



WEAR	<b>NORMAL</b>
CONTAMINATION	<b>ABNORMAL</b>
FLUID CONDITION	<b>NORMAL</b>

Machine Id  
**HAL PANNELL (S/N 2355)**  
Component  
**Starboard Reduction Gear**  
Fluid  
**CHEVRON MEROPA 220 (250 GAL)**

**RECOMMENDATION**

We recommend you service the filters on this component. We recommend an early resample to monitor this condition.

Test	UOM	Method	Limit/Abn	Current	History1	History2
Sample Number		Client Info		<b>MW0062358</b>	MW0066509	MW0066516
Sample Date		Client Info		<b>16 Mar 2024</b>	14 Feb 2024	16 Jan 2024
Machine Age	hrs	Client Info		<b>3318</b>	2552	1998
Oil Age	hrs	Client Info		<b>3318</b>	2552	1998
Filter Age	hrs	Client Info		<b>3318</b>	2552	1998
Oil Changed		Client Info		<b>Not Changd</b>	Not Changd	N/A
Filter Changed		Client Info		<b>N/A</b>	Not Changd	N/A
Sample Status				<b>ABNORMAL</b>	NORMAL	NORMAL

**WEAR**

All component wear rates are normal.

Iron	ppm	ASTM D5185m	>150	<b>16</b>	19	17
Chromium	ppm	ASTM D5185m	>10	<b>0</b>	<1	<1
Nickel	ppm	ASTM D5185m	>10	<b>0</b>	0	0
Titanium	ppm	ASTM D5185m		<b>0</b>	<1	0
Silver	ppm	ASTM D5185m		<b>0</b>	0	0
Aluminum	ppm	ASTM D5185m	>25	<b>&lt;1</b>	2	<1
Lead	ppm	ASTM D5185m	>100	<b>&lt;1</b>	<1	0
Copper	ppm	ASTM D5185m	>50	<b>3</b>	3	3
Tin	ppm	ASTM D5185m	>10	<b>0</b>	0	0
Vanadium	ppm	ASTM D5185m		<b>0</b>	0	0
White Metal	scalar	*Visual	NONE	<b>NONE</b>	NONE	NONE
Yellow Metal	scalar	*Visual	NONE	<b>NONE</b>	NONE	NONE

**CONTAMINATION**

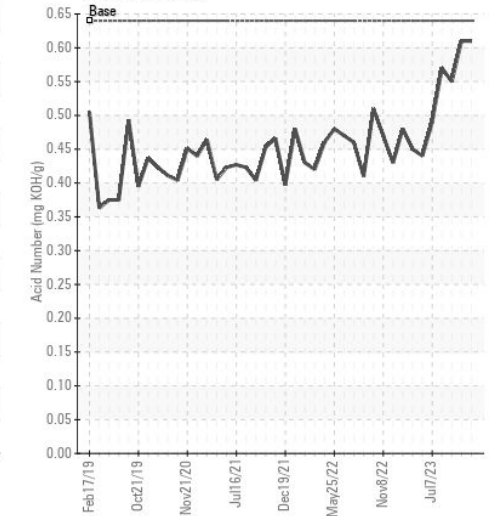
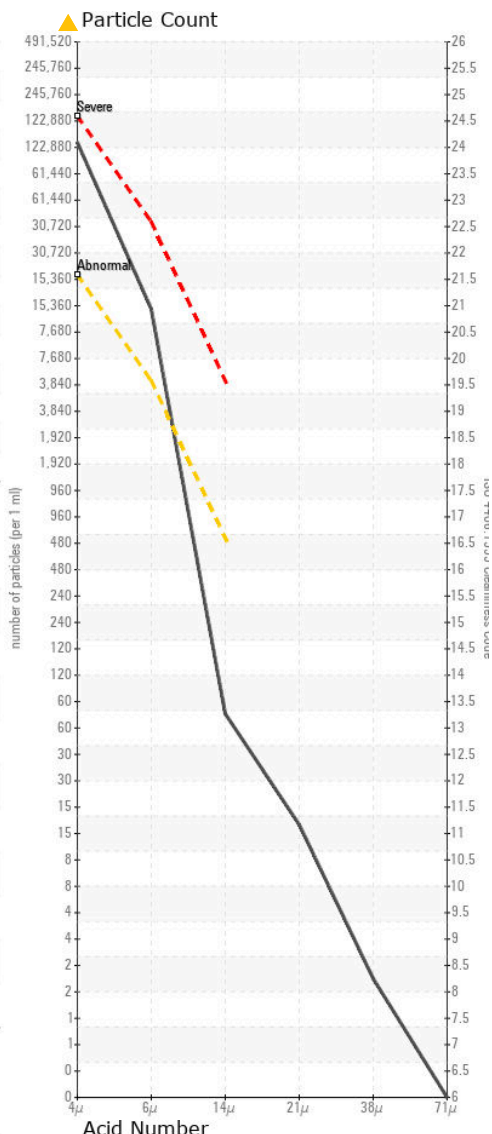
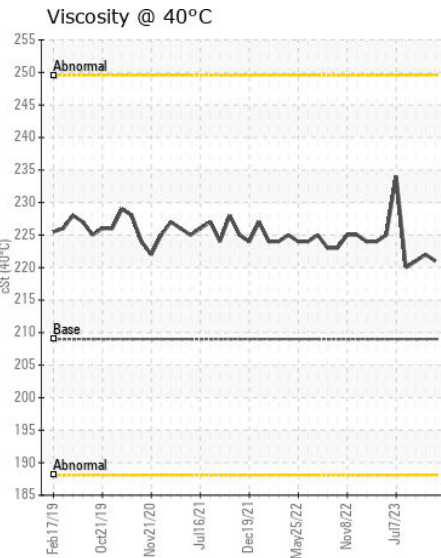
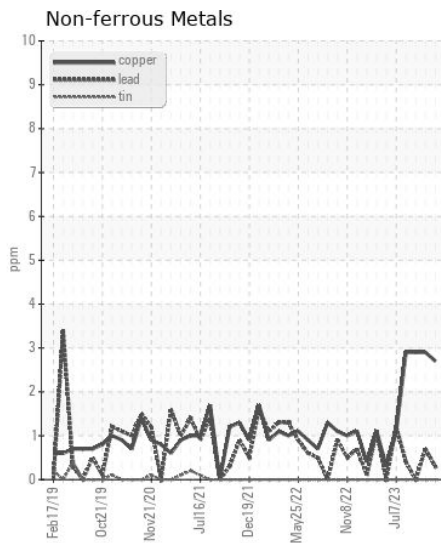
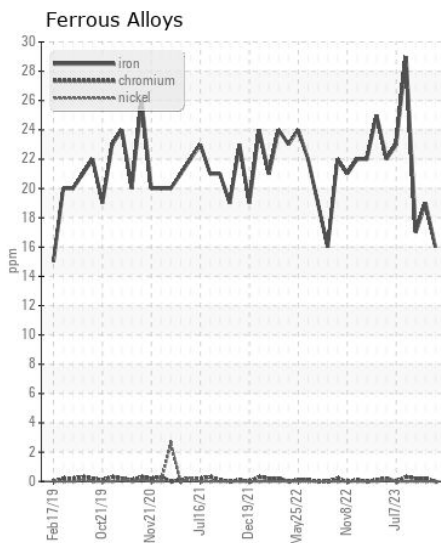
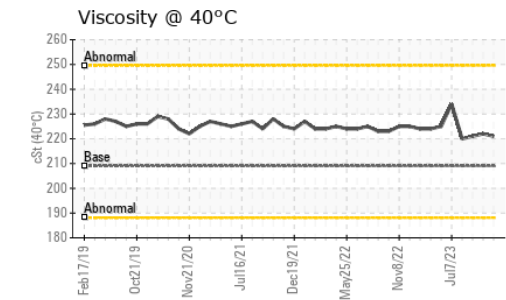
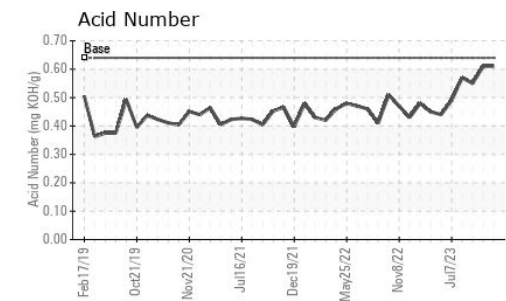
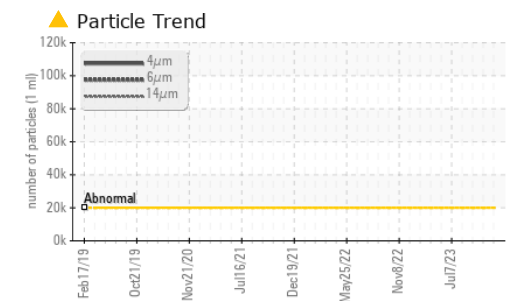
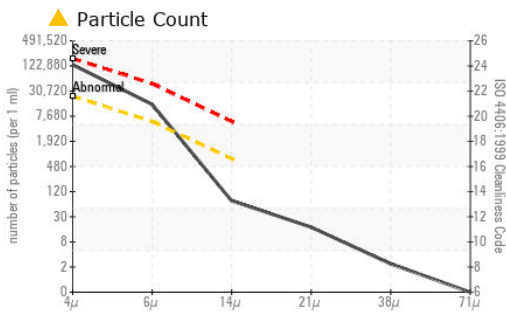
There is a moderate amount of silt (particulates < 14 microns in size) present in the oil.

Silicon	ppm	ASTM D5185m	>50	<b>1</b>	2	2
Potassium	ppm	ASTM D5185m	>20	<b>7</b>	2	0
Water		WC Method	>0.1	<b>NEG</b>	NEG	NEG
Particles >4µm		ASTM D7647	>20000	<b>▲ 113254</b>	---	---
Particles >6µm		ASTM D7647	>5000	<b>▲ 12763</b>	---	---
Particles >14µm		ASTM D7647	>640	<b>64</b>	---	---
Particles >21µm		ASTM D7647	>160	<b>15</b>	---	---
Particles >38µm		ASTM D7647	>40	<b>2</b>	---	---
Particles >71µm		ASTM D7647	>10	<b>0</b>	---	---
Oil Cleanliness		ISO 4406 (c)	>21/19/16	<b>▲ 24/21/13</b>	---	---
Silt	scalar	*Visual	NONE	<b>NONE</b>	NONE	NONE
Debris	scalar	*Visual	NONE	<b>NONE</b>	NONE	NONE
Sand/Dirt	scalar	*Visual	NONE	<b>NONE</b>	NONE	NONE
Appearance	scalar	*Visual	NORML	<b>NORML</b>	NORML	NORML
Odor	scalar	*Visual	NORML	<b>NORML</b>	NORML	NORML
Emulsified Water	scalar	*Visual	>0.1	<b>NEG</b>	NEG	NEG

**FLUID CONDITION**

The AN level is acceptable for this fluid. The oil is still serviceable provided that the contaminant(s) can be reduced to acceptable levels.

Sodium	ppm	ASTM D5185m		<b>3</b>	<1	2
Boron	ppm	ASTM D5185m	40	<b>12</b>	15	15
Barium	ppm	ASTM D5185m		<b>&lt;1</b>	0	0
Molybdenum	ppm	ASTM D5185m		<b>0</b>	0	0
Manganese	ppm	ASTM D5185m		<b>0</b>	0	<1
Magnesium	ppm	ASTM D5185m		<b>0</b>	<1	0
Calcium	ppm	ASTM D5185m		<b>15</b>	21	15
Phosphorus	ppm	ASTM D5185m	270	<b>208</b>	226	214
Zinc	ppm	ASTM D5185m		<b>10</b>	11	8
Sulfur	ppm	ASTM D5185m	8600	<b>6670</b>	7355	7067
Acid Number (AN)	mg KOH/g	ASTM D8045	0.64	<b>0.61</b>	0.61	0.55
Visc @ 40°C	cSt	ASTM D445	209	<b>221</b>	222	221



Certificate L2367

Laboratory : WearCheck USA - 501 Madison Ave., Cary, NC 27513

Sample No. : MW0062358

Lab Number : 06151931

Unique Number : 10982009

Test Package : MAR 2 ( Additional Tests: PrtCount )

Received : 17 Apr 2024

Tested : 18 Apr 2024

Diagnosed : 18 Apr 2024 - Wes Davis

AMERICAN COMMERCIAL LINES

PO BOX 610, 1701 E. MARKET STREET

JEFFERSONVILLE, IN

US 47130

Contact: RONALD SCHNEIDER

ronald.schneider@bargaeacbl.com

T:

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)

F: (812)288-1644