



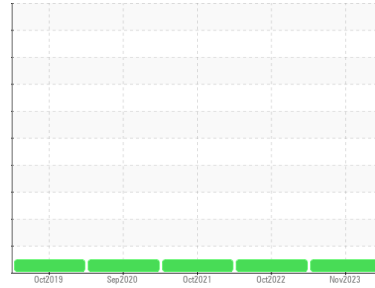
OIL ANALYSIS REPORT

Sample Rating Trend

NORMAL



Machine Id
CATERPILLAR STARBOARD (S/N 9WR01480)
 Component
Starboard Diesel Engine
 Fluid
SHELL ROTELLA T 15W40 (--- 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 oil.

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		RW0004159	RW0004157	RW0001507
Sample Date	Client Info		15 Nov 2023	29 Oct 2022	08 Oct 2021
Machine Age	hrs	Client Info	2077	2001	1928
Oil Age	hrs	Client Info	75	73	43
Oil Changed	Client Info		Changed	Changed	Changed
Sample Status			NORMAL	NORMAL	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	>86	14	10	10
Chromium	ppm	ASTM D5185m	>3	0	<1	<1
Nickel	ppm	ASTM D5185m	>3	0	<1	<1
Titanium	ppm	ASTM D5185m	>2	0	<1	<1
Silver	ppm	ASTM D5185m	>2	0	0	0
Aluminum	ppm	ASTM D5185m	>15	1	1	<1
Lead	ppm	ASTM D5185m	>16	0	<1	<1
Copper	ppm	ASTM D5185m	>250	38	23	10
Tin	ppm	ASTM D5185m	>2	0	<1	0
Antimony	ppm	ASTM D5185m		---	---	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	316	155	96	158
Barium	ppm	ASTM D5185m	0.0	6	0	0
Molybdenum	ppm	ASTM D5185m	1.2	4	14	1
Manganese	ppm	ASTM D5185m		0	<1	<1
Magnesium	ppm	ASTM D5185m	24	98	381	14
Calcium	ppm	ASTM D5185m	2292	2180	1790	2348
Phosphorus	ppm	ASTM D5185m	1064	1075	940	957
Zinc	ppm	ASTM D5185m	1160	1173	1159	1067
Sulfur	ppm	ASTM D5185m	4996	3655	3846	5156

CONTAMINANTS

	method	limit/base	current	history1	history2	
Silicon	ppm	ASTM D5185m	>35	6	4	3
Sodium	ppm	ASTM D5185m		0	2	2
Potassium	ppm	ASTM D5185m	>20	8	5	17

INFRA-RED

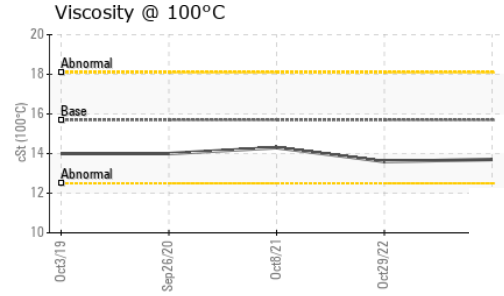
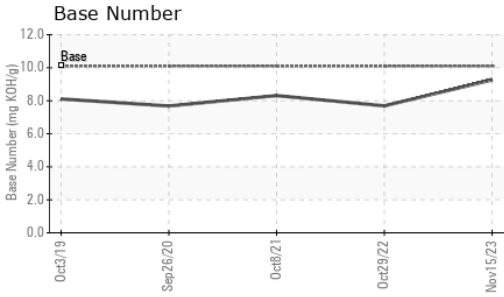
	method	limit/base	current	history1	history2	
Soot %	%	*ASTM D7844	>3	0.3	0.3	0.2
Nitration	Abs/cm	*ASTM D7624	>20	7.8	7.8	7.1
Sulfation	Abs/.1mm	*ASTM D7415	>30	20.8	20.2	21.4

FLUID DEGRADATION

	method	limit/base	current	history1	history2	
Oxidation	Abs/.1mm	*ASTM D7414	>25	16.3	15	17.4
Base Number (BN)	mg KOH/g	ASTM D2896	10.1	9.26	7.69	8.31



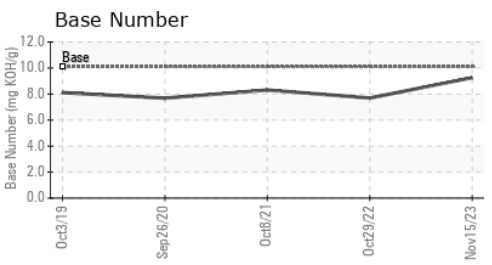
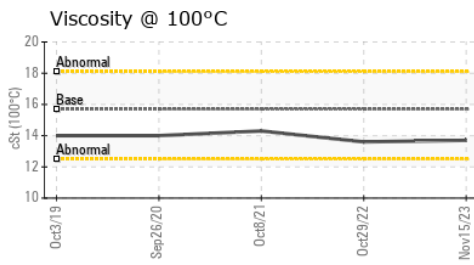
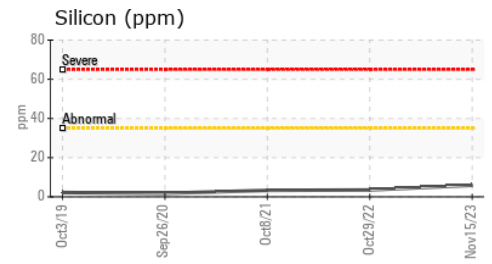
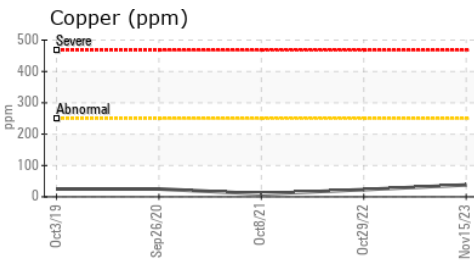
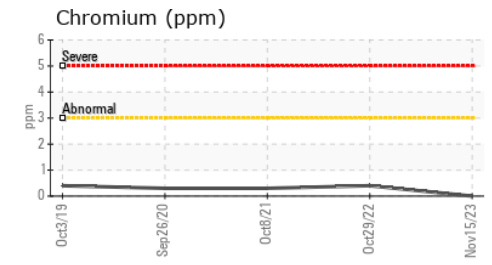
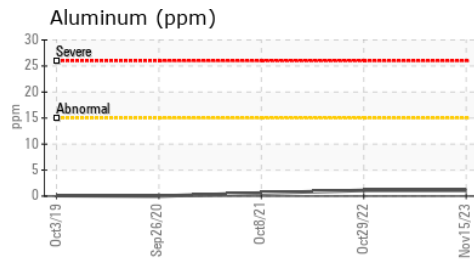
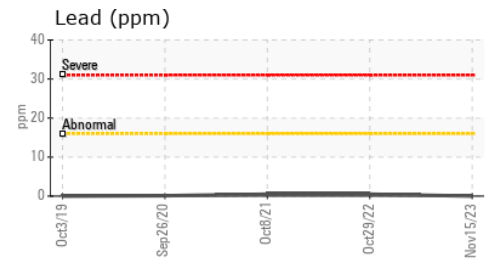
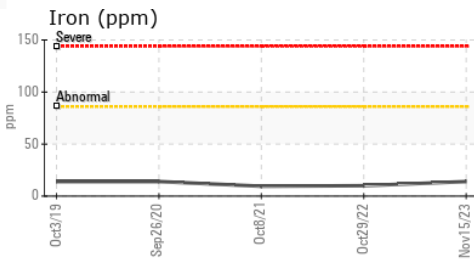
OIL ANALYSIS REPORT



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	15.7	13.7	13.6	14.3

GRAPHS



Laboratory : WearCheck USA - 501 Madison Ave., Cary, NC 27513
Sample No. : RW0004159 **Received** : 15 Nov 2023
Lab Number : 06009155 **Diagnosed** : 17 Nov 2023
Unique Number : 10742917 **Diagnostician** : Wes Davis
Test Package : MOB 2

RUSS SAGER
 109 BAY SHORE DR
 BAY CITY, MI
 US 48706
 Contact: RUSS SAGER
 rsager@dpbrownntech.com
 T:
 F:

Certificate L2367
 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)