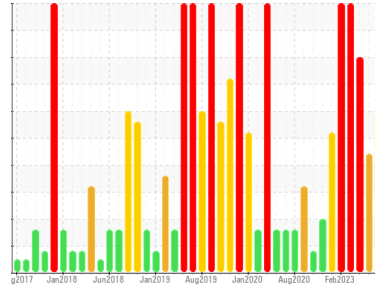
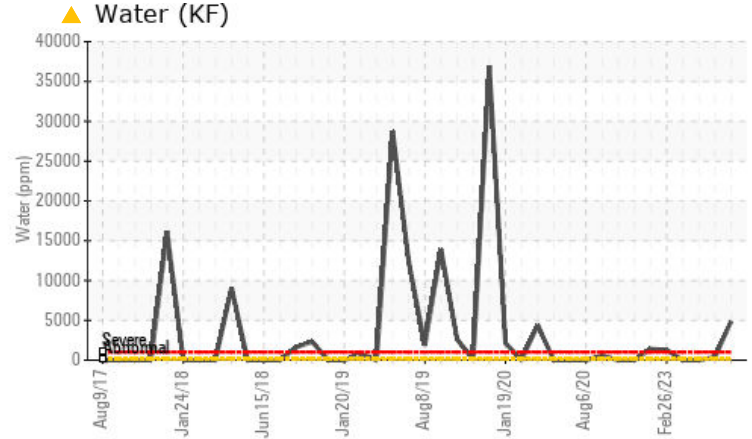
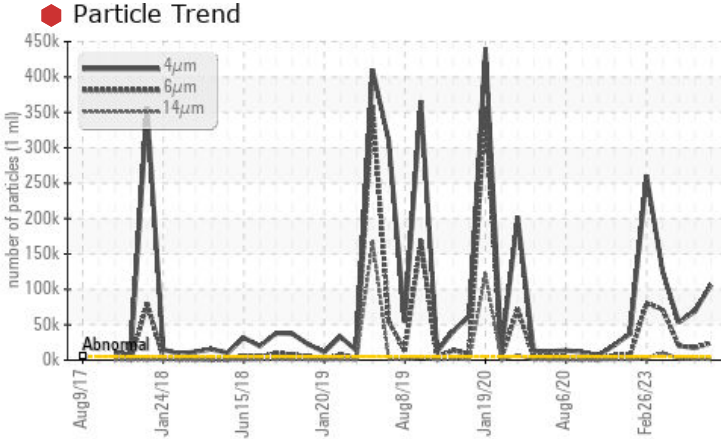




Area
Aft Machinery Space
Machine Id
Thruster Aft Center - Seal Oil System (S/N Sample Tag CL-06001-S3)
Component
Sealing System
Fluid
PETRO CANADA ENERGOL GR-XP ISO 150 (65 LTR)



COMPONENT CONDITION SUMMARY



RECOMMENDATION

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.

PROBLEMATIC TEST RESULTS

Sample Status			SEVERE	SEVERE	SEVERE
Water	%	ASTM D6304*	▲ 0.483	0.037	---
ppm Water	ppm	ASTM D6304*	▲ 4837	379.2	---
Particles >4µm		ASTM D7647 >5000	● 106205	● 69020	● 53288
Particles >6µm		ASTM D7647 >1300	● 24198	● 17397	● 20211
Particles >14µm		ASTM D7647 >160	▲ 946	▲ 1143	● 2241
Particles >21µm		ASTM D7647 >40	▲ 144	▲ 239	● 710
Oil Cleanliness		ISO 4406 (c) >19/17/14	● 24/22/17	● 23/21/17	● 23/22/18
Emulsified Water	scalar	Visual*	▲ .5%	.2%	NEG

Customer Id: TERHAM
Sample No.: PC
Lab Number: 02611253
Test Package: MAR 2



To manage this report scan the QR code

To discuss the diagnosis or test data:
Bill Quesnel CLS,OMA II,MLA-III,LLA-I +1
(289)291-4641 x4641
Bill.Quesnel@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 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.
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 Seals	---	---	?	Check seals and/or filters for points of contaminant entry.
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

14 Sep 2023 Diag: Bill Quesnel

ISO



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



14 Aug 2023 Diag: Kevin Marson

ISO



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 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



31 Mar 2023 Diag: Kevin Marson

ISO

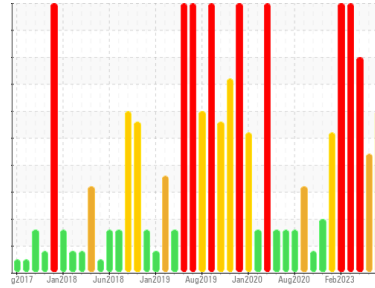


We advise that you check all areas where contaminants can enter the system. We advise that you perform a filter service, and use off-line filtration to improve the cleanliness of the system fluid. The air breather requires service. If unrated, we recommend that you replace with a suitable micron rated 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 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
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.

Wear
All component wear rates are normal.

Contamination
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.

Fluid Condition
The AN level is acceptable for this fluid. The fluid 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	PC	PC
Sample Date	Client Info	04 Jan 2024	14 Sep 2023	14 Aug 2023
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	15	36	21
Chromium	ppm ASTM D5185(m) >3	<1	<1	<1
Nickel	ppm ASTM D5185(m) >8	<1	<1	<1
Titanium	ppm ASTM D5185(m)	0	0	0
Silver	ppm ASTM D5185(m)	0	<1	<1
Aluminum	ppm ASTM D5185(m) >3	<1	<1	<1
Lead	ppm ASTM D5185(m)	0	<1	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	2	3
Barium	ppm ASTM D5185(m)	0	<1	0
Molybdenum	ppm ASTM D5185(m)	0	0	<1
Manganese	ppm ASTM D5185(m)	0	0	<1
Magnesium	ppm ASTM D5185(m)	4	4	<1
Calcium	ppm ASTM D5185(m)	6	7	4
Phosphorus	ppm ASTM D5185(m)	173	253	314
Zinc	ppm ASTM D5185(m)	10	14	12
Sulfur	ppm ASTM D5185(m)	8297	9395	9717
Lithium	ppm ASTM D5185(m)	<1	<1	<1

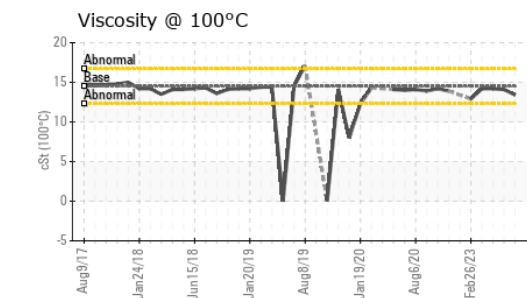
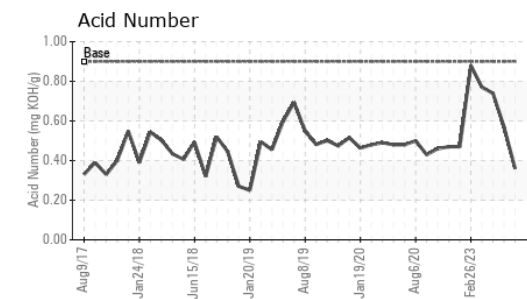
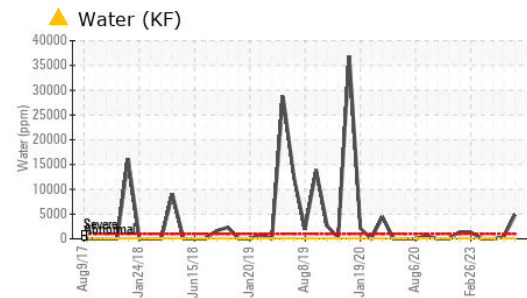
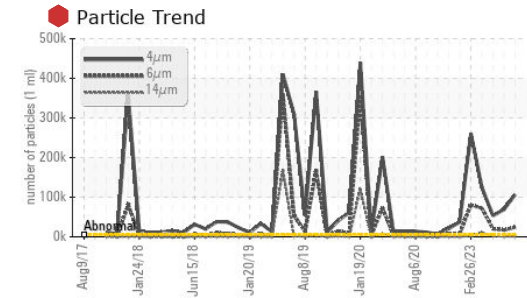
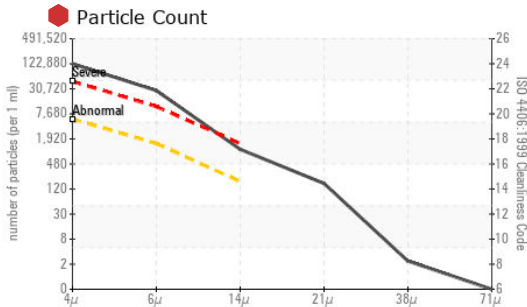
CONTAMINANTS

method	limit/base	current	history1	history2
Silicon	ppm ASTM D5185(m) >25	4	16	3
Sodium	ppm ASTM D5185(m)	21	4	1
Potassium	ppm ASTM D5185(m) >20	2	<1	<1
Water	% ASTM D6304*	▲ 0.483	0.037	---
ppm Water	ppm ASTM D6304*	▲ 4837	379.2	---

FLUID CLEANLINESS

method	limit/base	current	history1	history2
Particles >4µm	ASTM D7647 >5000	● 106205	● 69020	● 53288
Particles >6µm	ASTM D7647 >1300	● 24198	● 17397	● 20211
Particles >14µm	ASTM D7647 >160	▲ 946	▲ 1143	● 2241
Particles >21µm	ASTM D7647 >40	▲ 144	▲ 239	● 710
Particles >38µm	ASTM D7647 >10	2	3	▲ 20
Particles >71µm	ASTM D7647 >3	0	1	1
Oil Cleanliness	ISO 4406 (c) >19/17/14	● 24/22/17	● 23/21/17	● 23/22/18

OIL ANALYSIS REPORT

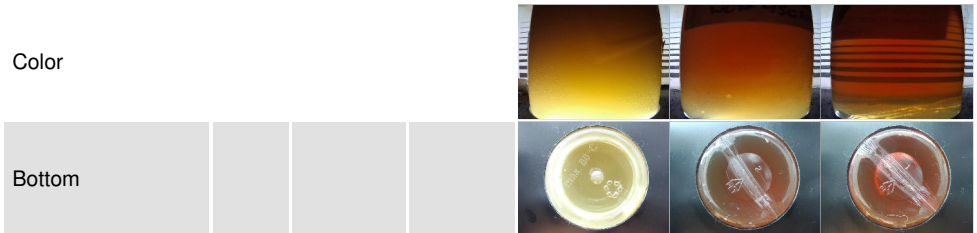


FLUID DEGRADATION		method	limit/base	current	history1	history2
Acid Number (AN)	mg KOH/g	ASTM D974*	0.9	0.36	0.57	0.74

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

FLUID PROPERTIES		method	limit/base	current	history1	history2
Visc @ 40°C	cSt	ASTM D7279(m)	149	142	144	144
Visc @ 100°C	cSt	ASTM D7279(m)	14.5	13.4	14.1	14.2
Viscosity Index (VI)	Scale	ASTM D2270*		87	94	95

SAMPLE IMAGES



ISO 17025:2017
Accredited
Laboratory

Laboratory : WearCheck - C8-1175 Appleby Line, Burlington, ON L7L 5H9
Sample No. : PC
Lab Number : **02611253**
Unique Number : 5720348
Test Package : MAR 2 (Additional Tests: KF, KV100, PQ, PrtCount, TAN Man, VI)
Received : 25 Jan 2024
Diagnosed : 29 Jan 2024
Diagnostician : Bill Quesnel

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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