



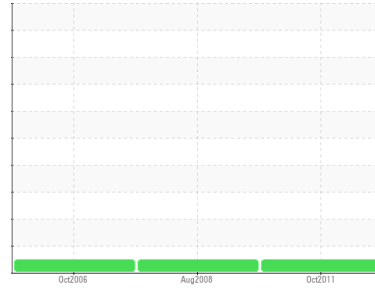
# OIL ANALYSIS REPORT

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

All component wear rates are normal.

### Contamination

There is no indication of any contamination in the component.

### Fluid Condition

The condition of oil is suitable for further service.

## SAMPLE INFORMATION

	method	limit/base	current	history1	history2
Sample Number	Client Info		<b>RP104855</b>	RP007018	RP007786
Sample Date	Client Info		<b>03 Oct 2011</b>	13 Aug 2008	17 Oct 2006
Machine Age	hrs	Client Info	<b>595</b>	469	421
Oil Age	hrs	Client Info	<b>150</b>	95	88
Oil Changed	Client Info		<b>Not Changed</b>	Not Changed	Not Changed
Sample Status			<b>NORMAL</b>	NORMAL	NORMAL

## CONTAMINATION

	method	limit/base	current	history1	history2
Fuel	WC Method		<b>&lt;1.0</b>	<1.0	<1.0
Glycol	WC Method		<b>NEG</b>	NEG	NEG

## WEAR METALS

	method	limit/base	current	history1	history2
Iron	ppm	ASTM D5185m	<b>27</b>	22	15
Chromium	ppm	ASTM D5185m	<b>&lt;1</b>	<1	<1
Nickel	ppm	ASTM D5185m	<b>&lt;1</b>	<1	<1
Titanium	ppm	ASTM D5185m	<b>&lt;1</b>	<1	<1
Silver	ppm	ASTM D5185m	<b>0</b>	0	0
Aluminum	ppm	ASTM D5185m	<b>2</b>	3	3
Lead	ppm	ASTM D5185m	<b>2</b>	2	2
Copper	ppm	ASTM D5185m	<b>195</b>	215	49
Tin	ppm	ASTM D5185m	<b>0</b>	0	0
Antimony	ppm	ASTM D5185m	<b>4</b>	0	2
Vanadium	ppm	ASTM D5185m	<b>0</b>	0	0
Cadmium	ppm	ASTM D5185m	<b>0</b>	<1	0

## ADDITIVES

	method	limit/base	current	history1	history2
Boron	ppm	ASTM D5185m	<b>23</b>	20	20
Barium	ppm	ASTM D5185m	<b>0</b>	0	0
Molybdenum	ppm	ASTM D5185m	<b>107</b>	97	80
Manganese	ppm	ASTM D5185m	<b>&lt;1</b>	<1	<1
Magnesium	ppm	ASTM D5185m	<b>183</b>	130	109
Calcium	ppm	ASTM D5185m	<b>3383</b>	3246	2620
Phosphorus	ppm	ASTM D5185m	<b>1111</b>	1082	986
Zinc	ppm	ASTM D5185m	<b>1263</b>	1233	1081

## CONTAMINANTS

	method	limit/base	current	history1	history2
Silicon	ppm	ASTM D5185m	<b>6</b>	5	5
Sodium	ppm	ASTM D5185m	<b>5</b>	4	5
Potassium	ppm	ASTM D5185m	<b>0</b>	0	0

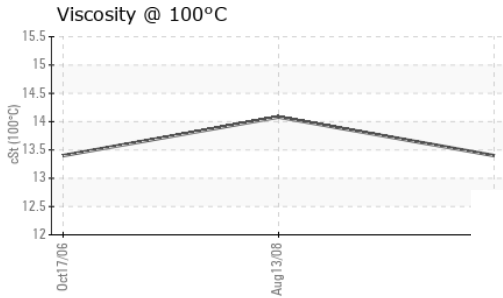
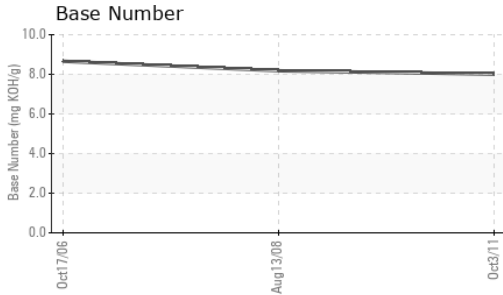
## INFRA-RED

	method	limit/base	current	history1	history2
Soot %	%	*ASTM D7844	<b>0.1</b>	0.1	0.1
Nitration	Abs/cm	*ASTM D7624	<b>10.</b>	8.	0.08
Sulfation	Abs/.1mm	*ASTM D7415	<b>28.</b>	19.	0.17

## FLUID DEGRADATION

	method	limit/base	current	history1	history2
Oxidation	Abs/.1mm	*ASTM D7414	<b>20.</b>	15.	0.23
Base Number (BN)	mg KOH/g	ASTM D2896	<b>8.01</b>	8.18	8.66

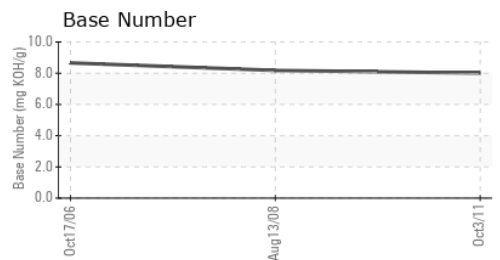
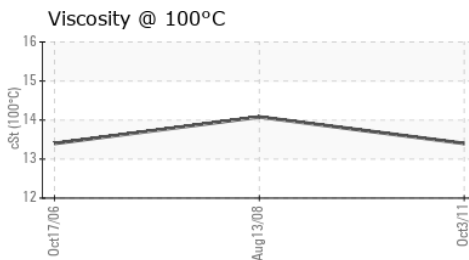
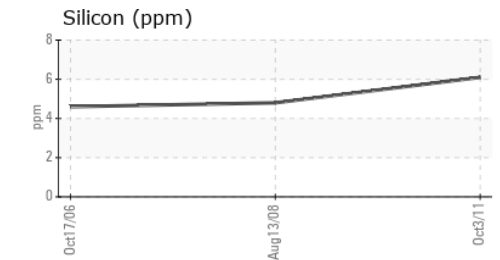
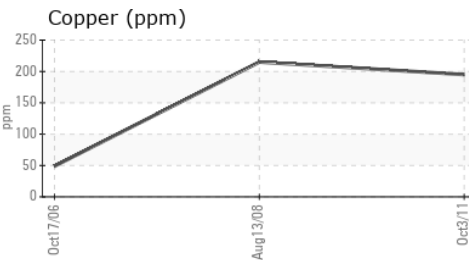
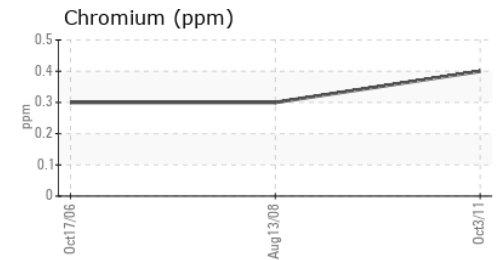
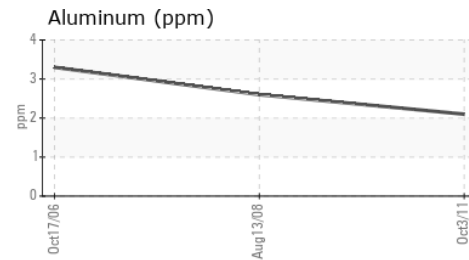
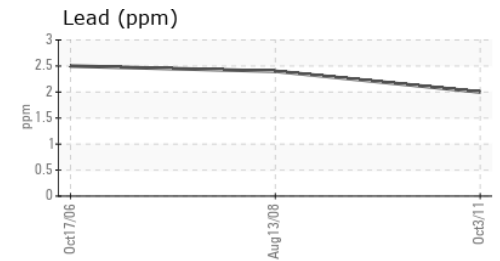
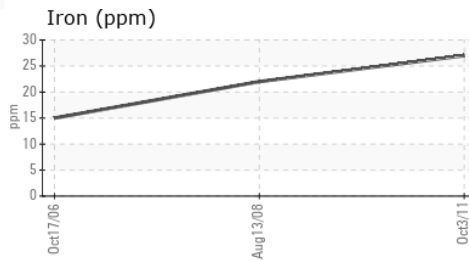
# OIL ANALYSIS REPORT



PARAMETER	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	NEG	NEG	NEG
Free Water	scalar	*Visual	NEG	NEG	NEG

FLUID PROPERTIES	method	limit/base	current	history1	history2
Visc @ 100°C	cSt	ASTM D445	13.4	14.08	13.4

## GRAPHS



Certificate L2367

**Laboratory** : WearCheck USA - 501 Madison Ave., Cary, NC 27513  
**Sample No.** : RP104855 **Received** : 13 Oct 2011  
**Lab Number** : 02942919 **Diagnosed** : 14 Oct 2011  
**Unique Number** : 5704477 **Diagnostician** : Don Baldrige  
**Test Package** : MOB 2

**GRAYLING GENERATING STATION**  
 4400 WEST FOUR MILE ROAD  
 GRAYLING, MI  
 US 49738  
 Contact: JASON SHEA  
 jason.j.shea@cmsenergy.com  
 T:  
 F: (989)348-4679

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)