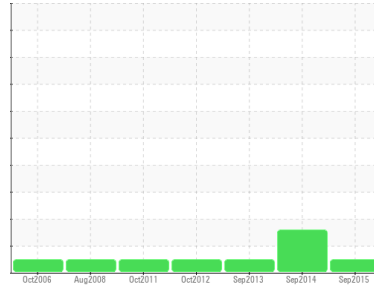




OIL ANALYSIS REPORT

Sample Rating Trend



NORMAL



Machine Id
CATERPILLAR 81Z12792
 Component
Diesel Engine
 Fluid
ROYAL PURPLE MOTOR OIL 15W40 (19 GAL)

DIAGNOSIS

Recommendation

Resample at the next service interval to monitor.

Wear

Metal levels are typical for a new component breaking in.

Contamination

There is no indication of any contamination in the component.

Fluid Condition

The BN result indicates that there is suitable alkalinity remaining in the oil. The condition of the oil is suitable for further service.

SAMPLE INFORMATION

	method	limit/base	current	history1	history2
Sample Number	Client Info		RP145671	RP007893	RP56631
Sample Date	Client Info		23 Sep 2015	04 Sep 2014	16 Sep 2013
Machine Age	hrs	Client Info	693	669	654
Oil Age	hrs	Client Info	248	336	321
Oil Changed	Client Info		Not Changed	Not Changd	Not Changed
Sample Status			NORMAL	MARGINAL	NORMAL

CONTAMINATION

	method	limit/base	current	history1	history2
Fuel	WC Method	>5	<1.0	<1.0	<1.0
Glycol	WC Method		NEG	NEG	NEG

WEAR METALS

	method	limit/base	current	history1	history2
Iron	ppm	ASTM D5185m >100	31	28	29
Chromium	ppm	ASTM D5185m >20	<1	<1	<1
Nickel	ppm	ASTM D5185m >2	2	<1	<1
Titanium	ppm	ASTM D5185m >2	<1	<1	0
Silver	ppm	ASTM D5185m >2	0	<1	0
Aluminum	ppm	ASTM D5185m >25	2	3	2
Lead	ppm	ASTM D5185m >40	3	3	4
Copper	ppm	ASTM D5185m >330	242	249	258
Tin	ppm	ASTM D5185m >15	0	0	3
Antimony	ppm	ASTM D5185m	0	0	0
Vanadium	ppm	ASTM D5185m	0	0	0
Cadmium	ppm	ASTM D5185m	0	0	0

ADDITIVES

	method	limit/base	current	history1	history2
Boron	ppm	ASTM D5185m 0	15	23	21
Barium	ppm	ASTM D5185m 0	0	0	0
Molybdenum	ppm	ASTM D5185m 100	90	90	100
Manganese	ppm	ASTM D5185m	<1	<1	<1
Magnesium	ppm	ASTM D5185m 60	151	140	153
Calcium	ppm	ASTM D5185m 3050	3194	3055	3116
Phosphorus	ppm	ASTM D5185m 1050	978	1034	1110
Zinc	ppm	ASTM D5185m 1200	1247	1277	1236

CONTAMINANTS

	method	limit/base	current	history1	history2
Silicon	ppm	ASTM D5185m >25	5	6	4
Sodium	ppm	ASTM D5185m	6	6	6
Potassium	ppm	ASTM D5185m >20	0	9	3

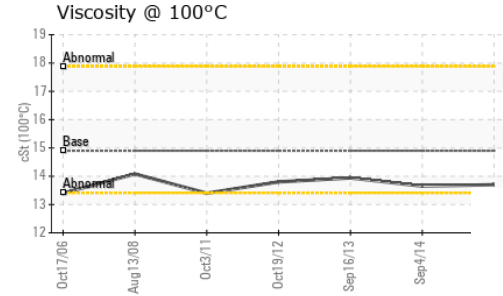
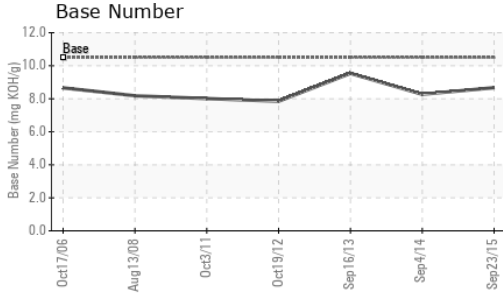
INFRA-RED

	method	limit/base	current	history1	history2
Soot %	%	*ASTM D7844 >3	0.1	0	0.1
Nitration	Abs/cm	*ASTM D7624	10.	7.	11.
Sulfation	Abs/.1mm	*ASTM D7415	27.	23.	29.

FLUID DEGRADATION

	method	limit/base	current	history1	history2
Oxidation	Abs/.1mm	*ASTM D7414	20.	12.	21.
Base Number (BN)	mg KOH/g	ASTM D2896 10.5	8.67	8.27	9.54

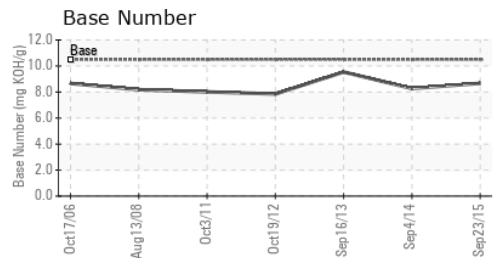
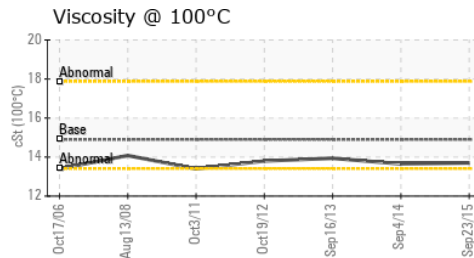
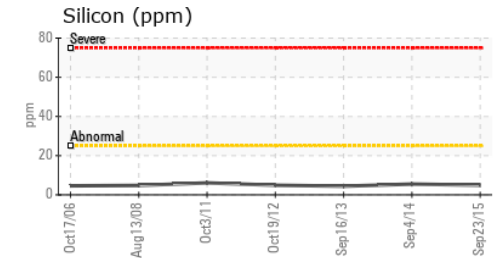
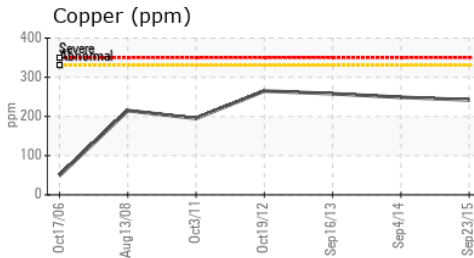
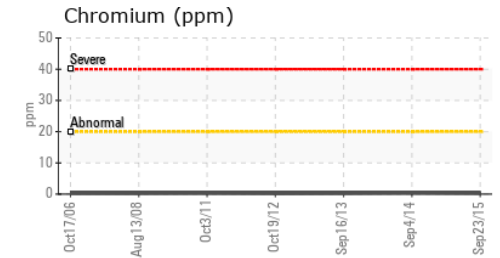
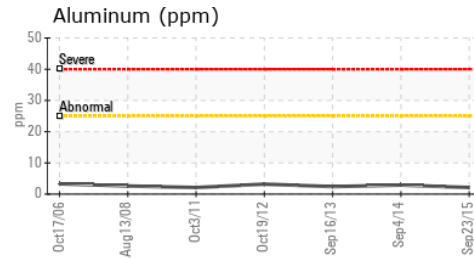
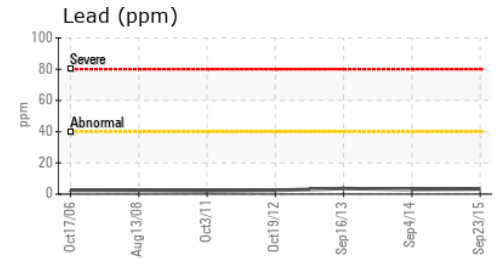
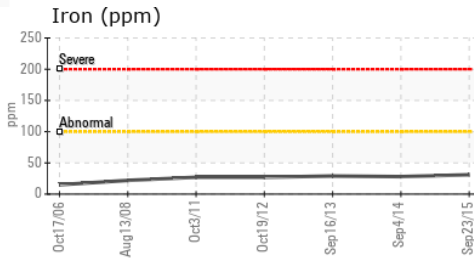
OIL ANALYSIS REPORT



VISUAL	method	limit/base	current	history1	history2
White Metal	scalar	*Visual	NONE	NONE	NONE
Yellow Metal	scalar	*Visual	NONE	NONE	NONE
Precipitate	scalar	*Visual	NONE	NONE	NONE
Silt	scalar	*Visual	NONE	NONE	NONE
Debris	scalar	*Visual	NONE	NONE	NONE
Sand/Dirt	scalar	*Visual	NONE	NONE	NONE
Appearance	scalar	*Visual	NORML	NORML	NORML
Odor	scalar	*Visual	NORML	NORML	NORML
Emulsified Water	scalar	*Visual	>0.2	NEG	NEG
Free Water	scalar	*Visual		NEG	NEG

FLUID PROPERTIES	method	limit/base	current	history1	history2
Visc @ 100°C	cSt	ASTM D445	14.9	13.7	13.65

GRAPHS



Certificate L2367

Laboratory : WearCheck USA - 501 Madison Ave., Cary, NC 27513
Sample No. : RP145671
Lab Number : 03834203
Unique Number : 7159399
Test Package : MOB 2

Received : 01 Oct 2015
Diagnosed : 05 Oct 2015
Diagnostician : Wes Davis

GRAYLING GENERATING STATION
 4400 WEST FOUR MILE ROAD
 GRAYLING, MI
 US 49738
 Contact: JASON SHEA
 jason.j.shea@cmsenergy.com

To discuss this sample report, contact Customer Service at 1-800-237-1369.

* - Denotes test methods that are outside of the ISO 17025 scope of accreditation.

Statements of conformity to specifications are based on the simple acceptance decision rule (JCGM 106:2012)

T: (989)348-4679