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Invoice #:	3157	
Work Order:	WO-00001780	
Service Date:	01/09/2015	
Technician(s):	William Haddow lan Frick	
Equipment #:	6628121	

WORK SUMMARY

SITE	CONTACT
Post Office - Los Angeles	Edwardo Martinez
7001 S. Central Ave. Los Angeles,CA,90052	(909) 731-9979

NATURE OF CALL

Engine Diagnostic

RECOMMENDATIONS

(DIAGNOSTIC) Engine faults include CYLINDER #4 PERFORMANCE, ENGINE EGR MALFUNCTION. Also found a high stumble at high speeds. Further evaluation revealed (2) Unit Pumps under-performing with suspected issues with the Nozzles and/or lines. Also discovered an EGR leak. Also discovered a possible valve "slap" issue. Recommend installing NEW Unit Pumps, NEW Nozzles, NEW Fuel Lines, Repairing EGR Leak and inspecting Cooler, Performing full TUNE-UP including Valve Adjustment and Inspection. (REPAIRS) Removed and Installed the following: FUEL NOZZLES, UNIT PUMPS, FUEL LINES. Found #3 and #4 Nozzles clogged. Found Cylinder #6 predetonation. Found Cyl #3 needing Nozzle Bored. Discovered USPS installed a NEW Turbocharger. Used PTT to check and calibrate the VGT on new turbo, OK. Installed NEW Unit Pump CALIBRATION FILES into ECM using PTT. Cleaned and Degreased the critical parts of engine.

Washed all soot off of truck, and replaced damaged exhaust clamps on DPF system. Test drove truck confirm engine operating OK. Discovered Transmissions FAULTS present. Found that the Transmission Fluid LOW. Added Trans Fluid as needed. Test drove truck again, and found Trans Faults coming back as soon as truck is driven, will make USPS aware of the faults.

VEHICLE

Equipment #	VIN	Equipment Year/Make/Model	Application	Muffler Configuration
6628121	1M1AK05Y67N012843	2006 Mack CXN613	Shipping (local: USPS, U-haul, UPS, etc)	

ENGINE

Serial Number	Year	Make/Model/Family Name	Horsepower	Mileage	Hours
29384YP1	2006	Mack A Series - 6MKXH11.9H70	350	264152	17246

Engine Summary

01/05/2015 Performed engine diagnostic using Volvo PTT. Found various engine and transmissions faults. Most notably EGR, and

Cylinder #4 performance. Performed diagnostic tests of engine: 1) Engine Cylinder CUT OUT (OK, slight non notice on 2 and 3) 2) Cylinder RUN UP, would not complete due to timeout. (Possible issue with Unit pumps) 3) Unit Pump CALIBRATIONS, spot checked 2, OK (however, the cals loaded inconsistent, need to ensure NEW Unit Pumps are entered correctly) 01/12/2014 Perform opacity test, both COLD and at NORMAL TEMP. Found both to fail (cold for high results, and warm due to abnormally high deviation). 01/24/2015 Used compressed air and brake clean to clean all surfaces, to avoid dirt debris dropping into engine. Removed Intake Boots and Hoses, removed Unit Pump Heat Shield, removed valve covers; in order to remove the following components: 1) Unit Pumps (6) 2) Fuel Line (Unit to Nozzle) (6) 3) Nozzles (6) Attempted to adjust valves, will have to complete tomorrow (too hot - need to complete cold). 01/26/2015 1) Adjusted valves as needed, no valves out of adjustment more than 0.005" (adjusted to spec). 2) Installed NEW components A) Unit Pumps (6) B) Fuel Nozzles (6) C) Fuel Lines (6) 3) Calibrated all unit pumps with PTT Tested all Fuel Nozzles and Pumps for performance and leaks, OK. Also re-installed all hoses, intake boots, etc. Primed the FUELING SYSTEM and started engine. See Conclusions for final cals.

Engine Images

VDEC

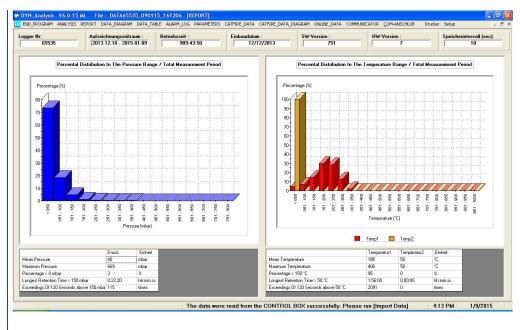
Serial Number	VDEC System Installed	Date Of Installation
B.0025942	HUG Filtersystems Mobiclean R	01/01/2013

After-Treatment Summary

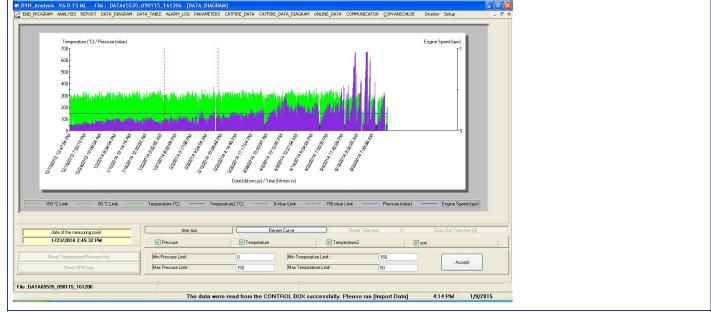
Performed Data Download of HUG System by use of CPK TERMINAL. Found the HUG DPF System functioning normally. However, the DPF core is soot loading very prematurely (most likely due to engine issue). Removed the DPF core for cleaning. Cleaned the core, and reInstalled. Found some exhaust clamps leaking, replaced as needed.

	DATA_DIAGRAM D	ATA_TABLE ALARM_LO	DG PARAMETERS CATFIRE_DATA CATFIRE_DATA_DIAGRA	M ONLINE_DATA	COMMUNICA	OR COM-ANSCHLUB Dru	:ker Setup	
Total Time Below Limit	0:00:00	hh:mm:ss	Total Time Below Limit	232:05:20	909:43:50	hhimmiss		~
Longest Period Below Limit	0:00:00	hh:mm:ss	Longest Period Below Limit	2:45:00	3:11:40	hhimmiss		
Percentage Below Limit	0	%	Percentage Below Limit	26	100	*		
Limit 2	150	mbar	Limit 2	50	50	°C		
Total Time Above Limit	27:24:40	hhommas	Total Time Above Limit	865:16:20	0:00:00	hummuss		
Longest Period Above Limit	0:22:20	hhcmmas	Longest Period Above Limit	1:56:00	0:00:00	hhmmas		
Percentage Above Limit	3	*	Percentage Above Limit	95	0	*		
Minimum Retention Time	120		Minimum Retention Time	120	120	8		
Limit Exceedings	115		Limit Exceedings	2091	0			
Deserve Deserve			Terrenter Dense					
Pressure Range	73.44	x	Temperature Range < 050	4.89	100.00	x		
051 - 100	73.44		051 - 100	4.89	0.00	× ×		
101 - 150	4.95		101 - 150	15.05	0.00	× X		
151 - 200	1.37	x	151 - 200	29.79	0.00	X		
201 - 250	0.59		201 - 250	28.33	0.00	2		
251 - 300	0.36	2	251 - 300	12.56	0.00	2		
301 - 350	0.30		301 - 350	2.22	0.00	x		
351 - 400	0.17	*	351 - 400	0.08	0.00	*		
401 - 450	0.09	*	401 - 450	0.00	0.00	*		
451 - 500	0.07	*	451 - 500	0.00	0.00	*		
501 - 550	0.05	2	501 - 550	0.00	0.00	%		
551 - 600	0.04	*	551 - 600	0.00	0.00	*		
601 - 650	0.02	*	601 - 650	0.00	0.00	%		
651 - 700	0.02	*	651 - 700	0.00	0.00	%		
701 - 750	0.00	*	701 - 750	0.00	0.00	*		
751 - 800	0.00	*	751 - 800	0.00	0.00	*		
			801 - 850	0.00	0.00	*		
			851 - 900	0.00	0.00	*		
			901 - 950	0.00	0.00	*		

Data Plot of Temp and Pressure (Lifetime data - since Dec 2013)



ALL Data below indicates that the DPF core was in need of cleaning after only ~3 months from date of install in Dec 2013



CORE/PRE-FILTER

Serial Number	Filter Type	Pre-Weight (grams)	Post-Weight (grams)
6628121	Core	43620	43230

Core/Pre-Filter Images

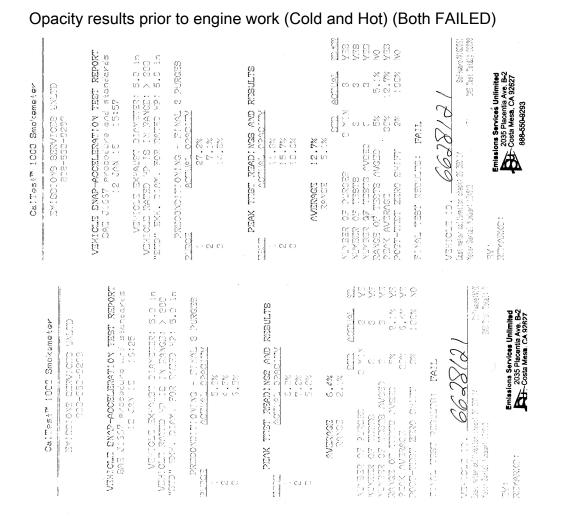
COMPLIANCE

Compliance Summary

PARTS USED

Parts Installed

OTHER IMAGES



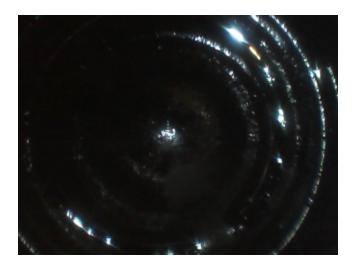
Performed various engine diagnostics, found misfires on #3 and #4

Premium Tech Tool - VCADS Pro				×
M File View Operation Job card Tools Help			8	Menu
1 23 - Fuel system		Injector Cut Out, Manual		_
Injector Cut Out, Manual				
	Injector Cut Out, Manual			
Individually stops injection to the selected cylinder to help identify the source of rough running or an engine miss.	Select Test Cylinder	F		
Select the injector to be cut out, then start the operation. Once started, the accelerator pedial mays be set to any PRM. To cut out a different injector, click on the radio button corresponding to the cylinder number to cut out, and injectorial mill start on the previous injector, then stop on the new nijector. To enable all cylinders, stop the operation. The current engine speed and the average engine speed is displayed during the current engine speed and the average engine speed is displayed during the start of the start o	Cylinder 1 Engine Speed Cylinder 2 Cylinder 3 Cylinder 4	= 645.00 ne Speed = 650.48		
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Once the test has been run and stopped, the accelerator pedal will not respond. Start the test again to use the accelerator pedal during further testing, or cycle the key switch to restore normal operation.				
To Print Displayed Cylinder Cut Out Test Information:				
All information displayed to the user from the Cylinder Cut Out Test operation can be printed out later from the Job card.		OK V Not OK		
Note: Cycle the ignition key before moving on to another test or returning the vehicle to service.				
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VCADS Pro - Operations [USPS-US813491]		VIN 1M1AK05Y67N012843		_
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Premium Tech Tool - VCADS Pro		
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	ha 1700-21-05-02 - Fault Codes	
Fault Codes	Fault Codes MID filter	
Shows the user to select and view the fault table of all, or selected	Read fault codes Clear all fault codes	
ontrollers. A fault table is a history of all faults that a controller has etected since the table was last cleared. Each fault history includes the	Fault codes Fault Reporter Setup	
controller responsible (MID), fault description (PID or SID), physical lescription (FMI), the number of fault occurrences, Current Status, Blink	MID PD 5D FMI Blink Code Severity Status Number Last 122 146 7 14-9 1 Institue 8 1/2/2001 12:00:00	
de, Mack Severity information.	128 412 0 5-8 1 Inetive 7 1/1/000112:00:00	
ault Reporter Information is available for any fault code in which there is an dicator in the camera column. To view more detailed information from the	128 231 8 6-4 4 Institive 7 1/1/0001 12:00:00	
ault reporter, click on the Fault Reporter tab at the top of the display bject.	130 152 14 0 Inactive 0 1/1/0001 12:00:00 130 153 14 0 Inactive 0 1/1/0001 12:00:00	
o Clear Fault Codes:	130 154 14 0 Institue 0 1/1/0001 12:00:00 * MID 128 Engine ECU	
Use MID filter, if desired, to display faults for only the controller(s) for hich faults are to be cleared.	SID 146 EGR value #1 mechanism FM1 7 [Mechanical system notresponding properly Number of orcurrences 8	
Click on the start button to display the fault codes for the selected MIDs.	Number of occurrences 0 Status Inactive Bink Code 4-9	
Click on the Clear All Fault Codes button.	Severity MUST BE SERVICED NOW	
Click on the start button again to clear the displayed faults.	First occurrence Last occurrence	
ote: If new faults occur while viewing the fault tables, clicking on the start tton will refresh the display.	Odometer VECU wigele wire mode	
	EECU viggle wire mode	
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o Print Displayed Fault Codes Information:		
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2		

Premium Tech Tool - VCAUS Pro			
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\$\$ 6 1 0 + → + 0 √ √ 0 0 0	N 46 PP		
1 - Service and maintenance	tal 1700-21-03-02 - Fault Codes		
- Fault Codes			
Fault Codes	ult Codes	MID filter	
	Read fault codes	Page (0.00 m)	
<u>م</u>	Clear all fault codes		
Allows the user to select and view the fault table of all, or selected	it codes Fault Reporter Setup		
controllers. A fault table is a history of all faults that a controller has detected since the table was last cleared. Each fault history includes the	at codes Fault Reporter Setup		
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		1/1/0001 12:00:00 *	
To Clear Fault Codes:	128 Engine ECU		
1. Use MID filter, if desired, to display faults for only the controller(s) for	ID 231 SAE J1939 Data Link		
which faults are to be cleared.	MI 8 Abnormal frequency, pulse width, o	r period	
	lumber of occurrences 7		
Click on the start button to display the fault codes for the selected MIDs.	tatus Inactive		
3 Click on the Clear All Fault Codes button	link Code 6- 4 everity Service Required = ENGINE IN LIMP MODE		
3. Click on the Clear All Fault Codes button.	irst occurrence		
4. Click on the start button again to clear the displayed faults.	ast occurrence		
	dometer		
Note: If new faults occur while viewing the fault tables, clicking on the start button will refresh the display.			
button will retresh the display.			
Note: If a fault occurs after the fault table is cleared and before the power to			
the controller is cycled (turned OFF and then ON again), the fault may not			
be entered into the controller's fault table. Therefore, a request to view the			
fault table immediately after it has been cleared may not accurately display faults that occurred after the table was cleared. To ensure all active and			
inactive faults are displayed in the Fault Table, turn the ignition off, allow the			
accessories relay to disengage, turn the igntion back on and select the			
Start button.			
To Print Displayed Fault Codes Information:			
All information displayed to the user from the Fault Code operation can be printed out later from the Job card.			
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VCADS Pro - Operations [USPS-US813491]	VIN 1M1AK05Y67N012843		

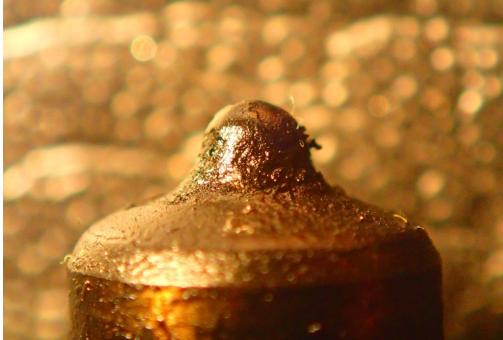
When removed NOZZLES, discovered one cylinder heavily carboned over, and had to be bored out

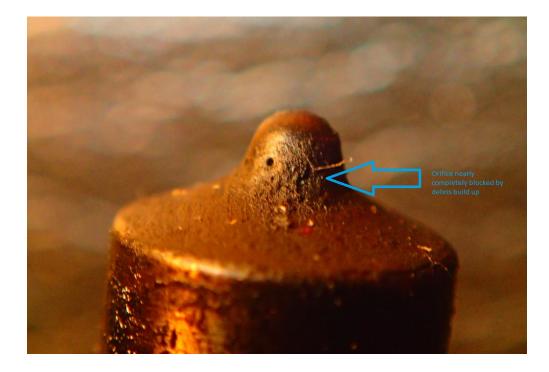


Discovered Cylinder #6 had heavy ash deposits and signs of predotonation

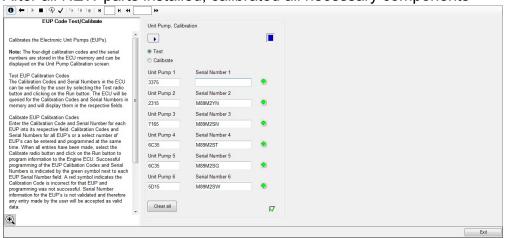


Removed Fuel Nozzles and discovered heavy blockage on #3 and #4 (install ALL NEW Fuel Nozzles)





After all NEW parts installed, calibrated all necessary components



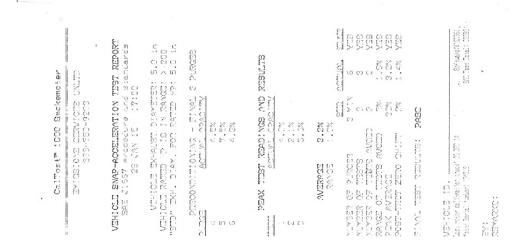
Found heavy exhaust leaks at Accuseal Clamps (removed)



Installed SEAL CLAMPS in place of all leaking AccuSeal (TM) Clamps (and cleaned all soot off truck)

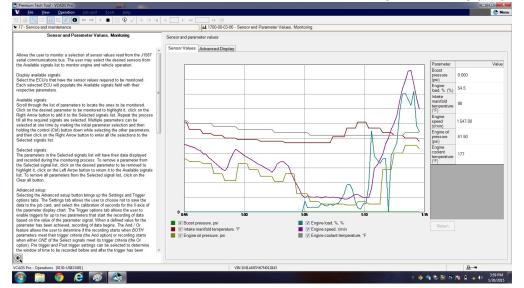


After all work completed, Post Opacity Test completed, yeilding a mere 3.2% Average!



Performed ROAD TEST to confirm all sensor and engine working properly

i.



Post DPF Cleaning, Exhaust Pressure (original was nearly 60mBAR at fast idle, now only ~20mBAR)

