


Performance Diagnostic Procedures

E-Series or F-Super Duty/Excursion

		F-Super Duty/Excursion/Econoline 2005 6.0L Power Stroke Diesel Engine Performance 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 GWV	1983 CLAIM NUMBER	AMBIENT TEMP.	DATE																								
CUSTOMER CONCERNS (Please list in this box)				TYPE OF SERVICE																									
				PERSONAL <input type="checkbox"/> COMMERCIAL <input type="checkbox"/>																									
1. Visual Engine/Chassis Inspection 6005F • Verify that there are no fluid or pressure leaks. • Inspect all wire connections for damage. • Inspect MAP hose, intercooler hose, and manifolds for leaks. <table border="1" style="width:100%; border-collapse: collapse; font-size: x-small;"> <tr> <td style="width: 50%;">Fuel Oil Coolant Electrical Hoses Leaks</td> <td style="width: 50%;"></td> </tr> <tr> <td>Method</td> <td>Check</td> </tr> <tr> <td>Visual</td> <td></td> </tr> </table>		Fuel Oil Coolant Electrical Hoses Leaks		Method	Check	Visual		8. EGR Position 6005F20 • Perform with key on, engine off. • Use scan tool to command Output State Control for EGR. • Monitor EGR position sensor PID and calculate travel. <table border="1" style="width:100%; border-collapse: collapse; font-size: x-small;"> <tr> <th>Instrument</th> <th>Spec.</th> <th>Actual</th> </tr> <tr> <td>Scan tool</td> <td>0% (Closed) 0.4 - 1.2 volts</td> <td>_____ Closed</td> </tr> <tr> <td></td> <td>100% (Open) 3.3 - 4.7 volts</td> <td>_____ Open</td> </tr> <tr> <td></td> <td>Travel > 2.71 volts</td> <td>_____ Travel</td> </tr> </table> * Repair issue causing out of spec. values before continuing.		Instrument	Spec.	Actual	Scan tool	0% (Closed) 0.4 - 1.2 volts	_____ Closed		100% (Open) 3.3 - 4.7 volts	_____ Open		Travel > 2.71 volts	_____ Travel	12a. Low Idle Stability (ICP Pressure) 6005F8 • Check at low idle, EOT above 70°C (158°F) • Monitor ICP and RPM with scan tool. <table border="1" style="width:100%; border-collapse: collapse; font-size: x-small;"> <tr> <th>Parameter</th> <th>Spec. @ 670 RPM</th> <th>Measurement</th> </tr> <tr> <td>ICP</td> <td>4.0-5.0 MPa ± 3 MPa (580-725 PSI ± 45 PSI)</td> <td></td> </tr> </table> Take reading before disconnecting ICP If engine RPM is unstable, disconnect ICP sensor (ICP will default). * If RPM is still unstable, re-connect sensor and go to 12b. * If RPM smooths out, the ICP sensor is at fault.		Parameter	Spec. @ 670 RPM	Measurement	ICP	4.0-5.0 MPa ± 3 MPa (580-725 PSI ± 45 PSI)	
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2. Sufficient Clean Fuel 6005F13 • Check if WATER IN FUEL indicator has been illuminated. • Drain sample from fuel control module housing. • Cetane rating between 40-50 is recommended for optimum performance <table border="1" style="width:100%; border-collapse: collapse; font-size: x-small;"> <tr> <td style="width: 50%;">Method</td> <td style="width: 50%;">Check</td> </tr> <tr> <td>Visual</td> <td></td> </tr> </table>		Method	Check	Visual		9. Exhaust Restriction 6005F11 • Visually inspect exhaust system for damage • Monitor EP with the scan tool with the engine temperature at 70°C (158°F) minimum at 3,800 RPM in park/neutral. <table border="1" style="width:100%; border-collapse: collapse; font-size: x-small;"> <tr> <th>Parameter</th> <th>Spec.</th> <th>Measurement</th> </tr> <tr> <td>EP/EBP</td> <td>244 kPa (35 PSI) MAX @ 3800 RPM</td> <td></td> </tr> </table>		Parameter	Spec.	Measurement	EP/EBP	244 kPa (35 PSI) MAX @ 3800 RPM		12b. Injection Pressure Regulator Test 6005F22 • Check at low idle, EOT above 70°C (158°F) • Monitor IPR with scan tool. <table border="1" style="width:100%; border-collapse: collapse; font-size: x-small;"> <tr> <th>Parameter</th> <th>Spec. @ 670 RPM</th> <th>Measurement</th> </tr> <tr> <td>IPR</td> <td>30% MAX</td> <td></td> </tr> </table> * If duty cycle is below MAX spec go to next step. * If duty cycle is above MAX spec, check for system leak with procedure in Hard Start/No Start section. Test 10c.		Parameter	Spec. @ 670 RPM	Measurement	IPR	30% MAX									
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3. Check Engine Oil Level 6005F • Check for contaminants (fuel, coolant). • Correct Grade/Viscosity. • Miles/hours on oil, correct level. <table border="1" style="width:100%; border-collapse: collapse; font-size: x-small;"> <tr> <td style="width: 50%;">Method</td> <td style="width: 50%;">Check</td> </tr> <tr> <td>Visual</td> <td></td> </tr> </table>		Method	Check	Visual		10a. Electric Fuel Pump Pressure 6005F18 • Measure fuel pressure at engine filter housing test port. • Road Test - engine at full load condition <table border="1" style="width:100%; border-collapse: collapse; font-size: x-small;"> <tr> <th>Instrument</th> <th>Spec.</th> <th>Measurement</th> </tr> <tr> <td>0-1.1 MPa (0-160 PSI) Gauge</td> <td>310-379 kPa (45-55 PSI) min.</td> <td></td> </tr> </table> * If fuel pressure falls low, Go to step 10b. * If pressure is above spec, check fuel return lines for restriction. * If no restriction is present, replace fuel pressure regulator valve.		Instrument	Spec.	Measurement	0-1.1 MPa (0-160 PSI) Gauge	310-379 kPa (45-55 PSI) min.		13. Boost Pressure Test 6005F12 • Carefully inspect intercooler tubes/connections, turbocharger connections, and MAP hose for signs of damage or leaks. • Perform boost test at 3300 RPM. • Monitor MGP and RPM with scan tool. • Road Test - select appropriate gear to obtain desired engine speed and full load on engine climbing hill or loaded truck.. <table border="1" style="width:100%; border-collapse: collapse; font-size: x-small;"> <tr> <th>Parameter</th> <th>Spec. PSI G</th> <th>Measurement</th> </tr> <tr> <td>MGP</td> <td>22 PSIG MIN F-Series 20 PSIG MIN Econoline</td> <td></td> </tr> </table> * If test fails low, inspect turbo blades for damage.		Parameter	Spec. PSI G	Measurement	MGP	22 PSIG MIN F-Series 20 PSIG MIN Econoline									
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4. Perform KOEO On Demand Test 6005F1 • Use the scan tool. • DTCs set during this test are current faults. <table border="1" style="width:100%; border-collapse: collapse; font-size: x-small;"> <tr> <td style="width: 50%;">Diagnostic Trouble Codes</td> <td style="width: 50%;"></td> </tr> </table>		Diagnostic Trouble Codes		10b. Elect. Fuel Pump Inlet Restriction 6005F19 • Measure restriction at fuel pump inlet. <table border="1" style="width:100%; border-collapse: collapse; font-size: x-small;"> <tr> <th>Instrument</th> <th>Spec.</th> <th>Measurement</th> </tr> <tr> <td>0-30" Hg vacuum</td> <td>6" Hg MAX</td> <td></td> </tr> </table> * 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.		Instrument	Spec.	Measurement	0-30" Hg vacuum	6" Hg MAX		14. Crankcase Pressure Test 6005F9 • Measure at oil fill tube with 6.0L Crankcase Pressure Tester p/n 303-758, with engine at 70°C (158°F) minimum. • Block breather tube on left valve cover. • Measure with no load at 3,000 RPM. <table border="1" style="width:100%; border-collapse: collapse; font-size: x-small;"> <tr> <th>Instrument</th> <th>Spec.</th> <th>Measurement</th> </tr> <tr> <td>(0-60" H₂O) Magnehelic</td> <td>8" H₂O MAX</td> <td></td> </tr> </table> If more than 8" H ₂ O, refer to base engine in Shop Manual		Instrument	Spec.	Measurement	(0-60" H ₂ O) Magnehelic	8" H ₂ O MAX											
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5. Retrieve Continuous DTC's 6005F1 • Use the scan tool. • DTCs retrieved during this test are historical faults. <table border="1" style="width:100%; border-collapse: collapse; font-size: x-small;"> <tr> <td style="width: 50%;">Diagnostic Trouble Codes</td> <td style="width: 50%;"></td> </tr> </table> * If self test codes are retrieved, go to appropriate PPT.		Diagnostic Trouble Codes		10c. Fuel Aeration Test 6005F21 • Install clear hose on fuel return line at fuel control module. Refer to shop manual for approved procedure. • Run at WOT for 2 min. Return fuel should be free of bubbles. <table border="1" style="width:100%; border-collapse: collapse; font-size: x-small;"> <tr> <th>Method</th> <th>Check</th> </tr> <tr> <td>Visual</td> <td></td> </tr> </table> * If air is present in return fuel, inspect fuel system for leaks.		Method	Check	Visual		15. Oil Aeration Test 6005F23 • Run engine at 3000 RPM for 1 minute. • Take oil sample from the EOT sensor port at idle. • Inspect sample for presence of air bubbles. <table border="1" style="width:100%; border-collapse: collapse; font-size: x-small;"> <tr> <td style="width: 50%;">Method</td> <td style="width: 50%;">Check</td> </tr> <tr> <td>Visual</td> <td></td> </tr> </table> * Excessive oil aeration can be caused by depleted oil additives, pick-up tube leak, front cover seal leak, or upper pan seal leak. Note: If performance concern still exists, refer to Enhanced Injector Diagnostics in the PCED.		Method	Check	Visual															
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6. KOEO Injector Electrical Self-Test 6005F2 • Use the scan tool. • All injectors will momentarily click, then individual injectors will click in sequence 1 through 8. <table border="1" style="width:100%; border-collapse: collapse; font-size: x-small;"> <tr> <td style="width: 50%;">Injector Trouble Codes</td> <td style="width: 50%;"></td> </tr> </table>		Injector Trouble Codes		11. Perform KOER On Demand Test 6005F6 • This will test the ICP, EGR and VGT performance. <table border="1" style="width:100%; border-collapse: collapse; font-size: x-small;"> <tr> <td style="width: 50%;">KOER DTC</td> <td style="width: 50%;"></td> </tr> </table>		KOER DTC																							
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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.																													

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