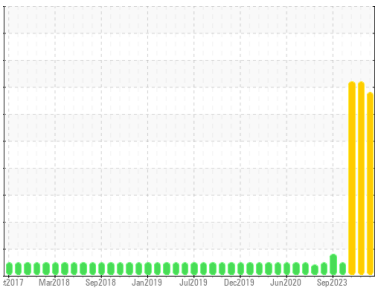
LUBE 360 DIAGNOSTICS

PROBLEM SUMMARY

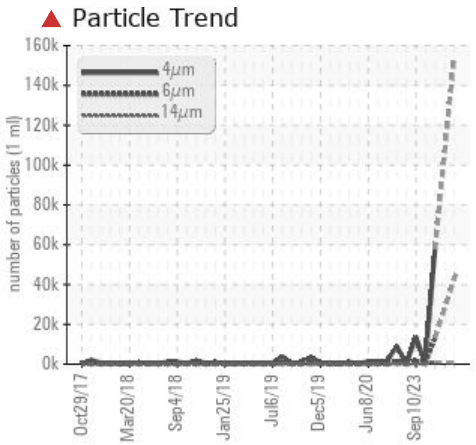
Sample Rating Trend

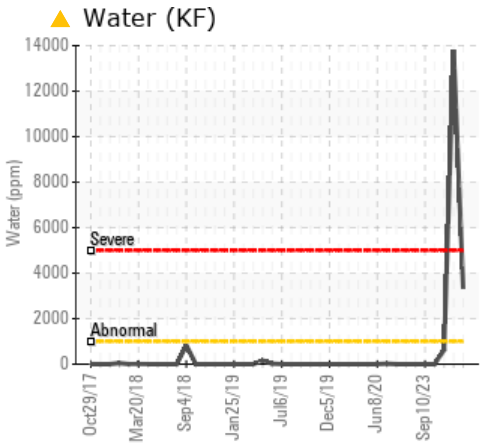


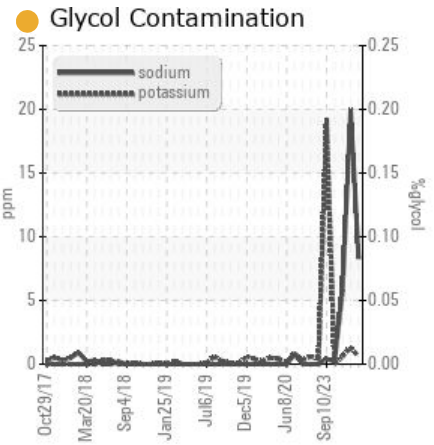
ISO

Area
Water Injection [450273732]
Machine Id
Pump Sea Water Injection (C) - Lube System (S/N Sample Tag PA-29002C-S1)
Component
Pump
Fluid
PETRO CANADA TURBOFLO 46 (1264 LTR)

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. 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. We recommend you service the filters on this component. Resample in 30-45 days to monitor this situation.

PROBLEMATIC TEST RESULTS

Sample Status				**SEVERE**	SEVERE	SEVERE
Water	%	ASTM D6304*	>.1	▲ **0.334**	▲ 1.379	0.062
ppm Water	ppm	ASTM D6304*	>1000	▲ **3341**	▲ 13790	629
Particles >6µm		ASTM D7647	>1300	▲ **42634**	---	▲ 13289
Particles >14µm		ASTM D7647	>160	▲ **705**	---	▲ 1010
Oil Cleanliness		ISO 4406 (c)	>--/17/14	▲ **24/23/17**	---	▲ 23/21/17
Appearance	scalar	Visual*	NORML	▲ **HAZY**	▲ WGOIL	▲ WGOIL
Emulsified Water	scalar	Visual*	>.1	▲ **.2%**	▲ .5%	.5%

Customer Id: TERHAM
Sample No.: PC
Lab Number: 02626074
Test Package: MAR 2

To manage this report scan the QR code

To discuss the diagnosis or test data:
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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.
Resample	---	---	?	Resample in 30-45 days to monitor this situation.
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.
Filter Fluid	---	---	?	We advise that you use off-line filtration with water adsorbent filters to attempt to remove the water from this oil.

HISTORICAL DIAGNOSIS

WATER

08 Feb 2024 Diag: Bill Quesnel

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. Confirm the source of the lubricant being utilized for top-up/fill. We recommend an early resample to monitor this condition. You have indicated that the oil has been changed to PETRO CANADA HYDREX AW 32, however, it appears that this is a sample of the previous fluid PETRO CANADA TURBOFLO 46.All component wear rates are normal. There is a high concentration of water present in the oil. Abnormal water content and sodium(Na) level and trace of magnesium and calcium indicate likely sea water contamination. Viscosity of sample indicates oil is within ISO 46 range, advise investigate. The AN level is acceptable for this fluid. The oil is no longer serviceable due to the presence of contaminants.

view report

ISO

19 Jan 2024 Diag: Kevin Marson

Check seals and/or filters for points of contaminant entry. We advise that you check all areas where contaminants can enter the system. 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 follow the water drain-off procedure for this component. We advise that you perform a filter service, and use off-line filtration to improve the cleanliness of the system fluid. Resample in 30-45 days to monitor this situation.All component wear rates are normal. There is a high amount of particulates (2 to 100 microns in size) present in the oil. Free water present. Abnormal water content and sodium(Na) level indicate possible sea water contamination. The system cleanliness code is much higher than the acceptable limit for the target ISO 4406 cleanliness code. The AN level is acceptable for this fluid.

view report

NORMAL

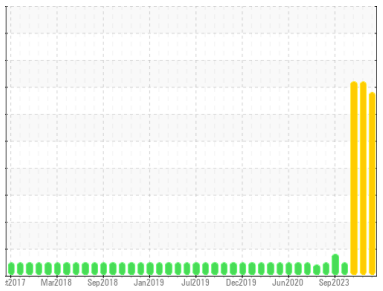
11 Oct 2023 Diag: Kevin Marson

Resample at the next service interval to monitor. Please contact your representative for information regarding the proper sampling kits for your service. NOTE: We recommend using IND 3 test kits, this testkit includes Analytical Ferrography which provides a detailed morphological analysis of wear particles present in the fluid.Component wear rates appear to be normal (unconfirmed). The system cleanliness is acceptable for your target ISO 4406 cleanliness code. The system and fluid cleanliness is acceptable. The AN level is acceptable for this fluid. The condition of the oil is suitable for further service.

view report

OIL ANALYSIS REPORT

Sample Rating Trend



ISO

Area
Water Injection [450273732]
Machine Id
Pump Sea Water Injection (C) - Lube System (S/N Sample Tag PA-29002C-S1)
Component
Pump
Fluid
PETRO CANADA TURBOFLO 46 (1264 LTR)

DIAGNOSIS

Recommendation

We advise that you check for the source of water entry. 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 advise that you use off-line filtration with water adsorbent filters to attempt to remove the water from this oil. We recommend you service the filters on this component. Resample in 30-45 days to monitor this situation.

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 moderate concentration of water present in the oil. Abnormal water content and sodium(Na) level indicate possible sea water contamination. The system cleanliness code is much higher than the acceptable limit for the target ISO 4406 cleanliness code.

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		**PC**	PC0076389	PC
Sample Date		Client Info		**13 Mar 2024**	08 Feb 2024	19 Jan 2024
Machine Age	hrs	Client Info		**0**	0	0
Oil Age	hrs	Client Info		**0**	0	0
Oil Changed		Client Info		**N/A**	N/A	N/A
Sample Status				**SEVERE**	SEVERE	SEVERE

WEAR METALS		method	limit/base	current	history1	history2
PQ		ASTM D8184*		**0**	0	0
Iron	ppm	ASTM D5185(m)	>75	**5**	4	2
Chromium	ppm	ASTM D5185(m)	>5	**0**	0	0
Nickel	ppm	ASTM D5185(m)		**0**	0	<1
Titanium	ppm	ASTM D5185(m)		**0**	0	0
Silver	ppm	ASTM D5185(m)		**0**	0	0
Aluminum	ppm	ASTM D5185(m)	>5	**0**	<1	<1
Lead	ppm	ASTM D5185(m)	>10	**0**	0	0
Copper	ppm	ASTM D5185(m)	>15	**<1**	<1	<1
Tin	ppm	ASTM D5185(m)		**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

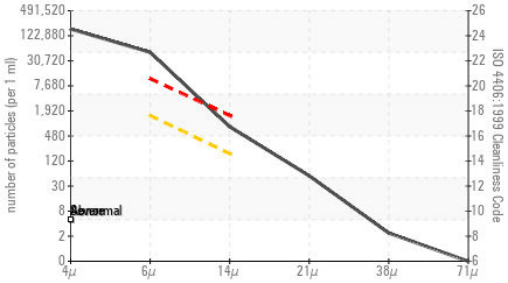
ADDITIVES		method	limit/base	current	history1	history2
Boron	ppm	ASTM D5185(m)	0	**<1**	<1	0
Barium	ppm	ASTM D5185(m)	0	**0**	0	0
Molybdenum	ppm	ASTM D5185(m)	0	**0**	0	0
Manganese	ppm	ASTM D5185(m)	0	**0**	0	0
Magnesium	ppm	ASTM D5185(m)	0	**2**	3	<1
Calcium	ppm	ASTM D5185(m)	0	**<1**	1	<1
Phosphorus	ppm	ASTM D5185(m)	110	**156**	165	160
Zinc	ppm	ASTM D5185(m)	0.0	**2**	2	1
Sulfur	ppm	ASTM D5185(m)		**241**	249	251
Lithium	ppm	ASTM D5185(m)		**<1**	<1	<1

CONTAMINANTS		method	limit/base	current	history1	history2
Silicon	ppm	ASTM D5185(m)	>20	**0**	<1	<1
Sodium	ppm	ASTM D5185(m)		**8**	20	6
Potassium	ppm	ASTM D5185(m)	>20	**<1**	1	<1
Water	%	ASTM D6304*	>.1	**0.334**	1.379	0.062
ppm Water	ppm	ASTM D6304*	>1000	**3341**	13790	629

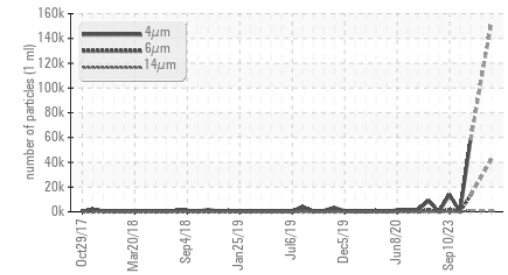
FLUID CLEANLINESS		method	limit/base	current	history1	history2
Particles >4µm		ASTM D7647		**154136**	---	57919
Particles >6µm		ASTM D7647	>1300	**42634**	---	13289
Particles >14µm		ASTM D7647	>160	**705**	---	1010
Particles >21µm		ASTM D7647	>40	**47**	---	167
Particles >38µm		ASTM D7647	>10	**2**	---	4
Particles >71µm		ASTM D7647	>3	**0**	---	0
Oil Cleanliness		ISO 4406 (c)	>--/17/14	**24/23/17**	---	23/21/17

OIL ANALYSIS REPORT

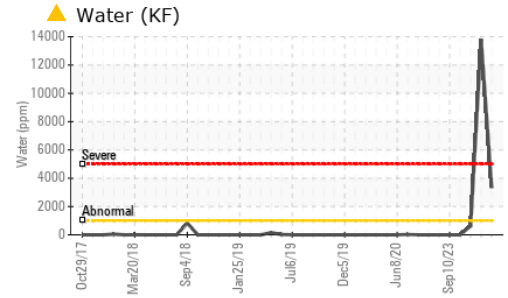
Particle Count



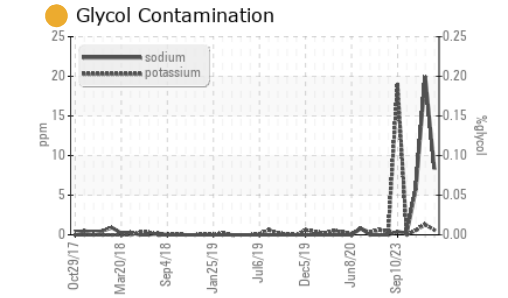
Particle Trend



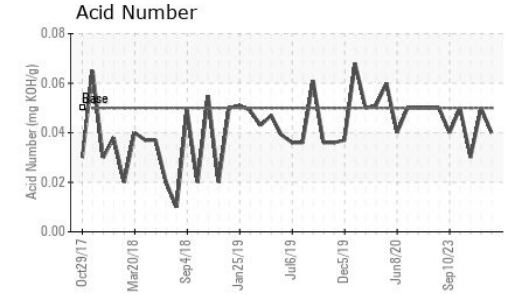
Water (KF)



Glycol Contamination



Acid Number



FLUID DEGRADATION		method	limit/base	current	history1	history2
Acid Number (AN)	mg KOH/g	ASTM D974*	0.05	**0.04**	0.05	0.03

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	**VLITE**	NONE	NONE
Silt	scalar	Visual*	NONE	**NONE**	NONE	NONE
Debris	scalar	Visual*	NONE	**NONE**	NONE	NONE
Sand/Dirt	scalar	Visual*	NONE	**VLITE**	NONE	NONE
Appearance	scalar	Visual*	NORML	▲ **HAZY**	▲ WGOIL	▲ WGOIL
Odor	scalar	Visual*	NORML	**NORML**	NORML	NORML
Emulsified Water	scalar	Visual*	>.1	▲ **.2%**	▲ .5%	.5%
Free Water	scalar	Visual*		**NEG**	NEG	▲ 1%

FLUID PROPERTIES		method	limit/base	current	history1	history2
Visc @ 40°C	cSt	ASTM D7279(m)	46.6	**45.7**	▲ 45.9	45.7
Visc @ 100°C	cSt	ASTM D7279(m)	7.04	**6.7**	5.7	6.7
Viscosity Index (VI)	Scale	ASTM D2270*	107	**98**	▲ 38	98

SAMPLE IMAGES	method	limit/base	current	history1	history2
Color					
Bottom					

ISO 17025:2017 Accredited Laboratory

Laboratory : WearCheck - C8-1175 Appleby Line, Burlington, ON L7L 5H9
Sample No. : PC
Lab Number : 02626074
Unique Number : 5759206
Test Package : MAR 2 (Additional Tests: KF, KV100, PQ, TAN Man, VI)
Received : 02 Apr 2024
Tested : 05 Apr 2024
Diagnosed : 05 Apr 2024 - Kevin Marson

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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