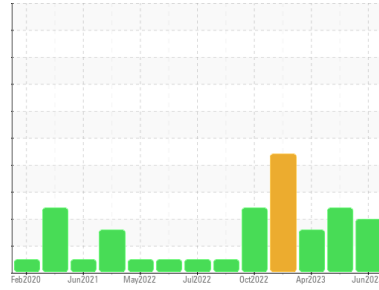




OIL ANALYSIS REPORT

Sample Rating Trend



ISO



Area
RIG 4
Machine Id
HYUNDAI HL757-9A R4-LOADER ENG NKL
Component
Diesel Engine
Fluid
CHEVRON 15W40 (--- GAL)

DIAGNOSIS

Recommendation

No corrective action is recommended at this time. Resample at the next service interval to monitor.

Wear

All component wear rates are normal.

Contamination

There is a moderate amount of particulates present 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		KL0012492	KL0012460	KL0011891
Sample Date	Client Info		24 Jun 2023	19 May 2023	14 Apr 2023
Machine Age	days	Client Info	45099	45063	45025
Oil Age	days	Client Info	0	0	0
Oil Changed	Client Info		N/A	N/A	N/A
Sample Status			ATTENTION	ABNORMAL	ATTENTION

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 >100	11	30	85
Chromium	ppm	ASTM D5185m >20	<1	<1	3
Nickel	ppm	ASTM D5185m >4	0	<1	0
Titanium	ppm	ASTM D5185m	0	0	0
Silver	ppm	ASTM D5185m >3	0	0	0
Aluminum	ppm	ASTM D5185m >20	9	6	25
Lead	ppm	ASTM D5185m >40	<1	0	0
Copper	ppm	ASTM D5185m >330	<1	<1	2
Tin	ppm	ASTM D5185m >15	<1	<1	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	449	345	307
Barium	ppm	ASTM D5185m	0	0	0
Molybdenum	ppm	ASTM D5185m	137	120	130
Manganese	ppm	ASTM D5185m	<1	<1	1
Magnesium	ppm	ASTM D5185m	762	659	641
Calcium	ppm	ASTM D5185m	1732	1470	1429
Phosphorus	ppm	ASTM D5185m	811	737	669
Zinc	ppm	ASTM D5185m	941	848	776
Sulfur	ppm	ASTM D5185m	3326	3408	2766

CONTAMINANTS

	method	limit/base	current	history1	history2
Silicon	ppm	ASTM D5185m >25	8	13	23
Sodium	ppm	ASTM D5185m >50	1	5	7
Potassium	ppm	ASTM D5185m >20	4	4	19

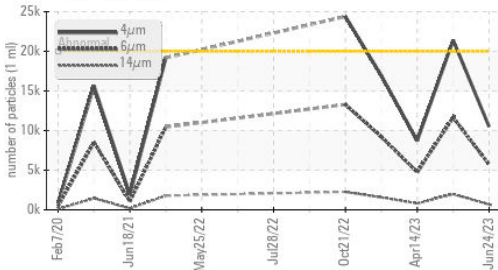
INFRA-RED

	method	limit/base	current	history1	history2
Soot %	%	*ASTM D7844 >3	0.2	0.1	0.6
Nitration	Abs/cm	*ASTM D7624 >20	5.4	5.1	8.6
Sulfation	Abs.1mm	*ASTM D7415 >30	22.7	22.4	22.6

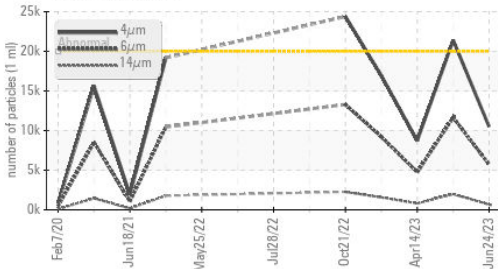


OIL ANALYSIS REPORT

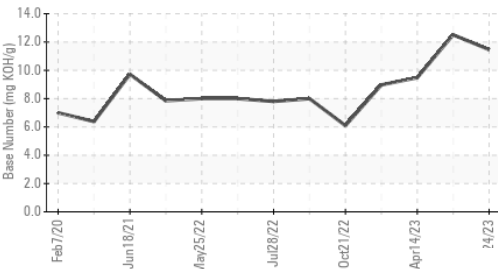
▲ Particle Trend



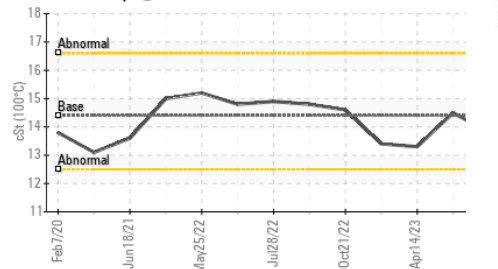
▲ Particle Trend



Base Number



Viscosity @ 100°C



FLUID CLEANLINESS	method	limit/base	current	history1	history2
Particles >4µm	ASTM D7647	>20000	10501	21401	8734
Particles >6µm	ASTM D7647	>5000	▲ 5720	▲ 11658	4758
Particles >14µm	ASTM D7647	>640	▲ 674	▲ 1984	▲ 810
Particles >21µm	ASTM D7647	>160	▲ 328	▲ 668	▲ 273
Particles >38µm	ASTM D7647	>40	▲ 51	▲ 103	▲ 42
Particles >71µm	ASTM D7647	>10	▲ 5	▲ 11	4
Oil Cleanliness	ISO 4406 (c)	>21/19/16	▲ 21/20/17	▲ 21/18	▲ 19/17

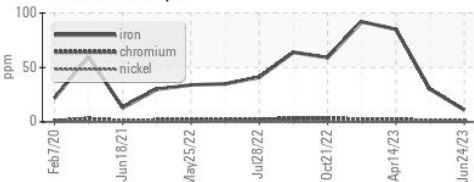
FLUID DEGRADATION	method	limit/base	current	history1	history2
Oxidation	Abs/.1mm *ASTM D7414	>25	15.6	14.7	17.1
Base Number (BN)	mg KOH/g ASTM D2896		11.46	12.51	9.48

VISUAL	method	limit/base	current	history1	history2
White Metal	scalar *Visual	NONE	NONE	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

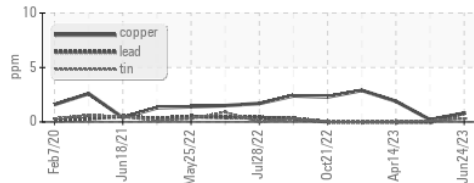
FLUID PROPERTIES	method	limit/base	current	history1	history2
Visc @ 100°C	cSt ASTM D445	14.4	13.8	14.5	13.3

GRAPHS

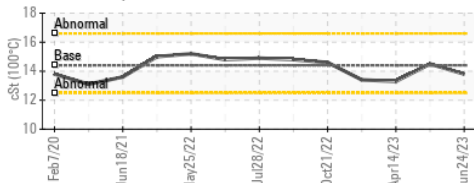
Ferrous Alloys



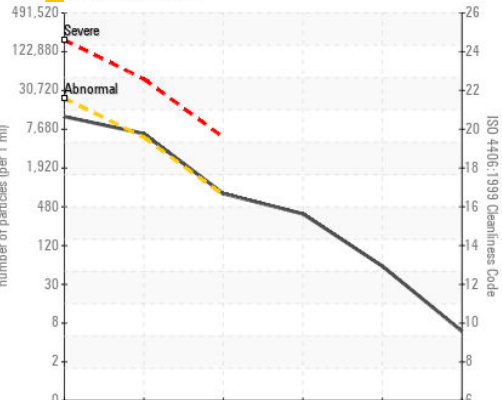
Non-ferrous Metals



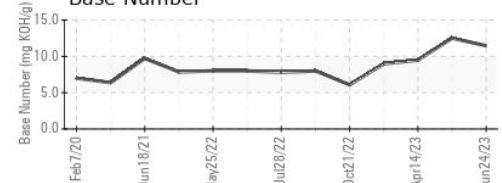
Viscosity @ 100°C



▲ Particle Count



Base Number



Certificate L2367

Laboratory : WearCheck USA - 501 Madison Ave., Cary, NC 27513
Sample No. : KL0012492 **Received** : 19 Jul 2023
Lab Number : 05902888 **Diagnosed** : 21 Jul 2023
Unique Number : 10564244 **Diagnostician** : Don Baldrige
Test Package : MOB 2 (Additional Tests: PrtCount)

CITADEL DRILLING
 7550 W 120
 ODESSA, TX
 US 79763
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 mcombden@citadelldrilling.com
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 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)