

HARD START/NO START DIAGNOSTICS

<p>F-Series/Excursion Powerstroke 2003.25 6.0L Power Stroke Diesel Engine Diagnostic Guide</p>	<p>-NOTE- IF CONCERN IS FOUND, SERVICE AS REQUIRED. IF THIS CORRECTS THE CONDITION, IT IS NOT NECESSARY TO COMPLETE THE REMAINDER OF THE DIAGNOSTIC PROCEDURE.</p>	<p>CUSTOMER NAME</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 30%;">MODEL YEAR</td> <td>VEHICLE SERIAL NO.(VIN)</td> </tr> <tr> <td colspan="2">CHASSIS STYLE</td> </tr> </table>	MODEL YEAR	VEHICLE SERIAL NO.(VIN)	CHASSIS STYLE	
MODEL YEAR	VEHICLE SERIAL NO.(VIN)					
CHASSIS STYLE						
Customer Concerns (Please list in this box)						
DEALER NAME	P & A CODE	1863 CLAIM NUMBER				
ENGINE SERIAL NUMBER	ODOMETER	DATE				
VEHICLE GVW	TRANSMISSION	AMBIENT TEMPERATURE				
		PERSONAL <input type="checkbox"/> COMMERCIAL <input type="checkbox"/>				

NOTE: A hard start/ No start concern with EOT Temp. below 60F perform step 10 first.

1. Visual Engine/Chassis Inspection

Fuel Oil Coolant Electrical Hoses Leaks
Method Check
Visual

2. Check Engine Oil Level

- Check for contaminants (fuel, coolant).
- Correct Grade/Viscosity.
- Miles/Hours on oil ,correct level.

Method Check
Visual

3. Intake/Exhaust Restriction

- Inspect air filter and inlet ducts.
- Inspect exhaust system.
- Check if air filter minder indicator has been illuminated

Method Check
Visual

4. Sufficient Clean Fuel

- Check if the WATER IN FUEL lamp has been illuminated.
- After verifying that there is fuel in the tank, drain a sample from fuel control module.
- Cetane rating between 40-50 is recommended for optimum start.

Method Check
Visual

5. Electric Fuel Pump Pressure

- Verify that the fuel pump has voltage and gnd. At key on.
- Measure fuel pressure at engine fuel filter housing test port with a (0-160 PSI) gauge at key on.

Fuel pump runs for 20 sec. at key on and pressure falls after key off.

Instrument Spec. Measurement		
0-160 PSI Gauge	45 PSI min.	

If pressure falls low go to next step to verify no restriction

6. Electric Fuel Pump Inlet Restriction

- Measure restriction at fuel pump inlet.

Instrument Spec. Measurement		
0-30 " Hg vacuum	6" Hg MAX	

» *If > 6" Hg restriction, check lines between pump and fuel tank.*
 » *If < 6" Hg, inspect both fuel filters. If filters are OK, check fuel regulator. If regulator and filters are OK, replace fuel pump.*

7. Perform KOEO On-Demand Self Test

- Use scan tool. DTC's set during this test are current faults

Diagnostic Trouble Codes

8. Retrieve Continuous Trouble Codes

- Use the scan tool.
- DTC's retrieved during this test are historical faults.

Diagnostic Trouble Codes

9. KOEO Injector Electrical Self Test (Click Test)

- Use scan tool. Injector DTC's will be displayed at test end.
- All injectors will momentarily click, then each injector will click in sequence 1-8. Sequence repeats three times.

Injector Trouble Codes

» *If self test codes are retrieved, go to appropriate PPT test.*

10. Scan Tool - Data List Monitoring

- Scan tool may reset below 9.5 volts.
- Select the parameters indicated from the scan tool parameter list and monitor while cranking engine.

Parameter	Spec.	Measurement
V PWR		
FICMLPWR	8 volt min.	
FICMVPWR		
RPM	100 RPM minimum	
ICP	3.5 mPa min. (500 PSI)	
ICP volts	.80 V min.	
FUEL PW	500 uS - 2 mS	
FICMSYNC	Yes/No	

A - V PWR - If low voltage condition is present, check battery, charging system, or power/gnd circuits to the PCM.

B - FICMLPWR - No/low voltage indicated could be caused by 12-way connector issue or logic power fuse.
Refer to Pinpoint S for detailed 12-way conn. diagnostics

C - FICMVPWR - No or low voltage indicated could be caused by 12-way connector issues.

D - RPM - Low RPM can be caused by starting/charging system issues. No RPM indicated while cranking could be CMP or CKP faults.

E - ICP - A minimum of 500 PSI (3.5 mPa) is required for the injectors to be enabled. No or low oil in the system, system leakage, injector O-Rings, faulty IPR, or high pressure pump could cause low pressure.
IPR duty cycle defaults to 14 % (300 PSI) w/o CKP signal.

F - ICP V - Voltage reading below spec indicates low ICP during crank.

G - FUEL PW - Pulse width defaults to 0 w/o CKP signal

H - FICMSYNC - No sync could be caused CMP or CKP faults.

» *Refer to PC/ED section 4 for detailed test procedures.*

11. Glow Plug System Operation

GPCM Operation

- Glow Plug ON time is dependent on oil temperature and altitude. The Glow Plug Control Module (GPCM) comes on between 1 and 120 sec., and does not come on at all if oil temp is above 131 F.
- Using a scan tool , check Continuous and KOEO DTC's. If codes are present go to Pinpoint Test AF.
- Verify B+ voltage is being supplied to GPCM.
- Using the scan tool GPCTM and EOT pids, verify glow plug "on" time .
- Turn key to run position, measure voltage ("on" time) (Dependent on oil temperature and altitude)

Relay on time	Spec.	Measurement
1 to 120 seconds	B +	

Wait to Start Lamp "on" time is independent from g/p "on" time

Glow Plug Resistance

- Disconnect the 4-pin connector at front of valve cover
- Measure each Glow Plug resistance to Bat. ground.
- Measure engine harness resistance to GPCM

Glow Plug Number	Glow Plug to Ground .1 to 2 ohms	Harness to GPCM connector 0 to 1 ohms
#1		
#3		
#5		
#7		
#2		
#4		
#6		
#8		

Time (seconds)

EOT (°F)

- Add 5 seconds to glow plug on time when above 7000 feet in altitude, but not to exceed 120 seconds.

See PC/ED manual, Section 4A for more detail on all of the above test steps

When troubleshooting a Hard Start/No Start or Performance concern, this form must be filled out to the point of repair and returned to receive warranty credit and diagnostic time for the following parts:
 Fuel Injectors (9E527), regulator-injection control pressure(9C968), pump assembly high pressure oil (9A543), turbo charger assembly/pedestal (6K684), fuel pump (9350), FICM (12B599) and PCM (EEC)(12A650
 Labor operations listed more than once are a continuation of the diagnostic procedure and should be claimed only once.

What problems were found and what repairs were performed?

List Part Name, Number and Serial Number of parts replaced.
