MAR I WEAR CHECK

OIL ANALYSIS REPORT

WEAR	NORMAL
CONTAMINATION	NORMAL
FLUID CONDITION	NORMAL

Area
SAMUELRIS
Machine Id
S30-2214 Main Propulsion Engine
Component
4 Main Engine
Fluid
CASTROL TLX PLUS 303 (670 LTR)

RECOMMENDATION

Resample at the next service interval to monitor. Please contact your representative for information regarding the proper sampling kits for your service. NOTE: We recommend using MAR 3 test kits, this testkit includes Analytical Ferrography which provides a detailed morphological analysis of wear particles present in the fluid. this testkit includes BN to determine the suitability of the oil for continued use.

WEAR

Component wear rates appear to be normal (unconfirmed).

CONTAMINATION

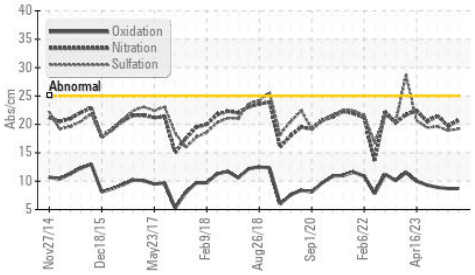
Elevated aluminum (Al) and/or lead (Pb) and potassium (K) levels in your metals analysis are likely a result of solder flux release into the lubricant and is common on new equipment/components. There is no indication of any contamination in the oil.

FLUID CONDITION

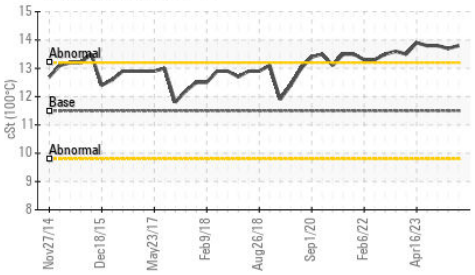
Viscosity of sample indicates oil is within SAE 40 range, advise investigate. The condition of the oil is acceptable for the time in service (unconfirmed).

Test	UOM	Method	Limit/Abn	Current	History1	History2
Sample Number		Client Info		WC0869803	WC0759145	WC0638059
Sample Date		Client Info		29 May 2024	22 Jan 2024	04 Nov 2023
Machine Age	hrs	Client Info		6074	5766	5467
Oil Age	hrs	Client Info		6074	5766	5467
Filter Age	hrs	Client Info		1371	1063	764
Oil Changed		Client Info		Not Changd	Not Changd	Not Changd
Filter Changed		Client Info		Not Changd	Not Changd	Not Changd
Sample Status				NORMAL	NORMAL	NORMAL
Iron	ppm	ASTM D5185(m)	>25	22	21	20
Chromium	ppm	ASTM D5185(m)	>5	<1	<1	<1
Nickel	ppm	ASTM D5185(m)	>5	0	0	<1
Titanium	ppm	ASTM D5185(m)	>3	0	0	0
Silver	ppm	ASTM D5185(m)	>2	0	0	<1
Aluminum	ppm	ASTM D5185(m)	>10	5	5	4
Lead	ppm	ASTM D5185(m)	>5	0	0	0
Copper	ppm	ASTM D5185(m)	>5	2	2	2
Tin	ppm	ASTM D5185(m)	>5	<1	<1	<1
Vanadium	ppm	ASTM D5185(m)		0	0	0
White Metal	scalar	Visual*	NONE	NONE	NONE	NONE
Yellow Metal	scalar	Visual*	NONE	NONE	NONE	NONE
Silicon	ppm	ASTM D5185(m)	>20	10	10	10
Potassium	ppm	ASTM D5185(m)	>20	5	5	4
Fuel		WC Method	>4.0	<1.0	<1.0	<1.0
Water		WC Method	>0.1	NEG	NEG	NEG
Glycol		WC Method		NEG	NEG	NEG
Soot %	%	ASTM D7844*	>2	1.6	1.3	1.4
Nitration	Abs/cm	ASTM D7624*	>20	20.7	19.7	21.5
Sulfation	Abs/.1mm	ASTM D7415*	>30	19.2	18.9	19.6
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*	>0.1	NEG	NEG	NEG
Sodium	ppm	ASTM D5185(m)	>75	9	8	8
Boron	ppm	ASTM D5185(m)		20	18	20
Barium	ppm	ASTM D5185(m)		<1	<1	<1
Molybdenum	ppm	ASTM D5185(m)		0	<1	<1
Manganese	ppm	ASTM D5185(m)		<1	0	0
Magnesium	ppm	ASTM D5185(m)		63	64	66
Calcium	ppm	ASTM D5185(m)	12000	13043	12673	13572
Phosphorus	ppm	ASTM D5185(m)	400	443	449	436
Zinc	ppm	ASTM D5185(m)	400	500	500	495
Sulfur	ppm	ASTM D5185(m)	12000	2650	2897	2843
Oxidation	Abs/.1mm	ASTM D7414*	>25	8.7	8.7	8.9
Visc @ 100°C	cSt	ASTM D7279(m)	11.5	13.8	13.7	13.8

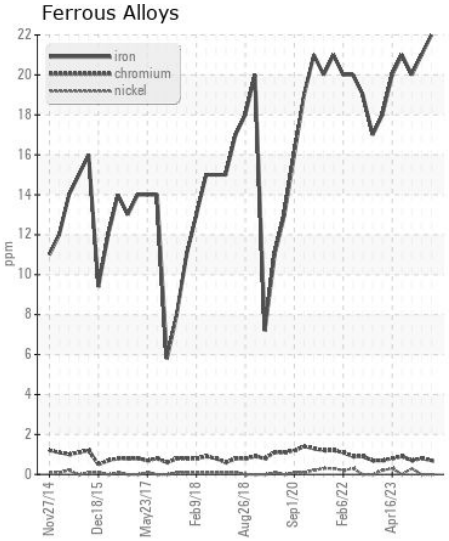
FT-IR (Direct Trend)



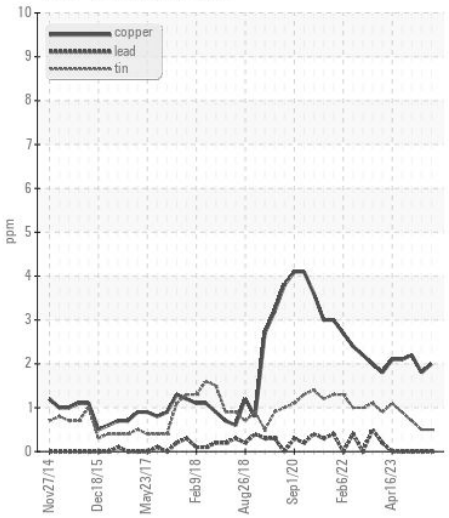
Viscosity @ 100°C



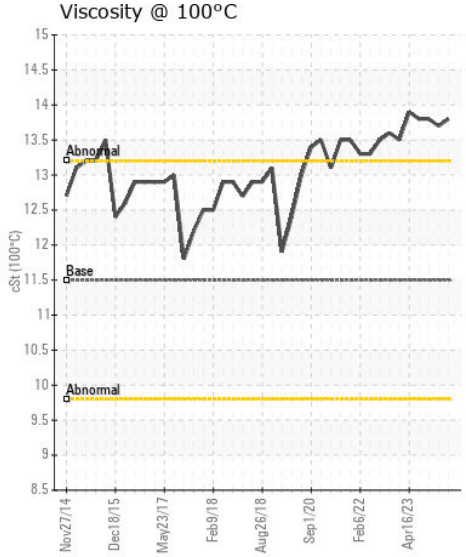
Ferrous Alloys



Non-ferrous Metals



Viscosity @ 100°C



ISO 17025:2017 Accredited Laboratory

Laboratory	: WearCheck - C8-1175 Appleby Line, Burlington, ON L7L 5H9			
Sample No.	: WC0869803	**Received**	: 06 Jun 2024	
Lab Number	: 02640182	**Tested**	: 06 Jun 2024	
Unique Number	: 5789344	**Diagnosed**	: 07 Jun 2024 - Kevin Marson	
Test Package	: MAR 1			

To discuss this sample report, contact Customer Service at 1-800-268-2131.
Test denoted (*) outside scope of accreditation, (m) method modified, (e) tested at external lab.
Validity of results and interpretation are based on the sample and information as supplied.

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