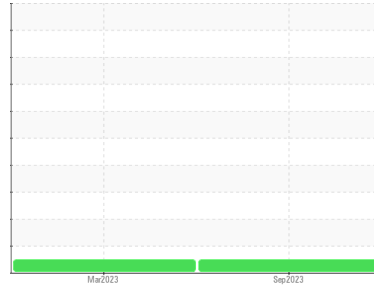




OIL ANALYSIS REPORT

Sample Rating Trend

NORMAL



Machine Id
PH601.052.13 (L.T.) STBD MAIN ENGINE (S/N 7914)

Component
Starboard Main Engine
Fluid
CASTROL MHP 154 (810 LTR)

DIAGNOSIS

Recommendation

Resample at the next service interval to monitor.

Wear

All component wear rates are normal. The direct-reading & analytical ferrographic results are normal indicating no abnormal wear in the system.

Contaminants

There is no indication of any contamination in the oil.

Oil 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		WC0797076	WC0797088	---
Sample Date	Client Info		15 Sep 2023	23 Mar 2023	---
Machine Age	hrs	Client Info	38500	37889	---
Oil Age	hrs	Client Info	0	0	---
Oil Changed	Client Info		Not Chngd	N/A	---
Sample Status			NORMAL	NORMAL	---

CONTAMINATION

	method	limit/base	current	history1	history2
Fuel	WC Method	>4.0	<1.0	<1.0	---
Glycol	WC Method		NEG	NEG	---

WEAR METALS

	method	limit/base	current	history1	history2
PQ	ASTM D8184*		0	0	---
Iron	ppm	ASTM D5185(m) >75	5	5	---
Chromium	ppm	ASTM D5185(m) >8	<1	<1	---
Nickel	ppm	ASTM D5185(m) >2	0	0	---
Titanium	ppm	ASTM D5185(m) >3	0	<1	---
Silver	ppm	ASTM D5185(m) >2	<1	0	---
Aluminum	ppm	ASTM D5185(m) >15	2	2	---
Lead	ppm	ASTM D5185(m) >18	<1	<1	---
Copper	ppm	ASTM D5185(m) >80	<1	0	---
Tin	ppm	ASTM D5185(m) >14	0	<1	---
Antimony	ppm	ASTM D5185(m)	0	<1	---
Vanadium	ppm	ASTM D5185(m)	0	0	---
Beryllium	ppm	ASTM D5185(m)	0	0	---
Cadmium	ppm	ASTM D5185(m)	0	0	---

ADDITIVES

	method	limit/base	current	history1	history2
Boron	ppm	ASTM D5185(m)	4	3	---
Barium	ppm	ASTM D5185(m)	<1	0	---
Molybdenum	ppm	ASTM D5185(m)	1	2	---
Manganese	ppm	ASTM D5185(m)	0	<1	---
Magnesium	ppm	ASTM D5185(m)	38	41	---
Calcium	ppm	ASTM D5185(m)	5330	5570	---
Phosphorus	ppm	ASTM D5185(m)	946	989	---
Zinc	ppm	ASTM D5185(m)	1011	1017	---
Sulfur	ppm	ASTM D5185(m)	10133	9934	---
Lithium	ppm	ASTM D5185(m)	<1	<1	---

CONTAMINANTS

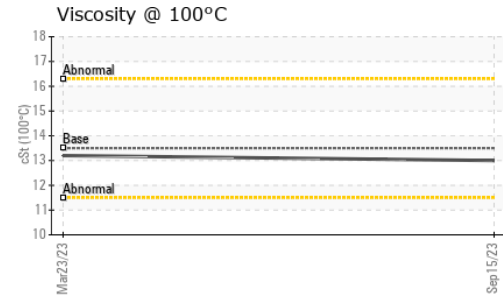
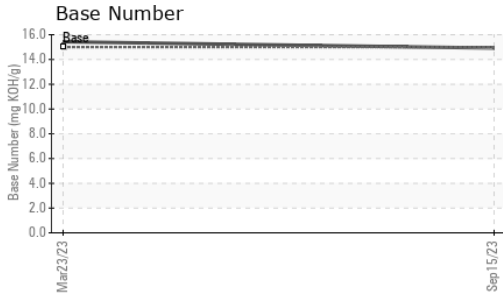
	method	limit/base	current	history1	history2
Silicon	ppm	ASTM D5185(m) >20	10	7	---
Sodium	ppm	ASTM D5185(m) >75	1	<1	---
Potassium	ppm	ASTM D5185(m) >20	0	1	---

INFRA-RED

	method	limit/base	current	history1	history2
Soot %	%	ASTM D7844*	0	0	---
Nitration	Abs/cm	ASTM D7624* >20	8.9	8.3	---
Sulfation	Abs./1mm	ASTM D7415* >30	14.4	21.5	---



OIL ANALYSIS REPORT

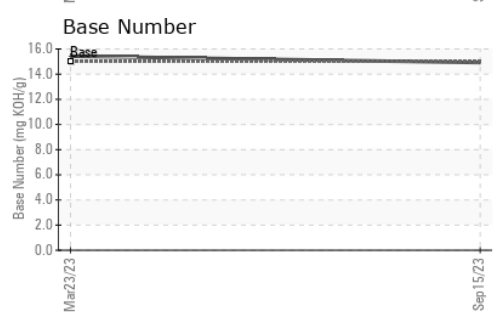
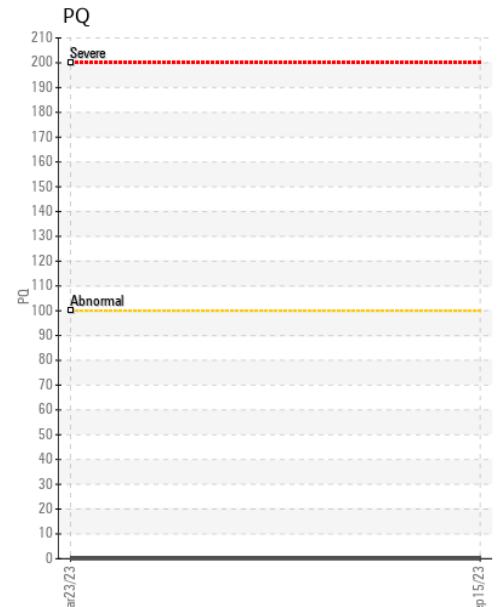
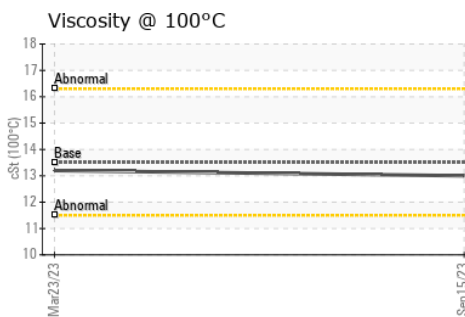
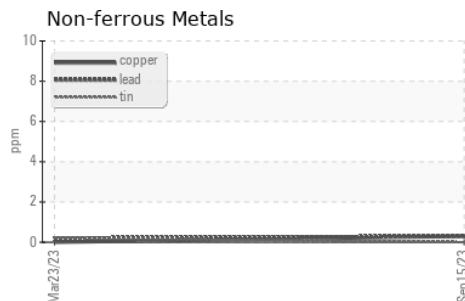
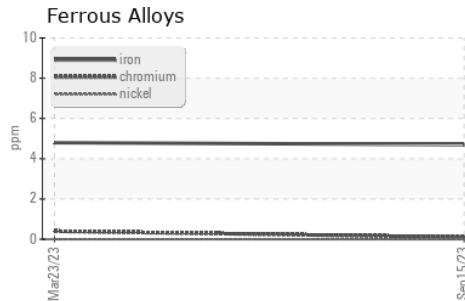


FLUID DEGRADATION		method	limit/base	current	history1	history2
Oxidation	Abs/.1mm	ASTM D7414*	>25	7.2	9.5	---
Base Number (BN)	mg KOH/g	ASTM D2896*	15.0	14.92	15.43	---

VISUAL		method	limit/base	current	history1	history2
White Metal	scalar	Visual*	NONE	VLITE	NONE	---
Yellow Metal	scalar	Visual*	NONE	NONE	NONE	---
Precipitate	scalar	Visual*	NONE	NONE	NONE	---
Silt	scalar	Visual*	NONE	NONE	NONE	---
Debris	scalar	Visual*	NONE	NONE	NONE	---
Sand/Dirt	scalar	Visual*	NONE	VLITE	NONE	---
Appearance	scalar	Visual*	NORML	NORML	NORML	---
Odor	scalar	Visual*	NORML	NORML	NORML	---
Emulsified Water	scalar	Visual*	>0.1	NEG	NEG	---
Free Water	scalar	Visual*		NEG	NEG	---

FLUID PROPERTIES		method	limit/base	current	history1	history2
Visc @ 100°C	cSt	ASTM D7279(m)	13.5	13.0	13.2	---

GRAPHS



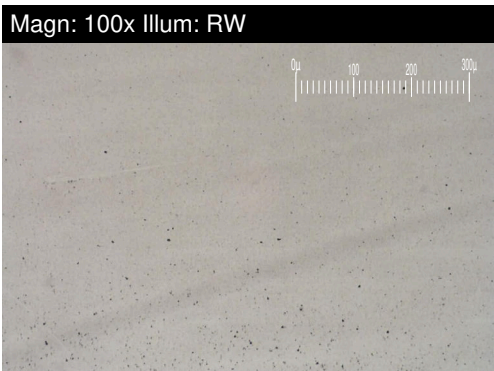
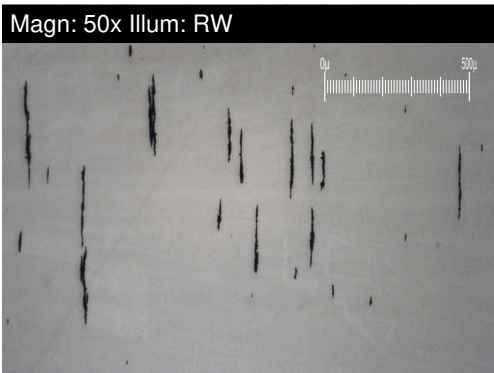
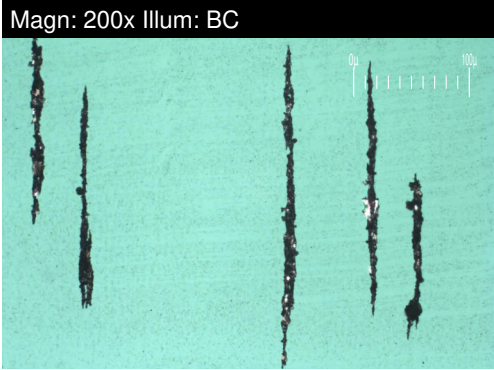
Laboratory : WearCheck - C8-1175 Appleby Line, Burlington, ON L7L 5H9
Sample No. : WC0797076 **Received** : 06 Oct 2023
Lab Number : **02587519** **Diagnosed** : 11 Oct 2023
Unique Number : 5656585 **Diagnostician** : Kevin Marson
Test Package : MAR 3 (Additional Tests: Visual)

CANSHIP UGLAND LTD.
 PLACENTIA HOPE, P.O. BOX 8274, STN. A
 ST. JOHN'S, NL
 CA A1B 3N4
 Contact: Don Gibbons
 dgibbons@canship.com
 T: (709)782-3333
 F: (709)782-0225

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.

FERROGRAPHY REPORT

Machine Id
PH601.052.13 (L.T.) STBD MAIN ENGINE (S/N 7914)
 Component
Starboard Main Engine
 Fluid
CASTROL MHP 154 (810 LTR)

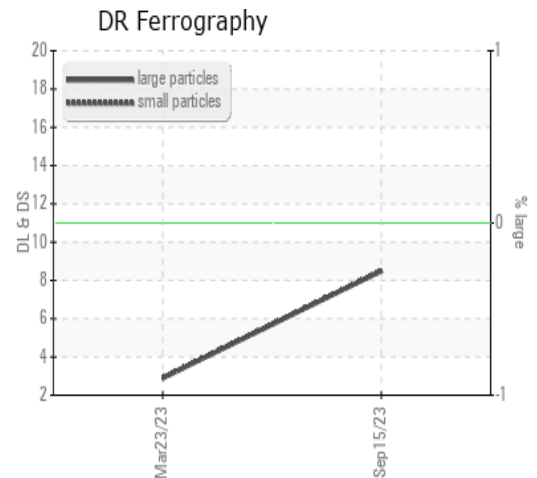


DR-FERROGRAPHY		method	limit/base	current	history1	history2
Large Particles		DR-Ferr*		8.5	2.9	---
Small Particles		DR-Ferr*		8.5	2.9	---
Total Particles		DR-Ferr*	>---	17	5.8	---
Large Particles Percentage	%	DR-Ferr*		0	0	---
Severity Index		DR-Ferr*		0	0	---

FERROGRAPHY		method	limit/base	current	history1	history2
Ferrous Rubbing	Scale 0-10	ASTM D7684*		3	1	
Ferrous Sliding	Scale 0-10	ASTM D7684*				
Ferrous Cutting	Scale 0-10	ASTM D7684*				
Ferrous Rolling	Scale 0-10	ASTM D7684*		1	1	
Ferrous Break-in	Scale 0-10	ASTM D7684*				
Ferrous Spheres	Scale 0-10	ASTM D7684*				
Ferrous Black Oxides	Scale 0-10	ASTM D7684*		1		
Ferrous Red Oxides	Scale 0-10	ASTM D7684*				
Ferrous Corrosive	Scale 0-10	ASTM D7684*				
Ferrous Other	Scale 0-10	ASTM D7684*				
Nonferrous Rubbing	Scale 0-10	ASTM D7684*				
Nonferrous Sliding	Scale 0-10	ASTM D7684*				
Nonferrous Cutting	Scale 0-10	ASTM D7684*				
Nonferrous Rolling	Scale 0-10	ASTM D7684*				
Nonferrous Other	Scale 0-10	ASTM D7684*				
Carbonaceous Material	Scale 0-10	ASTM D7684*				
Lubricant Degradation	Scale 0-10	ASTM D7684*				
Sand/Dirt	Scale 0-10	ASTM D7684*		1	1	
Fibres	Scale 0-10	ASTM D7684*				
Spheres	Scale 0-10	ASTM D7684*				
Other	Scale 0-10	ASTM D7684*		1	1	

WEAR

All component wear rates are normal. The direct-reading & analytical ferrographic results are normal indicating no abnormal wear in the system.



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