



# F-Super Duty/Excursion/Econline 2004 - Late Build 6.0L Power Stroke Diesel Engine Hard Start/No Start Diagnostic Guide

-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.

CUSTOMER NAME		DEALER NAME		P & A CODE	ODOMETER
MODEL YEAR	VEHICLE SERIAL NO.(VIN)		ENGINE SERIAL NUMBER		TRANSMISSION
CHASSIS STYLE		VEHICLE GVW	1863 CLAIM NUMBER	AMBIENT TEMP.	DATE
CUSTOMER CONCERNS (Please list in this box)				TYPE OF SERVICE	PERSONAL <input type="checkbox"/> COMMERCIAL <input type="checkbox"/>

**NOTE: A hard start/no start concern with EOT Temp. below 60°F perform step 11 first.**

## 1. Visual Engine/Chassis Inspection 6005E

<i>Fuel Oil Coolant Electrical Hoses Leaks</i>	
<b>Method</b>	<b>Check</b>
Visual	

## 2. Check Engine Oil Level 6005E

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

<b>Method</b>	<b>Check</b>
Visual	

## 3. Intake/Exhaust Restriction 6005E

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

<b>Method</b>	<b>Check</b>
Visual	

## 4. Sufficient Clean Fuel 6005E6

- 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.

<b>Method</b>	<b>Check</b>
Visual	

## 5. Electric Fuel Pump Pressure 6005E7

- 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.**

<b>Instrument</b>	<b>Spec.</b>	<b>Measurement</b>
0-160 PSI Gauge	45 PSI min.	

*If pressure fails low go to next step to verify no restriction*

## 6. Electric Fuel Pump Inlet Restriction 6005E8

- Measure restriction at fuel pump inlet.

<b>Instrument</b>	<b>Spec.</b>	<b>Measurement</b>
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 6005E2

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

Diagnostic Trouble Codes	
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## 8. Retrieve Continuous Trouble Codes 6005E3

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

Diagnostic Trouble Codes	
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## 9. KOEO Injector Self Test (Click Test) 6005E3

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

## 10. Scan Tool - Data List Monitoring 6005E4

- 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
<b>B+</b>		
<b>FICMLPWR</b>	8 volt min.	
<b>FICMVPWR</b>		
<b>RPM</b>	100 RPM minimum	
<b>ICP</b>	3.5 mPa min. (500 PSI)	
<b>ICP volts</b>	.80 V min.	
<b>FUEL PW</b>	500 μS - 2 mS	
<b>FICMSYNC</b>	Yes/No	

- A - B+** - 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 6005E5

### 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 GPCMT and EOT pids, verify glow plug "on" time .
- Turn key to run position, measure voltage ("on" time) (Dependent on oil temperature and altitude)

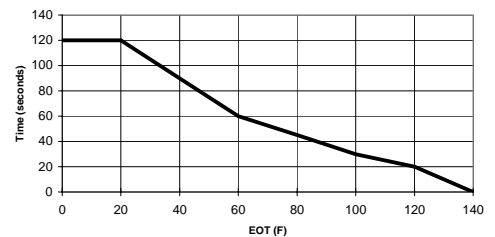
Relay on time	Spec.	Measurement
1 to 120 seconds	B +	

*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		



- 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 4 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 for diagnostic time for the parts listed below.**

Fuel Injectors (9E527), regulator-injection control pressure (9C968), pump assembly-high pressure oil (9A543), turbo charger assembly (6K682), fuel control module (9G282), FICM (12B599), PCM (12A650), EGR valve (9P452), CKP sensor (6C315), CMP sensor (12K073), GPCM (12B533), and Glow Plugs (12A342).

Some labor operations are listed in more than one test step. Those operations include time for all occurrences and can be claimed only once.

What problems were found and what repairs were performed?

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