

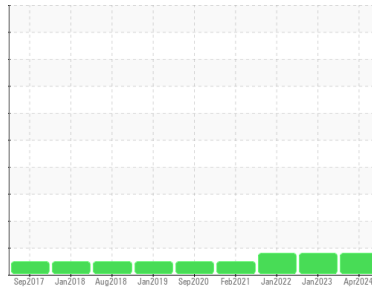


# OIL ANALYSIS REPORT



Machine Id  
**CATERPILLAR D4K II 319 (S/N KMM00283)**  
 Component  
**Diesel Engine**  
 Fluid  
**DIESEL ENGINE OIL SAE 15W40 (4 GAL)**

### Sample Rating Trend



**WEAR**



### DIAGNOSIS

#### Recommendation

Oil and filter change at the time of sampling has been noted. Resample at the next service interval to monitor.

#### Wear

The aluminum level is abnormal. All other component wear rates are normal.

#### Contamination

There is no indication of any contamination in the oil.

#### Fluid Condition

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

### SAMPLE INFORMATION

	method	limit/base	current	history1	history2
Sample Number	Client Info		<b>RW0005475</b>	RW0003976	RW0002934
Sample Date	Client Info		<b>20 Apr 2024</b>	11 Jan 2023	14 Jan 2022
Machine Age	hrs	Client Info	<b>6626</b>	6360	5977
Oil Age	hrs	Client Info	<b>266</b>	383	331
Oil Changed	Client Info		<b>Changed</b>	Changed	Changed
Sample Status			<b>ABNORMAL</b>	ABNORMAL	ABNORMAL

### CONTAMINATION

	method	limit/base	current	history1	history2
Fuel	WC Method	>5	<b>&lt;1.0</b>	<1.0	<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>34</b>	22	21
Chromium	ppm	ASTM D5185m >20	<b>&lt;1</b>	1	<1
Nickel	ppm	ASTM D5185m >2	<b>0</b>	<1	<1
Titanium	ppm	ASTM D5185m >2	<b>0</b>	<1	<1
Silver	ppm	ASTM D5185m >2	<b>0</b>	0	0
Aluminum	ppm	ASTM D5185m >25	<b>▲ 40</b>	▲ 36	▲ 32
Lead	ppm	ASTM D5185m >40	<b>0</b>	0	<1
Copper	ppm	ASTM D5185m >330	<b>0</b>	2	4
Tin	ppm	ASTM D5185m >15	<b>&lt;1</b>	<1	0
Antimony	ppm	ASTM D5185m	<b>---</b>	---	0
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>14</b>	17	66
Barium	ppm	ASTM D5185m 10	<b>&lt;1</b>	12	<1
Molybdenum	ppm	ASTM D5185m 100	<b>64</b>	60	81
Manganese	ppm	ASTM D5185m	<b>&lt;1</b>	<1	<1
Magnesium	ppm	ASTM D5185m 450	<b>915</b>	732	202
Calcium	ppm	ASTM D5185m 3000	<b>1163</b>	1222	2191
Phosphorus	ppm	ASTM D5185m 1150	<b>1124</b>	956	1188
Zinc	ppm	ASTM D5185m 1350	<b>1278</b>	1132	1351
Sulfur	ppm	ASTM D5185m 4250	<b>3779</b>	3226	3471

### CONTAMINANTS

	method	limit/base	current	history1	history2
Silicon	ppm	ASTM D5185m >25	<b>6</b>	7	8
Sodium	ppm	ASTM D5185m >158	<b>2</b>	2	4
Potassium	ppm	ASTM D5185m >20	<b>0</b>	0	<1

### INFRA-RED

	method	limit/base	current	history1	history2
Soot %	%	*ASTM D7844 >3	<b>0.3</b>	0.4	0.4
Nitration	Abs/cm	*ASTM D7624 >20	<b>8.3</b>	9.4	10.7
Sulfation	Abs/.1mm	*ASTM D7415 >30	<b>17.7</b>	18.1	20.4

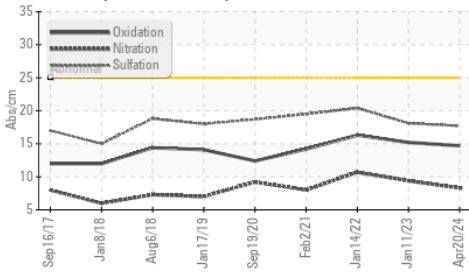
### FLUID DEGRADATION

	method	limit/base	current	history1	history2
Oxidation	Abs/.1mm	*ASTM D7414 >25	<b>14.7</b>	15.2	16.3
Base Number (BN)	mg KOH/g	ASTM D2896 8.5	<b>10.48</b>	9.00	7.60

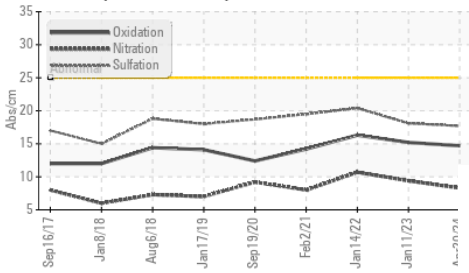


# OIL ANALYSIS REPORT

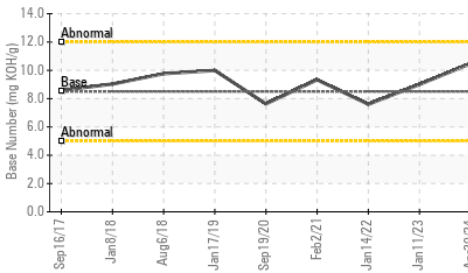
FT-IR (Direct Trend)



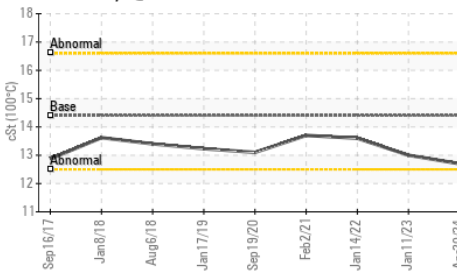
FT-IR (Direct Trend)



Base Number



Viscosity @ 100°C

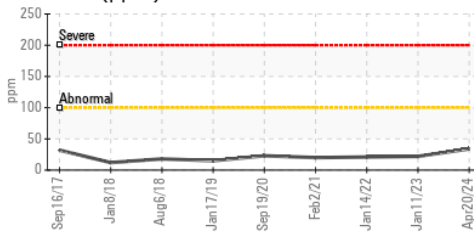


VISUAL	method	limit/base	current	history1	history2
White Metal	scalar	*Visual	NONE	NONE	NONE
Yellow Metal	scalar	*Visual	NONE	NONE	NONE
Precipitate	scalar	*Visual	NONE	NONE	NONE
Silt	scalar	*Visual	NONE	NONE	NONE
Debris	scalar	*Visual	NONE	NONE	NONE
Sand/Dirt	scalar	*Visual	NONE	NONE	NONE
Appearance	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

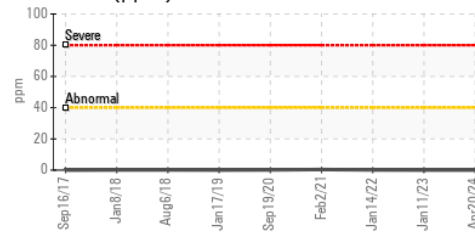
FLUID PROPERTIES	method	limit/base	current	history1	history2
Visc @ 100°C	cSt	ASTM D445	14.4	12.7	13.0

GRAPHS

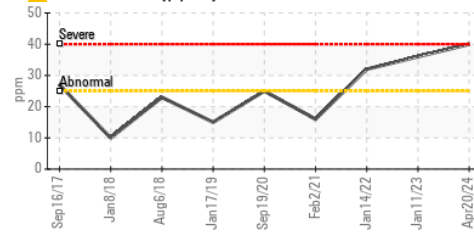
Iron (ppm)



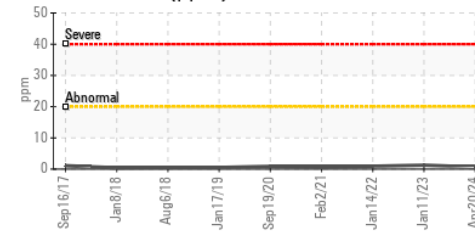
Lead (ppm)



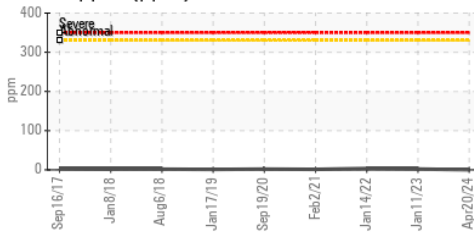
Aluminum (ppm)



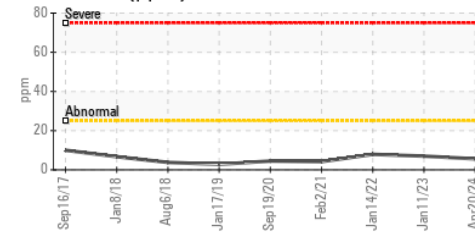
Chromium (ppm)



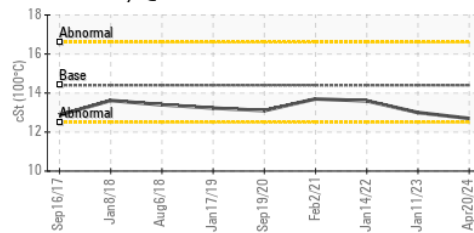
Copper (ppm)



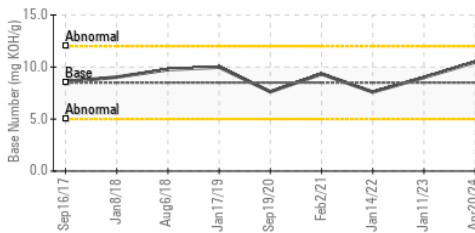
Silicon (ppm)



Viscosity @ 100°C



Base Number



Certificate L2367

Laboratory : WearCheck USA - 501 Madison Ave., Cary, NC 27513  
 Sample No. : RW0005475  
 Lab Number : 06176219  
 Unique Number : 11022272  
 Test Package : MOB 2

Received : 10 May 2024  
 Tested : 13 May 2024  
 Diagnosed : 14 May 2024 - Don Baldrige

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

Contact: DAN HALLACK KARL BUTCHER  
 shop@hallackcontracting.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)

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