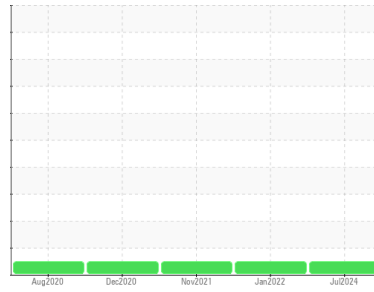




OIL ANALYSIS REPORT

Area
BACKHOE
 Machine Id
CASE 590SN V161
 Component
Diesel Engine
 Fluid
HIGH PERFORMANCE LUBRICANTS HDMO 15W40 (13 QTS)

Sample Rating Trend



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		HPL0002271	RP0012223	RP0012746
Sample Date	Client Info		09 Jul 2024	26 Jan 2022	18 Nov 2021
Machine Age	hrs	Client Info	4561	3756	3653
Oil Age	hrs	Client Info	300	495	392
Oil Changed	Client Info		Not Chngd	Not Chngd	Not Chngd
Sample Status			NORMAL	NORMAL	NORMAL

CONTAMINATION

	method	limit/base	current	history1	history2
Fuel	WC Method	>5	<1.0	<1.0	<1.0
Water	WC Method	>0.2	NEG	NEG	NEG
Glycol	WC Method		NEG	NEG	NEG

WEAR METALS

	method	limit/base	current	history1	history2
Iron	ppm	ASTM D5185m >100	46	74	57
Chromium	ppm	ASTM D5185m >20	<1	1	<1
Nickel	ppm	ASTM D5185m >4	0	<1	0
Titanium	ppm	ASTM D5185m	0	<1	<1
Silver	ppm	ASTM D5185m >3	0	<1	<1
Aluminum	ppm	ASTM D5185m >20	10	2	3
Lead	ppm	ASTM D5185m >40	<1	2	<1
Copper	ppm	ASTM D5185m >330	4	10	8
Tin	ppm	ASTM D5185m >15	<1	<1	<1
Antimony	ppm	ASTM D5185m	---	<1	0
Vanadium	ppm	ASTM D5185m	<1	<1	<1
Cadmium	ppm	ASTM D5185m	0	<1	0

ADDITIVES

	method	limit/base	current	history1	history2
Boron	ppm	ASTM D5185m 200	43	209	187
Barium	ppm	ASTM D5185m	0	0	2
Molybdenum	ppm	ASTM D5185m 85	609	739	733
Manganese	ppm	ASTM D5185m	<1	<1	<1
Magnesium	ppm	ASTM D5185m 525	905	447	459
Calcium	ppm	ASTM D5185m 4300	2910	4007	4122
Phosphorus	ppm	ASTM D5185m 1000	1120	853	893
Zinc	ppm	ASTM D5185m 1100	1346	1017	969
Sulfur	ppm	ASTM D5185m 20200	12049	19495	17411

CONTAMINANTS

	method	limit/base	current	history1	history2
Silicon	ppm	ASTM D5185m >25	18	17	15
Sodium	ppm	ASTM D5185m	5	10	8
Potassium	ppm	ASTM D5185m >20	3	<1	2

INFRA-RED

	method	limit/base	current	history1	history2
Soot %	%	*ASTM D7844 >3	1.8	1.2	1
Nitration	Abs/cm	*ASTM D7624 >20	11.8	10.7	9.8
Sulfation	Abs/.1mm	*ASTM D7415 >30	38.0	32.9	30.2

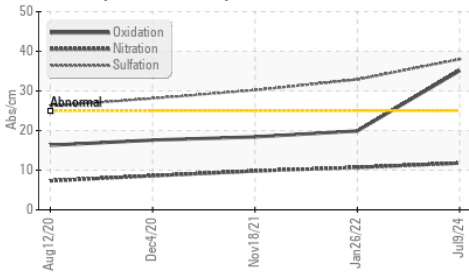
FLUID DEGRADATION

	method	limit/base	current	history1	history2
Oxidation	Abs/.1mm	*ASTM D7414 >25	35.1	19.9	18.4
Base Number (BN)	mg KOH/g	ASTM D2896 14.5	15.33	14.4	14.5

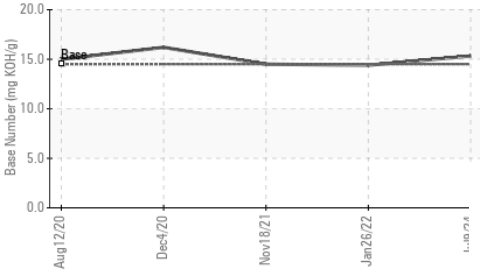


OIL ANALYSIS REPORT

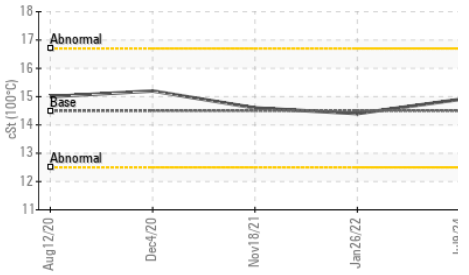
FT-IR (Direct Trend)



Base Number



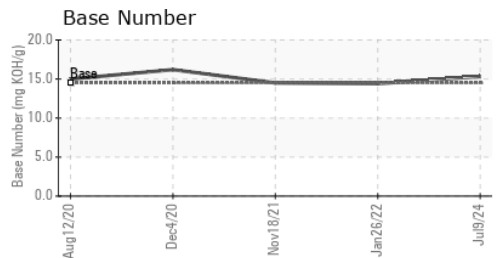
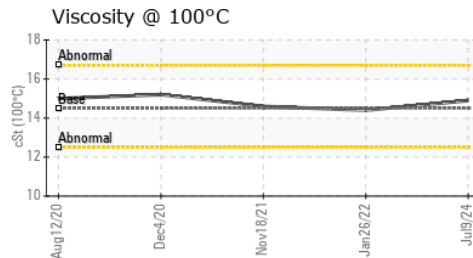
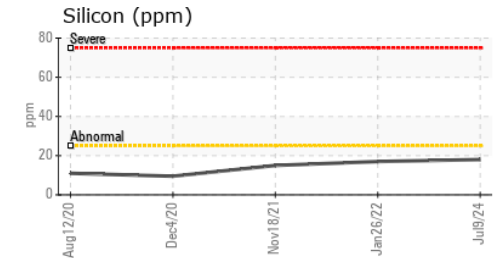
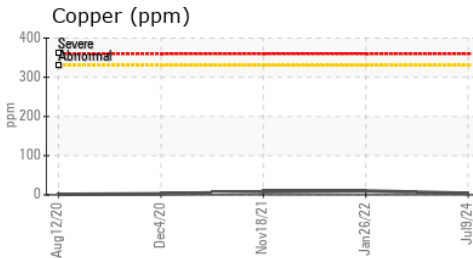
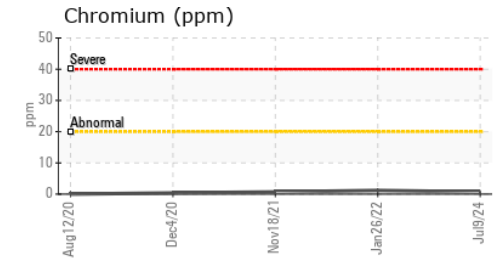
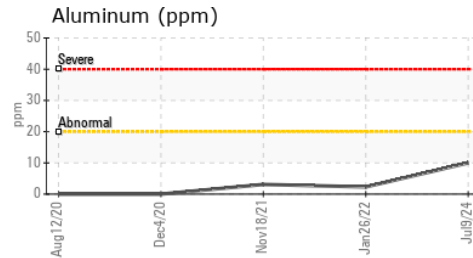
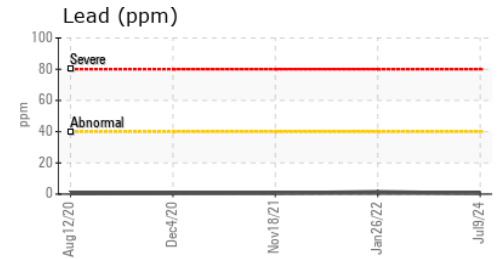
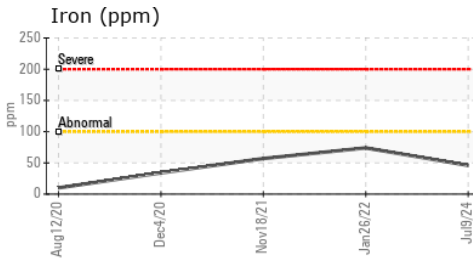
Viscosity @ 100°C



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	>0.2	NEG	NEG
Free Water	scalar	*Visual		NEG	NEG

FLUID PROPERTIES	method	limit/base	current	history1	history2
Visc @ 100°C	cSt	ASTM D445	14.5	14.9	14.4

GRAPHS



Certificate L2367

Laboratory : WearCheck USA - 501 Madison Ave., Cary, NC 27513
Sample No. : HPL0002271
Lab Number : 06235128
Unique Number : 11123962
Test Package : MOB 2

Received : 12 Jul 2024
Tested : 15 Jul 2024
Diagnosed : 15 Jul 2024 - Sean Felton

MUSCATINE POWER AND WATER
 3205 CEDAR STREET
 MUSCATINE, IA
 US 52761
 Contact: JUSTIN CONKLIN
 justin.conklin@mpw.org
 T: (563)262-3351
 F:

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)