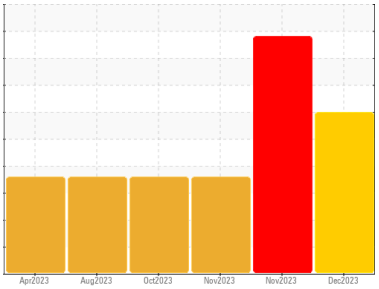
PROBLEM SUMMARY

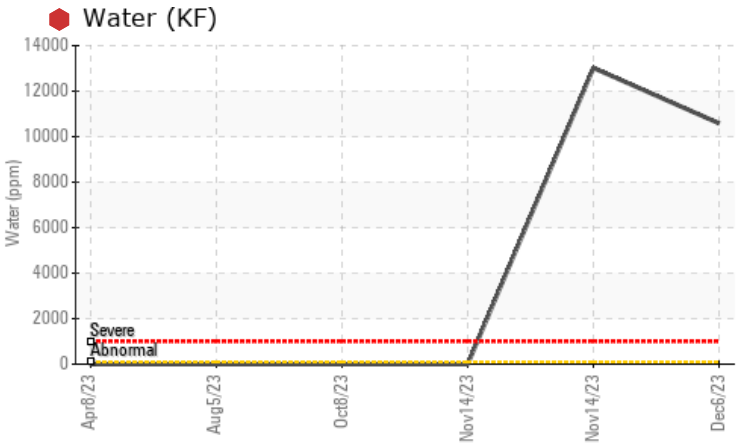
Sample Rating Trend

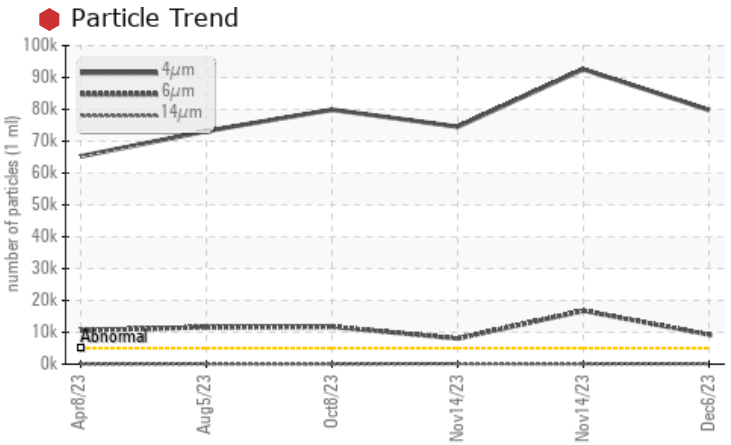


WATER

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

COMPONENT CONDITION SUMMARY





RECOMMENDATION

We advise that you check for the source of water entry. Check seals and/or filters for points of contaminant entry. We advise that you follow the water drain-off procedure for this component. 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. (Customer Sample Comment:
Top Up Amount: ~50-100L)

PROBLEMATIC TEST RESULTS

Sample Status				**SEVERE**	SEVERE	SEVERE
Water	%	ASTM D6304*	>0.2	**1.058**	1.302	---
ppm Water	ppm	ASTM D6304*		**10586**	13023	---
Particles >4µm		ASTM D7647	>5000	**79781**	74521	92585
Particles >6µm		ASTM D7647	>1300	**9243**	8031	16757
Oil Cleanliness		ISO 4406 (c)	>19/17/14	**23/20/13**	23/20/14	24/21/12
Appearance	scalar	Visual*	NORML	**MILKY**	MILKY	NORML
Emulsified Water	scalar	Visual*	>0.2	**.2%**	.2%	NEG

Customer Id: VMASSEY
Sample No.: WC0877831
Lab Number: 02602011
Test Package: MAR 2

To manage this report scan the QR code

To discuss the diagnosis or test data:
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Kevin.Marson@wearcheck.com

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
Change Filter	---	---	?	We recommend you service the filters on this component.
Water Drain-off	---	---	?	We advise that you follow the water drain-off procedure for this component.
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 Water Access	---	---	?	We advise that you check for the source of water entry.
Check Seals	---	---	?	Check seals and/or filters for points of contaminant entry.

HISTORICAL DIAGNOSIS

WATER

14 Nov 2023 Diag: Kevin Marson

We advise that you check for the source of water entry. Check seals and/or filters for points of contaminant entry. We advise that you follow the water drain-off procedure for this component. 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 advise that you use off-line filtration with water adsorbent filters to attempt to remove the water from this oil. 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. There is a high concentration of water present in the oil. Free water present. Abnormal water content and sodium(Na) level indicate possible sea water contamination. The AN level is acceptable for this fluid.

view report

ISO

14 Nov 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.

view report

ISO

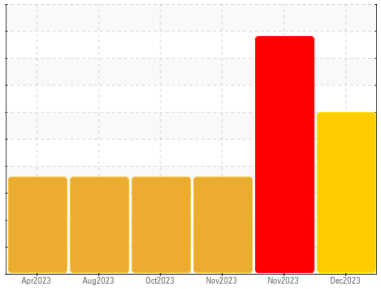
08 Oct 2023 Diag: Wes Davis

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. 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.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.

view report

OIL ANALYSIS REPORT

Sample Rating Trend



WATER

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

DIAGNOSIS

Recommendation

We advise that you check for the source of water entry. Check seals and/or filters for points of contaminant entry. We advise that you follow the water drain-off procedure for this component. 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. (Customer Sample Comment:
Top Up Amount: ~50-100L)

Wear

All component wear rates are normal.

Contamination

There is a high amount of silt (particulates < 14 microns in size) present in the oil. There is a high concentration of water 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		**WC0877831**	WC0848595	WC0848594
Sample Date		Client Info		**06 Dec 2023**	14 Nov 2023	14 Nov 2023
Machine Age	hrs	Client Info		**22720**	22659	22659
Oil Age	hrs	Client Info		**1000**	0	0
Oil Changed		Client Info		**Oil Added**	N/A	N/A
Sample Status				**SEVERE**	SEVERE	SEVERE

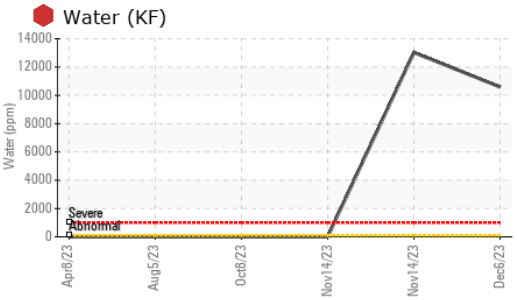
WEAR METALS		method	limit/base	current	history1	history2
Iron	ppm	ASTM D5185(m)	>90	**27**	23	4
Chromium	ppm	ASTM D5185(m)	>10	**0**	0	0
Nickel	ppm	ASTM D5185(m)	>10	**<1**	<1	<1
Titanium	ppm	ASTM D5185(m)		**0**	0	0
Silver	ppm	ASTM D5185(m)		**<1**	<1	<1
Aluminum	ppm	ASTM D5185(m)	>10	**<1**	<1	<1
Lead	ppm	ASTM D5185(m)	>20	**<1**	<1	<1
Copper	ppm	ASTM D5185(m)	>20	**4**	3	4
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

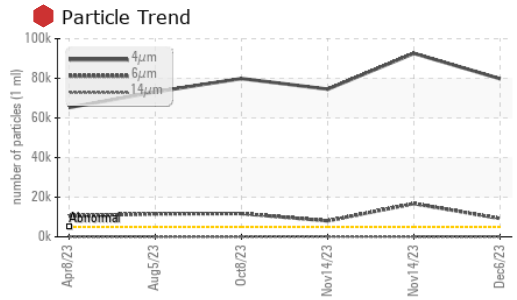
ADDITIVES		method	limit/base	current	history1	history2
Boron	ppm	ASTM D5185(m)	69	**53**	46	63
Barium	ppm	ASTM D5185(m)	1	**<1**	<1	<1
Molybdenum	ppm	ASTM D5185(m)	1	**0**	0	0
Manganese	ppm	ASTM D5185(m)	1	**0**	0	0
Magnesium	ppm	ASTM D5185(m)	1	**9**	12	<1
Calcium	ppm	ASTM D5185(m)	1	**8**	7	3
Phosphorus	ppm	ASTM D5185(m)	246	**246**	246	254
Zinc	ppm	ASTM D5185(m)	1	**13**	11	4
Sulfur	ppm	ASTM D5185(m)	3670	**4335**	4299	4195
Lithium	ppm	ASTM D5185(m)		**2**	2	<1

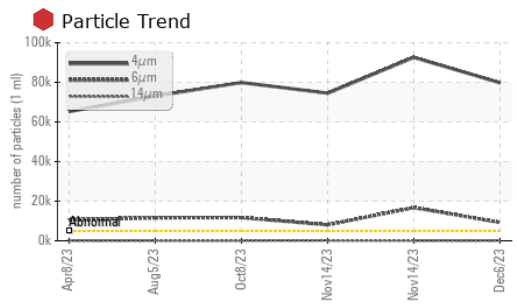
CONTAMINANTS		method	limit/base	current	history1	history2
Silicon	ppm	ASTM D5185(m)	>7	**3**	3	2
Sodium	ppm	ASTM D5185(m)		**60**	▲ 81	1
Potassium	ppm	ASTM D5185(m)	>20	**2**	3	<1
Water	%	ASTM D6304*	>0.2	**1.058**	1.302	---
ppm Water	ppm	ASTM D6304*		**10586**	13023	---

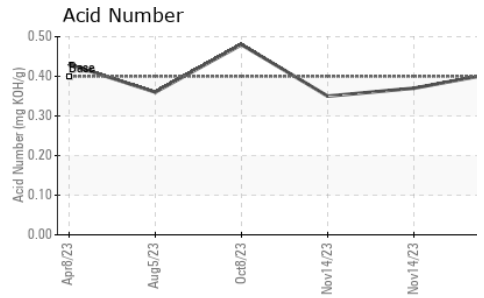
FLUID CLEANLINESS		method	limit/base	current	history1	history2
Particles >4µm		ASTM D7647	>5000	**79781**	74521	92585
Particles >6µm		ASTM D7647	>1300	**▲ 9243**	▲ 8031	16757
Particles >14µm		ASTM D7647	>160	**65**	113	36
Particles >21µm		ASTM D7647	>40	**9**	19	9
Particles >38µm		ASTM D7647	>10	**1**	4	6
Particles >71µm		ASTM D7647	>3	**1**	0	5
Oil Cleanliness		ISO 4406 (c)	>19/17/14	**23/20/13**	23/20/14	24/21/12

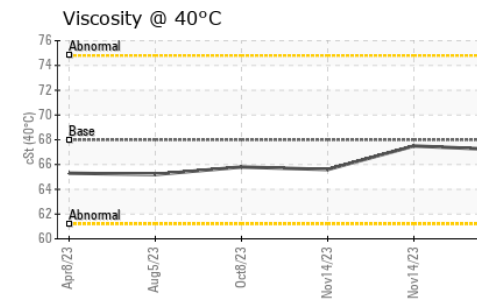
OIL ANALYSIS REPORT









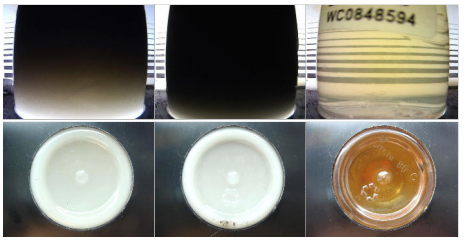


FLUID DEGRADATION		method	limit/base	current	history1	history2
Acid Number (AN)	mg KOH/g	ASTM D974*	0.4	**0.41**	0.37	0.35

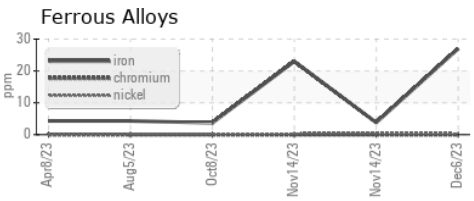
VISUAL		method	limit/base	current	history1	history2
White Metal	scalar	Visual*	NONE	**NONE**	NONE	NONE
Yellow Metal	scalar	Visual*	NONE	**NONE**	NONE	NONE
Precipitate	scalar	Visual*	NONE	**NONE**	NONE	NONE
Silt	scalar	Visual*	NONE	**NONE**	NONE	NONE
Debris	scalar	Visual*	NONE	**NONE**	VLITE	NONE
Sand/Dirt	scalar	Visual*	NONE	**NONE**	NONE	NONE
Appearance	scalar	Visual*	NORML	▲ **MILKY**	▲ MILKY	NORML
Odor	scalar	Visual*	NORML	**NORML**	NORML	NORML
Emulsified Water	scalar	Visual*	>0.2	▲ **.2%**	▲ .2%	NEG
Free Water	scalar	Visual*		**NEG**	▲ 1%	NEG

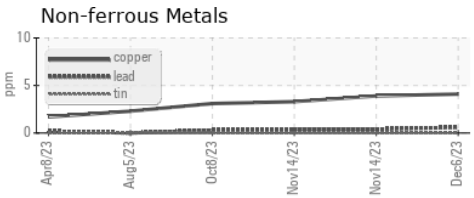
FLUID PROPERTIES		method	limit/base	current	history1	history2
Visc @ 40°C	cSt	ASTM D7279(m)	68.0	**67.2**	67.5	65.6

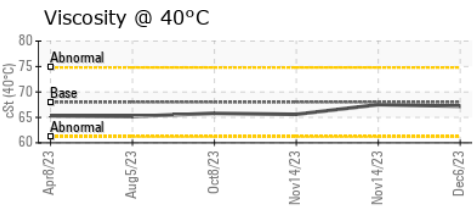
SAMPLE IMAGES	method	limit/base	current	history1	history2
Color					
Bottom					

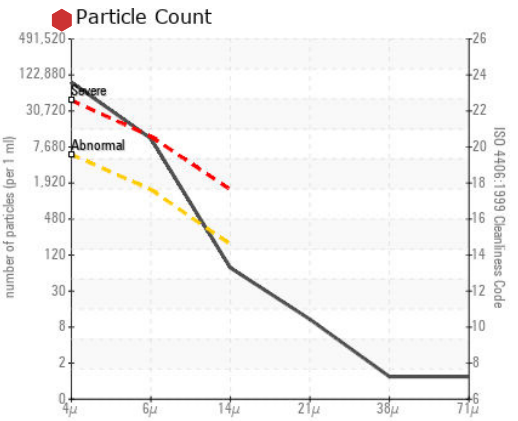


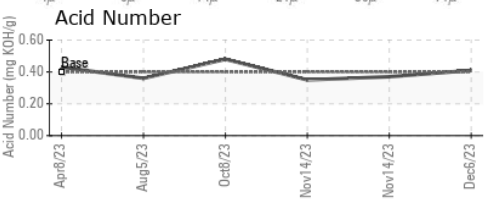
GRAPHS











ISO 17025:2017 Accredited Laboratory

Laboratory	: WearCheck - C8-1175 Appleby Line, Burlington, ON L7L 5H9		
Sample No.	: WC0877831	**Received**	: 08 Dec 2023
Lab Number	: 02602011	**Diagnosed**	: 11 Dec 2023
Unique Number	: 5695096	**Diagnostician**	: Kevin Marson
Test Package	: MAR 2 (Additional Tests: KF, TAN Man)		

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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