

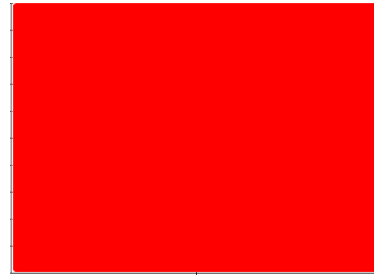


PROBLEM SUMMARY

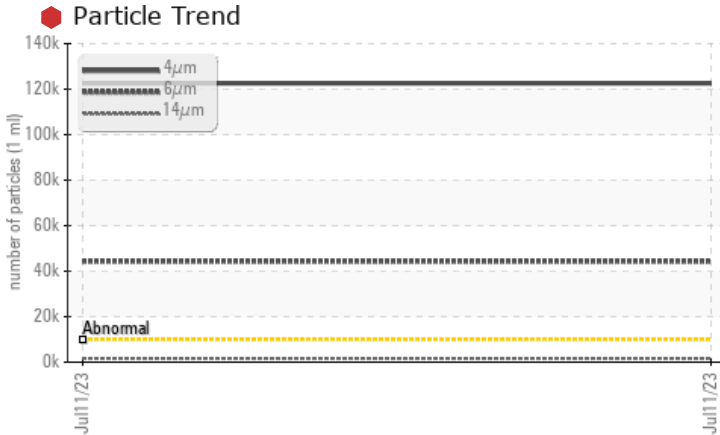
Sample Rating Trend

VISUAL METAL

Area
[1846352]
 Machine Id
UNIT 2 TURBINE GUIDE
 Component
Thrust Bearing
 Fluid
PETRO CANADA TURBOFLO XL46 (--- GAL)



COMPONENT CONDITION SUMMARY



RECOMMENDATION

We advise that you check all areas where contaminants can enter the system. We advise that you check for visible metal particles in the oil. Wear particles and/or ppm levels are abnormally high indicating the need to review OEM limits with attention to components that may generate this type of wear. Include all test results and maintenance activities that have been performed since the abnormal condition was first detected in this review. We advise that you perform a filter service, and use off-line filtration to improve the cleanliness of the system fluid. 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. Resample in 30-45 days to monitor this situation. Re-sampling is suggested to confirm test results prior to significant maintenance activities being performed. Please indicate that this is a resample on your Sample Information Form (SIF). NOTE: Please provide information regarding reservoir capacity, filter type and micron rating with next sample.

PROBLEMATIC TEST RESULTS

Sample Status				SEVERE	---	---
Particles >4µm	ASTM D7647	>10000	122525	---	---	---
Particles >6µm	ASTM D7647	>2500	44334	---	---	---
Particles >14µm	ASTM D7647	>160	1609	---	---	---
Particles >21µm	ASTM D7647	>40	229	---	---	---
Oil Cleanliness	ISO 4406 (c)	>20/18/14	24/23/18	---	---	---
White Metal	scalar	Visual*	NONE	LTMOD	---	---
PrtFilter					no image	no image

Customer Id: MUSHAP
 Sample No.: WC0412140
 Lab Number: 02609412
 Test Package: IND 2



To manage this report scan the QR code

To discuss the diagnosis or test data:
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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
Monitor	---	---	?	Wear particles and/or ppm levels are abnormally high indicating the need to review OEM limits with attention to components that may generate this type of wear. Include all test results and maintenance activities that have been performed since the abnormal condition was first detected in this review.
Change Filter	---	---	?	We advise that you perform a filter service, and use off-line filtration to improve the cleanliness of the system fluid.
Resample	---	---	?	Resample in 30-45 days to monitor this situation. Re-sampling is suggested to confirm test results prior to significant maintenance activities being performed. Please indicate that this is a resample on your Sample Information Form (SIF).
Alert	---	---	?	Wear particles and/or ppm levels are abnormally high indicating the need to review OEM limits with attention to components that may generate this type of wear. Include all test results and maintenance activities that have been performed since the abnormal condition was first detected in this review.
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 Dirt Access	---	---	?	We advise that you check all areas where contaminants can enter the system.
Check For Visual Metal	---	---	?	We advise that you check for visible metal particles in the oil.
Filter Fluid	---	---	?	We advise that you perform a filter service, and use off-line filtration to improve the cleanliness of the system fluid.

HISTORICAL DIAGNOSIS

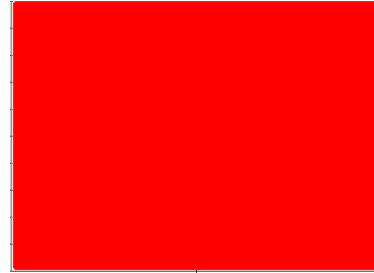


OIL ANALYSIS REPORT

Sample Rating Trend

VISUAL METAL

Area
[1846352]
 Machine Id
UNIT 2 TURBINE GUIDE
 Component
Thrust Bearing
 Fluid
PETRO CANADA TURBOFLO XL46 (--- GAL)



DIAGNOSIS

Recommendation

We advise that you check all areas where contaminants can enter the system. We advise that you check for visible metal particles in the oil. Wear particles and/or ppm levels are abnormally high indicating the need to review OEM limits with attention to components that may generate this type of wear. Include all test results and maintenance activities that have been performed since the abnormal condition was first detected in this review. We advise that you perform a filter service, and use off-line filtration to improve the cleanliness of the system fluid. 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. Resample in 30-45 days to monitor this situation. Re-sampling is suggested to confirm test results prior to significant maintenance activities being performed. Please indicate that this is a resample on your Sample Information Form (SIF). NOTE: Please provide information regarding reservoir capacity, filter type and micron rating with next sample.

Wear

Moderate concentration of visible metal present. Bearing wear is indicated.

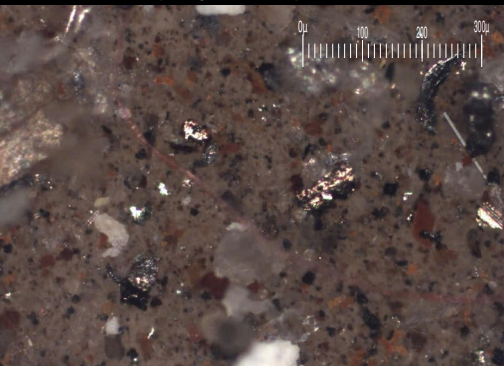
Contamination

There is a high amount of particulates (2 to 100 microns in size) present in the oil.

Fluid Condition

The AN level is acceptable for this fluid. The oil is no longer serviceable as a result of the abnormal and/or severe wear.

Particle Filter (Magn: 100 x)



SAMPLE INFORMATION

	method	limit/base	current	history1	history2
Sample Number	Client Info		WC0412140	---	---
Sample Date	Client Info		11 Jul 2023	---	---
Machine Age	hrs	Client Info	0	---	---
Oil Age	hrs	Client Info	0	---	---
Oil Changed	Client Info		N/A	---	---
Sample Status			SEVERE	---	---

CONTAMINATION

	method	limit/base	current	history1	history2
Water	WC Method	>2	NEG	---	---

WEAR METALS

	method	limit/base	current	history1	history2
Iron	ppm	ASTM D5185(m) >85	3	---	---
Chromium	ppm	ASTM D5185(m) >20	0	---	---
Nickel	ppm	ASTM D5185(m) >20	0	---	---
Titanium	ppm	ASTM D5185(m)	0	---	---
Silver	ppm	ASTM D5185(m)	0	---	---
Aluminum	ppm	ASTM D5185(m) >40	<1	---	---
Lead	ppm	ASTM D5185(m) >60	0	---	---
Copper	ppm	ASTM D5185(m) >7	<1	---	---
Tin	ppm	ASTM D5185(m) >40	2	---	---
Antimony	ppm	ASTM D5185(m)	0	---	---
Vanadium	ppm	ASTM D5185(m)	0	---	---
Beryllium	ppm	ASTM D5185(m)	0	---	---
Cadmium	ppm	ASTM D5185(m)	0	---	---

ADDITIVES

	method	limit/base	current	history1	history2
Boron	ppm	ASTM D5185(m)	0	---	---
Barium	ppm	ASTM D5185(m)	0	---	---
Molybdenum	ppm	ASTM D5185(m)	0	---	---
Manganese	ppm	ASTM D5185(m)	0	---	---
Magnesium	ppm	ASTM D5185(m)	1	---	---
Calcium	ppm	ASTM D5185(m)	2	---	---
Phosphorus	ppm	ASTM D5185(m)	8	---	---
Zinc	ppm	ASTM D5185(m) 0	7	---	---
Sulfur	ppm	ASTM D5185(m)	662	---	---
Lithium	ppm	ASTM D5185(m)	<1	---	---

CONTAMINANTS

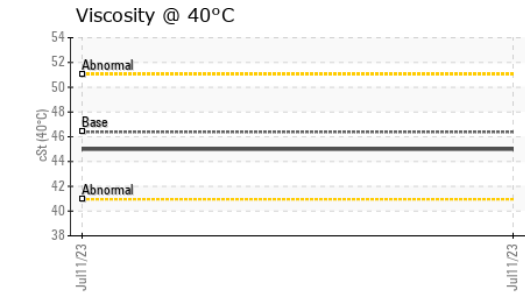
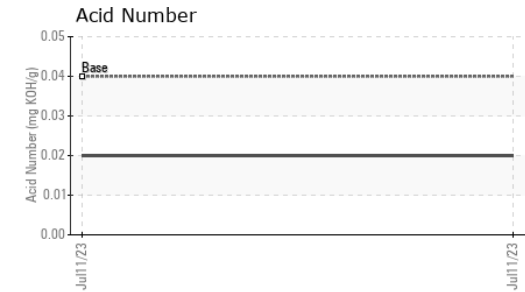
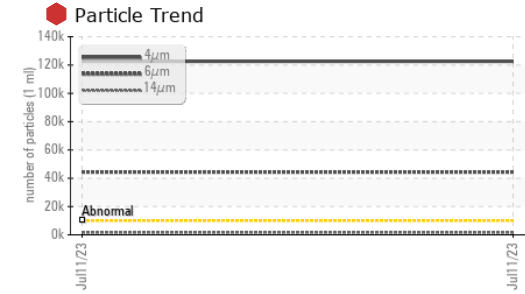
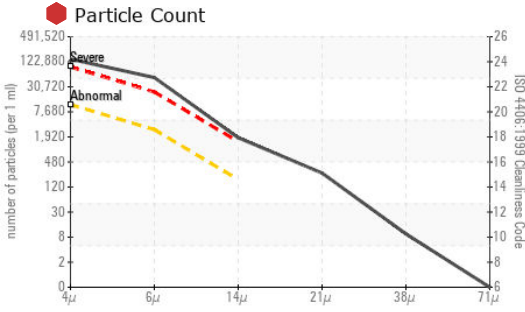
	method	limit/base	current	history1	history2
Silicon	ppm	ASTM D5185(m) >20	12	---	---
Sodium	ppm	ASTM D5185(m)	0	---	---
Potassium	ppm	ASTM D5185(m) >20	<1	---	---

FLUID CLEANLINESS

	method	limit/base	current	history1	history2
Particles >4µm	ASTM D7647	>10000	122525	---	---
Particles >6µm	ASTM D7647	>2500	44334	---	---
Particles >14µm	ASTM D7647	>160	1609	---	---
Particles >21µm	ASTM D7647	>40	229	---	---
Particles >38µm	ASTM D7647	>10	8	---	---
Particles >71µm	ASTM D7647	>3	0	---	---
Oil Cleanliness	ISO 4406 (c)	>20/18/14	24/23/18	---	---



OIL ANALYSIS REPORT



FLUID DEGRADATION		method	limit/base	current	history1	history2
Acid Number (AN)	mg KOH/g	ASTM D974*	0.04	0.02	---	---

VISUAL		method	limit/base	current	history1	history2
White Metal	scalar	Visual*	NONE	LTMOD	---	---
Yellow Metal	scalar	Visual*	NONE	NONE	---	---
Precipitate	scalar	Visual*	NONE	NONE	---	---
Silt	scalar	Visual*	NONE	VLITE	---	---
Debris	scalar	Visual*	NONE	NONE	---	---
Sand/Dirt	scalar	Visual*	NONE	NONE	---	---
Appearance	scalar	Visual*	NORML	NORML	---	---
Odor	scalar	Visual*	NORML	NORML	---	---
Emulsified Water	scalar	Visual*	>2	NEG	---	---
Free Water	scalar	Visual*		NEG	---	---

FLUID PROPERTIES		method	limit/base	current	history1	history2
Visc @ 40°C	cSt	ASTM D7279(m)	46.39	45.0	---	---

SAMPLE IMAGES		method	limit/base	current	history1	history2
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Color		no image	no image
Bottom		no image	no image
PrtFilter		no image	no image



Laboratory : WearCheck - C8-1175 Appleby Line, Burlington, ON L7L 5H9
Sample No. : WC0412140
Lab Number : **02609412**
Unique Number : 5710498
Test Package : IND 2 (Additional Tests: BottomAnalysis, FilterPatch, PrtCount, PrtFilter)

MUSKRAT FALLS CORPORATION
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 HAPPY VALLEY-GOOSE BAY, NL
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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.