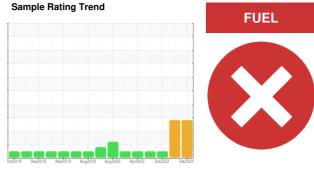


OIL ANALYSIS REPORT





LIEBHERR A954CHD MH-31 (S/N 450-46118) Component **Diesel Engine**

Fluid DETRO CANADA DURON HP 15W40 (-

PETRO CANADA DU	RON HP 15W40 (LTR)	Dct2018 De	c2018 Mar2019 Aug20	119 Aug2020 Apr2022 Oct20	22 Feb2024	
DIAGNOSIS	SAMPLE INFO	RMATION	method	limit/base	current	history1	history2
Recommendation	Sample Number		Client Info		PCA0113882	PCA0094330	PCA0083717
Ne advise that you check the fuel injection system. The oil change at the time of sampling has been	Sample Date		Client Info		05 Feb 2024	07 Dec 2023	30 Oct 2022
	Machine Age	hrs	Client Info		20003	31914	19147
ed. We recommend an early resample to	Oil Age	hrs	Client Info		150	50	500
nitor this condition.	Oil Changed		Client Info		Changed	Not Changd	Changed
ear	Sample Status				SEVERE	SEVERE	NORMAL
component wear rates are normal.		TION	and the set	Parel III and a			history O
Contamination	CONTAMINA	HON	method	limit/base	current	history1	history2
ere is a high amount of fuel present in the oil.	Water		WC Method	>0.2	NEG	NEG	NEG
sts confirm the presence of fuel in the oil.	Glycol		WC Method		NEG	NEG	NEG
Fluid Condition BN result indicates that there is suitable	WEAR META	LS	method	limit/base	current	history1	history2
alinity remaining in the oil. Fuel is present in the	Iron	ppm	ASTM D5185m	>100	3	28	22
and is lowering the viscosity. The oil is no longer	Chromium	ppm	ASTM D5185m	>5	0	<1	<1
serviceable due to the presence of contaminants.	Nickel	ppm	ASTM D5185m		<1	1	0
	Titanium	ppm	ASTM D5185m		0	0	0
	Silver	ppm	ASTM D5185m	>3	0	0	0
	Aluminum	ppm	ASTM D5185m		1	2	<1
	Lead	ppm	ASTM D5185m		0	<1	<1
	Copper	ppm	ASTM D5185m		3	9	10
	Tin	ppm	ASTM D5185m		<1	1	<1
	Vanadium	ppm	ASTM D5185m	20	0	0	0
	Cadmium	ppm	ASTM D5185m		0	0	0
	ADDITIVES		method	limit/base	current	history1	history2
	Boron	ppm	ASTM D5185m		6	2	2
	Barium	ppm	ASTM D5185m		0	0	0
	Molybdenum	ppm	ASTM D5185m		34	30	68
	Manganese	ppm	ASTM D5185m		<1	<1	<1
	Magnesium	ppm	ASTM D5185m		587	520	1024
	Calcium	ppm	ASTM D5185m		612	553	1219
	Phosphorus	ppm	ASTM D5185m		627	554	1116
	Zinc	ppm	ASTM D5185m		750	691	1309
	Sulfur	ppm	ASTM D5185m		2002	1598	3954
	CONTAMINA		method	limit/base		history1	history2
	Silicon	ppm	ASTM D5185m		3	3	4
	Sodium	ppm	ASTM D5185m		<1	<1	1
	Potassium	ppm	ASTM D5185m	>20	1	1	0
	Fuel	%	ASTM D3524		937.2	42.0	<1.0
	INFRA-RED		method	limit/base		history1	history2
	Soot %	%	*ASTM D7844		0.1	0.5	1
	Nitration	Abs/cm	*ASTM D7624		6.0	7.2	8.6
	Sulfation	Abs/.1mm	*ASTM D7415		14.9	15.3	21.4
	FLUID DEGRA		method	limit/base	current	history1	history2
	Oxidation		*ASTM D7414		9.7	9.1	15.8
	Onidation	nus/.111111	A01W D7414	220	5.1	0.1	10.0

Base Number (BN) mg KOH/g ASTM D2896 9.8

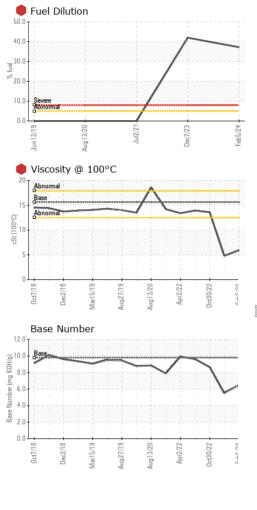
5.52

6.49

8.67



OIL ANALYSIS REPORT



	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
ec 7/2:	Appearance	scalar	*Visual				NORML
							NORML
				>0.2			NEG
			^Visual		NEG	NEG	NEG
\sim			method		current	history1	history2
		cSt	ASTM D445	15.6	5.9	4.8	13.6
L							
	Iron (ppm) 250			-,, - 8			
122	200 - Severe				Severe		
Oct30, Cate							
	abnormal			d.4	Abnormal		
	50 -	· · · ·	\land	2	20		
			2	4		6 0	2
	0ct7/1)ec2/1 ar15/1	13/2	Apr2/2 ct30/2	Feb 5/2	0ct7/1)ec2/1 ar15/1	13/2	Apr2/22 0ct30/22
	2	Au Au	- 0	hadan.	2		ŏ
	Aluminum (ppm)			1 1	12) m)	
	30 - Severe			1	10 - Severe		
					8-		
30/22 46.04	ġ.			dd	4 Abnormal		
	10-				2		
		19	22			10	
	0ct7/1 Dec2/1	ug27/7 ug13/2	Apr2/2	Feb5/2	0ct7/i Dec2/1	ug 13/2	Apr2/22 0ct30/22
	⊂ ≥ Copper (ppm)	A A	0		 Silicon (ppm)	A A	5
	600 T			8			
		Δ		6	60 - Sever emal		
	E 300 Severe			Ed 4	10		
	200 - Abnormal	T					
		IV	\sim				
		13/20	pr2/22 30/22	eb5/24 -	ct7/18 -	13/20	Apr2/22 - 0ct30/22 -
	- 2		Ar	a.	2	Aug	Ar
	20	;		12.	.0		
	Base	\wedge	<u>k</u>	(B/HO)	.0 - Base		~
		~	-	3 Bul).	.0		$\langle \rangle$
				ia du	.0.		
	5-			N ase 2.	.0		
		20	22	0.	.0	719	22
	0ct7/ Dec2/ Aar15/	Aug27, ug13/.	Apr2/ 0ct30/	Feb 5/	0ct7/ Dec2/ Aar15/	Aug27/ iug13/	Apr2/22 0ct30/22
	2	4 4	-		2	4 4	_
Laboratory					SCRAP ME		
Sample No. Lab Number		Recei Teste		3 Feb 2024 7 Feb 2024			ST U.S. HWY HESTERTON,
		Diagr	-	Feb 2024 - V	Ves Davis	01	US 463
Unique Number	. 100300/0						
Test Package	: MOB 2 (Additional Te	ests: Perc	centFuel)				
Test Package sample report		ests: Perc ice at 1-8	centFuel) 200-237-1369	9.	dw		OOMINIC WHIT etalservices.co
	Laboratory Sample No.	White Metal Yellow Metal Precipitate Silt Debris Sand/Dit Appearance Odor Emulsified Water Free Water FLUID PROPE Visc @ 100°C GRAPHS Iron (ppm) 4 4 4 4 4 4 4 5 5 5 5 5 5 5 5 5 5 5 5	White Metal scalar Yellow Metal scalar Precipitate scalar Sitt scalar Debris scalar Sand/Dirt scalar Appearance scalar Odor scalar Free Water scalar Free Water scalar Free Water scalar Free Water scalar Free Water scalar Odor cst GRAPHS Tron (ppm) Aluminum (ppm) Opport (ppm) Op	White Metal scalar 'Visual Precipitate scalar 'Visual Debris scalar 'Visual Debris scalar 'Visual Debris scalar 'Visual Appearance scalar 'Visual Emulsified Water scalar 'Visual Free Water scalar 'Visual Free Water scalar 'Visual Free Water scalar 'Visual Free Water scalar 'Visual Muninum (ppm) Copper (ppm) Co	White Metal scalar 'Visual NONE Precipitate scalar 'Visual NONE Precipitate scalar 'Visual NONE Silt scalar 'Visual NONE Sana/Dirt scalar 'Visual NONE Appearance scalar 'Visual NONE Emulsified Water scalar 'Visual NORML Cdor scalar 'Visual NORML Emulsified Water scalar 'Visual NORML Emulsified Water scalar 'Visual NORML Codor Scalar 'Visual NORML Emulsified Water scalar 'Visual 'S.6 FLUID PROPERTIES method imit/base Visc @ 100°C cSt ASTM D445 15.6 CRAPHS Tron (ppm) Aluminum (ppm) Copper (pm) Copper (pm) Copper (pm) Copper (pm) WearCheck USA - 501 Madison Ave., Cary, NC 27513 Sample No. : :WearCheck USA - 501 Madison Ave., Cary, NC 27513	White Metal scalar 'Visual NONE NONE Precipitate scalar 'Visual NONE NONE Site scalar 'Visual NONE NONE Sand/Dirt scalar 'Visual NONE NONE NORML	White Metal scalar 'Visual NONE NONE NONE NONE Precipitate scalar 'Visual NONE NONE NONE Sand/Dirt scalar 'Visual NONE NONE NONE NONE NONE Sand/Dirt scalar 'Visual NONE NONE NONE NONE NONE Appearance scalar 'Visual NORML N