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20/12/2016
Job #1948

To: Minespec Part Pty Ltd
Attn: Simon Ross & Ray McQuillan
O/No: PO302

Inspect and repair followed by dyno testing of 2nd Cummins QSK45C.

Model: QSK45C
S/No: 33152354B
Arr: Hitachi EX5500
Spec: 1350Hp @ 1800Rpm

Low hour overhauled engine based on repair history

Logged hours: 31,944 on ECM at start of dyno test, hour meter did register change during dyno testing. Operational hours on the dyno were 1.5 hours. ECM final reading was 31,945.5 hours.

The engine was set up for testing on the dynamometer following removal of the flywheel drive adaptor plate and other attachments. The following repairs were required prior to testing and were discussed with the customer.

- Relocate the engine into the workshop with a Franna crane.
- Remove the lower sump pan section to clean and reseal with supplied gasket. Various hoses removed were resealed and along with some sump pan fittings.
- Replace the coolant line from pressure sensor connection to thermostat housing – hose was perished and blocked
- Reseal RHS rear cam box cover – weeping oil
- Reseal the fittings for the prelube line connections to engine oil filter head.
- Remove and fit new oil and fuel filters.
- Fill the engine with 260 liters of specified engine oil – Dyno Power supplied.

The engine was started with good oil pressure indicated and warmed up to operating temperature with the following concerns noted. Both the alternator and fan belt were left on in an attempt to clean the multi V pulleys on the engine.

- Water temperature thermostats appeared to possibly stuck open but functioned correctly during the test.
- Engine oil weeps from the mounting flange of the LTA water pump drive.

The engine achieved the desired specifications of horsepower output. The engine did not have any untoward noises or vibrations whilst under load or while running.

The engine was removed from the dyno test bed and all open ports sealed up

The engine was operated for 1.5 hours of run time on the dyno.

All filters and parts were supplied by Minespec Parts P/L

Dyno Power supplied the engine oil and replacement coolant hose assembly and necessary hydraulic caps and plugs for open porting on the engine.

Engine specifications

Horsepower output: 1407 hp @ 1800 rpm (Spec: 1350Hp @ 1800Rpm)

Full torque output: 4721 ilb/ft. @ 1300rpm

Regards,

Stuart Sinclair

Data Monitor/Logger

Engine Serial Number :33152354
 Customer Unit Number :
 Work Order Name :NA

INSITE 7.6.2.240 SP5
 Company Name :Cummins Inc.
 ECM Image Name :NA
 Customer Name :

Parameter	Value	Units	Minimum Measured	Maximum Measured
Calibration Software Phase	05090708			
Coolant Pressure	16.9	psig	0.2	33.4
Coolant Temperature	181.5	F	80.9	215.4
Crankcase Blowby Pressure	0.64	inH2O	0.21	1.94
Desired Fuel Pump Current	0.735717	A	0.000000	1.031982
Desired Rail Fueling	57.54	Percent	0.00	73.34
Desired Timing Fueling	33.35	Percent	20.89	70.63
Engine Oil Pressure	54.5	psi	0.0	77.0
Engine Speed	1285	RPM	0	1924
Estimated Rail Fueling	57.17	Percent	7.26	69.23
Estimated Timing Fueling	32.45	Percent	30.62	95.48
Fuel Pump Output Pressure	224.8	psi	25.1	323.4
Fuel Rate	156.64	gph	0.00	201.52
Fuel Temperature	88.6	F	82.5	92.0
Intake Manifold Pressure	38.3	InHg	0.0	52.6
Intake Manifold Temperature	124.6	F	84.5	135.8
Key Switch	On			
Percent Throttle	100	Percent	0	100
Rail Feedback Current	0.862800	A	0.106400	0.974400
Rail Pressure	112.7	psi	14.2	170.4
Timing Deviation	-0.46	Percent	-32.64	22.94
Timing Feedback Current	1.426000	A	0.194600	2.162800
Timing Pressure	35.6	psi	20.2	166.0
Total Engine Hours (Engine Run Time)	31944:36:56	HH:MM:SS		
User Fueling State	Maximum Throttle			

1948 TORQUE CHECK @ 1300 RPM

Data Monitor/Logger

Engine Serial Number :33152354
 Customer Unit Number :
 Work Order Name :NA

INSITE 7.6.2.240 SP5
 Company Name :Cummins Inc.
 ECM Image Name :NA
 Customer Name :

Parameter	Value	Units	Minimum Measured	Maximum Measured
Calibration Software Phase	05090708			
Coolant Pressure	30.5	psig	0.2	32.4
Coolant Temperature	177.1	F	80.9	215.4
Crankcase Blowby Pressure	0.86	inH2O	0.21	1.94
Desired Fuel Pump Current	0.692504	A	0.000000	1.031982
Desired Rail Fueling	52.34	Percent	0.00	73.34
Desired Timing Fueling	39.61	Percent	20.89	70.63
Engine Oil Pressure	66.0	psi	0.0	77.0
Engine Speed	1811	RPM	0	1924
Estimated Rail Fueling	52.10	Percent	7.26	69.23
Estimated Timing Fueling	40.53	Percent	33.85	95.48
Fuel Pump Output Pressure	299.5	psi	25.1	323.4
Fuel Rate	200.44	gph	0.00	201.41
Fuel Temperature	87.9	F	82.5	92.0
Intake Manifold Pressure	50.3	InHg	0.0	52.5
Intake Manifold Temperature	131.4	F	84.5	135.8
Key Switch	On			
Percent Throttle	100	Percent	0	100
Rail Feedback Current	0.905500	A	0.106400	0.974400
Rail Pressure	168.5	psi	14.2	170.4
Timing Deviation	-0.51	Percent	-32.64	22.94
Timing Feedback Current	1.570800	A	0.194600	2.162800
Timing Pressure	69.9	psi	20.2	166.0
Total Engine Hours (Engine Run Time)	31944:27:09	HH:MM:SS		
User Fueling State	Maximum Throttle			

#1948 ECM DATA @ FULL LOAD RUN.
 FULL LOAD IS MEANT TO BE 1350HP @ 1800 RPM

Data Monitor/Logger

Engine Serial Number :33152354
 Customer Unit Number :
 Work Order Name :NA

INSITE 7.6.2.240 SP5
 Company Name :Cummins Inc.
 ECM Image Name :NA
 Customer Name :

Parameter	Value	Units	Minimum Measured	Maximum Measured
Calibration Software Phase	05090708			
Coolant Pressure	0.0	psig	0.0	35.7
Coolant Temperature	148.0	F	80.9	215.4
Crankcase Blowby Pressure	0.64	inH2O	0.00	1.94
Desired Fuel Pump Current	0.000000	A	0.000000	1.199951
Desired Rail Fueling	0.00	Percent	0.00	73.34
Desired Timing Fueling	21.46	Percent	20.89	70.63
Engine Oil Pressure	0.0	psi	0.0	77.0
Engine Speed	0	RPM	0	2137
Estimated Rail Fueling	27.47	Percent	2.83	69.23
Estimated Timing Fueling	37.21	Percent	29.64	95.48
Fuel Pump Output Pressure	26.9	psi	24.7	407.8
Fuel Rate	0.00	gph	0.00	216.42
Fuel Temperature	146.4	F	82.5	157.3
Intake Manifold Pressure	0.0	InHg	0.0	52.6
Intake Manifold Temperature	138.3	F	84.5	152.4
Key Switch	On			
Percent Throttle	0	Percent	0	100
Rail Feedback Current	0.105500	A	0.099400	1.013200
Rail Pressure	13.9	psi	13.7	197.9
Timing Deviation	-15.56	Percent	-50.26	22.94
Timing Feedback Current	0.187500	A	0.181400	2.162800
Timing Pressure	22.8	psi	17.2	292.5
Total Engine Hours (Engine Run Time)	31945:37:01	HH:MM:SS		
User Fueling State	Engine Stop			

*ECM Dump For # 1948
 MINESPEC PARTS AFTER DYNO*