MAR I WEAR CHECK

OIL ANALYSIS REPORT

WEAR	NORMAL
CONTAMINATION	ABNORMAL
FLUID CONDITION	NORMAL

Machine Id
PORT STEERING (S/N 115841-080001)
Component
Port Steering
Fluid
CASTROL HYSPIN AWH-M ISO 32 (800 LTR)

RECOMMENDATION

Check seals and/or filters for points of contaminant entry. Oil and filter change at the time of sampling has been noted. We recommend an early resample to monitor this condition. Please specify the component make and model with your next sample. Please contact your representative for information regarding the proper sampling kits for your service. NOTE: We recommend using MAR 2 test kits, this testkit includes AN to determine the suitability of the fluid for continued use. this testkit includes Particle Count to determine the ISO cleanliness of the fluid. (Customer Sample Comment: System flushed and new oil added.)

WEAR

All component wear rates are normal.

CONTAMINATION

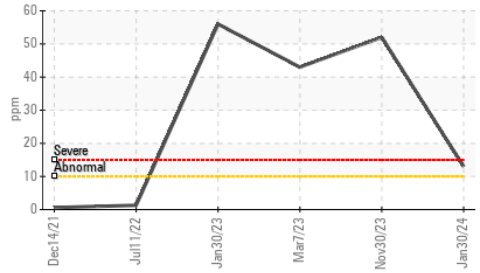
Elemental level of silicon (Si) above normal indicating ingress of seal material.

FLUID CONDITION

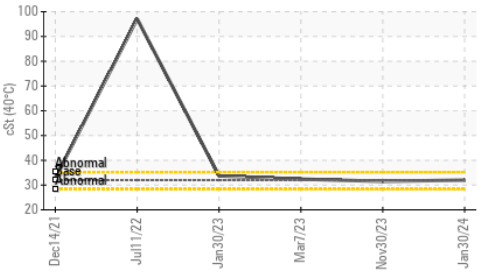
The fluid is no longer serviceable due to the presence of contaminants.

Test	UOM	Method	Limit/Abn	Current	History1	History2
Sample Number		Client Info		WC0787184	WC0787174	WC0787170
Sample Date		Client Info		30 Jan 2024	30 Nov 2023	07 Mar 2023
Machine Age	hrs	Client Info		0	0	0
Oil Age	hrs	Client Info		1	0	1
Filter Age	hrs	Client Info		1	0	1
Oil Changed		Client Info		Changed	Not Changd	Changed
Filter Changed		Client Info		Changed	None	Changed
Sample Status				ABNORMAL	SEVERE	SEVERE
Iron	ppm	ASTM D5185(m)	>60	2	6	2
Chromium	ppm	ASTM D5185(m)	>12	0	0	0
Nickel	ppm	ASTM D5185(m)	>6	0	<1	0
Titanium	ppm	ASTM D5185(m)		0	0	0
Silver	ppm	ASTM D5185(m)		0	0	0
Aluminum	ppm	ASTM D5185(m)	>4	0	<1	<1
Lead	ppm	ASTM D5185(m)	>12	0	<1	<1
Copper	ppm	ASTM D5185(m)	>30	<1	<1	<1
Tin	ppm	ASTM D5185(m)		0	0	0
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)	>10	▲ 13	▲ 52	▲ 43
Potassium	ppm	ASTM D5185(m)	>20	<1	1	1
Water		WC Method		NEG	NEG	NEG
Silt	scalar	Visual*	NONE	NONE	VLITE	NONE
Debris	scalar	Visual*	NONE	VLITE	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*		NEG	NEG	NEG
Sodium	ppm	ASTM D5185(m)		<1	<1	<1
Boron	ppm	ASTM D5185(m)		0	0	<1
Barium	ppm	ASTM D5185(m)		0	0	0
Molybdenum	ppm	ASTM D5185(m)		0	0	0
Manganese	ppm	ASTM D5185(m)		0	0	0
Magnesium	ppm	ASTM D5185(m)		<1	<1	<1
Calcium	ppm	ASTM D5185(m)		70	45	49
Phosphorus	ppm	ASTM D5185(m)		425	390	415
Zinc	ppm	ASTM D5185(m)		327	459	450
Sulfur	ppm	ASTM D5185(m)		3026	4034	3786
Visc @ 40°C	cSt	ASTM D7279(m)	32.0	32.0	31.5	32.4

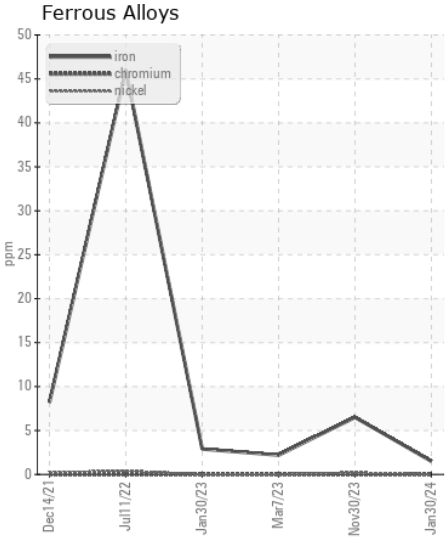
Silicon (ppm)



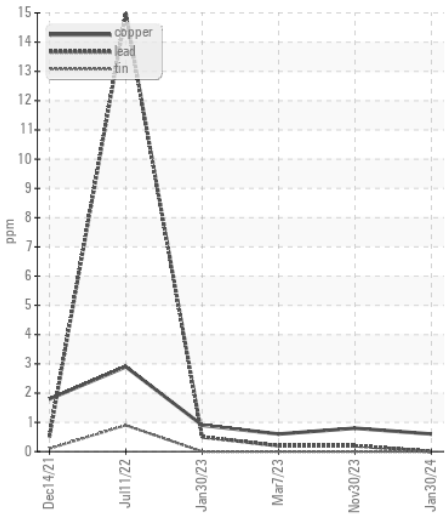
Viscosity @ 40°C



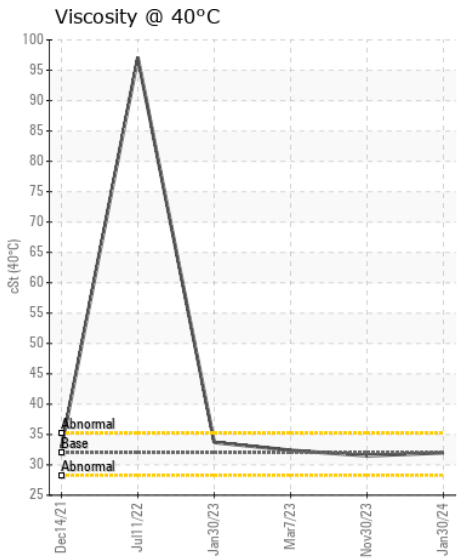
Ferrous Alloys



Non-ferrous Metals



Viscosity @ 40°C



ISO 17025:2017 Accredited Laboratory

Laboratory	: WearCheck - C8-1175 Appleby Line, Burlington, ON L7L 5H9		
Sample No.	: WC0787184	**Received**	: 29 May 2024
Lab Number	: 02638484	**Tested**	: 30 May 2024
Unique Number	: 5787646	**Diagnosed**	: 31 May 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.

Horizon Maritime Services Ltd. - K.J. Gardner
101 Research Drive, Main Floor
Dartmouth, NS
CA B2Y 4T6
Contact: Chief engineer
cheng.kjgardner@kotugcanada.ca
T: (250)208-7255
F: