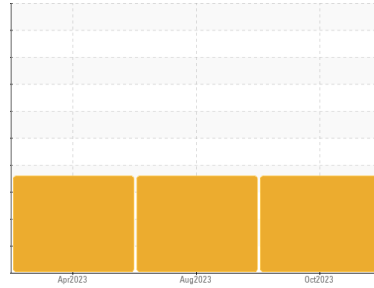




PROBLEM SUMMARY

Sample Rating Trend

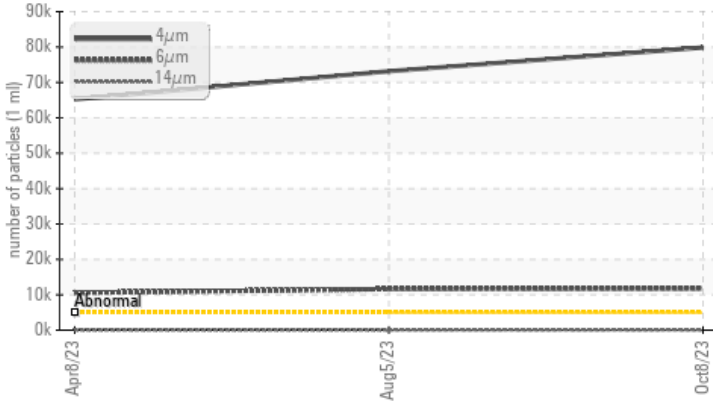
ISO



Area
Thrusters
 Machine Id
Bow Thruster
 Component
Center Bow Thruster
 Fluid
PETRO CANADA ENDURATEX EP 68 (--- GAL)

COMPONENT CONDITION SUMMARY

Particle Trend



RECOMMENDATION

Check seals and/or filters for points of contaminant entry. The air breather requires service. If unrated, we recommend that you replace with a suitable micron rated and/or desiccant air breather. If rated, we recommend that you service/replace the breather. The filter change at the time of sampling has been noted. Resample in 30-45 days to monitor this situation. NOTE: Please provide information regarding reservoir capacity, filter type and micron rating with next sample.

PROBLEMATIC TEST RESULTS

Sample Status			SEVERE	SEVERE	SEVERE
Particles >4µm	ASTM D7647	>5000	79880	73160	65241
Particles >6µm	ASTM D7647	>1300	11743	11615	10568
Oil Cleanliness	ISO 4406 (c)	>19/17/14	23/21/12	23/21/12	23/21/12

Customer Id: VMASSEY
 Sample No.: WC0848605
 Lab Number: 02588282
 Test Package: MAR 2



To manage this report scan the QR code

To discuss the diagnosis or test data:
 Wes Davis +1 905-569-8600 x223
wesd@wearcheck.ca

To change component or sample information:
 Gloria Gonzalez +1 (289)291-4643 x4643
gloria.gonzalez@wearcheck.com

RECOMMENDED ACTIONS

Action	Status	Date	Done By	Description
Resample	---	---	?	Resample in 30-45 days to monitor this situation.
Information Required	---	---	?	NOTE: Please provide information regarding reservoir capacity, filter type and micron rating with next sample.
Check Breathers	---	---	?	The air breather requires service. If unrated, we recommend that you replace with a suitable micron rated and/or desiccant air breather. If rated, we recommend that you service/replace the breather.
Check Seals	---	---	?	Check seals and/or filters for points of contaminant entry.

HISTORICAL DIAGNOSIS

05 Aug 2023 Diag: Wes Davis



Check seals and/or filters for points of contaminant entry. The air breather requires service. If unrated, we recommend that you replace with a suitable micron rated and/or desiccant air breather. If rated, we recommend that you service/replace the breather. We recommend you service the filters on this component. Resample in 30-45 days to monitor this situation. NOTE: Please provide information regarding reservoir capacity, filter type and micron rating with next sample. All component wear rates are normal. There is a high amount of silt (particulates < 14 microns in size) present in the oil. The AN level is acceptable for this fluid. The oil is still serviceable provided that the contaminant(s) can be reduced to acceptable levels.



08 Apr 2023 Diag: Wes Davis



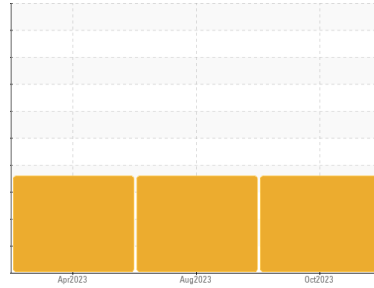
Check seals and/or filters for points of contaminant entry. The air breather requires service. If unrated, we recommend that you replace with a suitable micron rated and/or desiccant air breather. If rated, we recommend that you service/replace the breather. We recommend you service the filters on this component. Resample in 30-45 days to monitor this situation. NOTE: Please provide information regarding reservoir capacity, filter type and micron rating with next sample. All component wear rates are normal. There is a high amount of silt (particulates < 14 microns in size) present in the oil. The AN level is acceptable for this fluid. The oil is still serviceable provided that the contaminant(s) can be reduced to acceptable levels.





OIL ANALYSIS REPORT

Sample Rating Trend



ISO



Area
Thrusters
 Machine Id
Bow Thruster

Component
Center Bow Thruster
 Fluid

PETRO CANADA ENDURATEX EP 68 (--- GAL)

DIAGNOSIS

Recommendation

Check seals and/or filters for points of contaminant entry. The air breather requires service. If unrated, we recommend that you replace with a suitable micron rated and/or desiccant air breather. If rated, we recommend that you service/replace the breather. The filter change at the time of sampling has been noted. Resample in 30-45 days to monitor this situation. NOTE: Please provide information regarding reservoir capacity, filter type and micron rating with next sample.

Wear

All component wear rates are normal.

Contamination

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

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.

SAMPLE INFORMATION

	method	limit/base	current	history1	history2
Sample Number	Client Info		WC0848605	WC0810853	WC0763473
Sample Date	Client Info		08 Oct 2023	05 Aug 2023	08 Apr 2023
Machine Age	hrs	Client Info	22569	0	0
Oil Age	hrs	Client Info	50	0	0
Oil Changed	Client Info		Changed	Oil Added	N/A
Sample Status			SEVERE	SEVERE	SEVERE

WEAR METALS

	method	limit/base	current	history1	history2
Iron	ppm	ASTM D5185(m) >90	4	4	4
Chromium	ppm	ASTM D5185(m) >10	0	0	0
Nickel	ppm	ASTM D5185(m) >10	<1	<1	0
Titanium	ppm	ASTM D5185(m)	0	0	0
Silver	ppm	ASTM D5185(m)	<1	0	0
Aluminum	ppm	ASTM D5185(m) >10	<1	<1	<1
Lead	ppm	ASTM D5185(m) >20	<1	0	<1
Copper	ppm	ASTM D5185(m) >20	3	2	2
Tin	ppm	ASTM D5185(m) >15	0	0	0
Antimony	ppm	ASTM D5185(m)	0	0	0
Vanadium	ppm	ASTM D5185(m)	0	0	0
Beryllium	ppm	ASTM D5185(m)	0	0	0
Cadmium	ppm	ASTM D5185(m)	0	0	0

ADDITIVES

	method	limit/base	current	history1	history2
Boron	ppm	ASTM D5185(m) 69	63	63	62
Barium	ppm	ASTM D5185(m) 1	<1	0	0
Molybdenum	ppm	ASTM D5185(m) 1	0	0	0
Manganese	ppm	ASTM D5185(m) 1	0	0	0
Magnesium	ppm	ASTM D5185(m) 1	<1	<1	<1
Calcium	ppm	ASTM D5185(m) 1	3	3	1
Phosphorus	ppm	ASTM D5185(m) 246	251	268	275
Zinc	ppm	ASTM D5185(m) 1	6	8	5
Sulfur	ppm	ASTM D5185(m) 3670	4202	4245	4489
Lithium	ppm	ASTM D5185(m)	<1	1	<1

CONTAMINANTS

	method	limit/base	current	history1	history2
Silicon	ppm	ASTM D5185(m) >7	2	2	2
Sodium	ppm	ASTM D5185(m)	1	2	2
Potassium	ppm	ASTM D5185(m) >20	0	0	<1

FLUID CLEANLINESS

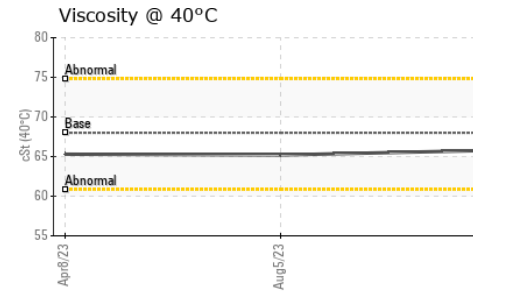
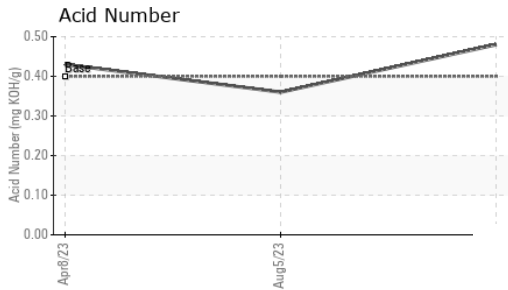
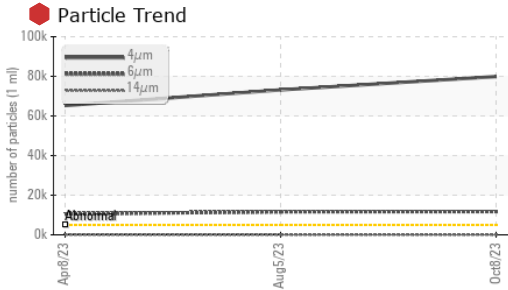
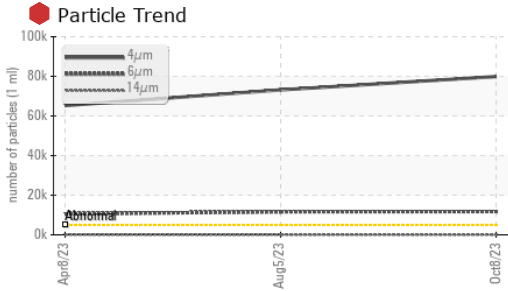
	method	limit/base	current	history1	history2
Particles >4µm	ASTM D7647	>5000	79880	73160	65241
Particles >6µm	ASTM D7647	>1300	11743	11615	10568
Particles >14µm	ASTM D7647	>160	29	34	29
Particles >21µm	ASTM D7647	>40	7	5	7
Particles >38µm	ASTM D7647	>10	5	1	4
Particles >71µm	ASTM D7647	>3	4	1	4
Oil Cleanliness	ISO 4406 (c)	>19/17/14	23/21/12	23/21/12	23/21/12

FLUID DEGRADATION

	method	limit/base	current	history1	history2
Acid Number (AN)	mg KOH/g	ASTM D974* 0.4	0.48	0.36	0.43



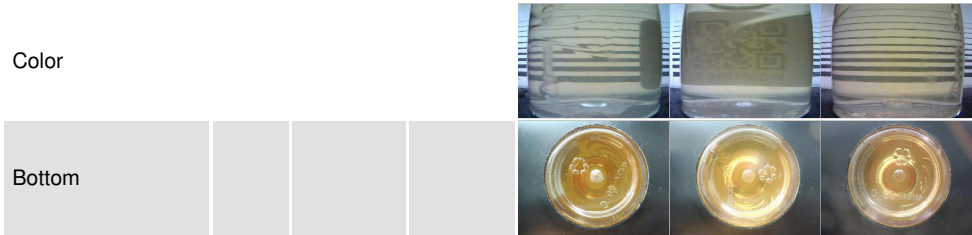
OIL ANALYSIS REPORT



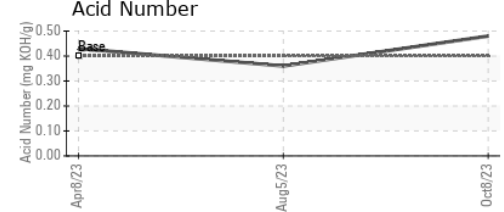
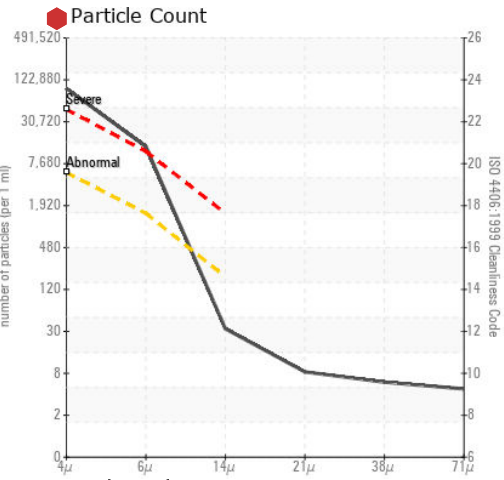
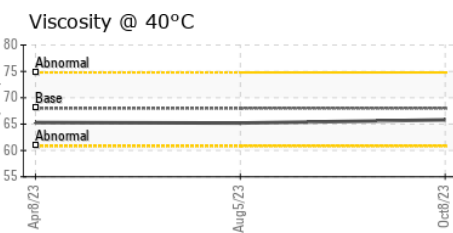
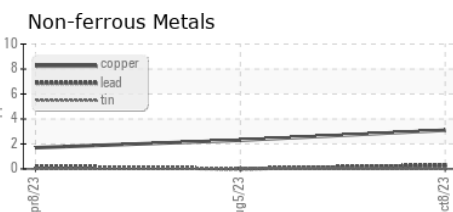
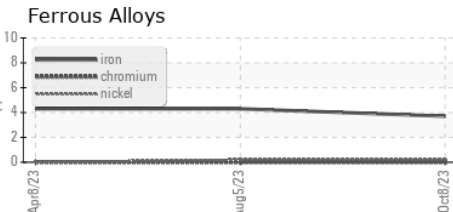
VISUAL	method	limit/base	current	history1	history2
White Metal	scalar	Visual*	NONE	NONE	NONE
Yellow Metal	scalar	Visual*	NONE	NONE	NONE
Precipitate	scalar	Visual*	NONE	NONE	NONE
Silt	scalar	Visual*	NONE	NONE	NONE
Debris	scalar	Visual*	NONE	NONE	NONE
Sand/Dirt	scalar	Visual*	NONE	NONE	NONE
Appearance	scalar	Visual*	NORML	NORML	NORML
Odor	scalar	Visual*	NORML	NORML	NORML
Emulsified Water	scalar	Visual*	>0.2	NEG	NEG
Free Water	scalar	Visual*		NEG	NEG

FLUID PROPERTIES	method	limit/base	current	history1	history2
Visc @ 40°C	cSt	ASTM D7279(m)	68.0	65.2	65.3

SAMPLE IMAGES	method	limit/base	current	history1	history2
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GRAPHS



Laboratory : WearCheck - C8-1175 Appleby Line, Burlington, ON L7L 5H9
Sample No. : WC0848605
Lab Number : 02588282
Unique Number : 5657348
Test Package : MAR 2 (Additional Tests: TAN Man)

Canadian Coast Guard
 CCGS Vincent Massey, 101 Boul. Champlain
 Quebec, QC
 CA G1K 7Y7
 Contact: Vincent Massey
 vincentmasseyse@ccgs-ngcc.gc.ca

Received : 11 Oct 2023
 Diagnosed : 12 Oct 2023
 Diagnostician : Wes Davis
 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.