Visual (refer to Fuel Tank and Lines, Section 310 of the Workshop Manual for system description)

### Chart 20

Engine Noise (under hood)

**Note:** Attempt to identify source of noise. If noise is from source other than those listed below, refer to Symptom Index (for noise such as spark knock) or applicable Workshop Manual section.

SYSTEM/COMPONENT	REFERENCE (Section 5 Pinpoint Test unless noted)
<b>Snap noise that may be due to secondary ignition arcing:</b> Secondary Ignition System	For vehicles equipped with a coil pack ignition system, <a href="#">GO to Pinpoint Test JC</a> . For all others, CHECK the condition of the spark plug boots.

### Chart 21

Climate Control:

- Lack of Cooling (A/C)/ A/C Not Functioning
- A/C Always On

- A/C Compressor Runs Continuously
- A/C Does Not CUT-OFF Under WOT Conditions (Mustang only)

SYSTEM/COMPONENT	REFERENCE (Section 5 Pinpoint Test unless noted)
<b>Mustang only:</b> A/C electrical circuits	<b>For lack of A/C cooling or A/C not functioning:</b> GO to <a href="#">X42</a> (Mustang) <b>For A/C always on:</b> GO to <a href="#">X69</a> (Mustang) <b>For A/C does not CUT-OFF under WOT conditions:</b> GO to <a href="#">X67</a> (Mustang)
A/C System	<b>If sent here from Workshop Manual with WACF PID indicating a fault (or YES):</b> GO to Section 4, Powertrain Diagnostic Trouble Code (DTC) Charts and follow direction for KOEO DTC P0645. <b>All others:</b> Climate Control System, Section 412 of the Workshop Manual

### Chart 22

- Exhaust System Concerns
- Odor (Sulfur, Rotten Egg Smell)

**Note:** A slight sulfur smell may be normal. Catalysts with less than 8,000-16,000 kilometers (5,000-10,000 miles) (new vehicle or replaced catalyst) are likely to have a sulfur smell due to the highly active state of new catalysts. Replacing the catalyst can actually make the symptom worse.

SYSTEM/COMPONENT	REFERENCE (Section 5 Pinpoint Test unless noted)
Check for any driveability or exhaust smoke symptoms	Refer to STEP 2: NO DTC(s) PRESENT SYMPTOM Chart INDEX for direction to repair other symptoms.
Fuel Delivery System	<b>Natural Gas Applications:</b> GO to <a href="#">HB1</a> <b>All others:</b> GO to <a href="#">HC1</a>
EVAP System	GO to <a href="#">HX14</a>

SYSTEM/COMPONENT	REFERENCE (Section 5 Pinpoint Test unless noted)
Fuel Source	Talk with customer. Since sulfur content can vary in different fuels, suggest trying a different fuel source.

**Chart 23**

Starting Concerns:

- No Crank

SYSTEM/COMPONENT	REFERENCE (Section 5 Pinpoint Test unless noted)
Add-on Anti-Theft Devices	Visual, check with customer.
Anti-Theft	Anti-Theft - Section 419 of the Workshop Manual
Base Engine (Starting System)	Engine System - Section 303 of the Workshop Manual