BLACKSTONE LABORATORIES

OIL REPORT

LAB NUMBER: G36984 **UNIT ID:** CHADMILLISOR F350
REPORT DATE: 10/7/2014 **CLIENT ID:** 73637
CODE: 20/636 **PAYMENT:** CC: MC

UNIT

MAKE/MODEL: Navistar 6.0L Power Stroke
FUEL TYPE: Diesel
ADDITIONAL INFO: Ford F-350
OIL TYPE & GRADE: Diesel Engine Oil
OIL USE INTERVAL: 4,711 Miles

CLIENT

KEVIN ADAMS
LUBRICATION SPECIALTIES
255 NEAL AVE
MT. GILEAD, OH 43338
PHONE:
FAX:
ALT PHONE:
EMAIL:

COMMENTS

KEVIN: This is the initial test at 217,548 miles. Metals are very high in this sample, primarily iron (from steel parts), along with aluminum and chrome (pistons/rings) and copper and lead, from bearings. The high levels of potassium and sodium indicate a coolant leak, with ~1.92% antifreeze present in this oil sample. That's probably causing a lot of the wear, along with the high insolubles. The initial particle count reading was 22/21/18.

ELEMENTS IN PARTS PER MILLION

		UNIT / LOCATION AVERAGES						UNIVERSAL AVERAGES
MI/HR on Oil	4,711							
MI/HR on Unit	217,548							
Sample Date	10/01/14							
Make Up Oil Added								
ALUMINUM	**20**							3
CHROMIUM	**6**							1
IRON	**186**							20
COPPER	**7**							3
LEAD	**14**							3
TIN	1							1
MOLYBDENUM	86							35
NICKEL	**7**							0
MANGANESE	2							0
SILVER	0							0
TITANIUM	2							0
POTASSIUM	**1034**							12
BORON	35							61
SILICON	**31**							11
SODIUM	**962**							5
CALCIUM	2070							2521
MAGNESIUM	98							244
PHOSPHORUS	1198							1104
ZINC	1083							1271
BARIUM	11							1

PROPERTIES

		Values Should Be*
SUS Viscosity @ 210°F	61.5	
cSt Viscosity @ 100°C	10.65	
Flashpoint in °F	**410**	>415
Fuel %	0.5	<2.0
Antifreeze %	**1.92**	0.0
Water %	0.0	<0.1
Insolubles %	**0.6**	<0.6
TBN		
TAN		
ISO Code	22/21/18	

PARTICLE COUNT

ISO CODE (2)	21/18
NAS 1638 Class	12
ISO CODE (3)	22/21/18
>= 2 Micron	41,182
>= 5 Micron	15,258
>= 10 Micron	4,224
>= 15 Micron	1,631
>= 25 Micron	391
>= 50 Micron	37
>= 100 Micron	1

* THIS COLUMN APPLIES ONLY TO THE CURRENT SAMPLE

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After 200 Miles on Frantz

BLACKSTONE LABORATORIES

OIL REPORT

LAB NUMBER: G37254 **UNIT ID:** CHADMILLISOR F350
REPORT DATE: 10/7/2014 **CLIENT ID:** 73637
CODE: 20/636 **PAYMENT:** CC: MC

UNIT

MAKE/MODEL: Navistar 6.0L Power Stroke
FUEL TYPE: Diesel
ADDITIONAL INFO: Ford F-350
OIL TYPE & GRADE: Diesel Engine Oil
OIL USE INTERVAL: 4,929 Miles

CLIENT

KEVIN ADAMS
LUBRICATION SPECIALTIES
255 NEAL AVE
MT. GILEAD, OH 43338
PHONE:
FAX:
ALT PHONE:
EMAIL:

COMMENTS

KEVIN: This is the second sample, taken at 217,776 miles (the spectral analysis was already completed prior to your phone conversation yesterday, so that's why those results were already included). There's been a significant drop in iron, and in the level of coolant contamination -- sodium and potassium. Insolubles improved as well (0.5% is an acceptable level for engine oil), and the particle count improved to 17/16/13.

41,182 – 1641

			UNIT / LOCATION AVERAGES						UNIVERSAL AVERAGES
	MI/HR on Oil	4,929		4,711	4,711				
	MI/HR on Unit	217,776		217,548	217,548				
	Sample Date	10/01/14		10/01/14	10/01/14				
	Make Up Oil Added								
PARTS PER MILLION	ALUMINUM	**19**			**20**				3
	CHROMIUM	**5**			**6**				1
	IRON	**128**			**186**				20
	COPPER	**9**			**7**				3
	LEAD	**16**			**14**				3
	TIN	0			1				1
	MOLYBDENUM	106			86				35
	NICKEL	3			**7**				0
	MANGANESE	2			2				0
ELEMENTS IN	SILVER	0			0				0
	TITANIUM	2			2				0
	POTASSIUM	**840**			**1034**				12
	BORON	28			35				61
	SILICON	**33**			**31**				11
	SODIUM	**270**			**962**				5
	CALCIUM	1915			2070				2521
	MAGNESIUM	87			98				244
	PHOSPHORUS	1107			1198				1104
	ZINC	1008			1083				1271
	BARIUM	10			11				1

			Values Should Be*			
PROPERTIES	SUS Viscosity @ 210°F	62.9			61.5	
	cSt Viscosity @ 100°C	11.04			10.65	
	Flashpoint in °F	**405**	>415		**410**	
	Fuel %	1.0	<2.0		0.5	
	Antifreeze %	**0.54**	0.0		**1.92**	
	Water %	0.0	<0.1		0.0	
	Insolubles %	0.5	<0.6		**0.6**	
	TBN					
	TAN					
	ISO Code	17/16/13		21/20/17	22/21/18	

PARTICLE COUNT	
ISO CODE (2)	16/13
NAS 1638 Class	8
ISO CODE (3)	17/16/13
>= 2 Micron	1,641
>= 5 Micron	608
>= 10 Micron	168
>= 15 Micron	65
>= 25 Micron	15
>= 50 Micron	1
>= 100 Micron	0

* THIS COLUMN APPLIES ONLY TO THE CURRENT SAMPLE

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NEW OIL

BLACKSTONE LABORATORIES

OIL REPORT

LAB NUMBER: G52932 **UNIT ID:** BASELINE
REPORT DATE: 1/2/2015 **CLIENT ID:** 73637
CODE: 20/636 **PAYMENT:** CC: MC

UNIT

MAKE/MODEL: Virgin 15W/40 OIL TYPE & GRADE: Shell Rotella T 15W/40
FUEL TYPE: OIL USE INTERVAL:
ADDITIONAL INFO: Shell Rotella

CLIENT

KEVIN ADAMS PHONE:
LUBRICATION SPECIALTIES FAX:
255 NEAL AVE ALT PHONE:
MT. GILEAD, OH 43338 EMAIL:

COMMENTS

KEVIN: This is the baseline sample for Rotella for comparison purposes. No water or solids were found and the particle count read 17/16/14, which is clean. This is serviceable oil.

ELEMENTS IN PARTS PER MILLION

		UNIT / LOCATION AVERAGES						UNIVERSAL AVERAGES
MI/HR on Oil								
MI/HR on Unit								
Sample Date	12/29/14							
Make Up Oil Added								
ALUMINUM	1	1						0
CHROMIUM	0	0						0
IRON	2	2						1
COPPER	0	0						0
LEAD	0	0						0
TIN	0	0						0
MOLYBDENUM	1	1						28
NICKEL	2	2						0
MANGANESE	0	0						0
SILVER	0	0						0
TITANIUM	0	0						2
POTASSIUM	4	4						1
BORON	43	43						63
SILICON	4	4						5
SODIUM	2	2						3
CALCIUM	2098	2098						2113
MAGNESIUM	6	6						303
PHOSPHORUS	913	913						975
ZINC	1010	1010						1139
BARIUM	0	0						0

PROPERTIES

		Values Should Be*			
SUS Viscosity @ 210°F	77.1	69-78			
cSt Viscosity @ 100°C	14.79	12.7-15.3			
Flashpoint in °F	455	>415			
Fuel %	-				
Antifreeze %	-				
Water %	0.0	<0.1			
Insolubles %	0.0	<0.8			
TBN					
TAN					
ISO Code	17/16/14				

PARTICLE COUNT

ISO CODE (2)	17/13
NAS 1638 Class	8
ISO CODE (3)	17/16/14
>= 2 Micron	1,818
>= 5 Micron	673
>= 10 Micron	186
>= 15 Micron	72
>= 25 Micron	17
>= 50 Micron	1
>= 100 Micron	0

* THIS COLUMN APPLIES ONLY TO THE CURRENT SAMPLE

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