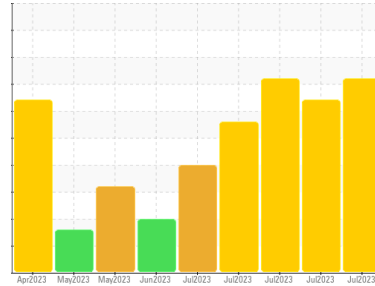




OIL ANALYSIS REPORT

Sample Rating Trend



WATER



Area
RIG 879
 Machine Id
R879-P-02-NKL
 Component
Pump
 Fluid
GEAR OIL ISO 320 (--- GAL)

DIAGNOSIS

Recommendation

We advise that you check for the source of water entry. We advise that you check all areas where dirt can enter the system. We advise that you follow the water drain-off procedure for this component. We recommend an early resample to monitor this condition. There is too much water present in this sample to perform a particle count.

Wear

An increase in the iron level is noted.

Contamination

Appearance is milky. There is a high concentration of water present in the oil. Elemental levels of silicon (Si) and aluminum (Al) indicate alumina-silicate (coarse dirt) ingress.

Fluid Condition

The AN level is acceptable for this fluid.

SAMPLE INFORMATION

	method	limit/base	current	history1	history2
Sample Number	Client Info		KL0012133	KL0011972	KL0011975
Sample Date	Client Info		16 Jul 2023	13 Jul 2023	11 Jul 2023
Machine Age	days	Client Info	45123	45120	45118
Oil Age	days	Client Info	0	0	0
Oil Changed	Client Info		N/A	N/A	N/A
Sample Status			SEVERE	SEVERE	SEVERE

WEAR METALS

	method	limit/base	current	history1	history2
Iron	ppm	ASTM D5185m >500	▲ 400	235	107
Chromium	ppm	ASTM D5185m >7	4	2	1
Nickel	ppm	ASTM D5185m	<1	<1	<1
Titanium	ppm	ASTM D5185m	2	2	1
Silver	ppm	ASTM D5185m	0	0	0
Aluminum	ppm	ASTM D5185m >25	▲ 40	▲ 46	▲ 40
Lead	ppm	ASTM D5185m >35	0	0	<1
Copper	ppm	ASTM D5185m >50	16	15	9
Tin	ppm	ASTM D5185m >5	<1	1	1
Vanadium	ppm	ASTM D5185m	<1	<1	<1
Cadmium	ppm	ASTM D5185m	0	0	0

ADDITIVES

	method	limit/base	current	history1	history2
Boron	ppm	ASTM D5185m 50	20	19	13
Barium	ppm	ASTM D5185m 15	24	24	10
Molybdenum	ppm	ASTM D5185m 15	4	5	4
Manganese	ppm	ASTM D5185m	3	2	1
Magnesium	ppm	ASTM D5185m 50	42	47	36
Calcium	ppm	ASTM D5185m 50	183	211	168
Phosphorus	ppm	ASTM D5185m 350	175	171	151
Zinc	ppm	ASTM D5185m 100	117	123	103
Sulfur	ppm	ASTM D5185m 12500	11299	11363	11258

CONTAMINANTS

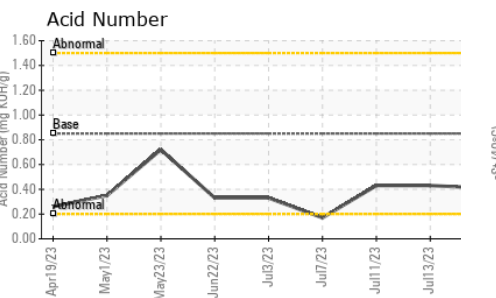
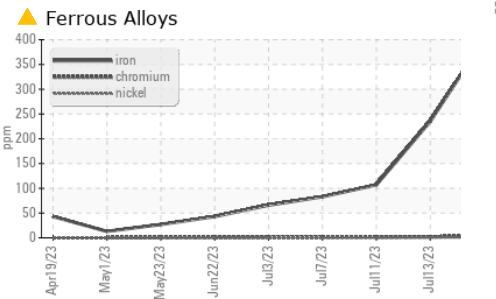
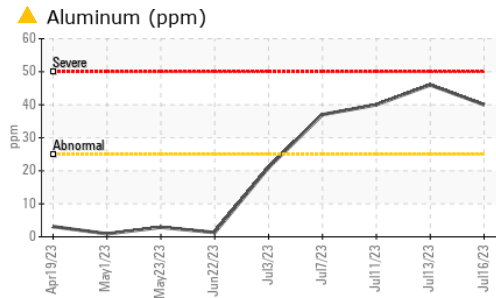
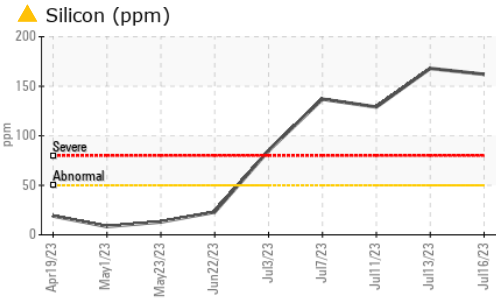
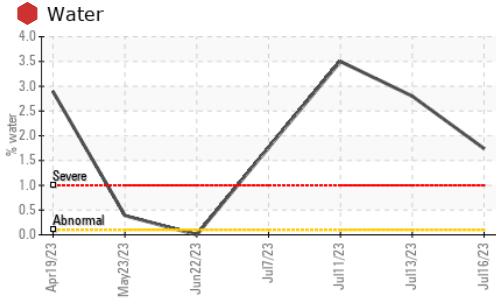
	method	limit/base	current	history1	history2
Silicon	ppm	ASTM D5185m >50	▲ 162	▲ 168	▲ 129
Sodium	ppm	ASTM D5185m	1591	1924	1699
Potassium	ppm	ASTM D5185m >20	21	25	22
Water	%	ASTM D6304	● 1.74	● 2.80	● 3.50
ppm Water	ppm	ASTM D6304 >.1	● 17400	● 28000	● 35000

FLUID DEGRADATION

	method	limit/base	current	history1	history2
Acid Number (AN)	mg KOH/g	ASTM D8045 0.85	0.41	0.43	0.43



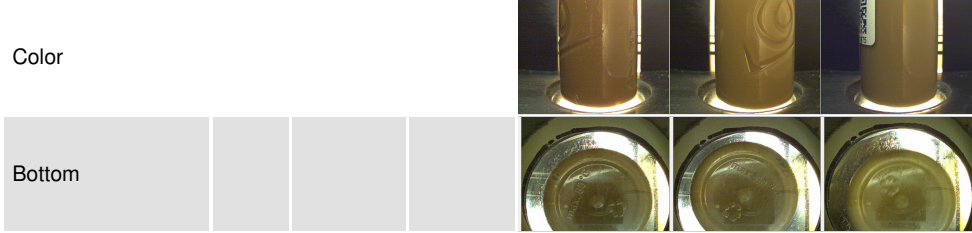
OIL ANALYSIS REPORT



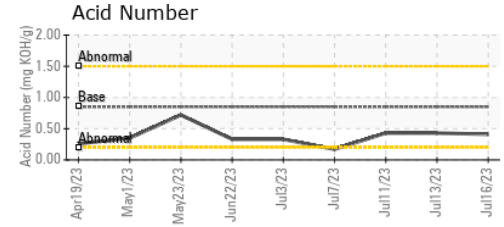
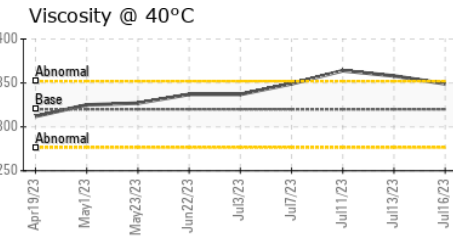
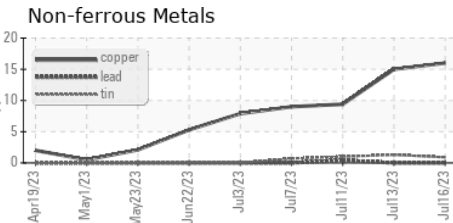
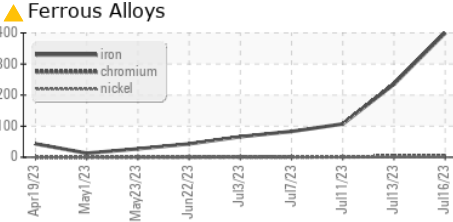
VISUAL	method	limit/base	current	history1	history2
White Metal	scalar	*Visual	NONE	NONE	NONE
Yellow Metal	scalar	*Visual	NONE	NONE	NONE
Precipitate	scalar	*Visual	NONE	NONE	NONE
Silt	scalar	*Visual	NONE	NONE	▲ MODER
Debris	scalar	*Visual	NONE	NONE	LIGHT
Sand/Dirt	scalar	*Visual	NONE	NONE	NONE
Appearance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

FLUID PROPERTIES	method	limit/base	current	history1	history2
Visc @ 40°C	cSt	ASTM D445	320	358	364

SAMPLE IMAGES	method	limit/base	current	history1	history2
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GRAPHS



Laboratory : WearCheck USA - 501 Madison Ave., Cary, NC 27513
Sample No. : KL0012133 **Received** : 21 Jul 2023
Lab Number : 05904320 **Diagnosed** : 26 Jul 2023
Unique Number : 10565676 **Diagnostician** : Don Baldrige
Test Package : MOB 2 (Additional Tests: KF, PrtCount)

PATTERSON - UTI DRILLING
 9915 WEST INDUSTRIAL
 MIDLAND, TX
 US 79706
 Contact: SERVICE MANAGER

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)

T:
 F: (432)561-9388