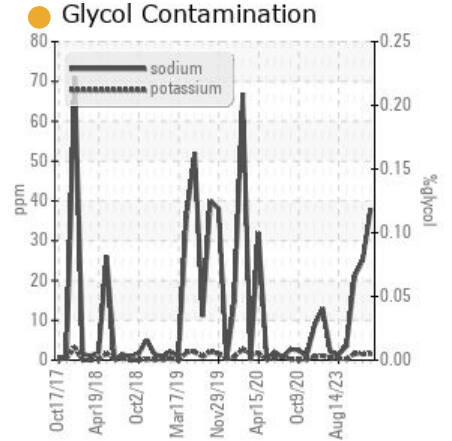
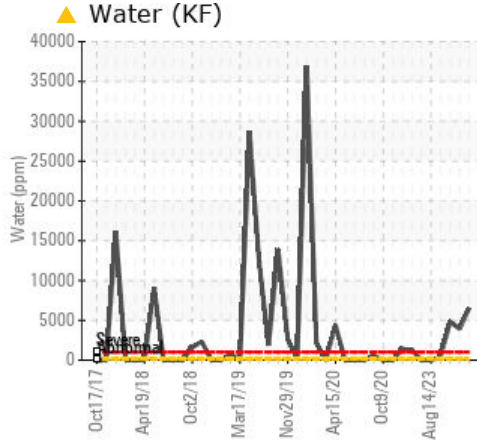
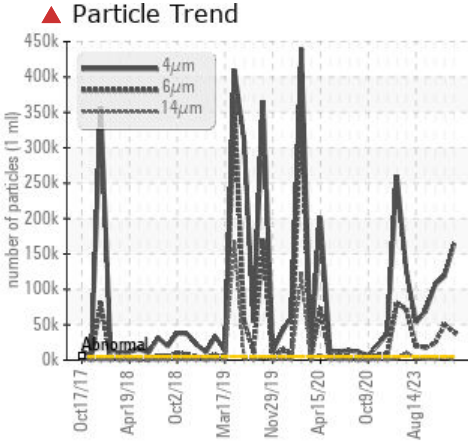


Area
Aft Machinery Space
Machine Id
Thruster Aft Center - Seal Oil System (S/N Sample Tag CL-06001-S3)
Component
Sealing System
Fluid
PETRO CANADA ENERGOL GR-XP ISO 150 (65 LTR)

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 recommend that you change the 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*		▲ 0.655	▲ 0.392	▲ 0.483
ppm Water	ppm	ASTM D6304*		▲ 6553	▲ 3923	▲ 4837
Particles >4µm		ASTM D7647	>5000	▲ 164408	▲ 119034	▲ 106205
Particles >6µm		ASTM D7647	>1300	▲ 39507	▲ 50347	▲ 24198
Oil Cleanliness		ISO 4406 (c)	>19/17/14	▲ 25/22/13	▲ 24/23/19	▲ 24/22/17
Precipitate	scalar	Visual*	NONE	▲ MODER	NONE	NONE
Appearance	scalar	Visual*	NORML	▲ WGOIL	▲ LAYRD	WGOIL
Emulsified Water	scalar	Visual*		▲ .5%	▲ 1%	▲ .5%
Free Water	scalar	Visual*		▲ >10%	▲ >10%	NEG
Viscosity Index (VI)	Scale	ASTM D2270*		▲ 75	▲ 175	87

Customer Id: TERHAM
Sample No.: PC
Lab Number: 02634783
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 Fluid	---	---	?	We recommend that you change the oil.
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.

HISTORICAL DIAGNOSIS

ISO



26 Feb 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 use off-line filtration with water adsorbent filters to attempt to remove the water from this fluid. We advise that you follow the water drain-off procedure for this component. 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 fluid. There is a moderate concentration of water present in the fluid. Free water present. The AN level is acceptable for this fluid.

view report



ISO



04 Jan 2024 Diag: Bill Quesnel

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 use off-line filtration with water adsorbent filters to attempt to remove the water from this fluid. 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 fluid. There is a moderate concentration of water present in the fluid. The AN level is acceptable for this fluid. The fluid is still serviceable provided that the contaminant(s) can be reduced to acceptable levels.

view report



ISO

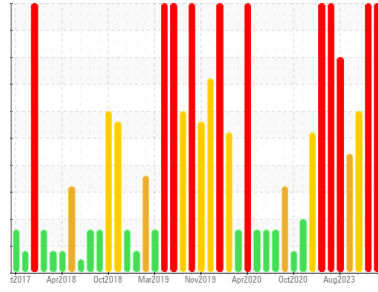


14 Sep 2023 Diag: Bill Quesnel

We advise that you check all areas where contaminants can enter the system. 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. All component wear rates are normal. There is a high amount of particulates (2 to 100 microns in size) present in the fluid. The water content is negligible. The AN level is acceptable for this fluid. The fluid is still serviceable provided that the contaminant(s) can be reduced to acceptable levels.

view report





Area

Aft Machinery Space

Machine Id
Thruster Aft Center - Seal Oil System (S/N Sample Tag CL-06001-S3)

Component

Sealing System

Fluid

PETRO CANADA ENERGOL GR-XP ISO 150 (65 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 recommend that you change the 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 fluid. There is a moderate concentration of water present in the fluid. Excessive free water present. Abnormal water content and sodium(Na) level indicate possible sea water contamination.

Fluid Condition

The white residue present in the sample is fluid additive precipitate. The AN level is acceptable for this fluid. The fluid is no longer serviceable due to the presence of contaminants.

SAMPLE INFORMATION

method	limit/base	current	history1	history2
Sample Number	Client Info	PC	PC0082728	PC
Sample Date	Client Info	21 Apr 2024	26 Feb 2024	04 Jan 2024
Machine Age	hrs	0	0	0
Oil Age	hrs	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) >100	13	14	15
Chromium	ppm	ASTM D5185(m) >3	<1	<1	<1
Nickel	ppm	ASTM D5185(m) >8	0	<1	<1
Titanium	ppm	ASTM D5185(m)	0	0	0
Silver	ppm	ASTM D5185(m)	0	0	0
Aluminum	ppm	ASTM D5185(m) >3	<1	<1	<1
Lead	ppm	ASTM D5185(m)	0	0	0
Copper	ppm	ASTM D5185(m) >3	<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)	1	<1	<1
Barium	ppm	ASTM D5185(m)	0	0	0
Molybdenum	ppm	ASTM D5185(m)	0	0	0
Manganese	ppm	ASTM D5185(m)	0	0	0
Magnesium	ppm	ASTM D5185(m)	6	4	4
Calcium	ppm	ASTM D5185(m)	6	5	6
Phosphorus	ppm	ASTM D5185(m)	111	138	173
Zinc	ppm	ASTM D5185(m)	8	12	10
Sulfur	ppm	ASTM D5185(m)	7679	8434	8297
Lithium	ppm	ASTM D5185(m)	<1	<1	<1

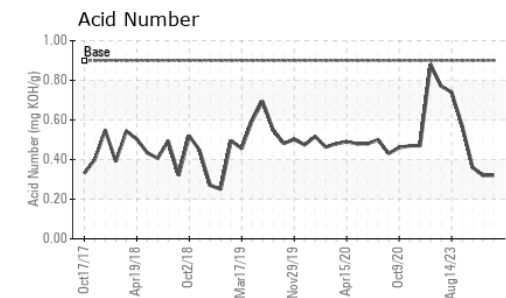
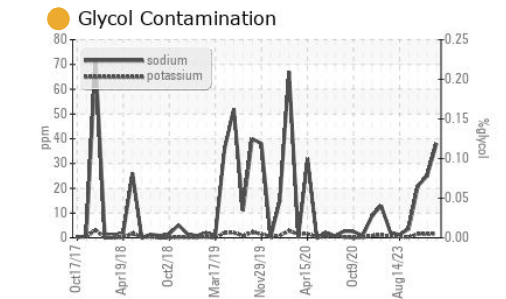
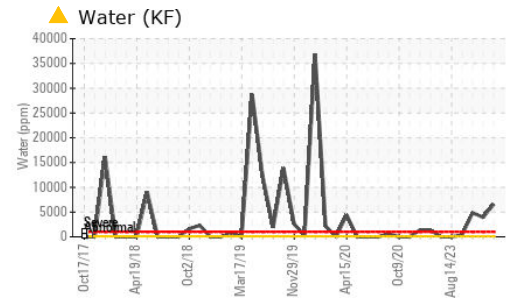
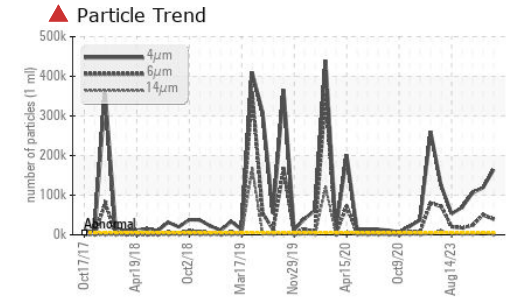
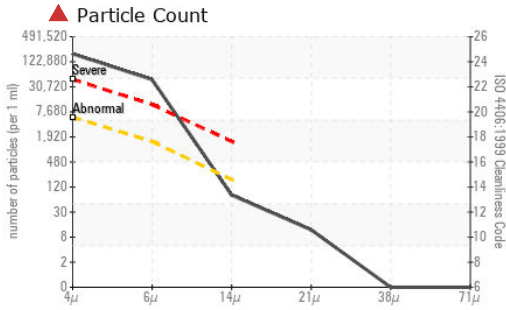
CONTAMINANTS

method	limit/base	current	history1	history2	
Silicon	ppm	ASTM D5185(m) >25	2	4	4
Sodium	ppm	ASTM D5185(m)	38	25	21
Potassium	ppm	ASTM D5185(m) >20	2	2	2
Water	%	ASTM D6304*	0.655	0.392	0.483
ppm Water	ppm	ASTM D6304*	6553	3923	4837

FLUID CLEANLINESS

method	limit/base	current	history1	history2	
Particles >4µm	ASTM D7647	>5000	164408	119034	106205
Particles >6µm	ASTM D7647	>1300	39507	50347	24198
Particles >14µm	ASTM D7647	>160	68	4544	946
Particles >21µm	ASTM D7647	>40	10	553	144
Particles >38µm	ASTM D7647	>10	0	7	2
Particles >71µm	ASTM D7647	>3	0	2	0
Oil Cleanliness	ISO 4406 (c)	>19/17/14	25/22/13	24/23/19	24/22/17

OIL ANALYSIS REPORT

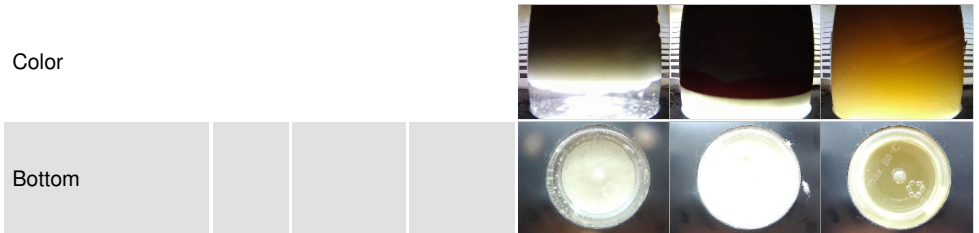


FLUID DEGRADATION		method	limit/base	current	history1	history2
Acid Number (AN)	mg KOH/g	ASTM D974*	0.9	0.32	0.32	0.36

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	▲ MODER	NONE	NONE
Silt	scalar	Visual*	NONE	NONE	NONE	NONE
Debris	scalar	Visual*	NONE	NONE	NONE	NONE
Sand/Dirt	scalar	Visual*	NONE	NONE	NONE	NONE
Appearance	scalar	Visual*	NORML	▲ WGOIL	▲ LAYRD	WGOIL
Odor	scalar	Visual*	NORML	NORML	NORML	NORML
Emulsified Water	scalar	Visual*		▲ .5%	▲ 1%	▲ .5%
Free Water	scalar	Visual*		▲ >10%	▲ >10%	NEG

FLUID PROPERTIES		method	limit/base	current	history1	history2
Visc @ 40°C	cSt	ASTM D7279(m)	149	143	143	142
Visc @ 100°C	cSt	ASTM D7279(m)	14.5	12.7	21.4	13.4
Viscosity Index (VI)	Scale	ASTM D2270*		▲ 75	▲ 175	87

SAMPLE IMAGES



Laboratory : WearCheck - C8-1175 Appleby Line, Burlington, ON L7L 5H9
Sample No. : PC
Lab Number : 02634783
Unique Number : 5775936
Test Package : MAR 2 (Additional Tests: Bottom, KF, KV100, PQ, PrtCount, TAN Man, VI)

Suncor - Terra Nova Projects
 Scotia Centre, 235 Water Street
 St. John's, NL
 CA A1C 1B6
 Contact: Josh Hynes
 joshynes@suncor.com
 T: (709)778-3575
 F: (709)724-2835

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.