

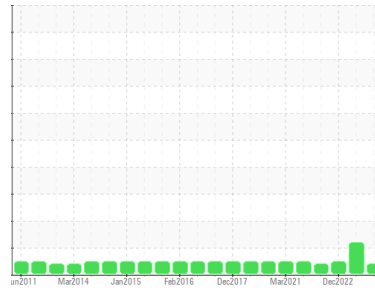


# OIL ANALYSIS REPORT



Machine Id  
**CATERPILLAR D5N 311 (S/N AKD01217)**  
 Component  
**Diesel Engine**  
 Fluid  
**DIESEL ENGINE OIL SAE 15W40 (7 GAL)**

Sample Rating Trend



## VISCOSITY



### DIAGNOSIS

#### Recommendation

Oil and filter change at the time of sampling has been noted. 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 oil.

#### Fluid Condition

The oil viscosity is lower than normal. The BN result indicates that there is suitable alkalinity remaining in the oil. Confirm oil type.

### SAMPLE INFORMATION

	method	limit/base	current	history1	history2
Sample Number	Client Info		<b>RW0005004</b>	RW0004498	RW0004137
Sample Date	Client Info		<b>06 Apr 2024</b>	17 Aug 2023	09 Dec 2022
Machine Age	hrs	Client Info	<b>13229</b>	13083	12705
Oil Age	hrs	Client Info	<b>146</b>	378	128
Oil Changed	Client Info		<b>Changed</b>	Changed	Changed
Sample Status			<b>ATTENTION</b>	ABNORMAL	NORMAL

### CONTAMINATION

	method	limit/base	current	history1	history2
Fuel	WC Method	>5	<b>&lt;1.0</b>	▲ 2.9	<1.0
Water	WC Method	>0.2	<b>NEG</b>	NEG	NEG
Glycol	WC Method		<b>NEG</b>	NEG	NEG

### WEAR METALS

	method	limit/base	current	history1	history2
Iron	ppm	ASTM D5185m >100	<b>4</b>	11	4
Chromium	ppm	ASTM D5185m >20	<b>0</b>	<1	<1
Nickel	ppm	ASTM D5185m >2	<b>0</b>	<1	0
Titanium	ppm	ASTM D5185m >2	<b>0</b>	0	0
Silver	ppm	ASTM D5185m >2	<b>0</b>	0	0
Aluminum	ppm	ASTM D5185m >25	<b>1</b>	0	<1
Lead	ppm	ASTM D5185m >40	<b>&lt;1</b>	<1	<1
Copper	ppm	ASTM D5185m >330	<b>&lt;1</b>	0	<1
Tin	ppm	ASTM D5185m >15	<b>0</b>	<1	<1
Vanadium	ppm	ASTM D5185m	<b>0</b>	0	0
Cadmium	ppm	ASTM D5185m	<b>0</b>	0	0

### ADDITIVES

	method	limit/base	current	history1	history2
Boron	ppm	ASTM D5185m 250	<b>7</b>	12	4
Barium	ppm	ASTM D5185m 10	<b>0</b>	0	0
Molybdenum	ppm	ASTM D5185m 100	<b>64</b>	67	66
Manganese	ppm	ASTM D5185m	<b>0</b>	<1	<1
Magnesium	ppm	ASTM D5185m 450	<b>992</b>	1083	1001
Calcium	ppm	ASTM D5185m 3000	<b>1253</b>	1279	1246
Phosphorus	ppm	ASTM D5185m 1150	<b>1144</b>	1159	1105
Zinc	ppm	ASTM D5185m 1350	<b>1359</b>	1459	1356
Sulfur	ppm	ASTM D5185m 4250	<b>4069</b>	4161	3900

### CONTAMINANTS

	method	limit/base	current	history1	history2
Silicon	ppm	ASTM D5185m >25	<b>3</b>	3	4
Sodium	ppm	ASTM D5185m >158	<b>&lt;1</b>	<1	1
Potassium	ppm	ASTM D5185m >20	<b>&lt;1</b>	<1	0

### INFRA-RED

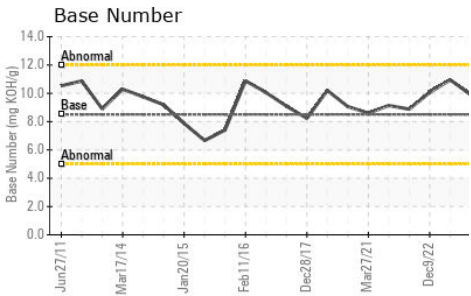
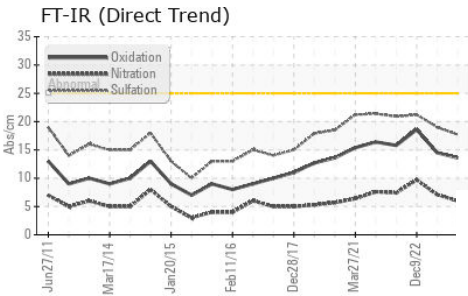
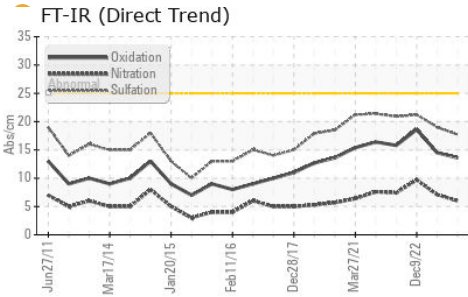
	method	limit/base	current	history1	history2
Soot %	%	*ASTM D7844 >3	<b>0.2</b>	0.3	0.3
Nitration	Abs/cm	*ASTM D7624 >20	<b>6.0</b>	7.1	9.7
Sulfation	Abs/.1mm	*ASTM D7415 >30	<b>17.7</b>	19.0	21.2

### FLUID DEGRADATION

	method	limit/base	current	history1	history2
Oxidation	Abs/.1mm	*ASTM D7414 >25	<b>13.6</b>	14.5	18.6
Base Number (BN)	mg KOH/g	ASTM D2896 8.5	<b>9.91</b>	10.95	10.06



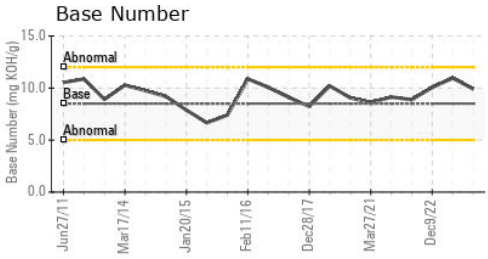
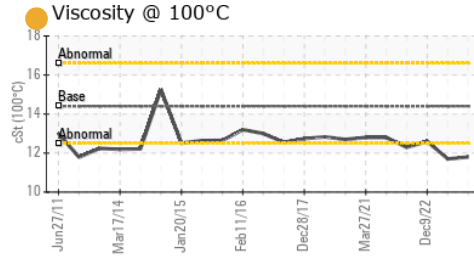
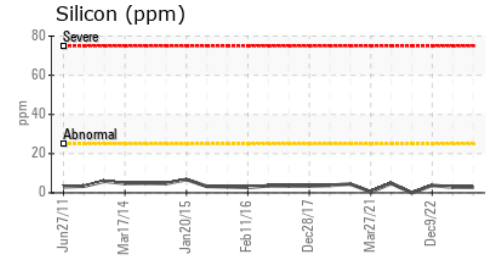
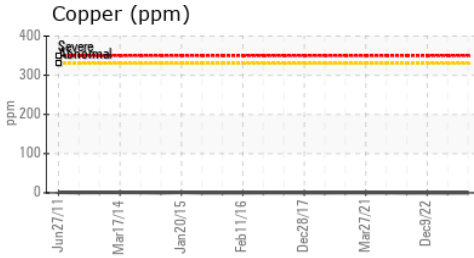
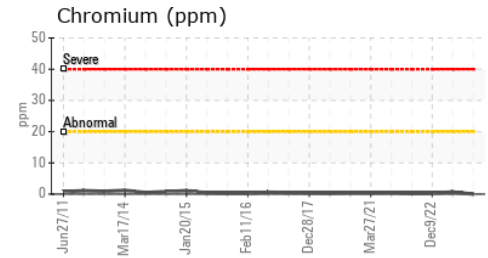
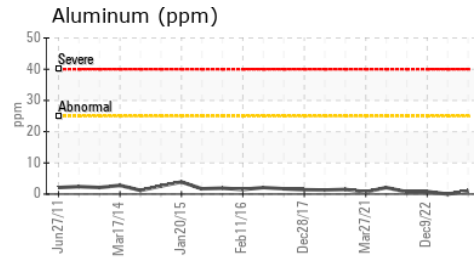
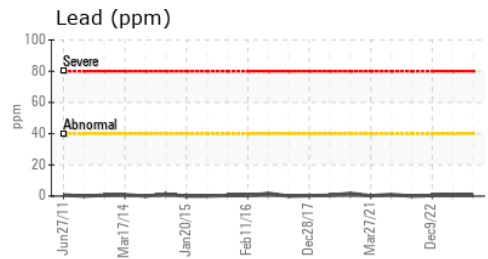
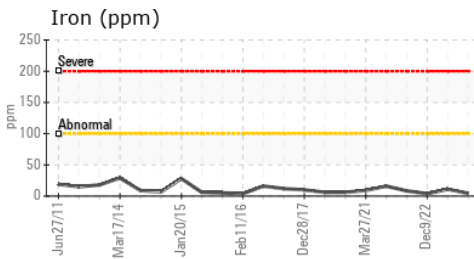
# OIL ANALYSIS REPORT



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

FLUID PROPERTIES	method	limit/base	current	history1	history2	
Visc @ 100°C	cSt	ASTM D445	14.4	11.8	11.7	12.6

### GRAPHS



Certificate L2367

**Laboratory** : WearCheck USA - 501 Madison Ave., Cary, NC 27513  
**Sample No.** : RW0005004  
**Lab Number** : 06161025  
**Unique Number** : 10996448  
**Test Package** : MOB 2

**Received** : 25 Apr 2024  
**Tested** : 26 Apr 2024  
**Diagnosed** : 29 Apr 2024 - Don Baldrige

**HALLACK CONTRACTING, INC.**  
 4223 W POLK  
 HART, MI  
 US 49420

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

Contact: DAN HALLACK KARL BUTCHER  
shop@hallackcontracting.com

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

T: (231)873-5081

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

F: (231)873-2889